

## MENACE FROM MEDUSAE OFF MADRAS WITH NOTES ON THEIR UTILITY AND TOXICITY

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### ABSTRACT

Two species of jelly fish *Crambionella stuhlmanni* (Chun) and *Dactylometra quinquecirrha* L. Agassiz were found to be common around Madras almost round the year. Based on the data collected from the Research Vessel *Cadalmin III* their effect on fish catch is studied for five years. It was found that the fish catch was less when medusae were abundant. Some remarks on the utility and toxicity of the medusae are also given in the paper.

### INTRODUCTION

ALTHOUGH medusae are common and conspicuous organisms in the sea off Madras almost round the year, very little information is available on them and on their effect on fishing. To take effective measures against medusae menace, information on their biology, movements, etc. is therefore urgently required.

Swarms of jelly fishes in inshore waters are a common sight off Madras. Menon (1930) published an account of Scyphomedusae of Madras Coast. During the present study *Crambionella stuhlmanni* (Chun) (Pl. I) and *Dactylometra quinquecirrha* L. Agassiz were noted in large numbers with the former species accounting more than 95% among the medusae. The diameter of the umbrella in *C. stuhlmanni* varies from 150 to 230 mm. The arms, eight in number vary in length from 75 to 120 mm. The colour is light brown with light greenish-blue patches on the tentacles.

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### EFFECT ON FISH CATCH

Nair (1945) reported on the correlation of medusae with inshore fishing from Trivandrum. To quantify the occurrence of medusae off Madras and to understand the possible effect of medusae on fish catch, the log sheets of the Institute's Research Vessel CADALMIN III (overall length 43.5') for the years 1981-85 were analysed to arrive at the respective catch rates considered here as measure of abundance. During the period, the vessel operated demersal trawl in the area between Ennore (north of Madras) and Thiruvanniyur (south of Madras) at depths ranging from 10 to 40 m.

Though the Research Vessel was not in operation during certain months every year, a trend was apparent in the month-wise catch rates of medusae. The catch rates were high during June, July and August (857, 572 and 465 kg/hr respectively) and there was no catch during the monsoon period (November to January) (Table 1). Raghunathan and

TABLE 1. *Monthwise effort (hrs) expended by the Research Vessel Cadalmin III during the years 1981-1985 and the corresponding catches (kg) of fish (F) and medusa (M)*

Month	Effort							Catch						Ratio (Fish : Medusa)	
	1981	1982	1983	1984	1985	Total		1981	1982	1983	1984	1985	Total		
January	..	14.66	18.92	0.00	10.75	0.75	45.08	F M	277 0	124 0	— —	73 0	18 0	492 0	—
February	..	19.67	0.50	0.00	0.00	0.00	20.17	F M	60 5860	15 0	— —	— —	— —	75 5860	1 : 78.1
March	..	28.50	31.50	0.00	0.00	0.00	60.00	F M	836 2245	229 206	— —	— —	— —	1065 4309	1 : 4.0
April	..	23.00	8.25	0.00	0.00	0.00	31.25	F M	857 70	158 0	— —	— —	— —	1015 70	1 : 0.1
May	..	26.84	16.32	0.00	0.00	9.78	52.74	F M	1026 0	1011 360	— —	— —	279 237	2316 597	1 : 0.3
June	..	0.00	4.75	0.00	0.00	0.00	4.75	F M	— —	32 4070	— —	— —	— —	32 4070	1 : 127.1
July	..	0.00	17.50	0.00	0.00	0.00	17.50	F M	— —	598 10013	— —	— —	— —	598 10013	1 : 16.7
August	..	0.00	5.00	11.50	3.92	18.17	38.59	F M	— —	89 20	65 21	233 120	332 17800	719 17961	1 : 25.0
September	..	0.00	24.68	28.50	23.71	26.33	103.22	F M	— —	720 4105	1109 0	556 8005	499 3043	2884 15153	1 : 5.3
October	..	0.00	3.25	7.75	5.42	26.25	42.67	F M	— —	36 0	110 0	53 23	400 0	599 23	1 : 0.04
November	..	0.00	0.00	0.00	1.00	—	1.00	F M	— —	— —	— —	6 0	— —	6 0	—
December	..	0.00	0.00	0.00	6.75	—	6.75	F M	— —	— —	— —	122 0	— —	122 0	—
Total	..	112.67	130.67	47.75	51.55	81.08	423.72	F M	3056 8175	3012 20632	1284 21	1043 8148	1528 21080	9923 58056	1 : 5.9

Srinivasan (1983) also reported that medusae were abundant in Ennore estuary during the period June-August. Chidambaram (1984) observed more number of medusae during January to June at Pondicherry.

The occurrence of medusae in large quantities in the inshore waters of Madras seems to have influenced the monthwise catch rate of fish during most part of the year (Fig. 1). During a particular month an increase or decrease in the catch rate of medusae (as compared to the previous month) has brought about an opposite trend in the catch rate of fish, e.g. during the period from January to September (except in August). During the remaining months, this

TABLE 2. Annual catch rates (kg/hr) of medusae and fishes

Year	Catch rate (kg/hr)		Fish : Medusa
	Medusa	Fish	
1981	72.56	27.12	1 : 2.7
1982	157.89	23.04	1 : 6.9
1983	0.44	26.88	1 : 0.02
1984	158.06	20.23	1 : 7.8
1985	260.00	18.85	1 : 13.8

rate of fish decreased by nearly 30% during this period. Keeping the catch rate of fish as 1, a ratio between the catch rates of fish and

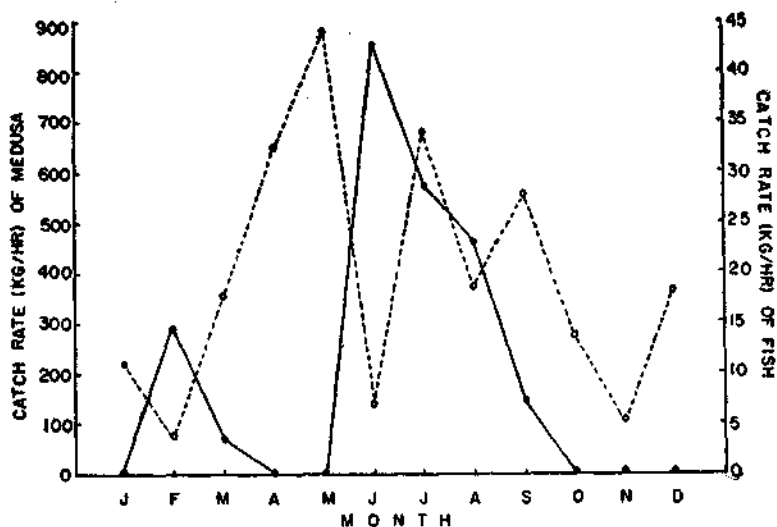


Fig. 1. Catch rates of medusa (●—●) and fish (○....○) during different months; data pooled for the years 1981-1985.

opposing relationship is not noticed perhaps due to the prevailing monsoonic conditions and non-availability of medusae.

Analysis of data on the annual catch rates of medusae and fish too has established a negative relationship between these two groups. The annual catch rate of medusae increased from 73 kg/hr in 1981 to 260 kg/hr in 1985 (for 1985, the catch rate pertains to the first 10 months only) (Table 2). On the other hand the catch

medusa has been worked out for each year. The fish : medusa ratio has increased from 1 : 0.02 in 1983 to 1 : 13.8 in 1985. Though it is not possible to conclude that increase in fish : medusa ratio is solely responsible for the decrease in fish catch rate, the available data provide a clue that a spurt in the abundance of medusa may be one of the factors that affects the fish catch rate. Whether or not it is true calls for detailed investigation on this aspect

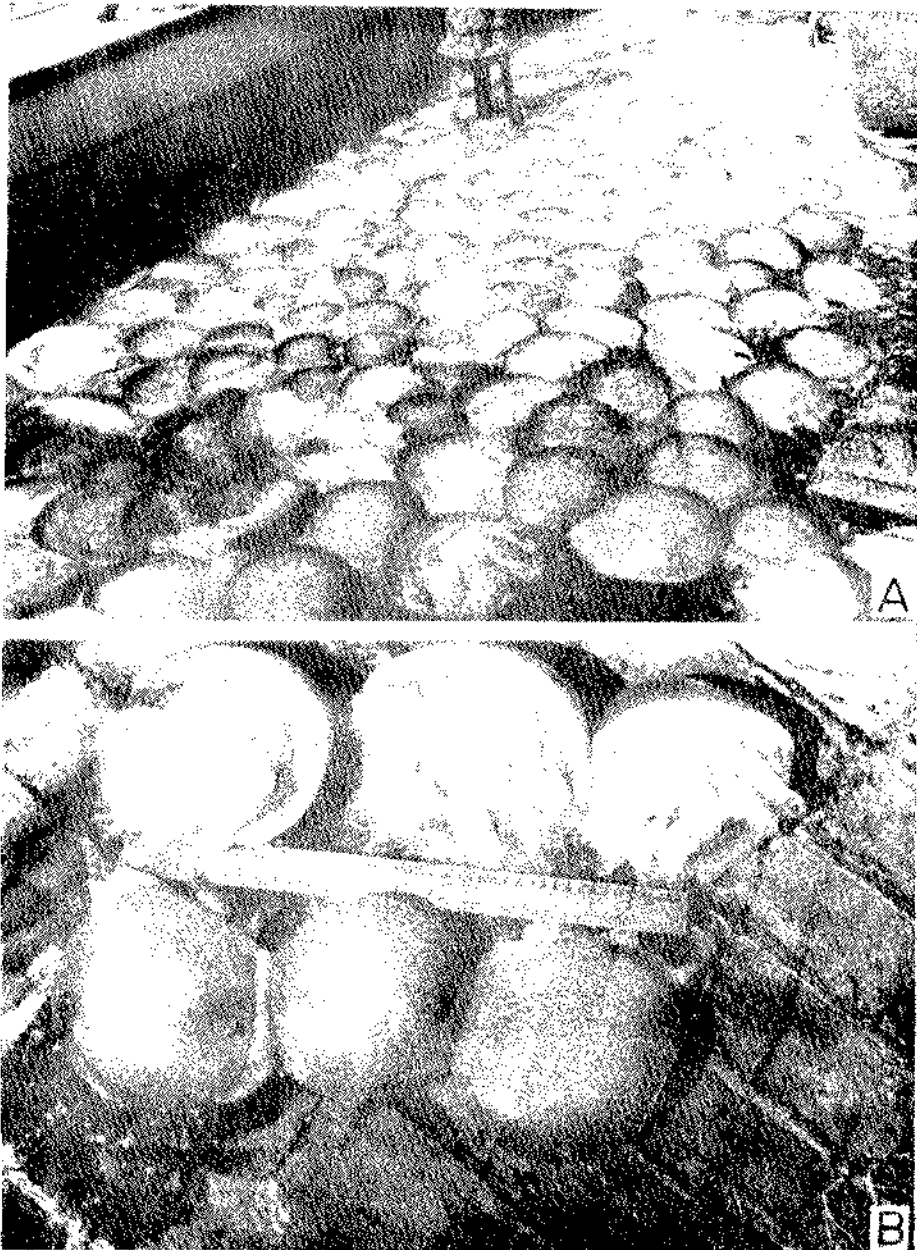


PLATE I The medusae *Crambionella stullmanni*: A, On the deck of the Research Vessel *Cadabir* III and B, Close up view of dorsal and ventral sides.

in addition to continuous monitoring of fish : medusa ratio in future years.

The fishermen are well aware of the presence of the medusae. Fishing operations are not suspended due to the presence of medusae but they change the grounds where medusae are less in number. The medusae appear to be distributed in the entire water column and they are mostly found in the inshore waters.

#### UTILITY

Govindan (1984) stated that there is great export potential for the jelly fish. According to him it has good demand in Japan and Hong Kong markets. Krishnan (1984) has described the methods of processing medusae in detail. Chidambaram (1984) has described the processing of umbrella and arms in seven stages. He stated that jelly fish are exported from Pondicherry and south Arcot in Tamil Nadu. According to him, in 1984, 21 tonnes of jelly fish were processed and exported. Medusae were processed in large numbers at Alambarkuppam near Mahabalipuram in 1987.

#### TOXIC EFFECTS

It is well known that jelly fishes have a battery of nematocysts which inflict painful lesions sometimes resulting in death. Hashimoto (1979) and Russel (1984) have listed a number of Scyphomedusae which are toxic. Menon (1930) has stated that *D. quinquecirrha* is a common sting jelly fish of Madras coast. Gravely (1941) reported that accidental contact with the masses of the above mentioned medusa will result in a painful week in bed. One of the authors (DBJ) has handled both the species

in the living condition for more than half an hour to take measurements and to note other characters. While no pain or irritation was experienced on the palm during handling, an accidental touch on the face with the palms caused severe stinging pain on the eye lids where the skin is delicate. After one hour when the face was washed with soap the pain increased severely on both the eyelids which lasted for several hours. This clearly shows that the nematocysts which stick to the palm get stuck to the tender skin of the eye lids while washing.

Panikkar and Prasad (1952), Jones (1960) and Mansueti (1963) have reported on the association of medusae with fish. The present authors have also observed the association of mullets with medusae in the timber pond of Madras harbour. Mulletts were seen to swim beneath the umbrella of the medusa *C. stuhlmanni*. When disturbed, in no time the fishes again joined the medusae and swam along with them. From the observations made by the authors at Madras harbour and at Mandapam (Palk Bay) it is clear that medusae do not serve as repellents for certain select fish groups like mulletts and carangids.

#### GENERAL REMARKS

The above analysis clearly shows that the medusae are becoming more abundant year after year. The causes for their increase every year have to be thoroughly investigated. Also ways and means are urgently required to keep the medusae from entering the tunnels that take sea water for the Atomic Power Plant at Kalpakkam in order not to stall its work.

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