UNITED STATES ARMY
ENVIRONMENTAL HYGIENE
AGENCY
ABERDEEN PROVING GROUND, MD 21010

TOPICAL HAZARD EVALUATION PROGRAM
OF CANDIDATE INSECT REPELLENT AI3-70735aGa
US DEPARTMENT OF AGRICULTURE PROPRIETARY COMPOUND
STUDY NO. 75-51-0025-80
APRIL 1977 - AUGUST 1979

Approved for public release, distribution unlimited.
A preliminary hazard evaluation of A13-70735aGa was performed by means of laboratory animal studies using rats, rabbits, and guinea pigs. The technical grade compound caused mild corneal irritation and proved to be moderately toxic if ingested. It did not cause any skin or photoirritation and did not sensitize guinea pigs. It was recommended that A13-70735aGa, USDA Proprietary Compound, be approved for further testing as a candidate insect repellent.
SUBJECT: Topical Hazard Evaluation Program of Candidate Insect Repellent
A13-70735aGa, US Department of Agriculture Proprietary Compound,
Study No. 75-51-0025-80, April 1977 to August 1979

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

A preliminary hazard evaluation of A13-70735aGa was performed by means of laboratory animal studies using rats, rabbits, and guinea pigs. The technical grade compound caused mild corneal irritation and proved to be moderately toxic if ingested. It did not cause any skin or photoirritation and did not sensitize guinea pigs. It was recommended that A13-70735aGa, USDA Proprietary Compound, be approved for further testing as a candidate insect repellent.

FOR THE COMMANDER:

BRENDAN E. JOYCE, Ph.D.
COL, MSC
Director, Laboratory Services

1 Incl
as (5 cy)

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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 Administrations, 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 the candidate insect repellent AI3-70735aGa.

4. SUMMARY OF FINDINGS. A hazard evaluation of the candidate repellent AI3-70735aGa, US Department of Agriculture (USDA) Proprietary Compound, was conducted by this Agency using New Zealand White rabbits for skin and eye studies, Hartley guinea pigs for a skin sensitization study and Sprague-Dawley rats for determination of oral toxicity. 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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TABLE. PRESENTATION OF DATA

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
<th>Interpretation</th>
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<tbody>
<tr>
<td>SKIN IRRITATION STUDIES</td>
<td></td>
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<tr>
<td>Rabbits</td>
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<tr>
<td>Single 24-hour application</td>
<td>Compound AI3-70735aGa did not cause any irritation of the intact skin or of the skin surrounding an abrasion.</td>
<td>USAEHA Category I (ref Appendix).</td>
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<td>to intact and abraded skin of New Zealand White rabbits. 0.5 ml technical grade compound applied to each of six rabbits.</td>
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<tr>
<td>EYE IRRITATION STUDIES</td>
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<tr>
<td>Rabbits</td>
<td></td>
<td></td>
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<tr>
<td>Single 24-hour application</td>
<td>Compound AI3-70735aGa caused a mild corneal irritation in 5 of 6 rabbits at 24 hours. Evidence of injury was present at 72 hours, but all eyes had healed by 7 days.</td>
<td>USAEHA Category B (ref Appendix).</td>
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<tr>
<td>of 0.1 ml technical grade compound to one eye of each of six New Zealand White rabbits.</td>
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<tr>
<td>APPROXIMATE LETHAL DOSE (ALD)</td>
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<tr>
<td>Oral</td>
<td></td>
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<tr>
<td>Rats (male) - no diluent</td>
<td>ALD = 851 mg/kg</td>
<td>Presents a moderate lethal hazard from accidental ingestion.</td>
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<tr>
<td>Test</td>
<td>Results</td>
<td>Interpretation</td>
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<tr>
<td><strong>PHOTOCHEMICAL SKIN IRRITATION STUDIES</strong></td>
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<tr>
<td><strong>Rabbits</strong></td>
<td>A 25 percent solution of AI3-70735aGa in ethanol did not cause a photochemical irritation reaction under test conditions.</td>
<td>Compound AI3-70735aGa did not cause a photochemical irritation reaction under test conditions and is not expected to cause a photochemical irritation in humans.</td>
</tr>
<tr>
<td>A single 0.05 ml application of a 25 percent (w/v) solution of the compound and a 10 percent (w/v) Oil of Bergamot solution (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.</td>
<td>Positive control application and irradiation caused greater irritant effects than in unirradiated skin areas.</td>
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<td><strong>Control</strong></td>
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<td>Following UV exposures of the rabbits, 0.05 ml of 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 at 24, 48 and 72 hours.</td>
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</tbody>
</table>
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<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
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<tbody>
<tr>
<td><strong>SENSITIZATION STUDIES</strong></td>
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<tr>
<td>Guinea Pigs (Male)</td>
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<tr>
<td>Intradermal injections of 0.1 ml of a 0.1 percent solution (w/v) of</td>
<td>Challenge dose of AI3-70735aGa did not produce a sensitization reaction.</td>
<td>Compound AI3-70735aGa did not produce a sensitization reaction under test conditions and is not expected to produce a sensitization reaction in man.</td>
</tr>
<tr>
<td>AI3-70735aGa or of dinitrochlorobenzene (DNCB)* in a mixture</td>
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<td>containing 1 volume of propylene glycol and 29 volumes of saline.</td>
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<td>Ten test guinea pigs were given 10 sensitizing doses over a 3-week</td>
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<tr>
<td>period.</td>
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<td>After 2 weeks rest, they were challenged with ID injections of test</td>
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<td>compound.</td>
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<tr>
<td>Ten positive control guinea pigs were sensitized over 3 weeks with</td>
<td>Challenge dose of DNCB in positive control guinea pigs did not produce a marked reaction.</td>
<td>DNCB produced a marked reaction, indicating the guinea pigs respond to sensitizing agents.</td>
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<td>DNCB. After 2 pigs produced a marked reaction in 2 weeks rest, they</td>
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<td>were challenged with ID injections 10 out of 10 guinea pigs.</td>
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* A known skin sensitizer
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5. CONCLUSION. Technical grade compound AI3-70735aGa caused mild corneal irritation and is moderately toxic by ingestion. It did not cause any primary or photoirritation, and did not produce any sensitization reaction.

6. RECOMMENDATION. Under the provisions of the Memorandum of Understanding (paragraph 1b), it is recommended that AI3-70735aGa, USDA Proprietary Compound, be approved for further testing as a candidate insect repellent.

[Signature]
ALLEN W. SINGER
CPT, VC
Laboratory Veterinarian
Toxicology Division

APPROVED:

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ARTHUR H. McCREESH, Ph.D.
Chief, Toxicology Division
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 prognostic 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, vesication, 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 prognostic 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.