Indian J. Fish., 58(1) : 113-115, 2010

Note

Distribution and abundance of the mangrove bivalves *Isognomon ephippium* (Linnaeus) and *Cyrena ceylonica* (Chemnitz) in Andamans

R. THANGAVELU, R. SOUNDARARAJAN AND P. POOVANNAN*

Veraval Regional centre of Central Marine Fisheries Research Institute, Veraval - 362 269, Gujarat, India
**Madras Research Centre of Central Marine Fisheries Research Institute, Chennai - 600 028, Tamil Nadu, India*
e-mail: rthangavelu31@gmail.com

ABSTRACT

Investigations were carried out on the occurrence, distribution, population density, sex ratio, percentage edibility and total biomass of the oyster *Isognomon ephippium* in three different locations namely Sippighat creek, Mithagari jetty and Diglipur port area and the clam *Cyrena ceylonica* in the marshy areas around Sippighat and Bimbleton creeks of Andaman islands. The study revealed that the density of oyster population was high in Sippighat than the other two locations and the clam was more abundant in the mangrove creeks and backwater canal of Sippighat.

Keywords: Andamans, Clam, *Cyrena ceylonica*, Distribution, *Isognomon ephippium*, Oyster

Isognomon ephippium commonly known as leaf oyster grows to a maximum size of 5 inches in diameter and is often mistaken for a large pearl oyster. The shell is large and resembles that of pearl oyster and interior of the shell is lined with mother of pearl. In Andaman Islands, two species under the genus *Isognomon* are available namely, *Isognomon ephippium* (Linnaeus) and *Isognomon acutirostris* (Dunker). The former one occurs as dense beds on intertidal rocks in shallow areas of Sippighat, Mithagari and Diglipur, and the latter is rare and only one specimen was collected from Kodiyaghat area. Preston (1915) recorded the clam *Cyrena ceylonica* (Chemnitz) from Ceylon and mentioned that it is a tropical sub-tropical species distributed in Asia, Africa, America and Australia. Madhu and Madhu (2001) made some observations on the distribution of these clams in Andaman islands and found that their availability in Sippighat is restricted to a small area and were found to grow to a maximum size of 90 mm in the locality.

A preliminary survey was carried out by inspecting the oyster and clam beds in Sippighat area. Three stations were fixed at the creek and by placing a quadrat (50 x 50 cm) in three places in each station, all the oysters inside the quadrat were counted and collected. Similar samples were obtained at Mithagari and Diglipur areas also. Survey was also conducted in the swampy area adjacent to the canal behind the brackishwater fish farm of the Central Agricultural Research Institute (CARI) by employing the above method. The clams buried in the mud were dug out, counted and taken to the laboratory for linear measurements as well as gonadal studies, using a microscope.

The oyster *I. ephippium* (Fig. 1) was distributed in the intertidal area of Sippighat creek, Mithagari jetty and Diglipur port area. They were gregarious, occurred in clusters, distributed in the intertidal area, mostly attaching themselves to sluice gate, with byssal threads. The bottom was hard with fast moving water currents. The oysters were found along with the rock oysters near the sports complex of the Sippighat area. In Mithagari and Diglipur jetty, oysters have grown above rock oyster zone. In the muddy area of the intertidal region opposite the Naval office of Sippighat, the oysters were partly buried with shells open during low tide.

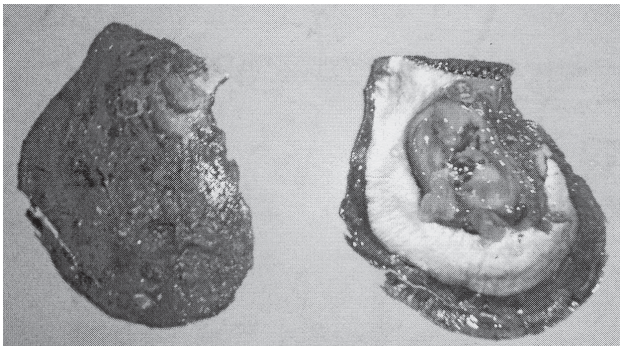

Fig. 1. Leaf oyster, *Isognomon ephippium* from Andaman Islands

The first Station was demarcated on the western side of Sippighat sluice gate. The oysters were attached to each other by means of byssal threads forming heaps. The bottom was hard with concrete structures. The total extend of oyster bed was 20 m^2 with an average number of 221 per m^2 and the average individual weight was 58.8 g. The size ranged between 26 and 123 mm (Fig. 2). The total biomass was estimated as 649.7 kg in Sippighat sluice gate area. Sex ratio showed that the females were dominant (58%) than the males. Two-third of the females were in the ripe

condition and the rest in spent condition. Among the males, 69% were ripe and the remaining in spent condition.

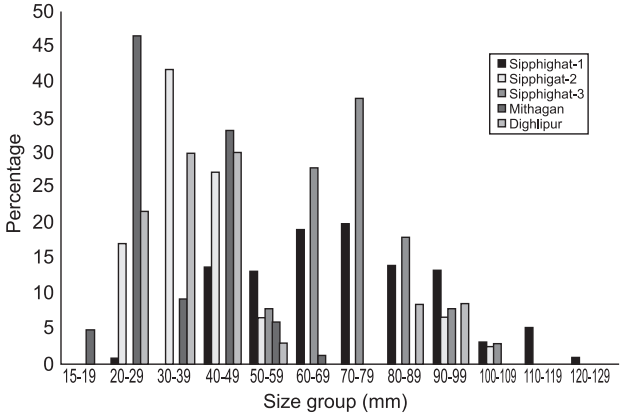

Fig. 2. Percentage size composition of *Isognomon ephippium*

In the second Station, the oysters were found settled nearer to the sports complex just above the rock oysters. Oysters were in the size range of 20 to 103 mm with an average size of 28.7 mm. The density of oysters was 142 no. m^{-2}, with an average individual weight of 9.4 g. The estimated biomass in this zone was 533.9 kg in a wide spread bed of 400 no. m^{-2}. The percentage edibility was 14.3%. Females were dominant (58.5%) in the population. Majority of oysters in both the sexes were found in the ripe condition and only a few individuals were in spent stage.

The proximal end of the Kalapathar creek was the third Station where the settlement of oysters was moderately high in the intertidal region and they were partly buried with their shell valves opened during the low tide. The density of population was 254 no. m^{-2} and mean weight was 109 g. The size ranged between 56 and 104 mm and the estimated standing stock was 5582.9 kg in this area. Females outnumbered (70%) males in the population. The gonadal stages revealed that more than 80% of both the sexes were in ripe condition and a few oysters in spent condition. The percentage edibility was 10.6%.

The oysters were settled on the piers and pillars of Mithagari jetty just above the rock oysters with a density of 124 no. m^{-2} with a mean individual weight of 15.3 g. The size ranged between 17 and 62 mm with a mean size of 21.1 mm. Total oyster biomass was estimated to 118.8 kg and the percentage edibility was 12.3%. Females (58.5%) were found to be dominant in the population. Among females, 90.3% and in males 86.4% were ripe and the remaining were in spent condition.

In Diglipur Aerial Bay Jetty, oysters were found to occur in the intertidal region along with rock oysters. The oysters were distributed in clusters for about half a meter width along the Warf to a length of 400 m and the total area of the bed was 200 m^2. The size ranged between 21 and 90 mm with a mean size of 24.8 mm. The total biomass was estimated as 308 kg. The percentage edibility was 15%. Females outnumbered males and more than 85% of the oysters were in ripe condition.

A rich ground of the clam *C. ceylonica* (Fig. 3)was found at the swampy area adjacent to backwater canal behind the brackishwater fish farm of Krishi Vigyan Kendra, Sippighat. On either side of the brackishwater canal, mangrove bushes are present spread over an area of 10 to 20 m. The bottom was muddy with blackish clay and the clams were distributed at about 10 cm depth. The clam bed was in the intertidal region exposed during the low tide and submerged during ebb tide. The feeding of these clams mainly depends on how long they remain submerged during low tide. The black clam was always larger with an average number of 38 per m^2 and average weight was 109.9 g. The size ranged between 55 and 83 mm with an average length of 69.4 mm. The clam bed area was 0.2 ha, the total biomass was estimated as 8264.5 kg and the meat weight could be realised to 10.6%. Males outnumbered females in the population. Out of the males, 83.3% were in the ripe condition and the remaining was in spent stage. Among females, 75% were ripe and 25% were in spent condition.

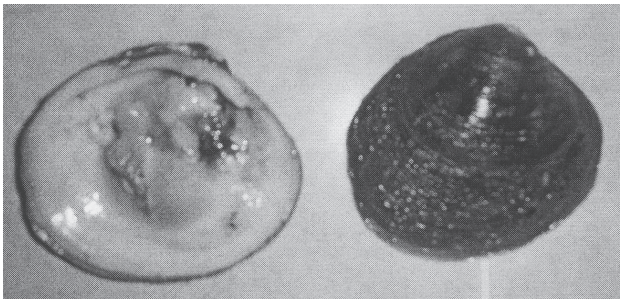

Fig. 3. *Cyrena ceylonica* from Andaman Islands

The intensity of clams at the second Station on the opposite bank of the canal was moderately lesser than the first station. The density of clam population was 31 no. m^{-2}. The size ranged between 47 and 73 mm with an average length and weight of 58.8 mm and 72.4 g respectively. The total biomass was estimated to be 4517.8 kg in 0.2 ha. The percentage edibility was 9.5%. Males were dominant in the population than the females. Both ripe and spent individuals were equal in population, and among the males 58.3% were ripe and 41.7% were in spent condition.

The third Station was fixed in the upper reaches of the canal at a distance of half a kilometer from the brackishwater farm. The density of population was 24 nos. m^{-2} and the average size was 65.5 mm. The total biomass was estimated to be 4387.1 kg in 0.2 ha. The percentage edibility was 10.5%. Females (55%) were

dominant in the population. In both the sexes the ripe ones were dominant.

The density of clam population was poor in the fourth Station as compared to the previous station and the average number was 14 per m^2 with an average weight of 101.4 g. The size of the clams ranged between 52 and 78 mm with a mean size of 67.4 mm (Fig. 4). The biomass was estimated to be 2758.1 kg in 0.2 ha. The condition index was 10.1%. Females outnumbered males in the population. Among females, ripe ones were dominant and in males, spent ones were found to be dominant.

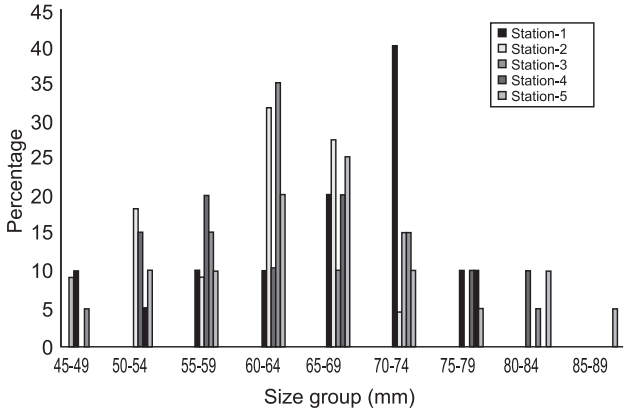

Fig. 4. Percentage size composition of *Cyrena ceylonica*

The density of clams was comparatively less at the fifth Station, which is about one kilometer distance from the farm area. The density of population was 10 no. m^{-2} with a mean weight of 87.4 g. The clam size ranged between 42 and 88 mm with a mean length of 61.7 mm. The total biomass was estimated to be 1695.5 kg. Males were found to be dominant (55%) in the population. In both the sexes, ripe clams were found to be dominant.

There was good settlement of the oyster *I. ephippium* in the intertidal areas of Sippighat, Mithagari jetty and Diglipur warf, and the black clam *C. ceylonica* in Sippighat swampy areas. They are edible and newly settled Biharis and Bengalis collect the oysters from Sippighat for their consumption. It is interesting to note that much of the large sized oysters were found in the Sippighat creek forming a good ground for collection.

Acknoledgements

The authors are thankful to the Director, CMFRI, Kochi. They also thank Dr. T. S. Velayudhan, Principal Scientist, Molluscan Fisheries Division for all the support and encouragement shown towards this work.

References

Preston, H. B. 1915**.** The fauna of British India including Ceylon and Burma*, Mollusca*, p. 201-207.

Madhu, K. and Madhu, R. 2001. Observations on the clam *Cyrena ceylonica* resources in Andaman islands. *Environ. Ecol*., 19 (3): 717-720.

Date of Receipt : 11.07.2008
Date of Acceptance : 14.09.2010