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AB Kamble
Research Center, Department of Zoology, Karmaveer Bhaurao Patil Mahavidyalaya, Pandharpur, Maharashtra, India

Corresponding Author:
AB Kamble
Research Center, Department of Zoology, Karmaveer Bhaurao Patil Mahavidyalaya, Pandharpur, Maharashtra, India

Study of intrinsic activity of an insecticide against mosquitoes at Pandharpur, dist. Solapur

AB Kamble

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Abstract
Mosquitoes transmit several diseases in human being like malaria, filariasis, dengue and chikun gunya, Japanese encephalitis and yellow fever. Temephos 50% Ec, Pyrethrum 2% EC and Cythion 50% Ec are the insecticides which are used in study area to control mosquitoes. These are used without checking whether mosquitoes are susceptible or not to specific insecticides. The present study focuses on intrinsic activity of an insecticide: Malathion to a mosquito *Culex geldius.* This species is highly susceptible to Malathion.

Keywords: Mosquitoes, Insecticides, Susceptible, Culex

Introduction
Mosquitoes transmit several diseases in human being like malaria, filariasis, dengue, chikun gunya, Japanese encephalitis and yellow fever. Under curative control several synthetic insecticides are used to control mosquitoes at its larval and adult stages. Organophosphorus compounds has been using to control mosquitoes. Mosquitoes are becoming resistant to several insecticides. Metabolic resistance to organophosphorus compounds in insects is mainly due to quantitative and qualitative differences in carboxylesterases (Hemingway J, Karunaratne SHPP (1998) [1]. To achieve effective control, it is necessary to enlist resistant and nonresistant species of mosquitoes. Several worker studied the intrinsic activity of an insecticide against mosquito like Hemingway, J., & Ranson, H. (2000) [2]., Herath PRJ *et al* (1987) [3]. Temephos 50% Ec, Pyrethrum 2% EC and Cythion 50% Ec are used in the study area to control adult stage of mosquitoes. No recent data is available on the susceptibility status of mosquitoes to commonly used insecticides in this area. The present study focuses on intrinsic activity of an insecticide (Malathion) to a mosquitoes (*Culex geldius).*

Material and Methods
Indoor resting adult mosquitoes were collected with the help of suction tube. It was brought to laboratory in test tubes for further study. It was identified by using key of Barraud P.J. 1934 [4]. Topical solution was prepared by dissolving malathion in acetone (5% v/v Solution). Batch of 18 adult mosquitoes were selected for experiment. Cold anesthesia were given to adult mosquitoes by kept in refrigerated environment for few second. Each mosquito was exposed to insecticide. 0.1 µl of insecticide solution was deposited on the pronotum of each mosquito with the help of micropipette. After each test mosquitoes are transferred into plastic cups and provided with 10% honey in water on cotton wool and held for 24 hours at 27^{O}c to 2^{O}C and 80% +/-10% relative humidity (RH). Mortality was recorded 24 hours after the topical applications. Batch of 18 females treated with 0.1 µl of pure acetone serve as control.

Result and Discussion
Mosquitogenic conditions are very more common in the monsoon seasons. Waterlogged conditions are found everywhere. Houses and surroundings are full of with larval and adult stages of mosquitoes. *Culex gelidus* was mainly found in the study area. It is one of the important vector of Japanese Encephalitis Virus (JEV) and several strains of the virus which were isolated from Malaysia, India and other Southeast Asian countries since 1950. (Sudeep

A.B. 2014) [5]. For preventive measures Temephos 50% Ec, Pyrethrum 2% EC and Cythion 50% Ec are frequently used in study area by Municipal Corporation. This practice is followed without checking whether mosquitoes are susceptible or not to specific insecticides. Effective mosquito control entails the regular monitoring of insecticide resistance status of mosquito species. The objective of this study was to assess the susceptibility status of adult mosquito found in local area. During study no mortalities of *Culex gelidus* was occurred against tested insecticide (5% v/v Solution of Malathion). Even though high level of resistance to topical solution of Malathion was occurred in adult species of *Culex geldius*. It is in similar line with the Development of DDT resistance in *Culex quinquefasciatus* in several areas like Nagpur, Pune (Brown AWA, Pal R.1971) [6]. Mukhopadhyay A.K. *et al*. 1993 [7]. Fagbohun, I.K. *et al*. (2020) [8]. Resistance of Organophosphate and Propoxur to *Culex quinquefasciatus* was studied by Bisset J.A, *et al*. (1990) [9]. Susceptibility status of *Culex gelidus* is represented in the table 1

Table 1: Susceptibility status of *Culex geldius*

Insecticides (Conc)	No. of mosquito used	% mortality
Malathion (5%)	18	0
Control	18	0

As a baseline study it may be concluded that adult of *Culex geldius* are susceptible to Malathion (5% v/v Solution). No mortalities occurred for adult mosquitoes in control also.

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