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## SHORT COMMUNICATION

### A NEW SIZE RECORD OF HILSA, *TENUALOSA ILISHA* (HAM., 1822) FROM HOOGHLY ESTUARY, WEST BENGAL

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The Hilsa shad, *Tenualosa ilisha* (Hamilton, 1822), occurs in foreshore areas, estuaries, brackish-water lakes and freshwater rivers of the western division of the Indo-Pacific region. It is well known as a delicious, high priced fish of commercial and cultural importance, especially in state of West Bengal and the North Eastern states of India as well as Bangladesh. Along the Indian coast of Bay of Bengal, the Hooghly estuarine system is one of the largest and most productive estuaries and is an important migratory route of the anadromous hilsa. The estuarine system is constituted by the first offshoot of river Ganga-the Bhagirathi, which flows southwards through the lower Ganga deltaic plains and joins Bay of Bengal in Sunderbans. Hilsa shad is the most economically significant fishery of the system and it is a major contributor to the total fish landings of this system. Hydrological alterations in the form of barrages and dams built across the major east and west coast rivers, especially along the Ganges and Narmada have blocked its migratory routes to breeding grounds in riverine areas, resulting in the collapse of its fishery in the river stretches above these barrages and as a result, hilsa landing is now concentrated in estuarine part of these rivers (Raja, 1985; De, 1998). After commissioning of the Farakka barrage in 1975, the hilsa fishery is confined to downstream of the barrage, the Hooghly-Bhagirathi system. The indiscriminate exploitation of hilsa adults as well as juveniles during the past years has caused the decline of the once lucrative commercial fisheries of the fish, more

particularly along the Hooghly estuary, due to recruitment failure. The comparison of time scale mean size recorded from Hooghly-Bhagirathi river system over past years indicated a declining trend and an increasing contribution of smaller size groups in the catch pointing towards the growth overfishing of hilsa populations. The aim of this paper represents a new record size of hilsa with record fecundity from Hooghly estuarine system.

The specimen of *T. ilisha* has been collected from commercial catches as part of catch monitoring study of hilsa along Hooghly estuarine system. The specimen was by fishermen using gill net of mesh size 90 mm at Godakhali on October 19th, 2015 (Fig. 1). Godakhali lies at 22°23'57" North latitude and 88°08'5" East longitude and falls in the tidal freshwater stretch of Hooghly estuary (Fig. 2), where the river channel attains maximum width of 1347 m (Roshith *et al.*, 2013). The specimen was brought to laboratory, photographed and the species identification was confirmed following FAO (1974) and Talwar and Jhingran (1991). Detailed morphometric measurements were noted

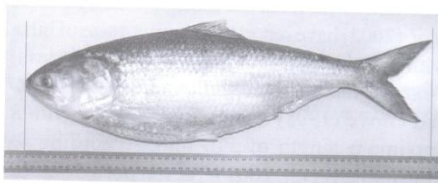


Fig. 1. The *T. ilisha* (573 mm TL) caught from Godakhali, Hooghly estuary.

Table 1. Morphometric details of *T. ilisha* captured from Godakhali, Hooghly estuary

Morphometric characters	Measurements (mm)
Total length	573
Std. length	476
Fork length	493
Head length	133
Eye diameter	17
Body Depth	188
Pre dorsal length	229
Pre pectoral length	137
Pre pelvic length	239
Pre anal length	370
Pre caudal length	462

using a calliper, with an accuracy of 0.1 cm (Table 1) and the specimen was dissected for biological observation. Maturity stages in females were recognized on the basis of the colour, shape, size of ovary and the space it occupied in the body cavity, ova diameter and deposition of the yolk in the ova (Pillay, 1964). After recording the sex and maturity stages, the ovaries were preserved in 5% formaldehyde for fecundity and ova diameter studies. Total fecundity was calculated by gravimetric method (Bagenel, 1978). Relative fecundity was calculated using equation  $F/W$  where  $F$  is fecundity and  $W$  body weight of fish in grams (Bagenel and Braum, 1978). Ova diameter was measured using micrometer.

The specimen of *Tenualosa ilisha* was 573 mm of total length with a weight of 2480 g. The fish was caught at Godakhali, a tidal freshwater stretch of Hooghly estuary and is the largest hilsa specimen recorded so far from the Hooghly estuary. Amin *et al.* (2002) have reported maximum size of hilsa with a total length of 570 mm from Bangladesh. From Kuwait waters in North Arabian Gulf, Albaz and Grove (1995) have observed hilsa with a maximum length of 570 mm. According to Mohammed *et al.*, 2001 largest reported size of hilsa, from North West Arabian Gulf, Iraq is 580 mm. The normal size range in commercial catches

of hilsa in Indian waters is between lengths of 250 mm to 300 mm (Bhaumik and Sharma, 2012). From river Godavari, Pillay and Rao (1963) reported hilsa of lengths 525 mm, whereas Rajyalakshmi (1973) recorded the fish to reach about 610 mm in the river. The largest size description of hilsa from India so far is 614 mm and 4250 g from Tapti estuary Gujarat (Bhaumik *et al.*, 2012). De and Datta (1990) and Khan *et al.* (2001) reported maximum length of 545 mm and 566 mm, respectively from Hooghly estuarine system. Unusually large specimen of hilsa obtained in this study from Hooghly estuarine system while fishing is an indication that at least a few of them survive the fishing pressure to grow old bringing out hope of a viable hilsa population with enough larger or older individuals among them.

The specimen was a mature female, with fully mature ovary of stage VI. The ovary weighed 470.92 g. Total fecundity of the fish was 21,34,721 and the relative fecundity estimated was 860.77/g. The maximum reported fecundity for hilsa is 29,17,000 from Indus River by Bhuyian and Talbot (1968). Pillay (1955) recorded fecundity in the range of 2,50,000 to 16,00,000 in fish measuring 253 to 481 mm in length from the Hooghly estuary. The highest fecundity of hilsa reported so far from Hooghly estuary was 16,99,760 for fish of 566 mm, weighing 2100 g (Khan *et al.*, 2001). Consequently, the current observed fecundity of 21,34,721 appears to be the highest from Hooghly estuary. The high fecundity observed augments the established knowledge that larger individuals usually have exponentially higher fecundity. The ova diameters of the mature oocytes were also high, ranging from 0.56 mm to 0.84 mm, with an average of 0.72 mm. The highest reported ova-diameter from Hooghly estuary was 0.87 mm (De and Sen, 1986). The higher ova-diameters are in approval of the studies indicating egg and larval size and/or

## NEW SIZE RECORD OF HILSA

viability also increase with size and age of fishes (Chambers *et al.*, 1989; Zastrow *et al.*, 1989; Buckley *et al.*, 1991).

Age truncation, the removal of older age classes via fishing, occurs in every fishery. Selective fishing pressure on the larger (older) individuals over recent decades has caused rapid evolution of decreased body size and fecundity of some harvested fishes (Olsen *et al.*, 2004), indicating the importance of older or larger individuals in fish populations as crucial for sustaining fish stocks. The reproductive potential of populations is disproportionately affected when fishermen target larger individuals (Birkeland and Dayton, 2005). Over the years, a declining trend in the mean size was observed in the Hooghly estuarine system and this unusually larger specimen of hilsa obtained shows that at least a few of them survive the fishing pressure. Thrust can be given for protecting larger or older individuals of hilsa especially large females in the breeding stock for ensuring a viable hilsa population.

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