

Accumulation of organophosphate estimated by Gas liquid chromatography in fresh water sponges (*S.lacustris*)

D.N. Shinde

Department of Chemistry, BNN College, Bhiwandi, Thane, Maharashtra, India

ABSTRACT

Accumulation of the pesticides varies as per the target tissue in the victim. The amount of pesticidal residue accumulated by an organism via oral or other routes of entry. In the present study the accumulation of organophosphate (dimethoate) exposed to fresh water sponge at sub-lethal concentrations. As sponges have a canal system for incurrent and excurrent. Accumulation of dimethoate was estimated by gas liquid chromatography with standard concentration of pesticide and experimental *S.lacustris*. The GLC results showed that accumulation of dimethoate in the fresh water sponge (*S.lacustris*).

Keywords : *S.Lacustris*, Phylum Porifera, Organophosphate, Accumulation, GLC.

I. INTRODUCTION

One of the prime factors for the degradation of the biosphere is a synthetic organic chemical, which includes pesticide, polychlorobiphenyls, and polyaromatic hydrocarbon. The use of pesticides in agriculture and other areas is not recent but prior to 1940s. The insecticides like lime, sulphur, nicotine, pyrethrum, kerosene and rotenone were extensively used. In the progress of time with increasing population the demand of the food has increased, as a result the use of chemicals in the agriculture sector has increased for maximum food production.

The amount of pesticidal residue accumulated by an organism via oral or other route of entry, results in increased concentration of pesticide in the specific body tissues [1]. The pesticide level can be determined by uptake or elimination, which in terms of the concept, translocation, accumulation, and behaviour of pesticide residues among the biological system [2]. Accumulation occurs whenever the

amount of uptake is larger than elimination [3]. Some reports about the concentration of organochlorine compounds in different species of fishes [4]. At least 25% of the insecticide used for agricultural and pest vector control are expected to reach water reservoirs [5].

In the present study, accumulation of organophosphate in *S.lacustris* exposed to sub-lethal concentration was studied. *Spongilla* is a group of filter-feeding organisms and considered as an excellent for bio-monitoring purpose [6]. Fresh water sponges can tolerate a minor amount of pollution [7]. Keeping the perspectives in mind, the *Spongilla lacustris* were selected as an experimental organism and the pesticide organophosphate (dimethoate) was used.

Study area—*S.lacustris* were brought from Latipada Dam, at Pimpalner, Tal, Sakri, Dist. Dhule (M.S.). Dam is located at the latitude 20°55'N and longitude at 74°5'30"E at 532 MSL.

II. METHODS AND MATERIAL [Page Layout]

The test organism *S.lacustris* was brought in the laboratory for acclimatization then it was subjected to sub lethal concentration of dimethoate for thirty days. The method used for estimation of pesticide by GLC for pesticidal analysis [8]. A stock solution of dimethoate 5ppm were prepared with chloroform and used as a standard. After thirty days adoption *S.lacustris* were brought to about one gm of weight and homogenized in pestle and mortar with 10 cm³ of chloroform and filtered by watmann no.1 filter paper. The pesticide residues were extracted by chloroform followed by the method [9]. The extract was evaporated about 1cm³ and further analysis by gas liquid chromatography (GLC). Operating conditions for estimation as below,

GLC model--- Nucon-5700

Column-----1/8 inches,packing OV-17

Carrier-----Nitrogen@30ml/min.

Oxidant-----Oxygen@300ml/min

Fuel-----Hydrogen@30ml/min

Sample concentration-----5ppm

Injected volume-----5.00ul

Injector temp.-----260°C

Detector temp.-----260°C

Oven initial temp.-----180°C

Oven final temp.-----250°C

Detector-----FID.

III. RESULTS AND DISCUSSION

The results estimated by GLC indicate that the accumulation of dimethoate was 87.68% than the standard concentration of dimethoate. Few reports are available to state the bio-monitoring role of sponges for heavy metals [10]. In fresh water sponges *E.fluviatilis*, *E.muelleri* and *S.lacustris* accumulates the pollutants [11]. Some reports [6] were showed that *S.lacustris* is the excellent species for monitoring chlorinated hydrocarbon pesticides. Similar studies on toxicity have shown the accumulation in the tissues of aquatic organisms.[12]

The pesticide residues are known to bio-accumulate in the lipid tissues of the fish and via food chain to the human bodies [13].

In the present study the lipid content present in the tissues of *S.lacustris* developed by secreted cells in the form of droplets. The accumulation of dimethoate in the tissues observed in the gemmules, ameobocytes, loaded vesicles etc. were disrupted to certain extent.

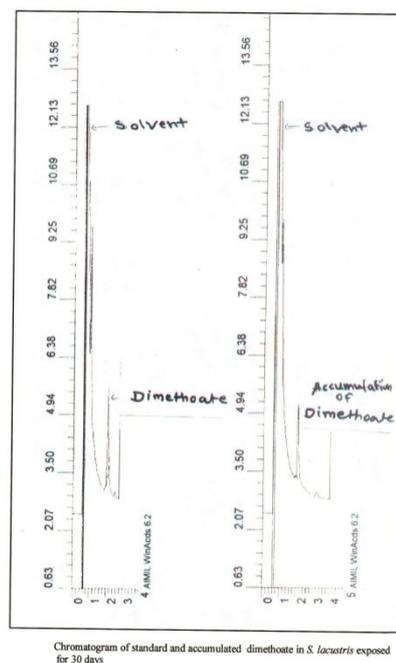


Figure 1

IV. CONCLUSION

Pesticides are added in the aquatic environment mainly through agricultural activities affects on fresh water sponges. The accumulation of pesticides was observed in the tissues estimated by GLC technique. Preservation and conservation of sponges is important due to their environmental value. Sponges are able to tolerate wide range of pollutants. Hence a group of spongilla can be consider as a pollution indicator.

V. REFERENCES

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