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ARMY ENVIRONMENTAL HYGIENE AGENCY ABERDEEN PROVING GR--ETC F/G 6/20  
TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENT--ETC(U)  
AUG 79 J G HARVEY, A W SINGER  
USAEHA-75-51-0135-79

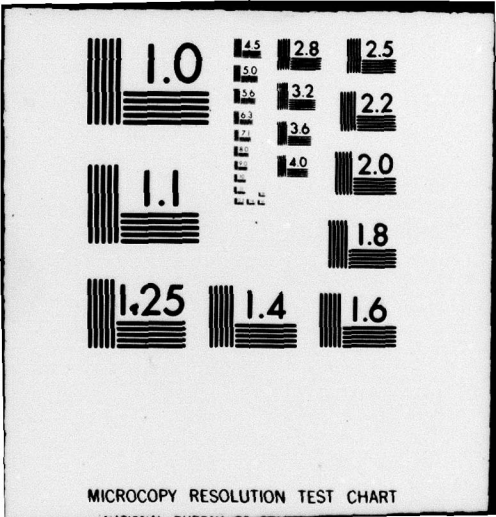
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**UNITED STATES ARMY  
ENVIRONMENTAL HYGIENE  
AGENCY**

**ABERDEEN PROVING GROUND, MD 21010**

TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENTS  
AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a,  
AND AI3-34960b

US DEPARTMENT OF AGRICULTURE PROPRIETARY CHEMICALS  
STUDY NOS. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79, 75-51-0145-79,  
75-51-0147-79, AND 75-51-0149-79  
SEPTEMBER 1978 - JUNE 1979

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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4. TITLE (and Subtitle) Topical Hazard Evaluation Program of Candidate Insect Repellents AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b, US Department of Agriculture Proprietary Chemicals, Study Nos. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79, 75-51-0145-79, 75-51-0147-79, and 75-51-0149-79,	5. TYPE OF REPORT & PERIOD COVERED Final, Sep 78 - Jun 79	
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Topical Hazard Evaluation AI3-37444a USDA Proprietary Chemicals AI3-37446a AI3-37432a AI3-34960a AI3-20827c Eye Irritation AI3-37435a Candidate Repellent		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Hazard evaluations of candidate insect repellents AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b were performed by means of laboratory studies using New Zealand White rabbits. The technical grade compounds caused severe corneal and conjunctival irritation. Compounds AI3-37432a, AI3-37435a, AI3-37446a, and AI3-34960b were particularly severe, causing corneal damage which persisted at 7 days in all rabbits.	038 150	





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

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SUBJECT: Topical Hazard Evaluation Program of Candidate Insect Repellents  
AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and  
AI3-34960b, US Department of Agriculture Proprietary Chemicals,  
Study Nos. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79,  
75-51-0145-79, 75-51-0147-79, and 75-51-0149-79, September 1978 -  
June 1979

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:

Hazard evaluations of candidate insect repellents AI3-37432a, AI3-20827c,  
AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b were performed by means of  
laboratory studies using New Zealand White rabbits. The technical grade  
compounds caused severe corneal and conjunctival irritation. Compounds  
AI3-37432a, AI3-37435a, AI3-37446a, and AI3-34960b were particularly severe,  
causing corneal damage which persisted at 7 days in all rabbits. It was  
recommended that all six compounds not be approved for further testing as  
candidate insect repellents. If, however, any of these compounds should show  
pest repellent properties which are a significant improvement over currently  
available compounds, it is suggested that they be resubmitted in their  
proposed use formulations and/or concentrations.

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

**TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENTS**  
**AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a,**  
**AND AI3-34960b**

**US DEPARTMENT OF AGRICULTURE PROPRIETARY CHEMICALS**  
**STUDY NOS. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79, 75-51-0145-79,**  
**75-51-0147-79, AND 75-51-0149-79**  
**SEPTEMBER 1978 - JUNE 1979**

**1. AUTHORITY.**

a. Letter, US Department of Agriculture - Agricultural Research Service, Southern Region, Insects Affecting Man and Animal Research Laboratory, Gainesville, Florida, 13 September 1978.

a. Memorandum of Understanding between the US Army Environmental Hygiene Agency; the US Army Health Services Command; the Department of the Army, Office of The Surgeon General; the Armed Forces Pest Control Board; and the US Department of Agriculture, Agricultural Research, Science and Education Administration; titled, Coordination of Biological and Toxicological Testing of Pesticides, effective 23 January 1979.

**2. REFERENCE.** Toxicology Division Procedural Guide, USAEHA, 1972, revised 1976.

**3. PURPOSE.** The purpose of this study is to provide guidance for further entomological testing of the candidate insect repellents AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b.

**4. SUMMARY OF FINDINGS.** Hazard evaluations of the candidate repellents AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b, USDA Proprietary Chemicals, were conducted by this Agency using New Zealand White rabbits for eye studies. A tabular presentation of animal toxicity data developed in this Agency follows:\*†

\* In conducting the studies described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals," US Department of Health, Education, and Welfare Publication No. (NIH) 74-23, revised 1978.

† The experiments reported herein were performed in animal facilities, fully accredited by the American Association for the Accreditation of Laboratory Animal Care.

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Topical Hazard Eval Study Nos. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79,  
75-51-0145-79, 75-51-0147-79, and 75-51-0149-79, Sep 78-Jun 79

TABULAR PRESENTATION OF DATA

Test	Results	Interpretation
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EYE IRRITATION STUDIES

Rabbits

Single 24-hour application of 0.1 ml technical grade compound to one eye of each of six rabbits. Eyes are examined and graded at 24, 48, and 72 hrs, and again at 7 days.	Compounds AI3-20827c and AI3-37444a produced moderately severe corneal and conjunctival irritation and damage in 6 of 6 rabbits which persisted at 72 hours. Irritation was not apparent at 7 days.	USAEHA Category E (ref Appendix)
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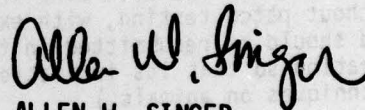
	Compounds AI3-37435a and AI3-37446a produced moderately severe corneal and conjunctival irritation and damage in 6 of 6 rabbits which persisted at 72 hours. Corneal ulcers or scars were present in 4 of 6 rabbits for both compounds at 7 days.	USAEHA Category E (ref Appendix)
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	Compounds AI3-37432a and AI3-34960b produced severe corneal and conjunctival irritation and damage in 6 of 6 rabbits which persisted at 72 hours. Corneal ulcers and damage was present in 6 of 6 rabbits at 7 days for compound AI3-37437a. Compound AI3-34960b caused rupture of the anterior chamber in 2 of 6 rabbits by 7 days, damage being irreversible.	USAEHA Category F (ref Appendix)
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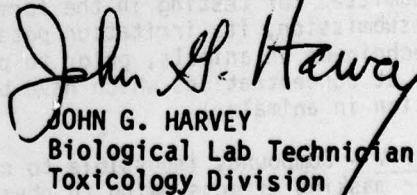
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75-51-0145-79, 75-51-0147-79, and 75-51-0149-79, Sep 78-Jun 79

5. CONCLUSIONS. The candidate insect repellents AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b caused moderately severe to severe corneal and conjunctival damage and do not qualify as nonhazardous insect repellents.

6. RECOMMENDATIONS. Under the provisions of the Memorandum of Understanding (paragraph 1b), it is recommended that AI3-37432a, AI3-20827c, AI3-37435a, AI3-37444a, AI3-37446a, and AI3-34960b not be approved for further testing as candidate insect repellents. Although the skin irritation studies were not performed, the severity of the ocular irritation reactions warrant the recommendation given. If, however, any of these compounds should show a significant improvement in pest repellent properties over currently available compounds, it is suggested they be resubmitted in their proposed use formulation and/or concentrations.

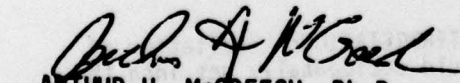


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Topical Hazard Eval Study Nos. 75-51-0135-79, 75-51-0136-79, 75-51-0137-79,  
75-51-0145-79, 75-51-0147-79, and 75-51-0149-79, Sep 78-Jun 79

#### 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.