

The Life History and Fishery of Hilsa in Bangladesh and their Implication for Management

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Introduction

Hilsa (*Tenualosa* (=Hilsa) *ilisha*, Fam. Clupeidae) (Fig. 1) is the national fish of Bangladesh. It is an anadromous migratory fish available in the freshwater rivers, estuaries and the sea. The production of hilsa is about 30% of the total fish production of the country. About 2% of the population is directly or indirectly engaged in this fishery. Historically, the major fishing activities were restricted to the upper reaches of the rivers but nowadays, the major fishing activities are confined in the lower reaches and mainly in the sea.

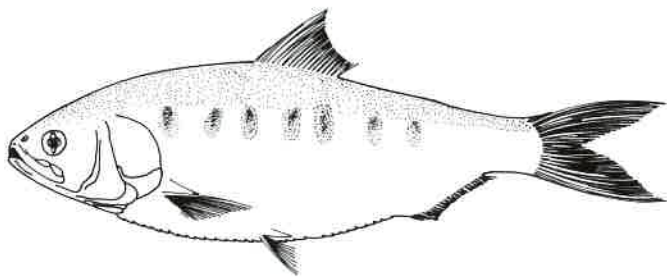


Fig. 1. Hilsa (*Tenualosa* (=Hilsa) *ilisha*, Fam. Clupeidae).

Life history

The females attain larger sizes than the males. The males are abundant up to 35-40 cm length groups but beyond 46 cm, males are not generally found. The maximum length of the females is about 55 cm. The fish may attain maturity at the end of first year or at the beginning of the second year. Islam et al. (1987) reported that the males appear to attain first maturity at size 26-29 cm as compared to 31-33 cm in the case of females.

The spawning of hilsa takes place almost around the year, but the major spawning appears to take

place in October-November, with subsidiary spawnings in June-July and February-March. The former two are considered "summer spawning" and the latter is "winter spawning".

The upstream migration of hilsa mainly takes place during the main breeding season with the beginning of the southwest monsoon and consequent flooding of the rivers. Maturing hilsa ascend the river till they reach the spawning grounds; after spawning, they migrate to the sea. According to some authors, some stocks of hilsa are permanent resident of the rivers and do not migrate into the sea. Qureshi (1968) has suggested that the breeding grounds are mostly located in the Meghna and its tributaries.

The fecundity of hilsa increases with the body weight of the fish. The estimated range is from 0.1 to 2.0 million eggs for fish ranging in the length of 25 to 55 cm. The diameter of the fully ripe ovarian egg has been found to range, generally, between 0.70 and 0.90 mm.

The juvenile hilsa is mainly available in the rivers Meghna, Padma and the estuaries from December to May. The size range varies from 4 to 16 cm, and after that time, they disappear from the rivers and migrate to the sea for feeding and maturation.

Hilsa is essentially a plankton feeder. Generally, the food items are crustaceans (particularly copepod), diatoms, green and blue algae and sometimes organic detritus.

Fishery

The hilsa fishery is mainly confined to the artisanal sector - with traditional non-mechanized and mechanized boats in the inland and sea water, respectively. The riverine and estuarine stocks are exploited by a variety of gears like clap-net, gillnet, seine net, etc., but the major contribution comes from gillnet. The seine net is mainly used to catch the smaller juvenile hilsa during December to May. The most common mesh size of the gillnets ranges

from 10 to 12.5 cm. The sea fishing boats are purely mechanized and contributes 60% to total hilsa landings.

The main hilsa fishing season starts with the commencement of the monsoon when adult fish migrate up the rivers for spawning. The main peak season is September and October in all environments.

Earlier, Ahsanullah (1964) reported that the riverine contribution was about 94% of the total hilsa catch for the period 1956-1957 to 1961-1962 and the marine contribution was only 6%. At present, however, the marine contribution is about 60%. Some authors suggest that due to the changing geographical condition and construction of barriers, the upper reaches of the rivers are very much silted, so much so that the upstream migration of hilsa has been hindered. Other authors have suggested that due to the rapid mechanization of crafts exploiting hilsa in the marine environment, very few hilsa are left to migrate upstream.

Considering the above changing condition, the Ministry of Fisheries and Livestock of Bangladesh, and the International Development Research Center jointly sponsored a research program for the improved management of the fishery. The work has been started from November 1986. The main objective of the project is to gain a better understanding of the life cycle of hilsa and to establish a capable "hilsa team" for future research in the country.

The length-frequency data so far collected by the Bangladesh Fisheries Research Institute, Riverine Station, Chandpur, were brought to ICLARM for analysis by this author, working under the guidance of Dr. Daniel Pauly (Islam 1989). It was found, though, that the data do not show any normal modal progression and hence, are not suitable for computer analysis using methods such as the ELEFAN I program. Since hilsa is mostly exploited by highly selective gillnets and most of the catch falls within the range of 30-50 cm length groups, it is very hard to get sufficient fish sample for length below 30 to 25 cm (see Fig. 2).

To overcome this situation, a comprehensive study of growth structure, based on otolith, should be conducted and at the same time, effort should be made to collect all the length classes by experimental fishing in all the environments; also, gill net selection experiments should be conducted such that the available length-frequency data can be interpreted more straightforwardly.

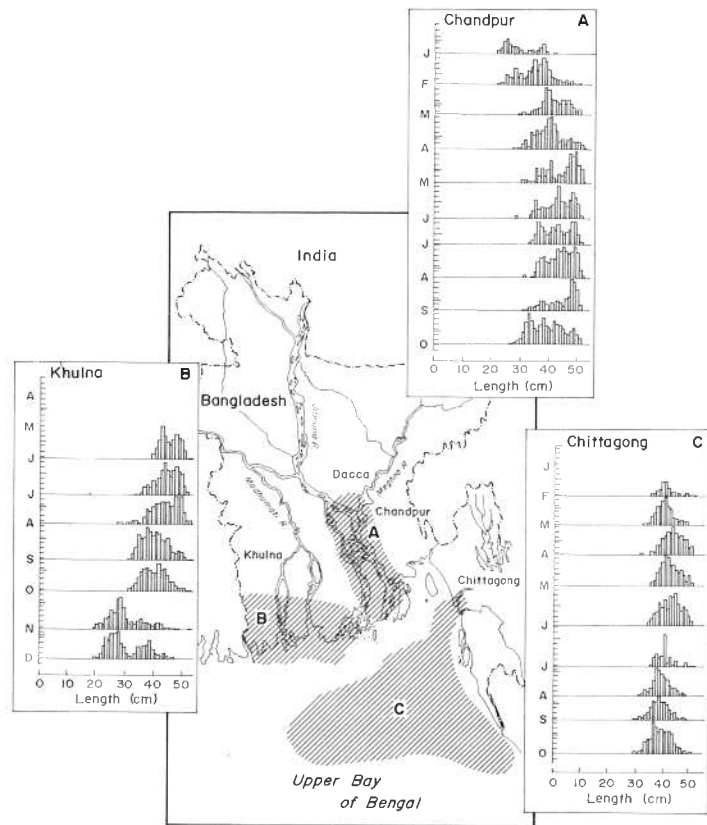


Fig. 2. Major fishing grounds of Hilsa in Bangladesh and length frequency obtained at Chandpur (A), Khulna (B) and Chittagong (C). Note absence of clear shifts of modes attributable to growth.

References

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