from plankton. This may perhaps be shared with the prawn. In turn the hydroid colony which will get smothered by sediments, if it grows in a stationary place, is kept intact by the locomotor activity of prawns. Prawns are omnivorous detritus feeders. They scoop up the bottom with the maxillipeds and legs and select their food. The unwanted materials are sifted above from which the hydroids can collect their food. Ectocommensalic relationship between the hydroid *Hydractinia* sp. and the hermit crab has been reported (Wright, 1973). The basal plate of hydroid was found to be helpful in enlarging the shell. In the same way the basal plate of hydroid colony may induce growth in prawns also. Thus the association between the hydroid and the prawn is of advantage to both the partners, a clear case of true mutualism.

The authors are thankful to late Prof. K. Ramamoorthi, Centre of Advanced Study in Marine Biology, Parangipettai for confirming the identity of the hydroid and to Prof. V. K. Venugopalan, Director of the above institute and authorities of Annamalai University for the facilities.

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PRELIMINARY STUDY ON THE TOXICITY OF FISHES OF CUDDALORE AND PARANGIPETTAI WATERS

ABSTRACT

Among the eight fishes collected from Cuddalore and Parangipettai waters and screened for toxicity tests, three tetrodontiformes exhibited positive results and other fishes belonging to Flat-head, sole fish and another three tetrodontiformes showed negative results. The results obtained from the analyses of different tissues of different fishes are discussed in the present note.

MARINE toxins have been extensively studied in Japan and other developed countries (Tani, 1945 ; Tsuda and Kawamura, 1962 ; Goto, 1964 ; Russell, 1965 ; Halstead, 1967 ; Hashimoto, 1969; 1979; Clarke and George, 1979 ; 500 species of marine fishes are known to be toxic. Studies on marine toxins are very limited from Indian waters. Such studies are immediately warranted as they would pose problems to fishing industry and public health. The present work was carried out to find out the toxic fishes from Cuddalore and Parangipettai waters.

The authors are thankful to the Director, CAS in Marine Biology for providing the facilities and the second author (R.J.) thanks the UGC for the award of Research Associateship.

Material and methods

The fishes were collected from Cuddalore and Parangipettai waters for toxicity tests. The method described by Hashimoto (1979) was followed with slight modifications to prepare the test solutions for toxicity studies. The skin, gonad and liver of the experimental

fishes were dissected and minced with 70% ethanol. To this minced tissues 50 ml of 70% ethanol was added and kept in waterbath for 30 minutes at 60 to 65°C. The supernatant was filtered and again 50 ml of 70% ethanol was added to the residue. This process was repeated three times. The pooled supernatant (150 ml) was concentrated to 10 ml in vacuum rotary evaporator. Equal volume of this crude extract and 1% Tween 60 solutions were mixed for emulsification. From this test solution 0.5 ml was injected interperitoneally into male mice weighing 20 gms. A control was maintained by injecting 0.5 ml of 1% Tween 60 without extract. The time of death after injection was noted. Death within 24 hrs, was followed as criteria for toxicity.

Results

The results of the bioassay were given in Table 1. Among the eight fishes screened for toxicity tests, three tetrodontiformes exhibited positive results, other five species including three tetrodontiformes, one flat head and one sole fish showed negative results. Whenever a toxic extract was injected into mice they suffered from suffocation, paralysis of limbs and they urinated and defaecated frequently before they become inactive, probably due to inhibition of nerve conduction (Halstead, 1967). Many species of tetrodontid fishes have been reported to contain tetrodotoxins in their gonads, skin, liver, muscle and intestine. During spawning period the ovaries become more toxic than the liver (Tani, 1945). The appearance and amounts of toxin in the fishes is related to reproductive cycle. The absence of toxins in the ovary extracts of *Arothron stellatus* and *Amblyrhynchotes hypselogenion* may be due to the fact that they were caught during non-spawning season. But the ovary extract of *Gastrophysis lunaris* inactivated the mouse within 20 minutes indicating the presence of more potent toxin in the ovary than in skin. In *Arothron stellatus* and *Amblyrhynchotes hypselogenion*, the skin extracts inactivated the mice within a very short period (16, 22 minutes respectively) than that of the liver extracts. This indicates that the concentration of toxins is more in the skin than in the liver. A detailed study on purification and pharmacological action of tetrodotoxin are in progress.

TABLE 1. *Toxicity of fishes*

Fishes	Skin	Ovary	Liver
Thysanophrys carbunculus (flat head)	—	—	—
Euryglossa orientalis (sole fish)	—	—	—
Lagocephalus inermis (tetrodon)	—	—	—
Arothron immaculatus (tetrodon)	—	—	—
Arothron leoparadus (tetrodon)	—	—	—
Arothron stellatus (tetrodon)	+	—	+
Amblyrhynchotes hypselogenion (tetrodon)	+	—	+
Gastrophysis lunaris (tetrodon)	+	+	—

+ : Positive (lethal)
— : Negative (non-lethal)

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