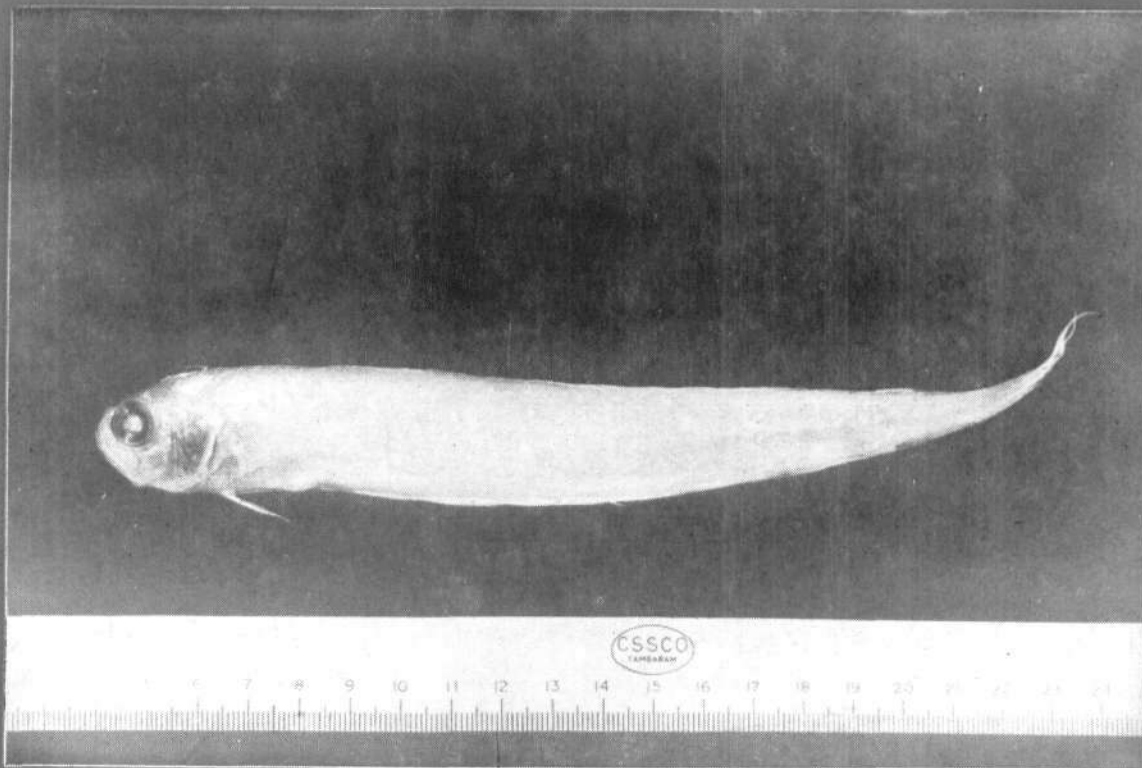




समुद्री मात्स्यकी सूचना सेवा MARINE FISHERIES INFORMATION SERVICE

No. 99

SEPTEMBER 1989



तकनीकी एवं TECHNICAL AND
विस्तार अंकावली EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यकी CENTRAL MARINE FISHERIES
अनुसंधान संस्थान RESEARCH INSTITUTE
कोचिन, भारत COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

AN UNUSUAL CONGREGATION OF ORGANISMS IN THE CATCHES OFF KOVALAM, MADRAS*

Introduction

The fishermen belonging to Kovalam (Lat. 12° 47' N, Long. 80° 25' E), a small village situated 40 km south of Madras, had a hectic activity in harvesting huge quantities of fish from the Kovalam bay from 26-8-'87 to 4-9-'87. Fishermen employed all available gears for catching the fish and prawns. While fishing, many rock-dwelling marine organisms such as crinoids, asteroids and gorgonians also got entangled in the nets. Though fishing activity was maximum off Kovalam, fishermen from villages north and south of Kovalam also reported unusually heavy landings of fish in the same period. According to them, this was due to the appearance of 'Vandal thanneer' or turbid water close to the shore. The present account embodies the results of the observations made on this unusual phenomenon.

Observations

Fishing: On the first day (26-8-'87), a few units of boat-seine (*Thuri-valai*), trammel net (*Manivalai*) and gill-net (*Pannu valai* and *Ara valai*) were operated from catamarans in the bay, where the depth ranged from 4 to 5 m, while the drag nets (*Konda valai*) were employed in the surf-beaten shore area. Encouraged by heavy catches, more units were put into operation repeatedly. The time taken for hauling each unit ranged from 1 to 2 hours. The sea was calm and turbid during the entire period of observation.

Catch: Date-wise estimated landings of fish and prawns at Kovalam during 26th August to 14th September, 1987 are given in Table 1. The catch was mainly constituted by coral fishes, silver bellies, ribbon fishes, soles, rays, eels and prawns (Fig. 1). At Panayurkuppam, which is 10 km north of Kovalam, heavy landings of fishes were recorded on 3-9-'87, mainly constituted by a deep water fish, *Acanthocephala* sp. (front cover photo) (1,014 kg), followed by soles (358 kg). The total estimated catch on that day was 1,742 kg. Similarly, unusual fishery comprising mainly of coral fishes, soles, rays and silver bellies were also reported from other villages bordering Kovalam bay.

Species composition: Fishes, prawns and crabs which were caught in the indigenous gears are listed below:

Fishes

1. Deep water: *Acanthocephala* sp., *Hoplobrotula gnathopus*, *Lepidaplois hirsutus*, *Trichiurus auriga*, *Holocentrus rubrum*, *H. sammara*.



Fig. 1. A boat-seine catch of demersal fishes, comprising mainly soles, ribbon fishes and silverbellies.

2. Coral reefs and rock-dwelling: *Abudefduf saxatilis*, *Alectis indica*, *Apogon fleurieu*, *A. quadrifasciatus*, *A. monochrous*, *A. bandanensis*, *Apogonichthys ellioti*, *A. queketti*, *Apistus* sp., *Coryphaesopla cornuta*, *Chaetodon vagabunda*, *Centropyge bispinosus*, *Chelonodon patoca*, *Cheilodipterus lineatus*, *Citharoides macrolepis*, *Canthigaster marginatus*, *Diploprion bifasciatus*, *Gastrophysus scleratus*, *Lagocephalus inermis*, *Muraena tessellata*, *Ostracion tuberculatus*, *Pomacanthodes semicirculatus*, *P. imperator*, *Pempheris moluca*, *Scorpaena natalensis*, *Siderea thyrsoides*, *Triacanthus blaculeatus*, *Trygon* sp.

3. Demersal: *Chiloscyllium griseum*, *Drepane punctata*, *Dasyatis jenkinsii*, *D. imbricatus*, *Gazza minuta*, *Glossogobius* sp., *Heteromycteris oculus*, *Leiognathus splendens*, *L. lineolatus*, *Lutjanus fulviflamma*, *L. argentimaculatus*, *Lethrinus fraenatus*, *Myripristis murdjan*, *Narcine timlel*, *N. brunnea*, *Narke dipterygia*, *Nemipterus mesoprion*, *Pseudorhombus triocellatus*, *Plotosus anguillar*, *Psettodes erumei*, *Platycephalus asper*, *Parupeneus indicus*, *P. barberinus*, *P. trifasciatus*, *Siganus canaliculatus*.

* Prepared by E.V. Radhakrishnan, M. Kathirvel, K. Devarajan, M. Vijayakumaran, P. Poovannan, R. Thangavelu, K. Shahul Hameed, S. Sankaralingam, A. Ramakrishnan and V. Thangaraj Subramanian, Madras Research Centre of CMFRI, Madras.

tus, *Secutor insidiator*, *Stolephrous bataviensis*, *S. heterolobus*, *Sillago sihama*, *Scomberomorus commersoni*, *Sphyræna jello*, *Trypauchen vagina*, *Upeneus vittatus*, *U. sulphureus*, *Zebrias quagga*.

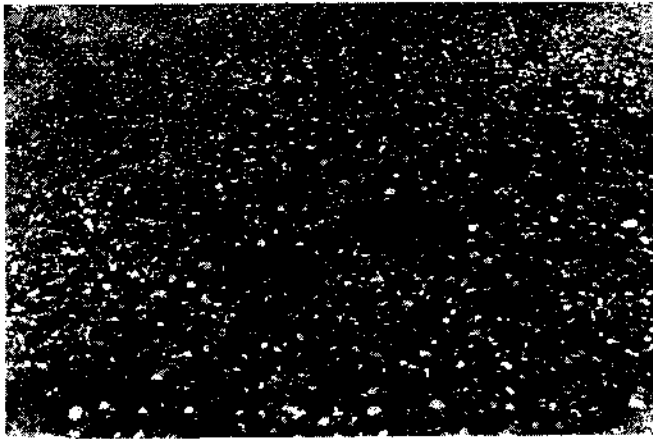


Fig. 2. A view of the intertidal area of the Kovalm beach strewn with living and dead molluscan shells.

Prawns

1. Penaeid prawns

Shallow water: *Metapenaeus dobsoni*, *M. monoceros*, *Penaeus indicus*, *P. monodon*, *P. semisulcatus*, *Parapenaeopsis maxillipedo*, *P. cornuta*, *P. stylifera*, *P. nana*, *Solenocera crassicornis*.

Deep water: *Parapenaeus longipes*, *Trachypenaeus* sp.

2. *Non-penaeid prawns:* *Acetes indicus*, *Exopalaemon styliferus*, *Exhippolysmata ensirostris*, *Nematopalaemon tenuipes*.

Crabs

1. *Shallow water:* *Charybdis annulata*, *C. (C.) feriata*, *Doclea hybrida*, *Matutabankii* sp., *Portunus pelagicus*, *P. sanguinolentus*.

2. *Deep water:* *Charybdis (C.) vertegate*.

3. *Coral-dwelling:* *Atergatis ufloridus*, *A. integerrimus*, *Schizophrys aspera*.

Among the penaeid prawns caught at Kovalam by boat seines, *Parapenaeopsis stylifera* (size range: 66–126 mm in total length; modal length: 101–110 mm for females and 81–90 mm for males) was dominant, followed by *P. maxillipedo* (58–110 mm in TL), *Metapenaeus*

monoceros (75–127 mm in TL), *M. dobsoni* (76–110 mm in TL) and *Trachypenaeus* sp. (71–91 mm in TL).

Apart from fishes, crustaceans and echinoderms from the shallow waters and huge quantities of molluscan shells were also washed ashore and their names are given below (Fig. 2).

Babylonia sp., *Barblita* sp., *Cardium* sp., *Crassostrea* sp., *Cyprea* sp., *Clinocardium* sp., *Chama* sp., *Donax* sp., *Modiolus* sp., *Murex trapa*, *M. virfiens*, *Oliva* sp., *Pecten* sp., *Prestrea* sp., *Pitar* sp., *Pteria* sp., *Saccostrea* sp., *Semele* sp., *Thais* sp., *Tellina* sp., *Turritella* sp., *Trichomya* sp., *Vesticardium flavum*.

Hydrographical parameters: Results of analysis of water samples collected during the course of study are given in Table 2. A steep fall in surface water temperature (26.0°C) was observed on the 4th day of observation. The surface temperature, seven days prior to the event was 28.0°C. Further, it lowered to 24.5°C on the seventh day (1–9-'87). Thereafter, it gradually increased to 27.0°C, which is four days after the event.

The values of dissolved oxygen was 2.37 ml/l on the fourth day and thereafter it varied from 2.38 to 3.22 ml/l. The comparatively higher values recorded during the present study may probably be due to the sampling in the surf-beaten area.

Remarks

From the local enquiries, it was learnt that appearance of turbid water ('Vandal thanneer') in Kovalam bay is an annual phenomenon particularly during August–September months. However, its conspicuous impact on the fishery of the area was observed only in certain years. In 1982, Vivekanandan *et al.*, reported a similar but widespread phenomenon along the north Tamilnadu coast and opined that this might be the result of upwelling-like phenomenon. The gradual drop in atmospheric and surface sea water temperature, fall in dissolved oxygen of the surface waters and high turbidity, all characteristics of coastal upwelling were recorded during the present observation. Besides, unusually large quantities of demersal fishes such as soles, rays and eels, coral-dwelling and deep water fishes and prawns, some of which not normally caught from the shallow areas of the Kovalam bay, were caught during this period. The exceptional congregation of coral-dwelling and deep water organisms would have been due to their movement into the shallow areas of the bay along with the movement of the oxygen deficient

Table 1. *Estimated total landings of fish at Kovalam*

Date	Estimated total landings in kg	Dominant items
26-8-'87	500	Silver bellies, ribbon fishes, prawns
27-8-'87	600	"
28-8-'87	850	"
29-8-'87	1,200	Coral fishes, soles, rays, prawns, eels and silver bellies
30-8-'87	450	"
31-8-'87	700	"
1-9-'87	2,300	"
2-9-'87	1,050	"
3-9-'87	150	"
4-9-'87	50	"

subsurface waters towards the coast. The most significant among the observations was the appearance of a deep water fish *Acanthocephala* sp. in the bay. The landing of more than 1,000 kg of this deep water fish at Panayurkuppam, 10 km north of Kovalam further substantiates the suggestion of shoreward movement of the deep water. Moreover, crinoids, gorgonians and molluscs which inhabit the rocky areas would have been washed away from their natural habitat by the strong shoreward currents associated with the upwelling-like phenomenon.

Table 2. *Hydrographical features of the surface waters of Kovalam bay from 18-8-'87 to 10-9-'87*

Date	Temperature (°C)		Salinity (‰)	Dissolved oxygen (ml/l)
	Atmospheric	Surface water		
18-8-'87	33.8	28.0	—	4.37
29-8-'87	30.5	26.0	—	2.37
30-8-'87	30.2	26.0	35.97	2.61
31-8-'87	29.9	26.0	"	2.38
1-9-'87	29.8	24.5	"	2.38
2-9-'87	29.6	25.6	"	—
3-9-'87	30.4	25.8	35.60	3.22
4-9-'87	31.2	27.0	36.10	3.03
8-9-'87	33.7	27.0	"	4.01
10-9-'87	34.1	30.8	36.92	—

Though there are several reports on coastal upwelling along the Indian coast, majority of them are from the west coast of India and only few were related with the fish catch. The present observation of unusual assembling of coral-dwelling and deep water fishes and prawns near the coast shows that shoreward movement of deep water occurs along the North Tamilnadu coast during August-September period. Further study of the hydrographical features and fishery during this period is required to substantiate the actual cause of such phenomena.

