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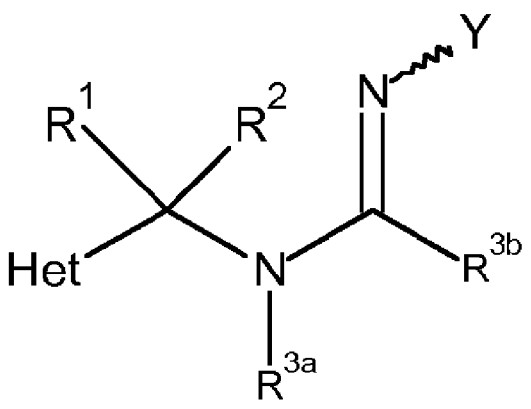
(54) Title: N-ACYLAMIDINE COMPOUNDS

(I)



(57) Abstract: The present invention relates to N-substituted imino compound formula (I):wherein The invention also relates to the use of the N-acylimino heterocyclic compounds, their stereoisomers, their tautomers and their salts, for combating invertebrate pests. Furthermore the invention relates also to methods of combating invertebrate pests, which comprises applying such compounds.

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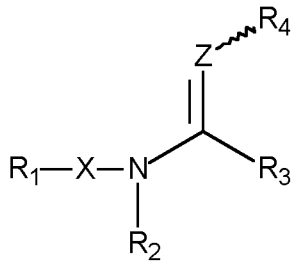
N-acylamidine compounds

The present invention relates to N,N'-substituted amidinecompounds of the formula (I) as defined herein, including their stereoisomers, tautomers and salts, and to compositions comprising such compounds. The invention also relates to the use of the N,N'-substituted amidinecompounds of the formula (I), their stereoisomers, their tautomers and their salts, for combating invertebrate pests. Furthermore the invention relates also to methods of combating invertebrate pests, which comprises applying such N,N'-substituted amidinecompounds.

Background of Invention

Invertebrate pests, such as insects, acaridae and nematode pests destroy growing and harvested crops and attack wooden dwelling and commercial structures, causing large economic loss to the food supply and to property. While a large number of pesticidal agents are known, due to the ability of target pests to develop resistance to said agents, there is an ongoing need for new agents for combating animal pests. In particular, animal pests such as insects and acaridae are difficult to be effectively controlled.

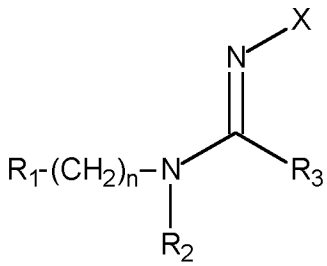
WO 91/04965 describes insecticidally active amidine compounds of the formula A,



(A)

wherein R_1 is a heterocyclic radical, X represents optionally substituted alkylene or alkylidene, R_2 is, inter alia, hydrogen, alkyl, carbamoyl, R_3 is, inter alia, optionally substituted alkyl, alkenyl, alkynyl or cycloalkyl, Z represents N or CH and R_4 is cyano or nitro.

EP 376 279 describes insecticidally active guanidine derivatives of the formula B

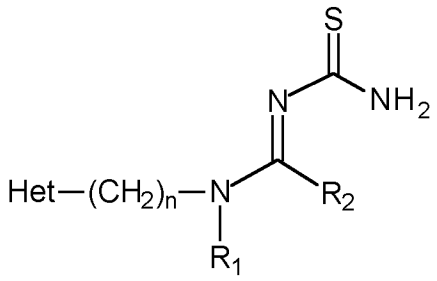


(B)

wherein R_1 is a heterocyclic radical, n is 0 or 1, R_2 is hydrogen or an optionally substituted hydrocarbon group, R_3 is a primary, secondary or tertiary amino group and X represents an electron attractive group such as, cyano, trifluoracetyl or nitro.

WO 2008/009360 describes compounds of formula A similar to those of WO 91/04965, wherein R_1 is aryl, heteroaryl or heterocyclyl, Z is N, R_2 is halogenated alkyl, alkenyl or cycloalkyl, R_3 is alkyl or cycloalkyl, R_4 is CN.

WO 97/01537 describes N-methylene thiourea derivatives of the formula C



(C)

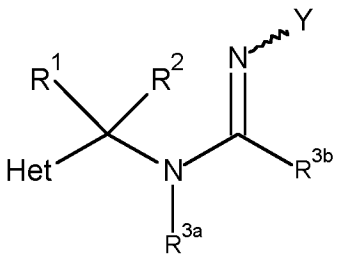
wherein Het is a heterocyclic radical, n is 0, 1 or 2, R_1 is hydrogen or alkyl and R_2 is hydrogen, alkyl, a primary, secondary or tertiary amino group, alkoxy or thioalkyl.

K. Ford et al., J. Agricultural and Food Chemistry describe N'-(aminocarbonyl)-N-[(6-chloro-3-pyridyl)methyl]-N-methyl ethanimidamide as a metabolite of N'-cyano-N-[(6-chloro-3-pyridyl)methyl]-N-methyl ethanimidamide (common name acetamiprid).

The pesticidal activity of the compounds is not satisfactory. It is therefore an object of the present invention to provide compounds having a good pesticidal activity, especially against difficult to control insects and acarid pests.

Summary of Invention

It has been found that these objects are solved by N,N'-substituted amidinecompounds of the general formula (I) described below, by their stereoisomers, their tautomers and their salts. Therefore, the present invention relates to N,N'-substituted amidinecompounds of formula (I):



(I)

wherein

Y is a radical Y^1, Y^2, Y^3, Y^4 or Y^5, where

Y^1 is O-C(=X)-R^4;

Y^2 is S-C(=X)-R^4;

Y^3 is N(R^{5a})-C(=X)-R^4;

Y^4 is N(R^{5a})-S(=O)-R^{5b};

Y^5 is $N(R^{5a})$-$S(=O)_2$-R^{5b};

and where X is O or S;

Het is a 5- or 6-membered carbon-bound or nitrogen-bound, saturated, partly unsaturated or aromatic heterocyclic radical comprising 2, 3, 4 or 5 carbon atoms and 1, 2 or 3 heteroatoms as ring members, which are independently selected from sulfur, oxygen and nitrogen, wherein the sulfur and nitrogen ring members can independently be partly or fully oxidized, and wherein each ring is optionally substituted by k identical or different substituents R^6, wherein k is an integer selected from 0, 1, 2, 3 or 4;

R^1, R^2 are independently from each other selected from the group consisting of hydrogen, halogen, CN, SCN, nitro, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

$Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl, benzyl, where the phenyl ring in the last two radicals is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or

R^1 and R^2 form, together with the carbon atom, which they attached to, a 3-, 4-, 5- or 6-membered saturated or partly unsaturated carbocyclic or heterocyclic ring, wherein each of the carbon atoms of said cycle are unsubstituted or may carry any combination of 1 or 2 identical or different radicals R^7,

or

R^1 and R^2 may together be =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$;

R^{3a} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

$NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, OR^8, $S(O)_nR^{8a}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

Cyc^1-Q^1, where

Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^{3b} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

OR^8, $S(O)_nR^{8a}$, $C(=N\text{-}O\text{-}R^{16a})R^{15}$,

Cyc^2-Q^2, where

Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^4 is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{18a}R^{18b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$, and

Cyc^3-Q^3, where

Cyc^3 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},and where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

Q^3 is a single bond, C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^4 and R^{5a}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkanediyl and C_2-C_6-alkenediyl, wherein the carbon atom in the two aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

R^{5a} if present, is selected from the group consisting of hydrogen, OH, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, wherein each of the 10 last mentioned radicals are unsubstituted, partly or completely halogenated,
$C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,
phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10};

R^{5b} is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$, Cyc^4-Q^4, where

Cyc^4 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^4 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

or

R^{5a} and R^{5b}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkanediyl and C_2-C_6-alkenediyl, wherein the carbon atom in the two aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

where, independently of their occurrence,

n is 0, 1 or 2;

R^6 is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_3-C_8-cycloalkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, and wherein the carbon atoms of the last 4 aliphatic and cycloaliphatic radicals may be partially or completely halogenated and/or further substituted independently from one another with 1, 2 or 3 radicals R^7, OR^8, $NR^{17a}R^{17b}$, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{7a}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=S)R^{7a}$, $C(=S)NR^{17a}R^{17b}$, $C(=S)OR^8$, $C(=S)SR^{8a}$, $C(=NR^{17})R^{7a}$, $C(=NR^{17})NR^{17a}R^{17b}$, $Si(R^{11})_2R^{12}$;
phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two of R^6 present on one ring carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$,
or two R^6 together form a linear C_2-C_7-alkylene chain, thus forming, together with the ring atom(s) to which they are bound, a 3-, 4-, 5-, 6-, 7- or 8-membered ring, where 1 or 2 CH_2 moieties of the alkylene chain may be replaced by 1 or 2 heteroatom moieties selected from O, S and NR^{17c} and/or 1 or 2 of the CH_2 groups of the alkylene chain may be replaced by a group C=O, C=S and/or $C=NR^{17}$; and where the alkylene chain is unsubstituted or may be substituted with 1, 2, 3, 4, 5 or 6 radicals selected from the group consisting of halogen, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, phenyl which may be substituted with 1, 2, 3, 4 or 5 radicals R^{10}, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2, as ring members, where the heterocyclic ring may be substituted with 1, 2, 3, 4 or 5 radicals R^{10};

R^7 independently of its occurrence, is selected from the group consisting of cyano, azido, nitro, -SCN, SF_5, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$,

$C(=O)OR^8$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=NR^{17})R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=S)R^{7a}$, NR^{17a}-$C(=O)OR^8$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$,
phenyl, phenoxy, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last three groups is optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two R^7 present on one carbon atom may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$,
or two R^7 may form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partly unsaturated carbocyclic or heterocyclic ring together with the carbon atoms to which the two R^7 are bonded, where the heterocyclic ring comprises 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{7a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, benzyl. where the phenyl ring in the two last-mentioned radicals is optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

R^{7b} independently of its occurrence, is selected from the group consisting of halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl,
phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or two of R^{7b} present on one carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$;

R^8 independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $C(=O)R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^{16}$,
phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

R^{8a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl,
phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 5- or 6-membered aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{9a}, R^{9b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl,
$S(O)_nR^{16}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;
phenyl, benzyl, 1-phenethyl or 2-phenethyl, where the phenyl ring in the last four mentioned radicals is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}; and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or,

R^{9a} and R^{9b} are together a C_2-C_7 alkylene-chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or

R^{9a} and R^{9b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{10} independently of its occurrence, is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, wherein the carbon atoms of the aforementioned aliphatic and cycloaliphatic radicals may optionally be substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN, NO_2, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

C_3-C_8-cycloalkyl, which is unsubstituted or carries 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN, NO_2, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

$Si(R^{11})_2R^{12}$, OH, SH, OR^{16}, $OS(O)_nR^{16a}$, $-S(O)_nR^{16a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=O)OR^{16}$, $-C(=NR^{17})R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$,

phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and

a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 substituents selected independently from one another from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or

two R^{10} present together on one carbon ring atom of a saturated or partly unsaturated heterocyclic radical may form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{17a}R^{17b}$;

or,

two R^{10} on adjacent carbon ring atoms may also be a bivalent radical selected from $CH_2CH_2CH_2CH_2$, CH=CH-CH=CH, N=CH-CH=CH, CH=N-CH=CH, N=CH-N=CH, $OCH_2CH_2CH_2$, $OCH=CHCH_2$, $CH_2OCH_2CH_2$, OCH_2CH_2O, OCH_2OCH_2, $CH_2CH_2CH_2$, $CH=CHCH_2$, CH_2CH_2O, CH=CHO, CH_2OCH_2, $CH_2C(=O)O$, $C(=O)OCH_2$, $O(CH_2)O$, $SCH_2CH_2CH_2$, $SCH=CHCH_2$, $CH_2SCH_2CH_2$, SCH_2CH_2S, SCH_2SCH_2, CH_2CH_2S, CH=CHS, CH_2SCH_2, $CH_2C(=S)S$, $C(=S)SCH_2$, $S(CH_2)S$, $CH_2CH_2NR^{17}$, $CH_2CH=N$, $CH=CH-NR^{17}$, OCH=N, SCH=N and form together with the carbon atoms to which the two R^{10} are bonded to a 5-membered or 6-membered partly saturated or unsaturated, aromatic carbocyclic or heterocyclic ring, wherein the ring may optionally be substituted with one or two substituents selected from =O, OH, CH_3, OCH_3, halogen, cyano, halomethyl and halomethoxy;

R^{11}, R^{12} independently of their occurrence, are selected from the group consisting of C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkoxy-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl-C_1-C_4-alkyl, C_1-C_6-haloalkoxy-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in last two radicals are unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{13}, R^{14} independently of their occurrence, are selected from the group consisting of hydrogen, halogen, CN, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, phenyl and benzyl;

R^{15} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy;
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or may carry 1 or 2 radicals R^7,
phenyl, benzyl, 5- or 6-membered hetaryl or 5- or 6-membered hetaryl-methyl, wherein the last four radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16a} independently of its occurrence, is selected from the group consisting of C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{17} independently of its occurrence, is selected from the group consisting of hydrogen, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,
C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, C_1-C_6-alkylthio, wherein the 11 last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4-alkoxy,

phenyl, benzyl, pyridyl, phenoxy, benzyloxy and pyridyloxy, wherein the six last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,

C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, wherein the four last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

phenyl, benzyl, pyridyl and phenoxy, wherein the four last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

or,

R^{17a} and R^{17b} may together be a C_2-C_6 alkylene chain forming a 3- to 7-membered saturated, partly saturated or unsaturated ring together with the nitrogen atom R^{17a} and R^{17b} are bonded to, wherein the alkylene chain may contain 1 or 2 heteroatoms selected, independently of each other, from oxygen, sulfur and nitrogen, and may optionally be substituted with halogen, C_1-C_4-haloalkyl, C_1-C_4-alkoxy or C_1-C_4-haloalkoxy, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or

R^{17a} and R^{17b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{17c} independently of its occurrence, is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,

phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{18a}, R^{18b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the four aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

OR^{16}, $S(O)_nR^{16a}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16a}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;

phenyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

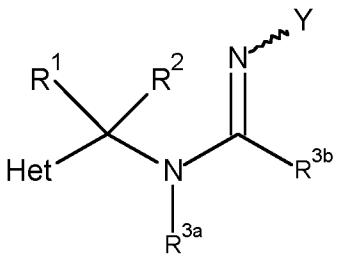
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or,

R^{18a} and R^{18b} are together a C_2-C_7-alkylene chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

the stereoisomers, tautomers and the salts thereof.

In a special embodiment, the present invention relates to N,N'-substituted amidinecompounds of formula (I)



(I)

wherein

Y is a radical Y^1, Y^2, Y^3, Y^4 or Y^5, where

Y^1 is O-C(=X)-R^4;
Y^2 is S-C(=X)-R^4;
Y^3 is N(R^{5a})-C(=X)-R^4;
Y^4 is N(R^{5a})-S(=O)-R^{5b};
Y^5 is N(R^{5a})-S(=O)$_2$-R^{5b};

and where X is O or S;

Het is a 5- or 6-membered carbon-bound or nitrogen-bound, saturated, partly unsaturated or aromatic heterocyclic radical comprising 2, 3, 4 or 5 carbon atoms and 1, 2 or 3 heteroatoms as ring members, which are independently selected from sulfur, oxygen or nitrogen, wherein the sulfur and nitrogen ring members can independently be partly or fully oxidized, and wherein each ring is optionally substituted by k identical or different substituents R^6, wherein k is an integer selected from 0, 1, 2, 3 or 4;

R^1, R^2 are independently from each other selected from the group consisting of hydrogen, halogen, CN, SCN, nitro, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

$Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl, benzyl, where the phenyl ring in the last two radicals is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or

R^1 and R^2 form, together with the carbon atom, which they attached to, a 3-, 4-, 5- or 6-membered saturated or partly unsaturated carbocyclic or heterocyclic ring, wherein each of the carbon atoms of said cycle are unsubstituted or may carry any combination of 1 or 2 identical or different radicals R^7,

or

R^1 and R^2 may together be =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$;

R^{3a} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

$NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, OR^8, $S(O)_nR^{8a}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

Cyc^1-Q^1, where

Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^1 is C_1-C_4-alkandiyl or C_2-C_4-alkendiyl;

R^{3b} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

OR^8, $S(O)_nR^{8a}$, $C(=N\text{-}O\text{-}R^{16a})R^{15}$,

Cyc^2-Q^2, where

Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^2 is C_1-C_4-alkandiyl or C_2-C_4-alkendiyl;

R^4 is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{18a}R^{18b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$, and

Cyc^3-Q^3, where

Cyc^3 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^3 is C_1-C_4-alkandiyl or C_2-C_4-alkendiyl;

R^4 and R^{5a}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkandiyl and C_2-C_6-alkendiyl, wherein the carbon atom in the four aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

R^{5a} if present, is selected from the group consisting of hydrogen, OH, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, wherein each of the 10 last mentioned radicals are unsubstituted, partly or completely halogenated, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$, phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10};

R^{5b} is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

Cyc^4-Q^4, where

Cyc^4 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^4 is C_1-C_4-alkandiyl or C_2-C_4-alkendiyl;

or

R^{5a} and R^{5b}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkandiyl and C_2-C_6-alkendiyl, wherein the carbon atom in the four aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

where, independently of their occurrence,

n is 0, 1 or 2;

R^6 is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_3-C_8-cycloalkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, and wherein the carbon atoms of the last 4 aliphatic and cycloaliphatic radicals may be partially or completely halogenated and/or further substituted independently from one another with 1, 2 or 3 radicals R^7,
OR^8, $NR^{17a}R^{17b}$, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{7a}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=S)R^{7a}$, $C(=S)NR^{17a}R^{17b}$, $C(=S)OR^8$, $C(=S)SR^{8a}$, $C(=NR^{17})R^{7a}$, $C(=NR^{17})NR^{17a}R^{17b}$, $Si(R^{11})_2R^{12}$;
phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two of R^6 present on one ring carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$,
or two R^6 together form a linear C_2-C_7 alkylene chain, thus forming, together with the ring atom(s) to which they are bound, a 3-, 4-, 5-, 6-, 7- or 8-membered ring, where 1 or 2 CH_2 moieties of the alkylene chain may be replaced by 1 or 2 heteroatom moieties selected from O, S and NR^{17c} and/or 1 or 2 of the CH_2 groups of the alkylene chain may be replaced by a group C=O, C=S and/or $C=NR^{17}$; and where the alkylene chain is unsubstituted or may be substituted with 1, 2, 3, 4, 5 or 6 radicals selected from the group consisting of halogen, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, phenyl which may be substituted with 1, 2, 3, 4 or 5 radicals R^{10}, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2, as ring members, where the heterocyclic ring may be substituted with 1, 2, 3, 4 or 5 radicals R^{10};

R^7 independently of its occurrence, is selected from the group consisting of cyano, azido, nitro, -SCN, SF_5, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=NR^{17})R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=S)R^{7a}$, NR^{17a}-$C(=O)OR^8$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$,
phenyl, phenoxy, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last three groups is optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and

and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two R^7 present on one carbon atom may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$,
or two R^7 may form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partly unsaturated carbocyclic or heterocyclic ring together with the carbon atoms to which the two R^7 are bonded, where the heterocyclic ring comprises 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{7a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

R^{7b} independently of its occurrence, is selected from the group consisting of halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or two of R^{7b} present on one carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$;

R^8 independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $C(=O)R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^{16}$, phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

R^{8a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
and a 5- or 6-membered aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{9a}, R^{9b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $S(O)_nR^{16}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;
phenyl, benzyl, 1-phenethyl or 2-phenethyl, where the phenyl ring in the last four mentioned radicals is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}; and
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur,

where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or,

R^{9a} and R^{9b} are together a C_2-C_7 alkylene chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur or nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or

R^{9a} and R^{9b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{10} independently of its occurrence, is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, wherein the carbon atoms of the aforementioned aliphatic and cycloaliphatic radicals may optionally be substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN, NO_2, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

C_3-C_8-cycloalkyl, which is unsubstituted or carries 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN, NO_2, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyl-oxy and (C_1-C_6-alkoxy)carbonyl,

$Si(R^{11})_2R^{12}$, OR^{16}, $OS(O)_nR^{16a}$, $-S(O)_nR^{16a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=O)OR^{16}$, $-C(=NR^{17})R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$,

phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)-amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and

and a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 substituents selected independently from one another from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or
two R^{10} present together on one carbon ring atom of a saturated or partly unsaturated heterocyclic radical may form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{17a}R^{17b}$;
or,
two R^{10} on adjacent carbon ring atoms may also be a bivalent radical selected from $CH_2CH_2CH_2CH_2$, CH=CH-CH=CH, N=CH-CH=CH, CH=N-CH=CH, N=CH-N=CH, $OCH_2CH_2CH_2$, $OCH=CHCH_2$, $CH_2OCH_2CH_2$, OCH_2CH_2O, OCH_2OCH_2, $CH_2CH_2CH_2$, $CH=CHCH_2$, CH_2CH_2O, CH=CHO, CH_2OCH_2, $CH_2C(=O)O$, $C(=O)OCH_2$, $O(CH_2)O$, $SCH_2CH_2CH_2$, $SCH=CHCH_2$, $CH_2SCH_2CH_2$, SCH_2CH_2S, SCH_2SCH_2, CH_2CH_2S, CH=CHS, CH_2SCH_2, $CH_2C(=S)S$, $C(=S)SCH_2$, $S(CH_2)S$, $CH_2CH_2NR^{17}$, $CH_2CH=N$, $CH=CH-NR^{17}$, OCH=N, SCH=N and form together with the carbon atoms to which the two R^{10} are bonded to a 5-membered or 6-membered partly saturated or unsaturated, aromatic carbocyclic or heterocyclic ring, wherein the ring may optionally be substituted with one or two substituents selected from =O, OH, CH_3, OCH_3, halogen, cyano, halomethyl and halomethoxy;

R^{11}, R^{12} independently of their occurrence, are selected from the group consisting of C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkoxy-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, C_3-C_8-cycloalkyl,

C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl-C_1-C_4-alkyl, C_1-C_6-haloalkoxy-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in last two radicals are unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{13}, R^{14} independently of their occurrence, are selected from the group consisting of hydrogen, halogen, CN, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, phenyl and benzyl;

R^{15} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy;
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or may carry 1, 2 or 3 radicals selected from the group consisting of CN, OH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=O)OR^{8a}$ and NR^{17a}-$C(=O)NR^{17a}R^{17b}$,
phenyl, benzyl, 5- or 6-membered hetaryl or 5- or 6-membered hetaryl-methyl, wherein the last four radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16a} independently of its occurrence, is selected from the group consisting of C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{17} independently of its occurrence, is selected from the group consisting of hydrogen, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,
C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, C_1-C_6-alkylthio, wherein the 11 last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4-alkoxy,

phenyl, benzyl, pyridyl, phenoxy, benzyloxy and pyridyloxy, wherein the six last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,

C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, wherein the four last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

phenyl, benzyl, pyridyl and phenoxy, wherein the four last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

or,

R^{17a} and R^{17b} may together be a C_2-C_6 alkylene chain forming a 3- to 7-membered saturated, partly saturated or unsaturated ring together with the nitrogen atom R^{17a} and R^{17b} are bonded to, wherein the alkylene chain may contain 1 or 2 heteroatoms selected, independently of each other, from oxygen, sulfur or nitrogen, and may optionally be substituted with halogen, C_1-C_4-haloalkyl, C_1-C_4-alkoxy or C_1-C_4-haloalkoxy, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or

R^{17a} and R^{17b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{17c} independently of its occurrence, is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,

phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{18a}, R^{18b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the four aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

OR^{16}, $S(O)_nR^{16a}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16a}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;

phenyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or,

R^{18a} and R^{18b} are together a C_2-C_7 alkylene chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur or nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

the stereoisomers, tautomers and the salts thereof.

In a further special embodiment, the present invention relates to compounds of the formula (I), the stereoisomers, tautomers and the salts therof, wherein R^{16} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or may carry 1 or 2 radicals R^7,
phenyl, benzyl, 5- or 6-membered hetaryl or 5- or 6-membered hetaryl-methyl, wherein the last four radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl and the other radicals have one of the meanings mentioned above.

Moreover, the present invention relates to and includes the following embodiments:

- agricultural and veterinary compositions comprising an amount of at least one compound of the formula (I) or a stereoisomer, tautomer or salt thereof;
- the use of the compounds of formula (I), the stereoisomers, the tautomers or the salts thereof for combating invertebrate pests;
- the use of the compounds of formula (I), the stereoisomers, the tautomers or the salts thereof for protecting growing plants from attack or infestation by invertebrate pests;
- the use of the compounds of formula (I), the stereoisomers, the tautomers or the salts, thereof for protecting plant proparagation material, especially seeds, from soil insects;
- the use of the compounds of formula (I), the stereoisomers, the tautomers or the salts thereof for protecting the seedlings roots and shoots of plants from soil and foliar insects;
- a method for combating or controlling invertebrate pests, which method comprises contacting said pest or its food supply, habitat or breeding grounds with a pesticidally effective amount of at least one compound of the formula (I) or a stereoisomer, a tautomer or salt thereof;
- a method for protecting growing plants from attack or infestation by invertebrate pests, which method comprises contacting a plant, or soil or water in which the plant is growing, with a pesticidally effective amount of at least one compound of the formula (I) or a stereoisomer, a tautomer or salt thereof, in particular a method protecting crop plants from attack or infestation by animal pests, which comprises contacting the crop plants with a pesticidally effective amount of at least one compound of the formula (I) or stereoisomer, a tautomer or salt thereof;
- a method for the protection of plant propagation, especially seeds, from soil insects and of the seedlings' roots and shoots from soil and foliar insects comprising contacting the seeds before sowing and/or after pregermination with at least one compound of the formula (I) or stereoisomer, a tautomer or salt thereof;
- seeds comprising a compound of the formula (I) or an enantiomer, diastereomer or salt thereof;
- the use of compounds of formula (I), the stereoisomers, the tautomers or the salts, in particular the veterinary acceptable salts, thereof for combating parasites in and on animals, in particular for the use in the treatment of animals infested or infected by parasites, for preventing animals of getting infected or infested by parasites or for protecting animals against infestation or infection by parasites;
- a method for treating animals infested or infected by parasites or preventing animals of getting infected or infested by parasites or protecting animals against infestation or infection by parasites which comprises administering or applying to the animals a parasiticidally effective amount of a compound of formula (I) or the stereoisomers and/or salts, in particular veterinary acceptable salts, thereof;
- a process for the preparation of a veterinary composition for treating, controlling, preventing or protecting animals against infestation or infection by parasites which comprises formulating a compound of formula (I) or a stereoisomer, tautomer and/or veterinary acceptable salt thereof with a carrier composition suitable for veterinary use;

- the use of a compound of formula (I) or the stereoisomers, tautomers and/or veterinary acceptable salt thereof for the preparation of a medicament for treating, controlling, preventing or protecting animals against infestation or infection by parasites.

The present invention also relates to plant propagation materials, in particular as mentioned above to seeds, containing at least one compound of formula (I), a stereoisomer, a tautomer and/or an agriculturally acceptable salt thereof.

Detailed Description of Invention

The present invention relates to every possible stereoisomer of the compounds of formula (I), i.e. to single enantiomers, diastereomers and E/Z-isomers as well as to mixtures thereof and also to the salts thereof. The present invention relates to each isomer alone, or mixtures or combinations of the isomers in any proportion to each other. Depending on the substitution pattern, the compounds of the formula (I) may have one or more centers of chirality, in which case they are present as mixtures of enantiomers or diastereomers. One center of chirality is the carbon ring atom carrying radical R^1. The invention provides both the pure enantiomers or diastereomers and their mixtures and the use according to the invention of the pure enantiomers or diastereomers of the compound I or its mixtures. Suitable compounds of the formula (I) also include all possible geometrical stereoisomers (cis/trans isomers, E/Z-isomers) and mixtures thereof, in particular the E/Z-isomers with regard to the C=N double bond in formula (I).

The present invention also relates to potential tautomers of the compounds of formula (I) and also to the salts of such tautomers. The present invention relates to the tautomer as such as well as to mixtures or combinations of the tautomers in any proportion to each other. The term "tautomers" encompasses isomers, which are derived from the compounds of formula (I) by the shift of an H-atom involving at least one H-atom located at a nitrogen, oxygen or sulphur atom. Examples of tautomeric forms are keto-enol forms, imine-enamine forms, urea-isourea forms, thiourea-isothiourea forms, (thio)amide-(thio)imidate forms etc.

The compounds of the present invention, i.e. the compounds of formula (I), their stereoisomers, their tautomers as well as their salts, in particular their agriculturally acceptable salts and their veterinarily acceptable salts, may be amorphous or may exist in one ore more different crystalline states (polymorphs) or modifications which may have a different macroscopic properties such as stability or show different biological properties such as activities. The present invention includes both amorphous and crystalline compounds of the formula (I), mixtures of different crystalline states or modifications of the respective stereoisomers or tautomers, as well as amorphous or crystalline salts thereof.

Salts of the compounds of the formula (I) are preferably agriculturally salts as well as veterinarily acceptable salts. They can be formed in a customary method, e.g. by reacting the compound with an acid of the anion in question if the compound of formula (I) has a basic functionality or by reacting an acidic compound of formula (I) with a suitable base.

Suitable agriculturally or veterinary useful salts are especially the salts of those cations or anions, in particular the acid addition salts of those acids, whose cations and anions, respectively, do not have any adverse effect on the action of the compounds according to the present invention. Suitable cations are in particular the ions of the alkali metals, preferably lithium, sodium and potassium, of the alkaline earth metals, preferably calcium, magnesium and barium, and of the transition metals, preferably manganese, copper, zinc and iron, and also ammonium (NH_4^+) and substituted ammonium in which one to four of the hydrogen atoms are replaced by C_1-C_4-alkyl, C_1-C_4-hydroxyalkyl, C_1-C_4-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkyl, hydroxy-C_1-C_4-alkoxy-C_1-C_4-alkyl, phenyl or benzyl. Examples of substituted ammonium ions comprise methylammonium, isopropylammonium, dimethylammonium, diisopropylammonium, trimethylammonium, tetramethylammonium, tetraethylammonium, tetrabutylammonium, 2-hydroxyethylammonium, 2-(2-hydroxyethoxy)ethyl-ammonium, bis(2-hydroxyethyl)ammonium, benzyltrimethylammonium and benzyltriethylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C_1-C_4-alkyl)sulfonium, and sulfoxonium ions, preferably tri(C_1-C_4-alkyl)sulfoxonium.

Anions of useful acid addition salts are primarily chloride, bromide, fluoride, hydrogen sulfate, sulfate, dihydrogen phosphate, hydrogen phosphate, phosphate, nitrate, hydrogen carbonate, carbonate, hexafluorosilicate, hexafluorophosphate, benzoate, and the anions of C_1-C_4-alkanoic acids, preferably formate, acetate, propionate and butyrate. They can be formed by reacting the compounds of the formulae I with an acid of the corresponding anion, preferably of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid or nitric acid.

The organic moieties mentioned in the above definitions of the variables are - like the term halogen - collective terms for individual listings of the individual group members. The prefix C_n-C_m indicates in each case the possible number of carbon atoms in the group.

"Halogen" will be taken to mean fluoro, chloro, bromo and iodo.

The term "partially or completely halogenated" will be taken to mean that 1 or more, e.g. 1, 2, 3, 4 or 5 or all of the hydrogen atoms of a given radical have been replaced by a halogen atom, in particular by fluorine or chlorine. For example, partially or completely halogenated alkyl is also termed haloalkyl, partially or completely halogenated cycloalkyl is also termed halocycloalkyl, partially or completely halogenated alkylenyl is also termed haloalkenyl, partially or completely halogenated alkylynyl is also termed haloalkynyl, partially or completely halogenated alkoxy is also termed haloalkoxy, partially or completely halogenated alkylthio is also termed haloalkthio, partially or completely halogenated alkylsulfinyl is also termed haloalkylsulfinyl, partially or completely halogenated alkylsulfonyl is also termed haloalsulfonyl, partially or completely halogenated cycloalkylalkyl is also termed halocycloalkylalkyl.

The term "C_n-C_m-alkyl" as used herein, and also in C_n-C_m-alkylamino, di-C_n-C_m-alkylamino, C_n-C_m-alkylaminocarbonyl, di-(C_n-C_m-alkylamino)carbonyl, C_n-C_m-alkylthio , C_n-C_m-alkylsulfinyl and C_n-C_m-alkylsulfonyl, refers to a branched or unbranched saturated hydrocarbon group having n to m, e.g. 1 to 10 carbon atoms, preferably 1 to 6 carbon atoms, for example methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, 1-ethylpropyl, hexyl, 1,1-

dimethylpropyl, 1,2-dimethylpropyl, 1-methylpentyl, 2-methylpentyl, 3-methylpentyl, 4-methylpentyl, 1,1-dimethylbutyl, 1,2-dimethylbutyl, 1,3-dimethylbutyl, 2,2-dimethylbutyl, 2,3-dimethylbutyl, 3,3-dimethylbutyl, 1-ethylbutyl, 2-ethylbutyl, 1,1,2-trimethylpropyl, 1,2,2-trimethylpropyl, 1-ethyl-1-methylpropyl, 1-ethyl-2-methylpropyl, heptyl, octyl, 2-ethylhexyl, nonyl and decyl and their isomers. C_1-C_4-alkyl means for example methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl or 1,1-dimethylethyl.

The term "C_n-C_m-haloalkyl" as used herein, and also in C_n-C_m-haloalkylthio (= C_n-C_m-haloalkylsulfenyl), C_n-C_m-haloalkylsulfinyl and C_n-C_m-haloalkylsulfonyl, refers to a straight-chain or branched alkyl group having n to m carbon atoms, e.g. 1 to 10 in particular 1 to 6 carbon atoms (as mentioned above), where some or all of the hydrogen atoms in these groups may be replaced by halogen atoms as mentioned above, for example C_1-C_4-haloalkyl, such as chloromethyl, bromomethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl, dichlorofluoromethyl, chlorodifluoromethyl, 1-chloroethyl, 1-bromoethyl, 1-fluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 2-chloro-2-fluoroethyl, 2-chloro-2,2-difluoroethyl, 2,2-dichloro-2-fluoroethyl, 2,2,2-trichloroethyl, pentafluoroethyl and the like. The term C_1-C_{10}-haloalkyl in particular comprises C_1-C_2-fluoroalkyl, which is synonym with methyl or ethyl, wherein 1, 2, 3, 4 or 5 hydrogen atoms are substituted by fluorine atoms, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1-fluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl and pentafluoromethyl. "Halomethyl" is methyl in which 1, 2 or 3 of the hydrogen atoms are replaced by halogen atoms. Examples are bromomethyl, chloromethyl, fluoromethyl, dichloromethyl, trichloromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl, dichlorofluoromethyl, chlorodifluoromethyl and the like. Similarly, "C_n-C_m-alkoxy", "C_n-C_m-alkylthio", or "C_n-C_m-alkylsulfenyl", respectively, "C_n-C_m-alkylsulfinyl" or "C_n-C_m-alkylsulfonyl" refer to straight-chain or branched alkyl groups having n to m carbon atoms, e.g. 1 to 10, in particular 1 to 6 or 1 to 4 carbon atoms (as mentioned above) bonded through O, S, S(=O) or $S(=O)_2$ linkages, respectively, at any bond in the alkyl group. Accordingly, the terms "C_n-C_m-haloalkoxy", "C_n-C_m-haloalkylthio" or "C_n-C_m-alkylsulfenyl", respectively, "C_n-C_m-haloalkylsulfinyl" or "C_n-C_m-haloalkylsulfonyl", refer to straight-chain or branched alkyl groups having n to m carbon atoms, e.g. 1 to 10, in particular 1 to 6 or 1 to 4 carbon atoms (as mentioned above) bonded through O, S, S(=O) or $S(=O)_2$ linkages, respectively, at any bond in the haloalkyl group, where some or all of the hydrogen atoms in these groups may be replaced by halogen atoms as mentioned above.

The term "C_n-C_m-alkoxy" is a C_n-C_m-alkyl group, as defined above, attached via an oxygen atom. C_1-C_2-Alkoxy is methoxy or ethoxy. C_1-C_4-Alkoxy is, for example, methoxy, ethoxy, n-propoxy, 1-methylethoxy (isopropoxy), butoxy, 1-methylpropoxy (sec-butoxy), 2-methylpropoxy (isobutoxy) or 1,1-dimethylethoxy (tert-butoxy). C_1-C_6-Alkoxy includes the meanings given for C_1-C_4-alkoxy and also includes, for example, pentoxy, 1-methylbutoxy, 2-methylbutoxy, 3-methylbutoxy, 1,1-dimethylpropoxy, 1,2-dimethylpropoxy, 2,2-dimethylpropoxy, 1-ethylpropoxy, hexoxy, 1-methylpentoxy, 2-methylpentoxy, 3-methylpentoxy, 4-methylpentoxy, 1,1-dimethylbutoxy, 1,2-dimethylbutoxy, 1,3-dimethylbutoxy, 2,2-dimethylbutoxy, 2,3-dimethylbutoxy, 3,3-dimethylbutoxy, 1-ethylbutoxy, 2-ethylbutoxy, 1,1,2-trimethylpropoxy, 1,2,2-

trimethylpropoxy, 1-ethyl-1-methylpropoxy or 1-ethyl-2-methylpropoxy. C_1-C_8-Alkoxy includes the meanings given for C_1-C_6-alkoxy and also includes, for example, heptyloxy, octyloxy, 2-ethylhexyloxy and positional isomers thereof. C_1-C_{10}-Alkoxy includes the meanings given for C_1-C_8-alkoxy and also includes, for example, nonyloxy, decyloxy and positional isomers thereof.

The term "C_n-C_m-alkylthio" is a C_n-C_m-alkyl group, as defined above, attached via a sulfur atom. C_1-C_2-Alkylthio is methylthio or ethylthio. C_1-C_4-Alkylthio is, for example, methylthio, ethylthio, n-propylthio, 1-methylethylthio (isopropylthio), butylthio, 1-methylpropylthio (sec-butylthio), 2-methylpropylthio (isobutylthio) or 1,1-dimethylethylthio (tert-butylthio). C_1-C_6-Alkylthio includes the meanings given for C_1-C_4-alkylthio and also includes, for example, pentylthio, 1-methylbutylthio, 2-methylbutylthio, 3-methylbutylthio, 1,1-dimethylpropylthio, 1,2-dimethylpropylthio, 2,2-dimethylpropylthio, 1-ethylpropylthio, hexylthio, 1-methylpentylthio, 2-methylpentylthio, 3-methylpentylthio, 4-methylpentylthio, 1,1-dimethylbutylthio, 1,2-dimethylbutylthio, 1,3-dimethylbutylthio, 2,2-dimethylbutylthio, 2,3-dimethylbutylthio, 3,3-dimethylbutylthio, 1-ethylbutylthio, 2-ethylbutylthio, 1,1,2-trimethylpropylthio, 1,2,2-trimethylpropylthio, 1-ethyl-1-methylpropylthio or 1-ethyl-2-methylpropylthio. C_1-C_8-Alkylthio includes the meanings given for C_1-C_6-alkylthio and also includes, for example, heptylthio, octylthio, 2-ethylhexylthio and positional isomers thereof. C_1-C_{10}-Alkylthio includes the meanings given for C_1-C_8-alkylthio and also includes, for example, nonylthio, decylthio and positional isomers thereof.

The term "C_n-C_m-alkylsulfinyl" is a C_n-C_m-alkyl group, as defined above, attached via a S(=O) group. The term "C_n-C_m-alkylsulfonyl" is a C_n-C_m-alkyl group, as defined above, attached via a $S(=O)_2$ group.

The term "C_n-C_m-haloalkyloxy" is a C_n-C_m-haloalkyl group, as defined above, attached via an oxygen atom. Examples include C_1-C_2-haloalkoxy, such as chloromethoxy, bromomethoxy, dichloromethoxy, trichloromethoxy, fluoromethoxy, difluoromethoxy, trifluoromethoxy, chlorofluoromethoxy, dichlorofluoromethoxy, chlorodifluoromethoxy, 1-chloroethoxy, 1-bromoethoxy, 1-fluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 2-chloro-2-fluoroethoxy, 2-chloro-2,2-difluoroethoxy, 2,2-dichloro-2-fluoroethoxy, 2,2,2-trichloroethoxy and pentafluoroethoxy.

The term "C_n-C_m-haloalkylthio" is a C_n-C_m-haloalkyl group, as defined above, attached via a sulfur atom. Examples include C_1-C_2-haloalkylthio, such as chloromethylthio, bromomethylthio, dichloromethylthio, trichloromethylthio, fluoromethylthio, difluoromethylthio, trifluoromethylthio, chlorofluoromethylthio, dichlorofluoromethylthio, chlorodifluoromethylthio, 1-chloroethylthio, 1-bromoethylthio, 1-fluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio, 2,2,2-trifluoroethylthio, 2-chloro-2-fluoroethylthio, 2-chloro-2,2-difluoroethylthio, 2,2-dichloro-2-fluoroethylthio, 2,2,2-trichloroethylthio and pentafluoroethylthio and the like.

Similarly the terms C_1-C_2-fluoroalkoxy and C_1-C_2-fluoroalkylthio refer to C_1-C_2-fluoroalkyl which is bound to the remainder of the molecule via an oxygen atom or a sulfur atom, respectively.

The term "C_n-C_m-haloalkylsulfinyl" is a C_n-C_m-haloalkyl group, as defined above, attached via a S(=O) group. The term "C_1-C_m-haloalkylsulfonyl" is a C_1-C_m-haloalkyl group, as defined above, attached via a $S(=O)_2$ group.

The term "C_2-C_m-alkenyl" as used herein denotes a linear or branched ethylenically unsaturated hydrocarbon group having 2 to m, e.g. 2 to 10 or 2 to 6 carbon atoms and a C=C-double bond in any position, such as ethenyl, 1-propenyl, 2-propenyl, 1-methyl-ethenyl, 1-butenyl, 2-butenyl, 3-butenyl, 1-methyl-1-propenyl, 2-methyl-1-propenyl, 1-methyl-2-propenyl, 2-methyl-2-propenyl, 1-pentenyl, 2-pentenyl, 3-pentenyl, 4-pentenyl, 1-methyl-1-butenyl, 2-methyl-1-butenyl, 3-methyl-1-butenyl, 1-methyl-2-butenyl, 2-methyl-2-butenyl, 3-methyl-2-butenyl, 1-methyl-3-butenyl, 2-methyl-3-butenyl, 3-methyl-3-butenyl, 1,1-dimethyl-2-propenyl, 1,2-dimethyl-1-propenyl, 1,2-dimethyl-2-propenyl, 1-ethyl-1-propenyl, 1-ethyl-2-propenyl, 1-hexenyl, 2-hexenyl, 3-hexenyl, 4-hexenyl, 5-hexenyl, 1-methyl-1-pentenyl, 2-methyl-1-pentenyl, 3-methyl-1-pentenyl, 4-methyl-1-pentenyl, 1-methyl-2-pentenyl, 2-methyl-2-pentenyl, 3-methyl-2-pentenyl, 4-methyl-2-pentenyl, 1-methyl-3-pentenyl, 2-methyl-3-pentenyl, 3-methyl-3-pentenyl, 4-methyl-3-pentenyl, 1-methyl-4-pentenyl, 2-methyl-4-pentenyl, 3-methyl-4-pentenyl, 4-methyl-4-pentenyl, 1,1-dimethyl-2-butenyl, 1,1-dimethyl-3-butenyl, 1,2-dimethyl-1-butenyl, 1,2-dimethyl-2-butenyl, 1,2-dimethyl-3-butenyl, 1,3-dimethyl-1-butenyl, 1,3-dimethyl-2-butenyl, 1,3-dimethyl-3-butenyl, 2,2-dimethyl-3-butenyl, 2,3-dimethyl-1-butenyl, 2,3-dimethyl-2-butenyl, 2,3-dimethyl-3-butenyl, 3,3-dimethyl-1-butenyl, 3,3-dimethyl-2-butenyl, 1-ethyl-1-butenyl, 1-ethyl-2-butenyl, 1-ethyl-3-butenyl, 2-ethyl-1-butenyl, 2-ethyl-2-butenyl, 2-ethyl-3-butenyl, 1,1,2-trimethyl-2-propenyl, 1-ethyl-1-methyl-2-propenyl, 1-ethyl-2-methyl-1-propenyl and 1-ethyl-2-methyl-2-propenyl.

The term "C_2-C_m-haloalkenyl" as used herein, which is also expressed as "C_2-C_m-alkenyl which is partially or completely halogenated", refers to C_2-C_m-alkenyl, where some or all of the hydrogen atoms in these groups are replaced by halogen atoms as mentioned above, in particular fluorine, chlorine and bromine, for example 1-fluoroethenyl, 2-fluoroethenyl, 2,2-difluoroethenyl, 1,2,2-trifluoroethenyl, 1-fluoro-2-propenyl, 2-fluoro-2-propenyl, 3-fluoro-2-propenyl, 1-fluoro-1-propenyl, 1,2-difluoro-1-propenyl, 3,3-difluoropropen-2-yl, 1-chloroethenyl, 2-chloroethenyl, 2,2,-dichloroethenyl, 1-chloro-2-propenyl, and the like.

The term "C_2-C_m-alkynyl" as used herein refers to a linear or branched unsaturated hydrocarbon group having 2 to m, e.g. 2 to 10 or 2 to 6 carbon atoms and containing at least one triple bond, such as ethynyl, propynyl, 1-butynyl, 2-butynyl, and the like.

The term "C_2-C_m-haloalkynyl" as used herein, which is also expressed as "C_2-C_m-alkynyl which is partially or completely halogenated", refers to C_2-C_m-alkynyl, where some or all of the hydrogen atoms in these groups are replaced by halogen atoms as mentioned above, in particular fluorine, chlorine and bromine. Examples of C_2-C_m-haloalkynyl include 1-fluoro-2-propenyl, 2-fluoro-2-propenyl, 3-fluoro-2-propenyl, 1-fluoro-2-propynyl and 1,1-difluoro-2-propenyl, and the like.

The term "C_3-C_m-cycloalkyl" as used herein refers to a monocyclic and polycyclic 3- to m-membered saturated cycloaliphatic radical, e.g. cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclodecyl, bicyclo[2.2.1]heptyl, bicyclo[3.1.1]heptyl, bicyclo[2.2.2]octyl

and bicyclo[3.2.1]octyl. Preferably, the term cycloalkyl denotes a monocyclic saturated hydrocarbon radical.

The term "C_3-C_m-cycloalkenyl" as used herein refers to a monocyclic and polycyclic 3- to m-membered unsaturated cycloaliphatic radical, e.g. cyclopropenyl, cyclobutenyl, cyclopentenyl, cyclohexenyl, cycloheptenyl, cyclooctenyl, cyclodecenyl, bicyclo[2.2.1]heptenyl, bicyclo[3.1.1]heptenyl, bicyclo[2.2.2]octenyl and bicyclo[3.2.1]octenyl. Preferably, the term cycloalkenyl denotes a monocyclic unsaturated hydrocarbon radical.

The term "C_3-C_m-halocycloalkyl" as used herein, which is also expressed as "cycloalkyl which is partially or completely halogenated", refers to C_3-C_m-cycloalkyl as mentioned above, in which some or all of the hydrogen atoms are replaced by halogen atoms as mentioned above, in particular fluorine, chlorine and bromine. Examples of C_3-C_m-halocycloalkyl include 1-fluorocyclopropyl, 2-fluorocyclopropyl, 2,2-difluorocyclopropyl, 1-chlorocyclcopropyl, 2-chlorocyclopropyl, 2,2-dichlorocyclopropyl, 2,3-difluorocyclopropyl, 1-fluorocycobutyl etc.

The term "C_3-C_m-cycloalkyl-C_1-C_4-alkyl" refers to a C_3-C_m-cycloalkyl group as defined above, which is bound to the remainder of the molecule via a C_1-C_4-alkyl group, as defined above. Examples for C_3-C_m-cycloalkyl-C_1-C_4-alkyl are cyclopropylmethyl, cyclopropylethyl, cyclopropylpropyl, cyclobutylmethyl, cyclobutylethyl, cyclobutylpropyl, cyclopentylmethyl, cyclopentylethyl, cyclopentylpropyl, cyclohexylmethyl, cyclohexylethyl and cyclohexylpropyl.

The term "C_3-C_m-halocycloalkyl-C_1-C_4-alkyl" refers to a C_3-C_m-halocycloalkyl group as defined above which is bound to the remainder of the molecule via a C_1-C_4-alkyl group, as defined above.

The term "C_1-C_4-alkoxy-C_1-C_4-alkyl" as used herein refers to alkyl having 1 to 4 carbon atoms, e.g. like specific examples mentioned above, wherein one hydrogen atom of the alkyl radical is replaced by an C_1-C_4-alkoxy group. Examples are methoxymethyl, ethoxymethyl, propoxymethyl, isopropoxymethyl, n-butoxymethyl, sec-butoxymethyl, isobutoxymethyl, tert-butoxymethyl, 1-methoxyethyl, 1-ethoxyethyl, 1-propoxyethyl, 1-isopropoxyethyl, 1-n-butoxyethyl, 1-sec-butoxyethyl, 1-isobutoxyethyl, 1-tert-butoxyethyl, 2-methoxyethyl, 2-ethoxyethyl, 2-propoxyethyl, 2-isopropoxyethyl, 2-n-butoxyethyl, 2-sec-butoxyethyl, 2-isobutoxyethyl, 2-tert-butoxyethyl, 1-methoxypropyl, 1-ethoxypropyl, 1-propoxypropyl, 1-isopropoxypropyl, 1-n-butoxypropyl, 1-sec-butoxypropyl, 1-isobutoxypropyl, 1-tert-butoxypropyl, 2-methoxypropyl, 2-ethoxypropyl, 2-propoxypropyl, 2-isopropoxypropyl, 2-n-butoxypropyl, 2-sec-butoxypropyl, 2-isobutoxypropyl, 2-tert-butoxypropyl, 3-methoxypropyl, 3-ethoxypropyl, 3-propoxypropyl, 3-isopropoxypropyl, 3-n-butoxypropyl, 3-sec-butoxypropyl, 3-isobutoxypropyl, 3-tert-butoxypropyl and the like.

The term C_1-C_4-haloalkoxy-C_1-C_4-alkyl is a straight-chain or branched alkyl group having from 1 to 4 carbon atoms, wherein one of the hydrogen atoms is replaced by a C_1-C_4-alkoxy group and wherein at least one, e.g. 1, 2, 3, 4 or all of the remaining hydrogen atoms, either in the alkoxy moiety or in the alkyl moiety or in both, are replaced by halogen atoms. Examples are difluoromethoxymethyl (CHF_2OCH_2), trifluoromethoxymethyl, 1-difluoromethoxyethyl, 1-trifluoromethoxyethyl, 2-difluoromethoxyethyl, 2-trifluoromethoxyethyl, difluoro-methoxy-methyl (CH_3OCF_2), 1,1-difluoro-2-methoxyethyl, 2,2-difluoro-2-methoxyethyl and the like.

The term "C_n-C_m-alkoxycarbonyl" is a C_n-C_m-alkoxy group, as defined above, attached via an carbonyl group atom. C_1-C_2-Alkoxycarbonyl is methoxycarbonyl or ethoxycarbonyl. C_1-C_4-Alkoxy is, for example, methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, 1-methylethoxycarbonyl, butoxycarbonyl, 1-methylpropoxycarbonyl, 2-methylpropoxycarbonyl or 1,1-dimethylethoxycarbonyl. C_1-C_6-Alkoxycarbonyl includes the meanings given for C_1-C_4-alkoxycarbonyl and also includes, for example, pentoxycarbonyl, 1-methylbutoxycarbonyl, 2-methylbutoxycarbonyl, 3-methylbutoxycarbonyl, 1,1-dimethylpropoxycarbonyl, 1,2-dimethylpropoxycarbonyl, 2,2-dimethylpropoxycarbonyl, 1-ethylpropoxycarbonyl, hexoxycarbonyl, 1-methylpentoxycarbonyl, 2-methylpentoxycarbonyl, 3-methylpentoxycarbonyl, 4-methylpentoxycarbonyl, 1,1-dimethylbutoxycarbonyl, 1,2-dimethylbutoxycarbonyl, 1,3-dimethylbutoxycarbonyl, 2,2-dimethylbutoxycarbonyl, 2,3-dimethylbutoxycarbonyl, 3,3-dimethylbutoxycarbonyl, 1-ethylbutoxy, 2-ethylbutoxycarbonyl, 1,1,2-trimethylpropoxycarbonyl, 1,2,2-trimethylpropoxycarbonyl, 1-ethyl-1-methylpropoxycarbonyl or 1-ethyl-2-methylpropoxycarbonyl.

The term "aryl" as used herein refers to an aromatic hydrocarbon radical such as naphthyl or in particular phenyl.

The term "3- to 6-membered carbocyclic ring" as used herein refers to cyclopropane, cyclobutane, cyclopentane and cyclohexane rings. The term "3- to 7-membered carbocyclic ring" as used herein refers to cyclopropane, cyclobutane, cyclopentane, cyclohexane and cycloheptane rings.

The term "3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic heterocyclic ring containing 1, 2 or 3 heteroatoms" or "containing heteroatom groups", wherein those heteroatom(s) (group(s)) are selected from N, O, S, NO, SO and SO_2 and are ring members, as used herein refers to monocyclic radicals, the monocyclic radicals being saturated, partially unsaturated or aromatic. The heterocyclic radical may be attached to the remainder of the molecule via a carbon ring member or via a nitrogen ring member.

Examples of 3-, 4-, 5-, 6- or 7-membered saturated heterocyclic rings include: oxiranyl, aziridinyl, azetidinyl, 2 tetrahydrofuranyl, 3-tetrahydrofuranyl, 2 tetrahydrothienyl, 3 tetrahydrothienyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 3 pyrazolidinyl, 4 pyrazolidinyl, 5-pyrazolidinyl, 2 imidazolidinyl, 4 imidazolidinyl, 2-oxazolidinyl, 4-oxazolidinyl, 5 oxazolidinyl, 3-isoxazolidinyl, 4 isoxazolidinyl, 5 isoxazolidinyl, 2 thiazolidinyl, 4-thiazolidinyl, 5-thiazolidinyl, 3 isothiazolidinyl, 4-isothiazolidinyl, 5 isothiazolidinyl, 1,2,4-oxadiazolidin-3-yl, 1,2,4 oxadiazolidin 5 yl, 1,2,4-thiadiazolidin-3-yl, 1,2,4 thiadiazolidin-5-yl, 1,2,4 triazolidin-3-yl, 1,3,4-oxadiazolidin-2-yl, 1,3,4 thiadiazolidin-2-yl, 1,3,4 triazolidin-2-yl, 2-tetrahydropyranyl, 4 tetrahydropyranyl, 1,3-dioxan-5-yl, 1,4-dioxan-2-yl, 2-piperidinyl, 3-piperidinyl, 4-piperidinyl, 3-hexahydropyridazinyl, 4 hexahydropyridazinyl, 2-hexahydropyrimidinyl, 4-hexahydropyrimidinyl, 5 hexahydropyrimidinyl, 2-piperazinyl, 1,3,5-hexahydrotriazin-2-yl and 1,2,4 hexahydrotriazin-3-yl, 2-morpholinyl, 3-morpholinyl, 2-thiomorpholinyl, 3-thiomorpholinyl, 1-oxothiomorpholin-2-yl, 1-oxothiomorpholin-3-yl, 1,1-dioxothiomorpholin-2-yl, 1,1-dioxothiomorpholin-3-yl, hexahydroazepin-1-, -2-, -3- or -4-yl, hexahydrooxepinyl, hexahydro-1,3-diazepinyl, hexahydro-1,4-diazepinyl, hexahydro-1,3-oxazepinyl, hexahydro-1,4-oxazepinyl, hexahydro-1,3-dioxepinyl, hexahydro-1,4-dioxepinyl and

the like. Examples of 3-, 4-, 5-, 6- or 7-membered partially unsaturated heterocyclic rings include: 2,3-dihydrofur-2-yl, 2,3-dihydrofur-3-yl, 2,4-dihydrofur-2-yl, 2,4-dihydrofur-3-yl, 2,3-dihydrothien-2-yl, 2,3 dihydrothien-3-yl, 2,4 dihydrothien-2-yl, 2,4-dihydrothien-3-yl, 2-pyrrolin-2-yl, 2-pyrrolin-3-yl, 3 pyrrolin-2-yl, 3-pyrrolin-3-yl, 2-isoxazolin-3-yl, 3-isoxazolin-3-yl, 4 isoxazolin 3 yl, 2-isoxazolin-4-yl, 3-isoxazolin-4-yl, 4-isoxazolin-4-yl, 2 isoxazolin-5-yl, 3-isoxazolin-5-yl, 4-isoxazolin-5-yl, 2-isothiazolin-3-yl, 3 isothiazolin-3-yl, 4-isothiazolin-3-yl, 2-isothiazolin-4-yl, 3-isothiazolin-4-yl, 4 isothiazolin-4-yl, 2-isothiazolin-5-yl, 3-isothiazolin-5-yl, 4-isothiazolin-5-yl, 2,3 dihydropyrazol-1-yl, 2,3-dihydropyrazol-2-yl, 2,3-dihydropyrazol-3-yl, 2,3 dihydropyrazol-4-yl, 2,3-dihydropyrazol-5-yl, 3,4-dihydropyrazol-1-yl, 3,4 dihydropyrazol-3-yl, 3,4-dihydropyrazol-4-yl, 3,4-dihydropyrazol-5-yl, 4,5 dihydropyrazol-1-yl, 4,5-dihydropyrazol-3-yl, 4,5-dihydropyrazol-4-yl, 4,5 dihydropyrazol-5-yl, 2,3-dihydrooxazol-2-yl, 2,3-dihydrooxazol-3-yl, 2,3 dihydrooxazol-4-yl, 2,3-dihydrooxazol-5-yl, 3,4-dihydrooxazol-2-yl, 3,4 dihydrooxazol-3-yl, 3,4-dihydrooxazol-4-yl, 3,4-dihydrooxazol-5-yl, 3,4 dihydrooxazol-2-yl, 3,4-dihydrooxazol-3-yl, 3,4-dihydrooxazol-4-yl, 2-, 3-, 4-, 5- or 6-di- or tetrahydropyridinyl, 3-di- or tetrahydropyridazinyl, 4 di- or tetrahydropyridazinyl, 2-di- or tetrahydropyrimidinyl, 4-di- or tetrahydropyrimidinyl, 5 di- or tetrahydropyrimidinyl, di- or tetrahydropyrazinyl, 1,3,5-di- or tetrahydrotriazin-2-yl, 1,2,4-di- or tetrahydrotriazin-3-yl, 2,3,4,5-tetrahydro[1H]azepin-1-, -2-, -3-, -4-, -5-, -6- or -7-yl, 3,4,5,6-tetrahydro[2H]azepin-2-, -3-, -4-, -5-, -6- or -7-yl, 2,3,4,7 tetrahydro[1H]azepin-1-, -2-, -3-, -4-, -5-, -6- or -7-yl, 2,3,6,7 tetrahydro[1H]azepin-1-, -2-, -3-, -4-, -5-, -6- or -7-yl, tetrahydrooxepinyl, such as 2,3,4,5-tetrahydro[1H]oxepin-2-, -3-, -4-, -5-, -6- or -7-yl, 2,3,4,7 tetrahydro[1H]oxepin-2-, -3-, -4-, -5-, -6- or -7-yl, 2,3,6,7 tetrahydro[1H]oxepin-2-, -3-, -4-, -5-, -6- or -7-yl, tetrahydro-1,3-diazepinyl, tetrahydro-1,4-diazepinyl, tetrahydro-1,3-oxazepinyl, tetrahydro-1,4-oxazepinyl, tetrahydro-1,3-dioxepinyl and tetrahydro-1,4-dioxepinyl.

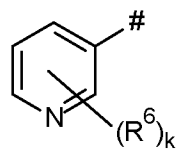
Examples of 5- or 6-membered aromatic heterocyclic rings, also termed heteroaromatic rings, heteroaryl or hetaryl, include: 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyrrolyl, 3-pyrrolyl, 3-pyrazolyl, 4-pyrazo¬lyl, 5-pyrazolyl, 2-oxazolyl, 4-oxazolyl, 5-oxazolyl, 2-thiazolyl, 4 thiazolyl, 5-thiazo¬lyl, 2-imidazolyl, 4-imidazolyl, 1,3,4-triazol-2-yl, 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 3-pyridazinyl, 4-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl and 2-pyrazinyl.

A "C_1-C_m-alkylene" is divalent branched or preferably non-branched or linear saturated aliphatic chain having 1 to m, e.g. 1 to 7 carbon atoms, for example CH_2, CH_2CH_2, -$CH(CH_3)$-, $CH_2CH_2CH_2$, $CH(CH_3)CH_2$, $CH_2CH(CH_3)$, $CH_2CH_2CH_2CH_2$, $CH_2CH_2CH_2CH_2CH_2$, $CH_2CH_2CH_2CH_2CH_2CH_2$, and $CH_2CH_2CH_2CH_2CH_2CH_2CH_2$.

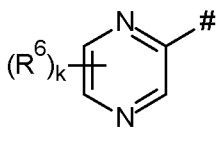
Embodiments of the present invention as well preferred compounds of the present invention are outlined in the following paragraphs. The remarks made below concerning preferred embodiments of the variables of the compounds of formula (I), especially with respect to their substituents Het, Y, R^1, R^2, R^{3a}, R^{3b}, including the variables X, R^4, R^{5a}, R^{5b}, as well as R^6 and the variable k are valid both on their own and, in particular, in every possible combination with each other.

When # appears in a formula showing a preferred substructure of a compound of the present invention, it denotes the attachment bond in the remainder molecule.

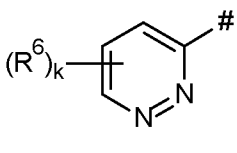
Preferred are compounds of formula (I), wherein Het is selected from the group consisting of radicals of formulae Het-1 to Het-24, with preference given to compounds of the formula (I), their stereoisomers, there tautomers and their salts, where Het is selected from the radicals of the formulae Het-1, Het-11 and Het-24:



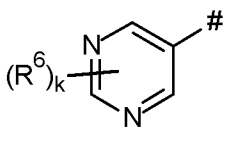
Het-1



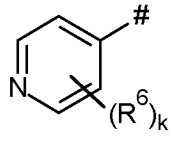
Het-2



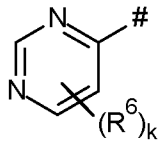
Het-3



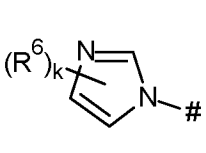
Het-4



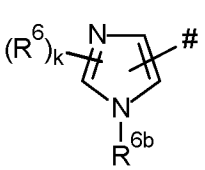
Het-5



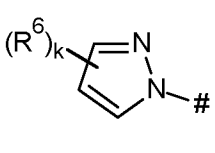
Het-6



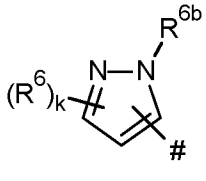
Het-7



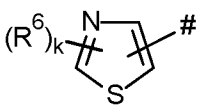
Het-8



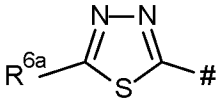
Het-9



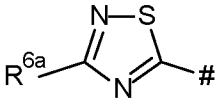
Het-10



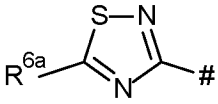
Het-11



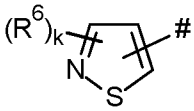
Het-12



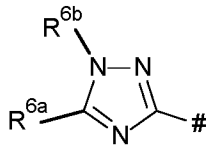
Het-13



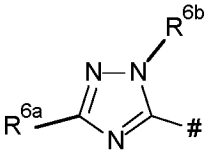
Het-14



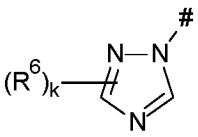
Het-15



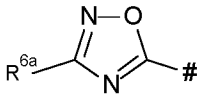
Het-16



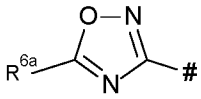
Het-17



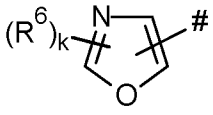
Het-18



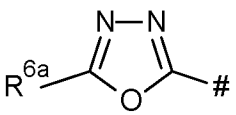
Het-19



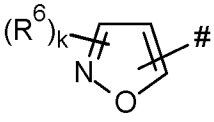
Het-20



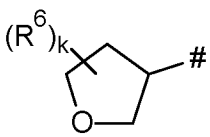
Het-21



Het-22



Het-23



Het-24

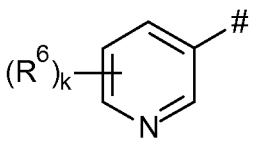
wherein # denotes the bond in formula (I), and wherein R^6 and k are as defined above and where R^{6a} is hydrogen or has one of the meanings given for R^6 and where R^{6b} is hydrogen or a C-bound radical mentioned as R^6 and where R^{6b} is in particular hydrogen, C_1-C_4-alkyl or C_1-C_4-haloalkyl. In particular k is 0, 1 or 2, especially 0 or 1. In formulae Het-1, Het-2, Het-3, Het-4, Het-7, Het-8, Het-9, Het-10, Het-11, Het-18 and Het-21, k is especially 1. In particular R^{6a} in formulae Het-12, Het-13, Het-14, Het-16, Het-17, Het-19, Het 20 and Het-22 is different from hydrogen.

Irrespectively of its occurrence, R^6 is preferably selected from the group consisting of halogen, cyano, C_1-C_6-alkyl, C_3-C_8-cycloalkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the four last mentioned radicals may optionally be partly or completely halogenated, in particular by fluorine or chlorine, or may be (further) substituted independently from one another with one or more (e.g. 1, 2 or 3) identical or different R^7, or R^6 may also be a radical selected from the group consisting of OR^8, $NR^{17a}R^{17b}$, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{7a}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=S)R^{7a}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{7a}$, $C(=NR^{17})NR^{17a}R^{17b}$. Irrespectively of its occurrence, R^6 is in particular selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl.

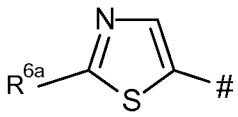
Irrespectively of its occurrence, R^{6a} is preferably selected from the group consisting of hydrogen, halogen, cyano, C_1-C_6-alkyl, C_3-C_8-cycloalkyl, C_2-C_6-alkenyl and C_2-C_6-alkynyl, wherein the carbon atoms of the aforementioned aliphatic and cycloaliphatic radicals may optionally be partly or completely halogenated, in particular by fluorine or chlorine, or may further substituted independently from one another with one or more identical or different R^7, or R^{6a} may also be a radical selected from the group consisting of OR^8, $NR^{17a}R^{17b}$, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{7a}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=S)R^{7a}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{7a}$, $C(=NR^{17})NR^{17a}R^{17b}$. Irrespectively of its occurrence, R^{6a} is in particular selected from the group consisting of hydrogen, halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl.

Irrespectively of its occurrence, R^{6b} is in particular selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl or ethyl, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl.

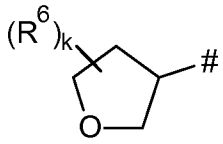
Particularly preferred are compounds of formula (I), wherein Het is selected from the group consisting of radicals of formulae Het-1, Het-11a and Het-24,



Het-1



Het-11a



Het-24 ,

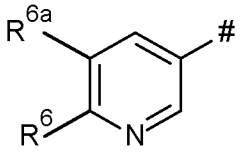
where

R^6 is selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl; and where

R^{6a} is selected from the group consisting of hydrogen, halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl and

k is 0, 1 or 2.

A particularly preferred group of embodiments relates to compounds of formula (I) to the stereoisomers, the tautomers and to the salts thereof, wherein Het is a radical of formula Het-1, where k is 0, 1 or 2, in particular 1 or 2 and especially 1 and where R^6 is as defined above and in particular selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl. Amongst the compounds of this particular group of embodiments, a particular sub-group of embodiments relates to compounds of the formula (I), to the stereoisomers, the tautomers and to the salts thereof, wherein Het is a radical of formula Het-1a



Het-1a

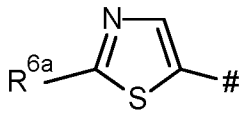
where

R^6 is as defined above and in particular selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, and even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl;

R^{6a} is as defined above and in particular selected from the group consisting of hydrogen, halogen, such as chlorine or fluorine and C_1-C_4-alkyl, such as methyl or ethyl, more preferably is hydrogen.

A special embodiment of the radical Het-1a is 6-chloropyridin-3-yl, i.e. R^{6a} is hydrogen and R^6 is chlorine. A further special embodiment of the radical Het-1a is 6-(trifluoromethyl)pyridin-3-yl, i.e. R^{6a} is hydrogen and R^6 is trifluoromethyl.

Another particularly preferred group of embodiments relates to compounds of formula (I) to the stereoisomers, the tautomers and to the salts thereof, wherein Het is a radical of formula Het-11, where k is 0, 1 or 2, in particular 0 or 1, and where Het is in particular a radical of formula Het-11a,



Het 11a

where R^{6a} is as defined above and wherein R^{6a} is in particular selected from the group consisting of hydrogen, halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl. A special embodiment of the radical Het-11a is 2-chlorothiazol-5-yl, i.e. R^{6a} is chlorine.

Another particularly preferred group of embodiments relates to compounds of formula (I) to the stereoisomers, the tautomers and to the salts thereof, wherein Het is a radical of formula Het-24, where k is 0, 1 or 2, in particular 0 or 1, and where R^6, if present, is as defined above and in particular selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, and even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl.

Preferred are compounds of formula (I), wherein R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, such as fluorine or chlorine, CN, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl or isopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such

as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or C_3-C_6-halocycloalkyl such as 1-fluorocyclopropyl or 2,2-difluorocyclopropyl.

Preferred are also compounds of formula (I), wherein R^1 and R^2 form, together with the carbon atom, which they attached to, a 3- to 5-membered saturated carbocyclic ring such as cyclopropyl, cyclobutyl or cyclopentyl.

Preferred are also compounds of formula (I), wherein R^1 and R^2 may together be $=CR^{13}R^{14}$.

Even more preferred are compounds of formula (I), wherein R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl.

Preferably at least one of the radicals R^1 and R^2 is hydrogen.

Even more preferred are compounds of formula (I), wherein R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen.

In a particular group of embodiments, R^1 and R^2 are both hydrogen.

A group of embodiments relates to compounds of formula (I), wherein R^{3a} is different from hydrogen. Another group of embodiments relates to compounds of formula (I), wherein R^{3a} is hydrogen.

Preferably, R^{3a} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^1-Q^1, where

  Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

  Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$.

In the context of R^{3a}, the variable R^7 is in particular selected from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of NO_2, CN, cyclopropyl and C_1-C_4-alkoxy.

In the context of R^{3a}, the variable R^{10} is in particular selected from the group consisting of halogen, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of halogen, such as fluorine or chlorine, NO_2, CN and C_1-C_4-alkoxy, such as methoxy or ethoxy.

In the context of R^{3a}, the variable Cyc^1 is in particular selected from the group consisting of phenyl and 5- or 6-membered hetaryl, such as pyridinyl, wherein phenyl and hetaryl are unsubstituted or carry 1, 2, 3, 4 or 5 radicals R^{10}, as defined above, which are in particular selected from the group consisting of halogen, such as fluorine, chlorine or bromine, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of NO_2, CN and C_1-C_4-alkoxy. Cyc^1 is especially phenyl, which is unsubstituted or carries 1, 2 or 3 radicals R^{10}, as defined above, which are in particular selected from the group consisting of halogen, such as fluorine, chlorine or bromine, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated.

In particular, R^{3a} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, in particular C_1-C_3-alkyl or C_1-C_3-haloalkyl, where alkyl and haloalkyl may further carry any combination of 1, 2 or 3 radicals R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where C_3-C_6-cycloalkyl is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen and C_1-C_4-alkyl. In this context, R^7 is as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy.

Especially, R^{3a} is selected from the group consisting of methyl, ethyl, difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN, CH_2NO_2 and $CH_2CH_2NO_2$.

Another group of embodiments relates to compounds of formula (I), wherein R^{3a} is a radical, which is selected from the group consisting of $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$ and $S(O)_nR^{8a}$. In the context of this embodiment, the radicals R^{7a}, R^8, R^{8a}, R^{9a} and R^{9b} are as defined above or have in particular the following meanings:

R^{7a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^8 is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, phenyl, benzyl, , where the phenyl ring in the last two mentioned radicals is unsbustituted or carries 1, 2, 3 or 4 radicals R^{10}, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, wherein the phenyl ring in the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{8a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{9a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{9b} is selected from the group consisting of hydrogen, C_1-C_4-alkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

In the context of radicals R^{7a}, R^8, R^{8a}, R^{9a} and R^{9b} the radical R^{10} is in particular selected from the group consisting of halogen, such as fluorine, chlorine or bromine, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated.

Preferably, R^{3b} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^2-Q^2, where

  Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

  Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$.

In the context of R^{3b}, the variable R^7 is in particular selected from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of NO_2, CN, cyclopropyl and C_1-C_4-alkoxy.

In the context of R^{3b}, the variable R^{10} is in particular selected from the group consisting of halogen, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of halogen, such as fluorine or chlorine, NO_2, CN and C_1-C_4-alkoxy, such as methoxy or ethoxy.

In the context of R^{3b}, the variable Cyc^2 is in particular selected from the group consisting of phenyl and 5- or 6-membered hetaryl, such as pyridinyl, wherein phenyl and hetaryl are unsubstituted or carry 1, 2, 3, 4 or 5 radicals R^{10}, as defined above, which are in particular selected from the group consisting of halogen, such as fluorine, chlorine or bromine, NO_2, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and especially selected from the group consisting of NO_2, CN and C_1-C_4-alkoxy. Cyc^2 is especially phenyl, which is unsubstituted or carries 1, 2 or 3 radicals R^{10}, as defined above, which are in particular selected from the group consisting of halogen, such as fluorine, chlorine or bromine, NO_2, CN,

C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated.

In particular, R^{3b} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, especially C_1-C_3-alkyl or C_1-C_3-haloalkyl, where alkyl and haloalkyl may carry 1, 2 or 3 further radicals R^7, which are identical or different. In this context, the radicals R^7 are as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy.

More particularly, R^{3b} is selected from the group consisting of C_1-C_3-alkyl and C_1-C_3-haloalkyl, especially from the group consisting of methyl, ethyl, difluoromethyl and trifluoromethyl.

In particular groups (1) of embodiments, the group Y in formula (I) is a group Y^1, where X is in particular O and where R^4 is as defined herein.

In further particular groups (2) of embodiments, the group Y in formula (I) is a group Y^2, where X is in particular O and where R^4 is as defined herein.

In yet further particular groups (3) of embodiments, the group Y in formula (I) is a group Y^3, where X is in particular O and where R^4 and R^{5a} as defined herein.

In further particular groups (4) of embodiments, the group Y in formula (I) is a group Y^4, where R^{5a} and R^{5b} as defined herein.

In further particular groups (5) of embodiments, the group Y in formula (I) is a group Y^4, where R^{5a} and R^{5b} as defined herein.

Particular preference is given to groups (1) and (3) of embodiments and especially to groups (3) of embodiments.

The radical X in the groups Y^1, Y^2 and Y^3 in the groups (1), (2) and (3) embodiments is in particular O.

In the context of groups (1), (2) and (3) of embodiments, the radical R^4 is in particular selected from the group consisting of

hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

OR^8, $NR^{18a}R^{18b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl, which is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized.

In the context of groups (1), (2) and (3) of embodiments, the radical R^4 is even more particularly selected from the group consisting of

hydrogen, C_1-C_4-alkyl, C_2-C_4-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

OR^8, $NR^{18a}R^{18b}$,

phenyl, which is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized.

In the context of groups (1), (2) and (3) embodiments, the radical R^4 is even more particularly selected from the group consisting of

C_1-C_6-alkyl, C_2-C_6-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

$NR^{18a}R^{18b}$,

phenyl, which is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 5- or 6- membered aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the aromatic heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}.

In the context of groups (1), (2) and (3) of embodiments, particular groups (1a), (2a) and (3a) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7, where R^7 is as defined above and in particular selected from the group consisting of from CN, NO_2, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_3-C_6-cycloalkyl, $S(O)_nR^{8a}$ and $S(O)_nNR^{17a}R^{17b}$.

Examples of this type of radicals R^4 include the following radicals R-4.1 to R-4.18:

R-4.1: methyl;

R-4.2: ethyl;

R-4.3: isopropyl;

R-4.4: tert.-butyl;

R-4.5: trifluoromethyl;

R-4.6: 2,2-difluoroethyl;

R-4.7: 2,2,2-trifluoroethyl;

R-4.8: cyanomethyl;

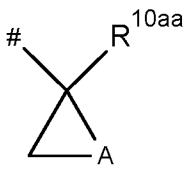
R-4.9: 1-cyanoethyl;

R-4.10: nitromethyl;
R-4.11: 1-nitroethyl;
R-4.12: CF_2-S-CH_3;
R-4.13: CF_2-S(O)-CH_3;
R-4.14: CF_2-$S(O)_2$-CH_3;
R-4.15: CF_2-S-C_2H_5;
R-4.16: CF_2-S(O)-C_2H_5;
R-4.17: CF_2-$S(O)_2$-C_2H_5;
R-4.18 1-cyano-1-methylethyl.

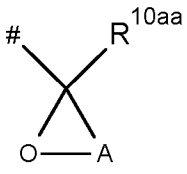
In the context of groups (1), (2) and (3) of embodiments, further particular groups (1b), (2b) and (3b) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is 6-membered heteroaryl, which is in particular selected from the group consisting of pyridinyl, pyrimidinyl, pyrazinyl and pyridazinyl, wherein 6-membered heteroaryl is unsubsituted or carries 1, 2, 3 or 4 radicals R^{10}, which are in particular selected from halogen, CN, NO_2, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy and C_1-C_4-haloalkoxy.

Examples of this type of radicals R^4 include 2-thiazolyl (R-40.1) and 2-pyrazinyl (R-40.2).

In the context of groups (1), (2) and (3) of embodiments, yet further particular groups (1c), (2c) and (3c) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is a radical of formula R-41 or R-42:



R-41



R-42

wherein # indicates the bond to the carbonyl group in formula (I)

A is CH_2, CH_2CH_2 or $CH_2CH_2CH_2$,

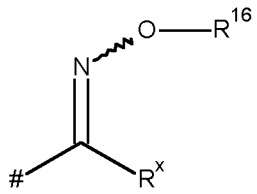
R^{10aa} is hydrogen or a radical R^{10} as defined above, which R^{10aa} is in particular selected from hydrogen, halogen, especially fluorine, $S(O)_nR^{16a}$, CN and NO_2, where n is 0, 1 or 2 and R^{16a} is as defined above an in particular selected from C_1-C_4-alkyl and C_1-C_4-haloalkyl.

Examples of radicals R-41 and R-42 include the following radicals R-41.1 to R-41.20 and R-42.1 to R-42.8:

R-41.1: cyclopropyl;
R-41.2: cyclobutyl;
R-41.3: 1-fluorocyclopropyl;
R-41.4: 1-fluorocyclobutyl;
R-41.5: 1-cyanocyclopropyl;
R-41.6: 1-cyanocylobutyl;

R-41.7: 1-nitrocyclopropyl;
R-41.8: 1-nitrocyclobutyl;
R-41.9: 1-(methylthio)cyclopropyl;
R-41.10: 1-(methylsulfinyl)cyclopropyl;
R-41.11: 1-(methylsulfonyl)cyclopropyl;
R-41.12: 1-(ethylthio)cyclopropyl;
R-41.13: 1-(ethylsulfinyl)cyclopropyl;
R-41.14: 1-(ethylsulfonyl)cyclopropyl;
R-41.15: 1-(methylthio)cyclobutyl;
R-41.16: 1-(methylsulfinyl)cyclobutyl;
R-41.17: 1-(methylsulfonyl)cyclobutyl;
R-41.18: 1-(ethylthio)cyclobutyl;
R-41.19: 1-(ethylsulfinyl)cyclobutyl;
R-41.20: 1-(ethylsulfonyl)cyclobutyl;
R-42.1: 2-oxiranyl;
R-42.2: 2-oxetanyl;
R-42.3: 2-fluoro-2-oxiranyl;
R-42.4: 2-fluoro-2-oxetanyl;
R-42.5: 2-cyano-2-oxiranyl;
R-42.6: 2-cyano-2-oxetanyl;
R-42.7: 2-nitro-2-oxiranyl and
R-42.8: 2-nitro-2-oxetanyl.

In the context of groups (1), (2) and (3) of embodiments, further particular groups (1d), (2d) and (3d) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is a radical of formula R-43:



(R-43)

wherein # indicates the bond to the carbonyl group in formula (I),

R^x is hydrogen, halogen, CN, NO_2, C_1-C_4-alkyl, C_1-C_4-haloalkyl, $NR^{17a}R^{17b}$, $S(O)_2NR^{17a}R^{17b}$, $S(O)_2R^{8a}$ or $C(=O)OR^8$ and in particular hydrogen, CN, C_1-C_4-alkyl, such as methyl, or C_1-C_4-haloalkyl, such as trifluoromethyl;

R^{16} is as defined above and in particular selected from the group consisting of hydrogen, C_1-C_6-alkyl and C_2-C_6-alkenyl, where the two aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry 1 or 2 radicals R^7, which are as defined above, and which are in particular selected from the group consisting of NO_2, CN, OR^8, $S(O)_nR^{8a}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$ and NR^{17a}-$C(=O)R^{7a}$, or

R^{16} is benzyl which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl.

In formula R-43, R^{16} is especially selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, where the two aforementioned radicals may carry 1 or 2 radicals R^7, which are selected from the group consisting of NO_2, CN and OR^8, C_2-C_4-alkenyl, C_2-C_4-haloalkenyl, and benzyl which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl.

Examples of radicals R-43 are the radicals R-43.1 to R-43.44, where R^x and R^{16} are as defined in the rows of the following table A:

Table A: Radicals R-43

	R^x	R^{16}
R-43.1	H	H
R-43.2	H	CH_3
R-43.3	H	C_2H_5
R-43.4	H	$CH_2CH_2OCH_3$
R-43.5	H	$CH(CH_3)_2$
R-43.6	H	$CH_2CH_2CH_3$
R-43.7	H	$CH_2CH=CH_2$
R-43.8	H	$CH_2CH=CHCl$
R-43.9	H	CH_2-C_6H_5
R-43.10	H	CH_2-(4-Cl-C_6H_4)
R-43.11	H	CH_2-(4-(OCH_3)-C_6H_4)
R-43.12	CH_3	H
R-43.13	CH_3	CH_3
R-43.14	CH_3	C_2H_5
R-43.15	CH_3	$CH_2CH_2OCH_3$
R-43.16	CH_3	$CH(CH_3)_2$
R-43.17	CH_3	$CH_2CH_2CH_3$
R-43.18	CH_3	$CH_2CH=CH_2$
R-43.19	CH_3	$CH_2CH=CHCl$
R-43.20	CH_3	CH_2-C_6H_5
R-43.21	CH_3	CH_2-(4-Cl-C_6H_4)
R-43.22	CH_3	CH_2-(4-(OCH_3)-C_6H_4)
R-43.23	CF_3	H

	R^x	R^{16}
R-43.24	CF_3	CH_3
R-43.25	CF_3	C_2H_5
R-43.26	CF_3	$CH_2CH_2OCH_3$
R-43.27	CF_3	$CH(CH_3)_2$
R-43.28	CF_3	$CH_2CH_2CH_3$
R-43.29	CF_3	$CH_2CH=CH_2$
R-43.30	CF_3	$CH_2CH=CHCl$
R-43.31	CF_3	CH_2-C_6H_5
R-43.32	CF_3	CH_2-(4-Cl-C_6H_4)
R-43.33	CF_3	CH_2-(4-(OCH_3)-C_6H_4)
R-43.34	CN	H
R-43.35	CN	CH_3
R-43.36	CN	C_2H_5
R-43.37	CN	$CH_2CH_2OCH_3$
R-43.38	CN	$CH(CH_3)_2$
R-43.39	CN	$CH_2CH_2CH_3$
R-43.40	CN	$CH_2CH=CH_2$
R-43.41	CN	$CH_2CH=CHCl$
R-43.42	CN	CH_2-C_6H_5
R-43.43	CN	CH_2-(4-Cl-C_6H_4)
R-43.44	CN	CH_2-(4-(OCH_3)-C_6H_4)

CH_2-C_6H_5: benzyl

CH_2-(4-Cl-C_6H_4): 4-chlorobenzyl

CH_2-(4-(OCH_3)-C_6H_4): 4-methoxybenzyl

In the context of groups (1), (2) and (3) of embodiments, further particular groups (1e), (2e) and (3e) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is a radical of formula $NR^{18a}R^{18b}$.

In context of the radical of formula $NR^{18a}R^{18b}$, the radicals R^{18a} and R^{18b} are each independently from one another preferably selected from the group consisting of

- hydrogen,
- C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, wherein the aforementioned alkyl radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, especially 1 radical R^7
- C_2-C_6-alkenyl, in particular C_2-C_4-alkenyl, such as $CH=CH_2$ or $CH=CH-CH_2$, wherein the aforementioned alkenyl radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, especially 1 radical R^7;

- C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, in particular C_3-C_6-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10};
- C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy,
- C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy,
- C_1-C_4-alkylcarbonyl, such as acetyl or propionyl,
- C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl,
- C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl,
- NH_2-C(O),
- C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl,
- di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl,
- NH_2-$S(O)_2$,
- C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl,
- C_1-C_4-haloalkylsulfonyl, such as trifluoromethylsulfonyl,
- C_1-C_4-alkylaminosulfonyl, such as methylaminosulfonyl or ethylaminosulfonyl,
- di-(C_1-C_4-alkyl)aminosulfonyl, such as dimethylaminosulfonyl or diethylaminosulfonyl;
- phenyl, which is unsubstituted or carries 1, 2 3 or 4 radicals R^{10},
- phenoxy, which is unsubstituted or carries 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,
- and a 5- or 6-membered aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}.

In the context of radicals R^{18a} and R^{18b} the radical R^7 is as defined above and in particular, independently of each other selected from the group consisting of CN, OH, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=O)OR^{8a}$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$, phenyl and phenoxy, where the phenyl ring in the last two mentioned radicals is unsubstituted or carriers 1, 2, 3, 4 or 5 radicals R^{10}.

In context of radical radicals R^{18a} and R^{18b}, the radical R^{10} is as defined herein and in particular selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH,

SH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, such as methylthio or ethylthio, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylthio, such as fluoromethylthio, difluoromethylthio, trifluoromethylthio, 1,1-difluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio or 2,2,2-trifluoroethylthio, C_1-C_4-haloalkylsulfonyl, such as fluoromethylsulfonyl, difluoromethylsulfonyl, trifluoromethylsulfonyl, 1,1-difluoroethylsulfonyl, 2-fluoroethylsulfonyl, 2,2-difluoroethylsulfonyl or 2,2,2-trifluoroethylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl and the like.

R^{18a} and R^{18b} may also together be a C_2-C_6-alkylene chain and form a 3-, 4-, 5-, 6- or 7-membered saturated ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, such as fluorine or chlorine, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_6-alkylthio, in particular C_1-C_4-alkylthio, such as methylsulfanly, ethylsulfanyl, n-propylsulfanyl, isopropylsulfanyl, n-butylsulfanyl, 2-butylsulfanyl or isobutylsulfanyl, and C_1-C_6-haloalkylthio in particular C_1-C_2-haloalkylthio, such as fluoromethylsulfanyl, difluoromethylsulfanyl, trifluoromethylsulfanyl, 1,1-difluoroethylsulfanyl, 2-fluoroethylsulfanyl, 2,2-difluoroethylsulfanyl or 2,2,2-trifluoroethylsulfanyl.

In particular R^{18a} is selected from the group consisting of hydrogen and C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, and especially hydrogen, while R^{18b} has one of the above given meanings and where R^{18b} is in particular

- hydrogen,
- C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl,
- C_2-C_6-alkenyl, in particular C_2-C_4-alkenyl, such as $CH=CH_2$ or $CH=CH-CH_2$,

wherein each of the alkyl and alkenyl radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, which is as defined above and in particular selected from the group consisting of CN, OH, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl; or

R^{18b} is C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl, NH_2-$S(O)_2$, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylsulfonyl, such as trifluoromethylsulfonyl, C_1-C_4-alkylaminosulfonyl, such as methylaminosulfonyl or ethylaminosulfonyl, di-(C_1-C_4-alkyl)aminosulfonyl, such as dimethylaminosulfonyl or diethylaminosulfonyl;

or R^{18a} and R^{18b} may also together be a C_2-C_6-alkylene chain and form a 3-, 4-, 5-, 6- or 7-membered saturated ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, such as fluorine or chlorine, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_6-alkylthio, in particular C_1-C_4-alkylthio, such as methylsulfanly, ethylsulfanyl, n-propylsulfanyl, isopropylsulfanyl, n-butylsulfanyl, 2-butylsulfanyl or isobutylsulfanyl, and C_1-C_6-haloalkylthio in particular C_1-C_2-haloalkylthio, such as fluoromethylsulfanyl, difluoromethylsulfanyl, trifluoromethylsulfanyl, 1,1-difluoroethylsulfanyl, 2-fluoroethylsulfanyl, 2,2-difluoroethylsulfanyl or 2,2,2-trifluoroethylsulfanyl.

Especially, R^{18a} is selected from the group consisting of hydrogen and C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, and especially hydrogen, while R^{18b} is in particular

- hydrogen,
- C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl,
- C_2-C_6-alkenyl, in particular C_2-C_4-alkenyl, such as CH=CH or CH=CH-CH_2,

wherein each of the alkyl and alkenyl radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, which is as defined above and in particular selected from the group consisting of CN, OH, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl;

or

- R^{18a} and R^{18b} may also together be a C_2-C_6 alkylene chain and form a 3-, 4-, 5-, 6- or 7-membered saturated ring together with the nitrogen atom they are bonded to.

Examples of radicals $NR^{18a}NR^{18b}$ include the following radicals R-44.1 to R-44.10

R-44.1: NH_2;
R-44.2: methylamino;
R-44.3: ethylamino;
R-44.4: (2,2-difluoroethyl)amino;
R-44.5: (2,2,2-trifluoroethyl)amino;
R-44.6: dimethylamino;
R-44.7: diethylamino;
R-44.8: cyclopropylmethylamino;
R-44.9: 1-(cyclopropyl)ethylamino;
R-44.10: 1-aziridinyl.

In the context of groups (1), (2) and (3) of embodiments, further particular groups (1f), (2f) and (3f) of embodiments relate to compounds of the formula (I), wherein the variable R^4 is O-R^8, wherein R^8 is as defined above and in particular selected from the group consisting of

- C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl,
- C_2-C_6-alkenyl, in particular C_2-C_4-alkenyl, such as CH=CH or CH=CH-CH_2,
  wherein each of the alkyl and alkenyl radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, which is as defined above and in particular selected from the group consisting of CN, OH, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl; or
- C_3-C_6-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, which are as defined above and preferably selected from the group consisting of halogen, such as fluorine or chlorine, CN, OH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-

haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl.

Examples of radicals OR^8 include the following radicals R-45.1 to R-45.6

R-45.1: methoxy;
R-45.2: ethoxy;
R-45.3: n-propoxy;
R-45.4: isopropoxy;
R-45.5: n-butoxy;
R-45.6: tert.-butoxy.

In context of radical R^4, the radical R^7 is as defined above and in particular selected from the group consisting of CN, OH, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-alkylthio, such as methylsulfanyl or ethylsulfanyl, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluoromethoxy, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=O)OR^{8a}$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$,
phenyl and phenoxy, where the phenyl ring in the last two mentioned radicals is unsubstituted or carriers 1, 2, 3, 4 or 5 radicals R^{10}, it being possible that two R^7 present on one carbon atom may together form $=NOR^{16}$ or $=N$-$NR^{9a}R^{9b}$.

In context of radical R^4, the radical R^{7a} is as defined above and in particular selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, such as cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals R^{10}, which are as defined herein or preferably selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl and di-(C_1-C_4-alkyl)aminocarbonyl and in particular from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

In context of radical R^4, the radical R^8 is as defined above and in particular selected from the group consisting of C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl and the like, phenyl, benzyl, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, where the phenyl ring in the last five radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

In context of radical R^4, the radical R^{8a} is as defined above and in particular selected from the group consisting of C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, phenyl which is unsubstitued or substituted by 1, 2, 3 or 4 identical or different radicals R^{10}, which are as defined herein or preferably selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl and di-(C_1-C_4-alkyl)aminocarbonyl and in particular from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

In context of radical R^4, the radicals R^{9a} and R^{9b} are preferably selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_4-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, and phenyl, which is unsubstituted or

carries 1, 2, 3 or 4 radicals R^{10}, which are as defined herein or preferably selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl and di-(C_1-C_4-alkyl)aminocarbonyl and in particular from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

In this context, $NR^{9a}R^{9b}$ may preferably also be a saturated N-bound 3-, 4-, 5- or 6-membered heterocycle, which in addition to the nitrogen atom may have 1 further heteroatom as ring members, which is selected from O and N and where the N-bound 3-, 4-, 5- or 6-membered heterocycle may be unsubstituted or carry 1, 2, 3 or 4 radicals selected from C_1-C_4-alkyl and C_1-C_4-haloalkyl. Examples of such radicals $NR^{9a}R^{9b}$ include, but are not limited to methylamino, ethylamino, n-propylamino, isopropylamino, n-butylamino, 2-butylamino, isobutylamino, dimethylamino, diethylamino, di-n-propylamino, di-n-butylamino, N-methyl-N-ethylamino, N-methyl-N-propylamino, N-methyl-N-n-propylamino, N-methyl-N-isopropylamino, N-methyl-N-n-butylamino, N-methyl-N-2-butylamino, N-methyl-N-isobutylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-piperazinly, 4-methyl-1-piperazinly and 4-morpholinyl.

In context of radical R^4, the radical R^{10} is as defined herein and in particular selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH, SH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, such as methylthio or ethylthio, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylthio, such as fluoromethylthio, difluoromethylthio, trifluoromethylthio, 1,1-difluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio or 2,2,2-trifluoroethylthio, C_1-C_4-haloalkylsulfonyl, such as fluoromethylsulfonyl, difluoromethylsulfonyl, trifluoromethylsulfonyl, 1,1-difluoroethylsulfonyl, 2-fluoroethylsulfonyl, 2,2-difluoroethylsulfonyl or 2,2,2-trifluoroethylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl and the like.

In context of radical R^4, the radical R^{15} is as defined above and in particular selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, phenyl which is unsubstitued or substituted by 1, 2, 3 or 4 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylthio, such as methylthio or ethylthio, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylthio, such as fluoromethylthio, difluoromethylthio, trifluoromethylthio, 1,1-difluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio or 2,2,2-trifluoroethylthio, C_1-C_4-haloalkylsulfonyl, such as fluoromethylsulfonyl, difluoromethylsulfonyl, trifluoromethylsulfonyl, 1,1-difluoroethylsulfonyl, 2-fluoroethylsulfonyl, 2,2-difluoroethylsulfonyl or 2,2,2-trifluoroethylsulfonyl, C_1-C_4-alkylamino, such as methylamino or ethylamino, di-(C_1-C_4-alkyl)amino, such as dimethylamino, diethylamino, N-methyl-N-ethylamino and the like.

In context of radical R^4, the radical R^{16} is in particular selected from the group consisting of C_1-C_4-alkyl,C_2-C_4-alkenyl, where the two aforementioned radicals are unsubstituted, partly or completely halogenated, and benzyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, phenyl which is unsubstitued or substituted by 1, 2, 3 or 4 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylthio, such as methylthio or ethylthio, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylthio, such as fluoromethylthio, difluoromethylthio, trifluoromethylthio, 1,1-difluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio or 2,2,2-trifluoroethylthio, C_1-C_4-haloalkylsulfonyl, such as fluoromethylsulfonyl, difluoromethylsulfonyl, trifluoromethylsulfonyl, 1,1-difluoroethylsulfonyl, 2-fluoroethylsulfonyl, 2,2-difluoroethylsulfonyl or 2,2,2-trifluoroethylsulfonyl, C_1-C_4-alkylamino, such as methylamino or ethylamino, di-(C_1-C_4-alkyl)amino, such as dimethylamino,

diethylamino, N-methyl-N-ethylamino, (C_1-C_4-alkyl)carbonyl, such as acetyl or propionyl, (C_1-C_4-alkyl)carbonyloxy, such as acetoxy or propionoxy, and (C_1-C_4-alkoxy)carbonyl such as methoxycarbonyl or ethoxycarbonyl.

In context of radical R^4, the radicals R^{17a} and R^{17b} are preferably selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, and C_1-C_4-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, phenyl or benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2, 3 or 4 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH, SH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylthio, such as methylthio or ethylthio, C_1-C_4-alkylsulfonyl, such as methylsulfonyl or ethylsulfonyl, C_1-C_4-haloalkylthio, such as fluoromethylthio, difluoromethylthio, trifluoromethylthio, 1,1-difluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio or 2,2,2-trifluoroethylthio, C_1-C_4-haloalkylsulfonyl, such as fluoromethylsulfonyl, difluoromethylsulfonyl, trifluoromethylsulfonyl, 1,1-difluoroethylsulfonyl, 2-fluoroethylsulfonyl, 2,2-difluoroethylsulfonyl or 2,2,2-trifluoroethylsulfonyl, C_1-C_4-alkylamino, such as methylamino or ethylamino, di-(C_1-C_4-alkyl)amino, such as dimethylamino, diethylamino, N-methyl-N-ethylamino and the like.

In context of radical $S(O)_nR^{8a}$, the variable n, irrespectively of its occurrence, is in particular 0 or 2.

In the context of groups (1a), (1b), (1c), (1d), (1e), (1f), (2a), (2b), (2c), (2d), (2e), (2f), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments the variables R^{7a}, R^8, R^{8a}, R^{15}, R^{17a}, R^{17b}, irrespectively of their occurrence, have especially one of the following meanings:

R^{7a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^8 is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, phenyl, benzyl, , where the phenyl ring in the last two mentioned radicals is unsbustituted or carries 1, 2, 3 or 4 radicals R^{10}, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{8a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{10} is selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbony and di-(C_1-C_4-alkyl)aminocarbonyl

two R^{10} present on one carbon atom may together form =NOR^{16};

R^{15} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, (C_1-C_6-alkyl)carbonyl and (C_1-C_6-alkoxy)carbonyl;

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, phenyl and benzyl, where the phenyl ring in the last two substitutents is unsubstituted or carries 1, 2 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, (C_1-C_6-alkyl)carbonyl and (C_1-C_6-alkoxy)carbonyl.

In the context of groups (1a), (1b), (1c), (1d), (1e), (1f), (2a), (2b), (2c), (2d), (2e), (2f), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments the variables R^{7a}, R^8, R^{8a}, R^{15}, R^{17a}, R^{17b}, irrespectively of their occurrence, have especially one of the following meanings:

R^{7a} is selected from the group consisting of C_1-C_4-alkyl or C_1-C_4-haloalkyl;

R^8 is selected from the group consisting of C_1-C_4-alkyl and C_1-C_4-haloalkyl;

R^{8a} is selected from the group consisting of C_1-C_4-alkyl and C_1-C_4-haloalkyl;

R^{9a} is selected from the group consisting of hydrogen and C_1-C_4-alkyl;

R^{9b} is selected from the group consisting of hydrogen and C_1-C_4-alkyl;

R^{10} is selected from the group consisting of halogen, CN, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio and C_1-C_4-haloalkylsulfonyl;

R^{15} is selected from the group consisting of hydrogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl;

R^{16a} is selected from the group consisting of C_1-C_4-alkyl, which is unsubstituted, partly or completely halogenated;

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen and C_1-C_4-alkyl.

In groups (3), (4) and (5) of embodiments, R^{5a} is as defined above and preferably selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_2-C_6-alkenyl, in particular C_2-C_4-alkyl, such as 2-propenyl, C_1-C_6-alkoxy, in particular C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropyloxy, C_3-C_8-cycloalkyl, such as cyclopropyl, cyclopbutyl, cyclopentyl or cyclohexyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, in particular C_3-C_6-cycloalkylmethyl, such as cyclopropylmethyl or cyclobutylmethyl, wherein alkyl, alkenyl, cycloalkyl and cycloalkylalkyl are unsubstituted, partly or completely halogenated,

$C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl and phenyl-C_1-C_4-alkyl, in particular phenyl and benzyl, where the phenyl ring in the last four mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}.

In groups (4) and (5) of embodiments, R^{5b} is in particular selected from the group consisting of C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_2-C_6-alkenyl, in particular C_2-C_4-alkyl, such as 2-propenyl, C_3-C_8-cycloalkyl, such as cyclopropyl, cyclopbutyl, cyclopentyl or cyclohexyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, in particular C_3-C_6-cycloalkylmethyl, such as cyclopropylmethyl or cyclobutylmethyl, wherein alkyl, alkenyl, cycloalkyl and cycloalkylalkyl are unsubstituted, partly or completely halogenated, phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, where the radical R^{10} is as defined above and in particular selected from the group consisting of halogen, such as chlorine or fluorine, CN, OH, SH, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl and the like.

In groups (3), (4) and (5) of embodiments, R^{5a} is in particular selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_6-alkoxy, in particular C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropyloxy, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, in particular C_3-C_6-cycloalkylmethyl, such as cyclopropylmethyl or cyclobutylmethyl, wherein alkyl, cycloalkyl and cycloalkylalkyl are unsubstituted, partly or completely halogenated,

$C(=O)OR^8$, $C(=O)R^{7a}$ and $C(=S)R^{7a}$.

In groups (3), (4) and (5) of embodiments, R^{5a} is especially selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl and C_1-C_6-alkoxy, in particular C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropyloxy..

In groups (3), (4) and (5) of embodiments, R^{5a} is especially hydrogen, OH, methyl or methoxy.

In context of radical R^{5a}, the radical R^{7a} is as defined above and in particular selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-

difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, such as cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals R^{10}, which are as defined above or preferably selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

In context of radical R^{5a}, the radical R^8 is as defined above and in particular selected from the group consisting of C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl or tert-butyl, C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl, pentafluoroethyl, 2-fluoro-1-methylethyl, 2,2-difluoro-1-methylethyl, 2,2,2-trifluoro-1-methylethyl, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl or heptafluoroisopropyl, C_1-C_4-alkylcarbonyl, such as acetyl or propionyl, C_1-C_4-haloalkylcarbonyl, such as difluoroacetyl or trifluoroacetyl, C_1-C_4-alkoxycarbonyl, such as methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, 2-butoxycarbonyl, isobutoxycarbonyl or tert.-butoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, such as methylaminocarbonyl or ethylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, such as dimethylaminocarbonyl, diethylaminocarbonyl, N-methyl-N-ethylaminocarbonyl and the like, phenyl, benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, where the phenyl ring in the last three mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl.

In groups (2) of embodiments, R^4 and R^{5a} together may also form a bivalent radical, as defined above, which is in particular selected from the group consisting of linear C_2-C_4-alkanediyl, i.e. CH_2CH_2, $CH_2CH_2CH_2$ or $CH_2CH_2CH_2CH_2$ and linear C_2-C_4-alkenediyl, such as

CH=CH, CH=CH-CH_2 or CH_2CH=CH-CH_2 wherein the carbon atom in the four aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b}, which is as defined above and in particular selected from the group consisting of halogen, such as fluorine or chlorine, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_6-alkylthio, in particular C_1-C_4-alkylthio, such as methylsulfanly, ethylsulfanyl, n-propylsulfanyl, isopropylsulfanyl, n-butylsulfanyl, 2-butylsulfanyl or isobutylsulfanyl, and C_1-C_6-haloalkylthio in particular C_1-C_2-haloalkylthio, such as fluoromethylsulfanyl, difluoromethylsulfanyl, trifluoromethylsulfanyl, 1,1-difluoroethylsulfanyl, 2-fluoroethylsulfanyl, 2,2-difluoroethylsulfanyl or 2,2,2-trifluoroethylsulfanyl.

In groups (4) and (5) of embodiments, R^{5a} and R^{5b} together may also form a bivalent radical, as defined above, which is in particular selected from the group consisting of linear C_2-C_4-alkanediyl, i.e. CH_2CH_2, $CH_2CH_2CH_2$ or $CH_2CH_2CH_2CH_2$ and linear C_2-C_4-alkenediyl, such as CH=CH, CH=CH-CH_2 or CH_2CH=CH-CH_2 wherein the carbon atom in the four aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b}, which is as defined above and in particular selected from the group consisting of halogen, such as fluorine or chlorine, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy, C_1-C_6-alkylthio, in particular C_1-C_4-alkylthio, such as methylsulfanly, ethylsulfanyl, n-propylsulfanyl, isopropylsulfanyl, n-butylsulfanyl, 2-butylsulfanyl or isobutylsulfanyl, and C_1-C_6-haloalkylthio in particular C_1-C_2-haloalkylthio, such as fluoromethylsulfanyl, difluoromethylsulfanyl, trifluoromethylsulfanyl, 1,1-difluoroethylsulfanyl, 2-fluoroethylsulfanyl, 2,2-difluoroethylsulfanyl or 2,2,2-trifluoroethylsulfanyl.

Particular preference is given to groups (1) of embodiments, where the radical R^4 is a radical as defined in groups (1a), (1b), (1c), (1d), (1e) and (1f) embodiments;

and where X is O.

Particular preference is also given to groups (3) of embodiments, where the radical R^4 is a radical as defined in groups (3a), (3b), (3c), (3d), (3e) and (3f) embodiments;

R^{5a} is in particular selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_6-alkoxy, in particular C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropyloxy, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, in particular C_3-C_6-cycloalkylmethyl, such as cyclopropylmethyl or cyclobutylmethyl, wherein alkyl, cycloalkyl and cycloalkylalkyl are unsubstituted, partly or completely halogenated,

C(=O)OR^8, C(=O)R^{7a} and C(=S)R^{7a};

and where R^{5a} is more particularly selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl and C_1-C_6-alkoxy, in particular C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropyloxy; and where R^{5a} is especially hydrogen, OH, methyl or methoxy.

and where X is O.

Particularly preferred are compounds of the formula (I) , in particular the compounds of groups (1), (2), (3), (4), (5), (1a), (1b), (1c), (1d), (1e), (1f), (2a), (2b), (2c), (2d), (2e), (2f), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, such as fluorine or chlorine, CN, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl or isopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or C_3-C_6-halocycloalkyl such as 1-fluorocyclopropyl or 2,2-difluorocyclopropyl, or wherein R^1 and R^2 form, together with the carbon atom, which they attached to, a 3- to 5-membered saturated carbocyclic ring such as cyclopropyl, cyclobutyl or cyclopentyl; and wherein R^1 and R^2 are more particularly independently from each other selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially where R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^1-Q^1, where

  Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

  Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$;

and

R^{3b} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^2-Q^2, where

Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$.

Particularly preferred are also compounds of the formula (I), in particular the compounds of groups (1), (2), (3), (4), (5), (1a), (1b), (1c), (1d), (1e), (1f), (2a), (2b), (2c), (2d), (2e), (2f), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially where R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is C_1-C_6-alkyl, especially C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where C_3-C_6-cycloalkyl is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen and C_1-C_4-alkyl. In this context, R^7 is as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy; and

R^{3b} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, especially C_1-C_3-alkyl or C_1-C_3-haloalkyl, where alkyl and haloalkyl may carry 1, 2 or 3 further radicals R^7, which are identical or different. In this context, the radicals R^7 are as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy.

Particularly preferred are also compounds of the formula (I), in particular the compounds of groups (1), (2), (3), (4), (5), (1a), (1b), (1c), (1d), (1e), (1f), (2a), (2b), (2c), (2d), (2e), (2f), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries a radical R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where R^7 is as defined above and in particular selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy and where

R^{3a} is especially selected from the group consisting of methyl, ethyl, difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN, CH_2NO_2 and $CH_2CH_2NO_2$;

and

R^{3b} is selected from the group consisting of C_1-C_3-alkyl and C_1-C_3-haloalkyl, especially from the group consisting of methyl, ethyl, difluoromethyl and trifluoromethyl.

Especially preferred are compounds of the formula (I) of groups (3), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, such as fluorine or chlorine, CN, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl or isopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or C_3-C_6-halocycloalkyl such as 1-fluorocyclopropyl or 2,2-difluorocyclopropyl, or wherein R^1 and R^2 form, together with the carbon atom, which they attached to, a 3- to 5 membered saturated carbocyclic ring such as cyclopropyl, cyclobutyl or cyclopentyl; and wherein R^1 and R^2 are more particularly independently from each other selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially where R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^1-Q^1, where

Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different

heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$;

and

R^{3b} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^2-Q^2, where

Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$.

Especially preferred are also compounds of the formula (I) of groups (3), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are independently from each other selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially where R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is C_1-C_6-alkyl, especially C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where C_3-C_6-cycloalkyl is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen and C_1-C_4-alkyl. In this context, R^7 is as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy;

and

R^{3b} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, especially C_1-C_3-alkyl or C_1-C_3-haloalkyl, where alkyl and haloalkyl may carry 1, 2 or 3 further radicals R^7, which are identical or different. In this context, the radicals R^7 are as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-

alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy.

Especially preferred are also compounds of the formula (I) of groups (3), (3a), (3b), (3c), (3d), (3e) and (3f) of embodiments, wherein

Het is as defined above and in particular a radical Het-1a, Het-11a or Het-24, more particularly a radical Het-1a, especially 6-chloropyridin-3-yl or 6-(trifluoromethyl)pyridin-3-yl;

X is preferably O;

R^1 and R^2 are both hydrogen or R^1 is methyl and R^2 is hydrogen;

R^{3a} is C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries a radical R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where R^7 is as defined above and in particular selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy and where

R^{3a} is especially selected from the group consisting of methyl, ethyl, difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN, CH_2NO_2 and $CH_2CH_2NO_2$;

and

R^{3b} is selected from the group consisting of C_1-C_3-alkyl and C_1-C_3-haloalkyl, especially from the group consisting of methyl, ethyl, difluoromethyl and trifluoromethyl.

Apart from that, the variables R^6, R^7, R^{7a}, R^{7b}, R^8, R^{8a}, R^{9a}, R^{9b}, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16a}, R^{17}, R^{17a}, R^{17b}, R^{17c}, irrespectively of their occurrence, in particular have the following meanings, if not stated otherwise:

R^6 irrespectively of its occurrence, is selected from the group consisting of halogen, such as chlorine or fluorine, C_1-C_4-alkyl, such as methyl or ethyl, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluormethoxy, and C_1-C_4-haloalkyl, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl.

R^7 irrespectively of its occurrence, is selected from the group consisting of CN, C_1-C_4-alkoxy, such as methoxy or ethoxy, C_1-C_4-haloalkoxy, such as difluoromethoxy or trifluormethoxy, such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, more preferably from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl, even more preferably from fluorine, chlorine, C_1-C_2-alkyl, such as methyl or ethyl and C_1-C_2-haloalkyl such as difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl or pentafluoroethyl, C_3-C_6-cycloalkyl such as cyclopropyl, cyclobutyl or cyclopropyl, and C_3-C_6-halocycloalkyl.

R^{7a} irrespectively of its occurrence, is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl- C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2

or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{7b} is preferably selected from the group consisting of halogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkylmethyl, and phenyl , it being possible for phenyl to be unsubstituted, partly or completely halogenated, or two radicals R^{7b} bound the same carbon atom may be =O, =S or $=CR^{13}R^{14}$ and where R^{7b} is more particularly fluorine, C_1-C_4-alkyl, such as methyl, ethyl, propyl, isopropyl or n-butyl, C_1-C_4-haloalkyl, especially C_1-C_2-fluoroalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl or two radicals R^{7b} bound the same carbon atom may be =O or $=CH_2$.

R^8 irrespectively of its occurrence, is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{8a} irrespectively of its occurrence, is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10}, which are preferably selected, independently of each other from halogen, CN, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy and C_1-C_4-haloalkyl.

R^{9a} and R^{9b} irrespectively of their occurrence, are preferably selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, and C_1-C_4-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or $NR^{9a}R^{9b}$ may also be a saturated N-bound 3-, 4-, 5- or 6-membered heterocycle, which in addition to the nitrogen atom may have 1 further heteroatom as ring members, which is selected from O and N and where the N-bound 3-, 4-, 5- or 6-membered heterocycle may be unsubstituted or carry 1, 2, 3 or 4 radicals selected from C_1-C_4-alkyl and C_1-C_4-haloalkyl. Examples of such radicals $NR^{9a}R^{9b}$ include, but are not limited to methylamino, ethylamino, n-propylamino, isopropylamino, n-butylamino, 2-butylamino, isobutylamino, dimethylamino, diethylamino, di-n-propylamino, di-n-butylamino, N-methyl-N-ethylamino, N-methyl-N-propylamino, N-methyl-N-n-propylamino, N-methyl-N-isopropylamino, N-methyl-N-n-butylamino, N-methyl-N-2-butylamino, N-methyl-N-

isobutylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-piperazinly, 4-methyl-1-piperazinly and 4-morpholinyl.

R^{10} irrespectively of its occurrence, is selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{11}, R^{12} independently of their occurrence, are selected from the group consisting of C_1-C_6-alkyl, C_1-C_6-alkoxy, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in last two radicals are unsubstituted or substituted with 1, 2, or 3 identical or different radicals selected from fluorine, chlorine, C_1-C_3-alkyl, C_1-C_2-haloalkyl, C_1-C_2-alkoxy and C_1-C_2-haloalkoxy.

R^{13}, R^{14} independently of their occurrence, are selected from the group consisting of hydrogen, fluorine, chlorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl or n-butyl, C_3-C_6-cycloalkyl, such as cyclopropyl, cyclobutyl or cyclopentyl, and phenyl.

R^{15} irrespectively of its occurrence, is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{16a} irrespectively of its occurrence, is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{17} irrespectively of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_4-haloalkyl, C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_3-C_6-alkenyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group

consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

R^{17a} and R^{17b} irrespectively of their occurrence, are preferably selected from the group consisting of hydrogen, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl or isobutyl, and C_1-C_4-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or $NR^{17a}R^{17b}$ may also be a saturated N-bound 3-, 4-, 5- or 6-membered heterocycle, which in addition to the nitrogen atom may have 1 further heteroatom as ring members, which is selected from O and N and where the N-bound 3-, 4-, 5- or 6-membered heterocycle may be unsubstituted or carry 1, 2, 3 or 4 radicals selected from C_1-C_4-alkyl and C_1-C_4-haloalkyl. Examples of such radicals $NR^{17a}R^{17b}$ include, but are not limited to methylamino, ethylamino, n-propylamino, isopropylamino, n-butylamino, 2-butylamino, isobutylamino, dimethylamino, diethylamino, di-n-propylamino, di-n-butylamino, N-methyl-N-ethylamino, N-methyl-N-propylamino, N-methyl-N-n-propylamino, N-methyl-N-isopropylamino, N-methyl-N-n-butylamino, N-methyl-N-2-butylamino, N-methyl-N-isobutylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-piperazinly, 4-methyl-1-piperazinly and 4-morpholinyl.

R^{17c} irrespectively of its occurrence, is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstitued or substituted by 1, 2 or 3 identical or different radicals selected from the group consisting of halogen, such as chlorine or fluorine, CN, C_1-C_4-alkyl, such as methyl, ethyl, n-propyl and isopropyl, C_1-C_4-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, C_1-C_4-alkoxy, such as methoxy, ethoxy, n-propoxy and isopropoxy, and C_1-C_4-haloalkoxy, in particular C_1-C_2-haloalkoxy, such as fluoromethoxy, difluoromethoxy, trifluoromethoxy, 1,1-difluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy or 2,2,2-trifluoroethoxy.

Particular preference is given to the compounds of the formulae I-A.1, I-A.2, I-A.3, I-A.4, I-B.1, I-B.2, I-C.1, I-C.2, to their tautomers, to their stereoisomers and to their salts, where R^1, R^{3a}, R^{3b} and R^4 are as defined above, in particular to those compounds, where

X is O or S, especially O;

R^1 is selected from the group consisting of hydrogen, halogen, such as fluorine or chlorine, CN, C_1-C_6-alkyl, in particular C_1-C_4-alkyl, such as methyl, ethyl, n-propyl or isopropyl, C_3-C_6-cycloalkyl, such as cyclopropyl or cyclobutyl, C_1-C_6-haloalkyl, in particular C_1-C_2-haloalkyl, such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl, or C_3-C_6-halocycloalkyl such as 1-fluorocyclopropyl or 2,2-difluorocyclopropyl,
in particular hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or

C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially hydrogen or methyl,;

R^{3a} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^1-Q^1, where

  Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

  Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$;

R^{3b} is a C-bound radical, in particular

- C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,
- C_3-C_6-cycloalkyl, which is unsubstituted carries any combination of 1, 2, 3, 4 or 5 radicals R^{10}, or
- Cyc^2-Q^2, where

  Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and

  Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl, in particular CH_2, CH_2CH_2 or $CHCH_3$;

R^4 is a radical as defined for the groups of embodiments (1a), (1b), (1c), (1d), (1e), (1f), (3a), (3b), (3c), (3d), (3e) or (3f);

and

R^{5a} if present, is selected from H, C_1-C_4-alkyl, OH and C_1-C_4-alkoxy.

Particular preference is also given to the compounds of the formulae I-A.1, I-A.2, I-A.3, I-A.4, I-B.1, I-B.2, I-C.1, I-C.2, to their tautomers, to their stereoisomers and to their salts, where R^1, R^{3a}, R^{3b} and R^4 are as defined below:

X is O or S, especially O;

R^1 is selected from the group consisting of hydrogen, halogen, cyano, C_1-C_3-alkyl, such as methyl ethyl or isopropyl, or C_1-C_3-haloalkyl such as fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl or 2,2,2-trifluoroethyl and especially hydrogen or methyl;

R^{3a} is C_1-C_6-alkyl, especially C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7, or C_3-C_6-cycloalkyl,

especially cyclopropyl, where C_3-C_6-cycloalkyl is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen and C_1-C_4-alkyl. In this context, R^7 is as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy;

R^{3b} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, especially C_1-C_3-alkyl or C_1-C_3-haloalkyl, where alkyl and haloalkyl may carry 1, 2 or 3 further radicals R^7, which are identical or different. In this context, the radicals R^7 are as defined above and in particular from the group consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated, and R^7 is especially selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy, and

R^4 is a radical as defined for the groups of embodiments (1a), (1b), (1c), (1d), (1e), (1f), (3a), (3b), (3c), (3d), (3e) or (3f);

and

R^{5a} if present, is selected from H, C_1-C_4-alkyl, OH and C_1-C_4-alkoxy.

Particular preference is also given to the compounds of the formulae I-A.1, I-A.2, I-A.3, I-A.4, I-B.1, I-B.2, I-C.1, I-C.2, to their tautomers, to their stereoisomers and to their salts, where R^1, R^{3a}, R^{3b} and R^4 are as defined below:

X is O or S, especially O;

R^1 is hydrogen or methyl and especially hydrogen;

R^{3a} is C_1-C_3-alkyl, which is unsubstituted, partly or completely halogenated and/or carries a radical R^7, or C_3-C_6-cycloalkyl, especially cyclopropyl, where R^7 is as defined above and in particular selected from the group consisting of NO_2, cyclopropyl, CN and C_1-C_4-alkoxy and where

R^{3a} is especially selected from the group consisting of methyl, ethyl, difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN, CH_2NO_2 and $CH_2CH_2NO_2$;

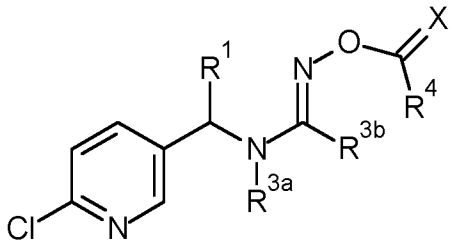
and

R^{3b} is selected from the group consisting of C_1-C_3-alkyl and C_1-C_3-haloalkyl, especially from the group consisting of methyl, ethyl, difluoromethyl and trifluoromethyl.

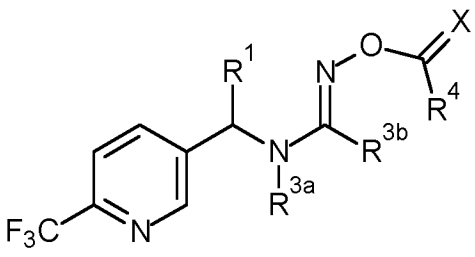
R^4 is a radical as defined for the groups of embodiments (1a), (1b), (1c), (1d), (1e), (1f), (3a), (3b), (3c), (3d), (3e) or (3f);

and

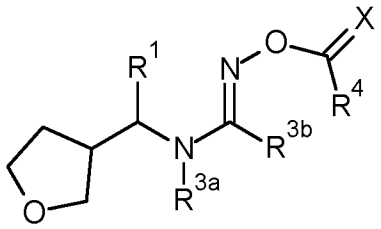
R^{5a} if present, is selected from H, C_1-C_4-alkyl, OH and C_1-C_4-alkoxy.



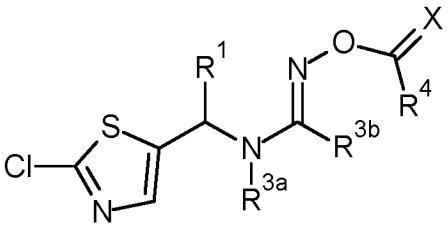
I-A.1



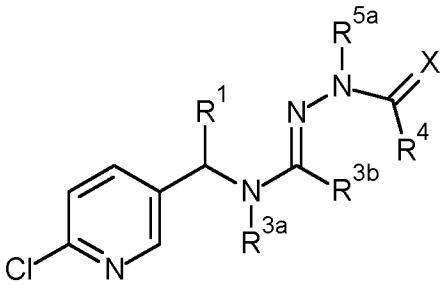
I-A.2



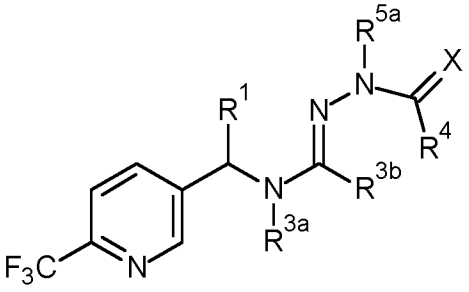
I-B.1



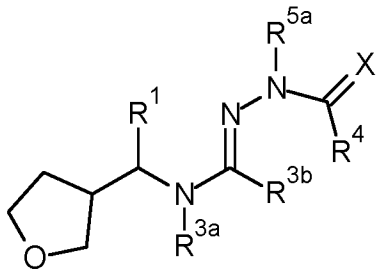
I-C.1



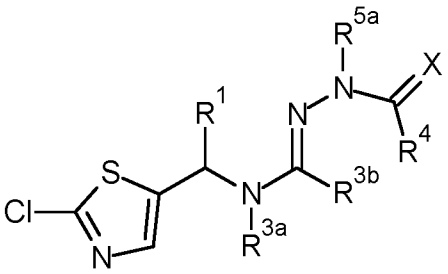
I-A.3



I-A.4



I-B.2



I-C.2

A special group of embodiments relates to the compounds of formula (I-A.1), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.1), their tautomers, their stereoisomers and their salts, where R^1 is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-A.2), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.2), their tautomers, their stereoisomers and their salts, where R^1 is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-B.1), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.1), their tautomers, their stereoisomers and their salts, where R^1 is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-C.1), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.1), their tautomers, their stereoisomers and their salts, where R^1 is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.1), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-A.3), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is O,

and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.3), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-A.4), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-A.4), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-B.2), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is O, and

where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-B.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

A further special group of embodiments relates to the compounds of formula (I-C.2), to their tautomers, to their stereoisomers and to their salts, where R^1 is hydrogen, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 are as defined in lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is H, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is CH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OH, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is O, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is H, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Further examples of this special group of embodiments are the compounds of formula (I-C.2), their tautomers, their stereoisomers and their salts, where R^1 is CH_3, R^{5a} is OCH_3, X is S, and where R^{3a}, R^{3b} and R^4 have one of the meanings given in any of lines 1 to 972 of the following table B.

Table B:

	R^{3a}	R^{3b}	R^4
1	CH_3	CH_3	R-4.1
2	CH_3	CH_3	R-4.2
3	CH_3	CH_3	R-4.3
4	CH_3	CH_3	R-4.4
5	CH_3	CH_3	R-4.5
6	CH_3	CH_3	R-4.6
7	CH_3	CH_3	R-4.7
8	CH_3	CH_3	R-4.8
9	CH_3	CH_3	R-4.9
10	CH_3	CH_3	R-4.10
11	CH_3	CH_3	R-4.11
12	CH_3	CH_3	R-4.12
13	CH_3	CH_3	R-4.13
14	CH_3	CH_3	R-4.14
15	CH_3	CH_3	R-4.15
16	CH_3	CH_3	R-4.16
17	CH_3	CH_3	R-4.17
18	CH_3	CH_3	R-4.18
19	CH_3	CH_3	R-41.1
20	CH_3	CH_3	R-41.2
21	CH_3	CH_3	R-41.3
22	CH_3	CH_3	R-41.4
23	CH_3	CH_3	R-41.5
24	CH_3	CH_3	R-41.6
25	CH_3	CH_3	R-41.7
26	CH_3	CH_3	R-41.8
27	CH_3	CH_3	R-43.1
28	CH_3	CH_3	R-43.2
29	CH_3	CH_3	R-43.3
30	CH_3	CH_3	R-43.4
31	CH_3	CH_3	R-43.5
32	CH_3	CH_3	R-43.6
33	CH_3	CH_3	R-43.7
34	CH_3	CH_3	R-43.8
35	CH_3	CH_3	R-43.9
36	CH_3	CH_3	R-43.10
37	CH_3	CH_3	R-43.11
38	CH_3	CH_3	R-43.12
39	CH_3	CH_3	R-43.13
40	CH_3	CH_3	R-43.14
41	CH_3	CH_3	R-43.15
42	CH_3	CH_3	R-43.16
43	CH_3	CH_3	R-43.17
44	CH_3	CH_3	R-43.18
45	CH_3	CH_3	R-43.19
46	CH_3	CH_3	R-43.20
47	CH_3	CH_3	R-43.21
48	CH_3	CH_3	R-43.22
49	CH_3	CH_3	R-43.23
50	CH_3	CH_3	R-43.24
51	CH_3	CH_3	R-43.25

	R^{3a}	R^{3b}	R^4
52	CH_3	CH_3	R-43.26
53	CH_3	CH_3	R-43.27
54	CH_3	CH_3	R-43.28
55	CH_3	CH_3	R-43.29
56	CH_3	CH_3	R-43.30
57	CH_3	CH_3	R-43.31
58	CH_3	CH_3	R-43.32
59	CH_3	CH_3	R-43.33
60	CH_3	CH_3	R-43.34
61	CH_3	CH_3	R-43.35
62	CH_3	CH_3	R-43.36
63	CH_3	CH_3	R-43.37
64	CH_3	CH_3	R-43.38
65	CH_3	CH_3	R-43.39
66	CH_3	CH_3	R-43.40
67	CH_3	CH_3	R-43.41
68	CH_3	CH_3	R-43.42
69	CH_3	CH_3	R-43.43
70	CH_3	CH_3	R-43.44
71	CH_3	CH_3	R-44.1
72	CH_3	CH_3	R-44.2
73	CH_3	CH_3	R-44.3
74	CH_3	CH_3	R-44.4
75	CH_3	CH_3	R-44.5
76	CH_3	CH_3	R-44.6
77	CH_3	CH_3	R-44.7
78	CH_3	CH_3	R-44.8
79	CH_3	CH_3	R-44.9
80	CH_3	CH_3	R-44.10
81	CH_3	CH_3	R-45.6
82	C_2H_5	CH_3	R-4.1
83	C_2H_5	CH_3	R-4.2
84	C_2H_5	CH_3	R-4.3
85	C_2H_5	CH_3	R-4.4
86	C_2H_5	CH_3	R-4.5
87	C_2H_5	CH_3	R-4.6
88	C_2H_5	CH_3	R-4.7
89	C_2H_5	CH_3	R-4.8
90	C_2H_5	CH_3	R-4.9

	R^{3a}	R^{3b}	R^4
91	C_2H_5	CH_3	R-4.10
92	C_2H_5	CH_3	R-4.11
93	C_2H_5	CH_3	R-4.12
94	C_2H_5	CH_3	R-4.13
95	C_2H_5	CH_3	R-4.14
96	C_2H_5	CH_3	R-4.15
97	C_2H_5	CH_3	R-4.16
98	C_2H_5	CH_3	R-4.17
99	C_2H_5	CH_3	R-4.18
100	C_2H_5	CH_3	R-41.1
101	C_2H_5	CH_3	R-41.2
102	C_2H_5	CH_3	R-41.3
103	C_2H_5	CH_3	R-41.4
104	C_2H_5	CH_3	R-41.5
105	C_2H_5	CH_3	R-41.6
106	C_2H_5	CH_3	R-41.7
107	C_2H_5	CH_3	R-41.8
108	C_2H_5	CH_3	R-43.1
109	C_2H_5	CH_3	R-43.2
110	C_2H_5	CH_3	R-43.3
111	C_2H_5	CH_3	R-43.4
112	C_2H_5	CH_3	R-43.5
113	C_2H_5	CH_3	R-43.6
114	C_2H_5	CH_3	R-43.7
115	C_2H_5	CH_3	R-43.8
116	C_2H_5	CH_3	R-43.9
117	C_2H_5	CH_3	R-43.10
118	C_2H_5	CH_3	R-43.11
119	C_2H_5	CH_3	R-43.12
120	C_2H_5	CH_3	R-43.13
121	C_2H_5	CH_3	R-43.14
122	C_2H_5	CH_3	R-43.15
123	C_2H_5	CH_3	R-43.16
124	C_2H_5	CH_3	R-43.17
125	C_2H_5	CH_3	R-43.18
126	C_2H_5	CH_3	R-43.19
127	C_2H_5	CH_3	R-43.20
128	C_2H_5	CH_3	R-43.21
129	C_2H_5	CH_3	R-43.22

	R^{3a}	R^{3b}	R^4
130	C_2H_5	CH_3	R-43.23
131	C_2H_5	CH_3	R-43.24
132	C_2H_5	CH_3	R-43.25
133	C_2H_5	CH_3	R-43.26
134	C_2H_5	CH_3	R-43.27
135	C_2H_5	CH_3	R-43.28
136	C_2H_5	CH_3	R-43.29
137	C_2H_5	CH_3	R-43.30
138	C_2H_5	CH_3	R-43.31
139	C_2H_5	CH_3	R-43.32
140	C_2H_5	CH_3	R-43.33
141	C_2H_5	CH_3	R-43.34
142	C_2H_5	CH_3	R-43.35
143	C_2H_5	CH_3	R-43.36
144	C_2H_5	CH_3	R-43.37
145	C_2H_5	CH_3	R-43.38
146	C_2H_5	CH_3	R-43.39
147	C_2H_5	CH_3	R-43.40
148	C_2H_5	CH_3	R-43.41
149	C_2H_5	CH_3	R-43.42
150	C_2H_5	CH_3	R-43.43
151	C_2H_5	CH_3	R-43.44
152	C_2H_5	CH_3	R-44.1
153	C_2H_5	CH_3	R-44.2
154	C_2H_5	CH_3	R-44.3
155	C_2H_5	CH_3	R-44.4
156	C_2H_5	CH_3	R-44.5
157	C_2H_5	CH_3	R-44.6
158	C_2H_5	CH_3	R-44.7
159	C_2H_5	CH_3	R-44.8
160	C_2H_5	CH_3	R-44.9
161	C_2H_5	CH_3	R-44.10
162	C_2H_5	CH_3	R-45.6
163	CH_2CHF_2	CH_3	R-4.1
164	CH_2CHF_2	CH_3	R-4.2
165	CH_2CHF_2	CH_3	R-4.3
166	CH_2CHF_2	CH_3	R-4.4
167	CH_2CHF_2	CH_3	R-4.5
168	CH_2CHF_2	CH_3	R-4.6

	R^{3a}	R^{3b}	R^4
169	CH_2CHF_2	CH_3	R-4.7
170	CH_2CHF_2	CH_3	R-4.8
171	CH_2CHF_2	CH_3	R-4.9
172	CH_2CHF_2	CH_3	R-4.10
173	CH_2CHF_2	CH_3	R-4.11
174	CH_2CHF_2	CH_3	R-4.12
175	CH_2CHF_2	CH_3	R-4.13
176	CH_2CHF_2	CH_3	R-4.14
177	CH_2CHF_2	CH_3	R-4.15
178	CH_2CHF_2	CH_3	R-4.16
179	CH_2CHF_2	CH_3	R-4.17
180	CH_2CHF_2	CH_3	R-4.18
181	CH_2CHF_2	CH_3	R-41.1
182	CH_2CHF_2	CH_3	R-41.2
183	CH_2CHF_2	CH_3	R-41.3
184	CH_2CHF_2	CH_3	R-41.4
185	CH_2CHF_2	CH_3	R-41.5
186	CH_2CHF_2	CH_3	R-41.6
187	CH_2CHF_2	CH_3	R-41.7
188	CH_2CHF_2	CH_3	R-41.8
189	CH_2CHF_2	CH_3	R-43.1
190	CH_2CHF_2	CH_3	R-43.2
191	CH_2CHF_2	CH_3	R-43.3
192	CH_2CHF_2	CH_3	R-43.4
193	CH_2CHF_2	CH_3	R-43.5
194	CH_2CHF_2	CH_3	R-43.6
195	CH_2CHF_2	CH_3	R-43.7
196	CH_2CHF_2	CH_3	R-43.8
197	CH_2CHF_2	CH_3	R-43.9
198	CH_2CHF_2	CH_3	R-43.10
199	CH_2CHF_2	CH_3	R-43.11
200	CH_2CHF_2	CH_3	R-43.12
201	CH_2CHF_2	CH_3	R-43.13
202	CH_2CHF_2	CH_3	R-43.14
203	CH_2CHF_2	CH_3	R-43.15
204	CH_2CHF_2	CH_3	R-43.16
205	CH_2CHF_2	CH_3	R-43.17
206	CH_2CHF_2	CH_3	R-43.18
207	CH_2CHF_2	CH_3	R-43.19

	R^{3a}	R^{3b}	R^4
208	CH_2CHF_2	CH_3	R-43.20
209	CH_2CHF_2	CH_3	R-43.21
210	CH_2CHF_2	CH_3	R-43.22
211	CH_2CHF_2	CH_3	R-43.23
212	CH_2CHF_2	CH_3	R-43.24
213	CH_2CHF_2	CH_3	R-43.25
214	CH_2CHF_2	CH_3	R-43.26
215	CH_2CHF_2	CH_3	R-43.27
216	CH_2CHF_2	CH_3	R-43.28
217	CH_2CHF_2	CH_3	R-43.29
218	CH_2CHF_2	CH_3	R-43.30
219	CH_2CHF_2	CH_3	R-43.31
220	CH_2CHF_2	CH_3	R-43.32
221	CH_2CHF_2	CH_3	R-43.33
222	CH_2CHF_2	CH_3	R-43.34
223	CH_2CHF_2	CH_3	R-43.35
224	CH_2CHF_2	CH_3	R-43.36
225	CH_2CHF_2	CH_3	R-43.37
226	CH_2CHF_2	CH_3	R-43.38
227	CH_2CHF_2	CH_3	R-43.39
228	CH_2CHF_2	CH_3	R-43.40
229	CH_2CHF_2	CH_3	R-43.41
230	CH_2CHF_2	CH_3	R-43.42
231	CH_2CHF_2	CH_3	R-43.43
232	CH_2CHF_2	CH_3	R-43.44
233	CH_2CHF_2	CH_3	R-44.1
234	CH_2CHF_2	CH_3	R-44.2
235	CH_2CHF_2	CH_3	R-44.3
236	CH_2CHF_2	CH_3	R-44.4
237	CH_2CHF_2	CH_3	R-44.5
238	CH_2CHF_2	CH_3	R-44.6
239	CH_2CHF_2	CH_3	R-44.7
240	CH_2CHF_2	CH_3	R-44.8
241	CH_2CHF_2	CH_3	R-44.9
242	CH_2CHF_2	CH_3	R-44.10
243	CH_2CHF_2	CH_3	R-45.6
244	CH_2CF_3	CH_3	R-4.1
245	CH_2CF_3	CH_3	R-4.2
246	CH_2CF_3	CH_3	R-4.3

	R^{3a}	R^{3b}	R^4
247	CH_2CF_3	CH_3	R-4.4
248	CH_2CF_3	CH_3	R-4.5
249	CH_2CF_3	CH_3	R-4.6
250	CH_2CF_3	CH_3	R-4.7
251	CH_2CF_3	CH_3	R-4.8
252	CH_2CF_3	CH_3	R-4.9
253	CH_2CF_3	CH_3	R-4.10
254	CH_2CF_3	CH_3	R-4.11
255	CH_2CF_3	CH_3	R-4.12
256	CH_2CF_3	CH_3	R-4.13
257	CH_2CF_3	CH_3	R-4.14
258	CH_2CF_3	CH_3	R-4.15
259	CH_2CF_3	CH_3	R-4.16
260	CH_2CF_3	CH_3	R-4.17
261	CH_2CF_3	CH_3	R-4.18
262	CH_2CF_3	CH_3	R-41.1
263	CH_2CF_3	CH_3	R-41.2
264	CH_2CF_3	CH_3	R-41.3
265	CH_2CF_3	CH_3	R-41.4
266	CH_2CF_3	CH_3	R-41.5
267	CH_2CF_3	CH_3	R-41.6
268	CH_2CF_3	CH_3	R-41.7
269	CH_2CF_3	CH_3	R-41.8
270	CH_2CF_3	CH_3	R-43.1
271	CH_2CF_3	CH_3	R-43.2
272	CH_2CF_3	CH_3	R-43.3
273	CH_2CF_3	CH_3	R-43.4
274	CH_2CF_3	CH_3	R-43.5
275	CH_2CF_3	CH_3	R-43.6
276	CH_2CF_3	CH_3	R-43.7
277	CH_2CF_3	CH_3	R-43.8
278	CH_2CF_3	CH_3	R-43.9
279	CH_2CF_3	CH_3	R-43.10
280	CH_2CF_3	CH_3	R-43.11
281	CH_2CF_3	CH_3	R-43.12
282	CH_2CF_3	CH_3	R-43.13
283	CH_2CF_3	CH_3	R-43.14
284	CH_2CF_3	CH_3	R-43.15
285	CH_2CF_3	CH_3	R-43.16

	R^{3a}	R^{3b}	R^4
286	CH_2CF_3	CH_3	R-43.17
287	CH_2CF_3	CH_3	R-43.18
288	CH_2CF_3	CH_3	R-43.19
289	CH_2CF_3	CH_3	R-43.20
290	CH_2CF_3	CH_3	R-43.21
291	CH_2CF_3	CH_3	R-43.22
292	CH_2CF_3	CH_3	R-43.23
293	CH_2CF_3	CH_3	R-43.24
294	CH_2CF_3	CH_3	R-43.25
295	CH_2CF_3	CH_3	R-43.26
296	CH_2CF_3	CH_3	R-43.27
297	CH_2CF_3	CH_3	R-43.28
298	CH_2CF_3	CH_3	R-43.29
299	CH_2CF_3	CH_3	R-43.30
300	CH_2CF_3	CH_3	R-43.31
301	CH_2CF_3	CH_3	R-43.32
302	CH_2CF_3	CH_3	R-43.33
303	CH_2CF_3	CH_3	R-43.34
304	CH_2CF_3	CH_3	R-43.35
305	CH_2CF_3	CH_3	R-43.36
306	CH_2CF_3	CH_3	R-43.37
307	CH_2CF_3	CH_3	R-43.38
308	CH_2CF_3	CH_3	R-43.39
309	CH_2CF_3	CH_3	R-43.40
310	CH_2CF_3	CH_3	R-43.41
311	CH_2CF_3	CH_3	R-43.42
312	CH_2CF_3	CH_3	R-43.43
313	CH_2CF_3	CH_3	R-43.44
314	CH_2CF_3	CH_3	R-44.1
315	CH_2CF_3	CH_3	R-44.2
316	CH_2CF_3	CH_3	R-44.3
317	CH_2CF_3	CH_3	R-44.4
318	CH_2CF_3	CH_3	R-44.5
319	CH_2CF_3	CH_3	R-44.6
320	CH_2CF_3	CH_3	R-44.7
321	CH_2CF_3	CH_3	R-44.8
322	CH_2CF_3	CH_3	R-44.9
323	CH_2CF_3	CH_3	R-44.10
324	CH_2CF_3	CH_3	R-45.6

	R^{3a}	R^{3b}	R^4
325	CH_3	CF_3	R-4.1
326	CH_3	CF_3	R-4.2
327	CH_3	CF_3	R-4.3
328	CH_3	CF_3	R-4.4
329	CH_3	CF_3	R-4.5
330	CH_3	CF_3	R-4.6
331	CH_3	CF_3	R-4.7
332	CH_3	CF_3	R-4.8
333	CH_3	CF_3	R-4.9
334	CH_3	CF_3	R-4.10
335	CH_3	CF_3	R-4.11
336	CH_3	CF_3	R-4.12
337	CH_3	CF_3	R-4.13
338	CH_3	CF_3	R-4.14
339	CH_3	CF_3	R-4.15
340	CH_3	CF_3	R-4.16
341	CH_3	CF_3	R-4.17
342	CH_3	CF_3	R-4.18
343	CH_3	CF_3	R-41.1
344	CH_3	CF_3	R-41.2
345	CH_3	CF_3	R-41.3
346	CH_3	CF_3	R-41.4
347	CH_3	CF_3	R-41.5
348	CH_3	CF_3	R-41.6
349	CH_3	CF_3	R-41.7
350	CH_3	CF_3	R-41.8
351	CH_3	CF_3	R-43.1
352	CH_3	CF_3	R-43.2
353	CH_3	CF_3	R-43.3
354	CH_3	CF_3	R-43.4
355	CH_3	CF_3	R-43.5
356	CH_3	CF_3	R-43.6
357	CH_3	CF_3	R-43.7
358	CH_3	CF_3	R-43.8
359	CH_3	CF_3	R-43.9
360	CH_3	CF_3	R-43.10
361	CH_3	CF_3	R-43.11
362	CH_3	CF_3	R-43.12
363	CH_3	CF_3	R-43.13

	R^{3a}	R^{3b}	R^4
364	CH_3	CF_3	R-43.14
365	CH_3	CF_3	R-43.15
366	CH_3	CF_3	R-43.16
367	CH_3	CF_3	R-43.17
368	CH_3	CF_3	R-43.18
369	CH_3	CF_3	R-43.19
370	CH_3	CF_3	R-43.20
371	CH_3	CF_3	R-43.21
372	CH_3	CF_3	R-43.22
373	CH_3	CF_3	R-43.23
374	CH_3	CF_3	R-43.24
375	CH_3	CF_3	R-43.25
376	CH_3	CF_3	R-43.26
377	CH_3	CF_3	R-43.27
378	CH_3	CF_3	R-43.28
379	CH_3	CF_3	R-43.29
380	CH_3	CF_3	R-43.30
381	CH_3	CF_3	R-43.31
382	CH_3	CF_3	R-43.32
383	CH_3	CF_3	R-43.33
384	CH_3	CF_3	R-43.34
385	CH_3	CF_3	R-43.35
386	CH_3	CF_3	R-43.36
387	CH_3	CF_3	R-43.37
388	CH_3	CF_3	R-43.38
389	CH_3	CF_3	R-43.39
390	CH_3	CF_3	R-43.40
391	CH_3	CF_3	R-43.41
392	CH_3	CF_3	R-43.42
393	CH_3	CF_3	R-43.43
394	CH_3	CF_3	R-43.44
395	CH_3	CF_3	R-44.1
396	CH_3	CF_3	R-44.2
397	CH_3	CF_3	R-44.3
398	CH_3	CF_3	R-44.4
399	CH_3	CF_3	R-44.5
400	CH_3	CF_3	R-44.6
401	CH_3	CF_3	R-44.7
402	CH_3	CF_3	R-44.8

	R^{3a}	R^{3b}	R^4
403	CH_3	CF_3	R-44.9
404	CH_3	CF_3	R-44.10
405	CH_3	CF_3	R-45.6
406	C_2H_5	CF_3	R-4.1
407	C_2H_5	CF_3	R-4.2
408	C_2H_5	CF_3	R-4.3
409	C_2H_5	CF_3	R-4.4
410	C_2H_5	CF_3	R-4.5
411	C_2H_5	CF_3	R-4.6
412	C_2H_5	CF_3	R-4.7
413	C_2H_5	CF_3	R-4.8
414	C_2H_5	CF_3	R-4.9
415	C_2H_5	CF_3	R-4.10
416	C_2H_5	CF_3	R-4.11
417	C_2H_5	CF_3	R-4.12
418	C_2H_5	CF_3	R-4.13
419	C_2H_5	CF_3	R-4.14
420	C_2H_5	CF_3	R-4.15
421	C_2H_5	CF_3	R-4.16
422	C_2H_5	CF_3	R-4.17
423	C_2H_5	CF_3	R-4.18
424	C_2H_5	CF_3	R-41.1
425	C_2H_5	CF_3	R-41.2
426	C_2H_5	CF_3	R-41.3
427	C_2H_5	CF_3	R-41.4
428	C_2H_5	CF_3	R-41.5
429	C_2H_5	CF_3	R-41.6
430	C_2H_5	CF_3	R-41.7
431	C_2H_5	CF_3	R-41.8
432	C_2H_5	CF_3	R-43.1
433	C_2H_5	CF_3	R-43.2
434	C_2H_5	CF_3	R-43.3
435	C_2H_5	CF_3	R-43.4
436	C_2H_5	CF_3	R-43.5
437	C_2H_5	CF_3	R-43.6
438	C_2H_5	CF_3	R-43.7
439	C_2H_5	CF_3	R-43.8
440	C_2H_5	CF_3	R-43.9
441	C_2H_5	CF_3	R-43.10

	R^{3a}	R^{3b}	R^4
442	C_2H_5	CF_3	R-43.11
443	C_2H_5	CF_3	R-43.12
444	C_2H_5	CF_3	R-43.13
445	C_2H_5	CF_3	R-43.14
446	C_2H_5	CF_3	R-43.15
447	C_2H_5	CF_3	R-43.16
448	C_2H_5	CF_3	R-43.17
449	C_2H_5	CF_3	R-43.18
450	C_2H_5	CF_3	R-43.19
451	C_2H_5	CF_3	R-43.20
452	C_2H_5	CF_3	R-43.21
453	C_2H_5	CF_3	R-43.22
454	C_2H_5	CF_3	R-43.23
455	C_2H_5	CF_3	R-43.24
456	C_2H_5	CF_3	R-43.25
457	C_2H_5	CF_3	R-43.26
458	C_2H_5	CF_3	R-43.27
459	C_2H_5	CF_3	R-43.28
460	C_2H_5	CF_3	R-43.29
461	C_2H_5	CF_3	R-43.30
462	C_2H_5	CF_3	R-43.31
463	C_2H_5	CF_3	R-43.32
464	C_2H_5	CF_3	R-43.33
465	C_2H_5	CF_3	R-43.34
466	C_2H_5	CF_3	R-43.35
467	C_2H_5	CF_3	R-43.36
468	C_2H_5	CF_3	R-43.37
469	C_2H_5	CF_3	R-43.38
470	C_2H_5	CF_3	R-43.39
471	C_2H_5	CF_3	R-43.40
472	C_2H_5	CF_3	R-43.41
473	C_2H_5	CF_3	R-43.42
474	C_2H_5	CF_3	R-43.43
475	C_2H_5	CF_3	R-43.44
476	C_2H_5	CF_3	R-44.1
477	C_2H_5	CF_3	R-44.2
478	C_2H_5	CF_3	R-44.3
479	C_2H_5	CF_3	R-44.4
480	C_2H_5	CF_3	R-44.5

	R^{3a}	R^{3b}	R^4
481	C_2H_5	CF_3	R-44.6
482	C_2H_5	CF_3	R-44.7
483	C_2H_5	CF_3	R-44.8
484	C_2H_5	CF_3	R-44.9
485	C_2H_5	CF_3	R-44.10
486	C_2H_5	CF_3	R-45.6
487	CH_2CHF_2	CF_3	R-4.1
488	CH_2CHF_2	CF_3	R-4.2
489	CH_2CHF_2	CF_3	R-4.3
490	CH_2CHF_2	CF_3	R-4.4
491	CH_2CHF_2	CF_3	R-4.5
492	CH_2CHF_2	CF_3	R-4.6
493	CH_2CHF_2	CF_3	R-4.7
494	CH_2CHF_2	CF_3	R-4.8
495	CH_2CHF_2	CF_3	R-4.9
496	CH_2CHF_2	CF_3	R-4.10
497	CH_2CHF_2	CF_3	R-4.11
498	CH_2CHF_2	CF_3	R-4.12
499	CH_2CHF_2	CF_3	R-4.13
500	CH_2CHF_2	CF_3	R-4.14
501	CH_2CHF_2	CF_3	R-4.15
502	CH_2CHF_2	CF_3	R-4.16
503	CH_2CHF_2	CF_3	R-4.17
504	CH_2CHF_2	CF_3	R-4.18
505	CH_2CHF_2	CF_3	R-41.1
506	CH_2CHF_2	CF_3	R-41.2
507	CH_2CHF_2	CF_3	R-41.3
508	CH_2CHF_2	CF_3	R-41.4
509	CH_2CHF_2	CF_3	R-41.5
510	CH_2CHF_2	CF_3	R-41.6
511	CH_2CHF_2	CF_3	R-41.7
512	CH_2CHF_2	CF_3	R-41.8
513	CH_2CHF_2	CF_3	R-43.1
514	CH_2CHF_2	CF_3	R-43.2
515	CH_2CHF_2	CF_3	R-43.3
516	CH_2CHF_2	CF_3	R-43.4
517	CH_2CHF_2	CF_3	R-43.5
518	CH_2CHF_2	CF_3	R-43.6
519	CH_2CHF_2	CF_3	R-43.7

	R^{3a}	R^{3b}	R^4
520	CH_2CHF_2	CF_3	R-43.8
521	CH_2CHF_2	CF_3	R-43.9
522	CH_2CHF_2	CF_3	R-43.10
523	CH_2CHF_2	CF_3	R-43.11
524	CH_2CHF_2	CF_3	R-43.12
525	CH_2CHF_2	CF_3	R-43.13
526	CH_2CHF_2	CF_3	R-43.14
527	CH_2CHF_2	CF_3	R-43.15
528	CH_2CHF_2	CF_3	R-43.16
529	CH_2CHF_2	CF_3	R-43.17
530	CH_2CHF_2	CF_3	R-43.18
531	CH_2CHF_2	CF_3	R-43.19
532	CH_2CHF_2	CF_3	R-43.20
533	CH_2CHF_2	CF_3	R-43.21
534	CH_2CHF_2	CF_3	R-43.22
535	CH_2CHF_2	CF_3	R-43.23
536	CH_2CHF_2	CF_3	R-43.24
537	CH_2CHF_2	CF_3	R-43.25
538	CH_2CHF_2	CF_3	R-43.26
539	CH_2CHF_2	CF_3	R-43.27
540	CH_2CHF_2	CF_3	R-43.28
541	CH_2CHF_2	CF_3	R-43.29
542	CH_2CHF_2	CF_3	R-43.30
543	CH_2CHF_2	CF_3	R-43.31
544	CH_2CHF_2	CF_3	R-43.32
545	CH_2CHF_2	CF_3	R-43.33
546	CH_2CHF_2	CF_3	R-43.34
547	CH_2CHF_2	CF_3	R-43.35
548	CH_2CHF_2	CF_3	R-43.36
549	CH_2CHF_2	CF_3	R-43.37
550	CH_2CHF_2	CF_3	R-43.38
551	CH_2CHF_2	CF_3	R-43.39
552	CH_2CHF_2	CF_3	R-43.40
553	CH_2CHF_2	CF_3	R-43.41
554	CH_2CHF_2	CF_3	R-43.42
555	CH_2CHF_2	CF_3	R-43.43
556	CH_2CHF_2	CF_3	R-43.44
557	CH_2CHF_2	CF_3	R-44.1
558	CH_2CHF_2	CF_3	R-44.2

	R^{3a}	R^{3b}	R^4
559	CH_2CHF_2	CF_3	R-44.3
560	CH_2CHF_2	CF_3	R-44.4
561	CH_2CHF_2	CF_3	R-44.5
562	CH_2CHF_2	CF_3	R-44.6
563	CH_2CHF_2	CF_3	R-44.7
564	CH_2CHF_2	CF_3	R-44.8
565	CH_2CHF_2	CF_3	R-44.9
566	CH_2CHF_2	CF_3	R-44.10
567	CH_2CHF_2	CF_3	R-45.6
568	CH_2CF_3	CF_3	R-4.1
569	CH_2CF_3	CF_3	R-4.2
570	CH_2CF_3	CF_3	R-4.3
571	CH_2CF_3	CF_3	R-4.4
572	CH_2CF_3	CF_3	R-4.5
573	CH_2CF_3	CF_3	R-4.6
574	CH_2CF_3	CF_3	R-4.7
575	CH_2CF_3	CF_3	R-4.8
576	CH_2CF_3	CF_3	R-4.9
577	CH_2CF_3	CF_3	R-4.10
578	CH_2CF_3	CF_3	R-4.11
579	CH_2CF_3	CF_3	R-4.12
580	CH_2CF_3	CF_3	R-4.13
581	CH_2CF_3	CF_3	R-4.14
582	CH_2CF_3	CF_3	R-4.15
583	CH_2CF_3	CF_3	R-4.16
584	CH_2CF_3	CF_3	R-4.17
585	CH_2CF_3	CF_3	R-4.18
586	CH_2CF_3	CF_3	R-41.1
587	CH_2CF_3	CF_3	R-41.2
588	CH_2CF_3	CF_3	R-41.3
589	CH_2CF_3	CF_3	R-41.4
590	CH_2CF_3	CF_3	R-41.5
591	CH_2CF_3	CF_3	R-41.6
592	CH_2CF_3	CF_3	R-41.7
593	CH_2CF_3	CF_3	R-41.8
594	CH_2CF_3	CF_3	R-43.1
595	CH_2CF_3	CF_3	R-43.2
596	CH_2CF_3	CF_3	R-43.3
597	CH_2CF_3	CF_3	R-43.4

	R^{3a}	R^{3b}	R^4
598	CH_2CF_3	CF_3	R-43.5
599	CH_2CF_3	CF_3	R-43.6
600	CH_2CF_3	CF_3	R-43.7
601	CH_2CF_3	CF_3	R-43.8
602	CH_2CF_3	CF_3	R-43.9
603	CH_2CF_3	CF_3	R-43.10
604	CH_2CF_3	CF_3	R-43.11
605	CH_2CF_3	CF_3	R-43.12
606	CH_2CF_3	CF_3	R-43.13
607	CH_2CF_3	CF_3	R-43.14
608	CH_2CF_3	CF_3	R-43.15
609	CH_2CF_3	CF_3	R-43.16
610	CH_2CF_3	CF_3	R-43.17
611	CH_2CF_3	CF_3	R-43.18
612	CH_2CF_3	CF_3	R-43.19
613	CH_2CF_3	CF_3	R-43.20
614	CH_2CF_3	CF_3	R-43.21
615	CH_2CF_3	CF_3	R-43.22
616	CH_2CF_3	CF_3	R-43.23
617	CH_2CF_3	CF_3	R-43.24
618	CH_2CF_3	CF_3	R-43.25
619	CH_2CF_3	CF_3	R-43.26
620	CH_2CF_3	CF_3	R-43.27
621	CH_2CF_3	CF_3	R-43.28
622	CH_2CF_3	CF_3	R-43.29
623	CH_2CF_3	CF_3	R-43.30
624	CH_2CF_3	CF_3	R-43.31
625	CH_2CF_3	CF_3	R-43.32
626	CH_2CF_3	CF_3	R-43.33
627	CH_2CF_3	CF_3	R-43.34
628	CH_2CF_3	CF_3	R-43.35
629	CH_2CF_3	CF_3	R-43.36
630	CH_2CF_3	CF_3	R-43.37
631	CH_2CF_3	CF_3	R-43.38
632	CH_2CF_3	CF_3	R-43.39
633	CH_2CF_3	CF_3	R-43.40
634	CH_2CF_3	CF_3	R-43.41
635	CH_2CF_3	CF_3	R-43.42
636	CH_2CF_3	CF_3	R-43.43

	R^{3a}	R^{3b}	R^4
637	CH_2CF_3	CF_3	R-43.44
638	CH_2CF_3	CF_3	R-44.1
639	CH_2CF_3	CF_3	R-44.2
640	CH_2CF_3	CF_3	R-44.3
641	CH_2CF_3	CF_3	R-44.4
642	CH_2CF_3	CF_3	R-44.5
643	CH_2CF_3	CF_3	R-44.6
644	CH_2CF_3	CF_3	R-44.7
645	CH_2CF_3	CF_3	R-44.8
646	CH_2CF_3	CF_3	R-44.9
647	CH_2CF_3	CF_3	R-44.10
648	CH_2CF_3	CF_3	R-45.6
649	CH_3	CHF_2	R-4.1
650	CH_3	CHF_2	R-4.2
651	CH_3	CHF_2	R-4.3
652	CH_3	CHF_2	R-4.4
653	CH_3	CHF_2	R-4.5
654	CH_3	CHF_2	R-4.6
655	CH_3	CHF_2	R-4.7
656	CH_3	CHF_2	R-4.8
657	CH_3	CHF_2	R-4.9
658	CH_3	CHF_2	R-4.10
659	CH_3	CHF_2	R-4.11
660	CH_3	CHF_2	R-4.12
661	CH_3	CHF_2	R-4.13
662	CH_3	CHF_2	R-4.14
663	CH_3	CHF_2	R-4.15
664	CH_3	CHF_2	R-4.16
665	CH_3	CHF_2	R-4.17
666	CH_3	CHF_2	R-4.18
667	CH_3	CHF_2	R-41.1
668	CH_3	CHF_2	R-41.2
669	CH_3	CHF_2	R-41.3
670	CH_3	CHF_2	R-41.4
671	CH_3	CHF_2	R-41.5
672	CH_3	CHF_2	R-41.6
673	CH_3	CHF_2	R-41.7
674	CH_3	CHF_2	R-41.8
675	CH_3	CHF_2	R-43.1

	R^{3a}	R^{3b}	R^4
676	CH_3	CHF_2	R-43.2
677	CH_3	CHF_2	R-43.3
678	CH_3	CHF_2	R-43.4
679	CH_3	CHF_2	R-43.5
680	CH_3	CHF_2	R-43.6
681	CH_3	CHF_2	R-43.7
682	CH_3	CHF_2	R-43.8
683	CH_3	CHF_2	R-43.9
684	CH_3	CHF_2	R-43.10
685	CH_3	CHF_2	R-43.11
686	CH_3	CHF_2	R-43.12
687	CH_3	CHF_2	R-43.13
688	CH_3	CHF_2	R-43.14
689	CH_3	CHF_2	R-43.15
690	CH_3	CHF_2	R-43.16
691	CH_3	CHF_2	R-43.17
692	CH_3	CHF_2	R-43.18
693	CH_3	CHF_2	R-43.19
694	CH_3	CHF_2	R-43.20
695	CH_3	CHF_2	R-43.21
696	CH_3	CHF_2	R-43.22
697	CH_3	CHF_2	R-43.23
698	CH_3	CHF_2	R-43.24
699	CH_3	CHF_2	R-43.25
700	CH_3	CHF_2	R-43.26
701	CH_3	CHF_2	R-43.27
702	CH_3	CHF_2	R-43.28
703	CH_3	CHF_2	R-43.29
704	CH_3	CHF_2	R-43.30
705	CH_3	CHF_2	R-43.31
706	CH_3	CHF_2	R-43.32
707	CH_3	CHF_2	R-43.33
708	CH_3	CHF_2	R-43.34
709	CH_3	CHF_2	R-43.35
710	CH_3	CHF_2	R-43.36
711	CH_3	CHF_2	R-43.37
712	CH_3	CHF_2	R-43.38
713	CH_3	CHF_2	R-43.39
714	CH_3	CHF_2	R-43.40

	R^{3a}	R^{3b}	R^4
715	CH_3	CHF_2	R-43.41
716	CH_3	CHF_2	R-43.42
717	CH_3	CHF_2	R-43.43
718	CH_3	CHF_2	R-43.44
719	CH_3	CHF_2	R-44.1
720	CH_3	CHF_2	R-44.2
721	CH_3	CHF_2	R-44.3
722	CH_3	CHF_2	R-44.4
723	CH_3	CHF_2	R-44.5
724	CH_3	CHF_2	R-44.6
725	CH_3	CHF_2	R-44.7
726	CH_3	CHF_2	R-44.8
727	CH_3	CHF_2	R-44.9
728	CH_3	CHF_2	R-44.10
729	CH_3	CHF_2	R-45.6
730	C_2H_5	CHF_2	R-4.1
731	C_2H_5	CHF_2	R-4.2
732	C_2H_5	CHF_2	R-4.3
733	C_2H_5	CHF_2	R-4.4
734	C_2H_5	CHF_2	R-4.5
735	C_2H_5	CHF_2	R-4.6
736	C_2H_5	CHF_2	R-4.7
737	C_2H_5	CHF_2	R-4.8
738	C_2H_5	CHF_2	R-4.9
739	C_2H_5	CHF_2	R-4.10
740	C_2H_5	CHF_2	R-4.11
741	C_2H_5	CHF_2	R-4.12
742	C_2H_5	CHF_2	R-4.13
743	C_2H_5	CHF_2	R-4.14
744	C_2H_5	CHF_2	R-4.15
745	C_2H_5	CHF_2	R-4.16
746	C_2H_5	CHF_2	R-4.17
747	C_2H_5	CHF_2	R-4.18
748	C_2H_5	CHF_2	R-41.1
749	C_2H_5	CHF_2	R-41.2
750	C_2H_5	CHF_2	R-41.3
751	C_2H_5	CHF_2	R-41.4
752	C_2H_5	CHF_2	R-41.5
753	C_2H_5	CHF_2	R-41.6

	R^{3a}	R^{3b}	R^4
754	C_2H_5	CHF_2	R-41.7
755	C_2H_5	CHF_2	R-41.8
756	C_2H_5	CHF_2	R-43.1
757	C_2H_5	CHF_2	R-43.2
758	C_2H_5	CHF_2	R-43.3
759	C_2H_5	CHF_2	R-43.4
760	C_2H_5	CHF_2	R-43.5
761	C_2H_5	CHF_2	R-43.6
762	C_2H_5	CHF_2	R-43.7
763	C_2H_5	CHF_2	R-43.8
764	C_2H_5	CHF_2	R-43.9
765	C_2H_5	CHF_2	R-43.10
766	C_2H_5	CHF_2	R-43.11
767	C_2H_5	CHF_2	R-43.12
768	C_2H_5	CHF_2	R-43.13
769	C_2H_5	CHF_2	R-43.14
770	C_2H_5	CHF_2	R-43.15
771	C_2H_5	CHF_2	R-43.16
772	C_2H_5	CHF_2	R-43.17
773	C_2H_5	CHF_2	R-43.18
774	C_2H_5	CHF_2	R-43.19
775	C_2H_5	CHF_2	R-43.20
776	C_2H_5	CHF_2	R-43.21
777	C_2H_5	CHF_2	R-43.22
778	C_2H_5	CHF_2	R-43.23
779	C_2H_5	CHF_2	R-43.24
780	C_2H_5	CHF_2	R-43.25
781	C_2H_5	CHF_2	R-43.26
782	C_2H_5	CHF_2	R-43.27
783	C_2H_5	CHF_2	R-43.28
784	C_2H_5	CHF_2	R-43.29
785	C_2H_5	CHF_2	R-43.30
786	C_2H_5	CHF_2	R-43.31
787	C_2H_5	CHF_2	R-43.32
788	C_2H_5	CHF_2	R-43.33
789	C_2H_5	CHF_2	R-43.34
790	C_2H_5	CHF_2	R-43.35
791	C_2H_5	CHF_2	R-43.36
792	C_2H_5	CHF_2	R-43.37
793	C_2H_5	CHF_2	R-43.38
794	C_2H_5	CHF_2	R-43.39
795	C_2H_5	CHF_2	R-43.40
796	C_2H_5	CHF_2	R-43.41
797	C_2H_5	CHF_2	R-43.42
798	C_2H_5	CHF_2	R-43.43
799	C_2H_5	CHF_2	R-43.44
800	C_2H_5	CHF_2	R-44.1
801	C_2H_5	CHF_2	R-44.2
802	C_2H_5	CHF_2	R-44.3
803	C_2H_5	CHF_2	R-44.4
804	C_2H_5	CHF_2	R-44.5
805	C_2H_5	CHF_2	R-44.6
806	C_2H_5	CHF_2	R-44.7
807	C_2H_5	CHF_2	R-44.8
808	C_2H_5	CHF_2	R-44.9
809	C_2H_5	CHF_2	R-44.10
810	C_2H_5	CHF_2	R-45.6
811	CH_2CHF_2	CHF_2	R-4.1
812	CH_2CHF_2	CHF_2	R-4.2
813	CH_2CHF_2	CHF_2	R-4.3
814	CH_2CHF_2	CHF_2	R-4.4
815	CH_2CHF_2	CHF_2	R-4.5
816	CH_2CHF_2	CHF_2	R-4.6
817	CH_2CHF_2	CHF_2	R-4.7
818	CH_2CHF_2	CHF_2	R-4.8
819	CH_2CHF_2	CHF_2	R-4.9
820	CH_2CHF_2	CHF_2	R-4.10
821	CH_2CHF_2	CHF_2	R-4.11
822	CH_2CHF_2	CHF_2	R-4.12
823	CH_2CHF_2	CHF_2	R-4.13
824	CH_2CHF_2	CHF_2	R-4.14
825	CH_2CHF_2	CHF_2	R-4.15
826	CH_2CHF_2	CHF_2	R-4.16
827	CH_2CHF_2	CHF_2	R-4.17
828	CH_2CHF_2	CHF_2	R-4.18
829	CH_2CHF_2	CHF_2	R-41.1
830	CH_2CHF_2	CHF_2	R-41.2
831	CH_2CHF_2	CHF_2	R-41.3

	R^{3a}	R^{3b}	R^4
832	CH_2CHF_2	CHF_2	R-41.4
833	CH_2CHF_2	CHF_2	R-41.5
834	CH_2CHF_2	CHF_2	R-41.6
835	CH_2CHF_2	CHF_2	R-41.7
836	CH_2CHF_2	CHF_2	R-41.8
837	CH_2CHF_2	CHF_2	R-43.1
838	CH_2CHF_2	CHF_2	R-43.2
839	CH_2CHF_2	CHF_2	R-43.3
840	CH_2CHF_2	CHF_2	R-43.4
841	CH_2CHF_2	CHF_2	R-43.5
842	CH_2CHF_2	CHF_2	R-43.6
843	CH_2CHF_2	CHF_2	R-43.7
844	CH_2CHF_2	CHF_2	R-43.8
845	CH_2CHF_2	CHF_2	R-43.9
846	CH_2CHF_2	CHF_2	R-43.10
847	CH_2CHF_2	CHF_2	R-43.11
848	CH_2CHF_2	CHF_2	R-43.12
849	CH_2CHF_2	CHF_2	R-43.13
850	CH_2CHF_2	CHF_2	R-43.14
851	CH_2CHF_2	CHF_2	R-43.15
852	CH_2CHF_2	CHF_2	R-43.16
853	CH_2CHF_2	CHF_2	R-43.17
854	CH_2CHF_2	CHF_2	R-43.18
855	CH_2CHF_2	CHF_2	R-43.19
856	CH_2CHF_2	CHF_2	R-43.20
857	CH_2CHF_2	CHF_2	R-43.21
858	CH_2CHF_2	CHF_2	R-43.22
859	CH_2CHF_2	CHF_2	R-43.23
860	CH_2CHF_2	CHF_2	R-43.24
861	CH_2CHF_2	CHF_2	R-43.25
862	CH_2CHF_2	CHF_2	R-43.26
863	CH_2CHF_2	CHF_2	R-43.27
864	CH_2CHF_2	CHF_2	R-43.28
865	CH_2CHF_2	CHF_2	R-43.29
866	CH_2CHF_2	CHF_2	R-43.30
867	CH_2CHF_2	CHF_2	R-43.31
868	CH_2CHF_2	CHF_2	R-43.32
869	CH_2CHF_2	CHF_2	R-43.33
870	CH_2CHF_2	CHF_2	R-43.34

	R^{3a}	R^{3b}	R^4
871	CH_2CHF_2	CHF_2	R-43.35
872	CH_2CHF_2	CHF_2	R-43.36
873	CH_2CHF_2	CHF_2	R-43.37
874	CH_2CHF_2	CHF_2	R-43.38
875	CH_2CHF_2	CHF_2	R-43.39
876	CH_2CHF_2	CHF_2	R-43.40
877	CH_2CHF_2	CHF_2	R-43.41
878	CH_2CHF_2	CHF_2	R-43.42
879	CH_2CHF_2	CHF_2	R-43.43
880	CH_2CHF_2	CHF_2	R-43.44
881	CH_2CHF_2	CHF_2	R-44.1
882	CH_2CHF_2	CHF_2	R-44.2
883	CH_2CHF_2	CHF_2	R-44.3
884	CH_2CHF_2	CHF_2	R-44.4
885	CH_2CHF_2	CHF_2	R-44.5
886	CH_2CHF_2	CHF_2	R-44.6
887	CH_2CHF_2	CHF_2	R-44.7
888	CH_2CHF_2	CHF_2	R-44.8
889	CH_2CHF_2	CHF_2	R-44.9
890	CH_2CHF_2	CHF_2	R-44.10
891	CH_2CHF_2	CHF_2	R-45.6
892	CH_2CF_3	CHF_2	R-4.1
893	CH_2CF_3	CHF_2	R-4.2
894	CH_2CF_3	CHF_2	R-4.3
895	CH_2CF_3	CHF_2	R-4.4
896	CH_2CF_3	CHF_2	R-4.5
897	CH_2CF_3	CHF_2	R-4.6
898	CH_2CF_3	CHF_2	R-4.7
899	CH_2CF_3	CHF_2	R-4.8
900	CH_2CF_3	CHF_2	R-4.9
901	CH_2CF_3	CHF_2	R-4.10
902	CH_2CF_3	CHF_2	R-4.11
903	CH_2CF_3	CHF_2	R-4.12
904	CH_2CF_3	CHF_2	R-4.13
905	CH_2CF_3	CHF_2	R-4.14
906	CH_2CF_3	CHF_2	R-4.15
907	CH_2CF_3	CHF_2	R-4.16
908	CH_2CF_3	CHF_2	R-4.17
909	CH_2CF_3	CHF_2	R-4.18

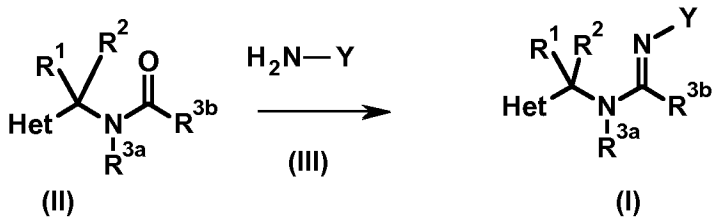
	R^{3a}	R^{3b}	R^4
910	CH_2CF_3	CHF_2	R-41.1
911	CH_2CF_3	CHF_2	R-41.2
912	CH_2CF_3	CHF_2	R-41.3
913	CH_2CF_3	CHF_2	R-41.4
914	CH_2CF_3	CHF_2	R-41.5
915	CH_2CF_3	CHF_2	R-41.6
916	CH_2CF_3	CHF_2	R-41.7
917	CH_2CF_3	CHF_2	R-41.8
918	CH_2CF_3	CHF_2	R-43.1
919	CH_2CF_3	CHF_2	R-43.2
920	CH_2CF_3	CHF_2	R-43.3
921	CH_2CF_3	CHF_2	R-43.4
922	CH_2CF_3	CHF_2	R-43.5
923	CH_2CF_3	CHF_2	R-43.6
924	CH_2CF_3	CHF_2	R-43.7
925	CH_2CF_3	CHF_2	R-43.8
926	CH_2CF_3	CHF_2	R-43.9
927	CH_2CF_3	CHF_2	R-43.10
928	CH_2CF_3	CHF_2	R-43.11
929	CH_2CF_3	CHF_2	R-43.12
930	CH_2CF_3	CHF_2	R-43.13
931	CH_2CF_3	CHF_2	R-43.14
932	CH_2CF_3	CHF_2	R-43.15
933	CH_2CF_3	CHF_2	R-43.16
934	CH_2CF_3	CHF_2	R-43.17
935	CH_2CF_3	CHF_2	R-43.18
936	CH_2CF_3	CHF_2	R-43.19
937	CH_2CF_3	CHF_2	R-43.20
938	CH_2CF_3	CHF_2	R-43.21
939	CH_2CF_3	CHF_2	R-43.22
940	CH_2CF_3	CHF_2	R-43.23
941	CH_2CF_3	CHF_2	R-43.24
942	CH_2CF_3	CHF_2	R-43.25
943	CH_2CF_3	CHF_2	R-43.26
944	CH_2CF_3	CHF_2	R-43.27
945	CH_2CF_3	CHF_2	R-43.28
946	CH_2CF_3	CHF_2	R-43.29
947	CH_2CF_3	CHF_2	R-43.30
948	CH_2CF_3	CHF_2	R-43.31
949	CH_2CF_3	CHF_2	R-43.32
950	CH_2CF_3	CHF_2	R-43.33
951	CH_2CF_3	CHF_2	R-43.34
952	CH_2CF_3	CHF_2	R-43.35
953	CH_2CF_3	CHF_2	R-43.36
954	CH_2CF_3	CHF_2	R-43.37
955	CH_2CF_3	CHF_2	R-43.38
956	CH_2CF_3	CHF_2	R-43.39
957	CH_2CF_3	CHF_2	R-43.40
958	CH_2CF_3	CHF_2	R-43.41
959	CH_2CF_3	CHF_2	R-43.42
960	CH_2CF_3	CHF_2	R-43.43
961	CH_2CF_3	CHF_2	R-43.44
962	CH_2CF_3	CHF_2	R-44.1
963	CH_2CF_3	CHF_2	R-44.2
964	CH_2CF_3	CHF_2	R-44.3
965	CH_2CF_3	CHF_2	R-44.4
966	CH_2CF_3	CHF_2	R-44.5
967	CH_2CF_3	CHF_2	R-44.6
968	CH_2CF_3	CHF_2	R-44.7
969	CH_2CF_3	CHF_2	R-44.8
970	CH_2CF_3	CHF_2	R-44.9
971	CH_2CF_3	CHF_2	R-44.10
972	CH_2CF_3	CHF_2	R-45.6

The compounds of formula (I) according to the present invention can be prepared e.g. according the preparation methods and preparation schemes as described below. Compounds of formula (I) according to the present invention can be prepared by standard methods of organic chemistry e.g. by the preparation methods and preparation schemes as described below. The definitions of Het, X, R^1, R^2, R^{3a}, R^{3b} and R^4 of the molecular structures given in the

following schemes are as defined above. Room temperature means a temperature range between about 20 and 25 °C.

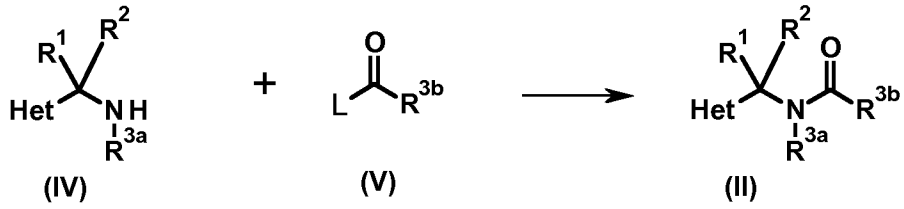
Compounds of formula I can be prepared as outlined in scheme 1 by reaction of a ketone of formula (II) with a compound (III), in the presence of a halogenating agent such as phosphoryl chloride by the method described in scheme 1.The reaction depicted in scheme 1 can be performend by analogy to the method described by Rapoport et al., Journal of the American Chemical Society, 72, 2783-4; 1950 or in EP 643040.

Scheme1:



Compounds of general formula (II) can be synthesized from the reaction of a primary or secondary amine of formula (IV) with an acid derivative of formula (V) as depicted in scheme 2. In formula (V), the radical L is a suitable leaving group such as halogen or O-CO)-R^{3b}. The reaction of compound is preferably carried out in aprotic polar solvents such as acetonitrile, N,N-dimethylformamide, N,N-dimethylacetamide, DMSO, N-metylpyrrolidine, or in an inert solvent such as dichloromethane, 1,2-dichloroethane, or 1,2-dimethoxyethane, in particular at temperatures ranging between room temperature and the reflux temperature of the solvent. An amine or inorganic base can be used to facilitate the reaction. Conditions for such a reaction can be found in WO 2004035549. Compounds of formula (IV) are commercially available or can be easily synthesized, e.g. by reduction of the corresponding nitriles or carboxamides. Compounds of the formula (V) are commercially available or can be synthesized from the corresponding carboxylic acid R^{3b}-C(O)OH using standard procedures of organic chemistry.

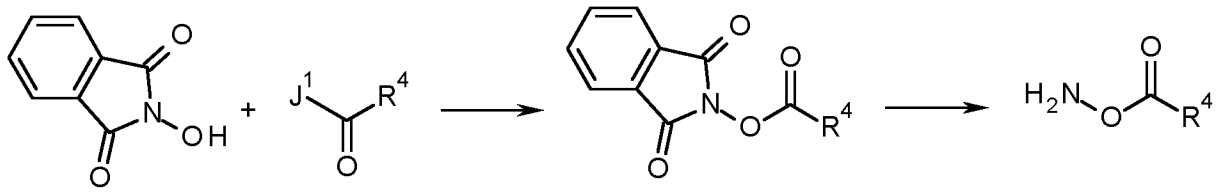
Scheme 2:



In cases where R^4 is a radical NHR^{5d}, the compound of formula (I) can be prepared by reaction of a compound of formula (II) with an isocyanate of the formula R^{5d}-N=C=O by analogy to the method described in US3998958.

Compounds of formula (III), in which Y is an oxygen bound radical O-C(=X)-R^4, can be obtained as shown in Scheme 3 below:

Scheme 3:

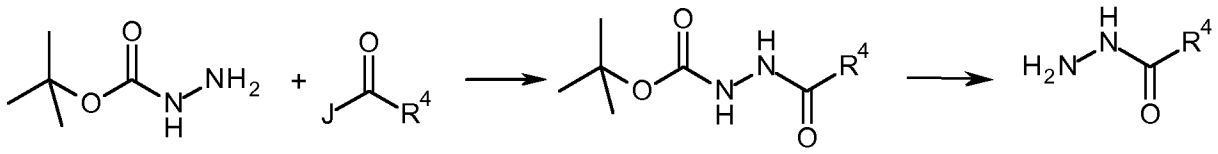


(VI) (VII) (VIII) (III-A)

Reaction of N-hydroxyphthalimide (VI) with compounds of formula (VII), in which J^1 is a chloro, bromo, iodo radical or another suitable leaving group such as OH, yields phthalimide compounds of formula (VIII). If J^1 is hydroxyl, the reaction may be performed by analogy to Mitsonobu's reaction in the presence of a suitable trialkyl or triaryl phosphine reagent and a N,N'-dialkylazodicarboxylate reagent, e.g. by analogy to conditions described in Organic Letters, 2009, 11(9), 2019-2022 or Synthesis, (4), 655-659, and references therein. Cleavage of the phthalimide protecting group in the compound of formula (VIIII) to give the compound of formula (III-A), which is a special case of compound of formula (III) where Y is O-C(=X)-R^4, may be carried out in the presence of hydrazine or methylhydrazine in a polar protic solvent such as methanol or in ethanol. Temperatures may range from 0 °C and 80 °C.

Compounds of formula (III), in which Y is an N bound radical NH-C(=X)-R^4, can be obtained as shown in Scheme 4 below:

Scheme 4:



(IX) (X) (XI) (III-B)

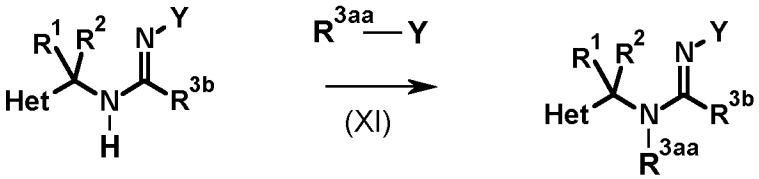
Reaction of a compound (IX) with compound (X) can be effected by analogy to the procedure described in J. Medicinal Chemistry, 2008, 41(15), 4601 - 4608. Thus obtained compound XI is subjected to acid conditions, where the tert-butyl carbamate compound (XI) decomposes to the free hydrazide of formula (III-B). The reaction can be performed as described in Greene, T. W.; Wutz, P. G. M., Protective Groups in Organic Synthesis, Wiley, Fourth Ed., e.g. by treating compounds of formula (XI) with concentrated mineral acid or trifluoroacetic acid in an aprotic organic solvent at temperatures between 0 °C and 50 °C.

By analogy to the methods described in scheme 4, compounds of formula (III) can be prepared were Y is NH-S(=O)R^{5b} or NH-S(=O)$_2R^{5b}$, respectively.

An alternative method to synthesize compound of formula (I), where R^{3a} is different from H, is described in scheme 5. In a first step, the compound of formula (I) with R^{3a} = H is prepared as described in Scheme 1, and then reacted with compound of formula (XI), to afford compounds of formula (I), where R^{3a} is different from H. In scheme 5, R^{3aa} in the compound of formula (VI) has one of the meanings of R^{3a} which is different from hydrogen. In particular, R^{3aa} represents a C-bound radical R^{3a}. LG in compound of formula (XI) is suitable leaving group. Examples of suitable leaving groups LG include, but are not limited to halogen, such as fluorine,

chlorine or bromine, alkyl sulfonate such as mesylate, haloalkyl sulfonate, such as trifluoromethansulfonate and alkyl phosphonate The reaction is preferably carried out in polar solvents such as acetonitrile, acetone, *tert*-butyl alcohol, tetrahydrofuran, N,N-dimethylformamide, N,N-dimethylacetamide, DMSO, N-methylpyrrolidine, dichloromethane, 1,2-dichloroethane, or 1,2-dimethoxyethane, in particular at temperatures ranging between room temperature and the reflux temperature of the solvent in the presence of a organic or inorganic base. Suitable reaction conditions can be found in: WO2008/009360.

Scheme 5:



(I): R^{3a} = H **(I): R^{3a} = R^{3aa}**

In cases where X in radicals Y^1, Y^2 or Y^3 of formula (I) is a sulfur atom, the sulfur atom may be introduced in a subsequent step by reacting a compound of formula (I), where **X** is an oxygen atom, with a thio phosphorous reagent, e.g. P_4-S_{10}-pyridine complex or Lawesson's reagent (2,4-Bis-(4-methoxyphenyl)-1,3,2,4-dithiadiphosphetan-2,4-disulfide) or a similar 2,4-Bis-(aryl)- or 2,4-'Bis(alkyl)-1,3,2,4-dithiadiphosphetan-2,4-disulfide, preferably in polar aprotic solvents such as acetonitrile, acetone, tetrahydrofuran, N,N-dimethylformamide, or in an inert solvent such as toluene, xylene, dichloromethane, chlorobenzene, 1,2-dichloroethane, or 1,2-dimethoxyethane. The reaction temperature may range from room temperature to the reflux temperature of the solvent. Representative reaction conditions for thionation analogous substrates are given in US 2013/102568.

The compounds of the formula (I), and their salts are in particular suitable for efficiently controlling arthropodal pests such as arachnids, myriapedes and insects as well as nematodes.

The compounds of the formula (I) are especially suitable for efficiently combating insects, in particular the following pests:

Insects from the order of the **lepidopterans** (***Lepidoptera***), for example *Acronicta major, Adoxophyes orana, Aedia leucomelas,* Agrotis spp. such as *Agrotis fucosa, Agrotis segetum, Agrotis ypsilon; Alabama argillacea, Anticarsia gemmatalis, Anticarsia spp., Argyresthia conjugella, Autographa gamma, Barathra brassicae, Bucculatrix thurberiella, Bupalus piniarius, Cacoecia murinana, Cacoecia podana, Capua reticulana, Carpocapsa pomonella, Cheimatobia brumata,* Chilo spp. such as *Chilo suppressalis; Choristoneura fumiferana, Choristoneura occidentalis, Cirphis unipuncta, Clysia ambiguella, Cnaphalocerus spp., Cydia pomonella, Dendrolimus pini, Diaphania nitidalis, Diatraea grandiosella, Earias insulana, Elasmopalpus lignosellus, Ephestia cautella, Ephestia kuehniella, Eupoecilia ambiguella, Euproctis chrysorrhoea, Euxoa spp., Evetria bouliana,* Feltia spp. such as *Feltia subterranean; Galleria mellonella, Grapholitha funebrana, Grapholitha molesta,* Helicoverpa spp. such as *Helicoverpa armigera, Helicoverpa zea;* Heliothis spp. such as *Heliothis armigera, Heliothis virescens,*

Heliothis zea; Hellula undalis, Hibernia defoliaria, Hofmannophila pseudospretella, Homona magnanima, Hyphantria cunea, Hyponomeuta padella, Hyponomeuta malinellus, Keiferia lycopersicella, Lambdina fiscellaria, Laphygma spp. such as *Laphygma exigua; Leucoptera coffeella, Leucoptera scitella, Lithocolletis blancardella, Lithophane antennata, Lobesia botrana, Loxagrotis albicosta, Loxostege sticticalis,* Lymantria spp. such as *Lymantria dispar, Lymantria monacha; Lyonetia clerkella, Malacosoma neustria,* Mamestra spp. such as *Mamestra brassicae; Mocis repanda, Mythimna separata, Orgyia pseudotsugata, Oria spp.,* Ostrinia spp. such as *Ostrinia nubilalis; Oulema oryzae, Panolis flammea,* Pectinophora spp. such as *Pectinophora gossypiella; Peridroma saucia, Phalera bucephala,* Phthorimaea spp. such as *Phthorimaea operculella; Phyllocnistis citrella,* Pieris spp. such as *Pieris brassicae, Pieris rapae; Plathypena scabra, Plutella maculipennis, Plutella xylostella, Prodenia spp., Pseudaletia spp., Pseudoplusia includens, Pyrausta nubilalis, Rhyacionia frustrana, Scrobipalpula absoluta, Sitotroga cerealella, Sparganothis pilleriana,* Spodoptera spp. such as *Spodoptera frugiperda, Spodoptera littoralis, Spodoptera litura; Thaumatopoea pityocampa, Thermesia gemmatalis, Tinea pellionella, Tineola bisselliella, Tortrix viridana,* Trichoplusia spp. such as *Trichoplusia ni; Tuta absoluta, and Zeiraphera canadensis;*

Beetles (***Coleoptera***), for example *Acanthoscehdes obtectus, Adoretus spp., Agelastica alni, Agrilus sinuatus,* Agriotes spp. such as *Agriotes fuscicollis, Agriotes lineatus, Agriotes obscurus; Amphimallus solstitialis, Anisandrus dispar, Anobium punctatum, Anomala rufocuprea,* Anoplophora spp. such as *Anoplophora glabripennis;* Anthonomus spp. such as *Anthonomus grandis, Anthonomus pomorum; Anthrenus spp., Aphthona euphoridae, Apogonia spp., Athous haemorrhoidalis,* Atomaria spp. such as *Atomaria linearis; Attagenus spp., Aulacophora femoralis, Blastophagus piniperda, Blitophaga undata, Bruchidius obtectus,* Bruchus spp. such as *Bruchus lentis, Bruchus pisorum, Bruchus rufimanus; Byctiscus betulae, Callosobruchus chinensis, Cassida nebulosa, Cerotoma trifurcata, Cetonia aurata,* Ceuthorhynchus spp. such as *Ceuthorrhynchus assimilis, Ceuthorrhynchus napi; Chaetocnema tibialis, Cleonus mendicus,* Conoderus spp. such as *Conoderus vespertinus; Cosmopolites spp., Costelytra zealandica, Crioceris asparagi, Cryptorhynchus lapathi,* Ctenicera ssp. such as *Ctenicera destructor; Curculio spp., Dectes texanus, Dermestes spp.,* Diabrotica spp. such as *Diabrotica 12-punctata Diabrotica speciosa, Diabrotica longicornis, Diabrotica semipunctata, Diabrotica virgifera;* Epilachna spp. such as *Epilachna varivestis, Epilachna vigintioctomaculata;* Epitrix spp. such as *Epitrix hirtipennis; Eutinobothrus brasiliensis, Faustinus cubae, Gibbium psylloides, Heteronychus arator, Hylamorpha elegans, Hylobius abietis, Hylotrupes bajulus, Hypera brunneipennis, Hypera postica, Hypothenemus spp., Ips typographus, Lachnosterna consanguinea, Lema bilineata, Lema melanopus,* Leptinotarsa spp. such as *Leptinotarsa decemlineata; Limonius californicus, Lissorhoptrus oryzophilus, Lissorhoptrus oryzophilus, Lixus spp.,* Lyctus spp. such as *Lyctus bruneus; Melanotus communis,* Meligethes spp. such as *Meligethes aeneus; Melolontha hippocastani, Melolontha melolontha, Migdolus spp.,* Monochamus spp. such as *Monochamus alternatus; Naupactus xanthographus, Niptus hololeucus, Oryctes rhinoceros, Oryzaephilus surinamensis, Otiorrhynchus sulcatus, Otiorrhynchus ovatus, Otiorrhynchus sulcatus, Oulema oryzae, Oxycetonia jucunda, Phaedon*

cochleariae, Phyllobius pyri, Phyllopertha horticola, Phyllophaga spp., Phyllotreta spp. such as *Phyllotreta chrysocephala, Phyllotreta nemorum, Phyllotreta striolata; Phyllophaga spp., Phyllopertha horticola, Popillia japonica, Premnotrypes spp., Psylliodes chrysocephala, Ptinus spp., Rhizobius ventralis , Rhizopertha dominica, Sitona lineatus,* Sitophilus spp. such as *Sitophilus granaria, Sitophilus zeamais;* Sphenophorus spp. such as *Sphenophorus levis;* Sternechus spp. such as *Sternechus subsignatus; Symphyletes spp., Tenebrio molitor,* Tribolium spp. such as *Tribolium castaneum; Trogoderma spp., Tychius spp., Xylotrechus spp., and Zabrus spp. such as Zabrus tenebrioides;*

Flies, mosquitoes (***Diptera***), e.g. Aedes spp. such as *Aedes aegypti, Aedes albopictus, Aedes vexans; Anastrepha ludens,* Anopheles spp. such as *Anopheles albimanus, Anopheles crucians, Anopheles freeborni, Anopheles gambiae, Anopheles leucosphyrus, Anopheles maculipennis, Anopheles minimus, Anopheles quadrimaculatus, Anopheles sinensis; Bibio hortulanus, Calliphora erythrocephala, Calliphora vicina, Cerafitis capitata, Ceratitis capitata,* Chrysomyia spp. such as *Chrysomya bezziana, Chrysomya hominivorax, Chrysomya macellaria; Chrysops atlanticus, Chrysops discalis, Chrysops silacea,* Cochliomyia spp. such as *Cochliomyia hominivorax;* Contarinia spp. such as *Contarinia sorghicola; Cordylobia anthropophaga,* Culex spp. such as *Culex nigripalpus, Culex pipiens, Culex quinquefasciatus, Culex tarsalis, Culex tritaeniorhynchus; Culicoides furens, Culiseta inornata, Culiseta melanura, Cuterebra spp., Dacus cucurbitae, Dacus oleae, Dasineura brassicae,* Delia spp. such as *Delia antique, Delia coarctata, Delia platura, Delia radicum; Dermatobia hominis, Drosophila spp.,* Fannia spp. such as *Fannia canicularis;* Gastraphilus spp. such as *Gasterophilus intestinalis; Geomyza Tripunctata, Glossina fuscipes, Glossina morsitans, Glossina palpalis, Glossina tachinoides, Haematobia irritans, Haplodiplosis equestris, Hippelates spp.,* Hylemyia spp. such as *Hylemyia platura;* Hypoderma spp. such as *Hypoderma lineata; Hyppobosca spp., Leptoconops torrens,* Liriomyza spp. such as *Liriomyza sativae, Liriomyza trifolii;* Lucilia spp. such as *Lucilia caprina, Lucilia cuprina, Lucilia sericata; Lycoria pectoralis, Mansonia titillanus,* Mayetiola spp. such as *Mayetiola destructor;* Musca spp. such as *Musca autumnalis, Musca domestica; Muscina stabulans,* Oestrus spp. such as *Oestrus ovis; Opomyza florum,* Oscinella spp. such as *Oscinella frit; Pegomya hysocyami, Phlebotomus argentipes,* Phorbia spp. such as *Phorbia antiqua, Phorbia brassicae, Phorbia coarctata; Prosimulium mixtum, Psila rosae, Psorophora columbiae, Psorophora discolor, Rhagoletis cerasi, Rhagoletis pomonella,* Sarcophaga spp. such as *Sarcophaga haemorrhoidalis; Simulium vittatum,* Stomoxys spp. such as *Stomoxys calcitrans;* Tabanus spp. such as *Tabanus atratus, Tabanus bovinus, Tabanus lineola, Tabanus similis; Tannia spp., Tipula oleracea, Tipula paludosa, and Wohlfahrtia spp.;*

Thrips (***Thysanoptera***), e.g. *Baliothrips biformis, Dichromothrips corbetti, Dichromothrips ssp., Enneothrips flavens,* Frankliniella spp. such as *Frankliniella fusca, Frankliniella occidentalis, Frankliniella tritici; Heliothrips spp., Hercinothrips femoralis, Kakothrips spp., Rhipiphorothrips cruentatus,* Scirtothrips spp. such as *Scirtothrips citri; Taeniothrips cardamoni,* Thrips spp. such as *Thrips oryzae, Thrips palmi, Thrips tabaci;*

Termites (**Isoptera**), e.g. *Calotermes flavicollis, Coptotermes formosanus, Heterotermes aureus, Heterotermes longiceps, Heterotermes tenuis, Leucotermes flavipes, Odontotermes*

spp., Reticulitermes spp. such as *Reticulitermes speratus, Reticulitermes flavipes, Reticulitermes grassei, Reticulitermes lucifugus, Reticulitermes santonensis, Reticulitermes virginicus; Termes natalensis;*

Cockroaches (Blattaria - Blattodea), e.g. *Acheta domesticus, Blatta orientalis, Blattella asahinae, Blattella germanica, Gryllotalpa spp., Leucophaea maderae, Locusta spp., Melanoplus spp., Periplaneta americana, Periplaneta australasiae, Periplaneta brunnea, Periplaneta fuligginosa, Periplaneta japonica;*

Bugs, aphids, leafhoppers, whiteflies, scale insects, cicadas (*Hemiptera*), e.g. Acrosternum spp. such as *Acrosternum hilare;* Acyrthosipon spp. such as *Acyrthosiphon onobrychis, Acyrthosiphon pisum; Adelges laricis, Aeneolamia spp., Agonoscena spp., Aleurodes spp., Aleurolobus barodensis, Aleurothrixus spp., Amrasca spp., Anasa tristis, Antestiopsis spp., Anuraphis cardui, Aonidiella spp., Aphanostigma piri, Aphidula nasturtii,* Aphis spp. such as *Aphis fabae, Aphis forbesi, Aphis gossypii, Aphis grossulariae, Aphis pomi, Aphis sambuci, Aphis schneideri, Aphis spiraecola; Arboridia apicalis, Arilus critatus, Aspidiella spp., Aspidiotus spp., Atanus spp., Aulacorthum solani,* Bemisia spp. such as *Bemisia argentifolii, Bemisia tabaci;* Blissus spp. such as *Blissus leucopterus; Brachycaudus cardui, Brachycaudus helichrysi, Brachycaudus persicae, Brachycaudus prunicola, Brachycolus spp., Brevicoryne brassicae, Calligypona marginata, Calocoris spp., Campylomma livida, Capitophorus horni, Carneocephala fulgida, Cavelerius spp., Ceraplastes spp., Ceratovacuna lanigera, Cercopidae, Cerosipha gossypii, Chaetosiphon fragaefolii, Chionaspis tegalensis, Chlorita onukii, Chromaphis juglandicola, Chrysomphalus ficus, Cicadulina mbila,* Cimex spp. such as *Cimex hemipterus, Cimex lectularius; Coccomytilus halli, Coccus spp., Creontiades dilutus, Cryptomyzus ribis, Cryptomyzus ribis, Cyrtopeltis notatus, Dalbulus spp., Dasynus piperis, Dialeurades spp., Diaphorina spp., Diaspis spp., Dichelops furcatus, Diconocoris hewetti, Doralis spp., Dreyfusia nordmannianae, Dreyfusia piceae, Drosicha spp.,* Dysaphis spp. such as *Dysaphis plantaginea, Dysaphis pyri, Dysaphis radicola; Dysaulacorthum pseudosolani,* Dysdercus spp. such as *Dysdercus cingulatus, Dysdercus intermedius; Dysmicoccus spp.,* Empoasca spp. such as *Empoasca fabae, Empoasca solana; Eriosoma spp., Erythroneura spp.,* Eurygaster spp. such as *Eurygaster integriceps; Euscelis bilobatus, Euschistus spp. such as Euschistuos heros, Euschistus impictiventris, Euschistus servus; Geococcus coffeae,* Halyomorpha spp. such as *Halyomorpha halys; Heliopeltis spp., Homalodisca coagulata, Horcias nobilellus, Hyalopterus pruni, Hyperomyzus lactucae, Icerya spp., Idiocerus spp., Idioscopus spp., Laodelphax striatellus, Lecanium spp., Lepidosaphes spp., Leptocorisa spp., Leptoglossus phyllopus, Lipaphis erysimi,* Lygus spp. such as *Lygus hesperus, Lygus lineolaris, Lygus pratensis; Macropes excavatus,* Macrosiphum spp. such as *Macrosiphum rosae, Macrosiphum avenae, Macrosiphum euphorbiae; Mahanarva fimbriolata, Megacopta cribraria, Megoura viciae, Melanaphis pyrarius, Melanaphis sacchari, Metcafiella spp., Metopolophium dirhodum, Miridae spp., Monellia costalis, Monelliopsis pecanis,* Myzus spp. such as *Myzus ascalonicus, Myzus cerasi, Myzus persicae, Myzus varians; Nasonovia ribis-nigri,* Nephotettix spp. such as *Nephotettix malayanus, Nephotettix nigropictus, Nephotettix parvus, Nephotettix virescens;* Nezara spp. such as *Nezara viridula; Nilaparvata lugens,*

Oebalus spp., Oncometopia spp., Orthezia praelonga, Parabemisia myricae, Paratrioza spp., Parlatoria spp., Pemphigus spp. such as *Pemphigus bursarius; Pentomidae, Peregrinus maidis, Perkinsiella saccharicida, Phenacoccus spp., Phloeomyzus passerinii, Phorodon humuli, Phylloxera spp., Piesma quadrata,* Piezodorus spp. such as *Piezodorus guildinii, Pinnaspis aspidistrae, Planococcus spp., Protopulvinaria pyriformis, Psallus seriatus, Pseudacysta persea, Pseudaulacaspis pentagona,* Pseudococcus spp. such as *Pseudococcus comstocki;* Psylla spp. such as *Psylla mali, Psylla piri; Pteromalus spp., Pyrilla spp., Quadraspidiotus spp., Quesada gigas, Rastrococcus spp., Reduvius senilis, Rhodnius spp., Rhopalomyzus ascalonicus,* Rhopalosiphum spp. such as *Rhopalosiphum pseudobrassicas, Rhopalosiphum insertum, Rhopalosiphum maidis, Rhopalosiphum padi; Sagatodes spp., Sahlbergella singularis, Saissetia spp., Sappaphis mala, Sappaphis mali, Scaphoides titanus, Schizaphis graminum, Schizoneura lanuginosa, Scotinophora spp., Selenaspidus articulatus, Sitobion avenae, Sogata spp., Sogatella furcifera, Solubea insularis , Stephanitis nashi, Stictocephala festina, Tenalaphara malayensis,* Thyanta spp. such as *Thyanta perditor; Tibraca spp., Tinocallis caryaefoliae, Tomaspis spp.,* Toxoptera spp. such as *Toxoptera aurantii;* Trialeurodes spp. such as *Trialeurodes vaporariorum; Triatoma spp., Trioza spp., Typhlocyba spp.,* Unaspis spp. such as *Unaspis yanonensis; and Viteus vitifolii;*

Ants, bees, wasps, sawflies (**Hymenoptera**), e.g. *Athalia rosae, Atta capiguara, Atta cephalotes, Atta cephalotes, Atta laevigata, Atta robusta, Atta sexdens, Atta texana, Bombus spp., Camponotus floridanus, Crematogaster spp., Dasymutilla occidentalis, Diprion spp., Dolichovespula maculata,* Hoplocampa spp. such as *Hoplocampa minuta, Hoplocampa testudinea;* Lasius spp. such as *Lasius niger, Linepithema humile, Monomorium pharaonis, Paravespula germanica, Paravespula pennsylvanica, Paravespula vulgaris, Pheidole megacephala, Pogonomyrmex barbatus, Pogonomyrmex californicus, Polistes rubiginosa, Solenopsis geminata, Solenopsis invicta, Solenopsis richteri, Solenopsis xyloni,* Vespa spp. such as *Vespa crabro, and Vespula squamosal;*

Crickets, grasshoppers, locusts (**Orthoptera**), e.g. *Acheta domestica, Calliptamus italicus, Chortoicetes terminifera, Dociostaurus maroccanus, Gryllotalpa africana, Gryllotalpa gryllotalpa, Hieroglyphus daganensis, Kraussaria angulifera, Locusta migratoria, Locustana pardalina, Melanoplus bivittatus, Melanoplus femurrubrum, Melanoplus mexicanus, Melanoplus sanguinipes, Melanoplus spretus, Nomadacris septemfasciata, Oedaleus senegalensis, Schistocerca americana, Schistocerca gregaria, Tachycines asynamorus, and Zonozerus variegatus;*

Earwigs (***Dermaptera***), e.g. *forficula auricularia*,

Lice (***Phthiraptera***), e.g. *Damalinia spp.*, Pediculus spp. such as *Pediculus humanus capitis, Pediculus humanus corporis; Pthirus pubis*, Haematopinus spp. such as *Haematopinus eurysternus*, *Haematopinus suis*; Linognathus spp. such as *Linognathus vituli; Bovicola bovis, Menopon gallinae, Menacanthus stramineus* and *Solenopotes capillatus, Trichodectes spp.;*

Fleas (***Siphonaptera***), e.g. *Ceratophyllus spp., Ctenocephalides felis*, *Ctenocephalides canis, Xenopsylla cheopis*, *Pulex irritans*, *Tunga penetrans*, and *Nosopsyllus fasciatus.*

The compounds of the formula (I) are also suitable for efficiently combating arthropd pests different from insects such as, in particular the following pests:

arachnids (***Arachnida***), such as acari,e.g. of the families Argasidae, Ixodidae and Sarcoptidae, such as Amblyomma spp. (e.g. *Amblyomma americanum, Amblyomma variegatum, Amblyomma maculatum*), Argas spp. (e.g. *Argas persicus*), Boophilus spp. (e.g. *Boophilus annulatus, Boophilus decoloratus, Boophilus microplus*), *Dermacentor silvarum, Dermacentor andersoni, Dermacentor variabilis,* Hyalomma spp. (e.g. *Hyalomma truncatum*), Ixodes spp. (e.g. *Ixodes ricinus, Ixodes rubicundus, Ixodes scapularis, Ixodes holocyclus, Ixodes pacificus*), Ornithodorus spp. (e.g. *Ornithodorus moubata, Ornithodorus hermsi, Ornithodorus turicata*), *Ornithonyssus bacoti, Otobius megnini, Dermanyssus gallinae,* Psoroptes spp. (e.g. *Psoroptes ovis*), Rhipicephalus spp. (e.g. *Rhipicephalus sanguineus, Rhipicephalus appendiculatus, Rhipicephalus evertsi), Rhizoglyphus spp.,* Sarcoptes spp. (e.g. *Sarcoptes scabiei*), and **Eriophyidae** spp. such as *Acaria sheldoni*, Aculops spp. (e.g. *Aculops pelekassi*) Aculus spp. (e.g. *Aculus schlechtendali*), *Epitrimerus pyri, Phyllocoptruta oleivora* and Eriophyes spp. (e.g. *Eriophyes sheldoni*); Tarsonemidae spp. such as *Hemitarsonemus spp.*, *Phytonemus pallidus and Polyphagotarsonemus latus, Stenotarsonemus spp.*; Tenuipalpidae spp. such as Brevipalpus spp. (e.g. *Brevipalpus phoenicis*); Tetranychidae spp. such as *Eotetranychus spp.*, *Eutetranychus spp.*, *Oligonychus spp., Tetranychus cinnabarinus, Tetranychus kanzawai, Tetranychus pacificus, Tetranychus telarius* and *Tetranychus* urticae; *Bryobia praetiosa*, Panonychus spp. (e.g. *Panonychus ulmi*, *Panonychus citri*), *Metatetranychus spp.* and Oligonychus spp. (e.g. *Oligonychus pratensis*), *Vasates lycopersici*; Araneida, e.g. *Latrodectus mactans*, and *Loxosceles reclusa*. And *Acarus siro, Chorioptes spp.*, *Scorpio maurus*;

Silverfish, firebrat (***Thysanura***), e.g. *Lepisma saccharina* and *Thermobia domestica;*

Centipedes (***Chilopoda***), e.g. *Geophilus spp.,* Scutigera spp. such as *Scutigera coleoptrata*;

Millipedes (***Diplopoda***), e.g. *Blaniulus guttulatus*, *Narceus spp.*,

Springtails (*Collembola*), *e.g.* Onychiurus ssp. such as *Onychiurus armatus,*

They are also suitable for controlling **nematodes**: plant parasitic nematodes such as root knot nematodes, *Meloidogyne hapla, Meloidogyne incognita, Meloidogyne javanica*, and other Meloidogyne species; cyst-forming nematodes, *Globodera rostochiensis* and other Globodera species*; Heterodera avenae, Heterodera glycines, Heterodera schachtii, Heterodera trifolii*, and other Heterodera species; Seed gall nematodes, Anguina species; Stem and foliar nematodes, Aphelenchoides species such as *Aphelenchoides besseyi* ; Sting nematodes, *Belonolaimus longicaudatus* and other Belonolaimus species; Pine nematodes, *Bursaphelenchus lignicolus Mamiya et Kiyohara, Bursaphelenchus xylophilus* and other Bursaphelenchus species; Ring nematodes, Criconema species, Criconemella species, Criconemoides species, Mesocriconema species; Stem and bulb nematodes, *Ditylenchus destructor, Ditylenchus dipsaci* and other Ditylenchus species; Awl nematodes, Dolichodorus species; Spiral nematodes, *Heliocotylenchus multicinctus* and other Helicotylenchus species; Sheath and sheathoid nematodes, Hemicycliophora species and Hemicriconemoides species;

Hirshmanniella species; Lance nematodes, Hoploaimus species; false rootknot nematodes, Nacobbus species; Needle nematodes, *Longidorus elongatus* and other Longidorus species; Lesion nematodes, *Pratylenchus brachyurus, Pratylenchus neglectus, Pratylenchus penetrans, Pratylenchus curvitatus, Pratylenchus goodeyi* and other Pratylenchus species; Burrowing nematodes, *Radopholus similis* and other Radopholus species; Reniform nematodes, *Rotylenchus robustus, Rotylenchus reniformis* and other Rotylenchus species; Scutellonema species; Stubby root nematodes, *Trichodorus primitivus* and other Trichodorus species, Paratrichodorus species; Stunt nematodes, *Tylenchorhynchus claytoni*, *Tylenchorhynchus dubius* and other Tylenchorhynchus species; Citrus nematodes, Tylenchulus species such as T*ylenchulus semipenetrans*; Dagger nematodes, Xiphinema species; and other plant parasitic nematode species.

Examples of further pest species which may be controlled by compounds of fomula (I) include: from the class of the *Bivalva*, for example, *Dreissena spp.*; from the class of the *Gastropoda,* for example, *Arion spp., Biomphalaria spp., Bulinus spp., Deroceras spp., Galba spp., Lymnaea spp., Oncomelania spp., Succinea spp.;* from the class of the *helminths,* for example, *Ancylostoma duodenale, Ancylostoma ceylanicum, Acylostoma braziliensis, Ancylostoma spp., Ascaris lubricoides, Ascaris spp., Brugia malayi, Brugia timori, Bunostomum spp., Chabertia spp., Clonorchis spp., Cooperia spp., Dicrocoelium spp., Dictyocaulus filaria, Diphyllobothrium latum, Dracunculus medinensis, Echinococcus granulosus, Echinococcus multilocularis, Enterobius vermicularis, Faciola spp.,* Haemonchus spp. such as *Haemonchus contortus; Heterakis spp., Hymenolepis nana, Hyostrongulus spp., Loa Loa, Nematodirus spp., Oesophagostomum spp., Opisthorchis spp., Onchocerca volvulus, Ostertagia spp., Paragonimus spp., Schistosomen spp., Strongyloides fuelleborni, Strongyloides stercora lis, Stronyloides spp., Taenia saginata, Taenia solium, Trichinella spiralis, Trichinella nativa, Trichinella britovi, Trichinella nelsoni, Trichinella pseudopsiralis, Trichostrongulus spp., Trichuris trichuria, Wuchereria bancrofti;* from the order of the *Isopoda,* for example, *Armadillidium vulgare, Oniscus asellus, Porcellio scaber;* from the order of the *Symphyla,* for example, *Scutigerella immaculata.*

Further examples of pest species which may be controlled by compounds of formula (I) include: *Anisoplia austriaca, Apamea spp., Austroasca viridigrisea, Baliothrips biformis, Caenorhabditis elegans, Cephus spp., Ceutorhynchus napi, Chaetocnema aridula, Chilo auricilius, Chilo indicus , Chilo polychrysus, Chortiocetes terminifera, Cnaphalocroci medinalis, Cnaphalocrosis spp., Colias eurytheme, Collops spp., Cornitermes cumulans, Creontiades spp., Cyclocephala spp., Dalbulus maidis, Deraceras reticulatum , Diatrea saccharalis, Dichelops furcatus, Dicladispa armigera ,* Diloboderus spp. such as *Diloboderus abderus; Edessa spp., Epinotia spp., Formicidae, Geocoris spp., Globitermes sulfureus, Gryllotalpidae, Halotydeus destructor, Hipnodes bicolor, Hydrellia philippina, Julus spp., Laodelphax spp., Leptocorsia acuta , Leptocorsia oratorius , Liogenys fuscus, Lucillia spp., Lyogenys fuscus, Mahanarva spp., Maladera matrida, Marasmia spp., Mastotermes spp., Mealybugs, Megascelis ssp, Metamasius hemipterus, Microtheca spp., Mocis latipes, Murgantia spp., Mythemina separata , Neocapritermes opacus, Neocapritermes parvus, Neomegalotomus spp., Neotermes spp.,*

Nymphula depunctalis, Oebalus pugnax, Orseolia spp. such as *Orseolia oryzae; Oxycaraenus hyalinipennis, Plusia spp., Pomacea canaliculata, Procornitermes ssp, Procornitermes triacifer , Psylloides spp., Rachiplusia spp., Rhodopholus spp., Scaptocoris castanea, Scaptocoris spp.,* Scirpophaga spp. such as *Scirpophaga incertulas , Scirpophaga innotata;* Scotinophara spp. such as *Scotinophara coarctata;* Sesamia spp. such as *Sesamia inferens, Sogaella frucifera, Solenapsis geminata, Spissistilus spp., Stalk borer, Stenchaetothrips biformis, Steneotarsonemus spinki, Sylepta derogata, Telehin licus, Trichostrongylus spp..*

Compounds of the formula (I) are particularly useful for controlling insects of the orders Hemiptera and Thysanoptera.

For use in a method according to the present invention, the compounds of the formula (I) can be converted into the customary formulations, e.g. solutions, emulsions, suspensions, dusts, powders, pastes, granules and directly sprayable solutions. The use form depends on the particular purpose and application method. Formulations and application methods are chosen to ensure in each case a fine and uniform distribution of the compound of the formula (I) according to the present invention.

The formulations are prepared in a known manner (see e.g. for review US 3,060,084, EP-A 707 445 (for liquid concentrates), Browning, "Agglomeration", Chemical Engineering, Dec. 4, 1967, 147-48, Perry's Chemical Engineer's Handbook, 4th Ed., McGraw-Hill, New York, 1963, pages 8-57 and et seq. WO 91/13546, US 4,172,714, US 4,144,050, US 3,920,442, US 5,180,587, US 5,232,701, US 5,208,030, GB 2,095,558, US 3,299,566, Klingman, Weed Control as a Science, John Wiley and Sons, Inc., New York, 1961, Hance et al., Weed Control Handbook, 8th Ed., Blackwell Scientific Publications, Oxford, 1989 and Mollet, H., Grubemann, A., Formulation technology, Wiley VCH Verlag GmbH, Weinheim (Germany), 2001, 2. D. A. Knowles, Chemistry and Technology of Agrochemical Formulations, Kluwer Academic Publishers, Dordrecht, 1998 (ISBN 0-7514-0443-8), for example by extending the active compound with auxiliaries suitable for the formulation of agrochemicals, such as solvents and/or carriers, if desired emulsifiers, surfactants and dispersants, preservatives, antifoaming agents, anti-freezing agents, for seed treatment formulation also optionally colorants and/or binders and/or gelling agents.

Solvents/carriers, which are suitable, are e.g.:

- solvents such as water, aromatic solvents (for example Solvesso products, xylene and the like), paraffins (for example mineral fractions), alcohols (for example methanol, butanol, pentanol, benzyl alcohol), ketones (for example cyclohexanone, gamma-butyrolactone), pyrrolidones (N-metyhl-pyrrolidone (NMP),N-octylpyrrolidone NOP), acetates (glycol diacetate), alkyl lactates, lactones such as g-butyrolactone, glycols, fatty acid dimethylamides, fatty acids and fatty acid esters, triglycerides, oils of vegetable or animal origin and modified oils such as alkylated plant oils. In principle, solvent mixtures may also be used.
- carriers such as ground natural minerals and ground synthetic minerals, such as silica gels, finely divided silicic acid, silicates, talc, kaolin, attaclay, limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate and magnesium sulfate,

magnesium oxide, ground synthetic materials, fertilizers, such as, for example, ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas and products of vegetable origin, such as cereal meal, tree bark meal, wood meal and nutshell meal, cellulose powders and other solid carriers.

Suitable emulsifiers are nonionic and anionic emulsifiers, for example polyoxyethylene fatty alcohol ethers, alkylsulfonates and arylsulfonates.

Examples of dispersants are lignin-sulfite waste liquors and methylcellulose.

Suitable surfactants are alkali metal, alkaline earth metal and ammonium salts of lignosulfonic acid, naphthalenesulfonic acid, phenolsulfonic acid, dibutylnaphthalenesulfonic acid, alkylarylsulfonates, alkyl sulfates, alkylsulfonates, fatty alcohol sulfates, fatty acids and sulfated fatty alcohol glycol ethers, furthermore condensates of sulfonated naphthalene and naphthalene derivatives with formaldehyde, condensates of naphthalene or of naphthalenesulfonic acid with phenol and formaldehyde, polyoxyethylene octylphenyl ether, ethoxylated isooctylphenol, octylphenol, nonylphenol, alkylphenyl polyglycol ethers, tributylphenyl polyglycol ether, tristearylphenyl polyglycol ether, alkylaryl polyether alcohols, alcohol and fatty alcohol/ethylene oxide condensates, ethoxylated castor oil, polyoxyethylene alkyl ethers, ethoxylated polyoxypropylene, lauryl alcohol polyglycol ether acetal, sorbitol esters,

Also anti-freezing agents such as glycerin, ethylene glycol, propylene glycol and bactericides such as can be added to the formulation.

Suitable antifoaming agents are for example antifoaming agents based on silicon or magnesium stearate.

Suitable preservatives are for example dichlorophen und benzyl alcohol hemiformal

Suitable thickeners are compounds which confer a pseudoplastic flow behavior to the formulation, i.e. high viscosity at rest and low viscosity in the agitated stage. Mention may be made, in this context, for example, of commercial thickeners based on polysaccharides, such as Xanthan Gum® (Kelzan® from Kelco), Rhodopol®23 (Rhone Poulenc) or Veegum® (from R.T. Vanderbilt), or organic phyllosilicates, such as Attaclay® (from Engelhardt). Antifoam agents suitable for the dispersions according to the invention are, for example, silicone emulsions (such as, for example, Silikon® SRE, Wacker or Rhodorsil® from Rhodia), long-chain alcohols, fatty acids, organofluorine compounds and mixtures thereof. Biocides can be added to stabilize the compositions according to the invention against attack by microorganisms. Suitable biocides are, for example, based on isothiazolones such as the compounds marketed under the trademarks Proxel® from Avecia (or Arch) or Acticide® RS from Thor Chemie and Kathon® MK from Rohm & Haas. Suitable antifreeze agents are organic polyols, for example ethylene glycol, propylene glycol or glycerol. These are usually employed in amounts of not more than 10% by weight, based on the total weight of the active compound composition. If appropriate, the active compound compositions according to the invention may comprise 1 to 5% by weight of buffer, based on the total amount of the formulation prepared, to regulate the pH, the amount and type of the buffer used depending on the chemical properties of the active compound or the active compounds. Examples of buffers are alkali metal salts of weak inorganic or organic acids, such as, for example, phosphoric acid, boronic acid, acetic acid, propionic acid, citric acid, fumaric

acid, tartaric acid, oxalic acid and succinic acid.

Substances which are suitable for the preparation of directly sprayable solutions, emulsions, pastes or oil dispersions are mineral oil fractions of medium to high boiling point, such as kerosene or diesel oil, furthermore coal tar oils and oils of vegetable or animal origin, aliphatic, cyclic and aromatic hydrocarbons, for example toluene, xylene, paraffin, tetrahydronaphthalene, alkylated naphthalenes or their derivatives, methanol, ethanol, propanol, butanol, cyclohexanol, cyclohexanone, isophorone, strongly polar solvents, for example dimethyl sulfoxide, N-methylpyrrolidone and water.

Powders, materials for spreading and dusts can be prepared by mixing or concomitantly grinding the active substances with a solid carrier.

Granules, for example coated granules, impregnated granules and homogeneous granules, can be prepared by binding the active ingredients to solid carriers. Examples of solid carriers are mineral earths such as silica gels, silicates, talc, kaolin, attaclay, limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate, magnesium sulfate, magnesium oxide, ground synthetic materials, fertilizers, such as, for example, ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas, and products of vegetable origin, such as cereal meal, tree bark meal, wood meal and nutshell meal, cellulose powders and other solid carriers.

In general, the formulations comprise from 0.01 to 95% by weight, preferably from 0.1 to 90% by weight, of the active ingredient. The active ingredients are employed in a purity of from 90% to 100%, preferably 95% to 100% (according to NMR spectrum).

For seed treatment purposes, respective formulations can be diluted 2-10 fold leading to concentrations in the ready to use preparations of 0,01 to 60% by weight active compound by weight, preferably 0,1 to 40% by weight.

The compound of formula (I) can be used as such, in the form of their formulations or the use forms prepared therefrom, for example in the form of directly sprayable solutions, powders, suspensions or dispersions, emulsions, oil dispersions, pastes, dustable products, materials for spreading, or granules, by means of spraying, atomizing, dusting, spreading or pouring. The use forms depend entirely on the intended purposes; they are intended to ensure in each case the finest possible distribution of the active compounds according to the invention.

The following are examples of formulations:

1. Products for dilution with water. For seed treatment purposes, such products may be applied to the seed diluted or undiluted.

A) Water-soluble concentrates (SL, LS)

10 parts by weight of the active compound is dissolved in 90 parts by weight of water or a water-soluble solvent. As an alternative, wetters or other auxiliaries are added. The active compound dissolves upon dilution with water, whereby a formulation with 10 % (w/w) of active compound is obtained.

B) Dispersible concentrates (DC)

20 parts by weight of the active compound is dissolved in 70 parts by weight of cyclohexanone with addition of 10 parts by weight of a dispersant, for example

polyvinylpyrrolidone. Dilution with water gives a dispersion, whereby a formulation with 20% (w/w) of active compounds is obtained.

C) Emulsifiable concentrates (EC)

15 parts by weight of the active compounds is dissolved in 7 parts by weight of xylene with addition of calcium dodecylbenzenesulfonate and castor oil ethoxylate (in each case 5 parts by weight). Dilution with water gives an emulsion, whereby a formulation with 15% (w/w) of active compounds is obtained.

D) Emulsions (EW, EO, ES)

25 parts by weight of the active compound is dissolved in 35 parts by weight of xylene with addition of calcium dodecylbenzenesulfonate and castor oil ethoxylate (in each case 5 parts by weight). This mixture is introduced into 30 parts by weight of water by means of an emulsifier machine (e.g. Ultraturrax) and made into a homogeneous emulsion. Dilution with water gives an emulsion, whereby a formulation with 25% (w/w) of active compound is obtained.

E) Suspensions (SC, OD, FS)

In an agitated ball mill, 20 parts by weight of the active compound is comminuted with addition of 10 parts by weight of dispersants, wetters and 70 parts by weight of water or of an organic solvent to give a fine active compound suspension. Dilution with water gives a stable suspension of the active compound, whereby a formulation with 20% (w/w) of active compound is obtained.

F) Water-dispersible granules and water-soluble granules (WG, SG)

50 parts by weight of the active compound is ground finely with addition of 50 parts by weight of dispersants and wetters and made as water-dispersible or water-soluble granules by means of technical appliances (for example extrusion, spray tower, fluidized bed). Dilution with water gives a stable dispersion or solution of the active compound, whereby a formulation with 50% (w/w) of active compound is obtained.

G) Water-dispersible powders and water-soluble powders (WP, SP, SS, WS)

75 parts by weight of the active compound are ground in a rotor-stator mill with addition of 25 parts by weight of dispersants, wetters and silica gel. Dilution with water gives a stable dispersion or solution of the active compound, whereby a formulation with 75% (w/w) of active compound is obtained.

H) Gel-Formulation (GF)

In an agitated ball mill, 20 parts by weight of the active compound is comminuted with addition of 10 parts by weight of dispersants, 1 part by weight of a gelling agent wetters and 70 parts by weight of water or of an organic solvent to give a fine active compound suspension. Dilution with water gives a stable suspension of the active compound, whereby a formulation with 20% (w/w) of active compound is obtained.

2. Products to be applied undiluted for foliar applications. For seed treatment purposes, such products may be applied to the seed diluted or undiluted.

I) Dustable powders (DP, DS)

5 parts by weight of the active compound are ground finely and mixed intimately with 95 parts by weight of finely divided kaolin. This gives a dustable product having 5% (w/w) of active compound.

J) Granules (GR, FG, GG, MG)

0.5 part by weight of the active compound is ground finely and associated with 95.5 parts by weight of carriers, whereby a formulation with 0.5% (w/w) of active compound is obtained. Current methods are extrusion, spray-drying or the fluidized bed. This gives granules to be applied undiluted for foliar use.

K) ULV solutions (UL)

10 parts by weight of the active compound is dissolved in 90 parts by weight of an organic solvent, for example xylene. This gives a product having 10% (w/w) of active compound, which is applied undiluted for foliar use.

Aqueous use forms can be prepared from emulsion concentrates, pastes or wettable powders (sprayable powders, oil dispersions) by adding water. To prepare emulsions, pastes or oil dispersions, the substances, as such or dissolved in an oil or solvent, can be homogenized in water by means of a wetter, tackifier, dispersant or emulsifier. Alternatively, it is possible to prepare concentrates composed of active substance, wetter, tackifier, dispersant or emulsifier and, if appropriate, solvent or oil, and such concentrates are suitable for dilution with water.

The active ingredient concentrations in the ready-to-use products can be varied within relatively wide ranges. In general, they are from 0.0001 to 10%, preferably from 0.01 to 1%.

The active ingredients may also be used successfully in the ultra-low-volume process (ULV), it being possible to apply formulations comprising over 95% by weight of active ingredient, or even to apply the active ingredient without additives.

In the method of this invention compounds of formula (I) may be applied with other active ingredients, for example with other pesticides, insecticides, herbicides, fertilizers such as ammonium nitrate, urea, potash, and superphosphate, phytotoxicants and plant growth regulators, safeners and nematicides. These additional ingredients may be used sequentially or in combination with the above-described compositions, if appropriate also added only immediately prior to use (tank mix). For example, the plant(s) may be sprayed with a composition of this invention either before or after being treated with other active ingredients.

M.1 Acetylcholine esterase (AChE) inhibitors from the class of

M.1A carbamates, for example aldicarb, alanycarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim, carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb, methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, trimethacarb, XMC, xylylcarb and triazamate; or from the class of

M.1B organophosphates, for example acephate, azamethiphos, azinphos-ethyl, azinphosmethyl, cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos, chlorpyrifos-methyl, coumaphos, cyanophos, demeton-S-methyl, diazinon, dichlorvos/ DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate, heptenophos, imicyafos, isofenphos, isopropyl

O- (methoxyaminothio-phosphoryl) salicylate, isoxathion, malathion, mecarbam, methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl, parathion, parathion-methyl, phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos- methyl, profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, tetrachlorvinphos, thiometon, triazophos, trichlorfon and vamidothion;

M.2. GABA-gated chloride channel antagonists such as:

M.2A cyclodiene organochlorine compounds, as for example endosulfan or chlordane; or

M.2B fiproles (phenylpyrazoles), as for example ethiprole, fipronil, flufiprole, pyrafluprole and pyriprole;

M.3 Sodium channel modulators from the class of

M.3A pyrethroids, for example acrinathrin, allethrin, d-cis-trans allethrin, d-trans allethrin, bifenthrin, bioallethrin, bioallethrin S-cylclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, lambda-cyhalothrin, gamma-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin, deltamethrin, empenthrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, imiprothrin, meperfluthrin,metofluthrin, momfluorothrin, permethrin, phenothrin, prallethrin, profluthrin, pyrethrin (pyrethrum), resmethrin, silafluofen, tefluthrin, tetramethylfluthrin, tetramethrin, tralomethrin and transfluthrin; or

M.3B sodium channel modulators such as DDT or methoxychlor;

M.4 Nicotinic acetylcholine receptor agonists (nAChR) from the class of

M.4A neonicotinoids, for example acteamiprid, chlothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid and thiamethoxam; or the compounds

M.4A.1: 1-[(6-chloro-3-pyridinyl)methyl]-2,3,5,6,7,8-hexahydro-9-nitro-(5S,8R)-5,8-Epoxy-1H-imidazo[1,2-a]azepine; or

M.4A.2: 1-[(6-chloro-3-pyridyl)methyl]-2-nitro-1-[(E)-pentylideneamino]guanidine; or

M4.A.3: 1-[(6-chloro-3-pyridyl)methyl]-7-methyl-8-nitro-5-propoxy-3,5,6,7-tetrahydro-2H-imidazo[1,2-a]pyridine;

or M.4B nicotine.

M.5 Nicotinic acetylcholine receptor allosteric activators from the class of spinosyns, for example spinosad or spinetoram;

M.6 Chloride channel activators from the class of avermectins and milbemycins, for example abamectin, emamectin benzoate, ivermectin, lepimectin or milbemectin;

M.7 Juvenile hormone mimics, such as

M.7A juvenile hormone analogues as hydroprene, kinoprene and methoprene; or others as M.7B fenoxycarb or M.7C pyriproxyfen;

M.8 miscellaneous non-specific (multi-site) inhibitors, for example

M.8A alkyl halides as methyl bromide and other alkyl halides, or

M.8B chloropicrin, or M.8C sulfuryl fluoride, or M.8D borax, or M.8E tartar emetic;

M.9 Selective homopteran feeding blockers, for example

M.9B pymetrozine, or M.9C flonicamid;

M.10 Mite growth inhibitors, for example

M.10A clofentezine, hexythiazox and diflovidazin, or M.10B etoxazole;

M.11 Microbial disruptors of insect midgut membranes, for example *bacillus thuringiensis* or *bacillus sphaericus* and the insecticdal proteins they produce such as *bacillus thuringiensis subsp. israelensis*, *bacillus sphaericus*, *bacillus thuringiensis subsp. aizawai*, *bacillus thuringiensis subsp. kurstaki* and *bacillus thuringiensis subsp. tenebrionis*, or the Bt crop proteins: Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb and Cry34/35Ab1;

M.12 Inhibitors of mitochondrial ATP synthase, for example

M.12A diafenthiuron, or

M.12B organotin miticides such as azocyclotin, cyhexatin or fenbutatin oxide, or M.12C propargite, or M.12D tetradifon;

M.13 Uncouplers of oxidative phosphorylation via disruption of the proton gradient, for example chlorfenapyr, DNOC or sulfluramid;

M.14 Nicotinic acetylcholine receptor (nAChR) channel blockers, for example nereistoxin analogues as bensultap, cartap hydrochloride, thiocyclam or thiosultap sodium;

M.15 Inhibitors of the chitin biosynthesis type 0, such as benzoylureas as for example bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron or triflumuron;

M.16 Inhibitors of the chitin biosynthesis type 1, as for example buprofezin;

M.17 Moulting disruptors, Dipteran, as for example cyromazine;

M.18 Ecdyson receptor agonists such as diacylhydrazines, for example methoxyfenozide, tebufenozide, halofenozide, fufenozide or chromafenozide;

M.19 Octopamin receptor agonists, as for example amitraz;

M.20 Mitochondrial complex III electron transport inhibitors, for example

M.20A hydramethylnon, or M.20B acequinocyl, or M.20C fluacrypyrim;

M.21 Mitochondrial complex I electron transport inhibitors, for example

M.21A METI acaricides and insecticides such as fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad or tolfenpyrad, or M.21B rotenone;

M.22 Voltage-dependent sodium channel blockers, for example

M.22A indoxacarb, or M.22B metaflumizone, or M.22C 1-[(E)-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]amino]-3-[4-(difluoromethoxy)phenyl]urea;

M.23 Inhibitors of the of acetyl CoA carboxylase, such as Tetronic and Tetramic acid derivatives, for example spirodiclofen, spiromesifen or spirotetramat;

M.24 Mitochondrial complex IV electron transport inhibitors, for example

M.24A phosphine such as aluminium phosphide, calcium phosphide, phosphine or zinc phosphide, or M.24B cyanide.

M.25 Mitochondrial complex II electron transport inhibitors, such as beta-ketonitrile derivatives, for example cyenopyrafen or cyflumetofen;

M.28 Ryanodine receptor-modulators from the class of diamides, as for example flubendiamide, chlorantraniliprole (rynaxypyr®), cyantraniliprole (cyazypyr®), or the phthalamide compounds

M.28.1: (R)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluormethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonylethyl)phthalamid and

M.28.2: (S)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluormethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonylethyl)phthalamid, or the compound

M.28.3: 3-bromo-N-{2-bromo-4-chloro-6-[(1-cyclopropylethyl)carbamoyl]phenyl}-1-(3-chlorpyridin-2-yl)-1H-pyrazole-5-carboxamide (proposed ISO name: cyclaniliprole), or the compound

M.28.4: methyl-2-[3,5-dibromo-2-({[3-bromo-1-(3-chlorpyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-1,2-dimethylhydrazinecarboxylate; or a compound selected from M.28.5a) to M.28.5l):

M.28.5a) N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5b) N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5c) N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5d) N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5e) N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(difluoromethyl)pyrazole-3-carboxamide;

M.28.5f) N-[4,6-dibromo-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5g) N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-cyano-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5h) N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide;

M.28.5i) N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methyl-phenyl]-5-bromo-2-(3-chloro-2-pyridyl)pyrazole-3-carboxamide;

M.28.5j) 5-chloro-2-(3-chloro-2-pyridyl)-N-[2,4-dichloro-6-[(1-cyano-1-methyl-ethyl)carbamoyl]phenyl]pyrazole-3-carboxamide;

M.28.5k) 5-bromo-N-[2,4-dichloro-6-(methylcarbamoyl)phenyl]-2-(3,5-dichloro-2-pyridyl)pyrazole-3-carboxamide;

M.28.5l) N-[2-(tert-butylcarbamoyl)-4-chloro-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(fluoromethoxy)pyrazole-3-carboxamide; or a compound selected from

M.28.6 N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)-3-iodo-phthalamide; or

M.28.7 3-chloro-N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)phthalamide;

M.UN.X insecticidal active compounds of unknown or uncertain mode of action, as for example afidopyropen, azadirachtin, amidoflumet, benzoximate, bifenazate, bromopropylate, chinomethionat, cryolite, dicofol, flufenerim, flometoquin, fluensulfone, flupyradifurone, piperonyl butoxide, pyridalyl, pyrifluquinazon, sulfoxaflor, pyflubumide or the compounds

M.UN.X.1: 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-[(2,2,2-trifluoro-ethylcarbamoyl)-methyl]-benzamide, or the compound

M.UN.X.2: 4-[5-[3-chloro-5-(trifluoromethyl)phenyl]-5-(trifluoromethyl)-4H-isoxazol-3-yl]-N-[2-oxo-2-(2,2,2-trifluoroethylamino)ethyl]naphthalene-1-carboxamide, or the compound

M.UN.X.3: 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxa-9-azadispiro[4.2.4.2]-tetradec-11-en-10-one, or the compound

M.UN.X.4: 3-(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-azaspiro[4.5]dec-3-en-2-one, or the compound

M.UN.X.5: 1-[2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulfinyl]phenyl]-3-(trifluoromethyl)-1H-1,2,4-triazole-5-amine, or actives on basis of *bacillus firmus* (Votivo, I-1582); or

M.UN.X.6; a compound selected from the group of

M.UN.X.6a) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide;

M.UN.X.6b) (E/Z)-N-[1-[(6-chloro-5-fluoro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide;

M.UN.X.6c) (E/Z)-2,2,2-trifluoro-N-[1-[(6-fluoro-3-pyridyl)methyl]-2-pyridylidene]acetamide;

M.UN.X.6d) (E/Z)-N-[1-[(6-bromo-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide;

M.UN.X.6e) (E/Z)-N-[1-[1-(6-chloro-3-pyridyl)ethyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide;

M.UN.X.6f) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide;

M.UN.X.6g) (E/Z)-2-chloro-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide;

M.UN.X.6h) (E/Z)-N-[1-[(2-chloropyrimidin-5-yl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide and

M.UN.X.6i) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,3,3,3-pentafluoro-propanamide.); or of the compounds

M.UN.X.7: 3-[3-chloro-5-(trifluoromethyl)phenyl]-4-oxo-1-(pyrimidin-5-ylmethyl)pyrido[1,2-a]pyrimidin-1-ium-2-olate; or

M.UN.X.8: 8-chloro-N-[2-chloro-5-methoxyphenyl)sulfonyl]-6-trifluoromethyl)-imidazo[1,2-a]pyridine-2-carboxamide; or

M.UN.X.9: 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4H-isoxazol-3-yl]-2-methyl-N-(1-oxothietan-3-yl)benzamide; or

M.UN.X.10: 5-[3-[2,6-dichloro-4-(3,3-dichloroallyloxy)phenoxy]propoxy]-1H-pyrazole.

The commercially available compounds of the group M listed above may be found in The Pesticide Manual, 15th Edition, C. D. S. Tomlin, British Crop Protection Council (2011) among other publications.

The quinoline derivative flometoquin is shown in WO 2006/013896. The aminofuranone compounds flupyradifurone is known from WO 2007/115644. The sulfoximine compound sulfoxaflor is known from WO 2007/149134. The pyrethroid momfluorothrin is known from US 6908945. The pyrazole acaricide pyflubumide is known from WO 2007/020986. The

isoxazoline compounds have been described likewise M.UN.X.1 in WO 2005/085216, M.UN.X2. in WO 2009/002809 and in WO 2011/149749 and the isoxazoline M.UN.X.9 in WO 2013/050317. The pyripyropene derivative afidopyropen has been described in WO 2006/129714. The spiroketal-substituted cyclic ketoenol derivative M.UN.X.3 is known from WO 2006/089633 and the biphenyl-substituted spirocyclic ketoenol derivative M.UN.X.4 from WO 2008/067911. Finally triazoylphenylsulfide like M.UN.X.5 have been described in WO 2006/043635 and biological control agents on basis of *bacillus firmus* in WO 2009/124707. The neonicotionids 4A.1 is known from WO 20120/069266 and WO 2011/06946, the M.4.A.2 from WO 2013/003977, the M4.A.3.from WO 2010/069266.

The Metaflumizone analogue M.22C is described in CN 10171577. The phthalamides M.28.1 and M.28.2 are both known from WO 2007/101540. The anthranilamide M.28.3 has been described in WO 2005/077934. The hydrazide compound M.28.4 has been described in WO 2007/043677. The anthranilamides M.28.5a) to M.28.5h) can be prepared as described in WO 2007/006670, WO 2013/024009 and WO 2013/024010, the anthranilamide M.28.5i) is described in WO 2011/085575, the M.28.5j) in WO 2008/134969, the M.28.5k) in US 2011/046186 and the M.28.5l) in WO 2012/034403. The diamide compounds M.28.6 and M.28.7 can be found in CN 102613183.

The compounds M.UN.X.6a) to M.UN.X.6i) listed in M.UN.X.6 have been described in WO 2012/029672. The mesoionic antagonist compound M.UN.X.7 was described in WO 2012/092115, the nematicide M.UN.X.8 in WO 2013/055584 and the Pyridalyl-type analogue M.UN.X.10 in WO 2010/060379.

In another embodiment of the invention, the compounds of formula (I), or their stereoisomers, salts, tautomers and N-oxides, may also be applied with fungicides as compound II.

The following list F of active substances, in conjunction with which the compounds according to the invention can be used, is intended to illustrate the possible combinations but does not limit them:

F.I) Respiration Inhibitors

F.I-1) Inhibitors of complex III at Qo site:

strobilurins: azoxystrobin, coumethoxystrobin, coumoxystrobin, dimoxystrobin, enestroburin, fluoxastrobin, kresoxim-methyl, metominostrobin, orysastrobin, picoxystrobin, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyribencarb, triclopyricarb/chlorodincarb, trifloxystrobin, 2-[2-(2,5-dimethyl-phenoxymethyl)-phenyl]-3-methoxy-acrylic acid methyl ester and 2 (2-(3-(2,6-dichlorophenyl)-1-methyl-allylideneaminooxymethyl)-phenyl)-2-methoxyimino-N methyl-acetamide;

oxazolidinediones and imidazolinones: famoxadone, fenamidone;

F.I-2) Inhibitors of complex II (e.g. carboxamides):

carboxanilides: benodanil, benzovindiflupyr, bixafen, boscalid, carboxin, fenfuram, fenhexamid, fluopyram, flutolanil, furametpyr, isopyrazam, isotianil, mepronil, oxycarboxin, penflufen, penthiopyrad, sedaxane, tecloftalam, thifluzamide, tiadinil, 2-amino-4 methyl-thiazole-5-carboxanilide, N-(3',4',5' trifluorobiphenyl-2 yl)-3-difluoromethyl-1-methyl-1H-pyrazole-4

carboxamide (fluxapyroxad), N-(4'-trifluoromethylthiobiphenyl-2-yl)-3 difluoromethyl-1-methyl-1H pyrazole-4-carboxamide, N-(2-(1,3,3-trimethyl-butyl)-phenyl)-1,3-dimethyl-5 fluoro-1H-pyrazole-4 carboxamide, 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(trifluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(trifluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3,5-trimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(trifluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(trifluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3,5-trimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide;

F.I-3) Inhibitors of complex III at Qi site: cyazofamid, amisulbrom, [(3S,6S,7R,8R)-8-benzyl-3-[(3-acetoxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate, [(3S,6S,7R,8R)-8-benzyl-3-[[3-(acetoxymethoxy)-4-methoxy-pyridine-2-carbonyl]amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate, [(3S,6S,7R,8R)-8-benzyl-3-[(3-isobutoxycarbonyloxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate, [(3S,6S,7R,8R)-8-benzyl-3-[[3-(1,3-benzodioxol-5-ylmethoxy)-4-methoxy-pyridine-2-carbonyl]amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate, 3*S*,6*S*,7*R*,8*R*)-3-[[(3-hydroxy-4-methoxy-2-pyridinyl)carbonyl]amino]-6-methyl-4,9-dioxo-8-(phenylmethyl)-1,5-dioxonan-7-yl 2-methylpropanoate;

F.I-4) Other respiration inhibitors (complex I, uncouplers) diflumetorim; (5,8-difluoro-quinazolin-4-yl)-{2-[2-fluoro-4-(4-trifluoromethylpyridin-2-yloxy)-phenyl]-ethyl}-amine; tecnazen;ametoctradin; silthiofam; nitrophenyl derivates: binapacryl, dinobuton, dinocap, fluazinam, ferimzone, nitrthal-isopropyl,
and including organometal compounds: fentin salts, such as fentin-acetate, fentin chloride or fentin hydroxide;

F.II) Sterol biosynthesis inhibitors (SBI fungicides)

F.II-1) C14 demethylase inhibitors (DMI fungicides, e.g. triazoles, imidazoles)

triazoles: azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, paclobutrazole, penconazole, propiconazole, prothioconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, uniconazole, 1-[*rel*-(2*S*;3*R*)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-5-thiocyanato-1H-[1,2,4]triazole, 2-[*rel*-(2*S*;3*R*)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-2H-[1,2,4]triazole-3-thiol;

imidazoles: imazalil, pefurazoate, oxpoconazole, prochloraz, triflumizole;

pyrimidines, pyridines and piperazines: fenarimol, nuarimol, pyrifenox, triforine, 1-[rel-(2*S*;3*R*)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-5-thiocyanato-1H-

[1,2,4]triazole, 2-[rel-(2S;3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-2H-[1,2,4]triazole-3-thiol;

F.II-2) Delta14-reductase inhitors (Amines, e.g. morpholines, piperidines)

morpholines: aldimorph, dodemorph, dodemorph-acetate, fenpropimorph, tridemorph;

piperidines: fenpropidin, piperalin; spiroketalamines: spiroxamine;

F.II-3) Inhibitors of 3-keto reductase: hydroxyanilides: fenhexamid;

F.III) Nucleic acid synthesis inhibitors

F.III-1) RNA, DNA synthesis

phenylamides or acyl amino acid fungicides: benalaxyl, benalaxyl-M, kiralaxyl, metalaxyl, metalaxyl-M (mefenoxam), ofurace, oxadixyl;

isoxazoles and iosothiazolones: hymexazole, octhilinone;

F.III-2) DNA topisomerase inhibitors: oxolinic acid;

F.III-3) Nucleotide metabolism (e.g. adenosin-deaminase), hydroxy (2-amino)-pyrimidines: bupirimate;

F.IV) Inhibitors of cell division and or cytoskeleton

F.IV-1) Tubulin inhibitors: benzimidazoles and thiophanates: benomyl, carbendazim, fuberidazole, thiabendazole, thiophanate-methyl;

triazolopyrimidines: 5-chloro-7 (4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5 a]pyrimidine;

F.IV-2) Other cell division inhibitors

benzamides and phenyl acetamides: diethofencarb, ethaboxam, pencycuron, fluopicolide, zoxamide;

F.IV-3) Actin inhibitors: benzophenones: metrafenone; pyriofenone;

F.V) Inhibitors of amino acid and protein synthesis

F.V-1) Methionine synthesis inhibitors (anilino-pyrimidines)

anilino-pyrimidines: cyprodinil, mepanipyrim, nitrapyrin, pyrimethanil;

F.V-2) Protein synthesis inhibitors (anilino-pyrimidines)

antibiotics: blasticidin-S, kasugamycin, kasugamycin hydrochloride-hydrate, mildiomycin, streptomycin, oxytetracyclin, polyoxine, validamycin A;

F.VI) Signal transduction inhibitors

F.VI-1) MAP / Histidine kinase inhibitors (e.g. anilino-pyrimidines)

dicarboximides: fluoroimid, iprodione, procymidone, vinclozolin;

phenylpyrroles: fenpiclonil, fludioxonil;

F.VI-2) G protein inhibitors: quinolines: quinoxyfen;

F.VII) Lipid and membrane synthesis inhibitors

F.VII-1) Phospholipid biosynthesis inhibitors

organophosphorus compounds: edifenphos, iprobenfos, pyrazophos;

dithiolanes: isoprothiolane;

F.VII-2) Lipid peroxidation: aromatic hydrocarbons: dicloran, quintozene, tecnazene, tolclofos-methyl, biphenyl, chloroneb, etridiazole;

F.VII-3) Carboxyl acid amides (CAA fungicides)

cinnamic or mandelic acid amides: dimethomorph, flumorph, mandiproamid, pyrimorph;

valinamide carbamates: benthiavalicarb, iprovalicarb, pyribencarb, valifenalate and N-(1-(1-(4-cyano-phenyl)ethanesulfonyl)-but-2-yl) carbamic acid-(4-fluorophenyl) ester;

F.VII-4) Compounds affecting cell membrane permeability and fatty acids:

1-[4-[4-[5-(2,6-difluorophenyl)-4,5-dihydro-3-isoxazolyl]-2-thiazolyl]-1-piperidinyl]-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, carbamates: propamocarb, propamocarb-hydrochlorid,

F.VII-5) fatty acid amide hydrolase inhibitors: 1-[4-[4-[5-(2,6-difluorophenyl)-4,5-dihydro-3-isoxazolyl]-2-thiazolyl]-1-piperidinyl]-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone;

F.VIII) Inhibitors with Multi Site Action

F.VIII-1) Inorganic active substances: Bordeaux mixture, copper acetate, copper hydroxide, copper oxychloride, basic copper sulfate, sulfur;

F.VIII-2) Thio- and dithiocarbamates: ferbam, mancozeb, maneb, metam, methasulphocarb, metiram, propineb, thiram, zineb, ziram;

F.VIII-3) Organochlorine compounds (e.g. phthalimides, sulfamides, chloronitriles):

anilazine, chlorothalonil, captafol, captan, folpet, dichlofluanid, dichlorophen, flusulfamide, hexachlorobenzene, pentachlorphenole and its salts, phthalide, tolylfluanid, N-(4-chloro-2-nitro-phenyl)-N-ethyl-4-methyl-benzenesulfonamide;

F.VIII-4) Guanidines and other: guanidine, dodine, dodine free base, guazatine, guazatine-acetate, iminoctadine, iminoctadine-triacetate, iminoctadine-tris(albesilate), 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetraone;

F.VIII-5) Anthraquinones: dithianon;

F.IX) Cell wall synthesis inhibitors

F.IX-1) Inhibitors of glucan synthesis: validamycin, polyoxin B;

F.IX-2) Melanin synthesis inhibitors: pyroquilon, tricyclazole, carpropamide, dicyclomet, fenoxanil;

F.X) Plant defence inducers

F.X-1) Salicylic acid pathway: acibenzolar-*S*-methyl;

F.X-2) Others: probenazole, isotianil, tiadinil, prohexadione-calcium;

phosphonates: fosetyl, fosetyl-aluminum, phosphorous acid and its salts;

F.XI) Unknown mode of action:bronopol, chinomethionat, cyflufenamid, cymoxanil, dazomet, debacarb, diclomezine, difenzoquat, difenzoquat-methylsulfate, diphenylamin, fenpyrazamine, flumetover, flusulfamide, flutianil, methasulfocarb, nitrapyrin, nitrothal-isopropyl, oxathiapiprolin, oxin-copper, proquinazid, tebufloquin, tecloftalam, triazoxide, 2-butoxy-6-iodo-3-propylchromen-4-one, N-(cyclopropylmethoxyimino-(6-difluoro-methoxy-2,3-difluoro-phenyl)-methyl)-2-phenyl acetamide, N'-(4-(4-chloro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N methyl formamidine, N' (4-(4-fluoro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamidine, N'-(2-methyl-5-trifluoromethyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine, N'-(5-difluoromethyl-2 methyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine, 2-{1-[2-(5-methyl-3-trifluoromethyl-pyrazole-1-

yl)-acetyl]-piperidin-4-yl}-thiazole-4-carboxylic acid methyl-(1,2,3,4-tetrahydro-naphthalen-1-yl)-amide, 2-{1-[2-(5-methyl-3-trifluoromethyl-pyrazole-1-yl)-acetyl]-piperidin-4-yl}-thiazole-4-carboxylic acid methyl-(*R*)-1,2,3,4-tetrahydro-naphthalen-1-yl-amide, methoxy-acetic acid 6-tert-butyl-8-fluoro-2,3-dimethyl-quinolin-4-yl ester and N-Methyl-2-{1-[(5-methyl-3-trifluoromethyl-1H-pyrazol-1-yl)-acetyl]-piperidin-4-yl}-N-[(1*R*)-1,2,3,4-tetrahydronaphthalen-1-yl]-4-thiazolecarboxamide, 3-[5-(4-chloro-phenyl)-2,3-dimethyl-isoxazolidin-3 yl]-pyridine, pyrisoxazole, 5-amino-2-isopropyl-3-oxo-4-ortho-tolyl-2,3-dihydro-pyrazole-1 carbothioic acid *S*-allyl ester, N-(6-methoxy-pyridin-3-yl) cyclopropanecarboxylic acid amide, 5-chloro-1 (4,6-dimethoxy-pyrimidin-2-yl)-2-methyl-1H-benzoimidazole, 2-(4-chloro-phenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynyloxyacetamide;

F.XI) Growth regulators: abscisic acid, amidochlor, ancymidol, 6-benzylaminopurine, brassinolide, butralin, chlormequat (chlormequat chloride), choline chloride, cyclanilide, daminozide, dikegulac, dimethipin, 2,6-dimethylpuridine, ethephon, flumetralin, flurprimidol, fluthiacet, forchlorfenuron, gibberellic acid, inabenfide, indole-3-acetic acid, maleic hydrazide, mefluidide, mepiquat (mepiquat chloride), naphthaleneacetic acid, N 6-benzyladenine, paclobutrazol, prohexadione (prohexadione-calcium), prohydrojasmon, thidiazuron, triapenthenol, tributyl phosphorotrithioate, 2,3,5 tri iodobenzoic acid, trinexapac-ethyl and uniconazole;

F.XII) Biological control agents

Ampelomyces quisqualis (e.g. AQ 10® from Intrachem Bio GmbH & Co. KG, Germany), *Aspergillus flavus* (e.g. AFLAGUARD® from Syngenta, CH), *Aureobasidium pullulans* (e.g. BOTECTOR® from bio-ferm GmbH, Germany), *Bacillus pumilus* (e.g. NRRL Accession No. B-30087 in SONATA® and BALLAD® Plus from AgraQuest Inc., USA), *Bacillus subtilis* (e.g. isolate NRRL-Nr. B-21661 in RHAPSODY®, SERENADE® MAX and SERENADE® ASO from AgraQuest Inc., USA), *Bacillus subtilis* var. *amyloliquefaciens* FZB24 (e.g. TAEGRO® from Novozyme Biologicals, Inc., USA), *Candida oleophila* I-82 (e.g. ASPIRE® from Ecogen Inc., USA), *Candida saitoana* (e.g. BIOCURE® (in mixture with lysozyme) and BIOCOAT® from Micro Flo Company, USA (BASF SE) and Arysta), Chitosan (e.g. ARMOUR-ZEN from BotriZen Ltd., NZ), *Clonostachys rosea* f. *catenulata,* also named *Gliocladium catenulatum* (e.g. isolate J1446: PRESTOP® from Verdera, Finland), *Coniothyrium minitans* (e.g. CONTANS® from Prophyta, Germany), *Cryphonectria parasitica* (e.g. *Endothia parasitica* from CNICM, France), *Cryptococcus albidus* (e.g. YIELD PLUS® from Anchor Bio-Technologies, South Africa), *Fusarium oxysporum* (e.g. BIOFOX® from S.I.A.P.A., Italy, FUSACLEAN® from Natural Plant Protection, France), *Metschnikowia fructicola* (e.g. SHEMER® from Agrogreen, Israel), *Microdochium dimerum* (e.g. ANTIBOT® from Agrauxine, France), *Phlebiopsis gigantea* (e.g. ROTSOP® from Verdera, Finland), *Pseudozyma flocculosa* (e.g. SPORODEX® from Plant Products Co. Ltd., Canada), *Pythium oligandrum* DV74 (e.g. POLYVERSUM® from Remeslo SSRO, Biopreparaty, Czech Rep.), *Reynoutria sachlinensis* (e.g. REGALIA® from Marrone BioInnovations, USA), *Talaromyces flavus* V117b (e.g. PROTUS® from Prophyta, Germany), *Trichoderma asperellum* SKT-1 (e.g. ECO-HOPE® from Kumiai Chemical Industry Co., Ltd., Japan), *T. atroviride* LC52 (e.g. SENTINEL® from Agrimm Technologies Ltd, NZ), *T. harzianum*

T-22 (e.g. PLANTSHIELD® der Firma BioWorks Inc., USA), *T. harzianum* TH 35 (e.g. ROOT PRO® from Mycontrol Ltd., Israel), *T. harzianum* T-39 (e.g. TRICHODEX® and TRICHODERMA 2000® from Mycontrol Ltd., Israel and Makhteshim Ltd., Israel), *T. harzianum* and *T. viride* (e.g. TRICHOPEL from Agrimm Technologies Ltd, NZ), *T. harzianum* ICC012 and *T. viride* ICC080 (e.g. REMEDIER® WP from Isagro Ricerca, Italy), *T. polysporum* and *T. harzianum* (e.g. BINAB® from BINAB Bio-Innovation AB, Sweden), *T. stromaticum* (e.g. TRICOVAB® from C.E.P.L.A.C., Brazil), *T. virens* GL-21 (e.g. SOILGARD® from Certis LLC, USA), *T. viride* (e.g. TRIECO® from Ecosense Labs. (India) Pvt. Ltd., Indien, BIO-CURE® F from T. Stanes & Co. Ltd., Indien), *T. viride* TV1 (e.g. T. viride TV1 from Agribiotec srl, Italy), *Ulocladium oudemansii* HRU3 (e.g. BOTRY-ZEN® from Botry-Zen Ltd, NZ).

The commercially available compounds II of the group F listed above may be found in The Pesticide Manual, 15th Edition, C. D. S. Tomlin, British Crop Protection Council (2011) among other publications. Their preparation and their activity against harmful fungi is known (cf.: http://www.alanwood.net/pesticides/); these substances are commercially available. The compounds described by IUPAC nomenclature, their preparation and their fungicidal activity are also known (cf. Can. J. Plant Sci. 48(6), 587-94, 1968; EP A 141 317; EP-A 152 031; EP A 226 917; EP A 243 970; EP A 256 503; EP-A 428 941; EP-A 532 022; EP-A 1 028 125; EP-A 1 035 122; EP A 1 201 648; EP A 1 122 244, JP 2002316902; DE 19650197; DE 10021412; DE 102005009458; US 3,296,272; US 3,325,503; WO 98/46608; WO 99/14187; WO 99/24413; WO 99/27783; WO 00/29404; WO 00/46148; WO 00/65913; WO 01/54501; WO 01/56358; WO 02/22583; WO 02/40431; WO 03/10149; WO 03/11853; WO 03/14103; WO 03/16286; WO 03/53145; WO 03/61388; WO 03/66609; WO 03/74491; WO 04/49804; WO 04/83193; WO 05/120234; WO 05/123689; WO 05/123690; WO 05/63721; WO 05/87772; WO 05/87773; WO 06/15866; WO 06/87325; WO 06/87343; WO 07/82098; WO 07/90624, WO 11/028657).

The invertebrate pest, e.g. the insects, arachnids and nematodes, the plant, soil or water in which the plant is growing can be contacted with the present compounds of formula (I), including their stereoisomers and tautomers, as well the salts thereof, or composition(s) containing them by any application method known in the art. As such, "contacting" includes both direct contact (applying the compounds/compositions directly on the animal pest or plant - typically to the foliage, stem or roots of the plant) and indirect contact (applying the compounds/compositions to the locus of the animal pest or plant).

The compounds of formula (I), including their stereoisomers and tautomers, as well the salts thereof, or the pesticidal compositions comprising them may be used to protect growing plants and crops from attack or infestation by animal pests, especially insects, acaridae or arachnids by contacting the plant/crop with a pesticidally effective amount of compounds of formula (I). The term "crop" refers both to growing and harvested crops.

The compounds of the present invention and the compositions comprising them are particularly important in the control of a multitude of insects on various cultivated plants, such as cereal, root crops, oil crops, vegetables, spices, ornamentals, for example seed of durum and other wheat, barley, oats, rye, maize (fodder maize and sugar maize / sweet and field corn),

soybeans, oil crops, crucifers, cotton, sunflowers, bananas, rice, oilseed rape, turnip rape, sugarbeet, fodder beet, eggplants, potatoes, grass, lawn, turf, fodder grass, tomatoes, leeks, pumpkin/squash, cabbage, iceberg lettuce, pepper, cucumbers, melons, Brassica species, melons, beans, peas, garlic, onions, carrots, tuberous plants such as potatoes, sugar cane, tobacco, grapes, petunias, geranium/pelargoniums, pansies and impatiens.

The compounds of the present invention are employed as such or in form of compositions by treating the insects or the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms to be protected from insecticidal attack with a insecticidally effective amount of the active compounds. The application can be carried out both before and after the infection of the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms by the insects.

The present invention also includes a method of combating animal pests which comprises contacting the animal pests, their habit, breeding ground, food supply, cultivated plants, seed, soil, area, material or environment in which the animal pests are growing or may grow, or the materials, plants, seeds, soils, surfaces or spaces to be protected from animal attack or infestation with a pesticidally effective amount of at least one active compound of the formula (I), a stereoisomers, a tautomere or a salt thereof.

Moreover, animal pests may be controlled by contacting the target pest, its food supply, habitat, breeding ground or its locus with a pesticidally effective amount of compounds of formula (I), a stereoisomer, a tautomere or a salt thereof. As such, the application may be carried out before or after the infection of the locus, growing crops, or harvested crops by the pest.

The compounds of the invention can also be applied preventively to places at which occurrence of the pests is expected.

The compounds of formula (I), including their stereoisomers and their tautomers, as well as their salts may be also used to protect growing plants from attack or infestation by pests. The use includes contacting the plant with a pesticidally effective amount of compounds of formula (I), a stereoisomer, a tautomere or a salt thereof. As such, "contacting" includes both direct contact, i.e. applying the compounds/compositions directly on the pest and/or plant - typically to the foliage, stem or roots of the plant, and indirect contact, i.e. applying the compounds/compositions to the locus of the pest and/or plant.

"Locus" means a habitat, breeding ground, plant, seed, soil, area, material or environment in which a pest or parasite is growing or may grow.

The term "plant propagation material" is to be understood to denote all the generative parts of the plant such as seeds and vegetative plant material such as cuttings and tubers (e. g. potatoes), which can be used for the multiplication of the plant. This includes seeds, roots, fruits, tubers, bulbs, rhizomes, shoots, sprouts and other parts of plants. Seedlings and young plants, which are to be transplanted after germination or after emergence from soil, may also be included. These plant propagation materials may be treated prophylactically with a plant protection compound either at or before planting or transplanting.

The term "cultivated plants" is to be understood as including plants which have been modified by breeding, mutagenesis or genetic engineering. Genetically modified plants are

plants, which genetic material has been so modified by the use of recombinant DNA techniques that under natural circumstances cannot readily be obtained by cross breeding, mutations or natural recombination. Typically, one or more genes have been integrated into the genetic material of a genetically modified plant in order to improve certain properties of the plant. Such genetic modifications also include but are not limited to targeted post-transtional modification of protein(s) (oligo- or polypeptides) poly for example by glycosylation or polymer additions such as prenylated, acetylated or farnesylated moieties or PEG moieties(e.g. as disclosed in Biotechnol Prog. 2001 Jul-Aug;17(4):720-8., Protein Eng Des Sel. 2004 Jan;17(1):57-66, Nat Protoc. 2007;2(5):1225-35., Curr Opin Chem Biol. 2006 Oct;10(5):487-91. Epub 2006 Aug 28., Biomaterials. 2001 Mar;22(5):405-17, Bioconjug Chem. 2005 Jan-Feb;16(1):113-21).

The term "cultivated plants" is to be understood also including plants that have been rendered tolerant to applications of specific classes of herbicides, such as hydroxy-phenylpyruvate dioxygenase (HPPD) inhibitors; acetolactate synthase (ALS) inhibitors, such as sulfonyl ureas (see e. g. US 6,222,100, WO 01/82685, WO 00/26390, WO 97/41218, WO 98/02526, WO 98/02527, WO 04/106529, WO 05/20673, WO 03/14357, WO 03/13225, WO 03/14356, WO 04/16073) or imidazolinones (see e. g. US 6,222,100, WO 01/82685, WO 00/26390, WO 97/41218, WO 98/02526, WO 98/02527, WO 04/106529, WO 05/20673, WO 03/14357, WO 03/13225, WO 03/14356, WO 04/16073); enolpyruvylshikimate-3-phosphate synthase (EPSPS) inhibitors, such as glyphosate (see e. g. WO 92/00377); glutamine synthetase (GS) inhibitors, such as glufosinate (see e. g. EP-A-0242236, EP-A-242246) or oxynil herbicides (see e. g. US 5,559,024) as a result of conventional methods of breeding or genetic engineering. Several cultivated plants have been rendered tolerant to herbicides by conventional methods of breeding (mutagenesis), for example Clearfield® summer rape (Canola) being tolerant to imidazolinones, e. g. imazamox. Genetic engineering methods have been used to render cultivated plants, such as soybean, cotton, corn, beets and rape, tolerant to herbicides, such as glyphosate and glufosinate, some of which are commercially available under the trade names RoundupReady® (glyphosate) and LibertyLink® (glufosinate).

The term "cultivated plants" is to be understood also including plants that are by the use of recombinant DNA techniques capable to synthesize one or more insecticidal proteins, especially those known from the bacterial genus Bacillus, particularly from Bacillus thuringiensis, such as ä-endotoxins, e. g. CrylA(b), CrylA(c), CrylF, CrylF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c; vegetative insecticidal proteins (VIP), e. g. VIP1, VIP2, VIP3 or VIP3A; insecticidal proteins of bacteria colonizing nematodes, for example Photorhabdus spp. or Xenorhabdus spp.; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins, or other insect-specific neurotoxins; toxins produced by fungi, such Streptomycetes toxins, plant lectins, such as pea or barley lectins; agglutinins; proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin or papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxysteroid oxidase, ecdysteroid-IDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors or HMG-CoA-reductase; ion channel blockers, such as blockers of sodium or calcium channels; juvenile hormone esterase;

diuretic hormone receptors (helicokinin receptors); stilben synthase, bibenzyl synthase, chitinases or glucanases. In the context of the present invention these insecticidal proteins or toxins are to be understood expressly also as pre-toxins, hybrid proteins, truncated or otherwise modified proteins. Hybrid proteins are characterized by a new combination of protein domains, (see, for example WO 02/015701). Further examples of such toxins or genetically-modified plants capable of synthesizing such toxins are dis-closed, for example, in EP-A 374 753, WO 93/007278, WO 95/34656, EP-A 427 529, EP-A 451 878, WO 03/018810 und WO 03/052073. The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, for example, in the publications mentioned above. These insecticidal proteins contained in the genetically modified plants impart to the plants producing these proteins protection from harmful pests from certain taxonomic groups of arthropods, particularly to beetles (Coleoptera), flies (Diptera), and butterflies and moths (Lepidoptera) and to plant parasitic nematodes (Nematoda).

The term "cultivated plants" is to be understood also including plants that are, e.g. by the use of recombinant DNA techniques, capable of synthesizing one or more proteins in order to increase the resistance or tolerance of those plants to bacterial, viral or fungal pathogens. Examples of such proteins are the so-called "pathogenesis-related proteins", also termed PR proteins - see, for example EP-A 0 392 225 -, or plant disease resistance genes - for example potato cultivars, which express resistance genes acting against Phytophthora infestans derived from the mexican wild potato Solanum bulbocastanum - or T4-lysozym - e. g. potato cultivars capable of synthesizing these proteins with increased resistance against bacteria such as Erwinia amylvora. The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, for example, in the publications mentioned above.

The term "cultivated plants" is to be understood also including plants that are, e.g. by the use of recombinant DNA techniques, capable of synthesizing one or more proteins to increase the productivity, e. g. bio mass production, grain yield, starch content, oil content or protein content, or to improve tolerance to drought, salinity or other growth-limiting environmental factors or tolerance to pests and fungal, bacterial or viral pathogens of those plants.

The term "cultivated plants" is to be understood also including plants that contain by the use of recombinant DNA techniques a modified amount of substances of content or new substances of content, specifically to improve human or animal nutrition, for ex-ample oil crops that produce health-promoting long-chain omega-3 fatty acids or unsaturated omega-9 fatty acids (e. g. Nexera® rape).

The term "cultivated plants" is to be understood also including plants that contain by the use of recombinant DNA techniques a modified amount of substances of content or new substances of content, specifically to improve raw material production, for example potatoes that produce increased amounts of amylopectin (e. g. Amflora® potato).

In general, "pesticidally effective amount" means the amount of active ingredient needed to achieve an observable effect on growth, including the effects of necrosis, death, retardation, prevention, and removal, destruction, or otherwise diminishing the occurrence and activity of the

target organism. The pesticidally effective amount can vary for the various compounds/compositions used in the invention. A pesticidally effective amount of the compositions will also vary according to the prevailing conditions such as desired pesticidal effect and duration, weather, target species, locus, mode of application, and the like.

In the case of soil treatment or of application to the pests dwelling place or nest, the quantity of active ingredient ranges from 0.0001 to 500 g per 100 m^2, preferably from 0.001 to 20 g per 100 m^2.

Customary application rates in the protection of materials are, for example, from 0.01 g to 1000 g of active compound per m^2 treated material, desirably from 0.1 g to 50 g per m^2.

Insecticidal compositions for use in the impregnation of materials typically contain from 0.001 to 95 weight %, preferably from 0.1 to 45 weight %, and more preferably from 1 to 25 weight % of at least one repellent and/or insecticide.

For use in treating crop plants, the rate of application of the active ingredients of this invention may be in the range of 0.1 g to 4000 g per hectare, desirably from 5 g to 500 g per hectare, more desirably from 5 g to 200 g per hectare.

The compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, are effective through both contact, e.g. via soil, glass, wall, bed net, carpet, plant parts or animal parts, and ingestion, e.g. via ingestion of bait or plant part.

The compounds of the invention may also be applied against non-crop insect pests, such as ants, termites, wasps, flies, mosquitos, crickets, or cockroaches. For use against said non-crop pests, compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, are preferably used in a bait composition.

The bait can be a liquid, a solid or a semisolid preparation (e.g. a gel). Solid baits can be formed into various shapes and forms suitable to the respective application e.g. granules, blocks, sticks, disks. Liquid baits can be filled into various devices to ensure proper application, e.g. open containers, spray devices, droplet sources, or evaporation sources. Gels can be based on aqueous or oily matrices and can be formulated to particular necessities in terms of stickyness, moisture retention or aging characteristics.

The bait employed in the composition is a product, which is sufficiently attractive to incite insects such as ants, termites, wasps, flies, mosquitos, crickets etc. or cockroaches to eat it. The attractiveness can be manipulated by using feeding stimulants or sex pheromones. Food stimulants are chosen, for example, but not exclusively, from animal and/or plant proteins (meat-, fish- or blood meal, insect parts, egg yolk), from fats and oils of animal and/or plant origin, or mono-, oligo- or polyorganosaccharides, especially from sucrose, lactose, fructose, dextrose, glucose, starch, pectin or even molasses or honey. Fresh or decaying parts of fruits, crops, plants, animals, insects or specific parts thereof can also serve as a feeding stimulant. Sex pheromones are known to be more insect specific. Specific pheromones are described in the literature and are known to those skilled in the art.

For use in bait compositions, the typical content of active ingredient is from 0.001 weight % to 15 weight %, desirably from 0.001 weight % to 5% weight % of active compound.

Formulations of compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, as aerosols, e.g in spray cans, oil sprays or pump sprays are highly suitable for the non-professional user for controlling pests such as flies, fleas, ticks, mosquitos or cockroaches. Aerosol recipes are preferably composed of the active compound, solvents such as lower alcohols, e.g. methanol, ethanol, propanol or butanol, ketones, e.g. acetone, methyl ethyl ketone, paraffin hydrocarbons, e.g. kerosenes or mineral oils, having boiling ranges of approximately 50 to 250°C, dimethylformamide, N-methylpyrrolidone, dimethyl sulfoxide, aromatic hydrocarbons such as toluene, xylene, water, furthermore auxiliaries such as emulsifiers such as sorbitol monooleate, oleyl ethoxylate having 3-7 mol of ethylene oxide, fatty alcohol ethoxylate, perfume oils such as ethereal oils, esters of medium fatty acids with lower alcohols, aromatic carbonyl compounds, if appropriate stabilizers such as sodium benzoate, amphoteric surfactants, lower epoxides, triethyl orthoformate and, if required, propellants such as propane, butane, nitrogen, compressed air, dimethyl ether, carbon dioxide, nitrous oxide, or mixtures of these gases.

The oil spray formulations differ from the aerosol recipes in that no propellants are used.

For use in spray compositions, the content of active ingredient is from 0.001 to 80 weights %, preferably from 0.01 to 50 weight % and most preferably from 0.01 to 15 weight %.

The compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, and their respective compositions can also be used in mosquito and fumigating coils, smoke cartridges, vaporizer plates or long-term vaporizers and also in moth papers, moth pads or other heat-independent vaporizer systems.

Methods to control infectious diseases transmitted by insects, such as malaria, dengue and yellow fever, lymphatic filariasis, and leishmaniasis, with compounds of formula (I) or the stereoisomers, tautomers or salts thereof, and with their respective compositions also comprise treating surfaces of huts and houses, air spraying and impregnation of curtains, tents, clothing items, bed nets, tsetse-fly trap or the like. Insecticidal compositions for application to fibers, fabric, knitgoods, nonwovens, netting material or foils and tarpaulins preferably comprise a mixture including the insecticide, optionally a repellent and at least one binder. Suitable repellents for example are N,N-Diethyl-meta-toluamide (DEET), N,N-diethylphenylacetamide (DEPA), 1-(3-cyclohexan-1-yl-carbonyl)-2-methylpiperine, (2-hydroxymethylcyclohexyl) acetic acid lactone, 2-ethyl-1,3-hexandiol, indalone, Methylneodecanamide (MNDA), a pyrethroid not used for insect control such as {(+/-)-3-allyl-2-methyl-4-oxocyclopent-2-(+)-enyl-(+)-trans-chrysantemate (Esbiothrin), a repellent derived from or identical with plant extracts like limonene, eugenol, (+)-Eucamalol (1), (-)-1-epi-eucamalol or crude plant extracts from plants like Eucalyptus maculata, Vitex rotundifolia, Cymbopogan martinii, Cymbopogan citratus (lemon grass), Cymopogan nartdus (citronella). Suitable binders are selected for example from polymers and copolymers of vinyl esters of aliphatic acids (such as such as vinyl acetate and vinyl versatate), acrylic and methacrylic esters of alcohols, such as butyl acrylate, 2-ethylhexylacrylate, and methyl acrylate, mono- and di-ethylenically unsaturated hydrocarbons, such as styrene, and aliphatic diens, such as butadiene.

The impregnation of curtains and bednets is done in general by dipping the textile material into emulsions or dispersions of the insecticide or spraying them onto the nets.

The compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, and their compositions can be used for protecting wooden materials such as trees, board fences, sleepers, etc. and buildings such as houses, outhouses, factories, but also construction materials, furniture, leathers, fibers, vinyl articles, electric wires and cables etc. from ants and/or termites, and for controlling ants and termites from doing harm to crops or human being, e.g. when the pests invade into houses and public facilities. The compounds of formula (I), their stereoisomers, their tautomers or their salts are applied not only to the surrounding soil surface or into the under-floor soil in order to protect wooden materials but it can also be applied to lumbered articles such as surfaces of the under-floor concrete, alcove posts, beams, plywoods, furniture, etc., wooden articles such as particle boards, half boards, etc. and vinyl articles such as coated electric wires, vinyl sheets, heat insulating material such as styrene foams, etc. In case of application against ants doing harm to crops or human beings, the ant controller of the present invention is applied to the crops or the surrounding soil, or is directly applied to the nest of ants or the like.

The compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, are also suitable for the treatment of seeds in order to protect the seed from insect pest, in particular from soil-living insect pests and the resulting plant's roots and shoots against soil pests and foliar insects.

The compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, are particularly useful for the protection of the seed from soil pests and the resulting plant's roots and shoots against soil pests and foliar insects. The protection of the resulting plant's roots and shoots is preferred. More preferred is the protection of resulting plant's shoots from piercing and sucking insects, wherein the protection from aphids is most preferred.

The present invention therefore comprises a method for the protection of seeds from insects, in particular from soil insects and of the seedling's roots and shoots from insects, in particular from soil and foliar insects, said method comprising contacting the seeds before sowing and/or after pregermination with a compound of the general formula (I), a tautomer, a stereosiomer or a salt thereof. Particularly preferred is a method, wherein the plant's roots and shoots are protected, more preferably a method, wherein the plants shoots are protected form piercing and sucking insects, most preferably a method, wherein the plants shoots are protected from aphids.

The term seed includes seeds and plant propagules of all kinds including but not limited to true seeds, seed pieces, suckers, corms, bulbs, fruit, tubers, grains, cuttings, cut shoots and the like and means in a preferred embodiment true seeds.

The term seed treatment includes all suitable seed treatment techniques known in the art, such as seed dressing, seed coating, seed dusting, seed soaking and seed pelleting.

The present invention also relates to seeds coated with or containing the active compound of the present invention, i.e. containing a compound of formula (I), a stereoisomer, a tautomer or a salt thereof.

The term "coated with and/or containing" generally signifies that the active ingredient is for the most part on the surface of the propagation product at the time of application, although a greater or lesser part of the ingredient may penetrate into the propagation product, depending on the method of application. When the said propagation product is (re)planted, it may absorb the active ingredient.

Suitable seed is seed of cereals, root crops, oil crops, vegetables, spices, ornamentals, for example seed of durum and other wheat, barley, oats, rye, maize (fodder maize and sugar maize / sweet and field corn), soybeans, oil crops, crucifers, cotton, sunflowers, bananas, rice, oilseed rape, turnip rape, sugarbeet, fodder beet, eggplants, potatoes, grass, lawn, turf, fodder grass, tomatoes, leeks, pumpkin/squash, cabbage, iceberg lettuce, pepper, cucumbers, melons, Brassica species, melons, beans, peas, garlic, onions, carrots, tuberous plants such as potatoes, sugar cane, tobacco, grapes, petunias, geranium/pelargoniums, pansies and impatiens.

In addition, the compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, may also be used for the treatment seeds from plants, which tolerate the action of herbicides or fungicides or insecticides owing to breeding, including genetic engineering methods.

For example, the compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, can be employed in treatment of seeds from plants, which are resistant to herbicides from the group consisting of the sulfonylureas, imidazolinones, glufosinate-ammonium or glyphosate-isopropylammonium and analogous active substances (see for example, EP-A-0242236, EP-A-242246) (WO 92/00377) (EP-A-0257993, U.S. Pat. No. 5,013,659) or in transgenic crop plants, for example cotton, with the capability of producing Bacillus thuringiensis toxins (Bt toxins) which make the plants resistant to certain pests (EP-A-0142924, EP-A-0193259),

Furthermore, the compounds of formula (I), including the tautomers and stereoisomers, as well as their salts, can be used also for the treatment of seeds from plants, which have modified characteristics in comparison with existing plants consist, which can be generated for example by traditional breeding methods and/or the generation of mutants, or by recombinant procedures). For example, a number of cases have been described of recombinant modifications of crop plants for the purpose of modifying the starch synthesized in the plants (e.g. WO 92/11376, WO 92/14827, WO 91/19806) or of transgenic crop plants having a modified fatty acid composition (WO 91/13972).

The seed treatment application of the active compound is carried out by spraying or by dusting the seeds before sowing of the plants and before emergence of the plants.

Compositions which are especially useful for seed treatment are e.g.:

A Soluble concentrates (SL, LS)

D Emulsions (EW, EO, ES)

E Suspensions (SC, OD, FS)

F Water-dispersible granules and water-soluble granules (WG, SG)

G Water-dispersible powders and water-soluble powders (WP, SP, WS)

H Gel-Formulations (GF)

I Dustable powders (DP, DS)

Conventional seed treatment formulations include for example flowable concentrates FS, solutions LS, powders for dry treatment DS, water dispersible powders for slurry treatment WS, water-soluble powders SS and emulsion ES and EC and gel formulation GF. These formulations can be applied to the seed diluted or undiluted. Application to the seeds is carried out before sowing, either directly on the seeds or after having pregerminated the latter

In a preferred embodiment a FS formulation is used for seed treatment. Typcially, a FS formulation may comprise 1-800 g/l of active ingredient, 1-200 g/l Surfactant, 0 to 200 g/l antifreezing agent, 0 to 400 g/l of binder, 0 to 200 g/l of a pigment and up to 1 liter of a solvent, preferably water.

Especially preferred FS formulations of a compound of formula (I), a stereoisomer, a tautomer or a salt, for seed treatment usually comprise from 0.1 to 80% by weight (1 to 800 g/l) of the the compound of formula (I), including its tautomers and stereoisomers, or a salt thereof, from 0.1 to 20 % by weight (1 to 200 g/l) of at least one surfactant, e.g. 0.05 to 5 % by weight of a wetter and from 0.5 to 15 % by weight of a dispersing agent, up to 20 % by weight, e.g. from 5 to 20 % of an anti-freeze agent, from 0 to 15 % by weight, e.g. 1 to 15 % by weight of a pigment and/or a dye, from 0 to 40 % by weight, e.g. 1 to 40 % by weight of a binder (sticker /adhesion agent), optionally up to 5 % by weight, e.g. from 0.1 to 5 % by weight of a thickener, optionally from 0.1 to 2 % of an anti-foam agent, and optionally a preservative such as a biocide, antioxidant or the like, e.g. in an amount from 0.01 to 1 % by weight and a filler/vehicle up to 100 % by weight.

Seed Treatment formulations may additionally also comprise binders and optionally colorants.

Binders can be added to improve the adhesion of the active materials on the seeds after treatment. Suitable binders are homo- and copolymers from alkylene oxides like ethylene oxide or propylene oxide, polyvinylacetate, polyvinylalcohols, polyvinylpyrrolidones, and copolymers thereof, ethylene-vinyl acetate copolymers, acrylic homo- and copolymers, polyethyleneamines, polyethyleneamides and polyethyleneimines, polysaccharides like celluloses, tylose and starch, polyolefin homo- and copolymers like olefin/maleic anhydride copolymers, polyurethanes, polyesters, polystyrene homo and copolymers

Optionally, also colorants can be included in the formulation. Suitable colorants or dyes for seed treatment formulations are Rhodamin B, C.I. Pigment Red 112, C.I. Solvent Red 1, pigment blue 15:4, pigment blue 15:3, pigment blue 15:2, pigment blue 15:1, pigment blue 80, pigment yellow 1, pigment yellow 13, pigment red 112, pigment red 48:2, pigment red 48:1, pigment red 57:1, pigment red 53:1, pigment orange 43, pigment orange 34, pigment orange 5, pigment green 36, pigment green 7, pigment white 6, pigment brown 25, basic violet 10, basic violet 49, acid red 51, acid red 52, acid red 14, acid blue 9, acid yellow 23, basic red 10, basic red 108.

Examples of a gelling agent is carrageen (Satiagel®)

In the treatment of seed, the application rates of the compounds of formula (I) are generally from 0.1 g to 10 kg per 100 kg of seed, preferably from 1 g to 5 kg per 100 kg of seed, more preferably from 1 g to 1000 g per 100 kg of seed and in particular from 1 g to 200 g per 100 kg of seed.

The invention therefore also relates to seed comprising a compound of the formula (I), a tautomer, a stereoisomer or an agriculturally useful salt thereof, as defined herein. The amount of the compound of the formula (I) or the agriculturally useful salt thereof will in general vary from 0.1 g to 10 kg per 100 kg of seed, preferably from 1 g to 5 kg per 100 kg of seed, in particular from 1 g to 1000 g per 100 kg of seed. For specific crops such as lettuce the rate can be higher.

The compounds of formula (I), including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof are in particular also suitable for being used for combating parasites in and on animals.

An object of the present invention is therfore also to provide new methods to control parasites in and on animals. Another object of the invention is to provide safer pesticides for animals. Another object of the invention is further to provide pesticides for animals that may be used in lower doses than existing pesticides. And another object of the invention is to provide pesticides for animals, which provide a long residual control of the parasites.

The invention also relates to compositions containing a parasiticidally effective amount of a compound of formula (I) or a stereoisomer or a tautomer or a veterinarily acceptable salt thereof and an acceptable carrier, for combating parasites in and on animals.

The present invention also provides a method for treating, controlling, preventing and protecting animals against infestation and infection by parasites, which comprises orally, topically or parenterally administering or applying to the animals a parasiticidally effective amount of a compound of formula (I) or a stereoisomer or a tautomer or a veterinarily acceptable salt thereof or a composition comprising it.

The invention also provides a process for the preparation of a composition for treating, controlling, preventing or protecting animals against infestation or infection by parasites which comprises a parasiticidally effective amount of a compound of formula (I) or a stereoisomer or a tautomer or a veterinarily acceptable salt thereof or a composition comprising it.

Activity of compounds against agricultural pests does not suggest their suitability for control of endo- and ectoparasites in and on animals which requires, for example, low, non-emetic dosages in the case of oral application, metabolic compatibility with the animal, low toxicity, and a safe handling.

Surprisingly it has now been found that compounds of formula (I), including their stereoisomers and tautomers, and the salts thereof, are suitable for combating endo- and ectoparasites in and on animals.

Compounds of formula (I), including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof, and compositions comprising them are preferably used for controlling and preventing infestations and infections animals including warm-blooded animals, including humans, and fish. They are for example suitable for controlling and preventing

infestations and infections in mammals such as cattle, sheep, swine, camels, deer, horses, pigs, poultry, rabbits, goats, dogs and cats, water buffalo, donkeys, fallow deer and reindeer, and also in fur-bearing animals such as mink, chinchilla and raccoon, birds such as hens, geese, turkeys and ducks and fish such as fresh- and salt-water fish such as trout, carp and eels.

Compounds of formula (I), including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof and compositions comprising them are preferably used for controlling and preventing infestations and infections in domestic animals, such as dogs or cats.

Infestations in warm-blooded animals and fish include, but are not limited to, lice, biting lice, ticks, nasal bots, keds, biting flies, muscoid flies, flies, myiasitic fly larvae, chiggers, gnats, mosquitoes and fleas.

The compounds of formula (I), including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof and compositions comprising them are suitable for systemic and/or non-systemic control of ecto- and/or endoparasites. They are active against all or some stages of development.

The compounds of formula (I) including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof are especially useful for combating ectoparasites.

The compounds of formula (I), including their stereoisomers and their tautomers, and the veterinarily acceptable salts thereof are especially useful for combating parasites of the following orders and species, respectively:

fleas (Siphonaptera), e.g. *Ctenocephalides felis*, *Ctenocephalides canis, Xenopsylla cheopis*, *Pulex irritans*, *Tunga penetrans*, and *Nosopsyllus fasciatus;*

cockroaches (Blattaria - Blattodea), e.g. *Blattella germanica, Blattella asahinae, Periplaneta americana, Periplaneta japonica, Periplaneta brunnea, Periplaneta fuligginosa*, *Periplaneta australasiae*, and *Blatta orientalis;*

flies, mosquitoes (Diptera), e.g. *Aedes aegypti, Aedes albopictus*, *Aedes vexans, Anastrepha ludens, Anopheles maculipennis, Anopheles crucians, Anopheles albimanus, Anopheles gambiae, Anopheles freeborni, Anopheles leucosphyrus, Anopheles minimus, Anopheles quadrimaculatus*, *Calliphora vicina, Chrysomya bezziana, Chrysomya hominivorax, Chrysomya macellaria, Chrysops discalis, Chrysops silacea, Chrysops atlanticus, Cochliomyia hominivorax, Cordylobia anthropophaga, Culicoides furens, Culex pipiens, Culex nigripalpus, Culex quinquefasciatus*, *Culex tarsalis, Culiseta inornata, Culiseta melanura*, *Dermatobia hominis, Fannia canicularis, Gasterophilus intestinalis, Glossina morsitans, Glossina palpalis, Glossina fuscipes, Glossina tachinoides, Haematobia irritans, Haplodiplosis equestris, Hippelates spp., Hypoderma lineata, Leptoconops torrens, Lucilia caprina, Lucilia cuprina, Lucilia sericata, Lycoria pectoralis, Mansonia spp., Musca domestica, Muscina stabulans, Oestrus ovis, Phlebotomus argentipes, Psorophora columbiae, Psorophora discolor*, *Prosimulium mixtum*, *Sarcophaga haemorrhoidalis*, *Sarcophaga sp., Simulium vittatum, Stomoxys calcitrans, Tabanus bovinus, Tabanus atratus, Tabanus lineola,* and *Tabanus similis;*

lice (Phthiraptera), e.g. *Pediculus humanus capitis, Pediculus humanus corporis, Pthirus pubis*, *Haematopinus eurysternus*, *Haematopinus suis*, *Linognathus vituli, Bovicola bovis, Menopon gallinae, Menacanthus stramineus* and *Solenopotes capillatus;*

ticks and parasitic mites (Parasitiformes): ticks (Ixodida), e.g. *Ixodes scapularis, Ixodes holocyclus, Ixodes pacificus, Rhiphicephalus sanguineus, Dermacentor andersoni, Dermacentor variabilis*, *Amblyomma americanum, Ambryomma maculatum, Ornithodorus hermsi, Ornithodorus turicata* and parasitic mites (Mesostigmata), e.g. *Ornithonyssus bacoti* and *Dermanyssus gallinae*;

Actinedida (Prostigmata) und Acaridida (Astigmata) e.g. *Acarapis spp., Cheyletiella spp., Ornithocheyletia spp., Myobia spp., Psorergates spp., Demodex spp., Trombicula spp., Listrophorus spp., Acarus spp., Tyrophagus spp., Caloglyphus spp., Hypodectes spp., Pterolichus spp., Psoroptes spp., Chorioptes spp., Otodectes spp., Sarcoptes spp., Notoedres spp.,Knemidocoptes spp., Cytodites spp.,* and *Laminosioptes spp;*

Bugs (Heteropterida): *Cimex lectularius, Cimex hemipterus, Reduvius senilis, Triatoma spp., Rhodnius ssp., Panstrongylus ssp.* and *Arilus critatus;*

Anoplurida, e.g. *Haematopinus spp., Linognathus spp., Pediculus spp., Phtirus spp.,* and *Solenopotes spp.;*

Mallophagida (suborders Arnblycerina and Ischnocerina), e.g. *Trimenopon spp., Menopon spp., Trinoton spp., Bovicola spp., Werneckiella spp., Lepikentron spp., Trichodectes spp.,* and *Felicola spp;*

Roundworms Nematoda:

Wipeworms and Trichinosis (Trichosyringida), e.g. Trichinellidae *(Trichinella spp.),* (Trichuridae*) Trichuris spp., Capillaria spp.;*

Rhabditida, e.g. *Rhabditis spp, Strongyloides spp., Helicephalobus spp;*

Strongylida, e.g. *Strongylus spp., Ancylostoma spp., Necator americanus, Bunostomum spp. (Hookworm), Trichostrongylus spp., Haemonchus contortus., Ostertagia spp. , Cooperia spp., Nematodirus spp., Dictyocaulus spp., Cyathostoma spp., Oesophagostomum spp., Stephanurus dentatus, Ollulanus spp., Chabertia spp., Stephanurus dentatus , Syngamus trachea*, *Ancylostoma spp., Uncinaria spp., Globocephalus spp., Necator spp., Metastrongylus spp., Muellerius capillaris, Protostrongylus spp., Angiostrongylus spp., Parelaphostrongylus spp. Aleurostrongylus abstrusus,* and *Dioctophyma renale;*

Intestinal roundworms (Ascaridida), e.g. *Ascaris lumbricoides, Ascaris suum, Ascaridia galli, Parascaris equorum, Enterobius vermicularis (Threadworm), Toxocara canis, Toxascaris leonine, Skrjabinema spp.,* and *Oxyuris equi;*

Camallanida, e.g. *Dracunculus medinensis* (guinea worm);

Spirurida, e.g. *Thelazia spp. Wuchereria spp., Brugia spp., Onchocerca spp., Dirofilari spp.a, Dipetalonema spp., Setaria spp., Elaeophora spp., Spirocerca lupi,* and *Habronema spp.;*

Thorny headed worms (Acanthocephala), e.g. *Acanthocephalus spp., Macracanthorhynchus hirudinaceus* and *Oncicola spp;*

Planarians (Plathelminthes):

Flukes (Trematoda), e.g. *Faciola spp., Fascioloides magna, Paragonimus spp., Dicrocoelium spp., Fasciolopsis buski, Clonorchis sinensis, Schistosoma spp., Trichobilharzia spp., Alaria alata, Paragonimus spp.,* and *Nanocyetes spp*;

Cercomeromorpha, in particular Cestoda (Tapeworms), e.g. *Diphyllobothrium spp., Tenia spp., Echinococcus spp., Dipylidium caninum, Multiceps spp., Hymenolepis spp., Mesocestoides spp., Vampirolepis spp., Moniezia spp., Anoplocephala spp., Sirometra spp., Anoplocephala spp.,* and *Hymenolepis spp.*

The compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof and compositions containing them are particularly useful for the control of pests from the orders Diptera, Siphonaptera and Ixodida.

Moreover, the use of the compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof and compositions containing them for combating mosquitoes is especially preferred.

The use of the compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof and compositions containing them for combating flies is a further preferred embodiment of the present invention.

Furthermore, the use of the compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof and compositions containing them for combating fleas is especially preferred.

The use of the compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof and compositions containing them for combating ticks is a further preferred embodiment of the present invention.

The compounds of formula (I), including their stereoisomers and their tautomers, and the salts thereof also are especially useful for combating endoparasites (roundworms nematoda, thorny headed worms and planarians).

Administration can be carried out both prophylactically and therapeutically.

Administration of the active compounds is carried out directly or in the form of suitable preparations, orally, topically/dermally or parenterally.

For oral administration to warm-blooded animals, the compounds of the present invention may be formulated as animal feeds, animal feed premixes, animal feed concentrates, pills, solutions, pastes, suspensions, drenches, gels, tablets, boluses and capsules. In addition, the compounds of the present invention may be administered to the animals in their drinking water. For oral administration, the dosage form chosen should provide the animal with 0.01 mg/kg to 100 mg/kg of animal body weight per day of the formula (I) compound, preferably with 0.5 mg/kg to 100 mg/kg of animal body weight per day.

Alternatively, the compounds of the present invention may be administered to animals parenterally, for example, by intraruminal, intramuscular, intravenous or subcutaneous injection. The compounds of the present invention may be dispersed or dissolved in a physiologically acceptable carrier for subcutaneous injection. Alternatively, the compounds of the present invention may be formulated into an implant for subcutaneous administration. In addition the compounds of the present invention may be transdermally administered to animals. For parenteral administration, the dosage form chosen should provide the animal with 0.01 mg/kg to 100 mg/kg of animal body weight per day of a compound of the present invention.

The compounds of the present invention may also be applied topically to the animals in the form of dips, dusts, powders, collars, medallions, sprays, shampoos, spot-on and pour-on formulations and in ointments or oil-in-water or water-in-oil emulsions. For topical application, dips and sprays usually contain 0.5 ppm to 5,000 ppm and preferably 1 ppm to 3,000 ppm of the compounds of the present invention. In addition, the compounds of the present invention may be formulated as ear tags for animals, particularly quadrupeds such as cattle and sheep.

Suitable preparations are:

- Solutions such as oral solutions, concentrates for oral administration after dilution, solutions for use on the skin or in body cavities, pouring-on formulations, gels;
- Emulsions and suspensions for oral or dermal administration; semi-solid preparations;
- Formulations in which the active compound is processed in an ointment base or in an oil-in-water or water-in-oil emulsion base;
- Solid preparations such as powders, premixes or concentrates, granules, pellets, tablets, boluses, capsules; aerosols and inhalants, and active compound-containing shaped articles.

Compositions suitable for injection are prepared by dissolving the active ingredient in a suitable solvent and optionally adding further ingredients such as acids, bases, buffer salts, preservatives, and solubilizers. The solutions are filtered and filled sterile.

Suitable solvents are physiologically tolerable solvents such as water, alkanols such as ethanol, butanol, benzyl alcohol, glycerol, propylene glycol, polyethylene glycols, N-methyl-pyrrolidone, 2-pyrrolidone, and mixtures thereof.

The compounds of the present invention can optionally be dissolved in physiologically tolerable vegetable or synthetic oils which are suitable for injection.

Suitable solubilizers are solvents which promote the dissolution of the active compound in the main solvent or prevent its precipitation. Examples are polyvinylpyrrolidone, polyvinyl alcohol, polyoxyethylated castor oil, and polyoxyethylated sorbitan ester.

Suitable preservatives are benzyl alcohol, trichlorobutanol, p-hydroxybenzoic acid esters, and n-butanol.

Oral solutions are administered directly. Concentrates are administered orally after prior dilution to the use concentration. Oral solutions and concentrates are prepared according to the state of the art and as described above for injection solutions, sterile procedures not being necessary.

Solutions for use on the skin are trickled on, spread on, rubbed in, sprinkled on or sprayed on.

Solutions for use on the skin are prepared according to the state of the art and according to what is described above for injection solutions, sterile procedures not being necessary.

Further suitable solvents are polypropylene glycol, phenyl ethanol, phenoxy ethanol, ester such as ethyl or butyl acetate, benzyl benzoate, ethers such as alkyleneglycol alkylether, e.g. dipropylenglycol monomethylether, ketons such as acetone, methylethylketone, aromatic hydrocarbons, vegetable and synthetic oils, dimethylformamide, dimethylacetamide, transcutol, solketal, propylencarbonate, and mixtures thereof.

It may be advantageous to add thickeners during preparation. Suitable thickeners are inorganic thickeners such as bentonites, colloidal silicic acid, aluminium monostearate, organic thickeners such as cellulose derivatives, polyvinyl alcohols and their copolymers, acrylates and methacrylates.

Gels are applied to or spread on the skin or introduced into body cavities. Gels are prepared by treating solutions which have been prepared as described in the case of the injection solutions with sufficient thickener that a clear material having an ointment-like consistency results. The thickeners employed are the thickeners given above.

Pour-on formulations are poured or sprayed onto limited areas of the skin, the active compound penetrating the skin and acting systemically.

Pour-on formulations are prepared by dissolving, suspending or emulsifying the active compound in suitable skin-compatible solvents or solvent mixtures. If appropriate, other auxiliaries such as colorants, bioabsorption-promoting substances, antioxidants, light stabilizers, adhesives are added.

Suitable solvents are, for example, water, alkanols, glycols, polyethylene glycols, polypropylene glycols, glycerol, aromatic alcohols such as benzyl alcohol, phenylethanol, phenoxyethanol, esters such as ethyl acetate, butyl acetate, benzyl benzoate, ethers such as alkylene glycol alkyl ethers such as dipropylene glycol monomethyl ether, diethylene glycol mono-butyl ether, ketones such as acetone, methyl ethyl ketone, cyclic carbonates such as propylene carbonate, ethylene carbonate, aromatic and/or aliphatic hydrocarbons, vegetable or synthetic oils, DMF, dimethylacetamide, n-alkylpyrrolidones such as methylpyrrolidone, n-butylpyrrolidone or n-octylpyrrolidone, N-methylpyrrolidone, 2-pyrrolidone, 2,2-dimethyl-4-oxy-methylene-1,3-diox- olane and glycerol formal.

Suitable colorants are all colorants permitted for use on animals and which can be dissolved or suspended.

Suitable absorption-promoting substances are, for example, DMSO, spreading oils such as isopropyl myristate, dipropylene glycol pelargonate, silicone oils and copolymers thereof with polyethers, fatty acid esters, triglycerides, fatty alcohols.

Suitable antioxidants are, for example, sulfites or metabisulfites such as potassium metabisulfite, ascorbic acid, butylhydroxytoluene, butylhydroxyanisole, tocopherol.

Suitable light stabilizers are, for example, novantisolic acid.

Suitable adhesives are, for example, cellulose derivatives, starch derivatives, polyacrylates, natural polymers such as alginates, gelatin.

Emulsions can be administered orally, dermally or as injections.

Emulsions are either of the water-in-oil type or of the oil-in-water type.

They are prepared by dissolving the active compound either in the hydrophobic or in the hydrophilic phase and homogenizing this with the solvent of the other phase with the aid of suitable emulsifiers and, if appropriate, other auxiliaries such as colorants, absorption-promoting substances, preservatives, antioxidants, light stabilizers, viscosity-enhancing substances.

Suitable hydrophobic phases (oils) are, for example: liquid paraffins, silicone oils, natural vegetable oils such as sesame oil, almond oil, castor oil, synthetic triglycerides such as

caprylic/capric biglyceride, triglyceride mixture with vegetable fatty acids of the chain length C_8-C_{12} or other specially selected natural fatty acids, partial glyceride mixtures of saturated or unsaturated fatty acids possibly also containing hydroxyl groups, mono- and diglycerides of the C_8-C_{10} fatty acids, fatty acid esters such as ethyl stearate, di-n-butyryl adipate, hexyl laurate, dipropylene glycol perlargonate, esters of a branched fatty acid of medium chain length with saturated fatty alcohols of chain length C_{16}-C_{18}, isopropyl myristate, isopropyl palmitate, caprylic/capric acid esters of saturated fatty alcohols of chain length C_{12}-C_{18}, isopropyl stearate, oleyl oleate, decyl oleate, ethyl oleate, ethyl lactate, waxy fatty acid esters such as synthetic duck coccygeal gland fat, dibutyl phthalate, diisopropyl adipate, and ester mixtures related to the latter, fatty alcohols such as isotridecyl alcohol, 2-octyldodecanol, cetylstearyl alcohol, oleyl alcohol, and fatty acids such as oleic acid and mixtures thereof.

Suitable hydrophilic phases are, for example, water, alcohols such as propylene glycol, glycerol, sorbitol and mixtures thereof.

Suitable emulsifiers are, for example,

- non-ionic surfactants, e.g. polyethoxylated castor oil, polyethoxylated sorbitan monooleate, sorbitan monostearate, glycerol monostearate, polyoxyethyl stearate, alkylphenol polyglycol ether;
- ampholytic surfactants such as di-sodium N-lauryl-p-iminodipropionate or lecithin;
- anionic surfactants, such as sodium lauryl sulfate, fatty alcohol ether sulfates, mono/dialkyl polyglycol ether orthophosphoric acid ester monoethanolamine salt;
- cation-active surfactants, such as cetyltrimethylammonium chloride.

Suitable further auxiliaries are substances which enhance the viscosity and stabilize the emulsion, such as carboxymethylcellulose, methylcellulose and other cellulose and starch derivatives, polyacrylates, alginates, gelatin, gum arabic, polyvinylpyrrolidone, polyvinyl alcohol, copolymers of methyl vinyl ether and maleic anhydride, polyethylene glycols, waxes, colloidal silicic acid or mixtures of the substances mentioned.

Suspensions can be administered orally or topically/dermally. They are prepared by suspending the active compound in a suspending agent, if appropriate with addition of other auxiliaries such as wetting agents, colorants, bioabsorption-promoting substances, preservatives, antioxidants, light stabilizers.

Liquid suspending agents are all homogeneous solvents and solvent mixtures.

Suitable wetting agents (dispersants) are the emulsifiers given above.

Other auxiliaries, which may be mentioned, are those given above.

Semi-solid preparations can be administered orally or topically/dermally. They differ from the suspensions and emulsions described above only by their higher viscosity.

For the production of solid preparations, the active compound is mixed with suitable excipients, if appropriate with addition of auxiliaries, and brought into the desired form.

Suitable excipients are all physiologically tolerable solid inert substances. Those used are inorganic and organic substances. Inorganic substances are, for example, sodium chloride, carbonates such as calcium carbonate, hydrogencarbonates, aluminium oxides, titanium oxide, silicic acids, argillaceous earths, precipitated or colloidal silica, or phosphates. Organic

substances are, for example, sugar, cellulose, foodstuffs and feeds such as milk powder, animal meal, grain meals and shreds, starches.

Suitable auxiliaries are preservatives, antioxidants, and/or colorants which have been mentioned above.

Other suitable auxiliaries are lubricants and glidants such as magnesium stearate, stearic acid, talc, bentonites, disintegration-promoting substances such as starch or crosslinked polyvinylpyrrolidone, binders such as starch, gelatin or linear polyvinylpyrrolidone, and dry binders such as microcrystalline cellulose.

In general, "parasiticidally effective amount" means the amount of active ingredient needed to achieve an observable effect on growth, including the effects of necrosis, death, retardation, prevention, and removal, destruction, or otherwise diminishing the occurrence and activity of the target organism. The parasiticidally effective amount can vary for the various compounds/compositions used in the invention. A parasiticidally effective amount of the compositions will also vary according to the prevailing conditions such as desired parasiticidal effect and duration, target species, mode of application, and the like.

The compositions which can be used in the invention can comprise generally from about 0.001 to 95% of a compound of formula (I), a stereoisomer, a tautomer or a salt thereof.

Generally it is favorable to apply the compounds of the present invention in total amounts of 0.5 mg/kg to 100 mg/kg per day, preferably 1 mg/kg to 50 mg/kg per day.

Ready-to-use preparations contain the compounds acting against parasites, preferably ectoparasites, in concentrations of 10 ppm to 80 per cent by weight, preferably from 0.1 to 65 per cent by weight, more preferably from 1 to 50 per cent by weight, most preferably from 5 to 40 per cent by weight.

Preparations which are diluted before use contain the compounds acting against ectoparasites in concentrations of 0.5 to 90 per cent by weight, preferably of 1 to 50 per cent by weight.

Furthermore, the preparations for controlling endoparasites comprise a compound of the present invention usually in concentrations of 10 ppm to 2 per cent by weight, preferably of 0.05 to 0.9 per cent by weight, very particularly preferably of 0.005 to 0.25 per cent by weight.

In a preferred embodiment of the present invention, the compositions comprising the a compound of the present invention are applied dermally / topically.

In a further preferred embodiment, the topical application is conducted in the form of compound-containing shaped articles such as collars, medallions, ear tags, bands for fixing at body parts, and adhesive strips and foils.

Generally it is favorable to apply solid formulations which release compounds of the present invention in total amounts of 10 mg/kg to 300 mg/kg, preferably 20 mg/kg to 200 mg/kg, most preferably 25 mg/kg to 160 mg/kg body weight of the treated animal in the course of three weeks.

For the preparation of the shaped articles, thermoplastic and flexible plastics as well as elastomers and thermoplastic elastomers are used. Suitable plastics and elastomers are polyvinyl resins, polyurethane, polyacrylate, epoxy resins, cellulose, cellulose derivatives,

polyamides and polyester which are sufficiently compatible with the compounds of the present invention. A detailed list of plastics and elastomers as well as preparation procedures for the shaped articles is given e.g. in WO 03/086075.

The present invention is now illustrated in further details by the following examples, without imposing any limitation thereto.

The following abbreviations are used:

TFA: trifluoroacetic acid

EtOAc: ethyl acetate

HPLC: High Performance Liquid Chromatography

MS: Mass spectrometry

MeOH: Methanol

t_R = retention time

The compound examples were characterized by coupled High Performance Liquid Chromatography with mass spectrometry (HPLC/MS) or by their melting point.

HPLC method 1: Phenomenex Kinetex 1.7 µm XB-C18 100A; 50 x 2.1 mm; mobile phase: A: water + 0.1% trifluoroacetic acid (TFA); B: acetonitrile + 0.1% TFA; gradient: 5-100% B in 1.50 minutes; 100% B 0.20 min; flow: 0.8-1.0ml/min in 1.50 minutes at 60°C.

HPLC method 3: Analytical HPLC column 1: RP-18 column Chromolith Speed ROD (from Merck KgaA, Germany). Elution: acetonitrile + 0.1 % TFA acid/ water + 0.1 % TFA in a ratio of from 5:95 to 95:5 in 5 minutes at 40 °C.

HPLC method 4: Analytical UPLC column Aquity BEH C18, 1.7 µm, 2.1 x 50 m; mobile phase A: 0.05% formic acid in water, B: 0.05 % formic acid in acetonitrile. Gradient: time/A%: 0/07, 0.3/97, 3.5/2, 4.8/2, 5/97, 5.01/97; flow: 0.6 ml/min; temp: 35°C.

MS-Method 1 (for HPLC-Methods 1 and 3): ESI positive.

MS-Method 2 (for HPLC-Method 4): quadrupole electrospray ionization, 80 V (positive mode).

Preparation Examples:

Example 1: Synthesis of 1-[(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino]-3-(2,2,2-trifluoroethyl)urea (Compound 1-1)

Step 1: N-[(6-chloro-3-pyridyl)methyl]-N-methyl-acetamide

To a solution of 1-(6-chloro-3-pyridyl)-N-methyl-methanamine (0.500 g, 3.19 mmol, 1.05 equiv.) and thriethylamine (0.61 mL, 0.45 g, 4.4 mmol, 1.45 equiv.) in dichloromethane (5 mL) was added a solution of acetic anhydride (0.29 mL, 0.31 g, 3.0 mmol, 1.00 equiv.) in dichloromethane (3 mL) dropwise at 0-5°C. The mixture was allowed to warm to room temperature over night and sequentially washed with aqueous NaOH (1%, 0°C), water,

hydrochloric acid (1%) and water. The organic layer was dried over sodium sulfate, filtered and concentrated to yield the title compound (0.56 g, 93%).

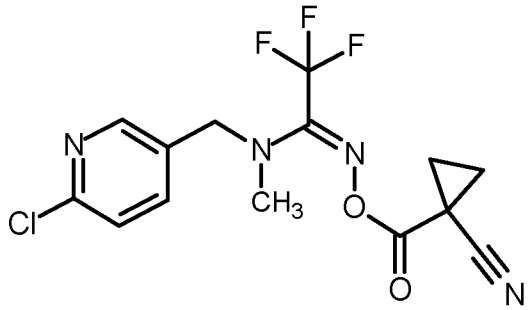
Characterization by HPLC-MS: 0.690 min, m/z = 199.4

Step 2: 1-[(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino]-3-(2,2,2-trifluoroethyl)urea

To a solution of N-[(6-chloro-3-pyridyl)methyl]-N-methyl-acetamide (obtained in step 1 of Example 1, 0.310 g, 1.56 mmol, 1.00 equiv.) in acetonitrile (10 mL) was added $POCl_3$ (0.16 mL, 0.26 g, 1.69 mmol, 1.1 equiv.) and heated at 80°C for 30 min. A suspension of 1-amino-3-(2,2,2-trifluoroethyl)urea (0.250 g, 1.56 mmol, 1.00 equiv.) was added and the mixture was heated at this temperature for 5 h. After cooling, $NaHCO_3$ (2 equiv.) were added and stirring was continued for 30 min. All solids were filtered off, washed with acetonitrile and the organic layers were combined and evaporated to dryness. Flash chromatography on reverse phase with methanol/water yielded the title compound (50 mg, 9%).

Characterization by ^{1}H-NMR (400 MHz, CD_3OD): δ[delta] = 2.18 (s, 3H), 2.97 (s, 3H), 3.85 (q, 2H), 4.60 (s, 2H), 7.43 (d, 1H), 7.75 (m, 1H), 8.27 (s, 1H).
Characterization by HPLC-MS: 0.694 min, m/z = 337.8

Example 2: Synthesis of E/Z-[1-[(6-chloro-3-pyridyl)methyl-methyl-amino]-2,2,2-trifluoro-ethylidene]amino] 1-cyanocyclopropanecarboxylate (Compound I-2) as a mixture of isomers.



Step 1: [(2,2,2-Trifluoroacetyl)amino] 2,2,2-trifluoroacetate

Hydroxylamine hydrochloride (2.8 g) was placed in a three necked round bottom flask with dry ice condenser. Trifluoroacetic acid chloride (18.62 g) was added at such a rate that no hydrogen chloride evolved. The mixture was stirred over night. All volatiles were removed in vacuum and the residie was dried to yield the title compound (7.63 g, 84%), which was used in the next step as such.

Step 2: [(1-Chloro-2,2,2-trifluoro-ethylidene)amino] 2,2,2-trifluoroacetate

A mixture of [(2,2,2-trifluoroacetyl)amino] 2,2,2-trifluoroacetate from step 1 (7.63 g) and PCl_5 (7.62 g) was slowly heated to 60°C until the gas evolution ceased. Under reduced pressure, the title compound (6.25 g) distilled at room temperature into a cooled flask and was used in the next step as such.

Step 3: 2,2,2-Trifluoro-N-hydroxy-acetimidoyl chloride

[(1-Chloro-2,2,2-trifluoro-ethylidene)amino] 2,2,2-trifluoroacetate from step 2 (6.25 g) was placed in a round bottom flask and slowly treated with anhydrous methanol (0.84 g, 1.07 mL) at 0°C. After warming to room temperature, all volatiles were removed in vacuum and the residue contained the title compound (4.0 g, containing impurities) and was used in step 5 directly.

Step 4: 1-(6-Chloro-3-pyridyl)-N-methyl-methanamine

A mixture of 2-chloro-5-(chloromethyl)pyridine (50 g) and methylamine (239.61 g of a 40% solution in water) was dissolved in ethanol (50 mL) and heated at reflux for 5 h. After cooling, the volatiles were removed in vacuum and the residue was taken up in ethyl acetate. The organic layer was washed successively with saturated aqueous sodium carbonate solution, water and brine, dried over sodium sulfate and concentrated in vacuum to obtain the title compound 40 g).

Step 5: N-[(6-Chloro-3-pyridyl)methyl]-2,2,2-trifluoro-N'-hydroxy-N-methyl-acetamidine

To a mixture of 1-(6-chloro-3-pyridyl)-N-methyl-methanamine from step 4 (3.93 g) and triethyl amine (2.70 g) in dichloromethane (30 mL) was adeded 2,2,2-trifluoro-N-hydroxy-acetimidoyl chloride from step 3 (3.7 g) in dichloromethane (5 mL) at 10-15°C. The mixture was allowed to reach room temperature and stirred over night. Saturared aqueous ammonium chloride was added and the layers were separated. The organic layer was dried over sodium sulfate and concentrated in vacuum. Flash chromatography on reverse phase RP18 with water/methanol yielded the title compound (3.5 g).
^{1}H-NMR (400 MHz, $CDCl_3$): δ[delta] = 2.81 (s, 3H), 4.45 (s, 2H), 7.34 (d, 1H), 7.58 (s, 1H), 7.72 (m, 1H), 8.36 (m, 1H).

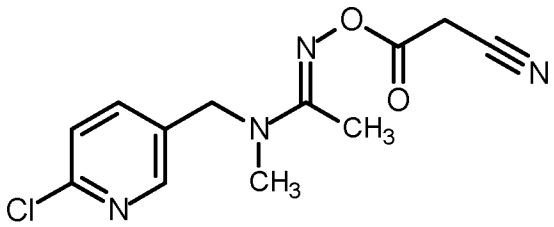
Step 6: E/Z- 1-[(6-chloro-3-pyridyl)methyl-methyl-amino]-2,2,2-trifluoro-ethylidene]amino] 1-cyanocyclopropanecarboxylate (Compound I-2)

To a solution of 1-cyanocyclopropanecarboxylic acid (70 mg) in dichloromethane (10 mL) was added 1-chloro-N,N,2-trimethyl-prop-1-en-1-amine (90 mg) at room temperature and stirred for 90 min. To this mixture, a solution of N-[(6-chloro-3-pyridyl)methyl]-2,2,2-trifluoro-N'-hydroxy-N-methyl-acetamidine from step 5 (0.15 g) in dichloromethane (2 mL) was added and the solution was stirred over night. Water was added and the layers were separated. The organic layer was

dried over sodium sulfate and concentrated in vacuum. The residue was purified via column chromatography on silica gel with ethyl acetate and cyclohexane to yield the title compound 90 mg, 46%).

^{1}H-NMR (400 MHz, $CDCl_3$): δ[delta] = 1.72 (m, 2H), 1.80 (m, 2H), 2.82 and 3.12 (2xs, 3H), 4.48 and 4.72 (2xs, 2H), 7.34 and 7.38 (2xd, 1H), 7.60 and 7.75 (2xm, 1H), 8.35 (m, 1H). The E/Z-isomers were not assigned.

Example 3: Synthesis of [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] 2-cyanoacetate (compound I-6)



Step 1: N-[(6-chloro-3-pyridyl)methyl]-N'-hydroxy-N-methyl-acetamidine

The title compound was prepared in analogy to N-[(6-chloro-3-pyridyl)methyl]-2,2,2-trifluoro-N'-hydroxy-N-methyl-acetamidine using 1-(6-chloro-3-pyridyl)-N-methyl-methanamine and N-hydroxy-acetimidoyl chloride.

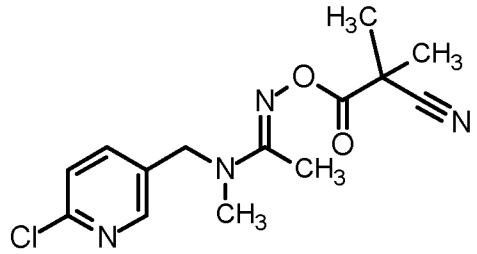
HPLC-MS: 1.12 min, m/z = 214.4 (method 4)

Step 2: [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] 2-cyanoacetate

A portion of 2-cyanoacetic acid (175 mg) was suspended in dichloromethane (10 mL). To this mixture, 1-chloro-N,N,2-trimethyl-prop-1-en-1-amine (Ghosez's reagent, 300 mL, 300 mg) was added dropwise and the mixture turned into a red solution. After 1.5 h at room temperature, a solution of N-[(6-chloro-3-pyridyl)methyl]-N'-hydroxy-N-methyl-acetamidine (400 mg) in dichloromethane (5 mL) was added and kept at this temperature for 12 h. Water was added and the layers were separated. The organic layer was dried over sodium sulfate and concentrated in vacuum. Flash chromatography on silica gel yielded the title compound (180 mg).

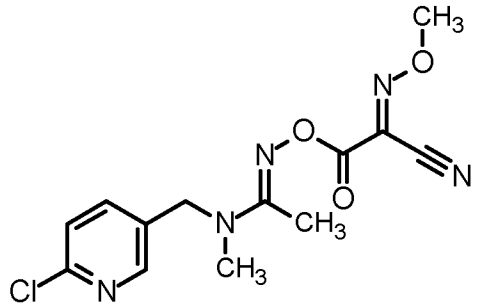
^{1}H-NMR (400 MHz, $CDCl_3$): δ[delta] = 2.17 (s, 3H), 2.93 (s, 3H), 3.56 (s, 2H), 4.51 (s, 2H), 7.32 (d, 1H), 7.71 (m, 1H), 8.32 (s, 1H).

Example 4: Synthesis of [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] 2-cyano-2-methyl-propanoate (compound I-7)



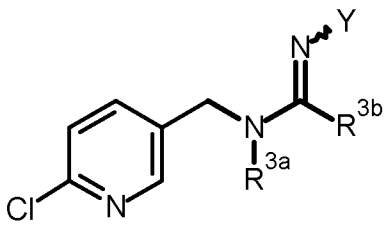
Following an analogous procedure as described above for [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] 2-cyanoacetate (compound I-6) using 2-cyano-2-methyl-propanoic acid as coupling agent, the title compound was obtained.
^{1}H-NMR (400 MHz, $CDCl_3$): δ[delta] = 2.18 (s, 3H), 2.94 (s, 6H), 3.06 (s, 3H), 4.51 (s, 2H), 7.32 (d, 1H), 7.74 (m, 1H), 8.32 (s, 1H).

Example 5: Synthesis of [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] (2E/Z)-2-cyano-2-methoxyimino-acetate (compound I-8)



Following an analogous procedure as described above for [(E/Z)-1-[(6-chloro-3-pyridyl)methyl-methyl-amino]ethylideneamino] 2-cyanoacetate (compound I-6) using potassium salt of 2-cyano-2-methoxyimino-acetate as coupling agent, the title compound was obtained.
^{1}H-NMR (400 MHz, $CDCl_3$): δ[delta] = = 2.19 (s, 3H), 2.97 (s, 3H), 4.33 (s, 3H), 4.53 (s, 2H), 7.31 (d, 1H), 7.75 (m, 1H), 8.31 (m, 1H).

The compounds of formula (I-A) (i.e. compounds of formula I, where Het is 6-chloropyridin-3-yl, R^1 = R^2 = H) summarized in table C.1 below can be prepared in analogy to the methods described above



(I-A)

Table C.1

No.	R^{3a}	R^{3b}	Y	t_R [min]	m/z $[M+H]^+$	method
I-1	CH_3	CH_3	2,2,2-trifluoroethylcarbamoylamino	0.694	337.8	1
I-2	CH_3	CF_3	(1-cyanocyclopropanecarbonyl)oxy	2.960	361.1	3
I-3	CH_3	CH_3	acetoxy	2.09	256.4	4
I-4	CH_3	CH_3	(1-cyanocyclopropanecarbonyl)oxy	2.36	307.4	4
I-5	CH_3	CH_3	(2-methoxyiminoacetyl)oxy	1.83	299.3	4

No.	R^{3a}	R^{3b}	Y	t_R [min]	m/z $[M+H]^+$	method
I-6	CH_3	CH_3	(2-cyanoacetyl)oxy	0.848	280.9	1
I-7	CH_3	CH_3	(2-cyano-2-methyl-propanoyl)oxy	0.979	309.0	1
I-8	CH_3	CH_3	(2-cyano-2-methoxyimino-acetyl)oxy	1.019	323.9	1
I-9	CH_3	CH_3	2,2,2-trifluoroethylcarbamoyloxy	2.44	339.5	4
I-10	CH_3	CH_3	ethylcarbamoyloxy	2.17	285.5	4
I-11	CH_3	CF_3	acetamido	1.85	309.1	4
I-12	CH_3	CF_3	tert-butoxycarbonylamino	3.01	367.2	4
I-13	CH_3	CF_3	2,2-dimethylpropanoylamino	2.60	351.3	4

B Biological Examples

The biological activity of the compounds of formula I of the present invention may be evaluated in biological tests as described in the following.

General conditions: If not otherwise specified, most test solutions are to be prepared as follows: The active compound is to be dissolved at the desired concentration in a mixture of 1:1 (vol:vol) distilled water:acteon. Further, the test solutions are to be prepared at the day of use (and, if not otherwised specified, in general at concentrations wt/vol).

B.1 Green Peach Aphid (*Myzus persicae*)

For evaluating control of green peach aphid (*Myzus persicae*) through systemic means, the test unit consists of 96-well-microtiter plates containing liquid artificial diet under an artificial membrane.

The compounds are formulated using a solution containing 75% v/v water and 25% v/v DMSO. Different concentrations of formulated compounds are pipetted into the aphid diet, using a custom built pipetter, at two replications.

After application, 5 – 8 adult aphids are placed on the artificial membrane inside the microtiter plate wells. The aphids are then allowed to suck on the treated aphid diet and incubated at about 23 + 1°C and about 50 + 5 % relative humidity for 3 days. Aphid mortality and fecundity is then visually assessed.

In this test, compounds , I-6, I-7, I-8 and I-10 at 2500 ppm showed at least 75 % mortality in comparison with untreated controls.

B.2 Vetch aphid (*Megoura viciae*)

The active compounds were formulated in 3:1 (vol:vol) water : DMSO with different concentrations of formulated compounds.

Bean leaf disks were placed into microtiterplates filled with 0.8% agar-agar and 2.5 ppm OPUS™. The leaf disks were sprayed with 2.5 µl of the test solution and 5 to 8 adult aphids

were placed into the microtiter plates which were then closed and kept at 23 ± 1 °C and 50 ± 5% relative humidity under fluorescent light for 6 days. Mortality was assessed on the basis of vital, reproduced aphids. Aphid mortality and fecundity was then visually assessed.
In this test, compounds I-4, I-5, I-6 and I-8 at 2500 ppm showed at least 75% mortality in comparison with untreated controls.

B.3 Cotton aphid (*Aphis gossypii*)

The active compounds were formulated in cyclohexanone as a 10,000 ppm solution supplied in 1.3 ml ABgene® tubes. These tubes were inserted into an automated electrostatic sprayer equipped with an atomizing nozzle and they served as stock solutions for which lower dilutions were made in 1:1 (vol:vol) water : aceton. A nonionic surfactant (Kinetic®) was included in the solution at a volume of 0.01% (v/v).

Cotton plants at the cotyledon stage were infested with aphids prior to treatment by placing a heavily infested leaf from the main aphid colony on top of each cotyledon. Aphids were allowed to transfer overnight to accomplish an infestation of 80-100 aphids per plant and the host leaf was removed. The infested plants were then sprayed by an automated electrostatic plant sprayer equipped with an atomizing spray nozzle. The plants were dried in the sprayer fume hood, removed from the sprayer, and then maintained in a growth room under fluorescent lighting in a 24-hr photoperiod at 25°C and 20-40% relative humidity. Aphid mortality on the treated plants, relative to mortality on untreated control plants, was determined after 5 days.

In this test, compound I-8 at 300 ppm showed at least 75 % mortality in comparison with untreated controls.

B.4 Cowpea aphid (*Aphis craccivora*)

The active compound is dissolved at the desired concentration in a mixture of 1:1 (vol:vol) distilled water : acetone. Surfactant (Alkamuls® EL 620) is added at a rate of 0.1% (vol/vol). The test solution is prepared at the day of use.

Potted cowpea plants are colonized with approximately 50 - 100 aphids of various stages by manually transferring a leaf tissue cut from infested plant 24 hours before application. Plants are sprayed after the pest population has been recorded. Treated plants are maintained on light carts at about 28°C. Percent mortality is assessed after 72 hours.

In this test, compounds I-6, I-7 and I-8 at 500 ppm showed at least 75 % mortality in comparison with untreated controls.

B.5 Orchid thrips (dichromothrips corbetti)

Dichromothrips corbetti adults used for bioassay are obtained from a colony maintained continuously under laboratory conditions. For testing purposes, the test compound is diluted in a 1:1 mixture of acetone:water (vol:vol), plus 0.01% vol/vol Alkamuls® EL 620 surfactant.

Thrips potency of each compound is evaluated by using a floral-immersion technique. Plastic petri dishes are used as test arenas. All petals of individual, intact orchid flowers are

dipped into treatment solution and allowed to dry. Treated flowers are placed into individual petri dishes along with about 20 adult thrips. The petri dishes are then covered with lids. All test arenas are held under continuous light and a temperature of about 28°C for duration of the assay. After 3 days, the numbers of live thrips are counted on each flower, and along inner walls of each petri dish. The percent mortality is recorded 72 hours after treatment.

In this test, compound I-8 at 500 ppm showed at least 75 % mortality in comparison with untreated controls.

B.6 Rice green leafhopper (*Nephotettix virescens*)

Rice seedlings are cleaned and washed 24 hours before spraying. The active compounds are formulated in 50:50 acetone:water (vol:vol), and 0.1% vol/vol surfactant (EL 620) is added. Potted rice seedlings are sprayed with 5 ml test solution, air dried, placed in cages and inoculated with 10 adults. Treated rice plants are kept at about 28-29°C and relative humidity of about 50-60%. Percent mortality is recorded after 72 hours.

In this test, compounds I-6 and I-8 at 500 ppm showed at least 75 % mortality in comparison with untreated controls.

B.7 Rice brown plant hopper (*Nilaparvata lugens*)

Rice seedlings are cleaned and washed 24 hours before spraying. The active compounds is formulated in 50:50 acetone:water (vol:vol) and 0.1% vol/vol surfactant (EL 620) was added. Potted rice seedlings are sprayed with 5 ml test solution, air dried, placed in cages and inoculated with 10 adults. Treated rice plants are kept at about 28-29°C and relative humidity of about 50-60%. Percent mortality is recorded after 72 hours.

In this test, compound I-11 at 500 ppm showed at least 75 % mortality in comparison with untreated controls.

B.8 Boll weevil (*Anthonomus grandis*)

The compounds were formulated in 3:1 (vol:vol) water : DMSO.

For evaluating control of boll weevil (Anthonomus grandis) the test unit consisted of 24-well-microtiter plates containing an insect diet and 20-30 A. grandis eggs. Different concentrations of formulated compounds were sprayed onto the insect diet at 20 µl, using a custom built micro atomizer, at two replications. After application, the microtiter plates were incubated at 23 ± 1°C and 50 ± 5 % relative humidity for 5 days. Egg and larval mortality was then visually assessed.

In this test, compounds I-8 and I-10 at 2500 ppm showed at least 75% mortality in comparison with untreated controls.

B.9 Diamond back moth (*Plutella xylostella*)

The active compound is dissolved at the desired concentration in a mixture of 1:1 (vol:vol) distilled water : aceteone. Surfactant (Kinetic HV) is added at a rate of 0.01% (vol/vol).The test solution is prepared at the day of use.

Leaves of cabbage were dipped in test solution and air-dried. Treated leaves were placed in petri dishes lined with moist filter paper and inoculated with ten 3rd instar larvae. Mortality was recorded 72 hours after treatment. Feeding damages were also recorded using a scale of 0-100%.

B.10 Mediterranean fruitfly (*Ceratitis capitata*)

For evaluating control of Mediterranean fruitfly (*Ceratitis capitata*) the test unit consisted of microtiter plates containing an insect diet and 50-80 *C. capitata* eggs.
The compounds were formulated using a solution containing 75% v/v water and 25% v/v DMSO. Different concentrations of formulated compounds were sprayed onto the insect diet at 5 µl, using a custom built micro atomizer, at two replications.
After application, microtiter plates were incubated at about 28 ± 1°C and about 80 ± 5 % relative humidity for 5 days. Egg and larval mortality was then visually assessed.

B.11 Silverleaf whitefly (*Bemisia argentifolii*)

The active compounds were formulated by a Tecan liquid handler in 100% cyclohexanone as a 10,000 ppm solution supplied in tubes. The 10,000 ppm solution was serially diluted in 100% cyclohexanone to make interim solutions. These served as stock solutions for which final dilutions were made by the Tecan in 50% acetone:50% water (v/v) into 5 or 10ml glass vials. A nonionic surfactant (Kinetic®) was included in the solution at a volume of 0.01% (v/v). The vials were then inserted into an automated electrostatic sprayer equipped with an atomizing nozzle for application to plants/insects.

Cotton plants at the cotyledon stage (one plant per pot) were sprayed by an automated electrostatic plant sprayer equipped with an atomizing spray nozzle. The plants were dried in the sprayer fume hood and then removed from the sprayer. Each pot was pla-ced into a plastic cup and about 10 to 12 whitefly adults (approximately 3-5 days old) were introduced. The insects were collected using an aspirator and a nontoxic Tygon® tubing connected to a barrier pipette tip. The tip, containing the collected insects, was then gently inserted into the soil containing the treated plant, allowing insects to crawl out of the tip to reach the foliage for feeding. Cups were covered with a reusable screened lid. Test plants were maintained in a growth room at about 25ºC and about 20-40% relative humidity for 3 days, avoiding direct exposure to fluorescent light (24 hour photoperiod) to prevent trapping of heat inside the cup. Mortality was assessed 3 days after treatment, compared to untreated control plants.

B.12 Southern armyworm (*Spodoptera eridania)*, 2nd instar larvae

The active compounds were formulated by a Tecan liquid handler in 100% cyclohexanone as a 10,000 ppm solution supplied in tubes. The 10,000 ppm solution was serially diluted in 100% cyclohexanone to make interim solutions. These served as stock solutions for which final dilutions were made by the Tecan in 50% acetone:50% water (v/v) into 5 or 10ml glass vials. A nonionic surfactant (Kinetic®) was included in the solution at a volume of 0.01% (v/v). The vials were then inserted into an automated electrostatic sprayer equipped with an atomizing nozzle for application to plants/insects.

Lima bean plants (variety Sieva) were grown 2 plants to a pot and selected for treatment at the 1st true leaf stage. Test solutions were sprayed onto the foliage by an automated electrostatic plant sprayer equipped with an atomizing spray nozzle. The plants were dried in the sprayer fume hood and then removed from the sprayer. Each pot was placed into perforated plastic bags with a zip closure. About 10 to 11 armyworm larvae were placed into the bag and the bags zipped closed. Test plants were maintained in a growth room at about 25°C and about 20-40% relative humidity for 4 days, avoiding direct exposure to fluorescent light (24 hour photoperiod) to prevent trapping of heat inside the bags. Mortality and reduced feeding were assessed 4 days after treatment, compared to untreated control plants.

B.13 Tobacco budworm (*Heliothis virescens*)

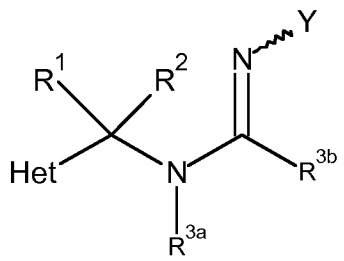
For evaluating control of tobacco budworm (*Heliothis virescens*) the test unit consisted of 96-well-microtiter plates containing an insect diet and 15-25 *H. virescens* eggs.
The compounds were formulated using a solution containing 75% v/v water and 25% v/v DMSO. Different concentrations of formulated compounds were sprayed onto the insect diet at 10 µl, using a custom built micro atomizer, at two replications.
After application, microtiter plates were incubated at about 28 ± 1°C and about 80 ± 5 % relative humidity for 5 days. Egg and larval mortality was then visually assessed.

B.14 Yellow fever mosquito *(Aedes aegypti)*

For evaluating control of yellow fever mosquito (*Aedes aegypti*) the test unit consisted of 96-well-microtiter plates containing 200µl of tap water per well and 5-15 freshly hatched *A. aegypti* larvae.
The active compounds were formulated using a solution containing 75% (v/v) water and 25% (v/v) DMSO. Different concentrations of formulated compounds or mixtures were sprayed onto the insect diet at 2.5µl, using a custom built micro atomizer, at two replications.
After application, microtiter plates were incubated at 28 + 1°C, 80 + 5 % RH for 2 days. Larval mortality was then visually assessed.

Claims

1. A compound of formula (I):



(I)

wherein

Y is a radical Y^1, Y^2, Y^3, Y^4 or Y^5, where

Y^1 is O-C(=X)-R^4;
Y^2 is S-C(=X)-R^4;
Y^3 is N(R^{5a})-C(=X)-R^4;
Y^4 is N(R^{5a})-S(=O)-R^{5b};
Y^5 is N(R^{5a})-S(=O)$_2$-R^{5b};

and where X is O or S;

Het is a 5- or 6-membered carbon-bound or nitrogen-bound, saturated, partly unsaturated or aromatic heterocyclic radical comprising 2, 3, 4 or 5 carbon atoms and 1, 2 or 3 heteroatoms as ring members, which are independently selected from sulfur, oxygen and nitrogen, wherein the sulfur and nitrogen ring members can independently be partly or fully oxidized, and wherein each ring is optionally substituted by k identical or different substituents R^6, wherein k is an integer selected from 0, 1, 2, 3 or 4;

R^1, R^2 are independently from each other selected from the group consisting of hydrogen, halogen, CN, SCN, nitro, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

$Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl, benzyl, where the phenyl ring in the last two radicals is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or

R^1 and R^2 form, together with the carbon atom, which they attached to, a 3-, 4-, 5- or 6-membered saturated or partly unsaturated carbocyclic or heterocyclic ring, wherein each of the carbon atoms of said cycle are unsubstituted or may carry any combination of 1 or 2 identical or different radicals R^7,

or

R^1 and R^2 may together be =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$;

R^{3a} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

$NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, OR^8, $S(O)_nR^{8a}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

Cyc^1-Q^1, where

Cyc^1 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^1 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^{3b} is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or carries any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may carry any combination of 1, 2, 3, 4 or 5 radicals R^{10},

OR^8, $S(O)_nR^{8a}$, $C(=N\text{-}O\text{-}R^{16a})R^{15}$,

Cyc^2-Q^2, where

Cyc^2 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

Q^2 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^4 is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $S(O)_nR^{8a}$, $S(O)_nNR^{9a}R^{9b}$, $NR^{18a}R^{18b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$, and

Cyc^3-Q^3, where

Cyc^3 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},and where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

Q^3 is a single bond, C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

R^4 and R^{5a}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkanediyl and C_2-C_6-alkenediyl, wherein the carbon atom in the two aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

R^{5a} if present, is selected from the group consisting of hydrogen, OH, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, wherein each of the 10 last mentioned radicals are unsubstituted, partly or completely halogenated,
$C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,
phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10};

R^{5b} is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the three aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

$Si(R^{11})_2R^{12}$, OR^8, $NR^{9a}R^{9b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,
Cyc^4-Q^4, where
Cyc^4 is phenyl or a 3-, 4-, 5-, 6- or 7-membered, saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the phenyl ring and the heterocyclic ring are unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},
Q^4 is C_1-C_4-alkanediyl or C_2-C_4-alkenediyl;

or

R^{5a} and R^{5b}, if present, together may also form a bivalent radical, selected from the group consisting of C_2-C_6-alkanediyl and C_2-C_6-alkenediyl, wherein the carbon atom in the two aforementioned radicals are unsubstituted or may carry 1, 2, 3 or 4 radicals R^{7b};

where, independently of their occurrence,

n is 0, 1 or 2;

R^6 is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_3-C_8-cycloalkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, and wherein the carbon atoms of the last 4 aliphatic and cycloaliphatic radicals may be partially or completely halogenated and/or further substituted independently from one another with 1, 2 or 3 radicals R^7,
OR^8, $NR^{17a}R^{17b}$, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{7a}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=S)R^{7a}$, $C(=S)NR^{17a}R^{17b}$, $C(=S)OR^8$, $C(=S)SR^{8a}$, $C(=NR^{17})R^{7a}$, $C(=NR^{17})NR^{17a}R^{17b}$, $Si(R^{11})_2R^{12}$;
phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two of R^6 present on one ring carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$,
or two R^6 together form a linear C_2-C_7-alkylene chain, thus forming, together with the ring atom(s) to which they are bound, a 3-, 4-, 5-, 6-, 7- or 8-membered ring, where 1 or 2 CH_2 moieties of the alkylene chain may be replaced by 1 or 2 heteroatom moieties selected from O, S and NR^{17c} and/or 1 or 2 of the CH_2 groups of the alkylene chain may be replaced by a group C=O, C=S and/or $C=NR^{17}$; and where the alkylene chain is unsubstituted or may be substituted with 1, 2, 3, 4, 5 or 6 radicals selected from the group consisting of halogen, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, phenyl which may be substituted with 1, 2, 3, 4 or 5 radicals R^{10}, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2, as ring members, where the heterocyclic ring may be substituted with 1, 2, 3, 4 or 5 radicals R^{10};

R^7 independently of its occurrence, is selected from the group consisting of cyano, azido, nitro, -SCN, SF_5, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $Si(R^{11})_2R^{12}$, OR^8, OSO_2R^{8a}, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$,

$C(=S)NR^{17a}R^{17b}$, $C(=O)OR^{8}$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=NR^{17})R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=S)R^{7a}$, NR^{17a}-$C(=O)OR^{8}$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$,
phenyl, phenoxy, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last three groups is optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or two R^7 present on one carbon atom may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$ or $=NNR^{9a}R^{9b}$,
or two R^7 may form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partly unsaturated carbocyclic or heterocyclic ring together with the carbon atoms to which the two R^7 are bonded, where the heterocyclic ring comprises 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{7a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl,
phenyl, benzyl. where the phenyl ring in the two last-mentioned radicals is optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

R^{7b} independently of its occurrence, is selected from the group consisting of halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or

different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or two of R^{7b} present on one carbon may together form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{9a}R^{9b}$;

R^8 independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, $C(=O)R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^{16}$,
phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

R^{8a} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl,
phenyl, phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and
a 5- or 6-membered aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10};

R^{9a}, R^{9b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl,
$S(O)_nR^{16}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;

phenyl, benzyl, 1-phenethyl or 2-phenethyl, where the phenyl ring in the last four mentioned radicals is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}; and

a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or,

R^{9a} and R^{9b} are together a C_2-C_7 alkylene-chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

or

R^{9a} and R^{9b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{10} independently of its occurrence, is selected from the group consisting of halogen, cyano, azido, nitro, SCN, SF_5, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, wherein the carbon atoms of the aforementioned aliphatic and cycloaliphatic radicals may optionally be substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN, NO_2, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

C_3-C_8-cycloalkyl, which is unsubstituted or carries 1, 2, 3, 4 or 5 identical or different radicals selected from the group consisting of halogen, azido, SCN, SF_5, OH, CN,

NO_2, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyl-oxy and (C_1-C_6-alkoxy)carbonyl,

$Si(R^{11})_2R^{12}$, OH, SH, OR^{16}, $OS(O)_nR^{16a}$, $-S(O)_nR^{16a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=S)R^{15}$, $C(=O)OR^{16}$, $-C(=NR^{17})R^{15}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$,

phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)-amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and

a 3-, 4-, 5-, 6- or 7-membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 substituents selected independently from one another from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or

two R^{10} present together on one carbon ring atom of a saturated or partly unsaturated heterocyclic radical may form =O, $=CR^{13}R^{14}$, =S, $=NR^{17}$, $=NOR^{16}$, $=NNR^{17a}R^{17b}$;

or,

two R^{10} on adjacent carbon ring atoms may also be a bivalent radical selected from $CH_2CH_2CH_2CH_2$, CH=CH-CH=CH, N=CH-CH=CH, CH=N-CH=CH, N=CH-N=CH, $OCH_2CH_2CH_2$, $OCH=CHCH_2$, $CH_2OCH_2CH_2$, OCH_2CH_2O, OCH_2OCH_2, $CH_2CH_2CH_2$, $CH=CHCH_2$, CH_2CH_2O, CH=CHO, CH_2OCH_2, $CH_2C(=O)O$, $C(=O)OCH_2$, $O(CH_2)O$, $SCH_2CH_2CH_2$, $SCH=CHCH_2$, $CH_2SCH_2CH_2$, SCH_2CH_2S, SCH_2SCH_2, CH_2CH_2S, CH=CHS, CH_2SCH_2, $CH_2C(=S)S$, $C(=S)SCH_2$, $S(CH_2)S$, $CH_2CH_2NR^{17}$, $CH_2CH=N$, $CH=CH-NR^{17}$, OCH=N, SCH=N and form together with the carbon atoms to which the two R^{10} are bonded to a 5-membered or 6-membered partly saturated or unsaturated, aromatic carbocyclic or heterocyclic ring, wherein the ring may

optionally be substituted with one or two substituents selected from =O, OH, CH_3, OCH_3, halogen, cyano, halomethyl and halomethoxy;

R^{11}, R^{12} independently of their occurrence, are selected from the group consisting of C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkoxy-C_1-C_4-alkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6-haloalkynyl, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl-C_1-C_4-alkyl, C_1-C_6-haloalkoxy-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in last two radicals are unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different radicals selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{13}, R^{14} independently of their occurrence, are selected from the group consisting of hydrogen, halogen, CN, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, phenyl and benzyl;

R^{15} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy;
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16} independently of its occurrence, is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or may carry 1 or 2 radicals R^7, phenyl, benzyl, 5- or 6-membered hetaryl or 5- or 6-membered hetaryl-methyl, wherein the last four radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-

alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{16a} independently of its occurrence, is selected from the group consisting of C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,
phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{17} independently of its occurrence, is selected from the group consisting of hydrogen, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,
C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyloxy, C_2-C_6-alkynyloxy, C_3-C_8-cycloalkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkoxy, C_1-C_6-alkylthio, wherein the 11 last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4-alkoxy,

phenyl, benzyl, pyridyl, phenoxy, benzyloxy and pyridyloxy, wherein the six last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylthio, trimethylsilyl, triethylsilyl, *tert*butyldimethylsilyl,

C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, wherein the four last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-

haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

phenyl, benzyl, pyridyl and phenoxy, wherein the four last mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,

or,

R^{17a} and R^{17b} may together be a C_2-C_6 alkylene chain forming a 3- to 7-membered saturated, partly saturated or unsaturated ring together with the nitrogen atom R^{17a} and R^{17b} are bonded to, wherein the alkylene chain may contain 1 or 2 heteroatoms selected, independently of each other, from oxygen, sulfur and nitrogen, and may optionally be substituted with halogen, C_1-C_4-haloalkyl, C_1-C_4-alkoxy or C_1-C_4-haloalkoxy, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

or

R^{17a} and R^{17b} together may form $=CR^{13}R^{14}$, $=NR^{17}$ or $=NOR^{16}$ moiety;

R^{17c} independently of its occurrence, is selected from the group consisting of hydrogen, CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein the five last mentioned aliphatic and cycloaliphatic radicals may be unsubstituted, partially or fully halogenated and/or oxygenated and/or may carry 1 or 2 radicals selected from C_1-C_4 alkoxy,

phenyl, benzyl and pyridyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{18a}, R^{18b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, wherein each of the four aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

OR^{16}, $S(O)_nR^{16a}$, $-S(O)_nNR^{17a}R^{17b}$, $C(=O)R^{15}$, $C(=O)OR^{16}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)R^{15}$, $C(=S)SR^{16a}$, $C(=S)NR^{17a}R^{17b}$, $C(=NR^{17})R^{15}$;

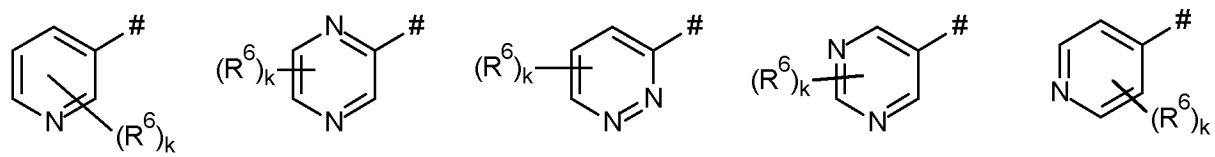
phenyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},
and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,
or,

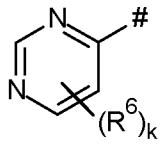
R^{18a} and R^{18b} are together a C_2-C_7-alkylene chain and form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated, partly unsaturated or aromatic ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-halocycloalkyl, C_2-C_6-alkenyl, C_2-C_6-haloalkenyl, C_2-C_6-alkynyl, C_2-C_6 haloalkynyl, phenyl, optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized;

the stereoisomers, tautomers and the salts thereof.

2. The compound of claim 1, wherein

Het is selected from the group consisting of radicals of the following formula Het-1 to Het-24:





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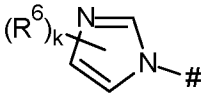

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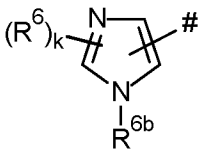

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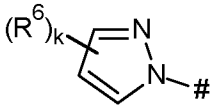

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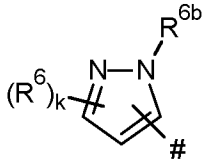

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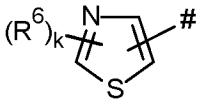

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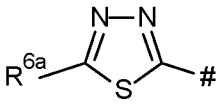

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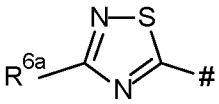

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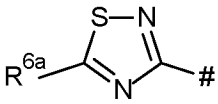

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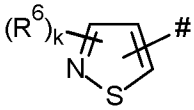

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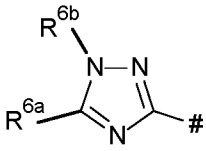

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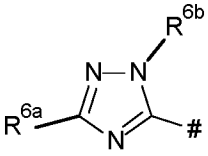
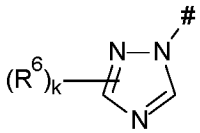
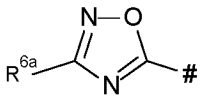


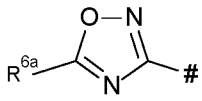
Het-17



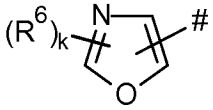
Het-18



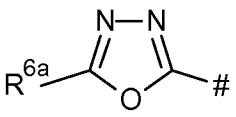
Het-19



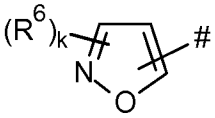
Het-20



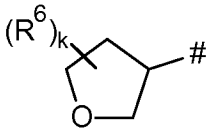
Het-21



Het-22



Het-23



Het-24

wherein # denotes the bond in formula (I), and wherein

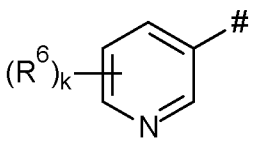
k is 0, 1 or 2; and

R^{6a} is hydrogen or has one of the meanings given for R^6 and

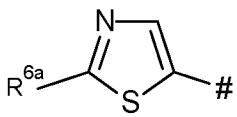
R^{6b} is hydrogen, C_1-C_4-alkyl or C_1-C_4-haloalkyl.

3. The compound of claim 2, wherein

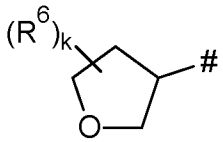
Het is selected from the group consisting of radicals of formulae Het-1, Het-11a and Het-24,



Het-1



Het-11a



Het-24 ,

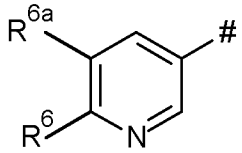
wherein # denotes the bond in formula (I), and wherein

R^6 is selected from halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy and C_1-C_4-haloalkyl;

R^{6a} is selected from hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy and C_1-C_4-haloalkyl; and

k is 0, 1 or 2.

4. The compound of claim 3, wherein Het is Het-1a



Het-1a ,

wherein # denotes the bond in formula (I),

R^6 is selected from halogen, C_1-C_4-alkyl and C_1-C_4-haloalkyl and

R^{6a} is hydrogen or halogen, in particular hydrogen.

5. The compound of any of the preceding claims, wherein

R^1, R^2 are independently from each other selected from the group consisting of hydrogen, halogen, CN, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_3-C_6-halocycloalkyl;

or

R^1 and R^2 may together be $=CR^{13}R^{14}$;

or

R^1 and R^2 form, together with the carbon atom, which they attached to, a 3- to 5-membered saturated carbocyclic ring,

and wherein both R^1 and R^2 are in particular hydrogen.

6. The compound of any of the preceding claims, wherein

R^{3a} is C_1-C_6-alkyl, C_1-C_6-haloalkyl, where the two radicals may carry 1, 2 or 3 further radicals R^7, which are selected from NO_2, cyclopropyl, CN and C_1-C_6-alkoxy, which is unsubstituted, partly or completely halogenated, or

C_3-C_6-cycloalkyl which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen and C_1-C_4-alkyl,

in particular methyl, ethyl, difluoromethyl, trifluoromethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN, CH_2NO_2 and $CH_2CH_2NO_2$.

7. The compound of any of the preceding claims, wherein

R^{3b} is C_1-C_6-alkyl or C_1-C_6-haloalkyl, where the two radicals may carry 1, 2 or 3 further radicals R^7, which are, independently of each other, selected from the group

consisting of NO_2, CN, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, =N-O-C_1-C_4-alkyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulfinyl and C_1-C_4-alkylsulfonyl, where the last three radicals are unsubstituted, partly or completely halogenated.

8. The compound of claim 7, wherein

R^{3b} is selected from the group consisting of methyl, ethyl, difluoromethyl and trifluoromethyl.

9. The compound of any of the preceding claims, where in the radicals Y^1, Y^2 and Y^3

R^4 is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_6-cycloalkyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

OR^8, $NR^{18a}R^{18b}$, $C(=O)NR^{9a}R^{9b}$, $C(=S)NR^{9a}R^{9b}$, $C(=O)OR^8$, $C(=O)R^{7a}$, $C(=S)R^{7a}$,

phenyl, which is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

and a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized.

10. The compound of claim 9, wherein

R^4 is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_2-C_4-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, OR^8, $NR^{18a}R^{18b}$,

C_3-C_6-cycloalkyl, which is unsubstituted or may be substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

phenyl, which is unsubstituted or optionally substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}, and

a 3-, 4-, 5-, 6- or 7- membered saturated, partly unsaturated or aromatic heterocyclic ring comprising 1, 2 or 3 identical or different heteroatoms as ring members, which are selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10}, and wherein the nitrogen and/or the sulfur atom(s) of the heterocyclic ring may optionally be oxidized,

where, irrespectively of their occurrence,

R^7 is selected from the group consisting of CN, nitro, OH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_3-C_6-cycloalkyl, $S(O)_nR^{8a}$, $S(O)_nNR^{17a}R^{17b}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=S)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$, NR^{17a}-$C(=O)R^{7a}$, NR^{17a}-$C(=O)OR^8$, NR^{17a}-$C(=O)NR^{17a}R^{17b}$, phenyl and phenoxy, where the phenyl ring in the last two mentioned radicals is unsubstituted or carriers 1, 2, 3, 4 or 5 radicals R^{10}, or two R^7 present on one carbon atom may together form $=NOR^{16}$ or $=N$-$NR^{9a}R^{9b}$;

R^{7a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^8 is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, phenyl, benzyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10}, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, wherein the last three radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{8a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{9a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{9b} is selected from the group consisting of hydrogen, C_1-C_4-alkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

$NR^{9a}R^{9b}$ may also be a saturated N-bound 3-, 4-, 5- or 6-membered heterocycle, which in addition to the nitrogen atom may have 1 further heteroatom as ring members, which is selected from O and N and where the N-bound 3-, 4-, 5- or 6-membered heterocycle may be unsubstituted or carry 1, 2, 3 or 4 radicals selected from C_1-C_4-alkyl and C_1-C_4-haloalkyl;

R^{10} is selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-

haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbonyl and di-(C_1-C_4-alkyl)aminocarbonyl or two R^{10} present on one carbon atom may together form =NOR^{16} or =N-N$R^{17a}R^{17b}$;

R^{15} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from the group consisting of halogen, CN, NO_2, C_1-C_4-alkyl, C_3-C_6-cycloalkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4 haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-haloalkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylsulfonyl, (C_1-C_6-alkyl)carbonyl and (C_1-C_6-alkoxy)carbonyl, (C_1-C_4-alkyl)amino and di-(C_1-C_4-alkyl)amino;

R^{16} is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, where the two aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry 1 or 2 radicals R^7, which are selected from the group consisting of NO_2, CN, OR^8, $S(O)_nR^{8a}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$ and NR^{17a}-$C(=O)R^{7a}$, and

benzyl which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, phenyl and benzyl, where the phenyl ring in the last two substitutents is unsubstituted or carries 1, 2, 3 or 4 radicals selected from the group consisting of halogen, CN, NO_2, C_1-C_4-alkyl, C_3-C_6-cycloalkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_1-C_4-haloalkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylsulfonyl, (C_1-C_4-alkyl)amino and di-(C_1-C_4-alkyl)amino;

R^{18a}, R^{18b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7, C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

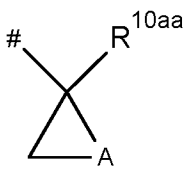
C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, NH_2-$S(O)_2$, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylsulfonyl, C_1-C_4-alkylaminosulfonyl, di-(C_1-

C_4-alkyl)aminosulfonyl,
phenyl, which is unsubstituted or carry 1, 2, 3 or 4 radicals R^{10},
phenoxy, which is unsubstituted or carries 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;
and a 5- or 6-membered aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10},
or,

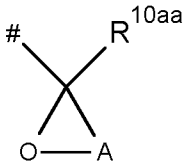
R^{18a} and R^{18b} are together a C_2-C_6-alkylene chain and form a 3-, 4-, 5-, 6- or 7-membered saturated ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio and C_1-C_6-haloalkylthio.

11. The compound of claim 10, wherein

R^4 is selected from the group consisting of
C_1-C_6-alkyl, which is unsubstituted, partly or completely halogenated and/or may carry any combination of 1, 2 or 3 radicals R^7, where R^7 is selected from CN, NO_2, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, $S(O)_nR^{8a}$ and $S(O)_nNR^{17a}R^{17b}$,
6-membered heteroaryl selected from the group consisting of pyridinyl, pyrimidinyl, pyrazinyl and pyridazinyl, wherein 6-membered heteroaryl is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, CN, NO_2, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy and C_1-C_4-haloalkoxy,
the radicals of formula R-41 and R-42:



R-41



R-42

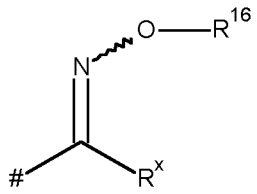
wherein # indicates the bond to the carbonyl group in formula (I)

A is CH_2, CH_2CH_2 or $CH_2CH_2CH_2$,

R^{10aa} is hydrogen, halogen, $S(O)_nR^{16a}$, CN or NO_2 and

n is 0, 1 or 2;

the radical of formula R-43



R-43

wherein # indicates the bond to the carbonyl group in formula (I)

R^x is hydrogen, halogen, CN, NO_2, C_1-C_4-alkyl, C_1-C_4-haloalkyl, $NR^{17a}R^{17b}$, $S(O)_2NR^{17a}R^{17b}$, $S(O)_2R^{8a}$ or $C(=O)OR^8$;

R^{16} is selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, where the two aforementioned radicals are unsubstituted, partly or completely halogenated and/or may carry 1 or 2 radicals R^7, which are selected from the group consisting of NO_2, CN, OR^8, $S(O)_nR^{8a}$, $NR^{17a}R^{17b}$, $C(=O)NR^{17a}R^{17b}$, $C(=O)OR^8$, $C(=O)R^{15}$ and NR^{17a}-$C(=O)R^{7a}$, and

benzyl which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

and the radical $NR^{18a}R^{18b}$, wherein

R^{18a}, R^{18b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, wherein each of the two aforementioned radicals are unsubstituted, partly or completely halogenated or may carry any combination of 1, 2 or 3 radicals R^7,

C_3-C_{10}-cycloalkyl, which is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10},

C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, NH_2-$S(O)_2$, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylsulfonyl, C_1-C_4-alkylaminosulfonyl, di-(C_1-C_4-alkyl)aminosulfonyl,

phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10},

phenoxy, which may be unsubstituted or may carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-

alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl,
and a 5- or 6-membered aromatic C-bound heterocyclic ring comprising 1, 2 or 3 heteroatoms as ring members, which are identical or different and selected from oxygen, nitrogen and sulfur, where the heterocyclic ring is optionally substituted with 1, 2, 3 or 4 identical or different substituents R^{10},

or,

R^{18a} and R^{18b} are together a C_2-C_6-alkylene chain and form a 3-, 4-, 5-, 6- or 7-membered saturated ring together with the nitrogen atom they are bonded to, wherein the alkylene chain may contain one or two heteroatoms, which are, independently of each other, selected from oxygen, sulfur and nitrogen, and where the alkylene chain may optionally be substituted with 1, 2, 3 or 4 radicals selected from halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio and C_1-C_6-haloalkylthio;

where, irrespectively of their occurrence,

R^{7a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^8 is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl, phenyl, benzyl, where the phenyl ring in the last two mentioned radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10}; phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl where the phenyl ring in the last three mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{8a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^{10} is selected from the group consisting of halogen, CN, OH, SH, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylthio, C_1-C_4-alkylsulfonyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulfonyl, SO_2NH_2, C_1-C_4-alkylaminocarbony and di-(C_1-C_4-alkyl)aminocarbonyl, or
two R^{10} present on one carbon atom may together form =NOR^{16};

R^{15} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, (C_1-C_6-alkyl)carbonyl and (C_1-C_6-alkoxy)carbonyl;

R^{16a} is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl and phenyl, which is unsubstituted or carries 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

R^{17a}, R^{17b} are each independently from one another selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, phenyl and benzyl, where the phenyl ring in the last two substituents is unsubstituted or carries 1, 2, 3 or 4 radicals selected from halogen, OH, CN, NO_2, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, (C_1-C_6-alkyl)carbonyl and (C_1-C_6-alkoxy)carbonyl.

12. The compound of any of the preceding claims, where in the radicals Y^3, Y^4 and Y^5,

R^{5a} if present, is selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein each of the six last mentioned radicals are unsubstituted, partly or completely halogenated,
C(=O)OR^8, C(=O)R^{7a}, C(=S)R^{7a},
phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}.

13. The compound of claim 12, wherein

R^{5a} if present, is selected from the group consisting of hydrogen, OH, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein each of the three last mentioned radicals are unsubstituted, partly or completely halogenated, C(=O)OR^8, C(=O)R^{7a} and C(=S)R^{7a},
where, irrespectively of their occurrence,

R^{7a} is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl, phenyl and benzyl, where the phenyl ring in the last two radicals is unsubstituted or carries 1, 2, 3 or 4 radicals R^{10};

R^8 is selected from the group consisting of C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkylcarbonyl, C_1-C_4-haloalkylcarbonyl, C_1-C_4-alkoxycarbonyl, NH_2-C(O), C_1-C_4-alkylaminocarbonyl, di-(C_1-C_4-alkyl)aminocarbonyl,

phenyl, benzyl, , where the phenyl ring in the last two mentioned radicals is unsbustituted or carries 1, 2, 3 or 4 radicals R^{10}, phenylcarbonyl, phenoxycarbonyl and phenylaminocarbonyl, where the phenyl ring in the last three mentioned radicals may be unsubstituted or carry 1, 2, 3 or 4 substituents selected from halogen, OH, CN, NO_2, SCN, SF_5, OH, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6 haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_1-C_6-alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, (C_1-C_6-alkyl)amino, di-(C_1-C_6-alkyl)amino, (C_1-C_6-alkyl)carbonyl, (C_1-C_6-alkyl)carbonyloxy and (C_1-C_6-alkoxy)carbonyl;

14. The compounds of any of the preceding claims, wherein Y is Y^1.

15. The compounds of claims 1 to 13, wherein Y is Y^3.

16. The compound of any of claims 1 to 8, 12 or 13, where in the radicals Y^4 and Y^5,
R^{5b} is selected from the group consisting of C_1-C_6-alkyl, C_2-C_6-alkenyl, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkyl-C_1-C_4-alkyl, wherein each of the five last mentioned radicals are unsubstituted, partly or completely halogenated, phenyl and phenyl-C_1-C_4-alkyl, where the phenyl ring in the last two mentioned groups is unsubstituted or substituted with 1, 2, 3, 4 or 5 identical or different substituents R^{10}.

17. The compound of any of the preceding claims, wherein
X if present, is O.

18. An agricultural or veterinary composition for combating animal pests comprising at least one compound as defined in any of claims 1 to 17 and at least one inert liquid and/or solid acceptable carrier and optionally, if desired, at least one surfactant.

19. The use of a compound as defined in any of claims 1 to 17 for combating or controlling invertebrate pests, for protecting growing plants from attack or infestation by invertebrate pests, for protecting plant propagation material, especially seeds, from soil insects, or for protect the seedlings roots and shoots of plants from soil and foliar insects.

20. The compound as defined in any of claims 1 to 17 for the use in the treatment animals infested or infected by parasites, for preventing animals of getting infected or infested by parasites or for protecting animals against infestation or infection by parasites.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/059330

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D213/61 A01N43/40
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C07D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/097604 A1 (BAYER CROPSCIENCE GMBH [DE]; ARAKI KOICHI [JP]; MURATA TETSUYA [JP]; G) 27 November 2003 (2003-11-27) claims 1, 11	4
X	LI X. Z. ET AL.: "Synthesis and biological activities of 3-(2-furyl)-4-aryl-1,2,4-triazole-5-thione s", CHINESE CHEMICAL LETTERS, vol. 13, no. 2, 1 January 2002 (2002-01-01), pages 129-132, XP9185441, table 1, compound 7t	4

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 July 2015	03/08/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bérillon, Laurent

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LI X. ET AL.: "The synthesis and biological activities of 1,2,4-triazole-5-thiones bearing 2-chloropyrid-5-methyl", HUAXUE TONGBAO, vol. 65, no. 2, 1 January 2002 (2002-01-01), pages W013/1-W013/4, XP9185440, compounds 9a-c	4
A	YE D.J. ET AL.: "Synthesis and fungicidal activities of thiourea derivatives containing pyridine moiety", HUAXUE SHIJI, vol. 32, no. 5, 1 January 2010 (2010-01-01), pages 411-412, 454, XP9185439, scheme on page 411, compounds a-e	4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2015/059330

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1-3, 5-20(all partially)
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-3, 5-20(all partially)

Present claims 1-3, 5-18 relate to an extremely large number of possible compounds. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only a very small proportion of the compounds (see compounds I-1 to I-6 of table C on pages 118 and 119). In addition, the initial phase of the search revealed a very large number of documents relevant to the issue of novelty. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search (PCT Guidelines 9.19 and 9.23). A full search search was only carried out for part of the claims which relate to compounds wherein Het is Het-1a as defined in claim 4, compositions thereof and use thereof.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2015/059330

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03097604 A1	27-11-2003	AP 1848 A	09-05-2008
		AU 2003242249 A1	02-12-2003
		BR 0309972 A	01-03-2005
		CA 2486090 A1	27-11-2003
		CN 1653048 A	10-08-2005
		CN 101230038 A	30-07-2008
		CO 5631434 A2	28-04-2006
		EP 1507761 A1	23-02-2005
		IL 165218 A	30-12-2010
		JP 4623279 B2	02-02-2011
		JP 2005537230 A	08-12-2005
		KR 20040111627 A	31-12-2004
		MX PA04011325 A	14-02-2005
		RU 2356891 C2	27-05-2009
		UA 79120 C2	25-05-2007
		US 2006166991 A1	27-07-2006
		WO 03097604 A1	27-11-2003
		ZA 200408409 A	31-10-2005