

An appraisal of Chinese dipnet fishery off Vypin, Kerala

S. Lakshmi Pillai¹, G. Maheswarudu¹, P. K. Baby¹ and A. P. Dineshababu²

¹ICAR-Central Marine Fisheries Research Institute, Kochi

²ICAR-Mangalore Research Centre of ICAR-Central Marine Fisheries Research Institute, Mangaluru

Among the fishing gears operated in the backwaters of Kerala, the Chinese dipnets are a familiar sight. Foreign in origin and commonly known as the '*cheenavala*' or Chinese dipnet, they were reportedly introduced in Kerala by the Portuguese. The different parts of the gear are named in the Portuguese dialect. This stationary fishing gear is operated in the Cochin backwaters that form the northern extension of the Vembanad Lake mainly in locations like Vypin, Fort Kochi and Cherai. Ten Chinese dip nets are operational off Vypin. Having a mesh size of 12 to 14 mm these are fixed in the tidal regions of the inshore waters with sinkers, floats and stakes and are operated up to depths of 5 m. The gear is operated from a wooden platform using lever system and is lifted at short intervals by using a 5 HP engine (Fig.1). The net is connected to

ropes tied with boulders for balancing the net so that it can be dipped and lifted at short frequencies of 10-15 minutes based on the availability of catch. Net operation depends on the tide, as it is made functional during low tide and fishing is stopped as



Fig. 1. Chinese dip net operation at Vypin

the tidal level rises. At night, a lantern hung from rod is used to attract fish. Once the net is lifted, fish are removed using a scoop net.

Landing per haul comprises fish and shrimp depending on the season and time of fishing. Observations on the landings along Vypin carried out for a period of two years (January 2013 to December 2014) revealed *Mugil cephalus* dominates (34%) the catch during most of the months followed by *Megalops cyprinoides* 12%, *Johnius glaucus* 8.8%, *Stolephorus indicus* 8%, *Scatophagus argus* 8%, *Arius caelatus* 5% and *Gerres filamentosus* 4%. Analysis of data employing Univariate Diversity Indices of Primer software 6 revealed maximum Species Diversity in May (3.0) and minimum in December (1.7). Margalef Species Richness was highest during July (5.8), closely followed by May (5.8). The high species diversity found during May - July, most probably relates to the southwest monsoon period (June - July), when the fishes migrate to the backwaters for their nursery phase. The minimum number of species as well as evenness recorded during December may be attributed to the migration of the fishes back to the sea to mature and spawn.

During the study period, size frequency of the various fishes caught was recorded (Table 1). The size range of some of the fishery resources caught in the gear during the study period along with L_m or the Length at First Maturity (size at which 50% of the fish are mature) as available in Fish Base (www.fishbase.org) was analysed. It is observed that important commercial species like *Stolephorus indicus*, *Leiognathus brevisrostris* and shrimps such as *F. indicus*, *M. dobsoni* and *M. monoceros* caught are mostly juveniles. Since majority of the species spend a part of their life cycle in the backwaters (post larval/juvenile phase) they are easily caught in the gear. Estuarine phase in the life cycle of fishes and crustaceans is often overlooked even though it plays a decisive role in marine fisheries management. A mesh size of 24 mm (Vijayan *et. al.*, 2000 *Naga, The ICLARM Quarterly*, 23(3):6-8) was recommended for stake nets to control juvenile fishing. Similarly, an increase in the mesh size of dipnets from the present 12 mm should be explored to reduce fishing morality of juveniles. Maps of the juvenile/post larval season of abundance of the dominant commercial fish species on a GIS platform can serve as the basis in defining seasonal closure.

| Species | Local name | Length range (cm) | L_m (cm) | Period of maximum occurrence of juveniles |
|------------------------------------|---------------------|-------------------|------------|---|
| <i>Scatophagus argus</i> | Nachara | 8-16.5 | 14 | ++ |
| <i>Mugil sp.</i> | Kannambu | 7-26.5 | - | - |
| <i>Gerres filamentosus</i> | Pranjil | 10-16.8 | 19 | May |
| <i>Cynoglossus sp.</i> | Nangu | 7-15.5 | 11.5 | ++ |
| <i>Alepes kleinii</i> | Vattapara | 7.2-21 | 12.9 | ++ |
| <i>Stolephorus indicus</i> * | Kozhuva | 5-7 | 7 | July |
| <i>Leiognathus brevisrostris</i> * | Kurichil | 7.3-9.5 | 18.1 | May |
| <i>Secutor insidiator</i> | Kurichil | 5.5-14.5 | 7.5 | ++ |
| <i>Anodontostoma chacunda</i> | Thodi | 8.5-14.5 | 14 | ++ |
| <i>Fenneropenaeus indicus</i> * | Naran chemmeen | 8-12 | 13 | May-June |
| <i>Leiognathus bindus</i> | Kurichil | 7.2-10.5 | 7.4 | ++ |
| <i>Ambassis ambassis</i> | Nandan | 5.2-12.5 | 5 | ++ |
| <i>Thryssa mystax</i> | Manangu | 6.0-18.0 | 13 | ++ |
| <i>Metapenaeus dobsoni</i> * | Poovalan chemmeen | 4-7.5 | 6 | June |
| <i>Sillago sihama</i> | Kathiran | 8.5-23.2 | 22.5 | ++ |
| <i>Metapenaeus monoceros</i> * | Kazhanthan chemmeen | 6.5-10 | 9 | June-July |
| <i>Johnius carutta</i> | Kuttan | 10-17 | 14 | ++ |
| <i>Johnius glaucus</i> | Kuttan | 3.5-22 | 18 | July |

* >50% caught (in numbers) are juveniles

++ percentage of juveniles < 20%