LEVEL

UNITED STATES ARMY
ENVIRONMENTAL HYGIENE
AGENCY

ABERDEEN PROVING GROUND, MD 21010

TOPICAL HAZARD EVALUATION PROGRAM OF
CANDIDATE INSECT REPELLENTS AI3-36693a, AI3-36701a, AND AI3-36746a
US DEPARTMENT OF AGRICULTURE PROPRIETARY COMPOUNDS
OCTOBER 1976 - APRIL 1980

Approved for public release; distribution unlimited.
## Topical Hazard Evaluation Program of Candidate Insect Repellents A13-36693a, A13-36701a, and A13-36746a

### Summary

Preliminary hazard evaluations of A13-36693a, A13-36701a, and A13-36746a were performed by means of laboratory animal studies using New Zealand White rabbits. The technical grade compounds caused moderate corneal and conjunctival injury in all animals, but no skin irritation. Based upon the ocular injuries, it was recommended that all three compounds not be approved for further testing as candidate insect repellents. If, however, any of these compounds provides a significant improvement of pest repellent properties over currently available compounds, it is suggested that they be purified through activated charcoal and resubmitted in their projected use formulation.

### Key Words

- Skin Irritation
- A13-36693a
- A13-36701a
- A13-36746a
- Topical Hazard Evaluation Program
- Corneal Injury
- New Zealand White rabbits
- Conjunctival Injury
A summary of the pertinent findings and recommendations of the inclosed report follows:

Preliminary hazard evaluations of A13-36693a, A13-36701a, and A13-36746a were performed by means of laboratory animal studies using New Zealand White rabbits. The technical grade compounds caused moderate corneal and conjunctival injury in all animals, but no skin irritation. Based upon the ocular injuries, it was recommended that all three compounds not be approved for further testing as candidate insect repellents. If, however, any of these compounds provides a significant improvement of pest repellent properties over currently available compounds, it is suggested that they be purified through activated charcoal and resubmitted in their projected use formulation.

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1. AUTHORITY.


   b. 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.


3. PURPOSE. The purpose of this program is to provide guidance for further entomological testing of candidate insect repellents AI3-36693a, AI3-36701a, and AI3-36746a.

4. SUMMARY OF FINDINGS. Hazard evaluations of the candidate repellents AI3-36693a, AI3-36701a, and AI3-36746a, US Department of Agriculture (USDA) Proprietary Compounds, were conducted by this Agency using New Zealand White rabbits for skin and 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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Study Nos. 75-51-0009-80, 75-51-0011-80, and 75-51-0012-80, Oct 76 - Apr 80

TABLE. PRESENTATION OF DATA

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKIN IRRITATION STUDIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbits</td>
<td>None of the compounds caused irritation of the intact skin or of the skin surrounding an abrasion.</td>
<td>USAEHA Category I (ref Appendix)</td>
</tr>
<tr>
<td>Single 24-hour application to intact and abraded skin of New Zealand White rabbits.</td>
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<tr>
<td>0.5 mL technical grade compound applied to each of six rabbits.</td>
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<tr>
<td>EYE IRRITATION STUDIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbits</td>
<td>Compounds A13-36693a, A13-36701a, and A13-36746a caused moderate injury to all corneas, and moderate to severe injury to conjunctival tissues in all rabbits tested. Evidence of injuries persisted at 72 hours but was gone by 7 days.</td>
<td>USAEHA Category E (ref Appendix)</td>
</tr>
<tr>
<td>Single 24-hour application of 0.1 mL technical grade compound to one eye of each of six New Zealand White rabbits.</td>
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<td></td>
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</tbody>
</table>
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5. CONCLUSION. The technical grade compounds A13-36693a, A13-36701a, and A13-36746a caused moderate corneal and conjunctival injuries and do not qualify as nonhazardous candidate repellents.

6. RECOMMENDATION. Under the provisions of the Memorandum of Understanding (paragraph 1b), it is recommended that A13-36693a, A13-36701a, and A13-36746a, USDA Proprietary Compounds, not be approved for further testing as candidate insect repellents. If, however, these compounds represent a significant improvement in pest repellent properties over currently available repellents, it is suggested that they be purified in activated charcoal and resubmitted in their proposed use formulation.

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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.