Bio Efficacy of Commercially available Two Aerosols on Different Surfaces against American Cockroach Periplaneta Americana

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ABSTRACT

Cockroaches are offensive pests visually and expel unpleasant smelling secretion that spoils the flavour of food and environment. Periplaneta americana Linnaeus (Dictyoptera: Blattidae) infests kitchen, store room, drainage and latrine. In the present study, two commercially available aerosols viz Hit (Imiprothrin 0.07% w/w + Cypermetrin 0.2% w/w), Jallad (d-trans Allethrin 0.25%), were evaluated in a specialized Wooden box chamber using different surfaces (Glass, and Wood). The KT50 and KT90 values of each aerosol against each surface were determined. Results indicate that Hit (Cockroach killer) exhibit significant activity on all surfaces followed by Jallad (Multipurpose insect killer) with respect to their knockdown values. Further detailed results were discussed in this paper.

Keywords: Periplaneta, americana, Imiprothrin, Cypermetrin, d-trans, Allethrin.

INTRODUCTION:

Cockroaches are important pest because they spread filth and ruin food, fabrics and book bindings may discharge a nauseous secretion both from their mouth parts and from glands opening on the body which give a long-lasting, offensive cockroach smell to areas or food visited by them.
Aerosol content:- Pyrethroid:- A Pyrethroid is a neurotoxic manufactured insecticide that is very similar in structure to pyrethrins. Aerosol content in Hit it contains cypermethrin and imiprothrin as pyrethroids used in it. Aerosol content in Jallad is d- trans Allethrin.

MATERIAL AND METHOD:

MATERIALS:

BIOLOGICAL:

The test organisms used in this project were 480 adult cockroaches of the species *P.americana*. Both males and females were used. The cockroaches were maintained separately in 20 liter plastic buckets having wooden board and covered with lid. Cockroaches were maintained in the laboratory at 28±2°C, ambient humidity (65-70%) and a photo period of 8:16 (L: D)/h and were provided with food (Dog Biscuit) and water (Feyereisen, r.2006).

CHEMICALS:

Hit contains Imiprothrin 0.07% with Cypermethrin 0.2% And the other one Jallad contains d-trans Allethrin 0.25%.

TEST AEROSOLS:

These Commercial formulations were obtained from local market. The first one is HIT which is containing imiprothrin and cypermethrin as its active ingredients, and the second one Jallad contains d-trans Allethrin.

METHOD:

Bioassay for contact toxicity was carried out in a glass test chamber of 20×20 cms square, internal surface area was used. All four sides of the chamber were covered with glass and Vaseline was smeared to all four sides to prevent cockroaches from escaping out, the two different surfaces were the glass surface and the plywood surface. Each surface was of 19 cms square shaped, different concentration of pyrethroids from aerosols was provided to both glass and plywood surface to obtain KT50 and KT90.The recording of spray in ml was in such a manner that the aerosol container weighted firstly and after spraying in the chamber, again the weight was recorded, and then the exact amount of pyrethroid applied was measured. There were triplicates for each test, i.e. each chamber contain different surface. Total nine chambers were used, in which three chambers were with glass surface and other three were with plywood surface, and three were treated as control. Ten cockroaches of mixed population were exposed to each chamber for a fixed time of 30 minutes and then collected back to plastic jars for 24 hours. The first reading was calculated in the first minute and subsequently five readings were taken at the interval of one minute till five minutes and then with five minutes interval up to 30 minutes.

RESULT:

The aerosol formulation caused mortality of *P. americana* at all the dosage tested with a maximum of 10 percent mortality on all.

DISCUSSION:

Table 1: Percentage mortality (100%) in minutes of each aerosol on Glass surface

Product	Amount sprayed (gms)	Glass (mins)
HIT	0.5	30
	1	5
	2	2
JALLAD	0.5	>30
	1	30
	2	20

Table 2: Percentage mortality (100%) in minutes of each aerosol on Wood surface

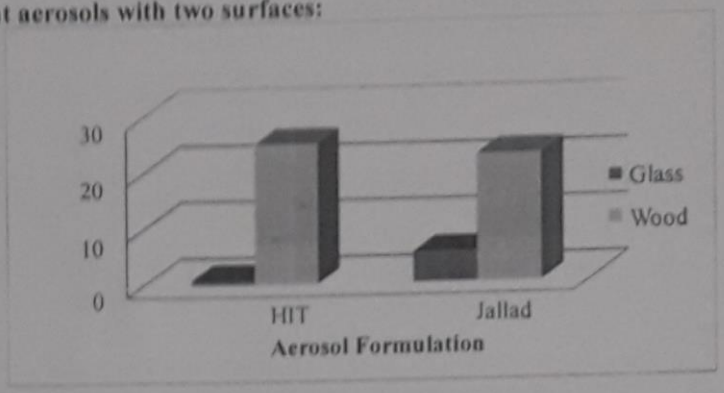
Product	Amount sprayed (gms)	Wood (mins)
HIT	2	>30
	3	>30
	4	>30
JALLAD	2	>30
	3	>30
	4	>30

Table 3: KT50 and KT90 values of each aerosol on different surfaces

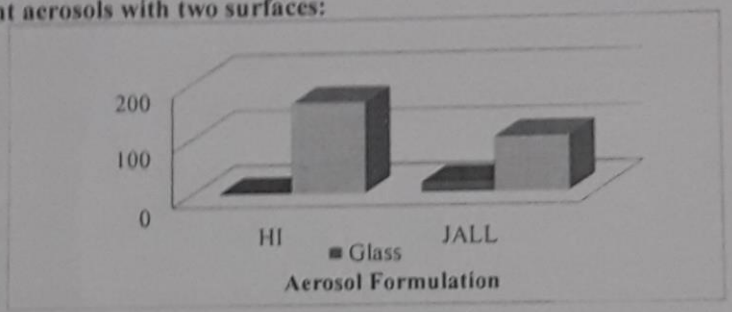
Product	Surface	Amount sprayed (gms)	KT50 (min)	95% confidence limit		KT90 (min)	95% confidence limit		Regression equation
				Lower	Upper		Lower	Upper	
HIT	Glass	2	0.895	0.749	1.0017	1.775	1.591	2.004	Y= 5.2067 30+4. 31175 9X
	Wood	4	25.036	21.151	30.8	164.907	112.915	273.739	Y= 2.8105 67+1.56 5476X

Product	Surface	Amount sprayed (gms)	KT50 (min)	95% confidence limit		KT90 (min)	95% confidence limit		Regression equation
				Lower	Upper		Lower	Upper	
JALLAD	Glass	2	5.507	4.498	6.697	18.568	13.945	28.581	Y=2.6 90839 +3.11 6473X
	Wood	4	22.74	17.522	33.123	99.766	59.147	254.94	Y=2.2 92296 + 1.9956 69X

KT_{50}value of different aerosols with two surfaces:



KT_{90}value of different aerosols with two surfaces:



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