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The work done on the biology of Indian freshwater fishes mainly deals with the Indian major carps, murrels and few catfishes, but no attention has been paid on study of the biology of the catfish, *Clupisoma garua* (family: Schilbeidae). This Gangetic catfish sold in the market is brought almost entirely from the river Ganga, which, in turn, showing the sign of dwindling. Therefore, this situation demands that scientific methods be applied for culturing catfish, but, development of a suitable method for
their culture is inconceivable without a sound knowledge of its biology. Keeping in mind the paucity of information on the biology of Clupisoma spp., an attempt was made here to study the biology of C. garua, which is the most important of the five species of the genus Clupisoma found in India.

The Gangetic catfish, Clupisoma garua reported to occur in Asia only. Altogether there are 6 genera reported so far from Indian region which are Ailia, Eutropiichthys, Pangasius, Pseudeutropius, Silonia, Clupisoma. There are 8 species under the genus Clupisoma which have been reported from Indian region so far. They are Clupisoma sykesii, C. goongwaree, C. taakree, C. acutirostris, C. murius, C. atherinoides, C. garua. A maximum length of 30 cm was recorded in the present study, and is considered to be very good table fish and very much popular in the plains of India particularly in those area where people like fish without bones. The body of Clupisoma garua is elongated and laterally compressed. Head and body covered with soft skin.
Occipital process narrow, long and extending up to the basal bone of the dorsal fin. The eyes are large ventro-lateral in position and provided with broad adipose eyelid. Mouth is sub-terminal and upper jaw is slightly longer as compared to the lower jaw. The gape of mouth is 2/5 in the length of the head. The barbels 4 pairs, nasal barbel is very short and \( \frac{1}{4} \) length of head, the maxillary extend up to the middle of the ventral fin, the other mandibular barbel is about it as the head while the inner pair is shorter. The branchiostegal rays varied 6-7 in number. The adipose is present only in young forms and is absent in adults. Gill opening was wide. Teeth are small of uniform size and them from bands in the jaws. Vomerine and palatine patches of teeth are continuous. Caudal fin is forked and lower lobe of the caudal fin is longer than the upper one. Dorsal fin is stronger and denticulate internally.

*Clupisoma garua* has been reported from India, Pakistan, Burma, Sind, Ceylon, Sri Lanka and Bangladesh. It occurs in a variety of freshwater habitats in the plains as well as in
the hills of India. It is common in rivers, lakes, ponds, canals, streams and estuaries of India. The fish patrols a body of water throughout its length.

The study of length - weight relationship of *C. garua* revealed that the fish did not follow the cube law strictly and the weight increase was at a rate less than the cube of the length in both juveniles and adults. A significant difference was noticed in the value of 'b' among juveniles, males, and females. The equations for length-weight relationship are, \( w = 5.403 \times 10^5 L^{2.3765} \) for juveniles, \( w = 1.213 \times 10^4 L^{2.08123} \) for males, \( w = 5.700 \times 10^6 L^{2.60228} \) for females and \( w = 3.400 \times 10^6 L^{2.29449} \) for the data of males and females combined. The comparatively high values of 'b' for juveniles and females indicates high growth rate. The high growth rate in juveniles may be due to their high feeding intensity and in females it may be due to the enormous growth of ovaries. The significance of variation in the estimates of coefficient 'b' of expected cube low tested a 't' test. A well marked change in weight relative to
its length was obtained up to the size length of 264 mm. Thereafter, there was no appreciable increase in weight with increase in length of the fish. A comparison of observed and calculated weight of *clupisoma garua* indicated that there is no synchronization between calculated and observed weights the observed of juveniles of size range 32-74 mm in length smaller individuals (115-154 cm in length) was and less than their calculated weight, while in the individuals of larger size more than 154 mm it was more than the calculated weight.

The catfish, *C. garua* is highly predacious in nature. A close correlation was noted between the feeding habits and the morphology of the organs concerned with the feeding and digestion. Developed dentition, elongated stubby gill rakers, sac-shaped thin walled stomach with high distensibility, a moderate length of intestine together with the presence of both animal and plant oriented material in the guts indicated the omnivorous nature of the feeding. Adults *C. garua* were carni-omnivores while younger individuals
were herbi-omnivores. The crustaceans and aquatic insect were basic food of the adults, while phytoplankton (blue green algae, diatoms, desmids) and crustaceans and macrophytes constituted the basic food of the juveniles. Teleostomi, zooplankton and phytoplankton (blue green algae) were secondary food for the adults, while microphytes, aquatic insects and zooplankton together could be considered as secondary food for juveniles. Molluscs could be regarded as incidental items for both juveniles as well as adults. Gut length/body length ratio of the fish varied from 1:1.9 to 1:2.15 in young individuals, while the same ratio varied from 1:0.89 to 1.02 in adults. Feeding intensity was high in early maturity stages and was got relatively lower in fish with ripe gonads. The larger individuals in the size range of 16-26 cm in length consumed more food during summer (May-July) than during rainy season and winter. The younger specimens including both size ranges 4-10 cm 11-15 cm were found to be feeding heavily during the post monsoon particularly in the months of October and
autumn period (March-April). Adults and juveniles both consumed lesser quantity of food during winter particularly in the month of December.

Breeding process of the fish was examined and it was found that the population of *C. garua* was slightly dominated by males. The male: female ratio varied from 1:0.39 to 1:0.95, with the average mean value being 1:0.73. The chi-square test showed no significant departure from the hypothetical 1:1 ratio, sex ratio varied with different size groups of this fish and with change in season. Gonads were differentiated into five stage of maturation which are immature virgin (stage I), maturing virgin and recovering spent (stage II), ripening (stage III), ripe (stage IV) and spent (stage V) respectively. Seasonal activities of the gonads were closely demonstrated. The gonadosomatic index was related to the stage of development; it increased with the development of gonad. In both the sexes high values of gonadosomatic index was recorded during the period May through July. Change in the indices was marked in females. Spawning in *C. garua*
commenced from July /August and coincides with marked in monsoon. Occurrence of ripe individuals up to late August / September showed the extent of the spawning of this fish. The fish spawn only once in a year. There was no evidence of fractional spawning as oocytes in each individual were all of same diameter showing only one batch of ova in ovary. Fecundity increased with growth in length and weight of fish. The C. garua of size range 5.26 cm in length produced minimum and maximum number of 2005 and 14568 eggs respectively. The length-wise fecundity 'factor' was 275 egg cm\(^{-1}\) body length, and weight-wise it was 129 eggs g\(^{-1}\) body weight. Fecundity- body length progression was stronger than fecundity- body weight relation.