

COMPARATIVE SUSCEPTIBILITY OF TWO ENTOMOPATHOGENIC FUNGI *PAECILOMYCES FARINOSUS* AND *VERTICILLIUM LACANII* AGAINST OBNOXIOUS MOSQUITO SP. *CULEX PIPINES*

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In recent years, microbial control of mosquito has been advocated and one of the group which is receiving attention is the Entomogenous fungi (Balaraman *et al.*, 1979). Many Species of deuteromycetous fungi are currently being considered for use in the microbial control of mosquito larvae (Anonymous, 1982). Herein, we report the comparative bioactivity of *Paecilomyces farinosus* and *Verticillium lacanii* against obnoxious mosquito species *Culex pipines* in laboratory conditions.

Larvae of *Culex pipines* were obtained from the departmental mosquito insectary and all bioassay were conducted on different instar larvae. The fungi *Paecilomyces farinosus* and *Verticillium lacanii* strains used are indigenous isolates and are promising against many insect pests (Agarwal & Rajak, 1985). Both the cultures were obtained from Mycological herbarium, Dept. of Bio Science, R.D. University, Jabalpur. Conidia of *P. farinosus* and *V. lacanii* were produced by growing them on Agar slants of Sabouraud's maltose Yeast extract medium.

For comparative susceptibility of different instars, 2 ml of inoculum of a particular concentration was added to 198 ml dechlorinated tap water in a 500 ml glass beaker to which 50 larvae were added. Four replicates for each instar larvae were run with appropriate control. Tests were conducted with different instars larvae of *Culex pipines* towards *P. farinosus* and *V. lacanii*.

For dose mortality response eight concentrations each of *P. farinosus* ranging from 7.2×10^4 conidia/ml to 1.2×10^2 conidia/ml and of *Verticillium lacanii* ranging from ca. 7.5×10^4 conidia/ml to 0.8×10^2 conidia/ml were prepared by serial dilution. For each test concentration two ml of inoculum of a particular

concentration was added to 198 ml dechlorinated tap water in a 500 ml glass beaker, to which, 50 larvae of second instar were added. Four replicates for each test concentration were run. Appropriate controls were kept for each test. Mortality was scored, and corrected using Abbott's formula (Abbott, 1925). LC 50 values and fiducial limits were calculated by probit regression analysis (Finney, 1971).

There was no mortality in control sets. All larval instars of *Cx. pipines* was found susceptible to *P. farinosus*, whereas *V. lacanii* was found comparatively less virulent, first instar larvae were less susceptible. Some of the larvae were infected in fourth instar and transformed into pupae and death occurred after pupation. Microscopic observation of such pupae showed the presence of fungal mycelium. The mode of action of fungi on mosquito larvae were found to involve the blocking of respiration siphon as a result of perispiracular infection, followed by growth of mycelium down the respiratory siphon (Roberts, 1974).

Table 1: Comparative susceptibility of different instars of mosquito species *Culex pipines* towards *Paecilomyces farinosus* and *Verticillium lacanii*

Pathogen	Mosquito	Instar	Fungal treated		Mortality due to Fungal infection (Am ± SD) ^c	
			N ^a	% Mortality ^b	Am ± SD ^c	SD ^c
<i>Paecilomyces farinosus</i>	<i>Culex pipines</i>	I	200	87.00	87	± 1.82
		II	200	81.00	81	± 0.74
		III	200	71.00	71	± 1.29
		IV	200	58.00	58	± 2.13
Dose : ca 7.2×10^4 conidia/ml						
<i>Verticillium lacanii</i>	<i>Culex pipines</i>	I	200	39.00	39	± 0.95
		II	200	34.00	34	± 1.22
		III	200	24.50	24	± 1.56
		IV	200	16.50	16.5	± 0.95
Dose: ca. 7.5×10^4 conidia/ml						

a = No. of mosquito larvae, b = Corrected to 0% control mortality using Abbotts formula, c = Arithmetic mean ± Standard deviation.

LC 50 values for *Cx. pipines* were ca. 1.87×10^3 conidia/ml with χ^2 as 19.18, when exposed to *P. farinosus* whereas, *V. lacanii* showed LC 50 as ca. 1.53×10^5 conidia/ml with χ^2 as 13.95. The various estimates of regression based on the probit regression analysis and chisquare test in all bio-assays, showed homogeneity in the data, which is a reflection of a good fit of the observed and expected responses.

In the present investigation *P. farinosus* showed comparatively higher per cent mortality in *Cx. pipines* larvae. This fungal agent is amenable to mass culture and is indigenous isolate. Fungal mycelia after disintegration of dead larvae is capable of living on dead organic matter in the breeding habitat as this fungus is facultative saprophyte. It can parasitize mosquito larvae when present in the habitat, and thus it is self perpetuating in the breeding habitat. Therefore, it is a potential agent for microbial control of mosquitoes. However, further investigations are necessary for its formulation under field conditions.

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