

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 January 2007 (25.01.2007)

PCT

(10) International Publication Number
WO 2007/010095 A2

(51) International Patent Classification: **Not classified**

(21) International Application Number:
PCT/FI2006/050447

(22) International Filing Date: 18 October 2006 (18.10.2006)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- upon request of the applicant, before the expiration of the time limit referred to in Article 21(2)(a)
- without international search report and to be republished upon receipt of that report
- without classification; title and abstract not checked by the International Searching Authority

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: BAIT COMPOSITION FOR COCKROACHES AND ANTS

(57) Abstract: Insecticidal bait composition for controlling cockroach and ant infestations, comprising boric acid, alum, potassium sorbate, wheat flour, sugar, onion, milk powder, glycerin, citric acid, forming the dry composition and water added to the dry composition.



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BAIT COMPOSITION FOR COCKROACHES AND ANTS

5 FIELD OF INVENTION

The invention relates to methods for controlling cockroach and ant infestations in buildings, structures and homes, and particularly to an improved insecticidal bait composition.

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STATE OF THE ART

Numerous attempts have been made to develop effective means and methods for controlling cockroach infestations, including traps, poisonous sprays, powders and compounds controlling the reproductive cycle of cockroaches. However, cock-
15 roaches breed at a high rate and they have unique ability to adapt to means for controlling the infestations.

Insecticidal compositions have been developed containing boric acid, i.e., sodium
20 tetraborate, which is a colourless, odourless white powder or transparent crystals. Compositions containing boric acid powder are placed in target areas where cockroaches are known to frequently walk. A cockroach whose body collects a sufficient amount of boric acid soon dies from the poisonous effect which boric acid has upon it.

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Compositions containing high amounts of boric acid are not directly consumed by cockroaches, but the boric acid adhered to the body of the roach kills it. Compositions with high concentrations of boric acid present health hazard, particularly in powder form and further powdery compositions have limited effectiveness over
30 time because of the fugacity of boric acid.

Various bait compositions containing boric acid for direct consumption by cockroaches are known in the art. JP 59067209 discloses a cockroach killer in the form of dried balls containing boric acid, onion and feeding substances such as rice bran, rice flour, wheat flour, fish powder, bone powder, powdered milk, milk butter or sugar. Onion acts as an attractant and binder, also aliphatic, alicyclic or aromatic hydrocarbons, alcohols, ethers, amines, aldehydes, esters, carboxylic acids or other synthetic attractants may be used.

JP 61093101 teaches the use of a bait comprising boric acid as a mixture with wheat flour as binder and onion, sugar, milk and sugar cane as attractor. Boric acid stops the digestive function of cockroach and at the same time makes the cockroach feel thirsty and gather to a water basin or drain.

WO 00/72673 presents a solid insecticide comprising boric acid and sorbic acid or salts thereof acting as fungicide to avoid decomposition of the product.

An insect bait composition is disclosed in US 4,944,950, particularly intended for cockroaches. The composition comprises a mixture of cucumber, eggs, potatoes, sugar and honey to attract cockroaches, and an insecticidally effective mixture of 15-50 % of boric acid, 5-25 % of mercuric chloride, 15-50 % of arsenic trioxide and 15-50 % of aluminium sulphate, by weight. The amount of the insecticidal mixture in the bait varies between 5 and 30 %.

US 6,007,832 discloses an insecticidal bait composition with low amounts of boric acid, intended for cockroaches. The bait composition comprises 10 – 40 % by weight of boric acid and attractant food bait. The food bait includes onions for masking boric acid, cane sugar, milk and flour or food grade lipid as feeding attractant. Preferably ascorbic acid (0.08 %) is added as a preservative to the composition, monoglycerides as binders and silica and xanthan gum as thickeners.

It is generally undesirable to distribute poisonous substances in the environment. Particularly in homes, food preparation areas, family environment, children's play areas and medical service areas efforts are made to avoid the use such substances, also there are people who philosophically wish to use only natural products.

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OBJECT OF THE INVENTION

An object o the invention is to provide an insecticidal bait composition for direct consumption of cockroaches and ants.

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A further object of the invention is an insecticidal bait composition for cockroaches and ants with low toxicity.

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The characteristic features of the bait composition for cockroaches and ants are presented in the claims.

SUMMARY OF THE INVENTION

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The present invention concerns insecticidal bait composition for cockroaches and ants, comprising boric acid, alum, potassium sorbate, wheat flour, sugar, onion, milk powder, glycerine, citric acid and water.

DETAILED DESCRIPTION OF THE INVENTION

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Surprisingly it was found that the problems and deficiencies of the solutions according to the state of the art can be avoided or at least significantly decreased with the bait composition according to the invention. The bait composition contains low amounts of boric acid in combination with food grade substances and compounds with very low toxicity to humans.

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The composition comprises:

	Boric acid	17 – 28 wt%, preferably 20 – 24 wt%
	Alum	2 – 4 wt%, preferably 2.9 – 3.2 wt%
	Potassium sorbate	10 – 14 wt%, preferably 11 – 13 wt%
5	Wheat flour	14 – 20 wt%, preferably 16 – 18 wt%
	Sugar	10 – 16 wt%, preferably 11 – 14 wt%
	Onion	5 – 10 wt%, preferably 6 – 8 wt%, calculated based on fresh onions
	Milk (powder)	16 – 24 wt%, preferably 17 – 23 wt%
10	Glycerin	2 – 4 wt%, preferably 2.9 – 3.2 wt%
	Citric Acid	2 – 4 wt%, preferably 2.9 – 3.2 wt%

The above forms the “dry composition”.

To the above dry composition 20 – 40 wt%, preferably 25 – 35 wt% of water is added to obtain the desired bait composition in paste form.

Boric acid is also known as sodium tetraborate ($\text{Na}_2\text{B}_4\text{O}_7 \times 10\text{H}_2\text{O}$) and Borax. Alum is aluminium sulphate. Both are used in the present invention in powdery or granular form. The combination of boric acid with alum kills insects, particularly the cockroaches and also dries the eggs, thus preventing effectively the reproduction of the insects.

Wheat flour, sugar, onion and milk (powder) attract the insects and potassium sorbate masks very effectively the smell and taste of alum and boric acid, thus making the bait even more tempting. Potassium sorbate also acts as a preservative.

Any commercially available granular or powdery potassium sorbate and wheat flour are suitable. Sugar may be any sugar, preferably granular or powdery white sugar or brown sugar. Milk may be any dehydrated milk powder. Onion comprises finely chopped or ground fresh onions, such as yellow onions (*Allium cepa*).

Glycerin (glycerol) acts as a binder and additionally gives a sweet taste to the bait composition. Any commercially available glycerol is suitable.

5 Citric acid acts as a preservative and also controls and improves the viscosity of the composition.

Variations in the above given bait composition are possible without detrimental effect in the efficacy of the formula within the confines of the variations.

10 The bait composition according to the invention is manufactured by mixing all the ingredients of the "dry composition" together, and adding water, preferably distilled or deionised water to form a paste or putty with the desired consistency.

15 The obtained bait composition is a non-smelling and tasty putty or paste.

The bait composition is encased in a plastic, glass, metal or paper container for distribution and storage.

20 The bait composition is typically used by placing a pinch of it, preferably at one to three locations at every entry point into a premises and under benches, sinks, refrigerator, in cupboard comers and similar locations, out of sight yet a very present deterrent to cockroaches and ants. The bait composition according to the invention may be used in home or workplace in food preparation areas, children's play and education areas, medical service areas, holiday rental properties and the
25 like. It may be housed in a trap. The bait composition according to the invention may also be placed in selected locations in and around the exterior of premises, such as trees and bushes, logs, gardens, rocks and concreted areas.

30 The bait composition according to the invention has several advantages. It is non-smelling, easily cleanable, leaves no marks, environmentally friendly, it is effective for at least 9 months time. It is efficient in houses and premises and also out

in gardens etc. It is very effective against insects, particularly against cockroaches and ants, killing the adult insects and destroys the eggs within them. It was surprising that alum dries and thus destroys so effectively the eggs within the cockroaches.

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The bait composition according to the invention kills cockroaches and ants effectively without using harsh poisons as can be seen from the examples. The specific combination of ingredients in the bait composition according to the invention attracts cockroaches and ants within minutes after application and the insects ingest the composition. The killing of the insect is delayed, however, because of the poisonous effect of boric acid and drying effect of alum, the eggs are also destroyed.

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The invention is illustrated in more detail in the following examples, to which however, the invention is not limited.

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EXAMPLES

EXAMPLE 1

20 A composition comprising the following components was blended:

	Boric acid	22 wt%
	Alum	3 wt%
	Potassium sorbate	12 wt%
25	Wheat flour	17 wt%
	Sugar	13 wt%
	Onion	7 wt% finely chopped fresh onion
	Milk (powder)	20 wt%
	Glycerin	3 wt%
30	Citric Acid	3 wt%

To the obtained blend 30 wt% of distilled water was added and mixed to obtain a homogeneous paste.

The obtained bait paste kills and repels cockroaches and ants effectively.

CLAIMS

1. Insecticidal bait composition, **characterized** in that the bait composition
5 comprises 17 – 28 wt% of boric acid, 2 – 4 wt% of alum, 10 – 14 wt% of potassium sorbate, 14 – 20 wt% of wheat flour, 10 – 16 wt% of sugar, 5 – 10 wt% of onion, 16 – 24 wt% of milk powder, 2 – 4 wt% of glycerin, 2 – 4 wt% of citric acid, and 20 – 40 wt% of water.
- 10 2. Insecticidal bait composition according to claim 1, **characterized** in that the bait composition comprises 20 – 24 wt% of boric acid, 2.9 – 3.2 wt% of alum, 11 – 13 wt% of potassium sorbate, 16 – 18 wt% of wheat flour, 11 – 14 wt% of sugar, 6 – 8 wt% of onion, 17 – 23 wt% of milk powder, 2.9 – 3.2 wt% of glycerin, 2.9 – 3.2 wt% of citric acid, and 25 – 35 wt% of
15 water.
3. Insecticidal bait composition according to claim 1 and 2, **characterized** in that it is paste or putty.
- 20 4. A method for the manufacture of the insecticidal bait composition according to any one of claims 1 – 3, **characterized** in that 17 – 28 wt% of boric acid, 2 – 4 wt% of alum, 10 – 14 wt% of potassium sorbate, 14 – 20 wt% of wheat flour, 10 – 16 wt% of sugar, 5 – 10 wt% of onion, 16 – 24 wt% of milk powder, 2 – 4 wt% of glycerin, 2 – 4 wt% of citric acid are mixed
25 to form a dry composition and 20 – 40 wt% of water is added to the dry composition to form a paste or putty.
5. The method according to claim 4 for the manufacture of the insecticidal bait composition according to any one of claims 1 – 3, **characterized** in
30 that 20 – 24 wt% of boric acid, 2.9 – 3.2 wt% of alum, 11 – 13 wt% of potassium sorbate, 16 – 18 wt% of wheat flour, 11 – 14 wt% of sugar, 6 – 8

wt% of onion, 17 – 23 wt% of milk powder, 2.9 – 3.2 wt% of glycerin, 2.9 – 3.2 wt% of citric acid are mixed to form a dry composition and 25 – 35 wt% of water is added to the dry composition to form a paste or putty.

- 5 6. Insecticidal bait composition according to any one of claims 1 - 3, **characterized** in that the insect is ant or cockroach.
7. Method for controlling cockroach and ant infestations, **characterized** in that a bait composition according to any one of claims 1 – 3 is used.