

US EPA ARCHIVE DOCUMENT

PM TEAM 17 PRODUCT PERFORMANCE REVIEW

PM: 15

02-09-89

50404-L, A
Permethrin Arthropod Repellent, Tick Repellent
Coulson International
Easton, PA 18044

IN: 08-22-88
DUE: -----
AC: ---
RN: 230035
228522
MRID: 407668-18

FORMULATION

Permethrin..... 00.050%

Aerosol
No net wt.

INTRODUCTION

Application for new registration. New use patterns not previously registered.

USES

See proposed label. Clothing treatment. No dosage specified. Protection against ticks, chiggers, and mosquitoes. Spray outer surfaces of clothing, headnets, bednets, and field bedding. Label restrictions indicate military use only.

SUBMITTED DATA

MRID 407668-18.

See the attached summary of the 20 items submitted.

1. The submitted data indicate that permethrin is an excellent repellent as a clothing application at a rate of 0.125 mg/cm². This has been shown to be effective for various species of ticks, mosquitoes, and chiggers. In most studies the material was applied as an aqueous dilution and the clothing kept in a plastic bag for 24 hours. When applied in this manner the material was not only immediately effective, but also appeared to give good repellency after wear and washing.

STUDY	AUTHOR	DATE	CITATION	FORMULATION	PEST	RESULTS
1	Schreck et al	1978	JEE 71(3):397-400	Lab studies		
2	No permethrin data					
3	Lindsay & Mcandless	1978	MosqNews 38(3):351	.07g/g-jacket	<i>Bedes cinerens</i> <i>Coq. perturbans</i>	Better than Deet at .25g/g
4	Schreck et al	1980	JEE (73):436-439	0.125mg/cm ²	<i>Amblyomma americana</i>	91% >Deet
5	Naasif et al	1980	PestSci (11):670-84	Dust for Body lice in Egypt		
6	Schreck et al	1980	JEE(73):451-53	Permethrin + Benzyl benzoat		
7	Hayfield & O'Loughlin	1980	CSIRO, Australia	Mothproofing		
8	Breedon et al	1981	manuscript	0.125 Water Chiggers 24 hr. soak		24 hours- 99.6% 48 hours - 79.4 72 hours- 74.2
9	Schreck et al	1982	Am.J.Trop.Med.Hyg 31(5):1046-1053	0.125 mg/cm ² Lutomyzia spp. 24 hr/water in Panama	<i>Csandifly</i>) 48.6% Deet Jacket-89.3	
10	Hount and Snoddy	1983	JEE(76):529-531	0.5% aero.	<i>Deracentor variabilis</i> <i>Amblyomma americana</i>	94, Deet 100 80, Deet 100
11	Schreck et al	1982	J.MedEnt(19)2:143-46	0.125 in bag, 24hrs	Mosquitoes and Ticks	OK after 3 washes
12	Schreck & Self	undated	manuscript for WHO	on treating mosquito nets		
13	Schreck et al	undated	manuscript for JEE	0.5% aerosol	<i>Amblyomma americana</i>	60 sec -86%, .030mg/cm ² 30sec 79, .013 15 sec- 40, .007
14	Schreck et al	1984	AmJTropMedHyg 33(4):725-730	0.125mg/cm ² 24 hr soak	<i>Bedes taeniorhynchus</i>	98%
15	Lane & Anderson	undated	manuscript	0.5% aero 14 seconds per side	<i>Deracentor occidentalis</i>	14%
16	Schreck et al	1986	JMedEnt(23)4:316-99	0.5% aero 30 sec on shirts, 30 on pants	<i>Ixodes dammini</i>	100%
17	Ito et al	1986	JMHC 21(4):503-06	Mosquito net study		
18	Schreck et al	undated	unpublished	commercial dye processing		
19	Anonymous	undated	unpublished RFPB	and therefore unexposed		
20	H.Hall, B.F.	undated	unpublished US Army, Natick	Application method evaluation for target of 0.125 mg/cm ² Field laundry method. Bednets poor and did not achieve target dosage.		

2. The data for the 0.5% aerosol are not as convincing. In reference 10, 0.5% sprays at 35 seconds for pants and 25 seconds for shirts gave good results for the lone star tick, but only marginal efficacy for the American dog tick. Reference 13 indicates good results for lone star tick with a 60 second spray, and marginal results at 30 seconds. Most disturbing are the deposition data in this study. The 60 second spray only provided for .030 mg/cm², and the 30 second spray only .013 mg/cm².

An 0.5% aerosol sprayed on coveralls for 14 seconds gave only a 14% infestation reduction for *Dermacentor occidentalis* in reference 15. However, 100% repellency of the deer tick was demonstrated with an 0.5% aerosol in reference 16, after applications of 30 seconds each to shirts and pants.

There were no data submitted regarding the use of aerosols for chiggers, mosquitoes, or other pests.

3. Reference 20 describes retention data after various treatment methods, with a target of 0.125mg/cm². Field laundries and hot dye baths were judged as inefficient. Pad Rolls and Dynamic absorption (soaking in a plastic bag) were very effective. Likewise, the use of a 2 gallon sprayer was also simple and accurate, but was not considered practical for field use. Aerosol cans were the worst at achieving the concentration. Applications gave only .003mg/cm² on cotton and .006 mg/cm² on a nylon/cotton blend.

4. No recommendations from the Armed Forces concerning the effectiveness or need for these products were submitted.

5. Overall, permethrin appears to be more repellent to some species than others. Success with the lone star tick and the deer tick are notable, considering less acceptable results with other common tick species such as the American dog tick or the pacific coast tick.

CONCLUSIONS

1. The submitted data are insufficient to support label claims. Claims for the lone star tick and the deer tick only would appear warranted if the label were revised to instruct the user to apply the product for a minimum of 30 seconds to each shirt or pair of pants treated.
2. Other label claims are not acceptable pending the submission of data indicating the ability of the application system to deliver the target dose of .125 mg/cm sq.
3. From a labeling standpoint, we are not sure how the user is to determine whether the article treated is dry (prior to being worn) without touching it and therefore violating the warning to not allow contact with the treated surface until the spray has dried. We recommend submission of information indicating a drying time (assuming humid conditions) prior to wearing. We suggest the PM run this by precautionary labeling review for their input.

Phil Hutton
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