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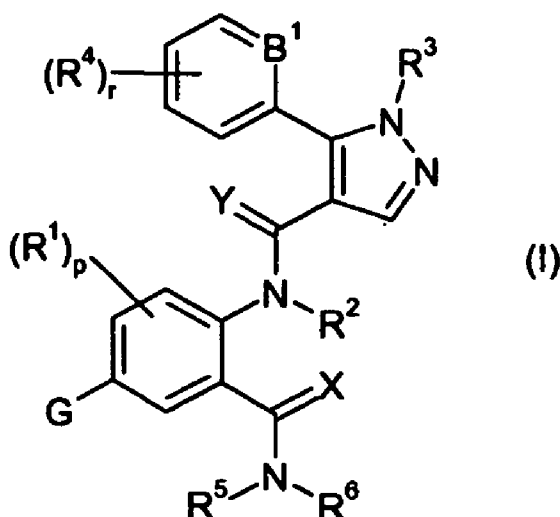
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(54) **Title:** ANTHRANILAMIDE COMPOUNDS AND THEIR USE AS PESTICIDES



(57) **Abstract:** The present invention relates to anthranilamide compounds and the stereoisomers, salts, tautomers and N-oxides thereof and to compositions comprising the same. The invention also relates to the use of the anthranilamide compounds or of the compositions comprising such compounds for combating invertebrate pests. Furthermore, the invention relates to methods of applying such compounds.



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Anthranilamide compounds and their use as pesticides

Description

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The present invention relates to anthranilamide compounds and the stereoisomers, salts, tautomers and N-oxides thereof and to compositions comprising the same. The invention also relates to the use of the anthranilamide compounds or of the compositions comprising such compounds for combating invertebrate pests. Furthermore, the invention relates to methods of applying such compounds.

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Invertebrate pests and in particular insects, arthropods and nematodes destroy growing and harvested crops and attack wooden dwelling and commercial structures, thereby 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 invertebrate pests such as insects, arachnids and nematodes. It is therefore an object of the present invention to provide compounds having a good pesticidal activity and showing a broad activity spectrum against a large number of different invertebrate pests, especially against difficult to control insects, arachnids and nematodes.

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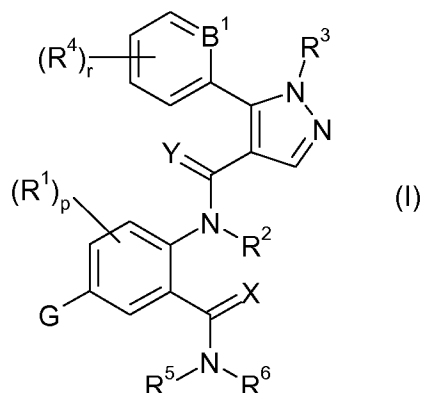
Anthranilamide compounds have been described in a number of patent applications (e.g. NL 9202079, WO 01/70671, WO 02/070483, WO 03/015518, WO 03/015519, WO 03/016284, WO 03/016300, WO 04/046129, WO 2005/085234, WO 2006/040113). Arylpyrazole anthranilic diamides and their use as insecticides have been presented in the IUPAC pesticides conference 2006 in Kobe, Japan. However, compounds with the characteristic substitution pattern as in the present invention have not yet been described.

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It has been found that the above objectives can be achieved by anthranilamide compounds of the general formula (I), as defined below, including their stereoisomers, their salts, in particular their agriculturally or veterinarily acceptable salts, their tautomers and their N-oxides.

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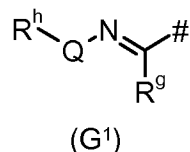
Therefore, in a first aspect the present invention relates to compounds of formula (I),



wherein

B¹ is N or CH;

G is a group of formula G¹



wherein

Q is O, N(R^{9a}) or a chemical bond;

R^g is selected from the group consisting of hydrogen, halogen, cyano, azido, nitro, -SCN, SF₅, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, -Si(R¹⁴)₂R¹³, -OR⁸, -OSO₂R⁸, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a})R^{9b}, -N(R^{9a})R^{9b},

-C(=O)N(R^{9a})R^{9b}, -C(=S)N(R^{9a})R^{9b}, -C(=O)OR⁸, -C(=O)R⁷, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁰;

R^h is selected from the group consisting of hydrogen, cyano, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkylsulfinyl, C₁-C₆-haloalkylsulfinyl, C₁-C₆-alkylsulfonyl, C₁-C₆-haloalkylsulfonyl, C₃-C₈-cycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, -Si(R¹⁴)₂R¹³, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a})R^{9b}, -N(R^{9a})R^{9b}, -N=CR¹⁵R¹⁶, -C(=O)R⁷, -C(=O)N(R^{9a})R^{9b}, -C(=S)N(R^{9a})R^{9b}, -C(=O)OR⁸, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁰;

with the proviso that R^h is not C_1 - C_6 -alkoxy or C_1 - C_6 -haloalkoxy if it is bound to an oxygen atom;

or G is a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

each R^1 is independently selected from the group consisting of halogen; cyano; azido; nitro; -SCN; SF_5 ; C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; $-Si(R^{14})_2R^{13}$; $-OR^8$; $-OS(O)_nR^8$; $-SR^8$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^{9b}$; $-N(R^{9a})R^{9b}$; $-N(R^{9a})C(=O)R^7$; $C(=O)R^7$; $-C(=O)OR^8$; $-C(=NR^{9a})R^7$; $-C(=O)N(R^{9a})R^{9b}$; $C(=S)N(R^{9a})R^{9b}$; phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} ; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

R^2 is selected from the group consisting of hydrogen; cyano; C_1 - C_{10} -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_{10} -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_{10} -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 ; $-N(R^{9a})R^{9b}$; $-Si(R^{14})_2R^{13}$; $-OR^8$; $-SR^8$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^9$; $-C(=O)R^7$; $-C(=O)OR^8$; $-C(=O)N(R^{9a})R^{9b}$; $-C(=S)R^7$; $-C(=S)OR^8$; $-C(=S)N(R^{9a})R^{9b}$; $-C(=NR^{9a})R^7$; phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} ; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring mem-

bers, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

R^3 is selected from the group consisting of hydrogen, cyano, nitro, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , $-Si(R^{14})_2R^{13}$, $-OR^8$, $-OS(O)_nR^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $N(R^{9a})C(=O)R^7$, $-C(=O)R^7$, $-C(=O)OR^8$, $-C(=S)R^7$, $-C(=S)OR^8$, $-C(=NR^{9a})R^7$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

each R^4 is independently selected from the group consisting of halogen, cyano, azido, nitro, $-SCN$, SF_5 , C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 , $-Si(R^{14})_2R^{13}$, $-OR^8$, $-OS(O)_nR^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $N(R^{9a})C(=O)R^7$, $-C(=O)R^7$, $-C(=O)OR^8$, $-C(=S)R^7$, $-C(=S)OR^8$, $-C(=NR^{9a})R^7$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

R^5 and R^6 are, independently of each other, selected from the group consisting of hydrogen, cyano, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals

R^{7a} , C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_6 -haloalkylthio, where the alkyl moiety in the four last-mentioned radicals may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , $-N(R^{9a})R^{9b}$; $-N(R^{9a})C(=O)R^7$; $-Si(R^{14})_2R^{13}$; $-OR^8$; $-SR^8$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^{9b}$; $-C(=O)R^7$; $-C(=O)OR^8$; $-C(=O)N(R^{9a})R^{9b}$; $-C(=S)R^7$; $-C(=S)OR^8$; $-C(=S)N(R^{9a})R^{9b}$; $-C(=NR^{9a})R^7$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^{9b}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

or R^5 and R^6 together form a group $=CR^{11}R^{12}$;

or R^5 and R^6 , together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally containing 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

each R^{7a} is independently selected from the group consisting of cyano, azido, nitro, $-SCN$, SF_5 , $-Si(R^{14})_2R^{13}$, $-OR^8$, $-OSO_2R^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, $-C(=O)R^{19}$,

and, in case R^{7a} is bound to a cycloalkyl group, R^{7a} may additionally be 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 -alkyl, C_2 - C_6 -alkenyl, C_2 - C_6 -haloalkenyl, C_2 - C_6 -alkynyl, C_2 - C_6 -haloalkynyl;

or two geminally bound radicals R^{7a} together form a group selected from $=CR^{11}R^{12}$, $=S(O)_mR^8$, $=S(O)_mN(R^{9a})R^{9b}$, $=NR^{9a}$, $=NOR^8$ and $=NNR^{9a}R^{9b}$;

each R^7 is independently selected from the group consisting of cyano, azido, nitro, $-\text{SCN}$, SF_5 , $\text{C}_3\text{-C}_8\text{-cycloalkyl}$, $\text{C}_3\text{-C}_8\text{-halocycloalkyl}$, $-\text{Si}(\text{R}^{14})_2\text{R}^{13}$, $-\text{OR}^8$, $-\text{OSO}_2\text{R}^8$, $-\text{SR}^8$, $-\text{S}(\text{O})_m\text{R}^8$, $-\text{S}(\text{O})_n\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{C}(=\text{O})\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{C}(=\text{S})\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{C}(=\text{O})\text{OR}^8$, $-\text{C}(=\text{O})\text{R}^{19}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

and, in case R^7 is bound to a cycloalkyl group or to a heterocyclic ring, R^7 may additionally be selected from the group consisting of $\text{C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_1\text{-C}_6\text{-haloalkyl}$, $\text{C}_1\text{-C}_6\text{-alkoxy-C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_2\text{-C}_6\text{-alkenyl}$, $\text{C}_2\text{-C}_6\text{-haloalkenyl}$, $\text{C}_2\text{-C}_6\text{-alkynyl}$, $\text{C}_2\text{-C}_6\text{-haloalkynyl}$ and benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} ;

and in groups $-\text{C}(=\text{O})\text{R}^7$, $-\text{C}(=\text{S})\text{R}^7$, $-\text{C}(=\text{NR}^{9a})\text{R}^7$, and $-\text{N}(\text{R}^{9a})\text{C}(=\text{O})\text{R}^7$, R^7 may additionally be selected from hydrogen, halogen, $\text{C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_1\text{-C}_6\text{-haloalkyl}$, $\text{C}_1\text{-C}_6\text{-alkoxy-C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_2\text{-C}_6\text{-alkenyl}$, $\text{C}_2\text{-C}_6\text{-haloalkenyl}$, $\text{C}_2\text{-C}_6\text{-alkynyl}$, $\text{C}_2\text{-C}_6\text{-haloalkynyl}$ and benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} ;

or two geminally bound radicals R^7 together form a group selected from $=\text{CR}^{11}\text{R}^{12}$, $=\text{S}(\text{O})_m\text{R}^8$, $=\text{S}(\text{O})_m\text{N}(\text{R}^{9a})\text{R}^{9b}$, $=\text{NR}^{9a}$, $=\text{NOR}^8$ and $=\text{NNR}^{9a}\text{R}^{9b}$;

or two radicals R^7 , together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members;

each R^8 is independently selected from the group consisting of hydrogen, cyano, $\text{C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_1\text{-C}_6\text{-haloalkyl}$, $\text{C}_1\text{-C}_6\text{-alkoxy}$, $\text{C}_1\text{-C}_6\text{-haloalkoxy}$, $\text{C}_1\text{-C}_6\text{-alkylthio}$, $\text{C}_1\text{-C}_6\text{-haloalkylthio}$, $\text{C}_1\text{-C}_6\text{-alkylsulfinyl}$, $\text{C}_1\text{-C}_6\text{-haloalkylsulfinyl}$, $\text{C}_1\text{-C}_6\text{-alkylsulfonyl}$, $\text{C}_1\text{-C}_6\text{-haloalkylsulfonyl}$, $\text{C}_3\text{-C}_8\text{-cycloalkyl}$, $\text{C}_3\text{-C}_8\text{-cycloalkyl-C}_1\text{-C}_4\text{-alkyl}$, $\text{C}_3\text{-C}_8\text{-halocycloalkyl}$, $\text{C}_2\text{-C}_6\text{-alkenyl}$, $\text{C}_2\text{-C}_6\text{-haloalkenyl}$, $\text{C}_2\text{-C}_6\text{-alkynyl}$, $\text{C}_2\text{-C}_6\text{-haloalkynyl}$, $-\text{Si}(\text{R}^{14})_2\text{R}^{13}$, $-\text{SR}^{20}$, $-\text{S}(\text{O})_m\text{R}^{20}$, $-\text{S}(\text{O})_n\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{N}=\text{CR}^{15}\text{R}^{16}$, $-\text{C}(=\text{O})\text{R}^{19}$, $-\text{C}(=\text{O})\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{C}(=\text{S})\text{N}(\text{R}^{9a})\text{R}^{9b}$, $-\text{C}(=\text{O})\text{OR}^{20}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

with the proviso that R⁸ is not C₁-C₆-alkoxy or C₁-C₆-haloalkoxy if it is bound to an oxygen atom;

R^{9a}, R^{9b} are, independently of each other and independently of each occurrence, selected from the group consisting of hydrogen, cyano, C₁-C₆-alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, where the alkyl moiety in the four last-mentioned radicals may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₃-C₈-cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₃-C₈-cycloalkyl-C₁-C₄-alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₂-C₆-alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₂-C₆-alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, -N(R²¹)R²²; -N(R²¹)C(=O)R¹⁹; -Si(R¹⁴)₂R¹³; -OR²⁰; -SR²⁰; -S(O)_mR²⁰; -S(O)_nN(R²¹)R²²; -C(=O)R¹⁹; -C(=O)OR²⁰; -C(=O)N(R²¹)R²²; -C(=S)R¹⁷; -C(=S)OR²⁰; -C(=S)N(R²¹)R²²; -C(=NR²¹)R¹⁷-S(O)_mR²⁰, -S(O)_nN(R²¹)R²², phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁰;

or R^{9a} and R^{9b} together form a group =CR¹¹R¹²;

or R^{9a} and R^{9b}, together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁰;

each R¹⁰ is independently selected from the group consisting of halogen, cyano, azido, nitro, -SCN, SF₅, C₁-C₁₀-alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁹, C₃-C₈-cycloalkyl which may be partially or fully halogenated and/or may be substituted

tuted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{19} , C_2 - C_{10} -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{19} , C_2 - C_{10} -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{19} , - $Si(R^{14})_2R^{13}$, - OR^{20} , - $OS(O)_nR^{20}$, - SR^{20} , - $S(O)_mR^{20}$, - $S(O)_nN(R^{21})R^{22}$, - $N(R^{21})R^{22}$, $C(=O)R^{19}$, - $C(=O)OR^{20}$, - $C(=NR^{21})R^{17}$, - $C(=O)N(R^{21})R^{22}$, - $C(=S)N(R^{21})R^{22}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, which may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals independently selected from halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy;

or two radicals R^{10} bound on adjacent atoms together form a group 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- , - $CH_2C(=S)S-$, - $C(=S)SCH_2-$, - $S(CH_2)S-$, - $CH_2CH_2NR^{21}-$, - $CH_2CH=N-$, - $CH=CH-NR^{21}-$, - $OCH=N-$ and - $SCH=N-$, thus forming, together with the atoms to which they are bound, a 5- or 6-membered ring, where the hydrogen atoms of the above groups may be replaced by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, substituents selected from halogen, methyl, halomethyl, hydroxyl, methoxy and halomethoxy or one or more, preferably 1 or 2, CH_2 groups of the above groups may be replaced by a $C=O$ group;

wherein, in the case of more than one R^{10} , R^{10} can be identical or different;

R^{11} , R^{12} are, independently of each other and independently of each occurrence, selected from the group consisting of hydrogen, halogen, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, 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_1 - C_6 -alkoxy- C_1 - C_6 -alkyl, C_1 - C_6 -haloalkoxy- C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, - $C(=O)R^{19}$, - $C(=O)OR^{20}$, - $C(=NR^{21})R^{17}$, - $C(=O)N(R^{21})R^{22}$, - $C(=S)N(R^{21})R^{22}$, phenyl which may be substituted by 1, 2, 3, 4, or 5 radicals R^{10} ; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, which may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

R¹³, R¹⁴ are, independently of each other and independently of each occurrence, selected from the group consisting of C₁-C₄-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, phenyl and benzyl;

R¹⁵, R¹⁶ are, independently of each other and independently of each occurrence, selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₁-C₆-haloalkoxy-C₁-C₆-alkyl, phenyl which may be substituted by 1, 2, 3, 4, or 5 radicals R¹⁰; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, which may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R¹⁰;

each R¹⁷ is independently selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₁-C₆-haloalkoxy-C₁-C₆-alkyl, phenyl and benzyl;

each R¹⁹ is independently selected from the group consisting of cyano, azido, nitro, -SCN, SF₅, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, -Si(R¹⁴)₂R¹³, -OR²⁰, -OSO₂R²⁰, -SR²⁰, -S(O)_mR²⁰, -S(O)_nN(R²¹)R²², -N(R²¹)R²², -C(=O)N(R²¹)R²², -C(=S)N(R²¹)R²², -C(=O)OR²⁰, -C(=O)R²⁰, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

and, in case R¹⁹ is bound to a cycloalkyl group, R¹⁹ may additionally be selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl and C₂-C₆-haloalkynyl;

and in groups -C(=O)R¹⁹ or -N(R²¹)C(=O)R¹⁹, R¹⁹ may additionally be selected from hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, and C₂-C₆-haloalkynyl;

or two geminally bound radicals R¹⁹ together form a group selected from =CR¹¹R¹², =S(O)_mR²⁰, =S(O)_mN(R²¹)R²², =NR²¹, =NOR²⁰ and =NNR²¹;

or two radicals R¹⁹, together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members;

each R²⁰ is independently selected from the group consisting of hydrogen, cyano, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkylsulfinyl, C₁-C₆-haloalkylsulfinyl, C₁-C₆-alkylsulfonyl, C₁-C₆-haloalkylsulfonyl, C₃-C₈-cycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, -Si(R¹⁴)₂R¹³, C₁-C₆-alkylaminosulfonyl, amino, C₁-C₆-alkylamino, di-(C₁-C₆-alkyl)-amino, C₁-C₆-alkylcarbonyl, C₁-C₆-haloalkylcarbonyl, aminocarbonyl, C₁-C₆-alkylaminocarbonyl, di-(C₁-C₆-alkyl)-aminocarbonyl, C₁-C₆-alkoxycarbonyl, C₁-C₆-haloalkoxycarbonyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

with the proviso that R²⁰ is not C₁-C₆-alkoxy or C₁-C₆-haloalkoxy if it is bound to an oxygen atom;

R²¹ and R²² are independently of each other and independently of each occurrence selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particu-

lar 1, radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

or R²¹ and R²², together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally containing 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals selected from halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

each m is independently 1 or 2;

each n is independently 0, 1 or 2;

p is 0, 1, 2 or 3;

r is 0, 1, 2, 3, or 4;

X is O or S; and

Y is O or S;

or a stereoisomer, salt, tautomer or N-oxide thereof.

Furthermore, the invention relates to processes for the synthesis of compounds according to the invention and to intermediate compounds for the synthesis of compounds of formula (I).

The compounds of the present invention, i.e. the compounds of formula (I), their stereoisomers, their salts, their tautomers or their N-oxides, are particularly useful for controlling invertebrate pests, in particular for controlling arthropods and nematodes and especially insects. Therefore, the invention also relates to the use of a compound of the present invention, for combating or controlling invertebrate pests, in particular invertebrate pests of the group of insects, arachnids or nematodes.

The term "compound(s) according to the invention" comprises the compound(s) as defined herein as well as a stereoisomer, salt, tautomer or N-oxide thereof. The term "compound(s) of the present invention" is to be understood as equivalent to the term "compound(s) according to the invention", therefore also comprising a stereoisomer, salt, tautomer or N-oxide thereof.

The term "composition(s) according to the invention" or "composition(s) of the present invention" comprises composition(s) comprising at least one compound according to the invention as defined above.

- 5 The invention also relates to a composition comprising at least one compound according to the invention, including a stereoisomer, salt, tautomer or N-oxide thereof, and at least one inert liquid and/or solid carrier. In particular, the invention relates to an agricultural or veterinary composition comprising at least one compound according to the invention including a stereoisomer, an agriculturally or veterinarily acceptable salt, tautomer or an N-oxide thereof, and at least one
10 liquid and/or solid carrier.

- The present invention also relates to a method for combating or controlling invertebrate pests, especially invertebrate pests of the group of insects, arachnids or nematodes, which method comprises contacting said pest or its food supply, habitat or breeding grounds with a pesticidally
15 effective amount of at least one compound according to the invention including a stereoisomer, salt, tautomer or N-oxide thereof or a composition according to the invention.

- The present invention also relates to a method for protecting growing plants from attack or infestation by invertebrate pests, especially invertebrate pests of the group of insects, arachnids
20 or nematodes, which method comprises contacting a plant, or soil or water in which the plant is growing or may grow, with a pesticidally effective amount of at least one compound according to the invention including a stereoisomer, salt, tautomer or N-oxide thereof or a composition according to the invention.

- 25 The present invention also relates to a method for the protection of plant propagation material, preferably 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 according to the invention including a stereoisomer, salt, tautomer or N-oxide thereof or a composition according to the invention..
30

The present invention also relates to plant propagation material, preferably seed, comprising a compound according to the invention including a stereoisomer, salt, tautomer or N-oxide thereof, preferably in an amount of from 0.01 g to 10 kg per 100 kg of the plant propagation material.

- 35 The present invention also relates to the use of a compound according to the invention including a stereoisomer, salt, tautomer or N-oxide thereof or a composition according to the invention for combating or controlling invertebrate pests of the group of insects, arachnids or nematodes.

- The present invention also relates to the use of a compound according to the invention including
40 a stereoisomer, salt or N-oxide thereof or a composition according to the invention for protecting growing plants from attack or infestation by invertebrate pests of the group of insects, arachnids or nematodes.

The present invention also relates to the use of a compound according to the invention including a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof or a composition according to the invention for combating or controlling invertebrate parasites in and on animals
5 and to the use of a compound according to the invention including a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof or a composition according to the invention for preparing a medicament for combating or controlling invertebrate parasites in and on animals.

The present invention also relates to a method for treating an animal infested or infected by
10 parasites or for preventing animals from getting infested or infected by parasites or for protecting an animal against infestation or infection by parasites which comprises orally, topically or parenterally administering or applying to the animal a parasitically effective amount of a compound according to the invention including a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof or a composition according to the invention.

15 The present invention also relates to the use of a compound according to the invention including a stereoisomer, veterinarily acceptable salt or N-oxide thereof or a composition according to the invention for the manufacture of a medicament for protecting an animal against infestation or infection by parasites or treating an animal infested or infected by parasites.

20 The present invention also relates to a process for the preparation of a composition for treating animals infested or infected by parasites, for preventing animals of getting infected or infested by parasites or protecting animals against infestation or infection by parasites which comprises a compound according to the invention including a stereoisomer, veterinarily acceptable salt,
25 tautomer or N-oxide thereof.

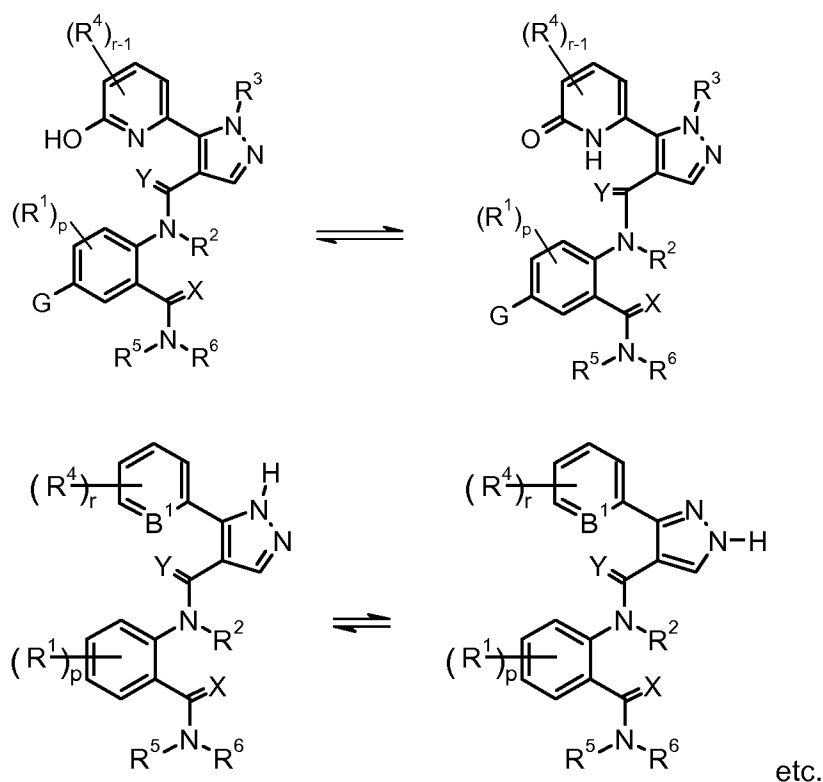
The present invention also relates to a compound according to the invention including a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof for use as a medicament.

30 The present invention also relates to a compound according to the invention including a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof for use in the treatment, control, prevention or protection of animals against infestation or infection by parasites.

35 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. The invention provides both the pure enantiomers or pure diastereomers of the compounds of formula (I), and their mixtures and the use according to the invention of the pure enantiomers or pure diastereomers of the compound of formula (I) or its mixtures. Suitable compounds of the formula (I) also include all possible geometrical stereoisomers (cis/trans isomers) and mixtures
40 thereof. Another aspect may be the presence of atropisomerism due to hindered rotation of the amide moiety (for review articles on axial chirality and atropisomerism, see for example J. Clayden, Tetrahedron 2004, 60, 4335 and for the axial chirality arising from the sp^2 - sp^2 axis of the

benzene-amide bond, see Y. Ishichi et al, Tetrahedron 2004, 60, 4481). Cis/trans isomers may be present with respect to an alkene, carbon-nitrogen double-bond, nitrogen-sulfur double bond or amide group. The term "stereoisomer(s)" encompasses both optical isomers, such as enantiomers or diastereomers, the latter existing due to more than one center of chirality in the molecule, as well as geometrical isomers (cis/trans isomers).

Depending on the substitution pattern, the compounds of the formula (I) may be present in the form of their tautomers. Hence the invention also relates to the tautomers of the formula (I) and the stereoisomers, salts, tautomers and N-oxides of said tautomers. For instance, if R⁴ is OH which is bound vicinally to B¹ and B¹ is N, or if R³ is H, the compounds (I) may be present in the below tautomeric forms:



The term "N-oxide" includes any compound of the present invention which has at least one tertiary nitrogen atom that is oxidized to an N-oxide moiety. N-oxides are in particular possible in compounds (I) in which B¹ is N. N-oxides of such compounds can be prepared by oxidizing the ring nitrogen atom with a suitable oxidizing agent, such as peroxy carboxylic acids or other peroxides.

The compounds of the present invention may be amorphous or may exist in one or more different crystalline states (polymorphs) which may have different macroscopic properties such as stability or show different biological properties such as activities. The present invention includes both amorphous and crystalline compounds of formula (I), their enantiomers or diastereomers, mixtures of different crystalline states of the respective compound of formula (I), its enantiomers

or diastereomers, as well as amorphous or crystalline salts thereof.

Salts of the compounds of the present invention are preferably agriculturally and veterinarily acceptable salts. They can be formed in a customary method, e.g. by reacting the compound
5 with an acid if the compound of the present invention has a basic functionality or by reacting the compound with a suitable base if the compound of the present invention has an acidic functionality.

Suitable agriculturally acceptable salts are especially the salts of those cations or the acid addition salts of those acids whose cations and anions, respectively, do not have any adverse effect
10 on the pesticidal 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
15 or benzyl. Examples of substituted ammonium ions comprise methylammonium, isopropylammonium, dimethylammonium, diisopropylammonium, trimethylammonium, tetramethylammonium, tetraethylammonium, tetrabutylammonium, 2-hydroxyethylammonium, 2-(2-hydroxyethoxy)ethylammonium, bis(2-hydroxyethyl)ammonium, benzyltrimethylammonium and
20 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, hydrogensulfate, sulfate, dihydrogenphosphate, hydrogenphosphate, phosphate, nitrate, bicarbonate, carbonate, hexafluorosilicate, hexafluorophosphate, benzoate, and the anions of C_1 - C_4 -alkanoic acids,
25 preferably formate, acetate, propionate and butyrate. They can be formed by reacting compounds of the present invention with an acid of the corresponding anion, preferably of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid or nitric acid.

Veterinarily acceptable salts of the compounds of the present invention encompass the salts of those cations or the acid addition salts which are known and accepted in the art for the formation of salts for veterinary use. Suitable acid addition salts, e.g. formed by compounds of the
30 present invention containing a basic nitrogen atom, e.g. an amino group, include salts with inorganic acids, for example hydrochlorids, sulphates, phosphates, and nitrates and salts of organic acids for example acetic acid, maleic acid, e.g. the monoacid salts or diacid salts of maleic acid, dimaleic acid, fumaric acid, e.g. the monoacid salts or diacid salts of fumaric acid, difumaric
35 acid, methane sulfenic acid, methane sulfonic acid, and succinic acid.

The term "invertebrate pest" as used herein encompasses animal populations, such as arthropode pests, including insects and arachnids, as well as nematodes, which may attack plants thereby causing substantial damage to the plants attacked, as well as ectoparasites which may
40 infest animals, in particular warm blooded animals such as e.g. mammals or birds, or other higher animals such as reptiles, amphibians or fish, thereby causing substantial damage to the animals infested.

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 "plants" comprises any types of plants including "non-cultivated plants" and in particular "cultivated plants".

The term "non-cultivated plants" refers to any wild type species or related species or related genera of a cultivated plant.

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, the genetic material of which has been modified by the use of recombinant DNA techniques so that under natural circumstances it 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-translational modification of protein(s) (oligo- or polypeptides), e.g. 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 6222100, 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 δ -endotoxins, e. g. CryIA(b), CryIA(c), CryIF, CryIF(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 *Streptomyces* 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 disclosed, 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 by the use of recombinant DNA techniques capable to synthesize one or more proteins 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" (PR proteins, see, for example EP-A 0 392 225), 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 amylovora*). 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 by the use of recombinant DNA techniques capable to synthesize one or more proteins to increase the productivity (e. g. bio mass production, grain yield, starch content, oil content or protein content), 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. Nex-
5 era® 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 in-
creased amounts of amylopectin (e. g. Amflora® potato).

10 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.

15 The term halogen denotes in each case fluorine, bromine, chlorine or iodine, in particular fluo-
rine, chlorine or bromine.

The term "partially or fully 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 par-
20 ticular by fluorine or chlorine. A partially or fully halogenated radical is termed below also "halo-
radical". For example, partially or fully halogenated alkyl is also termed haloalkyl.

The term "alkyl" as used herein (and in the alkyl moieties of other groups comprising an alkyl
group, e.g. alkoxy, alkylcarbonyl, alkylthio, alkylsulfinyl, alkylsulfonyl and alkoxyalkyl) denotes in
25 each case a straight-chain or branched alkyl group having usually from 1 to 10 carbon atoms,
frequently from 1 to 6 carbon atoms, preferably 1 to 4 carbon atoms and in particular from 1 to 3
carbon atoms. Examples of C₁-C₄-alkyl are methyl, ethyl, n-propyl, iso-propyl, n-butyl, 2-butyl
(sec-butyl), isobutyl and tert-butyl. Examples for C₁-C₆-alkyl are, apart those mentioned for C₁-
C₄-alkyl, n-pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, 1-ethylpropyl,
30 n-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 and 1-ethyl-2-methylpropyl. Examples for C₁-C₁₀-alkyl
are, apart those mentioned for C₁-C₆-alkyl, n-heptyl, 1-methylhexyl, 2-methylhexyl, 3-
35 methylhexyl, 4-methylhexyl, 5-methylhexyl, 1-ethylpentyl, 2-ethylpentyl, 3-ethylpentyl, n-octyl, 1-
methyloctyl, 2-methylheptyl, 1-ethylhexyl, 2-ethylhexyl, 1,2-dimethylhexyl, 1-propylpentyl, 2-
propylpentyl, nonyl, decyl, 2-propylheptyl and 3-propylheptyl.

40 The term "alkylene" (or alkanediyl) as used herein in each case denotes an alkyl radical as de-
fined above, wherein one hydrogen atom at any position of the carbon backbone is replaced by
one further binding site, thus forming a bivalent moiety.

The term "haloalkyl" as used herein (and in the haloalkyl moieties of other groups comprising a haloalkyl group, e.g. haloalkoxy, haloalkylthio, haloalkylcarbonyl, haloalkylsulfonyl and haloalkylsulfinyl) denotes in each case a straight-chain or branched alkyl group having usually from 1 to 10 carbon atoms ("C₁-C₁₀-haloalkyl"), frequently from 1 to 6 carbon atoms ("C₁-C₆-haloalkyl"), more frequently 1 to 4 carbon atoms ("C₁-C₄-haloalkyl"), wherein the hydrogen atoms of this group are partially or totally replaced with halogen atoms. Preferred haloalkyl moieties are selected from C₁-C₄-haloalkyl, more preferably from C₁-C₂-haloalkyl, more preferably from halomethyl, in particular from C₁-C₂-fluoroalkyl. Halomethyl is methyl in which 1, 2 or 3 of the hydrogen atoms are replaced by halogen atoms. Examples are bromomethyl, chloromethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl, dichlorofluoromethyl, chlorodifluoromethyl and the like. Examples for C₁-C₂-fluoroalkyl are fluoromethyl, difluoromethyl, trifluoromethyl, 1-fluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, pentafluoroethyl, and the like. Examples for C₁-C₂-haloalkyl are, apart those mentioned for C₁-C₂-fluoroalkyl, chloromethyl, dichloromethyl, trichloromethyl, bromomethyl, chlorofluoromethyl, dichlorofluoromethyl, chlorodifluoromethyl, 1-chloroethyl, 2-chloroethyl, 2,2-dichloroethyl, 2,2,2-trichloroethyl, 2-chloro-2-fluoroethyl, 2-chloro-2,2-difluoroethyl, 2,2-dichloro-2-fluoroethyl, 1-bromoethyl, and the like. Examples for C₁-C₄-haloalkyl are, apart those mentioned for C₁-C₂-haloalkyl, 1-fluoropropyl, 2-fluoropropyl, 3-fluoropropyl, 3,3-difluoropropyl, 3,3,3-trifluoropropyl, heptafluoropropyl, 1,1,1-trifluoroprop-2-yl, 3-chloropropyl, 4-chlorobutyl and the like.

The term "cycloalkyl" as used herein (and in the cycloalkyl moieties of other groups comprising a cycloalkyl group, e.g. cycloalkoxy and cycloalkylalkyl) denotes in each case a mono- or bicyclic cycloaliphatic radical having usually from 3 to 10 carbon atoms ("C₃-C₁₀-cycloalkyl"), preferably 3 to 8 carbon atoms ("C₃-C₈-cycloalkyl") or in particular 3 to 6 carbon atoms ("C₃-C₆-cycloalkyl"). Examples of monocyclic radicals having 3 to 6 carbon atoms comprise cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl. Examples of monocyclic radicals having 3 to 8 carbon atoms comprise cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl and cyclooctyl. Examples of bicyclic radicals having 7 or 8 carbon atoms comprise bicyclo[2.1.1]hexyl, bicyclo[2.2.1]heptyl, bicyclo[3.1.1]heptyl, bicyclo[2.2.1]heptyl, bicyclo[2.2.2]octyl and bicyclo[3.2.1]octyl.

The term "halocycloalkyl" as used herein (and in the halocycloalkyl moieties of other groups comprising an halocycloalkyl group, e.g. halocycloalkylmethyl) denotes in each case a mono- or bicyclic cycloaliphatic radical having usually from 3 to 10 carbon atoms, preferably 3 to 8 carbon atoms or in particular 3 to 6 carbon atoms, wherein at least one, e.g. 1, 2, 3, 4 or 5 of the hydrogen atoms are replaced by halogen, in particular by fluorine or chlorine. Examples are 1- and 2-fluorocyclopropyl, 1,2-, 2,2- and 2,3-difluorocyclopropyl, 1,2,2-trifluorocyclopropyl, 2,2,3,3-tetrafluorocyclopropyl, 1- and 2-chlorocyclopropyl, 1,2-, 2,2- and 2,3-dichlorocyclopropyl, 1,2,2-trichlorocyclopropyl, 2,2,3,3-tetrachlorocyclopropyl, 1-, 2- and 3-fluorocyclopentyl, 1,2-, 2,2-, 2,3-, 3,3-, 3,4-, 2,5-difluorocyclopentyl, 1-, 2- and 3-chlorocyclopentyl, 1,2-, 2,2-, 2,3-, 3,3-, 3,4-, 2,5-dichlorocyclopentyl and the like.

The term "cycloalkyl-alkyl" used herein denotes a cycloalkyl group, as defined above, which is bound to the remainder of the molecule via an alkylene group. The term "C₃-C₈-cycloalkyl-C₁-C₄-alkyl" refers to a C₃-C₈-cycloalkyl group as defined above which is bound to the remainder of the molecule via a C₁-C₄-alkyl group, as defined above. Examples are cyclopropylmethyl, cyclopropylethyl, cyclopropylpropyl, cyclobutylmethyl, cyclobutylethyl, cyclobutylpropyl, cyclopentylmethyl, cyclopentylethyl, cyclopentylpropyl, cyclohexylmethyl, cyclohexylethyl, cyclohexylpropyl, and the like.

The term "alkenyl" as used herein denotes in each case a monounsaturated straight-chain or branched hydrocarbon radical having usually 2 to 10 ("C₂-C₁₀-alkenyl"), preferably 2 to 6 carbon atoms ("C₂-C₆-alkenyl"), in particular 2 to 4 carbon atoms ("C₂-C₄-alkenyl"), and a double bond in any position, for example C₂-C₄-alkenyl, such as ethenyl, 1-propenyl, 2-propenyl, 1-methylethenyl, 1-butenyl, 2-butenyl, 3-butenyl, 1-methyl-1-propenyl, 2-methyl-1-propenyl, 1-methyl-2-propenyl or 2-methyl-2-propenyl; C₂-C₆-alkenyl, such as ethenyl, 1-propenyl, 2-propenyl, 1-methylethenyl, 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, 1-ethyl-2-methyl-2-propenyl and the like, or C₂-C₁₀-alkenyl, such as the radicals mentioned for C₂-C₆-alkenyl and additionally 1-heptenyl, 2-heptenyl, 3-heptenyl, 1-octenyl, 2-octenyl, 3-octenyl, 4-octenyl, 1-nonenyl, 2-nonenyl, 3-nonenyl, 4-nonenyl, 1-decenyl, 2-decenyl, 3-decenyl, 4-decenyl, 5-decenyl and the positional isomers thereof.

The term "haloalkenyl" as used herein, which may also be expressed as "alkenyl which may be substituted by halogen", and the haloalkenyl moieties in haloalkenyloxy, haloalkenylcarbonyl and the like refers to unsaturated straight-chain or branched hydrocarbon radicals having 2 to 10 ("C₂-C₁₀-haloalkenyl") or 2 to 6 ("C₂-C₆-haloalkenyl") or 2 to 4 ("C₂-C₄-haloalkenyl") carbon atoms and a double bond in any position, 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 chlorovinyl, chloroallyl and the like.

The term "alkynyl" as used herein denotes unsaturated straight-chain or branched hydrocarbon radicals having usually 2 to 10 ("C₂-C₁₀-alkynyl"), frequently 2 to 6 ("C₂-C₆-alkynyl"), preferably 2 to 4 carbon atoms ("C₂-C₄-alkynyl") and one or two triple bonds in any position, for example C₂-C₄-alkynyl, such as ethynyl, 1-propynyl, 2-propynyl, 1-butyne, 2-butyne, 3-butyne, 1-methyl-2-propynyl and the like, C₂-C₆-alkynyl, such as ethynyl, 1-propynyl, 2-propynyl, 1-butyne, 2-butyne, 3-butyne, 1-methyl-2-propynyl, 1-pentyne, 2-pentyne, 3-pentyne, 4-pentyne, 1-methyl-2-butyne, 1-methyl-3-butyne, 2-methyl-3-butyne, 3-methyl-1-butyne, 1,1-dimethyl-2-propynyl, 1-ethyl-2-propynyl, 1-hexynyl, 2-hexynyl, 3-hexynyl, 4-hexynyl, 5-hexynyl, 1-methyl-2-pentyne, 1-methyl-3-pentyne, 1-methyl-4-pentyne, 2-methyl-3-pentyne, 2-methyl-4-pentyne, 3-methyl-1-pentyne, 3-methyl-4-pentyne, 4-methyl-1-pentyne, 4-methyl-2-pentyne, 1,1-dimethyl-2-butyne, 1,1-dimethyl-3-butyne, 1,2-dimethyl-3-butyne, 2,2-dimethyl-3-butyne, 3,3-dimethyl-1-butyne, 1-ethyl-2-butyne, 1-ethyl-3-butyne, 2-ethyl-3-butyne, 1-ethyl-1-methyl-2-propynyl and the like.

The term haloalkynyl as used herein, which is also expressed as "alkynyl which may be substituted by halogen", refers to unsaturated straight-chain or branched hydrocarbon radicals having usually 3 to 10 carbon atoms ("C₂-C₁₀-haloalkynyl"), frequently 2 to 6 ("C₂-C₆-haloalkynyl"), preferably 2 to 4 carbon atoms ("C₂-C₄-haloalkynyl"), and one or two triple bonds in any position (as mentioned above), 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.

The term "alkoxy" as used herein denotes in each case a straight-chain or branched alkyl group usually having from 1 to 10 carbon atoms ("C₁-C₁₀-alkoxy"), frequently from 1 to 6 carbon atoms ("C₁-C₆-alkoxy"), preferably 1 to 4 carbon atoms ("C₁-C₄-alkoxy"), which is bound to the remainder of the molecule via an oxygen atom. C₁-C₂-Alkoxy is methoxy or ethoxy. C₁-C₄-Alkoxy is additionally, for example, n-propoxy, 1-methylethoxy (isopropoxy), butoxy, 1-methylpropoxy (sec-butoxy), 2-methylpropoxy (isobutoxy) or 1,1-dimethylethoxy (tert-butoxy). C₁-C₆-Alkoxy is additionally, 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. C₁-C₈-Alkoxy is additionally, for example, heptyloxy, octyloxy, 2-ethylhexyloxy and positional isomers thereof. C₁-C₁₀-Alkoxy is additionally, for example, nonyloxy, decyloxy and positional isomers thereof.

The term "haloalkoxy" as used herein denotes in each case a straight-chain or branched alkoxy group, as defined above, having from 1 to 10 carbon atoms ("C₁-C₁₀-haloalkoxy"), frequently from 1 to 6 carbon atoms ("C₁-C₆-haloalkoxy"), preferably 1 to 4 carbon atoms ("C₁-C₄-haloalkoxy"), more preferably 1 to 3 carbon atoms ("C₁-C₃-haloalkoxy"), wherein the hydrogen atoms of this group are partially or totally replaced with halogen atoms, in particular fluorine at-

oms. C₁-C₂-Haloalkoxy is, for example, OCH₂F, OCHF₂, OCF₃, OCH₂Cl, OCHCl₂, OCCl₃, chlorofluoromethoxy, dichlorofluoromethoxy, chlorodifluoromethoxy, 2-fluoroethoxy, 2-chloroethoxy, 2-bromoethoxy, 2-iodoethoxy, 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 or OC₂F₅. C₁-C₄-Haloalkoxy is additionally, for example, 2-fluoropropoxy, 3-fluoropropoxy, 2,2-difluoropropoxy, 2,3-difluoropropoxy, 2-chloropropoxy, 3-chloropropoxy, 2,3-dichloropropoxy, 2-bromopropoxy, 3-bromopropoxy, 3,3,3-trifluoropropoxy, 3,3,3-trichloropropoxy, OCH₂-C₂F₅, OCF₂-C₂F₅, 1-(CH₂F)-2-fluoroethoxy, 1-(CH₂Cl)-2-chloroethoxy, 1-(CH₂Br)-2-bromoethoxy, 4-fluorobutoxy, 4-chlorobutoxy, 4-bromobutoxy or nonafluorobutoxy. C₁-C₆-Haloalkoxy is additionally, for example, 5-fluoropentoxy, 5-chloropentoxy, 5-bromopentoxy, 5-iodopentoxy, undecafluoropentoxy, 6-fluorohexoxy, 6-chlorohexoxy, 6-bromohexoxy, 6-iodohexoxy or dodecafluorohexoxy.

The term "alkoxy-alkyl" as used herein denotes in each case alkyl usually comprising 1 to 6 carbon atoms, preferably 1 to 4 carbon atoms, wherein 1 carbon atom carries an alkoxy radical usually comprising 1 to 10, frequently 1 to 6, in particular 1 to 4, carbon atoms as defined above. "C₁-C₆-Alkoxy-C₁-C₆-alkyl" is a C₁-C₆-alkyl group, as defined above, in which one hydrogen atom is replaced by a C₁-C₆-alkoxy group, as defined above. Examples are CH₂OCH₃, CH₂-OC₂H₅, n-propoxymethyl, CH₂-OCH(CH₃)₂, n-butoxymethyl, (1-methylpropoxy)-methyl, (2-methylpropoxy)methyl, CH₂-OC(CH₃)₃, 2-(methoxy)ethyl, 2-(ethoxy)ethyl, 2-(n-propoxy)-ethyl, 2-(1-methylethoxy)-ethyl, 2-(n-butoxy)ethyl, 2-(1-methylpropoxy)-ethyl, 2-(2-methylpropoxy)-ethyl, 2-(1,1-dimethylethoxy)-ethyl, 2-(methoxy)-propyl, 2-(ethoxy)-propyl, 2-(n-propoxy)-propyl, 2-(1-methylethoxy)-propyl, 2-(n-butoxy)-propyl, 2-(1-methylpropoxy)-propyl, 2-(2-methylpropoxy)-propyl, 2-(1,1-dimethylethoxy)-propyl, 3-(methoxy)-propyl, 3-(ethoxy)-propyl, 3-(n-propoxy)-propyl, 3-(1-methylethoxy)-propyl, 3-(n-butoxy)-propyl, 3-(1-methylpropoxy)-propyl, 3-(2-methylpropoxy)-propyl, 3-(1,1-dimethylethoxy)-propyl, 2-(methoxy)-butyl, 2-(ethoxy)-butyl, 2-(n-propoxy)-butyl, 2-(1-methylethoxy)-butyl, 2-(n-butoxy)-butyl, 2-(1-methylpropoxy)-butyl, 2-(2-methylpropoxy)-butyl, 2-(1,1-dimethylethoxy)-butyl, 3-(methoxy)-butyl, 3-(ethoxy)-butyl, 3-(n-propoxy)-butyl, 3-(1-methylethoxy)-butyl, 3-(n-butoxy)-butyl, 3-(1-methylpropoxy)-butyl, 3-(2-methylpropoxy)-butyl, 3-(1,1-dimethylethoxy)-butyl, 4-(methoxy)-butyl, 4-(ethoxy)-butyl, 4-(n-propoxy)-butyl, 4-(1-methylethoxy)-butyl, 4-(n-butoxy)-butyl, 4-(1-methylpropoxy)-butyl, 4-(2-methylpropoxy)-butyl, 4-(1,1-dimethylethoxy)-butyl and the like.

The term "haloalkoxy-alkyl" as used herein denotes in each case alkyl as defined above, usually comprising 1 to 6 carbon atoms, preferably 1 to 4 carbon atoms, wherein 1 carbon atom carries an haloalkoxy radical as defined above, usually comprising 1 to 10, frequently 1 to 6, in particular 1 to 4, carbon atoms as defined above. Examples are fluoromethoxymethyl, difluoromethoxymethyl, trifluoromethoxymethyl, 1-fluoroethoxymethyl, 2-fluoroethoxymethyl, 1,1-difluoroethoxymethyl, 1,2-difluoroethoxymethyl, 2,2-difluoroethoxymethyl, 1,1,2-trifluoroethoxymethyl, 1,2,2-trifluoroethoxymethyl, 2,2,2-trifluoroethoxymethyl, pentafluoroethoxymethyl, 1-fluoroethoxy-1-ethyl, 2-fluoroethoxy-1-ethyl, 1,1-difluoroethoxy-1-ethyl, 1,2-difluoroethoxy-1-ethyl, 2,2-difluoroethoxy-1-ethyl, 1,1,2-trifluoroethoxy-1-ethyl, 1,2,2-

trifluoroethoxy-1-ethyl, 2,2,2-trifluoroethoxy-1-ethyl, pentafluoroethoxy-1-ethyl, 1-fluoroethoxy-2-ethyl, 2-fluoroethoxy-2-ethyl, 1,1-difluoroethoxy-2-ethyl, 1,2-difluoroethoxy-2-ethyl, 2,2-difluoroethoxy-2-ethyl, 1,1,2-trifluoroethoxy-2-ethyl, 1,2,2-trifluoroethoxy-2-ethyl, 2,2,2-trifluoroethoxy-2-ethyl, pentafluoroethoxy-2-ethyl, and the like.

5

The term "alkylthio" (also alkylsulfanyl or alkyl-S-) as used herein denotes in each case a straight-chain or branched saturated alkyl group as defined above, usually comprising 1 to 10 carbon atoms ("C₁-C₁₀-alkylthio"), frequently comprising 1 to 6 carbon atoms ("C₁-C₆-alkylthio"), preferably 1 to 4 carbon atoms ("C₁-C₄-alkylthio"), which is attached via a sulfur atom at any position in the alkyl group. C₁-C₂-Alkylthio is methylthio or ethylthio. C₁-C₄-Alkylthio is additionally, for example, n-propylthio, 1-methylethylthio (isopropylthio), butylthio, 1-methylpropylthio (sec-butylthio), 2-methylpropylthio (isobutylthio) or 1,1-dimethylethylthio (tert-butylthio). C₁-C₆-Alkylthio is additionally, 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. C₁-C₈-Alkylthio is additionally, for example, heptylthio, octylthio, 2-ethylhexylthio and positional isomers thereof. C₁-C₁₀-Alkylthio is additionally, for example, nonylthio, decylthio and positional isomers thereof.

The term "haloalkylthio" as used herein refers to an alkylthio group as defined above wherein the hydrogen atoms are partially or fully substituted by fluorine, chlorine, bromine and/or iodine. C₁-C₂-Haloalkylthio is, for example, SCH₂F, SCHF₂, SCF₃, SCH₂Cl, SCHCl₂, SClCl₃, chloro-fluoromethylthio, dichlorofluoromethylthio, chlorodifluoromethylthio, 2-fluoroethylthio, 2-chloroethylthio, 2-bromoethylthio, 2-iodoethylthio, 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 or SC₂F₅. C₁-C₄-Haloalkylthio is additionally, for example, 2-fluoropropylthio, 3-fluoropropylthio, 2,2-difluoropropylthio, 2,3-difluoropropylthio, 2-chloropropylthio, 3-chloropropylthio, 2,3-dichloropropylthio, 2-bromopropylthio, 3-bromopropylthio, 3,3,3-trifluoropropylthio, 3,3,3-trichloropropylthio, SCH₂-C₂F₅, SCF₂-C₂F₅, 1-(CH₂F)-2-fluoroethylthio, 1-(CH₂Cl)-2-chloroethylthio, 1-(CH₂Br)-2-bromoethylthio, 4-fluorobutylthio, 4-chlorobutylthio, 4-bromobutylthio or nonafluorobutylthio. C₁-C₆-Haloalkylthio is additionally, for example, 5-fluoropentylthio, 5-chloropentylthio, 5-bromopentylthio, 5-iodopentylthio, undecafluoropentylthio, 6-fluorohexylthio, 6-chlorohexylthio, 6-bromohexylthio, 6-iodohexylthio or dodecafluorohexylthio.

The terms "alkylsulfinyl" and "S(O)_n-alkyl" (wherein n is 1) are equivalent and, as used herein, denote an alkyl group, as defined above, attached via a sulfinyl [S(O)] group. For example, the term "C₁-C₂-alkylsulfinyl" refers to a C₁-C₂-alkyl group, as defined above, attached via a sulfinyl [S(O)] group. The term "C₁-C₄-alkylsulfinyl" refers to a C₁-C₄-alkyl group, as defined above, at-

5 attached via a sulfinyl [S(O)] group. The term "C₁-C₆-alkylsulfinyl" refers to a C₁-C₆-alkyl group, as defined above, attached via a sulfinyl [S(O)] group. C₁-C₂-alkylsulfinyl is methylsulfinyl or ethylsulfinyl. C₁-C₄-alkylsulfinyl is additionally, for example, n-propylsulfinyl, 1-methylethylsulfinyl (isopropylsulfinyl), butylsulfinyl, 1-methylpropylsulfinyl (sec-butylsulfinyl), 2-methylpropylsulfinyl (isobutylsulfinyl) or 1,1-dimethylethylsulfinyl (tert-butylsulfinyl). C₁-C₆-alkylsulfinyl is additionally, for example, pentylsulfinyl, 1-methylbutylsulfinyl, 2-methylbutylsulfinyl, 3-methylbutylsulfinyl, 1,1-dimethylpropylsulfinyl, 1,2-dimethylpropylsulfinyl, 2,2-dimethylpropylsulfinyl, 1-ethylpropylsulfinyl, hexylsulfinyl, 1-methylpentylsulfinyl, 2-methylpentylsulfinyl, 3-methylpentylsulfinyl, 4-methylpentylsulfinyl, 1,1-dimethylbutylsulfinyl, 1,2-dimethylbutylsulfinyl, 1,3-dimethylbutylsulfinyl, 2,2-dimethylbutylsulfinyl, 2,3-dimethylbutylsulfinyl, 3,3-dimethylbutylsulfinyl, 1-ethylbutylsulfinyl, 2-ethylbutylsulfinyl, 1,1,2-trimethylpropylsulfinyl, 1,2,2-trimethylpropylsulfinyl, 1-ethyl-1-methylpropylsulfinyl or 1-ethyl-2-methylpropylsulfinyl.

15 The terms "haloalkylsulfinyl" and "S(O)_n-haloalkyl" (wherein n is 1) are equivalent and, as used herein, denote a haloalkyl group, as defined above, attached via a sulfinyl [S(O)] group. The term "S(O)_n-C₁-C₄-haloalkyl" (wherein n is 1), i.e. "C₁-C₄-haloalkylsulfinyl", is a C₁-C₄-haloalkyl group, as defined above, attached via a sulfinyl [S(O)] group. The term "C₁-C₆-haloalkylsulfinyl" is a C₁-C₆-haloalkyl group, as defined above, attached via a sulfinyl [S(O)] group. C₁-C₂-Haloalkylsulfinyl is, for example, S(O)CH₂F, S(O)CHF₂, S(O)CF₃, S(O)CH₂Cl, S(O)CHCl₂, S(O)CCl₃, chlorofluoromethylsulfinyl, dichlorofluoromethylsulfinyl, chlorodifluoromethylsulfinyl, 2-fluoroethylsulfinyl, 2-chloroethylsulfinyl, 2-bromoethylsulfinyl, 2-iodoethylsulfinyl, 2,2-difluoroethylsulfinyl, 2,2,2-trifluoroethylsulfinyl, 2-chloro-2-fluoroethylsulfinyl, 2-chloro-2,2-difluoroethylsulfinyl, 2,2-dichloro-2-fluoroethylsulfinyl, 2,2,2-trichloroethylsulfinyl or S(O)C₂F₅. C₁-C₄-haloalkylsulfinyl is additionally, for example, 2-fluoropropylsulfinyl, 3-fluoropropylsulfinyl, 2,2-difluoropropylsulfinyl, 2,3-difluoropropylsulfinyl, 2-chloropropylsulfinyl, 3-chloropropylsulfinyl, 2,3-dichloropropylsulfinyl, 2-bromopropylsulfinyl, 3-bromopropylsulfinyl, 3,3,3-trifluoropropylsulfinyl, 3,3,3-trichloropropylsulfinyl, S(O)CH₂-C₂F₅, S(O)CF₂-C₂F₅, 1-(CH₂F)-2-fluoroethylsulfinyl, 1-(CH₂Cl)-2-chloroethylsulfinyl, 1-(CH₂Br)-2-bromoethylsulfinyl, 4-fluorobutylsulfinyl, 4-chlorobutylsulfinyl, 4-bromobutylsulfinyl or nonafluorobutylsulfinyl. C₁-C₆-Haloalkylsulfinyl is additionally, for example, 5-fluoropentylsulfinyl, 5-chloropentylsulfinyl, 5-bromopentylsulfinyl, 5-iodopentylsulfinyl, undecafluoropentylsulfinyl, 6-fluorohexylsulfinyl, 6-chlorohexylsulfinyl, 6-bromohexylsulfinyl, 6-iodohexylsulfinyl or dodecafluorohexylsulfinyl.

35 The terms "alkylsulfonyl" and "S(O)_n-alkyl" (wherein n is 2) are equivalent and, as used herein, denote an alkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. The term "C₁-C₂-alkylsulfonyl" refers to a C₁-C₂-alkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. The term "C₁-C₄-alkylsulfonyl" refers to a C₁-C₄-alkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. The term "C₁-C₆-alkylsulfonyl" refers to a C₁-C₆-alkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. C₁-C₂-alkylsulfonyl is methylsulfonyl or ethylsulfonyl. C₁-C₄-alkylsulfonyl is additionally, for example, n-propylsulfonyl, 1-methylethylsulfonyl (isopropylsulfonyl), butylsulfonyl, 1-methylpropylsulfonyl (sec-butylsulfonyl), 2-methylpropylsulfonyl (isobutylsulfonyl) or 1,1-dimethylethylsulfonyl (tert-butylsulfonyl). C₁-C₆-

alkylsulfonyl is additionally, for example, pentylsulfonyl, 1-methylbutylsulfonyl, 2-methylbutylsulfonyl, 3-methylbutylsulfonyl, 1,1-dimethylpropylsulfonyl, 1,2-dimethylpropylsulfonyl, 2,2-dimethylpropylsulfonyl, 1-ethylpropylsulfonyl, hexylsulfonyl, 1-methylpentylsulfonyl, 2-methylpentylsulfonyl, 3-methylpentylsulfonyl, 4-methylpentylsulfonyl, 1,1-dimethylbutylsulfonyl, 1,2-dimethylbutylsulfonyl, 1,3-dimethylbutylsulfonyl, 2,2-dimethylbutylsulfonyl, 2,3-dimethylbutylsulfonyl, 3,3-dimethylbutylsulfonyl, 1-ethylbutylsulfonyl, 2-ethylbutylsulfonyl, 1,1,2-trimethylpropylsulfonyl, 1,2,2-trimethylpropylsulfonyl, 1-ethyl-1-methylpropylsulfonyl or 1-ethyl-2-methylpropylsulfonyl.

The terms "haloalkylsulfonyl" and "S(O)_n-haloalkyl" (wherein n is 2) are equivalent and, as used herein, denote a haloalkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. The term "S(O)_n-C₁-C₄-haloalkyl" (wherein n is 2), i.e. "C₁-C₄-haloalkylsulfonyl", is a C₁-C₄-haloalkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. The term "C₁-C₆-haloalkylsulfonyl" is a C₁-C₆-haloalkyl group, as defined above, attached via a sulfonyl [S(O)₂] group. C₁-C₂-Haloalkylsulfonyl is, for example, S(O)₂CH₂F, S(O)₂CHF₂, S(O)₂CF₃, S(O)₂CH₂Cl, S(O)₂CHCl₂, S(O)₂CCl₃, chlorofluoromethylsulfonyl, dichlorofluoromethylsulfonyl, chlorodifluoromethylsulfonyl, 2-fluoroethylsulfonyl, 2-chloroethylsulfonyl, 2-bromoethylsulfonyl, 2-iodoethylsulfonyl, 2,2-difluoroethylsulfonyl, 2,2,2-trifluoroethylsulfonyl, 2-chloro-2-fluoroethylsulfonyl, 2-chloro-2,2-difluoroethylsulfonyl, 2,2-dichloro-2-fluoroethylsulfonyl, 2,2,2-trichloroethylsulfonyl or S(O)₂C₂F₅. C₁-C₄-Haloalkylsulfonyl is additionally, for example, 2-fluoropropylsulfonyl, 3-fluoropropylsulfonyl, 2,2-difluoropropylsulfonyl, 2,3-difluoropropylsulfonyl, 2-chloropropylsulfonyl, 3-chloropropylsulfonyl, 2,3-dichloropropylsulfonyl, 2-bromopropylsulfonyl, 3-bromopropylsulfonyl, 3,3,3-trifluoropropylsulfonyl, 3,3,3-trichloropropylsulfonyl, S(O)₂CH₂-C₂F₅, S(O)₂CF₂-C₂F₅, 1-(CH₂F)-2-fluoroethylsulfonyl, 1-(CH₂Cl)-2-chloroethylsulfonyl, 1-(CH₂Br)-2-bromoethylsulfonyl, 4-fluorobutylsulfonyl, 4-chlorobutylsulfonyl, 4-bromobutylsulfonyl or nonafluorobutylsulfonyl. C₁-C₆-Haloalkylsulfonyl is additionally, for example, 5-fluoropentylsulfonyl, 5-chloropentylsulfonyl, 5-bromopentylsulfonyl, 5-iodopentylsulfonyl, undecafluoropentylsulfonyl, 6-fluorohexylsulfonyl, 6-chlorohexylsulfonyl, 6-bromohexylsulfonyl, 6-iodohexylsulfonyl or dodecafluorohexylsulfonyl.

The term "alkylamino" as used herein denotes in each case a group -NHR, wherein R is a straight-chain or branched alkyl group usually having from 1 to 6 carbon atoms ("C₁-C₆-alkylamino"), preferably 1 to 4 carbon atoms ("C₁-C₄-alkylamino"). Examples of C₁-C₆-alkylamino are methylamino, ethylamino, n-propylamino, isopropylamino, n-butylamino, 2-butylamino, iso-butylamino, tert-butylamino, and the like.

The term "dialkylamino" as used herein denotes in each case a group -NRR', wherein R and R', independently of each other, are a straight-chain or branched alkyl group each usually having from 1 to 6 carbon atoms ("di-(C₁-C₆-alkyl)-amino"), preferably 1 to 4 carbon atoms ("di-(C₁-C₄-alkyl)-amino"). Examples of a di-(C₁-C₆-alkyl)-amino group are dimethylamino, diethylamino, dipropylamino, dibutylamino, methyl-ethyl-amino, methyl-propyl-amino, methyl-isopropylamino, methyl-butyl-amino, methyl-isobutyl-amino, ethyl-propyl-amino, ethyl-isopropylamino, ethyl-

butyl-amino, ethyl-isobutyl-amino, and the like.

5 The term "alkylaminosulfonyl" as used herein denotes in each case a straight-chain or branched alkylamino group as defined above, which is bound to the remainder of the molecule via a sulfonyl $[S(O)_2]$ group. Examples of an alkylaminosulfonyl group are methylaminosulfonyl, ethylaminosulfonyl, n-propylaminosulfonyl, isopropylaminosulfonyl, n-butylaminosulfonyl, 2-butylaminosulfonyl, iso-butylaminosulfonyl, tert-butylaminosulfonyl, and the like.

10 The term "dialkylaminosulfonyl" as used herein denotes in each case a straight-chain or branched alkylamino group as defined above, which is bound to the remainder of the molecule via a sulfonyl $[S(O)_2]$ group. Examples of an dialkylaminosulfonyl group are dimethylaminosulfonyl, diethylaminosulfonyl, dipropylaminosulfonyl, dibutylaminosulfonyl, methyl-ethylaminosulfonyl, methyl-propylaminosulfonyl, methyl-isopropylaminosulfonyl, methyl-butylaminosulfonyl, methyl-isobutylaminosulfonyl, ethyl-propylaminosulfonyl, ethylisopropylaminosulfonyl, ethyl-butylaminosulfonyl, ethyl-isobutylaminosulfonyl, and the like.

20 The suffix "-carbonyl" in a group denotes in each case that the group is bound to the remainder of the molecule via a carbonyl $C=O$ group. This is the case e.g. in alkylcarbonyl, haloalkylcarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkoxycarbonyl, haloalkoxycarbonyl.

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

25 The term "aryl" as used herein refers to a mono-, bi- or tricyclic aromatic hydrocarbon radical such as phenyl or naphthyl, in particular phenyl.

30 The term "het(ero)aryl" as used herein refers to a mono-, bi- or tricyclic heteroaromatic hydrocarbon radical, preferably to a monocyclic heteroaromatic radical, such as pyridyl, pyrimidyl and the like.

35 The term "3-, 4-, 5-, 6-, 7- or 8-membered saturated carbocyclic ring" as used herein refers to carbocyclic rings, which are monocyclic and fully saturated. Examples of such rings include cyclopropane, cyclobutane, cyclopentane, cyclohexane, cycloheptane, cyclooctane and the like. The terms "3-, 4-, 5-, 6-, 7- or 8-membered partially unsaturated carbocyclic ring" and "5- or 6-membered partially unsaturated carbocyclic ring" refer to carbocyclic rings, which are monocyclic and have one or more degrees of unsaturation. Examples of such rings include cyclopropene, cyclobutene, cyclopentene, cyclohexene, cycloheptene, cyclooctene and the like.

40 The term "3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members" [wherein "maximum unsaturated" includes also "aro-

matic"] as used herein denotes monocyclic radicals, the monocyclic radicals being saturated, partially unsaturated or maximum unsaturated (including aromatic). Unsaturated rings contain at least one C-C and/or C-N and/or N-N double bond(s). Maximum unsaturated rings contain as many conjugated C-C and/or C-N and/or N-N double bonds as allowed by the ring size. Maximum unsaturated 5- or 6-membered heterocyclic rings are aromatic. The heterocyclic ring may be attached to the remainder of the molecule via a carbon ring member or via a nitrogen ring member. As a matter of course, the heterocyclic ring contains at least one carbon ring atom. If the ring contains more than one O ring atom, these are not adjacent.

- Examples of a 3-, 4-, 5-, 6- or 7-membered saturated heterocyclic ring include: Oxiranyl, thiiranyl, aziridinyl, oxetanyl, thietanyl, azetidiny, tetrahydrofuran-2-yl, tetrahydrofuran-3-yl, tetrahydrothien-2-yl, tetrahydrothien-3-yl, pyrrolidin-1-yl, pyrrolidin-2-yl, pyrrolidin-3-yl, pyrazolidin-1-yl, pyrazolidin-3-yl, pyrazolidin-4-yl, pyrazolidin-5-yl, imidazolidin-1-yl, imidazolidin-2-yl, imidazolidin-4-yl, oxazolidin-2-yl, oxazolidin-3-yl, oxazolidin-4-yl, oxazolidin-5-yl, isoxazolidin-2-yl, isoxazolidin-3-yl, isoxazolidin-4-yl, isoxazolidin-5-yl, thiazolidin-2-yl, thiazolidin-3-yl, thiazolidin-4-yl, thiazolidin-5-yl, isothiazolidin-2-yl, isothiazolidin-3-yl, isothiazolidin-4-yl, isothiazolidin-5-yl, 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-1-yl, 1,3,4-triazolidin-2-yl, 2-tetrahydropyranyl, 4-tetrahydropyranyl, 1,3-dioxan-5-yl, 1,4-dioxan-2-yl, piperidin-1-yl, piperidin-2-yl, piperidin-3-yl, piperidin-4-yl, hexahydropyridazin-3-yl, hexahydropyridazin-4-yl, hexahydropyrimidin-2-yl, hexahydropyrimidin-4-yl, hexahydropyrimidin-5-yl, piperazin-1-yl, piperazin-2-yl, 1,3,5-hexahydrotriazin-1-yl, 1,3,5-hexahydrotriazin-2-yl and 1,2,4-hexahydrotriazin-3-yl, morpholin-2-yl, morpholin-3-yl, morpholin-4-yl, thiomorpholin-2-yl, thiomorpholin-3-yl, thiomorpholin-4-yl, 1-oxothiomorpholin-2-yl, 1-oxothiomorpholin-3-yl, 1-oxothiomorpholin-4-yl, 1,1-dioxothiomorpholin-2-yl, 1,1-dioxothiomorpholin-3-yl, 1,1-dioxothiomorpholin-4-yl, azepan-1-, -2-, -3- or -4-yl, oxepan-2-, -3-, -4- or -5-yl, 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 a 3-, 4-, 5-, 6- or 7-membered partially unsaturated heterocyclic ring 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 tetrahydro-

pyridazinyl, 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.

A 3-, 4-, 5-, 6- or 7-membered maximum unsaturated (including aromatic) heterocyclic ring is e.g. a 5- or 6-membered maximum unsaturated (including aromatic) heterocyclic ring. Examples are: 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 1-pyrrolyl, 2-pyrrolyl, 3-pyrrolyl, 1-pyrazolyl, 3-pyrazolyl, 4-pyrazolyl, 5-pyrazolyl, 2-oxazolyl, 4-oxazolyl, 5-oxazolyl, 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, 1-imidazolyl, 2-imidazolyl, 4-imidazolyl, 1,3,4-triazol-1-yl, 1,3,4-triazol-2-yl, 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 1-oxopyridin-2-yl, 1-oxopyridin-3-yl, 1-oxopyridin-4-yl, 3-pyridazinyl, 4-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl and 2-pyrazinyl.

The term "a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members" as used herein denotes on the one side a "3-, 4-, 5-, 6-, 7- or 8-membered saturated carbocyclic ring" as defined above, with the exception of the maximum unsaturated ring systems, and on the other side "a saturated or partially unsaturated 3-, 4-, 5-, 6-, 7- or 8-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members". The saturated or partially unsaturated 3-, 4-, 5-, 6- or 7-membered heterocyclic ring is as defined above.

When R⁵ and R⁶, together with the nitrogen atom to which they are bound, or R^{9a} and R^{9b}, together with the nitrogen atom to which they are bound, or R²¹ and R²², together with the nitrogen atom to which they are bound, form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, this is an N-bound heterocyclic ring which apart the nitrogen ring atom may additionally contain 1, 2, 3 or 4 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members. Examples are aziridin-1-yl, azetidin-1-yl, pyrrolidine-1-yl, pyrazolidin-1-yl, imidazolin-1-yl, oxazolidin-3-yl, isoxazolidin-3-yl, thiazolidin-1-yl, isothiazolidin-1-yl, triazolidin-1-yl, piperidin-1-yl, piperazin-1-yl, morpholin-4-yl, thiomorpholin-1-yl, 1,1-dioxothiomorpholin-4-yl, pyrrolin-1-yl, pyrrolin-1-yl, imidazolin-1-yl, dihydropyridin-1-yl, tetrahydropyridin-1-yl, pyrrol-1-yl, pyrazol-1-yl, imidazol-1-yl and the like.

The remarks made below as to preferred embodiments of the variables (substituents) of the compounds of formula (I) are valid on their own as well as preferably in combination with each other, as well as in combination with the stereoisomers, salts, tautomers or N-oxides thereof.

The remarks made below concerning preferred embodiments of the variables further are valid on their own as well as preferably in combination with each other concerning the compounds of formula (I) as well as concerning the uses and methods according to the invention and the composition according to the invention.

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As a matter of course, the r radicals R^4 replace a hydrogen atom on a carbon ring atom. For instance, if B^1 is defined to be CH and if this position is to be substituted by a radical R^4 , then B^1 is of course $C-R^4$. If there is more than one radical R^4 , these can be the same or different.

10 As a matter of course, the p radicals R^1 replace a hydrogen atom on a carbon ring atom. If there is more than one radical R^1 , these can be the same or different.

A preferred compound according to the invention is a compound of formula (I) or a stereoisomer, salt, tautomer or N-oxide thereof, wherein the salt is an agriculturally or veterinarily acceptable salt. A further preferred compound according to the invention is a compound of
15 formula (I) or a stereoisomer or salt thereof, especially an agriculturally or veterinarily acceptable salt. A most preferred compound according to the invention is a compound of formula (I) or a salt thereof, especially an agriculturally or veterinarily acceptable salt thereof.

20 Preferred is a compound of formula (I), wherein X is O.
Preferred is a compound of formula (I), wherein Y is O.
Preferred is a compound of formula (I), wherein X and Y are O.

Preferred is a compound of formula (I), wherein p is 1, 2 or 3, specifically 1.
25 Preferred is a compound of formula (I), wherein r is 0, 1, or 2, specifically 1.
Preferred is a compound of formula (I), wherein p is 1, 2 or 3, specifically 1; and r is 0, 1, or 2, specifically 1.

In a specific embodiment, B^1 is N.

30

In one embodiment, G is a group G^1 .

R^9 in group G^1 is in one preferred embodiment 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 -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, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or
35 more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . In particular, R^9 is selected from the group consisting of hydrogen, C_1-C_6 -alkyl and C_1-C_6 -haloalkyl and is specifically hydrogen.
40

In another preferred embodiment, R^9 in group G^1 is $-N(R^{9a})R^{9b}$. In this case, R^{9a} and R^{9b} are preferably selected, independently of each other, from hydrogen, C_1 - C_6 -alkyl and C_1 - C_6 -haloalkyl.

R^h in group G^1 is preferably 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_3 - C_8 -cycloalkyl, C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl, C_3 - C_8 -halocycloalkyl, $-C(=O)R^7$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} ;

with the proviso that R^h is not C_1 - C_6 -alkoxy or C_1 - C_6 -haloalkoxy if it is bound to an oxygen atom.

In particular, R^h is selected from the group consisting of hydrogen, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl and $-C(=O)N(R^{9a})R^{9b}$ and specifically from C_1 - C_6 -alkyl and $-C(=O)N(R^{9a})R^{9b}$. In these cases, R^{9a} and R^{9b} are preferably selected, independently of each other, from hydrogen, C_1 - C_6 -alkyl and C_1 - C_6 -haloalkyl and are specifically hydrogen.

Q is preferably O or $N(R^{9a})$. In this case, R^{9a} is preferably selected from hydrogen, C_1 - C_6 -alkyl and C_1 - C_6 -haloalkyl, more preferably from hydrogen and C_1 - C_6 -alkyl, in particular from hydrogen and methyl, and is specifically hydrogen.

In an alternative embodiment, G is a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups independently selected from N, O, S, NO, SO and SO_2 , as ring members, where the heterocyclic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . The heterocyclic ring G is preferably a 5- or 6-membered heteroaromatic ring containing 1, 2 or 3 heteroatoms independently selected from N, O and S, as ring members, where the heteroaromatic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . More preferably, the heterocyclic ring G is a 5- or 6-membered heteroaromatic ring containing 1 nitrogen ring atom and optionally 1 or two further heteroatoms selected from N, O and S, as ring members, where the heteroaromatic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . Specifically, the heterocyclic ring G is a 5-membered heteroaromatic ring containing 1 nitrogen ring atom and optionally 1 or two further heteroatoms selected from N, O and S, preferably from N, as ring members, where the heteroaromatic ring may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . Very specifically, the 5-membered heteroaromatic ring is N-bound.

Preferred is a compound of formula (I), wherein each R^1 is independently selected from halogen; cyano; C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; $-OR^8$;
 $-OS(O)_nR^8$; $-SR^8$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^{9b}$; $-N(R^{9a})R^{9b}$; $-N(R^{9a})C(=O)R^7$; $C(=O)R^7$; $-C(=O)OR^8$;
 phenyl which may be substituted by 1, 2 or 3 radicals R^{10} ; and a 5- or 6-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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} .

In particular, each R^1 is independently selected from halogen, cyano and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 . More particularly, each R^1 is independently selected from halogen, cyano, C_1 - C_6 -alkyl and C_1 - C_4 -haloalkyl. Specifically, each R^1 is independently selected from halogen, cyano, C_1 - C_4 -alkyl and CF_3 , more specifically from halogen and C_1 - C_4 -alkyl, and is very specifically Cl or methyl.

Preferred is a compound of formula (I), wherein R^2 is hydrogen or C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 . More preferably, R^2 is hydrogen or C_1 - C_4 -alkyl. Specifically, R^2 is hydrogen.

Preferred is a compound of formula (I), wherein R^3 is selected from hydrogen; cyano; C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; $C(=O)R^7$; $-C(=O)OR^8$; phenyl which may be substituted by 1, 2 or 3 radicals R^{10} ; and a 5- or 6-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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . More preferably, R^3 is selected from hydrogen, cyano and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be

substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 . In particular, R^3 is selected from hydrogen and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 . More particularly, R^3 is selected from C_1 - C_6 -alkyl and C_1 - C_4 -haloalkyl. Specifically, R^3 is selected from C_1 - C_6 -alkyl and C_1 - C_4 -haloalkyl, more specifically from C_1 - C_4 -alkyl and fluorinated C_1 - C_4 -alkyl, and very specifically from C_1 - C_4 -alkyl and fluorinated C_1 - C_2 -alkyl.

Preferred is a compound of formula (I), wherein each R^4 is independently selected from halogen; cyano; C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 ; $-OR^8$; $-OS(O)_nR^8$; $-SR^8$; $-S(O)_mR^8$; $-S(O)_nN(R^{9a})R^{9b}$; $-N(R^{9a})R^{9b}$; $-N(R^{9a})C(=O)R^7$; $C(=O)R^7$; $-C(=O)OR^8$; phenyl which may be substituted by 1, 2 or 3 radicals R^{10} ; and a 5-or 6-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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} . In particular, each R^4 is independently selected from halogen, cyano and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^7 . More particularly, each R^4 is independently selected from halogen and C_1 - C_4 -haloalkyl. Specifically, each R^4 is independently selected from halogen and is very specifically Cl.

Preferably, neither R^5 nor R^6 is C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , if G is a heterocyclic ring and especially pyridyl.

Preferred is a compound of formula (I), wherein R^5 and R^6 are independently selected from hydrogen, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_3 - C_6 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , C_3 - C_6 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2

or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} , phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{10} , $-C(=O)R^7$, $-C(=O)OR^8$ and $-C(=O)N(R^{9a})R^{9b}$;

or R^5 and R^6 , together with the nitrogen atom to which they are attached, form a saturated, partially unsaturated or aromatic 5- or 6-membered ring which optionally contains 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, and which may be substituted by 1, 2 or 3 radicals R^{10} .

More preferably, R^5 and R^6 , independently of each other, are selected from the group consisting of hydrogen, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , $-C(=O)R^7$, $-C(=O)OR^8$, and $-C(=O)N(R^{9a})R^{9b}$,

or R^5 and R^6 , together with the nitrogen atom to which they are bound, form a 5- or 6-membered saturated, partially unsaturated or aromatic heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, where the heterocyclic ring may be substituted by one or more radicals R^{10} .

Even more preferably, R^5 and R^6 are independently selected from hydrogen, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more, preferably 1, 2 or 3, more preferably 1 or 2, in particular 1, radicals R^{7a} and C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} ;

or R^5 and R^6 , together with the nitrogen atom to which they are attached, form a saturated, partially unsaturated or aromatic 5- or 6-membered ring which optionally contains 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, and which may be substituted by 1, 2 or 3 radicals R^{10} ;

preferably with the proviso that R^5 and R^6 are not C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , if G is a heterocyclic ring and especially pyridyl.

In particular, R^5 and R^6 are independently selected from hydrogen, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl and C_3 - C_6 -cycloalkyl- C_1 - C_4 -alkyl (preferably with the proviso that R^5 and R^6 are not C_3 - C_6 -cycloalkyl- C_1 - C_4 -alkyl if G is a heterocyclic ring and especially pyridyl);

or R^5 and R^6 , together with the nitrogen atom to which they are attached, form a saturated, partially unsaturated or aromatic 5- or 6-membered ring which optionally contains 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, and which may be substituted by 1, 2 or 3 radicals R^{10} .

More particularly, R^5 and R^6 are independently selected from hydrogen, C_1 - C_4 -alkyl and C_3 - C_6 -cycloalkyl- C_1 - C_4 alkyl (preferably with the proviso that R^5 and R^6 are not C_3 - C_6 -cycloalkyl- C_1 - C_4 -alkyl if G is a heterocyclic ring and especially pyridyl) and specifically from hydrogen and C_1 - C_4 -alkyl.

5

Specifically, at least one of R^5 and R^6 is not hydrogen.

In case R^7 is a substituent on an alkyl, alkenyl or alkynyl group, it is preferably selected from the group consisting of cyano, azido, nitro, -SCN, SF_5 , C_3 - C_8 -cycloalkyl, C_3 - C_8 -halocycloalkyl, -Si(R^{14})₂ R^{13} , -OR⁸, -OSO₂R⁸, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a}) R^{9b} , -N(R^{9a}) R^{9b} , -C(=O)N(R^{9a}) R^{9b} , -C(=S)N(R^{9a}) R^{9b} , -C(=O)OR⁸, -C(=O)R¹⁹, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R^{10} ; or two geminally bound radicals R^7 together form a group selected from =CR¹¹R¹², =S(O)_mR⁸, =S(O)_mN(R^{9a}) R^{9b} , =NR^{9a}, =NOR⁸ and =NNR^{9a} R^{9b} ; or two radicals R^7 , together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where R^8 , R^{9a} , R^{9b} , R^{10} , R^{11} , R^{12} , R^{13} , R^{14} and R^{19} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on an alkyl, alkenyl or alkynyl group, it is more preferably selected from the group consisting of cyano, C_3 - C_8 -cycloalkyl, C_3 - C_8 -halocycloalkyl, -OR⁸, -SR⁸, -C(=O)N(R^{9a}) R^{9b} , -C(=S)N(R^{9a}) R^{9b} , -C(=O)OR⁸, -C(=O)R¹⁹, -C(=NR^{9a})R¹⁹, phenyl which may be substituted by 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 SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R^{10} ; where R^8 , R^{9a} , R^{9b} and R^{10} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on an alkyl, alkenyl or alkynyl group, it is even more preferably selected from the group consisting of cyano, C_3 - C_6 -cycloalkyl, C_3 - C_6 -halocycloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -haloalkylthio, -C(=O)N(R^{9a}) R^{9b} , -C(=S)N(R^{9a}) R^{9b} , -C(=O)OR⁸, -C(=O)R¹⁹, phenyl which may be substituted by 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 SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R^{10} ; where R^{9a} , R^{9b} and R^{10} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on an alkyl, alkenyl or alkynyl group, it is in particular selected from the group consisting of cyano, C_3 - C_6 -cycloalkyl, C_3 - C_6 -halocycloalkyl, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, $-C(=O)R^{19}$, phenyl which may be substituted by 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 by one or more radicals R^{10} ;

where R^{9a} , R^{9b} and R^{10} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on a cycloalkyl group, it is preferably selected from the group consisting of cyano, azido, nitro, $-SCN$, SF_5 , C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy- C_1 - C_6 -alkyl, 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, $-Si(R^{14})_2R^{13}$, $-OR^8$, $-OSO_2R^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, phenyl which may be substituted by 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 by one or more radicals R^{10} ;

or two geminally bound radicals R^7 together form a group selected from $=CR^{11}R^{12}$, $=S(O)_mR^8$, $=S(O)_mN(R^{9a})R^{9b}$, $=NR^{9a}$, $=NOR^8$ and $=NNR^{9a}R^{9b}$;

or two radicals R^7 , together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or 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 R^8 , R^{9a} , R^{9b} , R^{10} , R^{11} , R^{12} , R^{13} and R^{14} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on a cycloalkyl group, it is more preferably selected from the group consisting of halogen, cyano, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy- C_1 - C_6 -alkyl, $-OR^8$, $-OSO_2R^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, phenyl which may be substituted by 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 by one or more radicals R^{10} ; where R^8 , R^{9a} , R^{9b} and R^{10} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on a cycloalkyl group, it is even more preferably selected from the group consisting of halogen, C_1 - C_4 -alkyl, C_1 - C_3 -haloalkyl, C_1 - C_4 -alkoxy and C_1 - C_3 -haloalkoxy. In

particular, R^7 as a substituent on a cycloalkyl group is selected from halogen, C_1 - C_4 -alkyl and C_1 - C_3 -haloalkyl.

In case R^7 is a substituent on $C(=O)$, $C(=S)$ or $C(=NR^{9a})$, it is preferably 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 -alkyl, 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, $-OR^8$, $-SR^8$, $-N(R^{9a})R^{9b}$, phenyl which may be substituted by 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 by one or more radicals R^{10} ; where R^8 , R^{9a} , R^{9b} and R^{10} have one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on $C(=O)$, $C(=S)$ or $C(=NR^{9a})$, it is more preferably selected from the group consisting of C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_3 - C_8 -cycloalkyl, C_3 - C_8 -halocycloalkyl, C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, phenyl which may be substituted by 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 by one or more radicals R^{10} ; where R^{10} has one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on $C(=O)$, $C(=S)$ or $C(=NR^{9a})$, it is more preferably selected from the group consisting of C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_3 - C_8 -cycloalkyl, C_3 - C_8 -halocycloalkyl, C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, phenyl which may be substituted by 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 by one or more radicals R^{10} ; where R^{10} has one of the meanings given above or in particular one of the preferred meanings given below.

In case R^7 is a substituent on $C(=O)$, $C(=S)$ or $C(=NR^{9a})$, it is even more preferably selected from the group consisting of C_1 - C_4 -alkyl, C_1 - C_3 -haloalkyl, C_3 - C_6 -cycloalkyl, C_3 - C_6 -halocycloalkyl, C_1 - C_4 -alkoxy, C_1 - C_3 -haloalkoxy, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 5- or 6-membered heteroaromatic ring containing 1, 2 or 3 heteroatoms selected from N, O and S, as ring members, where the heteroaromatic ring may be substituted by one or more radicals R^{10} ; where R^{10} has one of the meanings given above or in particular one of the preferred meanings given below.

Preferably, each R^8 is independently 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 -halocycloalkyl, C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl, phenyl which may be substituted by 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 SO₂, as ring members, where the heterocyclic ring may be substituted by one or more, e.g. 1, 2, 3 or 4, preferably 1 or 2, more preferably 1, radicals R¹⁰, where R¹⁰ has one of the meanings given above or in particular one of the preferred meanings given below.

More preferably, each R⁸ is independently selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰; and a 5- or 6-membered heteroaromatic ring containing 1, 2 or 3 heteroatoms selected from N, O and S, as ring members, where the heteroaromatic ring may be substituted by one or more radicals R¹⁰; where R¹⁰ has one of the meanings given above or in particular one of the preferred meanings given below.

R^{9a} and R^{9b} are independently of each other and independently of each occurrence preferably selected from the group consisting of hydrogen, cyano, C₁-C₆-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₂-C₆-alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₂-C₆-alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₃-C₈-cycloalkyl-C₁-C₆-alkyl, S(O)_mR²⁰, S(O)_nNR²¹R²², phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, benzyl wherein the phenyl moiety may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰; where R¹⁰, R¹⁹, R²⁰, R²¹ and R²² have one of the meanings given above or in particular one of the preferred meanings given below; or

R^{9a} and R^{9b} together form a group =CR¹¹R¹², where R¹¹ and R¹² have one of the meanings given above or in particular one of the preferred meanings given below; or

R^{9a} and R^{9b}, together with the nitrogen atom to which they are bound, form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic, preferably a saturated, heterocyclic ring which may additionally containing 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰, where R¹⁰ has one of the meanings given above or in particular one of the preferred meanings given below.

In the above preferred embodiment of R^{9a} and R^{9b}, R¹¹ is preferably hydrogen or methyl and R¹² is preferably C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, -C(=O)R¹⁹, -C(=O)OR²⁰, or -C(=O)N(R²¹)R²², where R¹⁹, R²⁰, R²¹ and R²² have one of the meanings given above or in particular one of the preferred meanings given below.

In the above preferred embodiment of R^{9a} and R^{9b}, R^{9a} and R^{9b}, if they do not form together a group =CR¹¹R¹² or together with the N atom to which they are bound a heterocyclic ring, are preferably selected from hydrogen, cyano, C₁-C₄-alkyl, C₁-C₄-haloalkyl, cyclopropyl, C₁-C₄-

alkylcarbonyl, C₁-C₄-haloalkylcarbonyl, C₁-C₄-alkoxycarbonyl and C₁-C₄-haloalkoxycarbonyl and are more preferably hydrogen or C₁-C₄-alkyl.

If R^{9a} and R^{9b}, together with the nitrogen atom to which they are bound, form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or aromatic heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, this is preferably a 3, 5 or 6-membered saturated heterocyclic ring which may additionally contain 1 further heteroatom or heteroatom group selected from N, O, S, NO, SO and SO₂, as ring member.

Specifically, R^{9a} and R^{9b} are independently of each other and independently of each occurrence selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-alkynyl, C₃-C₈-cycloalkyl-C₁-C₆-alkyl, benzyl wherein the phenyl moiety may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰. More specifically, R^{9b} is hydrogen or C₁-C₄-alkyl and R^{9a} has one of the meanings specified above.

Preferably, each R¹⁰ is independently selected from the group consisting of halogen, cyano, C₁-C₁₀-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₃-C₈-cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, -OR²⁰, -OS(O)_nR²⁰, -SR²⁰, -S(O)_mR²⁰, -S(O)_nN(R²¹)R²², -N(R²¹)R²², C(=O)R¹⁹, -C(=O)OR²⁰, -C(=O)N(R²¹)R²², phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, which may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy; or two radicals R¹⁰ bound on adjacent atoms together form a group selected from -CH₂CH₂CH₂CH₂-, -CH=CH-CH=CH-, -N=CH-CH=CH-, -CH=N-CH=CH-, -N=CH-N=CH-, -OCH₂CH₂CH₂-, -OCH=CHCH₂-, -CH₂OCH₂CH₂-, -OCH₂CH₂O-, -OCH₂OCH₂-, -CH₂CH₂CH₂-, -CH=CHCH₂-, -CH₂CH₂O-, -CH=CHO-, -CH₂OCH₂-, -CH₂C(=O)O-, -C(=O)OCH₂-, and -O(CH₂)O-, thus forming, together with the atoms to which they are bound, a 5- or 6-membered ring, where the hydrogen atoms of the above groups may be replaced by one or more substituents selected from halogen, methyl, halomethyl, hydroxyl, methoxy and halomethoxy or one or more CH₂ groups of the above groups may be replaced by a C=O group, where R¹⁹, R²⁰, R²¹ and R²² have one of the general or in particular one of the preferred meanings given above.

More preferably, each R¹⁰ is independently selected from the group consisting of halogen, cyano, C₁-C₁₀-alkyl which may be partially or fully halogenated and/or may be substituted by one

- or more radicals R^{19} , $-OR^{20}$, $-N(R^{21})R^{22}$, $C(=O)R^{19}$, $-C(=O)OR^{20}$, $-C(=O)N(R^{21})R^{22}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy; and a 3-, 4-, 5-, 6- or 7-membered saturated or unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, which may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy; where R^{19} , R^{20} , R^{21} and R^{22} have one of the general or in particular one of the preferred meanings given above.
- 10 Even more preferably, each R^{10} is independently selected from the group consisting of halogen, C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy and C_1 - C_4 -haloalkoxy. In particular, each R^{10} is independently selected from the group consisting of halogen, C_1 - C_4 -alkyl and C_1 - C_4 -haloalkyl.
- 15 Preferably, R^{11} and R^{12} are, independently of each other and independently of each occurrence, selected from the group consisting of hydrogen, halogen, C_1 - C_6 -alkyl and C_1 - C_6 -haloalkyl. More preferably, R^{11} and R^{12} are, independently of each other and independently of each occurrence, selected from the group consisting of hydrogen, halogen and C_1 - C_6 -alkyl and in particular from the group consisting of hydrogen and halogen. Specifically, they are hydrogen.
- 20 Preferably, R^{13} and R^{14} are, independently of each other and independently of each occurrence, selected from C_1 - C_4 -alkyl and are in particular methyl.
- 25 Preferably, R^{15} and R^{16} are, independently of each other and independently of each occurrence, selected from the group consisting of C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl and phenyl which may be substituted by 1, 2, 3, 4, or 5 radicals R^{10} ; where R^{10} has one of the general or in particular one of the preferred meanings given above.
- 30 Preferably, each R^{17} is independently selected from the group consisting of C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_3 - C_8 -cycloalkyl, C_3 - C_8 -halocycloalkyl, phenyl and benzyl. More preferably, each R^{17} is independently selected from the group consisting of C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl and phenyl and is in particular C_1 - C_4 -alkyl or C_1 - C_3 -haloalkyl.
- 35 In case R^{19} is a substituent on an alkyl, alkenyl or alkynyl group, it is preferably selected from the group consisting of cyano, C_3 - C_6 -cycloalkyl, C_3 - C_6 -halocycloalkyl, $-OR^{20}$, $-C(=O)N(R^{21})R^{22}$, $-C(=S)N(R^{21})R^{22}$, $-C(=O)OR^{20}$, $-C(=O)R^{20}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy, and a 5- or 6-membered 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 rings in the three last-mentioned radicals may be substituted by one or more radicals selected from
- 40 halogen, cyano, nitro, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy and C_1 - C_6 -haloalkoxy; where

R²⁰ is selected from hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, phenyl, benzyl, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals R¹⁰; and

5 R²¹ and R²², independently of each other and independently of each occurrence, are selected from hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, phenyl, benzyl, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals R¹⁰.

10 In case R¹⁹ is a substituent on a cycloalkyl group, it is preferably selected from the group consisting of cyano, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₃-C₆-cycloalkyl, C₃-C₆-halocycloalkyl, -C(=O)N(R²¹)R²², -C(=S)N(R²¹)R²², -C(=O)OR²⁰, -C(=O)R²⁰, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

20 where

R²⁰ is selected from hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, phenyl, benzyl, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals R¹⁰; and

25 R²¹ and R²², independently of each other and independently of each occurrence, are selected from hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, phenyl, benzyl, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals R¹⁰.

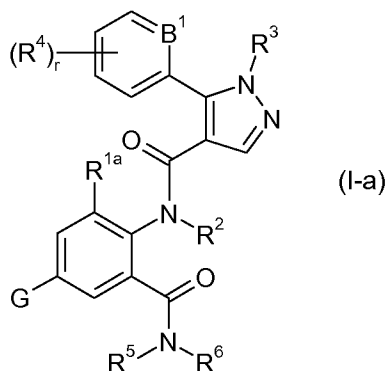
30 In case R¹⁹ is a substituent on a C(=O) group, it is preferably selected from the group consisting of hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₃-C₆-cycloalkyl, C₃-C₆-halocycloalkyl, C₃-C₆-cycloalkyl-C₁-C₄-alkyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy.

R²⁰ is preferably selected from the group consisting of hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₂-C₄-alkenyl, C₂-C₄-haloalkenyl, C₂-C₄-alkynyl, C₂-C₄-haloalkynyl, C₃-C₆-cycloalkyl, C₃-C₆-halocycloalkyl, C₃-C₆-cycloalkyl-C₁-C₄-alkyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy.

R²¹ and R²², independently of each other and independently of each occurrence, are preferably selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 5- or 6-membered heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the rings in the three last-mentioned radicals may be substituted by one or more radicals selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

or R²¹ and R²², together with the nitrogen atom to which they are bound, may form a 5- or 6-membered saturated, partially unsaturated or aromatic heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals selected from halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy.

In a preferred embodiment, the compound of formula (I) is of the general formula (I-a)

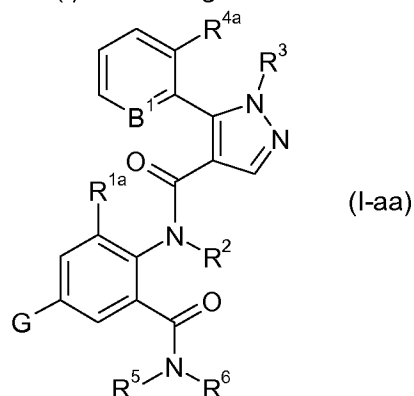


wherein

R^{1a} is selected from hydrogen and the group as defined for R¹; and

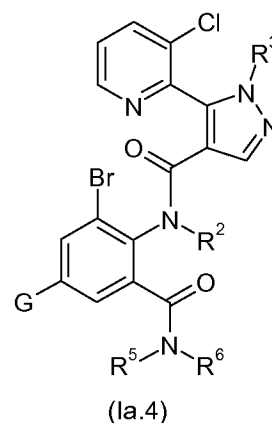
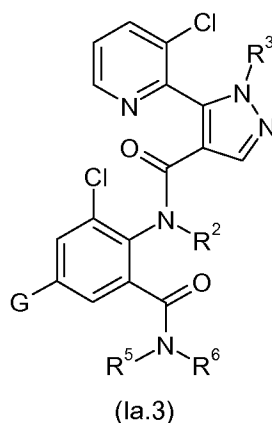
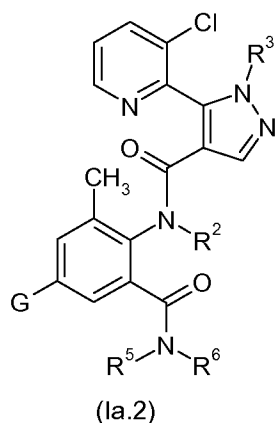
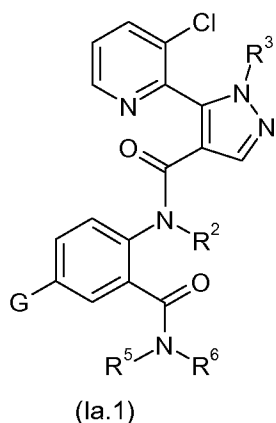
B¹, G, R², R³, R⁴, R⁵, R⁶ and r have one of the general meanings, or, in particular, one of the preferred meanings given above.

In particular, the compound of formula (I) is of the general formula (I-aa)



5 wherein
 R^{1a} is selected from hydrogen and the group as defined for R¹;
 R^{4a} is selected from hydrogen and the group as defined for R⁴; and
 B¹, G, R², R³, R⁵ and R⁶ have one of the general meanings, or, in particular, one of the preferred
 10 meanings given above.

Examples of preferred compounds are compounds of the following formulae Ia.1 to Ia.8, where
 the variables have one of the general or preferred meanings given above. Examples of pre-
 15 ferred compounds are the individual compounds compiled in the tables 1 to 192 below. More-
 over, the meanings mentioned below for the individual variables in the tables are per se, inde-
 pendently of the combination in which they are mentioned, a particularly preferred embodiment
 of the substituents in question.



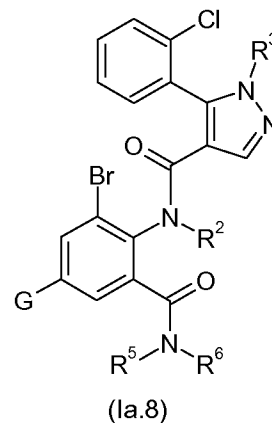
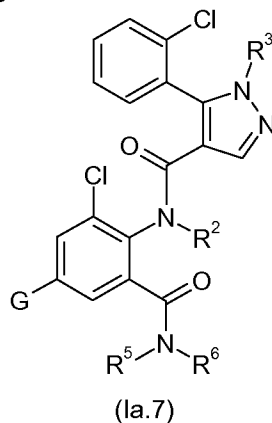
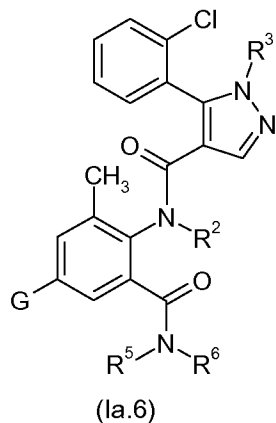
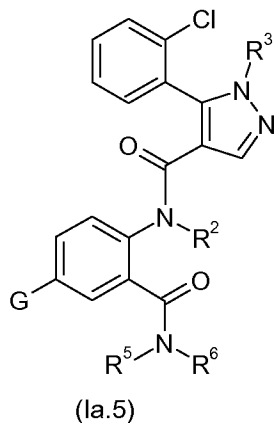


Table 1

Compounds of the formula Ia.1 in which G is a group G.1 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 2

Compounds of the formula Ia.1 in which G is a group G.2 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 3

Compounds of the formula Ia.1 in which G is a group G.3 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 4

Compounds of the formula Ia.1 in which G is a group G.4 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 5

Compounds of the formula Ia.1 in which G is a group G.5 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 6

Compounds of the formula Ia.1 in which G is a group G.6 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 7

Compounds of the formula Ia.1 in which G is a group G.7 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 8

Compounds of the formula Ia.1 in which G is a group G.8 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 9

Compounds of the formula Ia.1 in which G is a group G.9 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 10

Compounds of the formula Ia.1 in which G is a group G.10 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 11

Compounds of the formula Ia.1 in which G is a group G.11 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 12

- 5 Compounds of the formula Ia.1 in which G is a group G.12 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 13

Compounds of the formula Ia.1 in which G is a group G.13 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

- 10 Table 14

Compounds of the formula Ia.1 in which G is a group G.14 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 15

Compounds of the formula Ia.1 in which G is a group G.15 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

- 15

Table 16

Compounds of the formula Ia.1 in which G is a group G.16 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 17

- 20 Compounds of the formula Ia.1 in which G is a group G.17 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 18

Compounds of the formula Ia.1 in which G is a group G.18 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

- 25 Table 19

Compounds of the formula Ia.1 in which G is a group G.19 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 20

Compounds of the formula Ia.1 in which G is a group G.20 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

- 30

Table 21

Compounds of the formula Ia.1 in which G is a group G.21 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 22

- 35 Compounds of the formula Ia.1 in which G is a group G.22 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 23

Compounds of the formula Ia.1 in which G is a group G.23 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 24

Compounds of the formula Ia.1 in which G is a group G.24 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 25

- 5 Compounds of the formula Ia.1 in which G is a group G.25 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Table 26

Compounds of the formula Ia.1 in which G is a group G.26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

- 10 Tables 27 to 52

Compounds of the formula Ia.2 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Tables 53 to 78

- 15 Compounds of the formula Ia.3 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Tables 79 to 104

Compounds of the formula Ia.4 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Tables 105 to 130

- 20 Compounds of the formula Ia.5 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

Tables 131 to 156

Compounds of the formula Ia.6 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

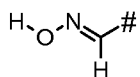
- 25 Tables 157 to 182

Compounds of the formula Ia.7 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

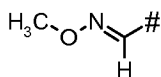
Tables 183 to 208

- 30 Compounds of the formula Ia.8 in which G is as defined in any of tables 1 to 26 and the combination of R³, R⁵ and R⁶ for a compound corresponds in each case to one row of Table A

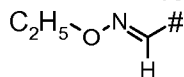
46



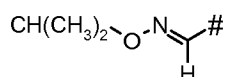
G.1



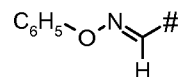
G.2



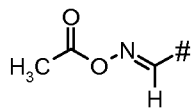
G.3



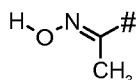
G.4



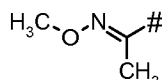
G.5



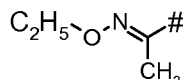
G.6



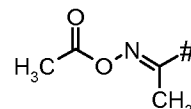
G.7



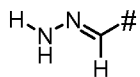
G.8



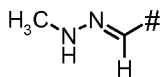
G.9



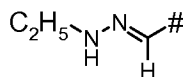
G.10



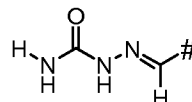
G.11



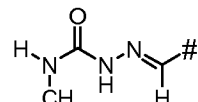
G.12



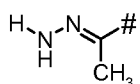
G.13



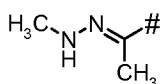
G.14



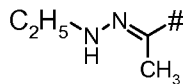
G.15



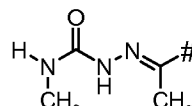
G.16



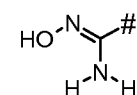
G.17



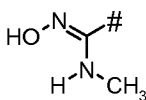
G.18



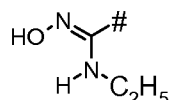
G.19



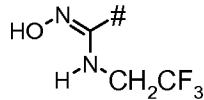
G.20



G.21



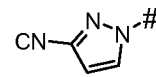
G.22



G.23



G.24



G.25



G.26

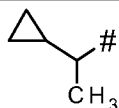
Table A

No.	R ³	R ⁵	R ⁶
A-1	H	H	H
A-2	H	H	CH ₃
A-3	H	CH ₃	CH ₃
A-4	H	H	C ₂ H ₅
A-5	H	CH ₃	C ₂ H ₅
A-6	H	C ₂ H ₅	C ₂ H ₅
A-7	H	C ₂ H ₅	C ₂ H ₅
A-8	H	C ₂ H ₅	C ₂ H ₅
A-9	H	H	CH ₂ CH ₂ CH ₃
A-10	H	CH ₃	CH ₂ CH ₂ CH ₃
A-11	H	C ₂ H ₅	CH ₂ CH ₂ CH ₃
A-12	H	CH ₂ CH ₂ CH ₃	CH ₂ CH ₂ CH ₃
A-13	H	H	CH(CH ₃) ₂

No.	R ³	R ⁵	R ⁶
A-14	H	CH ₃	CH(CH ₃) ₂
A-15	H	C ₂ H ₅	CH(CH ₃) ₂
A-16	H	CH ₂ CH ₂ CH ₃	CH(CH ₃) ₂
A-17	H	H	L.1
A-18	H	CH ₃	L.1
A-19	H	C ₂ H ₅	L.1
A-20	H	CH(CH ₂) ₃	L.1
A-21	H	L.1	L.1
A-22	CH ₃	H	H
A-23	CH ₃	H	CH ₃
A-24	CH ₃	CH ₃	CH ₃
A-25	CH ₃	H	C ₂ H ₅
A-26	CH ₃	CH ₃	C ₂ H ₅
A-27	CH ₃	C ₂ H ₅	C ₂ H ₅
A-28	CH ₃	C ₂ H ₅	C ₂ H ₅
A-29	CH ₃	C ₂ H ₅	C ₂ H ₅
A-30	CH ₃	H	CH ₂ CH ₂ CH ₃
A-31	CH ₃	CH ₃	CH ₂ CH ₂ CH ₃
A-32	CH ₃	C ₂ H ₅	CH ₂ CH ₂ CH ₃
A-33	CH ₃	CH ₂ CH ₂ CH ₃	CH ₂ CH ₂ CH ₃
A-34	CH ₃	H	CH(CH ₃) ₂
A-35	CH ₃	CH ₃	CH(CH ₃) ₂
A-36	CH ₃	C ₂ H ₅	CH(CH ₃) ₂
A-37	CH ₃	CH ₂ CH ₂ CH ₃	CH(CH ₃) ₂
A-38	CH ₃	H	L.1
A-39	CH ₃	CH ₃	L.1
A-40	CH ₃	C ₂ H ₅	L.1
A-41	CH ₃	CH(CH ₂) ₃	L.1
A-42	CH ₃	L.1	L.1
A-43	CH ₂ CH ₃	H	H
A-44	CH ₂ CH ₃	H	CH ₃
A-45	CH ₂ CH ₃	CH ₃	CH ₃
A-46	CH ₂ CH ₃	H	C ₂ H ₅
A-47	CH ₂ CH ₃	CH ₃	C ₂ H ₅
A-48	CH ₂ CH ₃	C ₂ H ₅	C ₂ H ₅
A-49	CH ₂ CH ₃	C ₂ H ₅	C ₂ H ₅
A-50	CH ₂ CH ₃	C ₂ H ₅	C ₂ H ₅
A-51	CH ₂ CH ₃	H	CH ₂ CH ₂ CH ₃
A-52	CH ₂ CH ₃	CH ₃	CH ₂ CH ₂ CH ₃
A-53	CH ₂ CH ₃	C ₂ H ₅	CH ₂ CH ₂ CH ₃

No.	R ³	R ⁵	R ⁶
A-54	CH ₂ CH ₃	CH ₂ CH ₂ CH ₃	CH ₂ CH ₂ CH ₃
A-55	CH ₂ CH ₃	H	CH(CH ₃) ₂
A-56	CH ₂ CH ₃	CH ₃	CH(CH ₃) ₂
A-57	CH ₂ CH ₃	C ₂ H ₅	CH(CH ₃) ₂
A-58	CH ₂ CH ₃	CH ₂ CH ₂ CH ₃	CH(CH ₃) ₂
A-59	CH ₂ CH ₃	H	L.1
A-60	CH ₂ CH ₃	CH ₃	L.1
A-61	CH ₂ CH ₃	C ₂ H ₅	L.1
A-62	CH ₂ CH ₃	CH(CH ₂) ₃	L.1
A-63	CH ₂ CH ₃	L.1	L.1
A-64	CH(CH ₃) ₂	H	H
A-65	CH(CH ₃) ₂	H	CH ₃
A-66	CH(CH ₃) ₂	CH ₃	CH ₃
A-67	CH(CH ₃) ₂	H	C ₂ H ₅
A-68	CH(CH ₃) ₂	CH ₃	C ₂ H ₅
A-69	CH(CH ₃) ₂	C ₂ H ₅	C ₂ H ₅
A-70	CH(CH ₃) ₂	C ₂ H ₅	C ₂ H ₅
A-71	CH(CH ₃) ₂	C ₂ H ₅	C ₂ H ₅
A-72	CH(CH ₃) ₂	H	CH ₂ CH ₂ CH ₃
A-73	CH(CH ₃) ₂	CH ₃	CH ₂ CH ₂ CH ₃
A-74	CH(CH ₃) ₂	C ₂ H ₅	CH ₂ CH ₂ CH ₃
A-75	CH(CH ₃) ₂	CH ₂ CH ₂ CH ₃	CH ₂ CH ₂ CH ₃
A-76	CH(CH ₃) ₂	H	CH(CH ₃) ₂
A-77	CH(CH ₃) ₂	CH ₃	CH(CH ₃) ₂
A-78	CH(CH ₃) ₂	C ₂ H ₅	CH(CH ₃) ₂
A-79	CH(CH ₃) ₂	CH ₂ CH ₂ CH ₃	CH(CH ₃) ₂
A-80	CH(CH ₃) ₂	H	L.1
A-81	CH(CH ₃) ₂	CH ₃	L.1
A-82	CH(CH ₃) ₂	C ₂ H ₅	L.1
A-83	CH(CH ₃) ₂	CH(CH ₂) ₃	L.1
A-84	CH(CH ₃) ₂	L.1	L.1
A-85	CH ₂ CF ₃	H	H
A-86	CH ₂ CF ₃	H	CH ₃
A-87	CH ₂ CF ₃	CH ₃	CH ₃
A-88	CH ₂ CF ₃	H	C ₂ H ₅
A-89	CH ₂ CF ₃	CH ₃	C ₂ H ₅
A-90	CH ₂ CF ₃	C ₂ H ₅	C ₂ H ₅
A-91	CH ₂ CF ₃	C ₂ H ₅	C ₂ H ₅
A-92	CH ₂ CF ₃	C ₂ H ₅	C ₂ H ₅
A-93	CH ₂ CF ₃	H	CH ₂ CH ₂ CH ₃

No.	R ³	R ⁵	R ⁶
A-94	CH ₂ CF ₃	CH ₃	CH ₂ CH ₂ CH ₃
A-95	CH ₂ CF ₃	C ₂ H ₅	CH ₂ CH ₂ CH ₃
A-96	CH ₂ CF ₃	CH ₂ CH ₂ CH ₃	CH ₂ CH ₂ CH ₃
A-97	CH ₂ CF ₃	H	CH(CH ₃) ₂
A-98	CH ₂ CF ₃	CH ₃	CH(CH ₃) ₂
A-99	CH ₂ CF ₃	C ₂ H ₅	CH(CH ₃) ₂
A-100	CH ₂ CF ₃	CH ₂ CH ₂ CH ₃	CH(CH ₃) ₂
A-101	CH ₂ CF ₃	H	L.1
A-102	CH ₂ CF ₃	CH ₃	L.1
A-103	CH ₂ CF ₃	C ₂ H ₅	L.1
A-104	CH ₂ CF ₃	CH(CH ₂) ₃	L.1
A-105	CH ₂ CF ₃	L.1	L.1

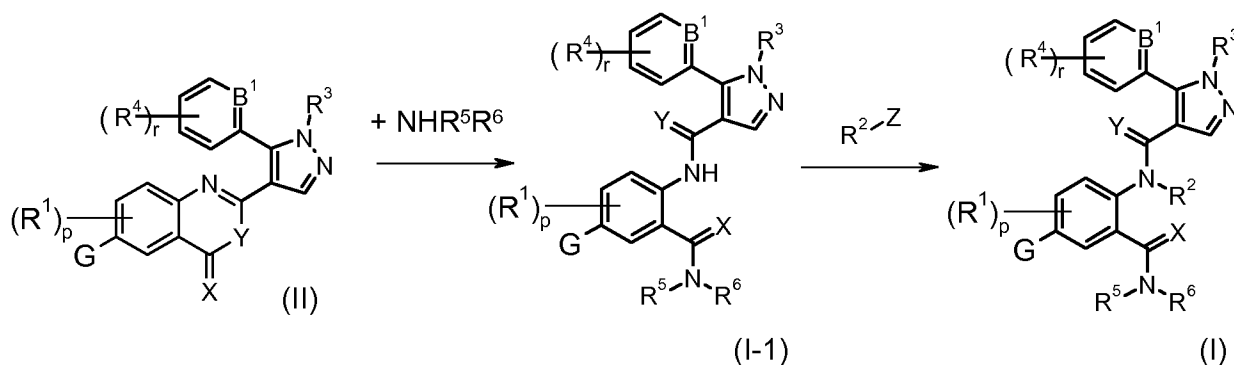


L.1

The compounds of the formula (I) can be prepared by the standard methods of organic chemistry, e.g. by the methods described hereinafter in schemes 1 to 5 and in the synthesis descriptions of the working examples. The substituents, variables and indices in schemes 1 to 5 are as defined above for formula (I), if not otherwise specified.

The compounds of formula (I) can be prepared as shown in the Scheme 1 below.

10 Scheme 1:



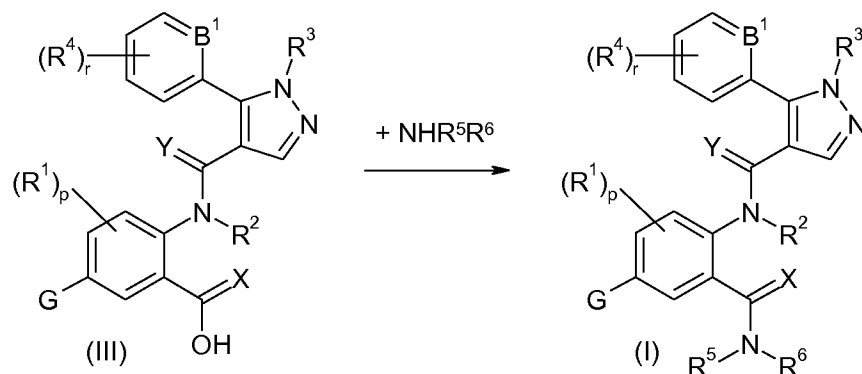
Compounds of formula (II) are reacted with an amine NHR^5R^6 . The reaction is suitably carried out in a polar or apolar aprotic solvent such as N,N-dimethylformamide, tetrahydrofuran, dioxane, acetonitrile, dimethylsulfoxide, pyridine, dichloromethane, benzene, toluene, the xylenes or chlorobenzene or mixtures of such solvents, in a temperature range of from 0 °C and 100 °C, preferably of from 20 °C and 90 °C. For converting compounds of formula (I-1) in which R^2 is H into compounds (I) in which R^2 is not H, compounds of formula (I-1) can be reacted with compounds of formula $\text{R}^2\text{-Z}$, wherein R^2 is not H and Z is a leaving group, such as for example a

bromine, chlorine or iodine atom or a tosylate, mesylate or triflate, to give compounds of formula (I). The reaction is suitably carried out in the presence of a base such as sodium hydride or potassium hydride, suitably in a polar aprotic solvent such as N,N-dimethylformamide, tetrahydrofuran, dioxane, acetonitrile, dimethylsulfoxide or pyridine, or mixtures of these solvents, in a temperature range of from 0°C and 100 C. Other preparation methods for compounds of formula I may also be adapted from analogous reactions, as for example described in WO 01/70671.

Benzoxazin(thi)ones or benzothiazin(thi)ones of formula (II) are available via known methods, e.g. via coupling of either an anthranilic acid or an isatoic anhydride with an acid chloride. For references to the synthesis and chemistry of benzazinones see Jacobsen et al, Bioorganic and Medicinal Chemistry, 2000, 8, 2095-2103 and references cited therein. See also Coppola, J. Heterocyclic Chemistry, 1999, 36, 563-588. The benzazin(thi)ones of formula (II) can also be prepared according to the procedures described in WO 04/046129 or WO 04/011447 as well as according to references cited therein and suitable modifications thereof.

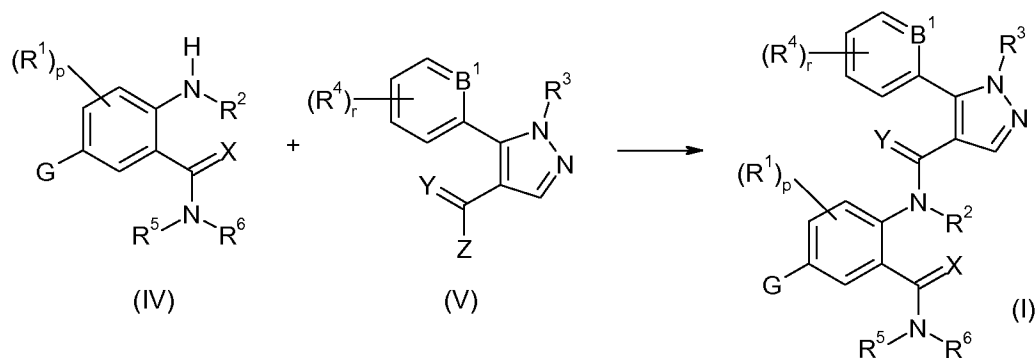
Alternatively, compounds of formula (I) can also be prepared as shown in scheme 2 below by reaction of a compound of formula (III) with an amine NHR^5R^6 .

Scheme 2:



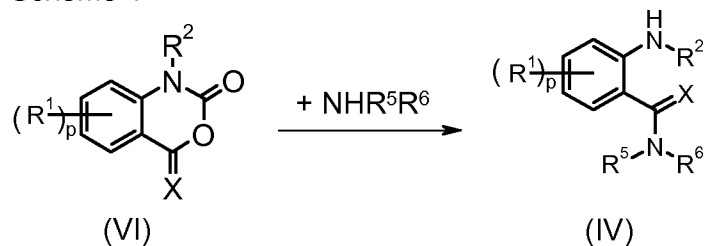
Alternatively, compounds of formula (I) can also be prepared as shown in scheme 3. Reaction of a compound of formula (IV) with a carboxylic acid derivative (V) yields compound (I). Z is a leaving group, such as halogen, in particular Cl, an anhydride residue or an active ester residue. Especially in case of Z being halogen the reaction is suitably carried out in the presence of a base. Suitable bases are for example carbonates, such as lithium, sodium or potassium carbonates, amines, such as trimethylamine or triethylamine, and basic N-heterocycles, such as pyridine, 2,6-dimethylpyridine or 2,4,6-trimethylpyridine. Suitable solvents are in particular aprotic solvents such as pentane, hexane, heptane, octane, cyclohexane, dichloromethane, chloroform, 1,2-dichloroethane, benzene, chlorobenzene, toluene, the xylenes, dichlorobenzene, trimethylbenzene, pyridine, 2,6-dimethylpyridine, 2,4,6-trimethylpyridine, diethyl ether, tetrahydrofuran, 2-methyl tetrahydrofuran, methyl tert-butylether, 1,4-dioxane, N,N-dimethyl formamide, N-methyl pyrrolidinone or mixtures thereof.

Scheme 3:



The compound of formula (IV) can be obtained by reacting the benzoxazinone (VI) with an amine NHR^5R^6 as shown in scheme 4 below. The reaction is suitably carried out in the presence of a base. Suitable bases include hydroxides, such as lithium, sodium or potassium hydroxide, carbonates, such as lithium, sodium or potassium carbonates, hydrogen carbonates, such as lithium, sodium or potassium hydrogen carbonates, phosphates, such as lithium, sodium or potassium phosphate, hydrogen phosphate, such as lithium, sodium or potassium hydrogen phosphate, alkoxides, such as sodium or potassium methoxide, sodium or potassium ethoxide or sodium or potassium tert-butanolate, carboxylates, such as lithium, sodium or potassium formate, lithium, sodium or potassium acetate or lithium, sodium or potassium propionate, ammonia and amines, such as dimethylamine, trimethylamine, diethylamine or triethylamine. Suitable solvents can be protic or aprotic. Examples for aprotic solvents are aliphatic hydrocarbons, such as alkanes, e.g. pentane, hexane or heptane, cycloaliphatic hydrocarbons, such as cycloalkanes, e.g. cyclopentane or cyclohexane, halogenated alkanes, such as methylene chloride, chloroform or 1,2-dichloroethane, aromatic hydrocarbons, such as benzene, toluene, the xylenes or chlorobenzene, open-chained ethers, such as diethylether, methyl-tert-butyl ether or methyl-isobutyl ether, cyclic ethers, such as tetrahydrofuran, 1,4-dioxane or 2-methyl tetrahydrofuran, sulfoxides, such as dimethylsulfoxide, or esters, such as ethyl acetate or ethyl propionate. Furthermore, pyridine, 2,6-dimethylpyridine, 2,4,6-trimethylpyridine, N,N-dimethyl formamide, N-methyl pyrrolidinone or mixtures of solvents mentioned above or below are suitable. Examples for polar protic solvents are C_1 - C_4 -alcohols such as methanol, ethanol, propanol and isopropanol, glycols, such as ethylene glycol and diethylene glycol, and mixtures thereof.

Scheme 4



Compounds of formula (I) with G representing a heterocycle may also be prepared as shown in scheme 5 below by a coupling reaction of heterocycles to compounds of formula (I-2), wherein Z is a bromine, chlorine, fluorine or iodine atom or a similar leaving group such as tosylate, me-

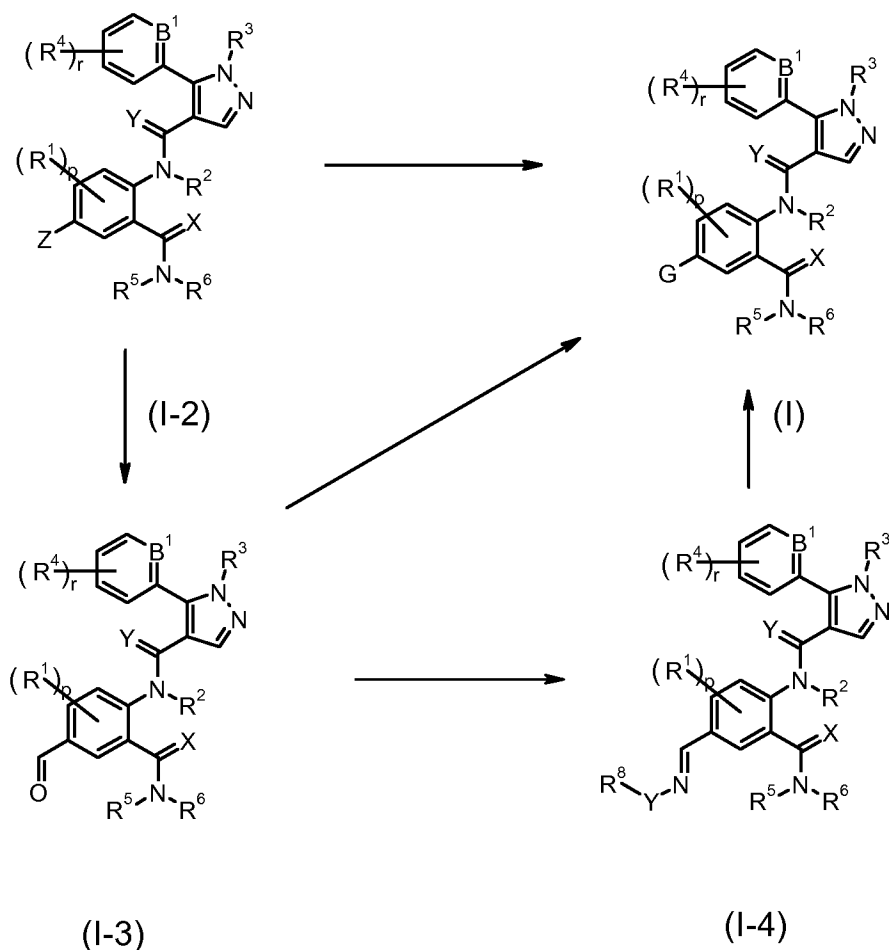
sylate or triflate in analogy to known methods, for example via a Suzuki type coupling as described for example in WO 2010/059773. Alternatively, the introduction of a heterocycle at the G-position may also be accomplished by a nucleophilic substitution reaction, as described for example in WO 2007/075459.

5

Compounds of formula (I) with G representing formula (G¹) may be prepared from aldehydes of formula (I-3) in analogy to the methods described in WO 2010/072781 and the references cited therein. Compounds of formula (I) with G representing formula (G¹) wherein R⁹ is N(R^{9a})R^{9b} may be prepared from a compound of formula (I-4) by amination in analogy to the methods described in WO 2010/072602 and the references cited therein. Compounds of formula (I-4) may be prepared from compounds of formula (I-3) in analogy to the methods described in WO 2010/072781. Aldehydes of formula (I-3) may be prepared by a carbonylation reaction of compounds of formula (I-2), as described for example in WO 2010/072781 or in WO 2006/103148.

10

15 Scheme 5



20

As a rule, the compounds of formula (I) including their stereoisomers, salts, tautomers and N-oxides, and their precursors in the synthesis process [especially (I-1), (II), (III), (IV), (V), (VI), (VI)], can be prepared by the methods described above. If individual compounds can not be prepared via the above-described routes, they can be prepared by derivatization of other com-

pounds (I) or the respective precursor or by customary modifications of the synthesis routes described. For example, in individual cases, certain compounds of formula (I) can advantageously be prepared from other compounds of formula (I) by derivatization, e.g. by ester hydrolysis, amidation, esterification, ether cleavage, olefination, reduction, oxidation and the like, or by customary modifications of the synthesis routes described.

The reaction mixtures are worked up in the customary manner, for example by mixing with water, separating the phases, and, if appropriate, purifying the crude products by chromatography, for example on alumina or on silica gel. Some of the intermediates and end products may be obtained in the form of colorless or pale brown viscous oils which are freed or purified from volatile components under reduced pressure and at moderately elevated temperature. If the intermediates and end products are obtained as solids, they may be purified by recrystallization or trituration.

Due to their excellent activity, the compounds of the present invention may be used for controlling invertebrate pests.

Accordingly, the present invention also provides a method for controlling invertebrate pests which method comprises treating the pests, their food supply, their habitat or their breeding ground or a cultivated plant, plant propagation materials (such as seed), soil, area, material or environment in which the pests are growing or may grow, or the materials, cultivated plants, plant propagation materials (such as seed), soils, surfaces or spaces to be protected from pest attack or infestation with a pesticidally effective amount of a compound of the present invention or a composition as defined above.

Preferably, the method of the invention serves for protecting plant propagation material (such as seed) and the plant which grows therefrom from invertebrate pest attack or infestation and comprises treating the plant propagation material (such as seed) with a pesticidally effective amount of a compound of the present invention as defined above or with a pesticidally effective amount of an agricultural composition as defined above and below. The method of the invention is not limited to the protection of the "substrate" (plant, plant propagation materials, soil material etc.) which has been treated according to the invention, but also has a preventive effect, thus, for example, according protection to a plant which grows from a treated plant propagation materials (such as seed), the plant itself not having been treated.

In the sense of the present invention, "invertebrate pests" are preferably selected from arthropods and nematodes, more preferably from harmful insects, arachnids and nematodes, and even more preferably from insects, acarids and nematodes. In the sense of the present invention, "invertebrate pests" are most preferably insects.

The invention further provides an agricultural composition for combating invertebrate pests, which comprises such an amount of at least one compound according to the invention and at

least one inert liquid and/or solid agronomically acceptable carrier that has a pesticidal action and, if desired, at least one surfactant.

Such a composition may comprise a single active compound of the present invention or a mixture of several active compounds of the present invention. The composition according to the present invention may comprise an individual isomer or mixtures of isomers or a salt as well as individual tautomers or mixtures of tautomers.

The compounds of the present invention, including their salts, stereoisomers and tautomers, are in particular suitable for efficiently controlling arthropodal pests such as arachnids, myriapedes and insects as well as nematodes. They are especially suitable for efficiently combating or controlling the following pests:

Insects from the order of the lepidopterans (Lepidoptera), for example *Agrotis ypsilon*, *Agrotis segetum*, *Alabama argillacea*, *Anticarsia gemmatalis*, *Argyresthia conjugella*, *Autographa gamma*, *Bupalus piniarius*, *Cacoecia murinana*, *Capua reticulana*, *Cheimatobia brumata*, *Choristoneura fumiferana*, *Choristoneura occidentalis*, *Cirphis unipuncta*, *Cydia pomonella*, *Dendrolimus pini*, *Diaphania nitidalis*, *Diatraea grandiosella*, *Earias insulana*, *Elasmopalpus lignosellus*, *Eupoecilia ambiguella*, *Evetria bouliana*, *Feltia subterranea*, *Galleria mellonella*, *Grapholitha funebrana*, *Grapholitha molesta*, *Heliothis armigera*, *Heliothis virescens*, *Heliothis zea*, *Hellula undalis*, *Hibernia defoliaria*, *Hyphantria cunea*, *Hyponomeuta malinellus*, *Keiferia lycopersicella*, *Lambdina fiscellaria*, *Laphygma exigua*, *Leucoptera coffeella*, *Leucoptera scitella*, *Lithocolletis blancardella*, *Lobesia botrana*, *Loxostege sticticalis*, *Lymantria dispar*, *Lymantria monacha*, *Lyonetia clerkella*, *Malacosoma neustria*, *Mamestra brassicae*, *Orgyia pseudotsugata*, *Ostrinia nubilalis*, *Panolis flammea*, *Pectinophora gossypiella*, *Peridroma saucia*, *Phalera bucephala*, *Phthorimaea operculella*, *Phyllocnistis citrella*, *Pieris brassicae*, *Pieris rapae*, *Plathypena scabra*, *Plutella xylostella*, *Pseudoplusia includens*, *Rhyacionia frustrana*, *Scrobipalpus absoluta*, *Sitotroga cerealella*, *Sparganothis pilleriana*, *Spodoptera frugiperda*, *Spodoptera littoralis*, *Spodoptera litura*, *Thaumatopoea pityocampa*, *Tortrix viridana*, *Trichoplusia ni* and *Zeiraphera canadensis*;

beetles (Coleoptera), for example *Agrilus sinuatus*, *Agriotes lineatus*, *Agriotes obscurus*, *Amphimallus solstitialis*, *Anisandrus dispar*, *Anthonomus grandis*, *Anthonomus pomorum*, *Aphthona euphoridae*, *Athous haemorrhoidalis*, *Atomaria linearis*, *Blastophagus piniperda*, *Blitophaga undata*, *Bruchus rufimanus*, *Bruchus pisorum*, *Bruchus lentis*, *Byctiscus betulae*, *Cassida nebulosa*, *Cerotoma trifurcata*, *Cetonia aurata*, *Ceuthorrhynchus assimilis*, *Ceuthorrhynchus napi*, *Chaetocnema tibialis*, *Conoderus vespertinus*, *Crioceris asparagi*, *Ctenicera ssp.*, *Diabrotica longicornis*, *Diabrotica semipunctata*, *Diabrotica 12-punctata*, *Diabrotica speciosa*, *Diabrotica virgifera*, *Epilachna varivestis*, *Epitrix hirtipennis*, *Eutinobothrus brasiliensis*, *Hylobius abietis*, *Hypera brunneipennis*, *Hypera postica*, *Ips typographus*, *Lema bilineata*, *Lema melanopus*, *Leptinotarsa decemlineata*, *Limonius californicus*, *Lissorhoptrus oryzophilus*, *Melanotus communis*, *Meligethes aeneus*, *Melolontha hippocastani*, *Melolontha melolontha*, *Oulema oryzae*, *Otiorrhynchus sulcatus*, *Otiorrhynchus ovatus*, *Phaedon cochleariae*, *Phyllobius pyri*, *Phyllotreta*

chrysocephala, *Phyllophaga* sp., *Phyllopertha horticola*, *Phyllotreta nemorum*, *Phyllotreta striolata*, *Popillia japonica*, *Sitona lineatus* and *Sitophilus granaria*;

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*, *Ceratitis capitata*, *Chrysomya bezziana*, *Chrysomya hominivorax*, *Chrysomya macellaria*, *Chrysops discalis*, *Chrysops silacea*, *Chrysops atlanticus*, *Cochliomyia hominivorax*, *Contarinia sorghicola*, *Cordylobia anthropophaga*, *Culicoides furens*, *Culex pipiens*,
 10 *Culex nigripalpus*, *Culex quinquefasciatus*, *Culex tarsalis*, *Culiseta inornata*, *Culiseta melanura*, *Dacus cucurbitae*, *Dacus oleae*, *Dasineura brassicae*, *Delia antique*, *Delia coarctata*, *Delia platura*, *Delia radicum*, *Dermatobia hominis*, *Fannia canicularis*, *Geomyza tripunctata*, *Gasterophilus intestinalis*, *Glossina morsitans*, *Glossina palpalis*, *Glossina fuscipes*, *Glossina tachinoides*, *Haematobia irritans*, *Haplodiplosis equestris*, *Hippelates* spp., *Hylemyia platura*, *Hypoderma*
 15 *lineata*, *Leptoconops torrens*, *Liriomyza sativae*, *Liriomyza trifolii*, *Lucilia caprina*, *Lucilia cuprina*, *Lucilia sericata*, *Lycoria pectoralis*, *Mansonia titillanus*, *Mayetiola destructor*, *Musca autumnalis*, *Musca domestica*, *Muscina stabulans*, *Oestrus ovis*, *Opomyza florum*, *Oscinella frit*, *Pegomya hysocyami*, *Phorbia antiqua*, *Phorbia brassicae*, *Phorbia coarctata*, *Phlebotomus argentipes*, *Psorophora columbiae*, *Psila rosae*, *Psorophora discolor*, *Prosimulium mixtum*, *Rhagoletis cerasi*, *Rhagoletis pomonella*, *Sarcophaga haemorrhoidalis*, *Sarcophaga* spp., *Simulium vittatum*, *Stomoxys calcitrans*, *Tabanus bovinus*, *Tabanus atratus*, *Tabanus lineola*, and *Tabanus similis*, *Tipula oleracea*, and *Tipula paludosa*;

thrips (Thysanoptera), e.g. *Dichromothrips corbetti*, *Dichromothrips* ssp., *Frankliniella fusca*,
 25 *Frankliniella occidentalis*, *Frankliniella tritici*, *Scirtothrips citri*, *Thrips oryzae*, *Thrips palmi* and *Thrips tabaci*,

termites (Isoptera), e.g. *Calotermes flavicollis*, *Leucotermes flavipes*, *Heterotermes aureus*, *Reticulitermes flavipes*, *Reticulitermes virginicus*, *Reticulitermes lucifugus*, *Reticulitermes santonensis*, *Reticulitermes grassei*, *Termes natalensis*, and *Coptotermes formosanus*;

cockroaches (Blattaria - Blattodea), e.g. *Blattella germanica*, *Blattella asahinae*, *Periplaneta americana*, *Periplaneta japonica*, *Periplaneta brunnea*, *Periplaneta fuliginosa*, *Periplaneta australasiae*, and *Blatta orientalis*;

35 bugs, aphids, leafhoppers, whiteflies, scale insects, cicadas (Hemiptera), e.g. *Acrosternum hi-lare*, *Blissus leucopterus*, *Cyrtopeltis notatus*, *Dysdercus cingulatus*, *Dysdercus intermedius*, *Eurygaster integriceps*, *Euschistus impictiventris*, *Leptoglossus phyllopus*, *Lygus hesperus*, *Lygus lineolaris*, *Lygus pratensis*, *Nezara viridula*, *Piesma quadrata*, *Solubea insularis*, *Thyanta perditor*, *Acyrtosiphon onobrychis*, *Adelges laricis*, *Aphidula nasturtii*, *Aphis fabae*, *Aphis forbesi*, *Aphis pomi*, *Aphis gossypii*, *Aphis grossulariae*, *Aphis schneideri*, *Aphis spiraeicola*,
 40 *Aphis sambuci*, *Acyrtosiphon pisum*, *Aulacorthum solani*, *Bemisia argentifolii*, *Brachycaudus*

- cardui, *Brachycaudus helichrysi*, *Brachycaudus persicae*, *Brachycaudus prunicola*, *Brevicoryne brassicae*, *Capitophorus horni*, *Cerosipha gossypii*, *Chaetosiphon fragaefolii*, *Cryptomyzus ribis*, *Dreyfusia nordmannianae*, *Dreyfusia piceae*, *Dysaphis radicola*, *Dysaulacorthum pseudosolani*, *Dysaphis plantaginea*, *Dysaphis pyri*, *Empoasca fabae*, *Hyalopterus pruni*, *Hyperomyzus lactu-*
5 *cae*, *Macrosiphum avenae*, *Macrosiphum euphorbiae*, *Macrosiphon rosae*, *Megoura viciae*, *Melanaphis pyraus*, *Metopolophium dirhodum*, *Myzus persicae*, *Myzus ascalonicus*, *Myzus cerasi*, *Myzus varians*, *Nasonovia ribis-nigri*, *Nephotettix virescens*, *Nilaparvata lugens*, *Pemphigus bursarius*, *Perkinsiella saccharicida*, *Phorodon humuli*, *Psylla mali*, *Psylla piri*, *Rhopalomyzus ascalonicus*, *Rhopalosiphum maidis*, *Rhopalosiphum padi*, *Rhopalosiphum insertum*,
10 *Sappaphis mala*, *Sappaphis mali*, *Schizaphis graminum*, *Schizoneura lanuginosa*, *Sitobion avenae*, *Trialeurodes vaporariorum*, *Toxoptera aurantiiand*, *Viteus vitifolii*, *Cimex lectularius*, *Cimex hemipterus*, *Reduvius senilis*, *Triatoma* spp., and *Arilus critatus*;
- ants, bees, wasps, sawflies (Hymenoptera), e.g. *Athalia rosae*, *Atta cephalotes*, *Atta capiguara*,
15 *Atta cephalotes*, *Atta laevigata*, *Atta robusta*, *Atta sexdens*, *Atta texana*, *Crematogaster* spp., *Hoplocampa minuta*, *Hoplocampa testudinea*, *Lasius niger*, *Monomorium pharaonis*, *Solenopsis geminata*, *Solenopsis invicta*, *Solenopsis richteri*, *Solenopsis xyloni*, *Pogonomyrmex barbatus*, *Pogonomyrmex californicus*, *Pheidole megacephala*, *Dasymutilla occidentalis*, *Bombus* spp., *Vespula squamosa*, *Paravespula vulgaris*, *Paravespula pennsylvanica*, *Paravespula germanica*,
20 *Dolichovespula maculata*, *Vespa crabro*, *Polistes rubiginosa*, *Camponotus floridanus*, and *Linepithema humile*;
- crickets, grasshoppers, locusts (Orthoptera), e.g. *Acheta domestica*, *Gryllotalpa gryllotalpa*, *Locusta migratoria*, *Melanoplus bivittatus*, *Melanoplus femurrubrum*, *Melanoplus mexicanus*, *Mel-*
25 *anoplus sanguinipes*, *Melanoplus spretus*, *Nomadacris septemfasciata*, *Schistocerca americana*, *Schistocerca gregaria*, *Dociostaurus maroccanus*, *Tachycines asynamorus*, *Oedaleus senegalensis*, *Zonozerus variegatus*, *Hieroglyphus daganensis*, *Kraussaria angulifera*, *Calliptamus italicus*, *Chortoicetes terminifera*, and *Locustana pardalina*;
- 30 arachnoidea, such as arachnids (Acarina), e.g. of the families Argasidae, Ixodidae and Sarcop-
tidae, such as *Amblyomma americanum*, *Amblyomma variegatum*, *Amblyomma maculatum*, *Argas persicus*, *Boophilus annulatus*, *Boophilus decoloratus*, *Boophilus microplus*, *Dermacentor silvarum*, *Dermacentor andersoni*, *Dermacentor variabilis*, *Hyalomma truncatum*, *Ixodes ricinus*, *Ixodes rubicundus*, *Ixodes scapularis*, *Ixodes holocyclus*, *Ixodes pacificus*, *Ornithodoros mou-*
35 *bata*, *Ornithodoros hermsi*, *Ornithodoros turicata*, *Ornithonyssus bacoti*, *Otobius megnini*, *Der-*
manyssus gallinae, *Psoroptes ovis*, *Rhipicephalus sanguineus*, *Rhipicephalus appendiculatus*, *Rhipicephalus evertsi*, *Sarcoptes scabiei*, and *Eriophyidae* spp. such as *Aculus schlechtendali*, *Phyllocoptrata oleivora* and *Eriophyes sheldoni*; *Tarsonemidae* spp. such as *Phytonemus pal-*
lidus and *Polyphagotarsonemus latus*; *Tenuipalpidae* spp. such as *Brevipalpus phoenicis*;
40 *Tetranychidae* spp. such as *Tetranychus cinnabarinus*, *Tetranychus kanzawai*, *Tetranychus pacificus*, *Tetranychus telarius* and *Tetranychus urticae*, *Panonychus ulmi*, *Panonychus citri*, and *Oligonychus pratensis*; *Araneida*, e.g. *Latrodectus mactans*, and *Loxosceles reclusa*;

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

5 silverfish, firebrat (*Thysanura*), e.g. *Lepisma saccharina* and *Thermobia domestica*,

centipedes (*Chilopoda*), e.g. *Scutigera coleoptrata*,

millipedes (*Diplopoda*), e.g. *Narceus* spp.,

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

lice (*Phthiraptera*), e.g. *Pediculus humanus capitis*, *Pediculus humanus corporis*, *Pthirus pubis*, *Haematopinus eurysternus*, *Haematopinus suis*, *Linognathus vituli*, *Bovicola bovis*, *Menopon*

15 *gallinae*, *Menacanthus stramineus* and *Solenopotes capillatus*.

Collembola (springtails), e.g. *Onychiurus* ssp..

The compounds of the present invention, including their salts, stereoisomers and tautomers, are
 20 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,
 25 *Aphelenchoides* species; Sting nematodes, *Belonolaimus longicaudatus* and other *Belonolaimus* species; Pine nematodes, *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;
 30 *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 neglectus*, *Pratylenchus penetrans*, *Pratylenchus curvatus*,
 35 *Pratylenchus goodeyi* and other *Pratylenchus* species; Burrowing nematodes, *Radopholus similis* and other *Radopholus* species; Reniform nematodes, *Rotylenchus robustus* 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,
 40 *Tylenchulus* species; Dagger nematodes, *Xiphinema* species; and other plant parasitic nematode species.

The compounds of the present invention, including their salts, stereoisomers and tautomers, are particularly useful for controlling insects, preferably chewing and biting and piercing and sucking insects such as insects from the genera Lepidoptera, Coleoptera and Hemiptera, in particular Lepidoptera, Coleoptera and true bugs.

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The compounds of the present invention, including their salts, stereoisomers and tautomers, are moreover useful for controlling insects of the orders Thysanoptera, Diptera (especially flies, mosquitos), Hymenoptera (especially ants) and Isoptera (especially termites).

- 10 The compounds of the present invention, including their salts, stereoisomers and tautomers, are particularly useful for controlling insects of the orders Lepidoptera and Coleoptera.

The compounds of the present invention can be converted into the customary formulations, e.g. solutions, emulsions, suspensions, dusts, powders, pastes, granules and directly sprayable so-

15 lutions. 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 present invention.

- 20 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.,
- 25 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,
- 30 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.:

- 35 - 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-methyl-pyrrolidone (NMP), N-octylpyrrolidone (NOP)], acetates (glycol diacetate), alkyl lactates, lactones such as gamma-butyrolactone, glycols, fatty acid dimethylamides, fatty acids and
- 40 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 surface-active compounds, such as anionic, cationic, nonionic and amphoteric surfactants, block polymers, polyelectrolytes, and mixtures thereof. Such surfactants can be used as emulsifier, dispersant, solubilizer, wetter, penetration enhancer, protective colloid, or adjuvant. Examples of surfactants are listed in McCutcheon's, Vol.1: Emulsifiers & Detergents, McCutcheon's Directories, Glen Rock, USA, 2008 (International Ed. or North American Ed.).

Suitable anionic surfactants are alkali, alkaline earth or ammonium salts of sulfonates, sulfates, phosphates, carboxylates, and mixtures thereof. Examples of sulfonates are alkylarylsulfonates, diphenylsulfonates, alpha-olefin sulfonates, lignine sulfonates, sulfonates of fatty acids and oils, sulfonates of ethoxylated alkylphenols, sulfonates of alkoxyated arylphenols, sulfonates of condensed naphthalenes, sulfonates of dodecyl- and tridecylbenzenes, sulfonates of naphthalenes and alkyl-naphthalenes, sulfosuccinates or sulfosuccinamates. Examples of sulfates are sulfates of fatty acids and oils, of ethoxylated alkylphenols, of alcohols, of ethoxylated alcohols, or of fatty acid esters. Examples of phosphates are phosphate esters. Examples of carboxylates are alkyl carboxylates, and carboxylated alcohol or alkylphenol ethoxylates.

Suitable nonionic surfactants are alkoxyates, N-substituted fatty acid amides, amine oxides, esters, sugar-based surfactants, polymeric surfactants, and mixtures thereof. Examples of alkoxyates are compounds such as alcohols, alkylphenols, amines, amides, arylphenols, fatty acids or fatty acid esters which have been alkoxyated with 1 to 50 equivalents. Ethylene oxide and/or propylene oxide may be employed for the alkoxylation, preferably ethylene oxide. Examples of N-substituted fatty acid amides are fatty acid glucamides or fatty acid alkanolamides. Examples of esters are fatty acid esters, glycerol esters or monoglycerides. Examples of sugar-based surfactants are sorbitans, ethoxylated sorbitans, sucrose and glucose esters or alkyl-polyglucosides. Examples of polymeric surfactants are home- or copolymers of vinylpyrrolidone, vinylalcohols, or vinylacetate.

Suitable cationic surfactants are quaternary surfactants, for example quaternary ammonium compounds with one or two hydrophobic groups, or salts of long-chain primary amines. Suitable

amphoteric surfactants are alkylbetains and imidazolines. Suitable block polymers are block polymers of the A-B or A-B-A type comprising blocks of polyethylene oxide and polypropylene oxide, or of the A-B-C type comprising alkanol, polyethylene oxide and polypropylene oxide. Suitable polyelectrolytes are polyacids or polybases. Examples of polyacids are alkali salts of polyacrylic acid or polyacid comb polymers. Examples of polybases are polyvinylamines or polyethyleneamines.

Suitable adjuvants are compounds, which have a neglectable or even no pesticidal activity themselves, and which improve the biological performance of the compound I on the target.

Examples are surfactants, mineral or vegetable oils, and other auxiliaries. Further examples are listed by Knowles, Adjuvants and additives, Agrow Reports DS256, T&F Informa UK, 2006, chapter 5.

Also anti-freezing agents, such as glycerin, ethylene glycol or propylene glycol, and bactericides, such as bronopol and isothiazolinone derivatives such as alkylisothiazolinones and benzisothiazolinones, 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.

5 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.

15 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.

25 In general, the formulations, i.e. the compositions according to the invention, 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.

30 The compounds of the present invention 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:

40 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 disper-

sion or solution of the active compound, whereby a formulation with 75% (w/w) of active compound is obtained.

H) Gel-Formulation (GF)

- 5 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.

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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)

- 15 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)

- 20 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.

25 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.

- 30 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
35 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 0.001 to 1%.

- 40 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 methods and uses of this invention, the compounds according to the invention 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.

The following list M of pesticides together with which the compounds according to the invention can be used and with which potential synergistic effects might be produced, is intended to illustrate the possible combinations, but not to impose any limitation:

M.1. Organo(thio)phosphate compounds: acephate, azamethiphos, azinphos-ethyl, azinphos-methyl, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos, chlorpyrifos-methyl, coumaphos, cyanophos, demeton-S-methyl, diazinon, dichlorvos/ DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenithion, flupyrazophos, fosthiazate, heptenophos, 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, vamidothion;

M.2. Carbamate compounds: 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, triazamate;

M.3. Pyrethroid compounds: acrinathrin, allethrin, d-cis-trans allethrin, d-trans allethrin, bifenthrin, bioallethrin, bioallethrin S-cyclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, lambda-cyhalothrin, gamma-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin, deltamethrin, empenethrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, imiprothrin, metofluthrin, permethrin, phenothrin, prallethrin, profluthrin, pyrethrin (pyrethrum), resmethrin, silafluofen, tefluthrin, tetramethrin, tralomethrin, transfluthrin;

M.4. Juvenile hormone mimics: hydroprene, kinoprene, methoprene, fenoxycarb, pyriproxyfen;

M.5. Nicotinic receptor agonists/antagonists compounds: acetamiprid, bensultap, cartap hydrochloride, clothianidin, dinotefuran, imidacloprid, thiamethoxam, nitenpyram, nicotine, spinosad (allosteric agonist), spinetoram (allosteric agonist), thiacloprid, thiocyclam, thiosultap-sodium and AKD1022.

M.6. GABA gated chloride channel antagonist compounds: chlordane, endosulfan, gamma-HCH (lindane); ethiprole, fipronil, pyrafluprole, pyriprole

M.7. Chloride channel activators: abamectin, emamectin benzoate, milbemectin, lepimectin;

- M.8. METI I compounds: fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad, tolfenpyrad, flufenimer, rotenone;
- M.9. METI II and III compounds: acequinocyl, fluacyprim, hydramethylnon;
- M.10. Uncouplers of oxidative phosphorylation: chlorfenapyr, DNOC;
- 5 M.11. Inhibitors of oxidative phosphorylation: azocyclotin, cyhexatin, diafenthiuron, fenbutatin oxide, propargite, tetradifon;
- M.12. Moulting disruptors: cyromazine, chromafenozide, halofenozide, methoxyfenozide, tebufenozide;
- 10 M.13. Synergists: piperonyl butoxide, tribufos;
- M.14. Sodium channel blocker compounds: indoxacarb, metaflumizone;
- M.15. Fumigants: methyl bromide, chloropicrin sulfuryl fluoride;
- M.16. Selective feeding blockers: crylotie, pymetrozine, flonicamid;
- M.17. Mite growth inhibitors: clofentezine, hexythiazox, etoxazole;
- 15 M.18. Chitin synthesis inhibitors: buprofezin, bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron, triflurumuron;
- M.19. Lipid biosynthesis inhibitors: spirotetramat, spiromesifen, spirotetramat;
- M.20. Octapaminergic agonists: amitraz;
- 20 M.21. Ryanodine receptor modulators: flubendiamide and the phthalamid compound (R)-, (S)- 3-Chlor-N1-{2-methyl-4-[1,2,2,2 – tetrafluor-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)ethyl)phthalamid (M21.1)
- M.22. Isoxazoline compounds: 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-pyridin-2-ylmethyl-benzamide (M22.1), 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-(2,2,2-trifluoro-ethyl)-benzamide (M22.2),
- 25 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-[(2,2,2-trifluoro-ethyl)carbamoyl]-methyl-benzamide (M22.3), 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-naphthalene-1-carboxylic acid [(2,2,2-trifluoro-ethyl)carbamoyl]-methyl-amide (M22.4), 4-[5-(3,5-Dichlorophenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-N-[(methoxyimino)methyl]-2-methylbenzamide (M22.5) 4-[5-(3-Chloro-5-trifluoromethyl-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-[(2,2,2-trifluoro-ethyl)carbamoyl]-methyl-benzamide (M22.6), 4-[5-(3-Chloro-5-trifluoromethyl-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-naphthalene-1-carboxylic acid [(2,2,2-trifluoro-ethyl)carbamoyl]-methyl-amide (M22.7) and 5-[5-(3,5-Dichloro-4-fluoro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-[1,2,4]triazol-1-yl-benzonitrile (M22.8);
- 35 M.23. Anthranilamide compounds: chloranthraniliprole, cyantraniliprole, 5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [4-cyano-2-(1-cyclopropyl-ethylcarbamoyl)-6-methyl-phenyl]-amide (M23.1), 5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [2-chloro-4-cyano-6-(1-cyclopropyl-ethylcarbamoyl)-phenyl]-amide (M23.2), 5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [2-bromo-4-cyano-6-(1-cyclopropyl-ethylcarbamoyl)-phenyl]-amide (M23.3), 5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [2-bromo-4-chloro-6-(1-cyclopropyl-ethylcarbamoyl)-phenyl]-amide (M23.4), 5-Bromo-2-(3-chloro-
- 40

- pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [2,4-dichloro-6-(1-cyclopropyl-ethylcarbamoyl)-phenyl]-amide (M23.5), 5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carboxylic acid [4-chloro-2-(1-cyclopropyl-ethylcarbamoyl)-6-methyl-phenyl]-amide (M23.6), N'-(2-[[5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-5-chloro-3-methyl-benzoyl)-
- 5 hydrazinecarboxylic acid methyl ester (M23.7), N'-(2-[[5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-5-chloro-3-methyl-benzoyl)-N'-methyl-hydrazinecarboxylic acid methyl ester (M23.8), N'-(2-[[5-Bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-5-chloro-3-methyl-benzoyl)-N,N'-dimethyl-hydrazinecarboxylic acid methyl ester (M23.9), N'-(3,5-Dibromo-2-[[5-bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-benzoyl)-
- 10 hydrazinecarboxylic acid methyl ester (M23.10), N'-(3,5-Dibromo-2-[[5-bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-benzoyl)-N'-methyl-hydrazinecarboxylic acid methyl ester (M23.11) and N'-(3,5-Dibromo-2-[[5-bromo-2-(3-chloro-pyridin-2-yl)-2H-pyrazole-3-carbonyl]-amino]-benzoyl)-N,N'-dimethyl-hydrazinecarboxylic acid methyl ester (M23.12);
- M.24. Malononitrile compounds: 2-(2,2,3,3,4,4,5,5-octafluoropentyl)-2-(3,3,3-trifluoropropyl)malononitrile ($\text{CF}_2\text{HCF}_2\text{CF}_2\text{CF}_2\text{CH}_2\text{C}(\text{CN})_2\text{CH}_2\text{CH}_2\text{CF}_3$) (M24.1) and 2-(2,2,3,3,4,4,5,5-octafluoropentyl)-2-(3,3,4,4,4-pentafluorobutyl)-malonodinitrile ($\text{CF}_2\text{HCF}_2\text{CF}_2\text{CF}_2\text{CH}_2\text{C}(\text{CN})_2\text{CH}_2\text{CH}_2\text{CF}_2\text{CF}_3$) (M24.2);
- M.25. Microbial disruptors: *Bacillus thuringiensis* subsp. *Israelensi*, *Bacillus sphaericus*, *Bacillus thuringiensis* subsp. *Aizawai*, *Bacillus thuringiensis* subsp. *Kurstaki*, *Bacillus thuringiensis*
- 20 subsp. *Tenebrionis*;
- M.26. Aminofuranone compounds:
- 4-[[[6-Bromopyrid-3-yl)methyl](2-fluoroethyl)amino]furan-2(5H)-on (M26.1), 4-[[[6-Fluoropyrid-3-yl)methyl](2,2-difluoroethyl)amino]furan-2(5H)-on (M26.2), 4-[[[2-Chloro-1,3-thiazolo-5-yl)methyl](2-fluoroethyl)amino]furan-2(5H)-on (M26.3), 4-[[[6-Chloropyrid-3-yl)methyl](2-
- 25 fluoroethyl)amino]furan-2(5H)-on (M26.4), 4-[[[6-Chloropyrid-3-yl)methyl](2,2-difluoroethyl)amino]furan-2(5H)-on (M26.5), 4-[[[6-Chloro-5-fluoropyrid-3-yl)methyl](methyl)amino]furan-2(5H)-on (M26.6), 4-[[[5,6-Dichloropyrid-3-yl)methyl](2-fluoroethyl)amino]furan-2(5H)-on (M26.7), 4-[[[6-Chloro-5-fluoropyrid-3-yl)methyl](cyclopropyl)amino]furan-2(5H)-on (M26.8), 4-[[[6-Chloropyrid-3-yl)methyl](cyclopropyl)amino]furan-
- 30 2(5H)-on (M26.9) and 4-[[[6-Chloropyrid-3-yl)methyl](methyl)amino]furan-2(5H)-on (M26.10);
- M.27. Various compounds: aluminium phosphide, amidoflumet, benclothiaz, benzoximate, bifenazate, borax, bromopropylate, cyanide, cyenopyrafen, cyflumetofen, chinomethionate, dicofol, fluoroacetate, phosphine, pyridalyl, pyrfluquinazon, sulfur, organic sulfur compounds, tartar emetic, sulfoxaflo, N-R'-2,2-dihalo-1-R''cyclo-propanecarboxamide-2-(2,6-dichloro-
- 35 α , α , α -trifluoro-p-tolyl)hydrazone or N-R'-2,2-di (R''')propionamide-2-(2,6-dichloro- α , α , α -trifluoro-p-tolyl)-hydrazone, wherein R' is methyl or ethyl, halo is chloro or bromo, R'' is hydrogen or methyl and R''' is methyl or ethyl, 4-But-2-ynyloxy-6-(3,5-dimethyl-piperidin-1-yl)-2-fluoropyrimidine (M27.1), Cyclopropaneacetic acid, 1,1'-[(3S,4R,4aR,6S,6aS,12R,12aS,12bS)-4-[(2-cyclopropylacetyl)oxy]methyl]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-12-hydroxy-4,6a,12b-tri-
- 40 methyl-11-oxo-9-(3-pyridinyl)-2H,11H-naphtho[2,1-b]pyrano[3,4-e]pyran-3,6-diyl] ester (M27.2) and 8-(2-Cyclopropylmethoxy-4-trifluoromethyl-phenoxy)-3-(6-trifluoromethyl-pyridazin-3-yl)-3-aza-bicyclo[3.2.1]octane (M27.3).

The commercially available compounds of the group M may be found in The Pesticide Manual, 13th Edition, British Crop Protection Council (2003) among other publications.

Paraoxon and their preparation have been described in Farm Chemicals Handbook, Volume 88, Meister Publishing Company, 2001. Flupyrzofos has been described in Pesticide Science 54, 1988, p.237-243 and in US 4822779.-AKD 1022 and its preparation have been described in US 6300348.-M21.1 is known from WO 2007/ 101540.-Isoxazolines M22.1 to M22.8 have been described in e.g. WO2005/085216, WO 2007/079162, WO 2007/026965, WO 2009/126668 and WO2009/051956. Anthranilamides M23.1 to M23.6 have been described in WO 2008/72743 and WO 200872783, those M23.7 to M23.12 in WO 2007/043677. Malononitriles M24.1 and M24.2 have been described in WO 02/089579, WO 02/090320, WO 02/090321, WO 04/006677, WO 05/068423, WO 05/ 068432 and WO 05/063694. Aminofuranones M26.1 to M26.10 have been described eg. in WO 2007/115644. Alkynylether M27.1 is described e.g. in JP 2006131529. Organic sulfur compounds have been described in WO 2007060839. Pyripyropene derivative M27.2 has been described in WO 2008/ 66153 and WO 2008/108491. Pyridazin M27.3 has been described in JP 2008/115155.

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 (e.g. strobilurins)

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

oxazolidinediones and imidazolinones: famoxadone, fenamidone;

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

carboxanilides: benodanil, 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, N-(4'-trifluoromethylthiobiphenyl-2-yl)-3 difluoromethyl-1-methyl-1H pyrazole-4-carboxamide and N-(2-(1,3,3-trimethyl-butyl)-phenyl)-1,3-dimethyl-5 fluoro-1H-pyrazole-4 carboxamide;

F.I-3) Inhibitors of complex III at Qi site: cyazofamid, amisulbrom;

F.I-4) Other respiration inhibitors (complex I, uncouplers)

diflumentorim; tecnazen; ferimzone; ametocetradin; silthiofam; nitrophenyl derivatives: binapacryl, dinobuton, dinocap, fluazinam, nitrthal-isopropyl, 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;
 imidazoles: imazalil, pefurazoate, oxpoconazole, prochloraz, triflumizole;
 pyrimidines, pyridines and piperazines: fenarimol, nuarimol, pyrifenox, triforine;
- 5 F.II-2) Delta14-reductase inhibitors (Amines, e.g. morpholines, piperidines)
 morpholines: aldimorph, dodemorph, dodemorph-acetate, fenpropimorph, tridemorph;
 piperidines: fenpropidin, piperalin;
 spiroketalamines: spiroxamine;
- 10 F.II-3) Inhibitors of 3-keto reductase: hydroxyanilides: fenhexamid;
 F.III) Nucleic acid synthesis inhibitors
- 15 F.III-1) RNA, DNA synthesis
 phenylamides or acyl amino acid fungicides: benalaxyl, benalaxyl-M, kiralaxyl, metalaxyl, metalaxyl-M (mefenoxam), ofurace, oxadixyl;
 isoxazoles and isothiazolones: hymexazole, othilinone;
- 20 F.III-2) DNA topoisomerase 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;
- 25 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;
- 30 F.IV-3) Actin inhibitors: benzophenones: metrafenone;
 F.V) Inhibitors of amino acid and protein synthesis
 F.V-1) Mmethionine synthesis inhibitors (anilino-pyrimidines)
 anilino-pyrimidines: cyprodinil, mepanipyrim, nitrapyrin, pyrimethanil;
- 35 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;
- 40 phenylpyrroles: fenpiclonil, fludioxonil;
 F.VI-2) G protein inhibitors: quinolines: quinoxifen;
 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

- 5 aromatic hydrocarbons: dicloran, quintozone, tecnazene, tolclofos-methyl, biphenyl, chloroneb, etridiazole;

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

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

- 10 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

carbamates: propamocarb, propamocarb-hydrochlorid

F.VIII) Inhibitors with Multi Site Action

- 15 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):

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

F.VIII-4) Guanidines: guanidine, dodine, dodine free base, guazatine, guazatine-acetate, iminoctadine, iminoctadine-triacetate, iminoctadine-tris(albesilate);

F.VIII-5) Ahtraquinones: dithianon;

- 25 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

- 30 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:

- 35 bronopol, chinomethionat, cyflufenamid, cymoxanil, dazomet, debacarb, diclomezine, difenzoquat, difenzoquat-methylsulfate, diphenylamin, flumetover, flusulfamide, flutianil, methasulfo-carb, 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-
- 40

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-[(1R)-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-dimethoxypyrimidin-2-yl)-2-methyl-1H-benzimidazole, 2-(4-chloro-phenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynoxy-acetamide;

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 triiodobenzoic acid, trinexapac-ethyl and uniconazole;

F.XII) Biological control agents

antifungal biocontrol agents: *Bacillus subtilis* strain with NRRL No. B-21661 (e.g. RHAP-SODY®, SERENADE® MAX and SERENADE® ASO from AgraQuest, Inc., USA.), *Bacillus pumilus* strain with NRRL No. B-30087 (e.g. SONATA® and BALLAD® Plus from AgraQuest, Inc., USA), *Ulocladium oudemansii* (e.g. the product BOTRY-ZEN from BotriZen Ltd., New Zealand), Chitosan (e.g. ARMOUR-ZEN from BotriZen Ltd., New Zealand).

The invention also relates to a composition containing one or more, preferably one, individualized compound(s) I of the invention and one or more, preferably one, two or three, in particular one, pesticide(s) selected from the above list M and/or F.

The composition according to the invention may be a physical mixture of the at least one compound I of the invention and the at least one pesticide selected from the above list M and/or F. Accordingly, the invention also provides a mixture comprising one or more, preferably one, compound(s) I of the invention and one or more, preferably one, two or three, in particular one, pesticide(s) selected from the above list M and/or F. However, the composition may also be any combination of at least one compound I of the invention with at least one pesticide selected from the above list M and/or F, it not being required for the compounds to be present together in the same formulation.

An example of a composition according to the invention in which the at least one compound I of the invention and the at least one pesticide selected from the above list M and/or F are not present together in the same formulation is a combipack. In a combipack, two or more components of a combipack are packaged separately, i.e., not jointly pre-formulated. As such, combipacks

include one or more separate containers such as vials, cans, bottles, pouches, bags or canisters, each container containing a separate component for an agrochemical composition. One example is a two-component combipack. Accordingly the present invention also relates to a two-component combipack, comprising a first component which in turn comprises at least one compound A, a liquid or solid carrier and, if appropriate, at least one surfactant and/or at least one customary auxiliary, and a second component which in turn comprises at least one compound B, a liquid or solid carrier and, if appropriate, at least one surfactant and/or at least one customary auxiliary. More details, e.g. as to suitable liquid and solid carriers, surfactants and customary auxiliaries are described below.

The invertebrate pest (also referred to as "animal pest"), i.e. the insects, arachnids and nematodes, the plant, soil or water in which the plant is growing or may grow can be contacted with the compounds of the present invention or composition(s) comprising them by any application method known in the art. As such, "contacting" includes both direct contact (applying the compounds/compositions directly on the invertebrate 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 invertebrate pest or plant).

The compounds of the present invention 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 the present invention. 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 an 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.

Moreover, invertebrate 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 the present invention. 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 present invention can also be applied preventively to places at which occurrence of the pests is expected.

The compounds of the present invention may be also used to protect growing plants from attack or infestation by pests by contacting the plant with a pesticidally effective amount of compounds of the present invention. As such, "contacting" includes both direct contact (applying the compounds/compositions directly on the pest and/or plant - typically to the foliage, stem or roots of the plant) and indirect contact (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.

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 m², preferably from 0.001 to 20 g per 100 m².

Customary application rates in the protection of materials are, for example, from 0.01 g to 1000 g of active compound per m² treated material, desirably from 0.1 g to 50 g per m².

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 the present invention are effective through both contact (via soil, glass, wall, bed net, carpet, plant parts or animal parts), and ingestion (bait, or plant part).

The compounds of the present 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 the present invention 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 attrac-

tiveness 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 ingredient.

Formulations of compounds of the present invention 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, butanol), ketones (e.g. acetone, methyl ethyl ketone), paraffin hydrocarbons (e.g. kerosenes) 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 the present invention and its 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 (e.g. malaria, dengue and yellow fever, lymphatic filariasis, and leishmaniasis) with compounds of the present invention and its 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, Cymbopogon martinii,

Cymbopogon citratus (lemon grass), Cymbopogon nardus (citronella). Suitable binders are selected for example from polymers and copolymers of vinyl esters of aliphatic acids (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 dienes, 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 the present invention 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 the present invention 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, ply-woods, 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 the present invention are also suitable for the treatment of plant propagation material, especially seeds, in order to protect them 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 the present invention 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 seedlings' 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 present invention, including 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 from piercing and sucking insects, most preferably a method, wherein the plants shoots are protected from aphids.

The term seed embraces 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 comprises 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 comprises seeds coated with or containing the active compound.

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 active compound 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 active compound 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 242 236, EP-A 242 246) (WO 92/00377) (EP-A 257 993, U.S. 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 142 924, EP-A 193 259),

Furthermore, the active compound 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. Typically, 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 compounds of the present invention for seed treatment usually comprise from 0.1 to 80% by weight (1 to 800 g/l) of the active ingredient, 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 the present invention are generally from 0.01 g to 10 kg per 100 kg of seed, preferably from 0.05 g to 5 kg per 100 kg of seed, more preferably from 0.1 g to 1000 g per 100 kg of seed and in particular from 0.1 g to 200 g per 100 kg of seed.

The invention therefore also relates to seed comprising a compound of the present invention, including an agriculturally useful salt of it, as defined herein. The amount of the compound of the present invention, including an agriculturally useful salt thereof will in general vary from 0.01 g to 10 kg per 100 kg of seed, preferably from 0.05 g to 5 kg per 100 kg of seed, in particular

from 0.1 g to 1000 g per 100 kg of seed. For specific crops such as lettuce the rate can be higher.

5 Methods which can be employed for treating the seed are, in principle, all suitable seed treatment and especially seed dressing techniques known in the art, such as seed coating (e.g. seed pelleting), seed dusting and seed imbibition (e.g. seed soaking). Here, "seed treatment" refers to all methods that bring seeds and the compounds of the present invention into contact with each other, and "seed dressing" to methods of seed treatment which provide the seeds with an amount of the compounds of the present invention, i.e. which generate a seed comprising a
10 compound of the present invention. In principle, the treatment can be applied to the seed at any time from the harvest of the seed to the sowing of the seed. The seed can be treated immediately before, or during, the planting of the seed, for example using the "planter's box" method. However, the treatment may also be carried out several weeks or months, for example up to 12 months, before planting the seed, for example in the form of a seed dressing treatment, without
15 a substantially reduced efficacy being observed.

Expediently, the treatment is applied to unsown seed. As used herein, the term "unsown seed" is meant to include seed at any period from the harvest of the seed to the sowing of the seed in the ground for the purpose of germination and growth of the plant.

20 Specifically, a procedure is followed in the treatment in which the seed is mixed, in a suitable device, for example a mixing device for solid or solid/liquid mixing partners, with the desired amount of seed treatment formulations, either as such or after previous dilution with water, until the composition is distributed uniformly on the seed. If appropriate, this is followed by a drying
25 step.

The compounds of the present invention, including their stereoisomers, veterinarily acceptable salts or N-oxides, are in particular also suitable for being used for combating parasites in and on animals.

30 An object of the present invention is therefore 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.

35 The invention also relates to compositions comprising a parasitically effective amount of compounds of the present invention, including their stereoisomers, veterinarily acceptable salts or N-oxides, 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 par-
40 enterally administering or applying to the animals a parasitically effective amount of a compound of the present invention, including its stereoisomers, veterinarily acceptable salts or N-oxides, 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 parasitically effective amount of a compound of the present invention, including its stereoisomers, veterinarily acceptable salts or N-oxides, or a composition comprising it.

- 5 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.

10 Surprisingly it has now been found that compounds of formula (I) and their stereoisomers, veterinarily acceptable salts, tautomers and N-oxides, are suitable for combating endo- and ectoparasites in and on animals.

The compounds of the present invention, especially compounds of formula (I) and their stereoisomers, veterinarily acceptable salts, tautomers and N-oxides, and compositions comprising them are preferably used for controlling and preventing infestations of and infections in animals
15 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
20 trout, carp and eels.

Compounds of the present invention, including their stereoisomers, veterinarily acceptable salts or N-oxides, and compositions comprising them are preferably used for controlling and preventing infestations and infections in domestic animals, such as dogs or cats.

25 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 the present invention, including their stereoisomers, veterinarily acceptable salts or N-oxides, 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
30 development.

The compounds of the present invention 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*,
35 cockroaches (Blattaria - Blattodea), e.g. *Blattella germanica*, *Blattella asahinae*, *Periplaneta americana*, *Periplaneta japonica*, *Periplaneta brunnea*, *Periplaneta fuliginosa*, *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*, *Cor-*

- dylobia 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,
- 10 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, Rhipicephalus sanguineus, Dermacentor andersoni, Dermacentor variabilis, Amblyomma americanum, Amblyomma maculatum, Ornithodoros hermsi, Ornithodoros turicata and parasitic mites (Mesostigmata), e.g. Ornithonyssus bacoti and Dermanyssus gallinae,
- 15 Actinedida (Prostigmata) und Acaridida (Astigmata) e.g. Acarapis spp., Cheyletiella spp., Ornithocheyletiella 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,
- 20 Bugs (Heteropterida): Cimex lectularius, Cimex hemipterus, Reduvius senilis, Triatoma spp., Rhodnius spp., Panstrongylus spp. and Arilus critatus,
- 25 Anoplurida, e.g. Haematopinus spp., Linognathus spp., Pediculus spp., Pthirus spp., and Solenopotes spp,
- Mallophagida (suborders Amblycerina and Ischnocerina), e.g. Trimenopon spp., Menopon spp., Trinoton spp., Bovicola spp., Werneckiella spp., Lepikentron spp., Trichodectes spp., and Felicola spp,
- 30 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.
- 35 (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,
- 40

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)

- 5 Spirurida, e.g. *Thelazia* spp. *Wuchereria* spp., *Brugia* spp., *Onchocerca* spp., *Dirofilari* spp., *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):

- 10 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. *Diphylobothrium* spp., *Tenia* spp., *Echinococcus* spp., *Dipylidium caninum*, *Multiceps* spp., *Hymenolepis* spp., *Mesocestoides*

- 15 spp., *Vampirolepis* spp., *Moniezia* spp., *Anoplocephala* spp., *Sirometra* spp., *Anoplocephala* spp., and *Hymenolepis* spp.

The present invention relates to the therapeutic and the non-therapeutic use of compounds of the present invention and compositions comprising them for controlling and/or combating parasites in and/or on animals. The compounds of the present invention and compositions comprising them may be used to protect the animals from attack or infestation by parasites by contacting them with a parasitically effective amount of compounds of the present invention and compositions containing them.

- 20 The compounds of the present invention and compositions comprising them can be effective through both contact (via soil, glass, wall, bed net, carpet, blankets or animal parts) and ingestion (e.g. baits). As such, "contacting" includes both direct contact (applying the pesticidal mixtures/compositions containing the compounds of the present invention directly on the parasite, which may include an indirect contact at its locus-P, and optionally also administering the pesticidal mixtures/composition directly on the animal to be protected) and indirect contact (applying the compounds/compositions to the locus of the parasite). The contact of the parasite through application to its locus is an example of a non-therapeutic use of compounds of the present invention. "Locus-P" as used above means the habitat, food supply, breeding ground, area, material or environment in which a parasite is growing or may grow outside of the animal.

- 30 In general, "parasitically 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 parasitically effective amount can vary for the various compounds/compositions of the present invention. A parasitically effective amount of the compositions will also vary according to the prevailing conditions such as desired parasitidal effect and duration, target species, mode of application, and the like.

40 The compounds of the present invention can also be applied preventively to places at which occurrence of the pests or parasites are expected.

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.

5 Examples

The present invention is now illustrated in further details by the following examples, without imposing any limitation thereto.

10 Preparation examples

Compounds can be characterized e.g. by coupled High Performance Liquid Chromatography / mass spectrometry (HPLC/MS), by ^1H -NMR and/or by their melting points.

Method A: Analytical HPLC column: RP-18 column Chromolith Speed ROD from Merck KgaA, Germany. Elution: acetonitrile + 0.1% trifluoroacetic acid (TFA) / water + 0.1% trifluoroacetic acid (TFA) in a ratio of from 5:95 to 95:5 in 5 minutes at 40 °C.

Method B: Analytical UPLC column: 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.

MS-method: ESI positive.

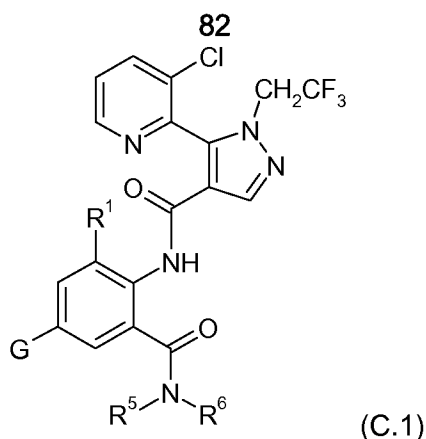
^1H -NMR, respectively ^{13}C -NMR: The signals are characterized by chemical shift (ppm, δ [delta]) vs. tetramethylsilane, respectively CDCl_3 for ^{13}C -NMR, by their multiplicity and by their integral (relative number of hydrogen atoms given). The following abbreviations are used to characterize the multiplicity of the signals: m = multiplett, q = quartett, t = triplett, d = doublet and s = singulett.

Abbreviations used are: h for hour(s), min for minute(s), room temperature for 20-25°C, THF for tetrahydrofuran, n-BuLi for n-butyl-lithium, MTBE for tert-butyl methyl ether.

30 C. Compound examples

C.1 Compound examples 1

Compound examples 1-1 to 1-8 correspond to compound formula C.1:



wherein R⁵ is hydrogen and R¹, R⁶ and G of each compound example is as defined in table C.1 below.

5

Table C.1

Cpd. Ex.	G	R ¹	R ⁶	HPLC-MS: R _t (min) and [M + H]		HPLC method
1-1	CH=N-O-CH ₃ (G.2)	CH ₃	CH ₃	2.85	509.0	A
1-2	1 <i>H</i> -1,2,4-triazol-1-yl (G.26)	CH ₃	CH ₃	2.48	519.1	A
1-3	CH=N-NH-C(=O)NH ₂ (G.14)	CH ₃	CH ₃	2.40	537.1	A
1-4	CH=N-O-CH ₂ CH ₃ (G.3)	CH ₃	CH ₃	3.02	523.2	A
1-5	CH=N-O-CH(CH ₃) ₂ (G.4)	CH ₃	CH ₃	3.23	537.1	A
1-6	CH=N-O-CH(CH ₃) ₂ (G.4)	CH ₃	CH(CH ₃) ₂	3.71	565.3	A
1-7	CH=N-O-CH ₂ CH ₃ (G.3)	Cl	CH(CH ₃) ₂	3.64	571.5	A
1-8	CH=N-O-CH ₂ CH ₃ (G.3)	Cl	CH ₃	3.12	543.3	A

S. Synthesis examples

10

S.1 Synthesis of 5-(3-chloro-2-pyridyl)-N-[4-[(*E*)-methoxyiminomethyl]-2-methyl-6-(methylcarbamoyl)phenyl]-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxamide (Compound 1-1 of table C.1)

15

Step 1: Synthesis of 3-chloropyridine-2-carbonyl chloride

20

To a solution of 3-chloropicolinic acid (20.006 g, 126.98 mmol) in toluene (200 mL) was added thionyl chloride (23.2 mL, 37.8 g, 317 mmol, 2.5 equiv.) and a catalytic amount of DMF (10 drops) and the mixture was heated at reflux for 1 h. After cessation of the gas evolution, the mixture was cooled and all volatiles were removed in vacuum to obtain the title compound (24.38 g, quant.) as a crude product, which was used in the next step without further purification.

Step 2: Synthesis of ethyl 3-(3-chloro-2-pyridyl)-3-oxo-propanoate

To a solution of potassium monoethyl malonate (43.225 g, 254.0 mmol, 1.83 equiv.) in acetonitrile (170 mL) was added triethylamine (35.3 mL, 25.7 g, 254 mmol, 1.83 equiv.) and MgCl_2 (29.016 g, 304.75 mmol, 2.20 equiv.) at 10-15°C. After 3 h at room temperature, the suspension was cooled to 0°C and 3-chloropyridine-2-carbonyl chloride (i.e. the product of step 1, 24.38 g, 138.5 mmol) in acetonitrile (50 mL) was added. The temperature was allowed to rise to room temperature over night and concentrated in vacuum. The residue was taken up in CH_2Cl_2 and acidified to pH 3 by the addition of aqueous hydrochloric acid (10%). The organic layer was washed with aqueous hydrochloric acid, followed by washing with saturated aqueous sodium carbonate solution, dried over Na_2SO_4 and evaporated. The residue contained the title compound (total yield: 22.19 g, 70%) as a crude product which was used in the next step in this quality.

Characterization by $^1\text{H-NMR}$ (400 MHz, CDCl_3):

δ [delta] = 1.23 (t, 3H), 4.16 (q, 2H), 7.42 (m, 1H), 7.83 (m, 1H), 8.53 (m, 1H).

Step 3: Synthesis of ethyl-2-(3-chloropyridine-2-carbonyl)-3-dimethylamino-prop-2-enoate

A mixture of ethyl 3-(3-chloro-2-pyridyl)-3-oxo-propanoate (i.e. the product of step 2, 3.00 g, 13.2 mmol) and N,N-dimethylformamide dimethylacetal (2.17 mL, 1.94 g, 15.8 mmol, 1.20 equiv.) was heated at reflux for 2 h. The mixture was diluted with ethyl acetate (300 mL) and washed with water. The organic layer was separated, dried over Na_2SO_4 and evaporated to obtain the title compound (2.59 g, 70%), which was used in the next step without further purification.

Characterization by HPLC-MS (method A): 2.085 min, M = 283.05

Characterization by $^1\text{H-NMR}$ (400 MHz, CDCl_3):

δ [delta] = 0.81 (t, 3H), 3.07 (s, 3H), 3.35 (s, 3H), 3.88 (q, 2H), 7.24 (m, 1H), 7.72 (m, 1H), 7.95 (s, 1H), 8.43 (m, 1H).

Step 4: Synthesis of ethyl 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxylate

To a solution of ethyl-2-(3-chloropyridine-2-carbonyl)-3-dimethylamino-prop-2-enoate (i.e. the product of step 3, 8.00 g, 23.3 mmol) ethanol (34 mL) was added 2,2,2-trifluoroethyl hydrazine trihydrate (1.31 g, 7.78 mmol, 1.10 equiv.) and the mixture was refluxed for 2 h. The mixture was concentrated in vacuum and taken up in CH_2Cl_2 /water. The layers were separated and the aqueous layer was washed with CH_2Cl_2 . Combined organic layers were dried over Na_2SO_4 and evaporated. The residue contained the title compound (1.95 g, 83%) which was used in the next transformation without further purification.

Characterization by HPLC-MS (method A): 3.156 min, M = 288.00

Characterization by $^1\text{H-NMR}$ (360 MHz, CDCl_3):

δ [delta] = 1.17 (t, 3H), 4.18 (m, 2H), 4.69 (m, 1H), 4.84 (m, 1H), 7.41 (dd, 1H), 7.89 (dd, 1H), 8.10 (s, 1H), 8.65 (m, 1H).

Step 5: Synthesis of 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxylic acid

5 To a solution of ethyl 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxylate (i.e. the product of step 4, 1.95 g, 5.84 mmol) in THF (30 mL) was added a solution of LiOH (0.560 g, 24.0 mmol, 4.0 equiv.) in water (6.0 mL, 0.33 mol, 57 equiv.) and the mixture was refluxed over night. Under ice-cooling, aqueous hydrochloric acid (10%) was added and the mixture was ex-
10 tracted with CH₂Cl₂ three times. Combined organic layers were dried over Na₂SO₄ and evaporated. The residue contained the title compound (1.50 g, 84%) which was used in the next transformation without further purification.

Characterization by HPLC-MS (method A): 2.358 min, M = 305.00

15 Characterization by ¹H-NMR (360 MHz, CDCl₃):

δ [delta] = 4.69 (m, 1H), 4.84 (m, 1H), 7.42 (dd, 1H), 7.89 (dd, 1H), 8.11 (s, 1H), 8.64 (m, 1H).

Step 6: Synthesis of 2-amino-5-iodo-3-methyl-benzoic acid

20 A mixture of 2-amino-3-methyl-benzoic acid (23.3 g, 151 mmol) and N-iodosuccinimide (35.0 g, 224 mmol, 1.01 equiv.) in DMF (190 mL) was heated at 75°C (bath temp.) for 3 h. After cooling to room temp. the mixture was poured onto ice/water/NH₄Cl solution and the resulting precipi-
tate was collected by filtration. After washing the residue with water and drying, the title com-
pound (41.10 g, 96%) was obtained as a brown solid.

25 Characterization by HPLC-MS (method A): 2.918 min, M = 277.95

Step 7: Synthesis of 2-amino-5-formyl-3-methyl-benzoic acid

30 To solution of 2-amino-5-iodo-3-methyl-benzoic acid (i.e. the product of Step 6, 11.10 g, 40.05 mmol) in DMF (400 mL) was added triethylsilane (12.9 mL, 9.40 g, 116 mmol, 2.9 equiv.), so-
dium carbonate (4.80 g, 105 mmol, 1.13 mmol and bis(diphenylphosphino)ferrocene
dichloropalladium(II) (1.48 g, 2.02 mmol, 0.05 equiv.). The mixture was heated to 80°C and the
35 atmosphere was exchanged by carbon monoxide under vigorous stirring. After 5 h the reaction
was complete and the mixture was concentrated under reduced pressure. The residue was
separated between water and MTBE. The aqueous layer was acidified with 10% HCl solution,
then the organic layer was separated and concentrated in vacuo. The residue was triturated
with ethyl acetate to obtain the title compound (5.30 g, 74%).

40 Characterization by HPLC-MS (method A): 1.866 min, M = 180.05

Step 8: 2-amino-5-[(E)-methoxyiminomethyl]-3-methyl-benzoic acid

A mixture of 2-amino-5-formyl-3-methyl-benzoic acid (i.e. the product of Step 7, 2.00 g, 11.2 mmol), methyl hydroxylamine hydrochloride (1.10 g, 13.2 mmol, 1.18 equiv.), acetic acid (8.5 mL) and ethanol (60 mL) was heated to 70°C (bath temperature) for 2 h. After cooling, the mixture was concentrated in vacuo. The residue was taken up in ethanol and heated to reflux. After cooling, a precipitate formed that was collected by filtration to obtain the title compound (1.40 g, 60%).

10 Characterization by HPLC-MS (method A): 2.414 min, M = 208.00

Step 9: 2-[5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazol-4-yl]-6-[(E)-methoxyiminomethyl]-8-methyl-3,1-benzoxazin-4-one

15 To a solution of methanesulfonyl chloride (0.27 mL, 3.5 mmol) in acetonitrile (5 mL) was added a solution of 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxylic acid (i.e. the product of Step 5, 1.00 g, 3.27 mmol, 1.00 equiv.) in acetonitrile (15 mL) at 0°C. After 30 min at that temperature, 2-amino-5-[(E)-methoxyiminomethyl]-3-methyl-benzoic acid (i.e. the product of Step 8, 0.680 g, 3.27 mmol, 1.00 equiv.) was added and stirred for 5 min. At 0°C, triethylamine (0.91 mL) in acetonitrile (5 mL) was added and left at this temperature for 45 min. Further methanesulfonyl chloride (0.27 mL, 3.5 mmol) was added and after 1 h at 0°C the mixture was allowed to warm to room temperature and stirred over night. Aqueous K₂CO₃ solution (5%, 20 mL) was added and the mixture was separated between water and dichloromethane. After filtration, the filtrate was concentrated and purified by flash chromatography on silica gel to obtain the title compound (490 mg, 31%).

Characterization by HPLC-MS (method A): 3.981 min, M = 478.05

30 Step 10: Synthesis of 5-(3-chloro-2-pyridyl)-N-[4-[(E)-methoxyiminomethyl]-2-methyl-6-(methylcarbamoyl)phenyl]-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxamide

To a solution of 2-[5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazol-4-yl]-6-[(E)-methoxyiminomethyl]-8-methyl-3,1-benzoxazin-4-one (i.e. the product of Step 9, 120 mg, 0.25 mmol) in THF (8 mL) was added a solution of methylamine (0.8 mL of a 2 M solution in THF, 1.6 mmol, 6.4 equiv.) at room temperature. After 4 h, the mixture was concentrated in vacuo and the residue was triturated with diethyl ether to obtain the title compound (115 mg, 90%).

Characterization by HPLC-MS (method A): 2.849 min, M = 509.00

40

Characterization by ¹H-NMR (500 MHz, DMSO-*d*₆):

δ [delta] = 2.20 (s, 3H), 2.66 (s, 3H), 3.91 (s, 3H), 4.95-5.32 (m, 2H), 7.54 (m, 3H), 8.07 (m, 1H), 8.20 (s, 1H), 8.24 (m, 1H), 8.35 (s, 1H), 8.68 (m, 1H), 9.89 (s, 1H) ppm.

- 5 S.2 Synthesis of 5-(3-chloro-2-pyridyl)-N-[2-methyl-6-(methylcarbamoyl)-4-(1,2,4-triazol-1-yl)phenyl]-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxamide (Compound 1-2 of table C.1)

Step 1: Synthesis of 2-amino-3-methyl-5-(1,2,4-triazol-1-yl)benzoic acid

- 10 A mixture of 2-amino-5-iodo-3-methyl-benzoic acid (i.e. the product of example S.1, Step 6, 2.77 g, 10.0 mmol), 1,2,4-triazole (0.970 g, 14.0 mmol, 1.40 equiv.), copper(I)-iodide (380 mg, 1.99 mmol, 0.2 equiv.), Cs₂CO₃ (6.5 g, 19.95 mmol, 2.00 equiv.) and DMF (20 mL) was heated at 120°C (bath temperature) over night. After filtration, the filtrate was concentrated in vacuo and the residue was separated between water and CH₂Cl₂. The aqueous layer was acidified with
15 10% hydrochloric acid. The precipitate was collected by filtration and taken up in methanol. Unsoluble particles were removed by filtration and after concentration of the mother liquid the title compound (1.50 g, 69%) was obtained.

Characterization by HPLC-MS (method A): 1.679 min, M = 219.00

20

Step 2: Synthesis of 8-methyl-6-(1,2,4-triazol-1-yl)-1H-3,1-benzoxazine-2,4-dione

- To a solution of 2-amino-3-methyl-5-(1,2,4-triazol-1-yl)benzoic acid (i.e. the product of Step 1, 1.50 g, 6.87 mmol) in 1,4-dioxane (17 mL) was added phosgene (4.21 mL of a 20% solution in
25 toluene, 8.00 mmol, 1.16 equiv.) at room temperature. After 6 h, the mixture was cooled and the precipitate was collected by filtration to obtain the title compound (1.68 g, 100%).

Characterization by HPLC-MS (method A): 1.687 min, M = 245.05

30

Step 3: Synthesis of 2-amino-N,3-dimethyl-5-(1,2,4-triazol-1-yl)benzamide

- A mixture of 8-methyl-6-(1,2,4-triazol-1-yl)-1H-3,1-benzoxazine-2,4-dione (i.e. the product of Step 2, 1.20 g, 4.91 mmol), methylamine (5.0 mL of a 2 M solution in THF, 10 mmol, 2.0 equiv.)
35 and THF (25 mL) was heated at reflux for 3 h. After cooling, the precipitate was collected by filtration to obtain the title compound (170 mg, 15%).

Characterization by HPLC-MS (method A): 1.520 min, M = 232.05

40

Step 4: Synthesis of 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carbonyl chloride

To a solution of 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxylic acid (i.e. the product of example S.1, Step 5, 10.00 g, 32.72 mmol) in toluene (80 mL) was successively added DMF (0.3 mL) and thionyl chloride (16.7 mL, 27.2 g, 229 mmol, 7.0 equiv.) and the mixture was heated at reflux for 2.5 h. After cooling, the mixture was concentrated in vacuo to obtain the title compound (10.60 g, 100 %).

Characterization by ¹H-NMR (400 MHz, CDCl₃):

δ [delta] = 4.70 (m, 1H), 4.90 (m, 1H), 7.44 (m, 1H), 7.91 (d, 1H), 8.22 (s, 1H), 8.66(d, 1H) ppm.

10 Step 5: Synthesis of 5-(3-chloro-2-pyridyl)-N-[2-methyl-6-(methylcarbamoyl)-4-(1,2,4-triazol-1-yl)phenyl]-1-(2,2,2-trifluoroethyl)pyrazole-4-carboxamide

To a solution of 2-amino-N,3-dimethyl-5-(1,2,4-triazol-1-yl)benzamide (i.e. the product of Step 3, 170 mg, 740 μmol) in pyridine (2 mL) was added N,N-dimethylamino pyridine (10 mg, 80 μmol, 0.11 equiv.) and a solution of 5-(3-chloro-2-pyridyl)-1-(2,2,2-trifluoroethyl)pyrazole-4-carbonyl chloride (i.e. the product of Step 4, 225 mg, 690 μmol, 0.94 equiv.) in pyridine (2 mL). The mixture was heated at 85°C (bath temperature) for 3 h. After cooling the mixture was concentrated in vacuo and the residue was purified by flash chromatography on silica gel to obtain the title compound (190 mg, 49%).

Characterization by HPLC-MS (method A): 2.479 min, M = 519.05

B. Biological examples

25 The activity of the compounds of formula I of the present invention could be demonstrated and evaluated in biological tests described in the following.

If not otherwise specified the test solutions are prepared as follow:

The active compound is dissolved at the desired concentration in a mixture of 1:1 (vol:vol) distilled water : acetone. The test solution is prepared at the day of use and in general at concentrations of ppm (wt/vol).

B.1 Cowpea aphid (*aphis craccivora*)

35 The active compound was 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 was prepared at the day of use.

Potted cowpea plants were colonized with approximately 50 - 100 aphids of various stages by manually transferring a leaf tissue cut from infested plant 24 hours before application. Plants were sprayed after the pest population has been recorded. Treated plants were maintained on light carts at about 28°C. Percent mortality was assessed after 72 hours.

In this test, compounds 1-1, 1-2, 1-3, 1-5, 1-6 and 1-7, respectively, at 500 ppm showed over 75 % mortality in comparison with untreated controls.

5 B.2 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.

- 10 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 $28 \pm 1^\circ\text{C}$ and about 80 ± 5 % relative humidity for 5 days. Egg and larval mortality was then visually assessed.

- 15 In this test, compounds 1-1, 1-2, 1-4, 1-5, 1-6, 1-7 and 1-8, respectively, at 2500 ppm showed over 75 % mortality in comparison with untreated controls.

B.3 Orchid thrips (*dichromothrips corbettii*)

- 20 *Dichromothrips corbettii* adults used for bioassay were obtained from a colony maintained continuously under laboratory conditions. For testing purposes, the test compound was 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 was evaluated by using a floral-immersion technique. Plastic
- 25 petri dishes were used as test arenas. All petals of individual, intact orchid flowers were dipped into treatment solution and allowed to dry. Treated flowers were placed into individual petri dishes along with about 20 adult thrips. The petri dishes were then covered with lids. All test arenas were held under continuous light and a temperature of about 28°C for duration of the assay. After 3 days, the numbers of live thrips were counted on each flower, and along inner
- 30 walls of each petri dish. The percent mortality was recorded 72 hours after treatment.

In this test, compounds 1-1, 1-2, 1-5 and 1-6, respectively, at 500 ppm showed over 75 % mortality in comparison with untreated controls.

35 B.4 Southern armyworm (*Spodoptera eridania*)

- The active compounds were formulated in cyclohexanone as a 10,000 ppm solution supplied in tubes. The 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 50% acetone:50% water (v/v). A nonionic surfactant (Kinetic®) was included in the solution at a volume
- 40 of 0.01% (v/v).

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.

In this test, compounds 1-1, 1-2, 1-4, 1-5, 1-7 and 1-8, respectively, at less than 300 ppm showed over 75 % mortality in comparison with untreated controls.

B.5 Vetch aphid (*Megoura viciae*)

For evaluating control of vetch aphid (*Megoura viciae*) through contact or systemic means the test unit consisted of 24-well-microtiter plates containing broad bean leaf disks.

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 leaf disks at 2.5 µl, using a custom built micro atomizer, at two replications.

After application, the leaf disks were air-dried and 5 – 8 adult aphids placed on the leaf disks inside the microtiter plate wells. The aphids were then allowed to suck on the treated leaf disks and incubated at about 23 ± 1°C and about 50 ± 5 % relative humidity for 5 days. Aphid mortality and fecundity was then visually assessed.

In this test, compounds 1-1, 1-2, 1-4, 1-5, 1-6 and 1-8, respectively, at 2500 ppm showed over 75 % mortality in comparison with untreated controls.

B.6 Tobacco budworm (*Heliothis virescens*) I

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.

In this test, compounds 1-1, 1-2, 1-4, 1-5, 1-6, 1-7 and 1-8, respectively, at 2500 ppm showed over 75 % mortality in comparison with untreated controls.

B.7 Boll weevil (*Anthonomus grandis*)

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.

The compounds were formulated using a solution containing 75% v/v water and 25% v/v

- 5 DMSO. 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, microtiter plates were incubated at about $23 \pm 1^\circ\text{C}$ and about $50 \pm 5\%$ relative humidity for 5 days. Egg and larval mortality was then visually assessed.

- 10 In this test, compounds 1-1, 1-2, 1-4, 1-5, 1-6 and 1-7, respectively, at 2500 ppm showed over 75 % mortality in comparison with untreated controls.

B.8 Green Peach Aphid (*Myzus persicae*)

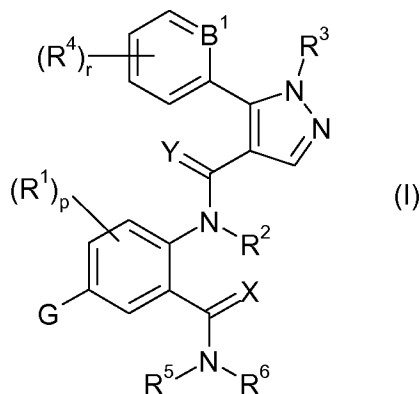
- 15 The active compounds were formulated in cyclohexanone as a 10,000 ppm solution supplied in tubes. The tubes were inserted into an automated electrostatic sprayer equipped with an atomizing nozzle and they served as stock solutions for which lower dilutions were made in 50% acetone:50% water (v/v). A nonionic surfactant (Kinetic®) was included in the solution at a volume of 0.01% (v/v).

- 20 Bell pepper plants at the first true-leaf stage were infested prior to treatment by placing heavily infested leaves from the main colony on top of the treatment plants. Aphids were allowed to transfer overnight to accomplish an infestation of 30-50 aphids per plant and the host leaves were removed. The infested plants were then sprayed by an automated electrostatic plant
- 25 sprayer equipped with an atomizing spray nozzle. The plants were dried in the sprayer fume hood, removed, and then maintained in a growth room under fluorescent lighting in a 24-hr photoperiod at about 25°C and about 20-40% relative humidity. Aphid mortality on the treated plants, relative to mortality on untreated control plants, was determined after 5 days.

- 30 In this test, compounds 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7 and 1-8, respectively, at 2500 ppm showed over 75 % mortality in comparison with untreated controls.

Claims

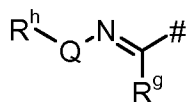
1. A compound of the general formula (I)



wherein

B^1 is N or CH;

G is a group of formula G^1



(G^1)

wherein

Q is O, $N(R^{9a})$ or a chemical bond;

R^g is selected from the group consisting of hydrogen, halogen, cyano, azido, nitro, $-SCN$, SF_5 , C_1-C_6 -alkyl, C_1-C_6 -haloalkyl, C_1-C_6 -alkoxy- C_1-C_6 -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, $-Si(R^{14})_2R^{13}$, $-OR^8$, $-OSO_2R^8$, $-SR^8$, $-S(O)_mR^8$, $-S(O)_nN(R^{9a})R^{9b}$, $-N(R^{9a})R^{9b}$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^8$, $-C(=O)R^7$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more radicals R^{10} ;

5 R^h is selected from the group consisting of hydrogen, cyano, 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 -alkylsulfinyl, C_1 - C_6 -haloalkylsulfinyl, C_1 - C_6 -alkylsulfonyl, C_1 - C_6 -haloalkylsulfonyl, 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, $-\text{Si}(R^{14})_2R^{13}$, $-\text{SR}^8$, $-\text{S}(\text{O})_mR^8$, $-\text{S}(\text{O})_n\text{N}(R^{9a})R^{9b}$, $-\text{N}(R^{9a})R^{9b}$, $-\text{N}=\text{CR}^{15}R^{16}$, $-\text{C}(=\text{O})R^7$, $-\text{C}(=\text{O})\text{N}(R^{9a})R^{9b}$, $-\text{C}(=\text{S})\text{N}(R^{9a})R^{9b}$, $-\text{C}(=\text{O})\text{OR}^8$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more radicals R^{10} ;

20 with the proviso that R^h is not C_1 - C_6 -alkoxy or C_1 - C_6 -haloalkoxy if it is bound to an oxygen atom;

25 or G is a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more radicals R^{10} ;

30 each R^1 is independently selected from the group consisting of halogen; cyano; azido; nitro; $-\text{SCN}$; SF_5 ; C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 ; C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 ; C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 ; C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 ; $-\text{Si}(R^{14})_2R^{13}$; $-\text{OR}^8$; $-\text{OS}(\text{O})_nR^8$; $-\text{SR}^8$; $-\text{S}(\text{O})_mR^8$; $-\text{S}(\text{O})_n\text{N}(R^{9a})R^{9b}$; $-\text{N}(R^{9a})R^{9b}$; $-\text{N}(R^{9a})\text{C}(=\text{O})R^7$; $\text{C}(=\text{O})R^7$; $-\text{C}(=\text{O})\text{OR}^8$; $-\text{C}(=\text{NR}^{9a})R^7$; $-\text{C}(=\text{O})\text{N}(R^{9a})R^{9b}$; $\text{C}(=\text{S})\text{N}(R^{9a})R^{9b}$; phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} ; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated het-

erocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;

- 5 R² is selected from the group consisting of hydrogen; cyano; C₁-C₁₀-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷; C₃-C₈-cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷; C₂-C₁₀-alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷; C₂-C₁₀-alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷; -N(R^{9a})R^{9b}; -Si(R¹⁴)₂R¹³; -OR⁸; -SR⁸; -S(O)_mR⁸; -S(O)_nN(R^{9a})R⁹; -C(=O)R⁷; -C(=O)OR⁸; -C(=O)N(R^{9a})R^{9b}; -C(=S)R⁷; -C(=S)OR⁸; -C(=S)N(R^{9a})R^{9b}; -C(=NR^{9a})R⁷; phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;
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- 15
- 20
- 25 R³ is selected from the group consisting of hydrogen, cyano, nitro, C₁-C₆-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷, C₃-C₈-cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷, C₂-C₆-alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷, C₂-C₆-alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷, -Si(R¹⁴)₂R¹³, -OR⁸, -OS(O)_nR⁸, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a})R^{9b}, -N(R^{9a})R^{9b}, N(R^{9a})C(=O)R⁷, -C(=O)R⁷, -C(=O)OR⁸, -C(=S)R⁷, -C(=S)OR⁸, -C(=NR^{9a})R⁷, -C(=O)N(R^{9a})R^{9b}, -C(=S)N(R^{9a})R^{9b}, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;
- 30
- 35

each R⁴ is independently selected from the group consisting of halogen, cyano, azido, nitro, -SCN, SF₅, C₁-C₆-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷, C₃-C₈-

cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 , $-\text{Si}(R^{14})_2R^{13}$, $-\text{OR}^8$, $-\text{OS}(\text{O})_nR^8$, $-\text{SR}^8$, $-\text{S}(\text{O})_mR^8$, $-\text{S}(\text{O})_n\text{N}(R^{9a})R^{9b}$, $-\text{N}(R^{9a})R^{9b}$, $\text{N}(R^{9a})\text{C}(=\text{O})R^7$, $-\text{C}(=\text{O})R^7$, $-\text{C}(=\text{O})\text{OR}^8$, $-\text{C}(=\text{S})R^7$, $-\text{C}(=\text{S})\text{OR}^8$, $-\text{C}(=\text{NR}^{9a})R^7$, $-\text{C}(=\text{O})\text{N}(R^{9a})R^{9b}$, $-\text{C}(=\text{S})\text{N}(R^{9a})R^{9b}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more radicals R^{10} ;

R^5 and R^6 are, independently of each other, selected from the group consisting of hydrogen, cyano, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_6 -haloalkylthio, where the alkyl moiety in the four last-mentioned radicals may be substituted by one or more radicals R^{7a} , C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , $-\text{N}(R^{9a})R^{9b}$;

$-\text{N}(R^{9a})\text{C}(=\text{O})R^7$; $-\text{Si}(R^{14})_2R^{13}$; $-\text{OR}^8$; $-\text{SR}^8$; $-\text{S}(\text{O})_mR^8$; $-\text{S}(\text{O})_n\text{N}(R^{9a})R^{9b}$; $-\text{C}(=\text{O})R^7$; $-\text{C}(=\text{O})\text{OR}^8$; $-\text{C}(=\text{O})\text{N}(R^{9a})R^{9b}$; $-\text{C}(=\text{S})R^7$; $-\text{C}(=\text{S})\text{OR}^8$, $-\text{C}(=\text{S})\text{N}(R^{9a})R^{9b}$; $-\text{C}(=\text{NR}^{9a})R^7$ - $\text{S}(\text{O})_mR^8$, $-\text{S}(\text{O})_n\text{N}(R^{9a})R^{9b}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated 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 by one or more radicals R^{10} ;

or R^5 and R^6 together form a group $=\text{CR}^{11}\text{R}^{12}$;

5 or R⁵ and R⁶, together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally containing 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;

10 each R^{7a} is independently selected from the group consisting of cyano, azido, nitro, -SCN, SF₅, -Si(R¹⁴)₂R¹³, -OR⁸, -OSO₂R⁸, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a})R^{9b}, -N(R^{9a})R^{9b}, -C(=O)N(R^{9a})R^{9b}, -C(=S)N(R^{9a})R^{9b}, -C(=O)OR⁸, -C(=O)R¹⁹,

15 and, in case R^{7a} is bound to a cycloalkyl group R^{7a} may additionally be selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl;

or two geminally bound radicals R^{7a} together form a group selected from =CR¹¹R¹², =S(O)_mR⁸, =S(O)_mN(R^{9a})R^{9b}, =NR^{9a}, =NOR⁸ and =NNR^{9a}R^{9b};

20 each R⁷ is independently selected from the group consisting of cyano, azido, nitro, -SCN, SF₅, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, -Si(R¹⁴)₂R¹³, -OR⁸, -OSO₂R⁸, -SR⁸, -S(O)_mR⁸, -S(O)_nN(R^{9a})R^{9b}, -N(R^{9a})R^{9b}, -C(=O)N(R^{9a})R^{9b}, -C(=S)N(R^{9a})R^{9b}, -C(=O)OR⁸, -C(=O)R¹⁹, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;

25 and, in case R⁷ is bound to a cycloalkyl group or to a heterocyclic ring, R⁷ may additionally be selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl and benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰;

30 and in groups -C(=O)R⁷, -C(=S)R⁷, -C(=NR^{9a})R⁷, and -N(R^{9a})C(=O)R⁷, R⁷ may additionally be selected from hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl and benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰;

or two geminally bound radicals R^7 together form a group selected from $=CR^{11}R^{12}$, $=S(O)_mR^8$, $=S(O)_mN(R^{9a})R^{9b}$, $=NR^{9a}$, $=NOR^8$ and $=NNR^{9a}R^{9b}$;

5 or two radicals R^7 , together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members;

10 each R^8 is independently selected from the group consisting of hydrogen, cyano, 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 -alkylsulfinyl, C_1 - C_6 -haloalkylsulfinyl, C_1 - C_6 -alkylsulfonyl, C_1 - C_6 -haloalkylsulfonyl, 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, $-Si(R^{14})_2R^{13}$, $-SR^{20}$, $-S(O)_mR^{20}$, $-S(O)_nN(R^{9a})R^{9b}$,
15 $-N(R^{9a})R^{9b}$, $-N=CR^{15}R^{16}$, $-C(=O)R^{19}$, $-C(=O)N(R^{9a})R^{9b}$, $-C(=S)N(R^{9a})R^{9b}$, $-C(=O)OR^{20}$, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R^{10} , and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members,
20 where the heterocyclic ring may be substituted by one or more radicals R^{10} ;

with the proviso that R^8 is not C_1 - C_6 -alkoxy or C_1 - C_6 -haloalkoxy if it is bound to an oxygen atom;

25 R^{9a} , R^{9b} are, independently of each other and independently of each occurrence, selected from the group consisting of hydrogen, cyano, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{19} , C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_6 -haloalkylthio, where the alkyl moiety in the four last-mentioned radicals may
30 be substituted by one or more radicals R^{19} , C_3 - C_8 -cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{19} , C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{19} , C_2 - C_6 -alkenyl which may be partially or fully halogenated and/or
35 may be substituted by one or more radicals R^{19} , C_2 - C_6 -alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{19} , $-N(R^{21})R^{22}$; $-N(R^{21})C(=O)R^{19}$; $-Si(R^{14})_2R^{13}$; $-OR^{20}$; $-SR^{20}$; $-S(O)_mR^{20}$; $-S(O)_nN(R^{21})R^{22}$; $-C(=O)R^{19}$; $-C(=O)OR^{20}$; $-C(=O)N(R^{21})R^{22}$; $-C(=S)R^{17}$; $-C(=S)OR^{20}$; $-C(=S)N(R^{21})R^{22}$; $-C(=NR^{21})R^{17}$ - $S(O)_mR^{20}$,

5 -S(O)_nN(R²¹)R²², phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;

or R^{9a} and R^{9b} together form a group =CR¹¹R¹²;

10 or R^{9a} and R^{9b}, together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally contain 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted
15 by one or more radicals R¹⁰;

each R¹⁰ is independently selected from the group consisting of halogen, cyano, azido, nitro, -SCN, SF₅, C₁-C₁₀-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₃-C₈-
20 cycloalkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₂-C₁₀-alkenyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, C₂-C₁₀-alkynyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R¹⁹, -Si(R¹⁴)₂R¹³, -OR²⁰, -OS(O)_nR²⁰,
25 -SR²⁰, -S(O)_mR²⁰, -S(O)_nN(R²¹)R²², -N(R²¹)R²², C(=O)R¹⁹, -C(=O)OR²⁰, -C(=NR²¹)R¹⁷, -C(=O)N(R²¹)R²², -C(=S)N(R²¹)R²², phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy; and a 3-, 4-, 5-, 6- or 7-membered saturated, partially or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, which may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;
30

35 or two radicals R¹⁰ bound on adjacent atoms together form a group selected from -CH₂CH₂CH₂CH₂-, -CH=CH-CH=CH-, -N=CH-CH=CH-, -CH=N-CH=CH-, -N=CH-N=CH-, -OCH₂CH₂CH₂-, -OCH=CHCH₂-, -CH₂OCH₂CH₂-, -OCH₂CH₂O-, -OCH₂OCH₂-, -CH₂CH₂CH₂-, -CH=CHCH₂-,

-CH₂CH₂O-, -CH=CHO-, -CH₂OCH₂-, -CH₂C(=O)O-, -C(=O)OCH₂-,
 -O(CH₂)O-, -SCH₂CH₂CH₂-, -SCH=CHCH₂-, -CH₂SCH₂CH₂-, -SCH₂CH₂S-,
 -SCH₂SCH₂-, -CH₂CH₂S-, -CH=CHS-, -CH₂SCH₂-, -CH₂C(=S)S-,
 -C(=S)SCH₂-, -S(CH₂)S-, -CH₂CH₂NR²¹-, -CH₂CH=N-, -CH=CH-NR²¹-,
 -OCH=N- and -SCH=N-, thus forming, together with the atoms to which they
 are bound, a 5- or 6-membered ring, where the hydrogen atoms of the
 above groups may be replaced by one or more substituents selected from
 halogen, methyl, halomethyl, hydroxyl, methoxy and halomethoxy or one or
 more CH₂ groups of the above groups may be replaced by a C=O group;

10

R¹¹, R¹² are, independently of each other and independently of each occurrence,
 selected from the group consisting of hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-
 haloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-
 haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₆-alkoxy-C₁-C₆-
 alkyl, C₁-C₆-haloalkoxy-C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy,
 -C(=O)R¹⁹, -C(=O)OR²⁰, -C(=NR²¹)R¹⁷, -C(=O)N(R²¹)R²², -C(=S)N(R²¹)R²²,
 phenyl which may be substituted by 1, 2, 3, 4, or 5 radicals R¹⁰; and a 3-, 4-,
 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsatu-
 rated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom
 groups selected from N, O, S, NO, SO and SO₂, as ring members, which
 may be substituted by one or more radicals R¹⁰;

20

R¹³, R¹⁴ are, independently of each other and independently of each occurrence,
 selected from the group consisting of C₁-C₄-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-
 alkoxy-C₁-C₄-alkyl, phenyl and benzyl;

25

R¹⁵, R¹⁶ are, independently of each other and independently of each occurrence,
 selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-
 alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-
 cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₁-C₆-haloalkoxy-
 C₁-C₆-alkyl, phenyl which may be substituted by 1, 2, 3, 4, or 5 radicals R¹⁰;
 and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maxi-
 mum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or het-
 eroatom groups selected from N, O, S, NO, SO and SO₂, as ring members,
 which may be substituted by one or more radicals R¹⁰;

30

35

each R¹⁷ is independently selected from the group consisting of hydrogen, halo-
 gen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-

alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₁-C₆-haloalkoxy-C₁-C₆-alkyl, phenyl and benzyl;

5 each R¹⁹ is independently selected from the group consisting of cyano, azido, nitro, -SCN, SF₅, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, -Si(R¹⁴)₂R¹³, -OR²⁰, -OSO₂R²⁰, -SR²⁰, -S(O)_mR²⁰, -S(O)_nN(R²¹)R²², -N(R²¹)R²², -C(=O)N(R²¹)R²², -C(=S)N(R²¹)R²², -C(=O)OR²⁰, -C(=O)R²⁰, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

and, in case R¹⁹ is bound to a cycloalkyl group, R¹⁹ may additionally be selected from the group consisting of C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl and C₂-C₆-haloalkynyl;

and in groups -C(=O)R¹⁹ or -N(R²¹)C(=O)R¹⁹, R¹⁹ may additionally be selected from hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, and C₂-C₆-haloalkynyl;

or two geminally bound radicals R¹⁹ together form a group selected from =CR¹¹R¹², =S(O)_mR²⁰, =S(O)_mN(R²¹)R²², =NR²¹, =NOR²⁰ and =NNR²¹;

or two radicals R¹⁹, together with the carbon atoms to which they are bound, form a 3-, 4-, 5-, 6-, 7- or 8-membered saturated or partially unsaturated carbocyclic or heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members;

35 each R²⁰ is independently selected from the group consisting of hydrogen, cyano, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkylsulfinyl, C₁-C₆-haloalkylsulfinyl, C₁-C₆-alkylsulfonyl, C₁-C₆-haloalkylsulfonyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₁-C₄-alkyl, C₃-C₈-halocycloalkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-

100

alkynyl, C₂-C₆-haloalkynyl, -Si(R¹⁴)₂R¹³, C₁-C₆-alkylaminosulfonyl, amino, C₁-C₆-alkylamino, di-(C₁-C₆-alkyl)-amino, C₁-C₆-alkylcarbonyl, C₁-C₆-haloalkylcarbonyl, aminocarbonyl, C₁-C₆-alkylaminocarbonyl, di-(C₁-C₆-alkyl)-aminocarbonyl, C₁-C₆-alkoxycarbonyl, C₁-C₆-haloalkoxycarbonyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

with the proviso that R²⁰ is not C₁-C₆-alkoxy or C₁-C₆-haloalkoxy if it is bound to an oxygen atom;

R²¹ and R²² are independently of each other and independently of each occurrence selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals independently selected from halogen, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

or R²¹ and R²², together with the nitrogen atom to which they are bound, may form a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring which may additionally containing 1

or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals selected from halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy and C₁-C₆-haloalkoxy;

5

each m is independently 1 or 2;

each n is independently 0, 1 or 2;

10

p is 0, 1, 2 or 3;

r is 0, 1, 2, 3, or 4;

X is O or S; and

15

Y is O or S;

or a stereoisomer, salt, tautomer or N-oxide thereof.

- 20 2. The compound according to claim 1, wherein R^g is selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy-C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-haloalkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkynyl, C₃-C₈-cycloalkyl, C₃-C₈-halocycloalkyl, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, benzyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6-
25 or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰.
- 30 3. The compound according to claim 2, wherein R^g is selected from the group consisting of hydrogen, C₁-C₆-alkyl and C₁-C₆-haloalkyl, and is preferably hydrogen.
4. The compound according to claim 1, wherein R^g is -N(R^{9a})R^{9b}.
- 35 5. The compound according to claim 4, wherein R^{9a} and R^{9b} are selected, independently of each other, from hydrogen, C₁-C₆-alkyl and C₁-C₆-haloalkyl.
6. The compound according to any of the preceding claims, wherein R^h is selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy,

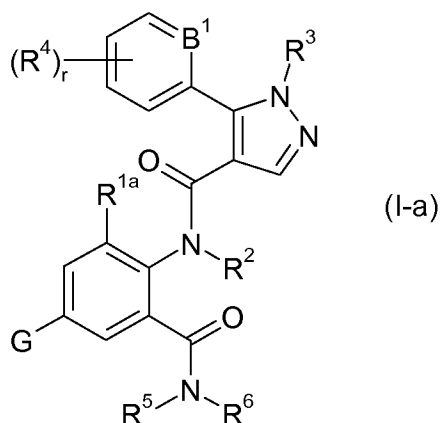
C₁-C₆-haloalkoxy, C₃-C₈-cycloalkyl, C₃-C₈-cycloalkyl-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl, -C(=O)R⁷, -C(=O)N(R^{9a})R^{9b}, -C(=O)OR⁸, phenyl which may be substituted by 1, 2, 3, 4 or 5 radicals R¹⁰, and a 3-, 4-, 5-, 6- or 7-membered saturated, partially unsaturated or maximum unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO₂, as ring members, where the heterocyclic ring may be substituted by one or more radicals R¹⁰;
with the proviso that R^h is not C₁-C₆-alkoxy or C₁-C₆-haloalkoxy if it is bound to an oxygen atom.

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7. The compound according to claim 6, wherein R^h is selected from the group consisting of hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl and -C(=O)N(R^{9a})R^{9b}.
8. The compound according to any of the preceding claims, wherein G is a 5- or 6-membered heteroaromatic ring containing 1, 2 or 3 heteroatoms selected from N, O and S, as ring members, where the heteroaromatic ring may be substituted by one or more radicals R¹⁰.
9. The compound according to any of the preceding claims, wherein Q is O or N(R^{9a}).
10. The compound according to any of the preceding claims, wherein X and Y are O.
11. The compound according to any of the preceding claims, wherein p is 1, 2 or 3, preferably 1.
12. The compound according to any of the preceding claims, wherein r is 0, 1, or 2, preferably 1.
13. The compound according to any of the preceding claims, wherein B¹ is N.
14. The compound according to any of the preceding claims, wherein each R¹ is independently selected from halogen, cyano and C₁-C₆-alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R⁷.
15. The compound according to claim 14, wherein each R¹ is independently selected from halogen and C₁-C₄-alkyl.

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16. The compound according to any of the preceding claims, wherein R^2 is hydrogen or C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 , and is preferably hydrogen.
- 5 17. The compound according to any of the preceding claims, wherein R^3 is selected from hydrogen, cyano and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 .
- 10 18. The compound according to claim 16, wherein R^3 is selected from C_1 - C_6 -alkyl and C_1 - C_4 -haloalkyl and is preferably C_1 - C_4 -haloalkyl.
- 15 19. The compound according to any of the preceding claims, wherein each R^4 is independently selected from halogen, cyano and C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^7 , and is preferably halogen.
- 20 20. The compound according to any of the preceding claims, wherein R^5 and R^6 , independently of each other, are selected from the group consisting of hydrogen, C_1 - C_6 -alkyl which may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl where the cycloalkyl moiety may be partially or fully halogenated and/or may be substituted by one or more radicals R^{7a} , $-C(=O)R^7$, $-C(=O)OR^8$, and $-C(=O)N(R^{9a})R^{9b}$, or, together with the nitrogen atom to which they are bound, form a 5- or 6-membered saturated, partially unsaturated or aromatic heterocyclic ring which may additionally contain-
25 ing 1 or 2 further heteroatoms or heteroatom groups selected from N, O, S, NO, SO and SO_2 , as ring members, where the heterocyclic ring may be substituted by one or more radicals R^{10} .
- 30 21. The compound according to claim 20, wherein R^5 and R^6 , independently of each other, are selected from the group consisting of hydrogen, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl and C_3 - C_6 -cycloalkyl- C_1 - C_4 -alkyl, and preferably from hydrogen and C_1 - C_6 -alkyl.
- 35 22. The compound according to any of the preceding claims, wherein the compound has the general formula (I-a)

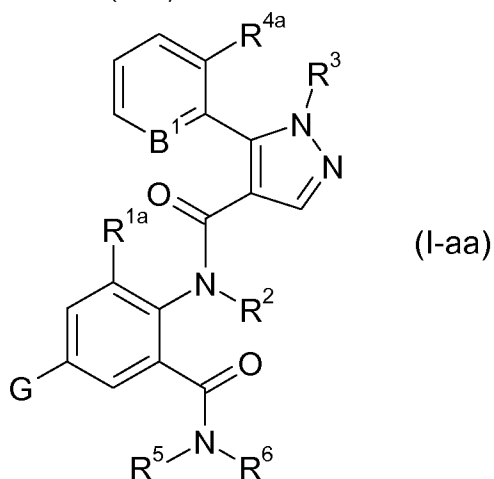


wherein

R^{1a} is selected from hydrogen and the group as defined for R¹; and

5 B¹, G, R², R³, R⁴, R⁵, R⁶ and r are as defined in any of the preceding claims.

23. The compound according to claim 22, wherein the compound has the general formula (I-aa)



wherein

R^{1a} is selected from hydrogen and the group as defined for R¹;

R^{4a} is selected from hydrogen and the group as defined for R⁴; and

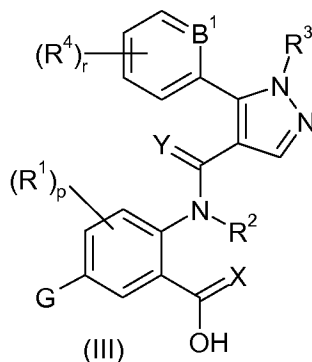
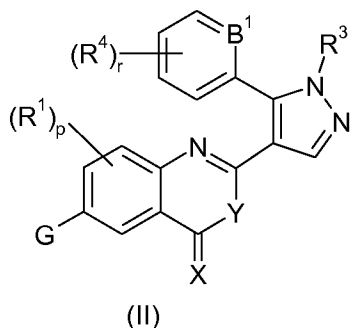
15 B¹, G, R², R³, R⁵ and R⁶ are as defined in any of the preceding claims.

24. The compound according to claim 23 of formula I-aa, wherein B¹ is N, R² is H, R³ is CH₂CF₃, R^{4a} is Cl, R⁵ is H, and G, R^{1a} and R⁶ have the following meanings:

- G is CH=N-O-CH₃, R^{1a} is CH₃ and R⁶ is CH₃; or
- G is 1*H*-1,2,4-triazol-1-yl, R^{1a} is CH₃ and R⁶ is CH₃; or
- 20 - G is CH=N-NH-C(=O)-NH₂, R^{1a} is CH₃ and R⁶ is CH₃; or

- 5
- G is CH=N-O-CH₂CH₃, R^{1a} is CH₃ and R⁶ is CH₃; or
 - G is CH=N-O-CH(CH₃)₂, R^{1a} is CH₃ and R⁶ is CH₃; or
 - G is CH=N-O-CH(CH₃)₂, R^{1a} is CH₃ and R⁶ is CH(CH₃)₂; or
 - G is CH=N-O-CH₂CH₃, R^{1a} is Cl and R⁶ is CH(CH₃)₂; or
 - G is CH=N-O-CH₂CH₃, R^{1a} is Cl and R⁶ is CH₃.

25. A method for preparing a compound of formula (I), comprising following step:
reacting a compound of formula (II) or a compound of formula (III)



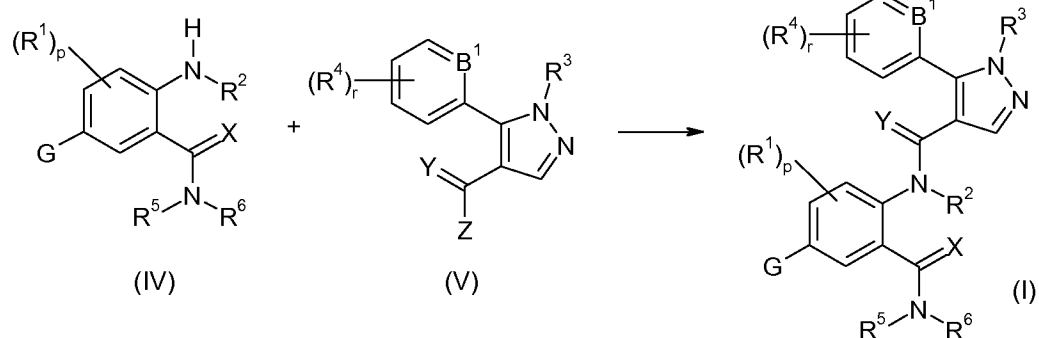
wherein B¹, G, R¹, R², R³, R⁴, X, Y, p and r are as defined in any of the preceding claims;

with an amine NHR⁵R⁶, wherein R⁵ and R⁶, are as defined in any of the preceding claims;

where in case of reaction of compound (II), a compound of formula (I) wherein R² is hydrogen is obtained, and,

if desired, reacting the compound (I) wherein R² is hydrogen with a compound R²-Z wherein R² is different from hydrogen and Z is a leaving group.

26. A method for preparing a compound of formula (I), comprising following step:
reacting a compound of formula (IV) with a compound of formula (V)



wherein Z is a leaving group and B¹, G, R¹, R², R³, R⁴, R⁵, R⁶, X, Y, p and r are as defined in any of the preceding claims, to yield a compound of formula (I).

27. An agricultural or veterinary composition comprising at least one compound as defined in any one of claims 1 to 24, or a stereoisomer, agriculturally or veterinarily acceptable salt, tautomer or N-oxide thereof and at least one liquid and/or solid carrier.
28. A method for combating or controlling invertebrate pests of the group of insects, arachnids or nematodes, which method comprises contacting said pest or its food supply, habitat or breeding grounds with a pesticidally effective amount of at least one compound as defined in any one of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof or a composition as defined in claim 27.
29. A method for protecting growing plants from attack or infestation by invertebrate pests of the group of insects, arachnids or nematodes, which method comprises contacting a plant, or soil or water in which the plant is growing or may grow, with a pesticidally effective amount of at least one compound as defined in any of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof or a composition as defined in claim 27.
30. A method for the protection of 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 as defined in any one of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof or a composition as defined in claim 27.
31. Seed comprising a compound as defined in any one of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof in an amount of from 0.1 g to 10 kg per 100 kg of the plant propagation material.
32. Use of a compound as defined in any one of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof or a composition as defined in claim 27 for combating or controlling invertebrate pests of the group of insects, arachnids or nematodes.
33. Use of a compound as defined in any of claims 1 to 24 or a stereoisomer, salt, tautomer or N-oxide thereof or a composition as defined in claim 27 for protecting growing plants from attack or infestation by invertebrate pests of the group of in-

sects, arachnids or nematodes.

- 5 34. Use of a compound as defined in any one of claims 1 to 24 or a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof or a composition as defined in claim 27 for combating or controlling invertebrate parasites in and on animals.
- 10 35. A method for treating an animal infested or infected by parasites or for preventing animals from getting infested or infected by parasites or for protecting an animal against infestation or infection by parasites which comprises orally, topically or parenterally administering or applying to the animal a parasitically effective amount of a compound as defined in any of claims 1 to 24 or a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof or a composition as defined in claim 27.
- 15 36. A compound as defined in any of claims 1 to 24 or a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof for use as a medicament.
- 20 37. A compound as defined in any of claims 1 to 24 or a stereoisomer, veterinarily acceptable salt, tautomer or N-oxide thereof for use in the treatment, control, prevention or protection of animals against infestation or infection by parasites.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/065647

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07D401/04 C07D401/14 A01N43/92
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 281 810 A1 (SINOCHEM CORP [CN]; SHENYANG RES INST CHEMICAL IND [CN]) 9 February 2011 (2011-02-09) claim 1 tables 1-3	1-37
A	----- WO 2007/024833 A1 (DU PONT [US]; FINKELSTEIN BRUCE LAWRENCE [US]; MCCANN STEPHEN FREDERIC) 1 March 2007 (2007-03-01) claim 1 the whole document	1-37
A	----- WO 01/70671 A2 (DU PONT [US]; LAHM GEORGE P [US]; MYERS BRIAN J [US]; SELBY THOMAS P []) 27 September 2001 (2001-09-27) cited in the application claim 1 Examples and Tables -----	1-37



Further documents are listed in the continuation of Box C.



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

26 November 2012

Date of mailing of the international search report

20/12/2012

Name and mailing address of the ISA/

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Authorized officer

Sarakinos, Georgios

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2012/065647

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.:
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:
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:

see additional sheet

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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-37(partially)

Oximes, hydrazones and imines (G = G1)

2. claims: 1-37(partially)

Heterocycles (G = heterocycle)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/065647

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