BIOASSAY OF CERTAIN INSECTICIDE TO EVALUATE THEIR POTENTIAL WITH SPECIAL REFERENCE TO DIFFERENT ANOPHELINE SPECIES OF MOSQUITOES

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ABSTRACT

Although individual protection from bites of adult nopheline mosquito, by smoke and other fumigant devices was well known in the past, large scale use of insecticides proved to be unexpected by successful since last 40 years in India. Insecticides acts slowly and some of them irritate the mosquitoes, leading to their flight towards the light and usually out of the domestic places. Large scale application of insecticides, will have a marked effect on those Anopheline species of mosquitoes, which preferably feed on man or take shelter in human dwellings, sheds of domestic animals. In Anopheline mosquito population which are susceptible to the insecticidal action are gradually killed and thus the proportion of the resistant mosquitoes are able to increase very rapidly.

Now a days the great increase of resistance of mosquitoes to chlorinated hydrocarbons, organophosphates and carbonates has stimulated some attempts to produces compounds of different concentration and structure. The dosage and cycles of their application should in such a way (3%,4%,5%. DDT Malathion, Pyrethrum) that only the mosquito population involved in the transmission of malaria is affected or killed. WHO test kite used in this approach.

Key Words : Anopheles, Bioassay, Insecticides, Concentration, Malaria Susceptible

INTRODUCTION

Malaria being a communicable disease is transmitted by mosquitoes. Anophele the known carrier of malaria also transmits filariasis and encephalitis. Mosquitoes are of the familiar insect of order-Diptera, suborder-Nematocera and family-culicidae. Bhopal is one of the Indian cities identified as high risk by Anopheles mosquito species.

In India about 53 species of Anophele mosquito are recorded and about six species are known to be available in Bhopal, but all the species do not transmit malaria. About nine species are known to transmit malaria in the country. The present study is aimed at studying the effect of insecticides to evaluate their mosquitocidal potential with special references to different species of Anophele.1,2

MATERIAL AND METHODS

Standard entomological methods, techniques were employed in the collection of mosquitoes in different surfaces, indoor and outdoor, General collection were made inside
human dwelling and outdoor areas cattle shed grass or low vegetation, water etc. Mosquitoes resting outdoors collected by hand or with the aid of an aspirator or by using a sucking tube. Dropnets were used for collecting mosquitoes from grass or low vegetation. The day-to-day routing collections were made at each fixed station. The actual time spent for the collection was recorded.  

Night collections were made at two hour’s intervals for half an hour each from sunset to sunrise.

The mosquitoes were kept in Barroud cages of standard size 15cm×15cm having an equal sized mosquito net. A cotton plug soaked in water was kept on the top of the cage. So as to feed the mosquitoes. At times glucose water was also served in place of pure water while transporting the cage was either kept in a wooden box or wrapped by a wet lint cloth.

The test kit supplied by WHO consisted of twenty four conical chambers of transparent plastic with 8.5cm in diameter, 5.5cm, height, aspirator tube with one end bent adhesive plastic sponge upholstery takes and adhesive plaster. Mosquitoes were collected from these the freshly fed female were selected to observe the residual effects of insecticide 3% DDT, 4% Malathion, 5% Pyrethrum.

Spraying of the suspension of the insecticide was done with the help of a stirrup pump. The nozzle was kept 18 inches away from the surface and the discharge rate of the nozzle tip was 26-28 ounces per minute. The surface was sprayed in proper manner. After an hour the bioassay test was conducted.  

RESULTS AND DISCUSSION

Bhopal city has a large number of water collection including ponds, pits, drains, lakes, disposal tanks and stagnant water.

Mosquitoes were collected from all the catching centre and female were observed from their abdominal condition from June 2005 to March 2006 in four catching centres i.e. Idgah hills Kotrasultanbad, Char-Imli and Pipani area, specially the study center on female anopheline mosquitoes. During the period of study in different catching centres of Bhopal city (India), different species of Anopheles are collected i.e. Anopheles culicifacies, Anopheles annularis, Anopheles subpictus, Anopheles stephensi, Anopheles turkhudi, Culex fatigans, Culex vishnoi, Aedes aegypti etc.

In Bhopal city Anopheles annularies were collected easily in fair numbers in houses, cattle sheds, store rooms during day time. Anopheles stephensi is one of the important malaria vector in Bhopal City. The control of the mosquito vector mainly depend upon the application of insecticides.

After the epoch making discovery by Rose in India and by Grassi and colleague in Greece on the mosquito transmission of malaria control anopheles as a means of control of malaria became a favourite subjects for study and experiment in many parts of the world.

Extract of pyrethrum flowers (Chrysanthemum cinerariae folium) have been used by centuries to kill insects. Pyrethrum power is neurotoxic because of its knock down effect and its rapidly absorption, almost all species will be knocked down as soon as they come in contact with it. It is a contact insecticide and pyrethrins have no residual effect and are quickly decomposed on exposure to sunlight.

During the study, mosquitoes were found to be highly resistant to DDT. This result was shown during the study of different localities of Bhopal city such as Ibrahimpura, Pipani area.

On Anopheles stephensi discriminative doses viz 3%X1 hour for DDT and 4%X1 hour for malathion Lc25 and Lc95 values were found respectively. Same test were done on same species in Idgah hill localities, mortality
obtained 20% in case of DDT, 90% in case of malathion Lc25 value for malathion and DDT against Anopheles stephensi were found in Char Imli area.

In case of Anopheles culiciacies and Anopheles annularies, susceptibility tests were done in some localities of Bhopal city, such as in Piplani area, susceptibility tests were done on Anopheles culiciacies and Le25 values for DDT were found Lc27 and Lc88 value for DDT and malathion against adult of Anopheles culiciacies were found in Kotra Sultanabad area. In the case of Anopheles annularies Lc20 and Lc85 values against DDT and malathion respectively were found in the area of Char Imli, Bhopal (India) also.

CONCLUSION

It is concluded from the result that more or less all the species of mosquitoes in Bhopal city have shown resistance against DDT. In the case of malathion all species of mosquitoes showed highly susceptible in comparison to another insecticide.

REFERENCES