

## **Mass landing of swimming crab (*Charybdis smithii*) along the coastal waters of the Southwest coast of India and potential for utilisation**

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Crustaceans are an economically valuable resource in Indian fisheries and in the last two decades, they contributed nearly 15% to the total landing. Among them, crabs are an important group which significantly contributes to the fishery after the penaeid and non-penaeid prawns. More than 60% edible marine crab fishery in India is contributed by three species, *Portunus sanguinolentus* (28.2%), *Portunus pelagicus* (25%) and *Charybdis feriata* (7.7%). Besides this, *C. lucifera*, *C. natator*, *C. smithii*, *C. annulata*, *Monomia gladiator*, *Podophthalmus vigil*, *Scylla serrata* and *S. olivacea* also contributed to the fishery on a small scale (Jose, 2022). Crabs are harvested using a variety of craft and gear combinations, among which trawl is the major one.

Among the above species, *C. smithii* (Fig:1) is endemic to the Indian Ocean (Bernd and Boetius, 2000) and this species is one of the very few swimming crabs that exhibits swarming in the open ocean. (Sankarankutty and Rangarajan; 1962 Croce and Holthuis

1965; Losse,1969; Rice,1969). Romanov et al (2009) reported that swimming crabs are dispersed by the monsoon current throughout the equatorial Indian Ocean and feed mainly on mesopelagics and *C. smithii* is an important prey for more than 30 species. Aggregation of the crabs on the continental shelf of the Indian Ocean precedes their breeding during North East monsoon from October to January (Van Couwelaar et al 1997). These crabs have a predatory impact on the upper water column and there are reports on the depredation of catch in gill nets and bait in the long-line fishery (Renjith et al 2023, Van Couwelaar et al 1997). Despite their swimming capabilities, many of the crab species live at the bottom of the sea. Due to the light and weakly calcified, non-granulated carapace, *C. smithii* actively swims in the open ocean and does not need any substrate to survive. This ability to remain and swim in the water column allows this species to form a swarm on the ocean surface. There are various observations on the occurrence of *C. smithii*

in the world's oceans. Balasubramanian and Suseelan (1990) reported the occurrence of this species along the west coast of India. Swarms occur throughout the year except during May and June. However, a significant difference in the average catch was reported during pre-monsoon, monsoon and post-monsoon. Swarming of *C. smithii* was reported during intra-monsoon (October to December) and NE monsoon from east Africa and off Oman respectively (Daniel and Chakrapany, 1983).



Fig. 1. *Charybdis smithii*

Recently, unusual landing of *C. smithii* was reported from trawlers operating along the coast of Kerala. Two months of onboard observations (October-November 2023) from RV Matsyakumari II of ICAR-Central Institute of Fisheries Technology, reported a total of 10.83 tons of *C. smithii* caught in 24 fishing operations and the average catch per day was about 400 kg (Fig. 2). The along off Kochi operations were conducted at a depth of less than 40 m, using bottom trawls, having cod-end mesh size of 25 mm



Fig. 2. *C. smithii* landed onboard Matsyakumari II

A survey was also conducted along the major fishing harbours of Kochi, to record the landing. Commercial trawls operating along the Kochi from various depths targeting *Heterocarpus gibbosus*, *H. woodmasoni*, (200-250m depth) cephalopods (30-50m), *Metapenaeus dobsoni*, *M. affinis* and *M. brevicornis* (15-25m) reported heavy landing of *C. smithii* as bycatch. Similar findings were observed for the last five to six years along the Kerala coast. The swarming usually commences by the end of August / beginning of September and will last till December. The catch depends on the area and depth of the operation, with *C. smithii* forming more than 60% of the catch during peak season. Dineshababu et al. (2020) reported massive landing of *C. smithii* from the Mangalore coast during January to March 2020. The catch rate was in the range of 200-1600 kg per trawler, which formed more than one-fourth of the multiday trawl boat landing. Dineshababu et al. (2020) have reported that these crabs are often sold at the rate of INR 10-13 rupees/ kilogram from the Mangalore coast, however, no such market exists for this crab in Kerala.

The higher number of low-value species in a targeted fishery causes several operational and economic problems for the fishery. Trawlers usually avoid or change the ground wherever such landing occurs. Fishers opined that nowadays distribution of this species extends up to the shallow waters and causes

damage to the coastal gillnets. Deep setting of the net by providing more sinkers is a strategy used by gillnet fishers to avoid net damage.

Yogesh et al (2019) reported that the nutritional profile of *C. smithii* is comparable with other edible crabs. Since the meat content of this crab is very low, the chances for utilization as seafood are negligible. As the seasonal swarming of *C. smithii* is regular along the coast, it is recommended that the resources can be effectively utilised for the preparation of fish meal, chitosan etc. and value addition of this species may be attempted. This resource can also be screened for biologically active compounds.

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