

# Short Communications

## Swarming of a Pteropod *Cavolinia uncinata pulsata* (Rang, 1829; Spoel, 1969) in the Inshore Waters off Cochin

M. SAKTHIVEL

National Institute of Oceanography, Cochin 18

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A swarm of *C. u. pulsata* is observed in the inshore waters off Cochin (9°58'N, 76°10'E). As this is an oceanic species the possibility of it being carried close to the coast because of mixing of oceanic water with coastal water is suggested. The morphology of the species is described.

OF the several groups of zooplankton, the swarming of a few groups such as cladocerans, amphipods and pteropods has been reported along the east and west coasts of India<sup>1-5</sup>. The area off Cochin along the south-west coast of India shows special significance with regard to a few species of zooplankton. A monotypical swarm of an hyperiid amphipod, *Hyperia sibaginis* Stebbing, is noticed by Nair<sup>3</sup> in the area off Cochin. Of all the areas explored in the Indian Ocean, the pseudothecosomatous pteropod *Desmopterus papilio* Chun reaches its maximum abundance in the area off Cochin<sup>6</sup>.

The species *Cavolinia uncinata* (S. or. Euthecosomata, Gastropoda) has three sub-species, viz. *C. u. uncinata*, *C. u. roperi* and *C. u. pulsata*. Of these the former two are found in the Atlantic and the latter in the Indian Ocean. Tesch<sup>7</sup> reports that *C. uncinata* is generally found in the equatorial zone with more common occurrence in the Indo-Malayan waters. Study of the International Indian Ocean Expedition material reveals that the major centre of the population of *C. uncinata pulsata* is found around Andaman Sea and often gets transported to the west by the North Equatorial Current<sup>8</sup>. As a branch of this current flows into the eastern Arabian Sea, this species is also found there, but absent in other parts of the Arabian Sea. Therefore *C. u. pulsata* is considered as an indicator of the Bay of Bengal water mass.

The present report is based on the examination of the zooplankton collections of the Arabian Sea 'Pelagic Fishery Project'. The plankton samples have been collected by 'Bongo Net'<sup>9</sup> along the Malabar and Mysore coasts during November 1971. In one of the samples, from the inshore waters off Cochin (9°58'N, 76°10'E) a swarm of *C. u. pulsata* was observed. About 95% of the volume of the sample was dominated by this species. This species which normally occurs in few numbers with less than 10/haul in the IIOE standard net collections made from 200 m to surface was found with 105 individuals in an oblique haul from 10 m to 0 m. The size of the swarm appears to be small as the neighbouring stations contained very few numbers. As this

is an oceanic species, the occurrence in such shallow inshore waters is reported for the first time. As November is the transition period and reversal of monsoon currents takes place, it is possible that this species could have been carried close to the coast because of mixing of oceanic water with coastal water. The mixing of cold water mass with the warmer coastal waters off Japan produces conditions for swarming in the *Euphausia pacifica*<sup>10</sup>.

The shell is dark brown in colour with a length to breadth ratio of 9:7. The maximum breadth is found at 1/2 of the total length or 2/5 of the body length of the shell. The caudal spine is distinctly curved like a hook. The upper lip of the dorsal valve is semicircular and bends like a hood over the ventral valve. The dorsal valve has five prominent ribs. The lateral fins are bilobed and the ventral fin is semicircular.

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## Premonsoon Tidal Flow Characteristics of Mandovi Estuary

C. S. MURTY & P. K. DAS

National Institute of Oceanography, Panaji

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Current and salinity changes over a complete tidal cycle (during spring tide) in Mandovi river estuary during 20-21 March 1970 are reported. Higher current speeds are observed during the flood compared to those of ebb, the maximum speed for flood and ebb currents being 160 and 108 cm/sec respectively. Salinity varies in accordance with the tide and also with depth with higher salinities found near the bottom. The salinity at Mandovi river mouth has an annual range of 25‰.

THIS note reports the results of the studies on the currents and salinities over a complete tidal cycle (during spring tide) made in the Mandovi river