

A note on mass mortality of Bloch's gizzard shad at Dhanushkodi lagoon, Tamil Nadu

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Mass mortality of Bloch's gizzard shad, *Nematalosa nasus* (Bloch, 1795) was observed around 5 km shore area of the lagoon from Ottathalai to Thavukadu near the Kothandaramar Temple, Dhanushkodi, Ramanathapuram District, Tamil Nadu on 19th October 2019. An estimated 3 tonnes of *Nematalosa nasus* were washed ashore and water samples collected from the site were analysed indicated Dissolved oxygen (2.17ppm), pH (7.83ppm), salinity (40ppt), temperature (30.6°C), ammonia, nitrite and nitrate (0.1, 0.2 and 0.43 ppm respectively). The lagoon stretches 15 km from Rameswaram Puthuroad to Arichalmunai with average breadth of 2 km and 0.46-0.6m depth. The strong currents in the Gulf of Mannar during April-October drift the sand and sediments through narrow channel between Arichalmunai and offshore sand dunes to the shallow Palk Bay. These deposits strengthen the sand bar between the intertidal region and open sea, leaving vast tidal areas dry. During the onset of north easterly wind (November-March), the weaker portion of the sand bar breaks and seawater enters through these narrow channels and a shallow lagoon is formed. As the winds become stronger, more channels are formed which triggers the fishery in the area. It has been found that when about 22-25 such channels are formed, sufficient mixing of water between lagoon and sea that helps to maintain key hydrological parameters such as temperature, dissolved oxygen, pH and salinity at optimum levels required by the various biotic communities to flourish. The local governing body, Cherankottai Grama Panchayat leases out the entire lagoon area to each village annually. The lessee

engages fishers from Vedalai village, Ramanathapuram District as they are skilled to operate small bag nets (*Thangoosivalai* and *Illuppuvalai*), to fish for mullets, milkfish, crab, shrimp, silverbiddies and gizzard shad etc available in the lagoon for six months. On this particular occasion, it was found that only two channels were active and shoals of *N. nasus* entered the lagoon immediately after the influx of water and got trapped in the lagoon during low tide and could not escape. A rise in water temperature (32.1°C) was noticed in the lagoon on 18th October 2019. The resulting warming up of the shallow lagoon, associated with limited mixing and declined dissolved oxygen level probably led the fish shoal to stress and mortality. Incidentally, this year the fishers from Vedalai were also not engaged for fishing, otherwise the fish shoal would have been captured.

Gross examination of dead fish did not show any parasitic infestation nor specific lesions indicative of bacterial infection. The pink discoloration may be attributed to the autolysis of this fatty clupeid. Examination of internal organs also did not reveal any bacterial or parasitic infection. The gut content analysis of the dead fish revealed 85% had empty stomachs and remaining indicated poorly fed stomachs. All the fishes were adults in the size range of 192-228 mm total length and each weighing between 72 -110 g with gonads in spent condition. It is inferred that increased temperature in the shallow water, osmotic imbalance and declined dissolved oxygen level led to the mass mortality of fishes.