

Is the Scyphozoan jellyfish *Lychnorhiza malayensis* symbiotically associated with the crucifix crab *Charybdis feriatus*?

Scyphozoan jellyfish (Medusae), the gelatinous invertebrate group, plays a vital role in the global oceanic and coastal ecosystems. By virtue of their floating nature, and horizontal and vertical spread in the water column, they are known to have varied associations with other invertebrates and teleosts, which make them an integral part of the marine ecosystem. In general, studies on ecology and trophic links of jellyfish from Indian waters are scanty.

Regular research cruises ($n = 45$) in 2014 conducted by the Central Marine Fisheries Research Institute, Kochi, on-board *FRV Silver Pompano*, the Scyphozoan Rhizostomeae jellyfish *Lychnorhiza malayensis* were caught in the experimental trawl catches. *L. malayensis* has a wide distribution in the Malayan Archipelago and the Indian Ocean. During the

last century, Nair¹ has reported the presence of this species off the Thiruvananthapuram coast (Kerala) for a short period, from September to October during 1942 and 1943. In the present study, distribution range of *L. malayensis* was found to be extended from Thiruvananthapuram to Goa, inhabiting the depth zone 6–50 m and the period of occurrence was also prolonged from July to October. Jellyfish sampled ($n = 468$) were examined for identifying the associated animals attached to the body of these jellyfish. They were caught in large numbers in 16 hauls; the crucifix crab *Charybdis feriatus* was found to have a close facultative commensalism with these jellyfish.

The associations of jellyfish species with brachyuran crabs in global oceans have been reviewed² as well as those

with fishes³. However, the symbiotic association of *L. malayensis* with *C. feriatus* has not been reported earlier. *C. feriatus* was found associated with ($n = 65$) jellyfish. These associations were noticed only from August to October, with maximum in September.

C. feriatus associations were observed in the jellyfishes which were caught in 12–18 m depth. The bell diameter (BD) and wet weight of the jellyfish were measured. BD of *L. malayensis* ranged from 11 to 33 cm and wet weight from 150 to 1250 g. The crabs were found clinging onto the oral arms (tentacles) of the jellyfish (Figure 1). Correlation between the association of crabs with size and weight of the jellyfish could not be established. Most of the jellyfish harboured single adult specimen of *C. feriatus*, while few had two crabs. The

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Figure 1. Commensalism of jellyfish *Lychnorhiza malayensis* with crucifix crab *Charybdis feriatus*.

carapace widths of the crabs were measured and ranged from 11 to 28 mm. Most of the small crabs (11–18 mm) were found clinging to the jellyfish oral arms in head downward position and few adults were in head upward position.

Maximum aggregation of *L. malayensis* near the seabed was observed during morning hours (0600–0900 hrs) and slowly the aggregation moved up to the middle of the water column by 1000–1100 hrs. *C. feriatus* generally found in the seabed were associated with jellyfish

during morning hours and transported to other pelagic environment during the daytime. It is presumed that the jellyfish provide shelter and protect the crabs from predators. Juveniles of the shrimp scad fish *Alepes djedaba* (12–42 mm length range) were also found to be associated with oral arms of *L. malayensis* and these may also form a feed for the crabs.

The jellyfish associated with crabs were brought to the laboratory and maintained in live condition in glass aquaria

filled with fresh seawater and their behaviour was observed. Laboratory observations showed that the crab was associated with jellyfish for the short period and moved out most of the time. This shows that the association of *C. feriatus* with *L. malayensis* is facultative commensalism.

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