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TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENT--ETC(U)
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TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENT AI3-34804 2,4-HEXADIENYL DECANOATE

STUDY NO. 51-0858-78

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DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

Mr. Weeks/ag/584-3980

HSE-LT-T/WP

16 JAN 1978

SUBJECT: Topical Hazard Evaluation Program of Candidate Insect Repellent AI3-34804, 2,4-Hexadienyl Decanoate, Study No. 51-0858-78, March 1976 - July 1977

Executive Secretary
Armed Forces Pest Control Board
Forest Glen Section, WRAMC
Washington, DC 20012

A summary of the pertinent findings and recommendations of the inclosed report follows:

A hazard evaluation of candidate insect repellent AI3-34804 was performed by means of laboratory studies using rats, rabbits and guinea pigs. The technical grade compound caused mild skin irritation, but no eye irritation, and no photochemical irritation in rabbits, no sensitization reactions in guinea pigs and did not demonstrate an acute ingestion hazard. It is recommended that AI3-34804, 2,4-hexadienyl decanoate, be approved for further testing as a candidate insect repellent.

FOR THE COMMANDER:

1 Incl
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2,4-hexadienyl decanoate	eye irritation
AI3-34804	sensitization
Topical Hazard Evaluation	oral toxicity
candidate repellent	
skin irritation	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A hazard evaluation of candidate insect repellent AI3-34804 was performed by means of laboratory studies using rats, rabbits and guinea pigs. The technical grade compound caused mild skin irritation, but no eye irritation, and no photochemical irritation in rabbits, no sensitization reactions in guinea pigs and did not demonstrate an acute ingestion hazard. It is recommended that AI3-34804, 2,4-hexadienyl decanoate be approved for further testing as a candidate insect repellent.

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TABULAR PRESENTATION OF DATA

Test	Results	Interpretation
SKIN IRRITATION STUDIES		
Rabbits		
Single 24-hour application to intact and abraded skin of New Zealand White rabbits.	Compound AI3-34804 produced mild primary irritation of the intact skin and of the skin surrounding an abrasion.	USAEHA Category II (ref Appendix).
0.5 ml technical grade compound applied to each of six rabbits.		
EYE IRRITATION STUDIES		
Rabbits		
Single 24-hour application of 0.1 ml technical grade compound to one eye of each of six New Zealand White rabbits.	Compound AI3-34804 did not produce any injury to the cornea and no injury to the conjunctiva in 6 out of 6 rabbits.	USAEHA Category A (ref Appendix).
APPROXIMATE LETHAL DOSE (ALD)		
Oral		
Rats (male) - no diluent	ALD >4300 mg/kg	Presents little lethal hazard from acute accidental ingestion.

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Test	Results	Interpretation
PHOTOCHEMICAL SKIN IRRITATION STUDIES		
Rabbits		
A single application (0.05 ml) of a 25 percent (w/v) solution of the compound (AI3-34804) and of a 10 percent (w/v) oil of Bergamot (positive control) in 95 percent ethyl alcohol, were applied to the intact skin of six rabbits. Five minutes after application, the rabbits were exposed to UV light (365 nm) for 30 minutes at a distance of 10-15 cm.	A 25 percent solution of AI3-34804 in ethanol did not cause a photochemical irritation reaction under test conditions. Positive control application and irradiation caused greater irritant effects than in unirradiated skin areas.	Compound AI3-34804 did not cause a photochemical irritation reaction under test conditions and is not expected to cause a photochemical irritation in humans.
Control		
Following UV exposures of the rabbits, 0.5 ml of test test compound, positive control and diluent were applied to additional skin areas to serve as unirradiated control sites. Application areas were checked for skin irritation reactions at 24, 48, and 72 hours.	Ethanol solutions of AI3-34804 caused a very slight irritation reaction on both UV and non-UV irradiated skin sites.	

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Test	Results	Interpretation
SENSITIZATION STUDIES		
Guinea Pig (Male)		
Intradermal injections of 0.1 ml of a 0.1 percent suspension (w/v) of AI3-34804 or of dinitrochlorobenzene (DNCB)* in a mixture containing 1 volume of propylene glycol and 29 volumes of saline.		
Ten test guinea pigs received and challenged with a 0.1 percent solution of AI3-34804.	Challenge dose of test compound (last intradermal injection) did not produce a sensitization reaction.	Compound AI3-34804 did not produce a sensitization reaction under these test conditions and us not expected to produce a sensitization reaction in man.
Ten positive control guinea pigs received and challenged with 0.1 percent suspension of DNCB.	Positive control (DNCB) produced a marked sensitization reaction in 10 out of 10 guinea pigs.	

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5. CONCLUSION. The candidate insect repellent AI3-34804, has a potential for causing some slight skin irritation but presents no acute hazard from eye, photochemical or sensitization contact or from acute ingestion.

6. RECOMMENDATION. Under the provisions of the Memorandum of Understanding (para 1b), it is recommended that AI3-34804, 2,4-hexadienyl decanoate, be approved for further testing as a candidate insect repellent. The compound should be used with caution around abrasions of the skin.

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APPENDIX

TOPICAL HAZARD EVALUATION PROGRAM
DEFINITIONS OF CATEGORIES OF COMPOUNDS BEING CONSIDERED FOR ACUTE SKIN APPLICATION

CATEGORY I - Compounds producing no primary irritation of the intact skin or no greater than mild primary irritation of the skin surrounding an abrasion. (INTERPRETATION: No restriction for acute application to the human skin.)

CATEGORY II - Compounds producing mild primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should be used only on human skin found by examination to have no abrasions or may be used as a clothing impregnant.)

CATEGORY III - Compounds producing moderate primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should not be used directly on the skin without a prophetic patch test having been conducted on humans to determine irritation potential to human skin. May be used without patch testing, with extreme caution, as clothing impregnants. Compound should be resubmitted in the form and at the intended use concentration so that its irritation potential can be reexamined using other test techniques on animals.)

CATEGORY IV - Compounds producing moderate to severe primary irritation of the intact skin and of the skin surrounding an abrasion and, in addition, producing necrosis, vesiculation and/or eschars. (INTERPRETATION: Should be resubmitted for testing in the form and at the intended use concentration. Upon resubmission, its irritation potential will be reexamined using other test techniques on animals. prior to possible prophetic patch testing in humans, at concentrations which have been shown not to produce primary irritation in animals.)

CATEGORY V - Compounds impossible to classify because of staining of the skin or other masking effects owing to physical properties of the compound. (INTERPRETATION: Not suitable for use on humans.)

EYE CATEGORIES:

A. Compounds noninjurious to the eye. INTERPRETATION: Irritation of human eyes is not expected if the compound should accidentally get into the eyes, provided it is washed out as soon as possible.

B. Compounds producing mild injury to the cornea. INTERPRETATION: Should be used with caution around the eyes.

C. Compounds producing mild injury to the cornea, and in addition some injury to the conjunctiva. INTERPRETATION: Should be used with caution around the eyes and mucosa.

D. Compounds producing moderate injury to the cornea. INTERPRETATION: Should be used with extreme caution around the eyes.

E. Compounds producing moderate injury to the cornea, and in addition producing some injury to the conjunctiva. INTERPRETATION: Should be used with extreme caution around the eyes and mucosa.

F. Compounds producing severe injury to the cornea and to the conjunctiva. INTERPRETATION: Should be used with extreme caution. It is recommended that use be restricted to areas other than the face.