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INSECT REPELLENT SOAP COMPOSITION AND METHOD

This invention relates to a topical insect repellent soap composition and to a method of protection using such a composition.

5 The composition can be used in the form of a toilet soap bar and contains specific ingredients for repelling and killing insects, in particular flies and mosquitoes, thus giving protection from their bites.

10 Product forms of topical insect repellents are quite diverse and include simple liquids, lotions, creams, gels, sticks, aerosol sprays and foams and single-use impregnated towelettes. It is an object of the present invention to provide a toilet soap type product which when used according
15 to directions, leaves a film on the skin that gives protection against biting flies and mosquitoes and which has the following important properties:

(a) is a mild non-irritating toilet soap having a composition that is compatible when combined with optimum
20 high concentrations of repellent chemicals;

(b) has a sufficiently high concentration of safe proven repellent chemicals to provide maximum intrinsic repellency as well as prolonged repellency; and

(c) is a combination of the repellent chemical with
25 an effective residual insecticide.

This invention relates to an insect repellent soap composition, which comprises:

(1) from 63.0 to 99.5 (preferably 72 to 89.7)% by wt of a soap mixture containing from 4.1 to 7% by wt of a soap
30 of caprylic acid, from 3.8 to 7% of a soap of capric acid, from 32.1 to 45% of a soap of lauric acid, from 12 to 17.5% by wt of a soap of myristic acid, from 5.0 to 10% by wt of a soap of palmitic acid, from 1.6 to 3% by wt of a soap of stearic acid, from 3.5 to 5% by wt of a soap of oleic acid
35 and from 0.9 to 5% by wt of a soap of linoleic acid;

- (2) from 0.1 to 2 (preferably 0.1 to 1)% by wt of C_8-C_{18} straight chain fatty acids;
- (3) from 0.2 to 30 (preferably 10 to 25)% by wt of an insect repellent chemical, preferably of N,N-diethyl-metatoluamide;
5. (4) from 0.2 to 5 (preferably 0.2 to 2)% by wt of an effective residual insecticide, preferably a synthetic pyrethroid, for example, 3-phenoxybenzyl ($\pm$), cis trans-2,2-dimethyl-3-(2,2-dichlorovinyl) cyclopropane-
10. 1-carboxylate, known as PERMETHRIN 25/75, the active ingredients (3) and (4) ^{being} ~~are~~ physically and chemically compatible with the other ingredients.

This invention also provides a method for protection of animals, in particular humans, against biting insects,

15. in particular flies and mosquitoes, which comprises applying to the skin of such animal an effective amount of a composition according to the invention.

The composition according to the invention gives considerable protection against insects such as flies and

20. biting (female) mosquitoes. It is believed that the composition according to the invention affects mosquitoes in two ways. Firstly, it uses topical repellents which interfere with the sensors of the female mosquito deflecting it from its attack path. Secondly, if by chance some mosquitoes

25. avoid deflection by the repellent chemical, they are killed on contact with a residual film of insecticide left on the skin.

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The soap compositions according to the invention contain very high percentages of active ingredients. These ingredients are incompatible with ordinary soap bases. It is not possible to incorporate these ingredients into such soaps even by boiling, since boiling would destroy the ingredients. Hence, active materials which are compatible with vegetable oil-based soaps, even at room temperature, are selected.

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Other optional ingredients are non-physiologically harmful perfumes and colorants.

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Soap compositions according to the present invention are not limited or restricted to the use of N,N-diethyl-met-toluamide as the repellent but may include one or more of the

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following repellent chemicals:

- (i) N,N-diethyl-2-ethoxybenzamide
- (ii) N,N-dipropyl-2-benzyloxyacetamide
- (iii) 1-butyl-4-methylcarbostyryl
- 5 (iv) N,N-dipropyl-2-ethoxybenzamide
- (v) 2-butyl-2-ethyl-1,3-propanediol
- (vi) 1,3-bis-butoxymethyl-2-imidazolidone
- (vii) hexachlorophenol
- (viii) 1,3-propanediol monobenzoate
- 10 (ix) diisobutyl malate
- (x) ethyl hexanediol
- (xi) dibutyl phthalate
- (xii) butyl-3-4-dihydro-2,2dimethyl-4-oxo-2h-1,3-oxazine
- (xiii) 1,5a,6,9,9a,9b-hexahydro-4a-(4H)-dibenzofurancarbo-
15 xaldehyde
- (xiv) di-n-propyl-2,5-pyridinedicarboxylate
- (xv) 3-acetyl-2-(2-6-dimethyl-5-heptenyl)-oxazolidine

The following Example illustrates one composition according to the invention:

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Example 1

The following ingredients were mixed at room temperature and then made up into the form of soap bars:

	Soap of caprylic acid	5.6	% by wt.
	Soap of capric acid	5.2	
25	Soap of lauric acid	44.0	
	Soap of myristic acid	16.0	
	Soap of palmitic acid	7.0	
	Soap of stearic acid	2.2	
	Soap of oleic acid	4.3	
30	Soap of linoleic acid	2.2	
	N,N-diethyl-meta-toluamide	12.0	
	Permethrin 25/75	1.0	
	C ₈ -C ₁₈ straight chain fatty acids	0.5	
		100.0	

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Example 2

The following ingredients were mixed at room temperature and then made up into the form of soap bars:

	Soap of caprylic acid	4.76
5	Soap of capric acid	4.4
	Soap of lauric acid	37.35
	Soap of myristic acid	13.9
	Soap of palmitic acid	5.86
	Soap of stearic acid	1.83
10	Soap of oleic acid	4.03
	Soap of linoleic acid	1.1
	N,N-diethyl-meta-toluamide	11.5
	Permethrin 25/75	0.5
	C ₈ -C ₁₈ straight chain fatty acids	0.6
15	Repellent chemical (xiii) above	7.0
	Repellent chemical (xiv) above	7.17
		100.0

The compositions according to the Examples are effective against mosquitoes. A soap bar according to the 20 invention was used as follows:

Water was sprinkled lightly onto the forearms of a human volunteer. The soap bar was rubbed gently on the wet skin to form a lather. This was allowed to dry on the skin to form a repellent film. Repellent activity was observed 25 for up to 12 hours.



Claims:

- An insect repellent soap composition, which comprises
5. (1) from 63.0 to 99.5% by wt of a soap mixture containing from 4.1 to 7% by wt of a soap of caprylic acid, from 3.8 to 7% of a soap of capric acid, from 32.1 to 45% of a soap of lauric acid, from 12 to 17.5% by wt of a soap of myristic acid, from 5.0 to 10% by wt of a soap of palmitic acid, from 1.6 to 3% by wt of a soap of stearic acid, from 3.5 to 5% by wt of a soap of oleic acid and from 0.9 to 5% by wt of a soap of linoleic acid;
 10. (2) from 0.1 to 2% by wt of C_8-C_{18} straight chain fatty acids;
 - (3) from 0.2 to 30% by wt of an insect repellent chemical;
 - (4) from 0.2 to 5% by wt of an effective residual insecticide, the active ingredients (3) and (4) ^{being} ~~are~~ physically and chemically compatible with the other ingredients.
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 20. 2. A composition as claimed in claim 1, wherein ingredient (1) is present in an amount from 72 to 89.7% by wt. of the soap mixture.
 25. 3. A composition as claimed in claim 1 or claim 2, wherein ingredient (2) is present in an amount from 0.1 to 1% by wt. of C_8-C_{18} straight chain fatty acids.
 30. 4. A composition as claimed in any one of claims 1 to 3, wherein ingredient (3) is present in an amount from 10 to 25% by wt. of repellent chemical.



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5. A composition as claimed in any one of claims 1 to 4, wherein ingredient (4) is present in an amount from 0.2 to 2% by wt of an effective residual insecticide.

5. 6. A composition as claimed in any one of claims 1 to 5, wherein the repellent chemical of ingredient (3) is N,N-diethyl-meta-toluamide.

10. 7. A composition as claimed in any one of claims 1 to 6, wherein ingredient (4) is a synthetic pyrethroid.

15. 8. A composition as claimed in any one of claims 1 to 7, wherein ingredient (4) is 3-phenoxybenzyl ($\pm$), cis trans 2,2-dimethyl-3-(2,2-dichlorovinyl) cyclopropane-1-carboxylate.

9. A composition as claimed in Claim 1, substantially as described in Example 1 or Example 2.

20. 10. A method for protection of animals against biting insects which comprises applying to the skin of such animal an effective amount of a composition as defined in any one of claims 1 to 9.

25. 11. A method for protection of humans against biting flies and mosquitoes which comprises applying to the skin of the human an effective amount of a composition as defined in any one of claims 1 to 9.

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