

A POISON BAIT FOR CONTROL OF NOXIOUS INSECTS

The present invention relates to a poison bait for control of noxious insects.

There have heretofore been commercially available some powdery posion baits for eradicating noxious insects such as cockroaches. These conventional poison baits in a powdery form are, however, practically disadvantageous and dangerous in causing many problems from the standpoints of sanitary and daily usages. For instance, they attach to the hands on handling, fly about the surroundings after being situated in desired places or are apt to be erroneously taken as food by infants and household pets.

In order to solve the above problems, poison baits in tablet form have been put onto the market, which comprise boric acid as the active ingredient. For assurance of the eradicating effect, however, such poison bait tablets should contain boric acid in an amount from about 20 to about 30 % by weight. For this reason, they are still not safe for infants and household pets. In fact, it is reported that a baby powder containing boric acid in an amount of only 5 % by weight accidentally produced the death of an infant (11th Japan Pharmacopoeia Commentary, C-1475 (1986)). In addition, bait containing boric acid makes cockroaches suffer from diarrhea and produce soft excrements, so that their habitats and surroundings are

considerably stained thereby.

There are also known some poison baits in tablet form, which comprise as the active ingredient an insecticide chosen from organic phosphorus insecticides, carbamate insecticides, etc. However, those insecticides each have characteristic odor, and a tablet preparation comprising any of them is apt to be repelled by cockroaches. Thus, the feeding attractant effect is much inferior, and thus the eradicating effect is lowered. Further, said insecticides easily hydrolyze even with a slight amount of water to produce a certain specific odor, thereby the feeding attractant effect is deteriorated and the eradicating effect is decreased. Said hydrolysis results in lowering of the content of the active ingredient itself, and the insecticidal effect is thus remarkably reduced.

A proposal was made to provide a poison bait composition in a tablet form which comprises at least one insect-growth controlling agent chosen from insect juvenile hormone-like compounds and insect chitin-synthesis inhibitors in a microencapsulated form, and crystalline cellulose (JP-A-01-224307). However, incorporation of a feeding attractant of good efficacy such as animal powders and crushed biscuit into said composition tends to cause cracking of the resultant tablets, and tableting is made impossible unless the feeding attractant is used in a finely pulverized state. For the above reason, usable feeding

attractants are restricted to starches or sugars, and therefore the effect is not satisfactory.

There has thus been a great demand for a poison bait having a high safety to human beings as well as domestic animals, a remarkable feeding attractant effect and a sufficient insecticidal effect in addition to the safety on handling and the stability of the active ingredient.

As a result of extensive study, it has now been found that a tabletted poison bait composition comprising a certain specific insect-growth controlling agent in an microencapsulated form in combination with some certain additives meet the above demand.

According to this invention, there is provided a tabletted poison bait composition, which comprises (a) at least one insect-growth controlling agent chosen from (a-1) compounds having an insect juvenile hormone activity

and (a-2) insect chitin-synthesis inhibitors in an microencapsulated form and (b) dextrin, said composition optionally further comprising (c) at least one food attractant chosen from (c-1)

plant oils in an amount of not more than 10 % by weight, (c-2) sugars in an amount of not more than 60 % by weight, (c-3) cereal flours in an amount of not more than 50 % by weight, (c-4) crushed biscuit in an amount of not more than 50 % by weight and (c-5) animal powders in an amount of not more than 10 % by weight of the total bait composition.

The bait composition comprising the above compo-

nents can be stably formulated into a tablet and exerts an eradicating effect against harmful insects. The composition is also effective in inhibiting emergence of insects as well as reducing reproductivity. Further, incorporation of sugars, cereal flours, crushed biscuit and/or animal powders as the additional components enhance the feeding attractant effect and the stability of the other components.

As the component (a-1), there are exemplified dodecadienoate compounds, oxime ether compounds, pyridyl ether compounds, carbamate compounds, etc., of which representative compounds are shown in Table 1:

Table 1

<u>Generic name or code</u>	<u>Chemical name</u>
Methoprene	Isopropyl (2E-4E)-11-methoxy-3,7,11-trimethyl-2,4-dodecadienoate
Hydroprene	Ethyl (2E-4E)-3,7,11-trimethyldodeca-2,4-dienoate
Pyriproxy-fen	2-[1-Methyl-2-(4-phenoxyphenoxy)ethoxy]-pyridine
S-21149	Propionaldehyde oxime O-2-(4-phenoxyphenoxy)ethyl ether
S-21150	Propionaldehyde oxime O-2-(4-phenoxyphenoxy)propyl ether
Fenoxycarb	O-Ethyl N-[2-(4-phenoxyphenoxy)ethyl]-carbamate
R-20458	1-(4-Ethylphenoxy)-6,7-epoxy-3,7-dimethyl-2-octene

As the component (a-2), benzoylphenyl urea

compounds may be used, of which examples are shown in Table 2:

Table 2

<u>Generic name or code</u>	<u>Chemical name</u>
Diflubenzu- ron	1-(4-Chlorophenyl)-3-(2,6-difluorobenzoyl)- urea
Triflumuro- ron	2-Chloro-N-[[[4-(trifluoromethoxy)phenyl] amino]carbonyl]benzamide
EL 494	N-[[[5-(4-Bromophenyl)-6-methyl-2-pyrazinyl]- amino]carbonyl]-2,6-dichlorobenzamide
Teflu- benzuron	1-(3,5-Dichloro-2,4-difluorophenyl)-3-(2,6- difluorobenzoyl)urea
Chlor- fluazuron	1-[3,5-Dichloro-4-(3-chloro-5-trifluoro- methyl-2-pyridyloxy)phenyl]-3-(2,6-di- fluorobenzoyl)urea
XRD-473	N-[[[3,5-Dichloro-4-(1,1,2,2-tetrafluoro- ethoxy)phenyl]amino]carbonyl]-2,6-difluoro- benzamide
S-71624	N-2,6-Difluorobenzoyl-N'-(2-fluoro-4-(1,1,2,2- tetrafluoroethoxy)phenyl)urea
S-71622	N-2,6-Difluorobenzoyl-N'-(2-fluoro-4-tri- fluoromethylphenyl)urea

The components (a-1) and (a-2) as exemplified above may include their geometric isomers and optical isomers.

The amount of the insect-growth controlling agent (a) varies depending on the kind of compound used and the target insect. Normally, however, the component (a) may be present in an amount of 0.01 to 2 % by weight of the total composition.

For the use in this invention, the insect-growth controlling agent is microencapsulated using any film-forming material. The film-forming material may be any one which can form a film having a strength tolerable to the impact which will be applied thereto at the subsequent tabletting step, and examples are polyureas, polyurethanes, polyamides, polyesters, polycarbonates, polysulfonates, polysulfonamides, epoxy resins, etc. Microencapsulation may be carried out by a per se conventional procedure, of which typical examples are interfacial polymerization processes, in-situ polymerization processes, drying in liquid processes, phase separation processes, spray drying processes, fluidized bed processes, cooling melted dispersion processes, etc. Among them, interfacial polymerization processes are preferred, because the particle size can be easily controlled. The microcapsules are favourable to have an average particle size of about 1 to about 1,000 microns and a particle size/film thickness ratio of about 10 to about 140. Tabletting is normally effected under a compression of about 10 to about 500 kg/cm².

Dextrin as the component (b) may be a hydrolyzed product of starch powders (e.g. potato, sweet potato, corn, wheat, rice) with an acid, heat or amylase. It is normally used in an amount of 10 to 99 % by weight of the total weight of the bait composition.

In addition to the above components, the

bait composition may optionally, further comprise at least one feeding attractant (c) chosen from (c-1) plant oils, (c-2) sugars, (c-3) cereal flours, (c-4) crushed biscuit and (c-5) animal powders. Specific examples of plant oils are soybean oil, rapeseed oil, sesame oil, wheat germ oil, etc. The amount to be used may be 0 to about 50 % by weight of the total composition. As the sugars, there may be exemplified sucrose, glucose, fructose, lactose, black sugar, brown sugar, soft brown sugar, etc., among which black sugar, brown sugar and soft brown sugar are particularly preferred. The sugars are normally used in an amount of 0 to about 60 % by weight to the total composition. The cereal flours may be, for instance, potato powders, sweet potato powders, corn powders, wheat flours, rice powders, corn flours, etc., the amount of which may be, for instance, 0 to about 50 % by weight. The crushed biscuit may be any of the commercial products on the market and is used in an amount of 0 to about 50 % by weight. Examples of the animal powders are fish powders, chrysalis powders, Euphausiacea powders, shrimp powders, etc. These may be used in an amount of 0 to about 10 % by weight of the total composition.

When desired, the bait composition may further comprise an additive(s) and/or an auxiliary agent(s), particularly an anti-oxidizing agent, a preservative, a mis-feeding inhibitor, a flavouring agent, a filler, etc.

Examples of the antioxidizing agent are erythorbic acid, sodium erythorbate, dibutyl hydroxytoluene, dl-alpha-tocopherol, nordihydroguaiaretic acid, methylhydroxyanisole, propyl gallate, guaiac resin, L-cysteine hydrochloride, etc. Examples of the preservative are benzoic acid, sodium benzoate, salicylic acid, diphenyl, sorbic acid, potassium sorbate, dehydroacetic acid, sodium dehydroacetate, isobutyl p-oxybenzoate, isopropyl p-oxybenzoate, ethyl p-oxybenzoate, butyl p-oxybenzoate, propyl p-oxybenzoate, calcium propionate, sodium propionate, etc. As the mis-feeding inhibitor, there may be exemplified red pepper powders, Amaranth, Amaranth aluminium lake, Erythrosine, Erythrosine aluminium lake, New Coccine, Phloxine, Rose Bengal, Acid Red, Tartrazine, Tartrazine aluminium lake, Sunset Yellow FCF, Sunset Yellow FCF aluminium lake, Fast Green FCF, Fast Green FCF aluminium lake, Brilliant Blue FCF, Brilliant Blue FCF aluminium lake, Indigo Carmine, Indigo Carmine aluminium lake, beta-carotene, copper chlorophyll, etc. Examples of the flavouring agent are cheese flavour, butter flavour, peanut flavour, peach flavour, strawberry flavour, milk flavour, etc. As the filler, there may be used calcium silicate, diatomaceous earth, crystalline cellulose, clay, kaolin, talc, bentonite, zeolite, sepiolite, attapulgite, etc.

The present invention also provides a method for controlling noxious insects which comprises applying a bait composition according to the present invention to the area that the noxious insects inhabit.

For preparation of the poison bait composition of the invention, the components as above mentioned may be mixed together to make a uniform

mixture, which is then subjected to tableting by a per se conventional procedure. For instance, one or more insect-growth controlling agents in microencapsulated form are mixed with dextrin and a food attractant to make a uniform mixture, which is then tableted by a per se conventional procedure to give a bait composition in a tablet form of desired size. When two or more insect-growth controlling agents are used, each of them or a mixture of them may be microencapsulated; if necessary, two or more agents may be each microencapsulated and combined together, followed by microencapsulation of the resultant mixture.

The thus obtained bait composition exerts an insecticidal effect against a wide range of harmful insects, of which examples are cockroaches (Blattidae) such as American cockroach (Periplaneta americana), German cockroach (Blattella germanica) and smokybrown cockroach (Periplaneta fuliginosa, ants (Formicidae) such as Monomorium sp. and Formica japonica, deathwatch and drugstore beetles (Anobiidae) such as cigarette beetle (Lasioderma serricorne) and biscuit beetle (Stegobium paniceum), darkling beetles (Tenebrionidae) such as red flour beetle (Tribolium castaneum) and confused flour beetle (Tribolium confusum) and cucujid beetles (Cucujidae) such as saw-toothed grain beetle (Oryzaephilus surinamensis) and flat grain beetle (Cryptolestes pusillus), termites (Isoptera) such as Formosan subterranean termite

(Coptotermes formosanus) and Reticulitermes speratus, etc.

Practical embodiments for preparation of the insecticidal composition according to the invention are illustratively shown in the following Examples wherein % are by weight unless otherwise indicated.

Examples 1 to 6

Pyriproxyfen (0.05 %) microencapsulated with polyurethane, dextrin (99.85 % in Example 1; 30.0 % in Examples 2 to 6) and dehydroacetic acid (0.1 %) were mixed together, and an essential oil, sugar, cereal flours, crushed biscuit and animal powders as shown in Table 3 were incorporated therein, followed by uniform mixing. The resultant mixture was tableted under a compression of 15 kg/cm² to make tablets, each weighing about 4 g (diameter, about 30 mm).

The thus obtained tablets as bait were subjected to evaluation of the tablettability, the stability of the active ingredient, the feeding attractant effect, the inhibitory effect on emergence and the inhibitory effect on reproduction according to the following procedures, and the results are shown in Table 3:

1) Tabletability:-

Observation was made immediately after the tableting and also after 10 days storage at 50°C, and the tabletability was evaluated with respect to production of cracking: (O) no crack; (X) cracks.

2) Stability of the active ingredient:-

The bait in a tablet form was kept at 50°C for 10 days and subjected to measurement of the residual percent of the active ingredient by gas chromatography. Evaluation was made on the following criteria:

<u>Criteria</u>	<u>Residual percent</u>
++	> 80 %
+	70 - 80 %
-	< 70 %

3) Feeding attractant effect (i.e. effect attracting and stimulating the insects to eat food):-

Fifty imagos of Blattella germanica (even numbers in male and female) were admitted in a container having a bottom area of 0.12 m² where the bait in a tablet form as well as a solid bait as control were placed. An attractant rate was calculated on the basis of the numbers of the insect being attracted by the bait within a designated period and classified on the following criteria:

<u>Criteria</u>	<u>Attractant rate</u>
++	> 80 %
+	70 - 80 %
-	< 70 %

4) Inhibitory effect on emergence:-

Ten last instar larvae of Blattella germanica (even numbers in male and female) were admitted in a container having a bottom area of 100 cm² where the bait in a tablet form as well as a solid bait as control were placed, and observation was made on failure in emergence, abnormality on wings and supernumerary molting over a period

of three weeks. The number of failure in emergence, abnormality on wings and supernumerary molting was counted to calculate the emergence inhibitory rate, and the results are classified on the following criteria:

<u>Criteria</u>	<u>Emergence inhibitory rate</u>
++	> 80 %
+	70 - 80 %
-	< 70 %

5) Inhibitory effect on reproduction:-

Ten last instar larvae of Blattella germanica (even numbers in male and female) were admitted in a container having a bottom area of 100 cm² where the bait in a tablet form as well as a solid bait as comparison were placed, and the number of hatched eggs and the rate of emergence were observed over a period of four weeks. Reduction in the number of the next generation in contrast to the untreated group was calculated, and the results were classified on the following criteria:

<u>Criteria</u>	<u>Reduction in the next generation</u>
++	> 80 %
+	70 - 80 %
-	< 70 %

Table 3

			Example					
			1	2	3	4	5	6
Composi- tion (%)	Pyriproxyfen ^{*1)}		0.05	0.05	0.05	0.05	0.05	0.05
	Dextrin		99.85	30.0	30.0	30.0	30.0	30.0
	Dehydroacetic acid		0.1	0.1	0.1	0.1	0.1	0.1
	Plant oil	Sesame oil	-	2.0	-	2.0	-	2.0
		Corn oil	-	-	10.0	-	-	-
	Sugar	Black sugar	-	-	20.0	-	-	10.0
		Brown sugar	-	-	-	50.0	-	-
		Soft brown sugar	-	-	-	-	10.0	-
	Starch powder	Potato starch	-	50.0	33.0	10.0	9.4	-
	Crushed biscuit		-	-	-	-	50.0	40.0
	Animal powder	Euphausiacea powder	-	2.5	-	-	-	5.0
		Chrysalis powder	-	2.5	-	-	-	5.0
	Calcium silicate		-	12.85	9.85	7.85	-	4.85

(Continued)

			Example					
			1	2	3	4	5	6
Evaluation	Tablet-ability	A ^{*2)}	0	0	0	0	0	0
		B ^{*3)}	0	0	0	0	0	0
	Stability of active ingredient		++	++	++	++	++	++
	Feeding attractant effect	A	++	++	++	++	++	++
		B	++	++	++	++	++	++
	Emergence inhibitory effect	A	++	++	++	++	++	++
		B	++	++	++	++	++	++
	Reproduction control effect	A	++	++	++	++	++	++
		B	++	++	++	++	++	++

Note: *1) microencapsulated with polyurethane.
 *2) immediately after tableting.
 *3) after being kept at 50°C for 10 days.

Examples 7 to 9

In the same manner as in Examples 1 to 6, there were prepared tablets as a bait comprising the components as shown in Table 4. The thus obtained tablets were subjected to evaluation of various properties in the same manner as in Examples 1 to 6, the results of which are also shown in Table 4.

Comparative Examples 1 to 3

In the same manner as in Examples 7 to 9 but using an insect-growth controlling agent as not microencapsulated, there were prepared tablets as a bait, and evaluation of

these baits was made in the same manner as in Examples 7 to 9. The results are also shown in Table 4.

Table 4

		Example			Comparative		
		7	8	9	1	2	3
Composi- tion (%)	Hydroprene *1)		0.5	-	-	-	-
			-	-	-	0.5	-
	Teflubenzuron *2)		-	0.7	-	-	-
			-	-	-	0.7	-
	Diflubenzuron *2)		-	-	1.0	-	-
			-	-	-	-	1.0
	Dextrin		50.0	50.0	50.0	50.0	50.0
	Cheese flavoring agent		0.3	0.3	0.3	0.3	0.3
	Black sugar		10.0	10.0	10.0	10.0	10.0
	Crushed biscuit		34.2	34.0	33.7	34.2	34.0
	Animal powder	Euphausiacea powder	2.5	2.5	2.5	2.5	2.5
		Chrysalis powder	2.5	2.5	2.5	2.5	2.5

(Continued)

			Example			Comparative		
			7	8	9	1	2	3
Evaluation	Tablet-ability	A ^{*3)}	0	0	0	0	0	0
		B ^{*4)}	0	0	0	0	0	0
	Stability of active ingredient		++	++	++	+	+	+
	Feeding attractant effect	A	++	++	++	++	++	++
		B	++	++	++	+	+	+
	Emergence inhibitory effect	A	++	++	++	++	++	++
		B	++	++	++	-	-	-
	Reproduction control effect	A	++	++	++	++	++	++
		B	++	++	++	-	-	-

Note: *1) microencapsulated with polyurethane.
 *2) microencapsulated with polyurea.
 *3) immediately after tableting.
 *4) after being kept at 50°C for 10 days.

Examples 10 to 16

In the same manner as in Examples 1 to 9, there were prepared tablets comprising the components as shown in Table 5. Various properties of the tablets were evaluated, and the results are shown in Table 5, from which it is understood that the tablets show an excellent property and no crack or damage is produced on tableting.

Table 5

Composition (%)	Example							
	10	11	12	13	14	15	16	
Hydroprene ^{*1)}	0.5	-	-	-	-	-	-	
S-21149 ^{*2)}	-	0.05	-	-	-	-	-	
Fenoxycarb ^{*1)}	-	-	0.1	-	-	-	-	
Triflumuron ^{*1)}	-	-	-	0.5	-	-	-	
Chlorfluazuron ^{*1)}	-	-	-	-	0.5	-	-	
S-71624 ^{*1)}	-	-	-	-	-	0.5	-	
S-71622 ^{*1)}	-	-	-	-	-	-	0.05	
Dextrin	72.4	59.85	37.0	97.5	52.4	67.4	67.85	
Potato starch	-	-	-	-	-	-	-	
Plant oil	Sesame oil	2.0	-	-	2.0	2.0	2.0	
	Corn oil	-	-	2.0	2.0	-	-	
Sugar	Black sugar	20.0	-	-	-	20.0	10.0	
	Brown sugar	-	20.0	-	-	-	-	
	Soft brown sugar	-	-	20.0	-	-	-	

(Continued)

		Example						
		10	11	12	13	14	15	16
	Crushed biscuit	-	20.0	20.0	-	20.0	10.0	10.0
	Animal powder	2.5	-	5.0	-	2.5	10.0	10.0
	Euphausi- acea powder							
	Chrysalis powder	2.5	-	5.0	-	2.5	-	-
	Red pepper powder	-	-	0.5	-	-	-	-
	Red pigment No. 1	-	-	-	-	trace	trace	trace
	Butter flavoring agent	-	-	0.3	-	-	-	-
	Calcium silicate	-	-	10.0	-	-	-	-
	Dehydroacetic acid	0.1	0.1	0.1	-	0.1	0.1	0.1

(Continued)

Evaluation		Example						
		10	11	12	13	14	15	16
Tabletability	A ^{*3)}	0	0	0	0	0	0	0
	B ^{*4)}	0	0	0	0	0	0	0
Stability of active ingredient		++	++	++	++	++	++	++
Feeding at-tractant effect	A	++	++	++	++	++	++	++
	B	++	++	++	++	++	++	++
Emergence inhibitory effect	A	++	++	++	++	++	++	++
	B	++	++	++	++	++	++	++
Reproduction control effect	A	++	++	++	++	++	++	++
	B	++	++	++	++	++	++	++

Note:

- *1) microencapsulated by polyurethane.
- *2) microencapsulated by polyurea.
- *3) immediately after tableting.
- *4) after being kept at 50°C for 10 days.

Comparative Examples 4 to 10

In the same manner as in Examples 10 to 16 but using potato starch instead of dextrin, there were prepared tablets as shown in Table 7. Various properties of these tablets were observed in the same manner as in Examples 10 to 16, and the results are shown in Table 7. It was noticeable that the tablets thus formulated had many cracks or, were damaged formulation. The feeding attractant effect, emergence : inhibitory effect and reproduction control effect were reduced.

Table 7

Composi- tion (%)	Comparative Example									
	4	5	6	7	8	9	10			
Hydroprene ^{*1)}	0.5	-	-	-	-	-	-	-	-	-
S-21149 ^{*2)}	-	0.05	-	-	-	-	-	-	-	-
Fenoxycarb ^{*1)}	-	-	0.1	-	-	-	-	-	-	-
Triflumuron ^{*1)}	-	-	-	0.5	-	-	-	-	-	-
Chlorfluazuron ^{*1)}	-	-	-	-	0.5	-	-	-	-	-
S-71624 ^{*1)}	-	-	-	-	-	0.5	-	0.5	-	-
S-71622 ^{*1)}	-	-	-	-	-	-	-	-	-	0.05
dextrin	-	-	-	-	-	-	-	-	-	-
Potato starch	72.4	59.85	37.0	97.5	52.4	67.4	67.85			
Plant oil	2.0	-	-	-	2.0	2.0	2.0			
Sugar	Corn oil	-	-	2.0	2.0	-	-	-	-	-
	Black sugar	20.0	-	-	-	20.0	10.0	10.0	-	-
	Brown sugar	-	20.0	-	-	-	-	-	-	-
	Soft brown sugar	-	-	20.0	-	-	-	-	-	-

(Continued)

		Comparative Example							
		4	5	6	7	8	9	10	
Crushed biscuit		-	20.0	20.0	-	20.0	10.0	10.0	
Animal powder	Euphausi- acea powder	2.5	-	5.0	-	2.5	10.0	10.0	
	Chrysalis powder	2.5	-	5.0	-	2.5	-	-	
Red pepper powder		-	-	0.5	-	-	-	-	
Red pigment No. 1		-	-	-	-	trace	trace	trace	
Butter flavoring agent		-	-	0.3	-	-	-	-	
Calcium silicate		-	-	10.0	-	-	-	-	
Dehydroacetic acid		0.1	0.1	0.1	-	0.1	0.1	0.1	

(Continued)

		Comparative Example							
Evaluation	Tabletability	A ^{*3)}	4	5	6	7	8	9	10
		B ^{*4)}	X	X	X	X	X	X	X
	Stability of active ingredient		++	++	++	++	++	++	++
	Feeding attractant effect	A	+	+	+	+	+	+	+
		B	+	+	+	+	+	+	+
Emergence inhibitory effect	Reproduction control effect	A	+	+	+	+	+	+	+
		B	+	+	+	+	+	+	+
	Reproduction control effect	A	+	+	+	+	+	+	+
		B	+	+	+	+	+	+	+

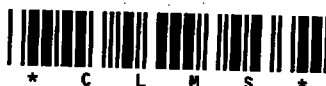
Note:

- *1) microencapsulated by polyurethane.
- *2) microencapsulated by polyurea.
- *3) immediately after tableting.
- *4) after being kept at 50°C for 10 days.

It is understood from the that the tablets according to the invention are quite satisfactory in stability, feeding attractant effect, emergence inhibitory effect and reproduction control effect. Further, since no crack or damage is recognized during tabletting, the composition of the invention is useful as a bait for harmful insects such as cockroaches.

CLAIMS:

1. A tablet bait composition, comprising (a) at least one insect-growth controlling agent chosen from (a-1) compounds having an insect juvenile hormone activity and (a-2) insect chitin-synthesis inhibitors in a microencapsulated form, and (b) dextrin.
2. A composition as claimed in claim 1, wherein component (a) is selected from isopropyl (2E-4E)-11-methoxy-3,7,11-trimethyl-2,4-dodecadienoate, ethyl (2E-4E)-3,7,11-trimethyldodeca-2,4-dienoate, 2-[1-methyl-2-(4-phenoxyphenoxy)ethoxy]-pyridine, propionaldehyde oxime 0-2-(4-phenoxyphenoxy)ethyl ether, propionaldehyde oxime 0-2-(4-phenoxyphenoxy)propyl ether, 0-ethyl-N-[2-(4-phenoxyphenoxy)ethyl]-carbamate, 1-(4-ethylphenoxy)-6,7-epoxy-3,7-dimethyl-2-octene, 1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl)-urea, 2-chloro-N-[[[4-(trifluoromethoxy)phenyl]amino]carbonyl]benzamide, N-[[[5-(4-bromophenyl)-6-methyl-2-pyrazinyl]-amino]carbonyl]-2,6-dichlorobenzamide, 1-(3,5-dichloro-2,4-difluorophenyl)-3-(2,6-difluorobenzoyl)urea, 1-[3,5-dichloro-4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenyl]-3-(2,6-difluorobenzoyl)urea, N-[[[3,5-dichloro-4-(1,1,2,2-tetrafluoroethoxy)phenyl]amino]carbonyl]-2,6-difluorobenzamide, N-2,6-difluorobenzoyl-N'-[2-fluoro-4-(1,1,2,2-tetrafluoroethoxy)phenyl]urea, and N-2,6-difluorobenzoyl-N'-(2-fluoro-4-trifluoromethylphenyl)urea.
3. A composition as claimed in claim 1 or claim 2, wherein component (a) and dextrin as component (b) are present in amounts from 0.01 to 2 % by weight and 10 to 99 % by weight respectively of the total composition.



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4. A composition as claimed in any one of claims 1 to 3, which further comprises (c) at least one feeding attractant chosen from (c-1) plant oils
5 in an amount of not more than 10 % by weight, (c-2) sugars in an amount of not more than 60 % by weight, (c-3) cereal flours in an amount of not more than 50 % by weight, (c-4) crushed biscuit in an amount of not more than 50 % by weight and (c-5) animal powders
10 in an amount of not more than 10 % by weight of the total composition.

5. A composition as claimed in claim 4 wherein component (c-1) is soybean oil, rapeseed oil, sesame
15 oil or wheat germ oil.

6. A composition as claimed in claim 4 or claim 5 wherein component (c-2) is sucrose, glucose, fructose, lactose, black sugar, brown sugar, or soft
20 brown sugar.

7. A composition as claimed in any one of claims 4 to 6 wherein component (c-3) is a potato powder, a sweet potato powder, a corn powder, a wheat
25 flour, a rice powder or a corn flour.

8. A composition as claimed in any one of claims 4 to 7 wherein (c-5) is fish powder, chrysalis powder, Euphauciasea powder or shrimp powder.
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9. A composition as claimed in any one of claims 1 to 8 which further comprises at least one further component which is an anti-oxidizing agent, a preservative, a mis-feeding inhibitor, a flavouring
35 agent or a filler.



10. A composition as claimed in claim 9 wherein the anti-oxidizing agent is erythorbic acid, sodium erythorbate, dibutyl hydroxytoluene, dl-alpha-tocopherol, nordihydroguaiaretic acid, methylhydroxyanisole, propyl gallate, guaiac resin or L-cysteine hydrochloride.

11. A composition as claimed in claim 9 or claim 10 wherein the preservative is benzoic acid, sodium benzoate, salicylic acid, diphenyl, sorbic acid, potassium sorbate, dehydroacetic acid, sodium dehydroacetate, isobutyl p-oxybenzoate, isopropyl p-oxybenzoate, ethyl p-oxybenzoate, butyl p-oxybenzoate, propyl p-oxybenzoate, calcium propionate or sodium propionate,

12. A composition as claimed in any one of claims 9 to 11 wherein the mis-feeding inhibitor is red pepper powder, Amaranth, Amaranth aluminium lake, Erythrosine, Erythrosine aluminium lake, New Coccine, Phloxine, Rose Bengal, Acid Red, Tartrazine, Tartrazine aluminium lake, Sunset Yellow FCF, Sunset Yellow FCF aluminium lake, Fast Green FCF, Fast Green FCF aluminium lake, Brilliant Blue FCF, Brilliant Blue FCF aluminium lake, Indigo Carmine, Indigo Carmine aluminium lake, beta-carotene or copper chlorophyll.

13. A composition as claimed in any one of claims 9 to 12 wherein the flavouring agent is cheese flavour, butter flavour, peanut flavour, peach flavour, strawberry flavour or milk flavour.

14. A composition as claimed in any one of claims 9 to 13 wherein the filler is calcium silicate, diatomaceous earth, crystalline cellulose,



clay, koalin, talc, bentonite, zeolite, sepiolite or
attaipulgite.

15. A method for controlling noxious insects
5 which comprises applying a bait composition as
 claimed in any of claims 1 to 14 to the area where
 said insects inhabit.

16. A method as claimed in claim 14 wherein the
10 noxious insects are ones belonging to Blattidae,
 Formicidae, Anobiidae, Tenebrionidae, Cucujidae or
 Isoptera.

17. A process for preparing a tablet poison bait
15 composition, which comprises uniformly mixing (a) at
 least one insect-growth controlling agent chosen from
 (a-1) compounds having an insect juvenile hormone
 activity and (a-2) insect chitin-synthesis inhibitors
 in a microencapsulated form and (b) dextrin, and
20 tableting the mixture.

18. A process as claimed in claim 17 further
 modified by any one or more of the features defined
 in any one of claims 2 to 14.
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19. A tablet bait composition as claimed in
 claim 1 as hereinbefore described.

20. A tablet bait composition as claimed in
30 claim 1 as hereinbefore described with reference to
 any one of the specific examples.

