

Short Communication

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INCIDENCE OF CROOKED VERTEBRAL COLUMN IN ADULT *CIRRHINUS MRIGALA* (HAMILTON) FROM KEENJHAR LAKE (DISTT: THATTA) SINDH, PAKISTAN

Abstract.- An adult *Cirrhinus mrigala* was obtained from the catch of the fishermen of Keenjhar lake (Distt: Thatta) Sindh. The specimen was thoroughly studied through X-rays and radiograph. The fish showed sign of lordosis that is ventral bending of the vertebral column in the posterior trunk-caudal peduncle region. The X-ray radiograph showed the defect at the junction of 21 and 22 vertebrae. The incidence of crooked vertebral column abnormality in the present specimen appears to be a cause of unfavorable environmental conditions during embryonic development.

Key words: Major carp, crooked vertebral column, Keenjhar Lake.

The major carp, *Cirrhinus mrigala* (Hamilton) is one of the important food fish of Pakistan. It is locally known as "Mori or Morakhi" (Mirza, *Freshwater fishes of Pakistan*, pp. 87-89, Urdu Science Board, Lahore, 1990). Abnormal specimens of fishes have been reported in many parts of the world. Several workers like Sarkar and Kaushik (*Proc. zool. Soc.*, **2**: 39, 1958), reported two deformed specimen of *Cirrhinus mrigala*. Similarly, deflexed tailed specimens of *Ctenopharyngodon idella* have been reported by (Benerji *et al.*, *J. Inland Fish. Soc. India*, **11**: 123-124, 1979) and Haque and Barua (*Banglaaesh J. Fish.*, **10**: 89-91, 1987). Crooked vertebral column abnormality in *C. mrigala* has also been described from River Yamuna India (Khan and Siddiqui, *J. Inland Fish. Soc. India*, **24**: 85-87, 1992). An anomalous dorsal fin of a catfish, *Rita rita* was reported by Jafri *et al.* (*Pakistan J. Zool.*, **30**: 159-161, 1998). To supplement the knowledge of

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abnormalities encountered in the fishes, an abnormal fish specimen, caught from the commercial catch of the fishermen of Keenjhar lake has been studied and reported here.

Materials and methods

During the visit of Keenjhar lake (Distt: Thatta) Sindh, on 20-11-2005 a single specimen of major carp, *Cirrhinus mrigala* (Hamilton), with crooked vertebral column, was encountered amongst other normal individuals of the species in the commercial catch of the fishermen. The fish was brought to the laboratory in frozen condition. The length was measured on a measuring board in mm and weight was recorded.

Results

The adult specimen of *C. mrigala* weighing 800 g and 35 cm in length was collected from Keenjhar lake (Distt: Thatta). The specimen was thoroughly studied through X-rays and radiograph. The fish showed sign of lordosis that is ventral bending of the vertebral column in the posterior trunk-caudal peduncle region (Fig. 1). The X-ray radiograph (Fig. 2) shows the defect at the junction of 21 and 22 vertebrae. It might be rare incidence may only be related with some kind of mechanical injury, which the fish might have felt at any time during its early embryonic stages of development, and it is not hereditary in origin or due to any toxicant activity.

Discussion

Several workers have reported skeletal abnormalities in fishes. Some workers have reported the vertebral abnormality in the natural population (Baumann and Hamilton, *J. Fish Biol.*, **25**: 25-33, 1984) and others have reported experimental vertebral damage with detailed discussion on the causative factors (Srivastava and Srivastava, *J. environ. Biol.*, **11**: 45-49, 1990). Yet, some others have also dealt with effects of toxicants on bone development and growth of fish (Mehrle and Mayer, Whilet Interscience Publishing, New York, pp. 301-

304, 1977). They suggested that vertebral lesions induced by contaminants could be brought about

either by acute exposure altering bone composition

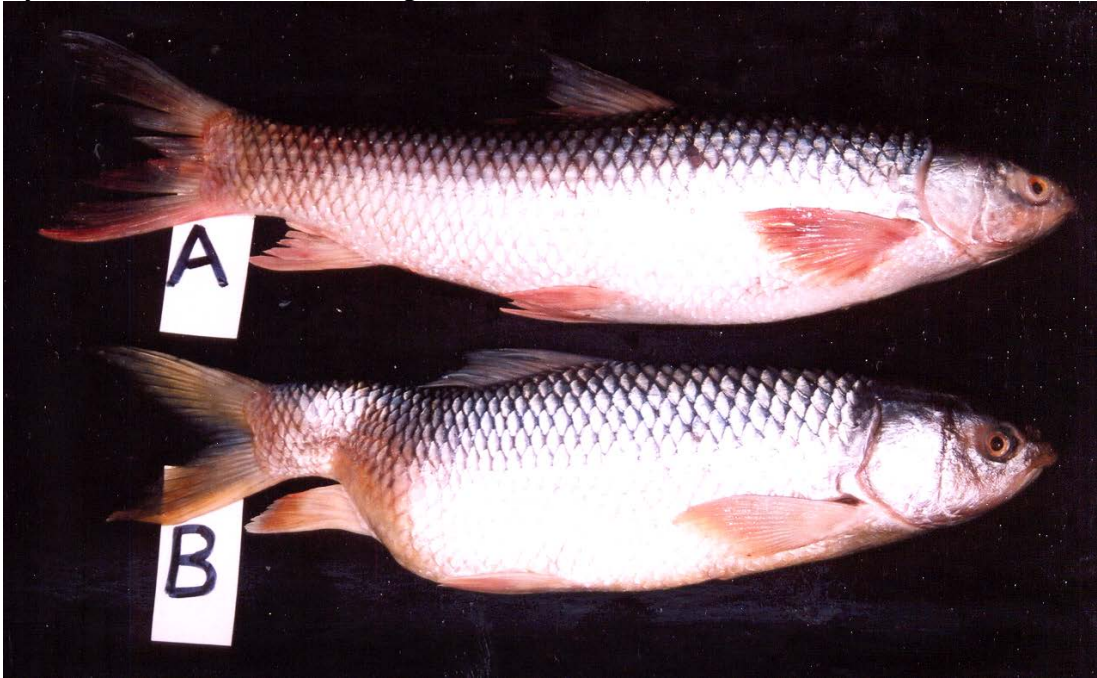


Fig. 1. Crooked vertebral column in adult *Cirrhinus mrigala* (Hamilton) from Keenjhar Lake (Distt: Thatta), Sindh, A, normal, B, abnormal specimen.

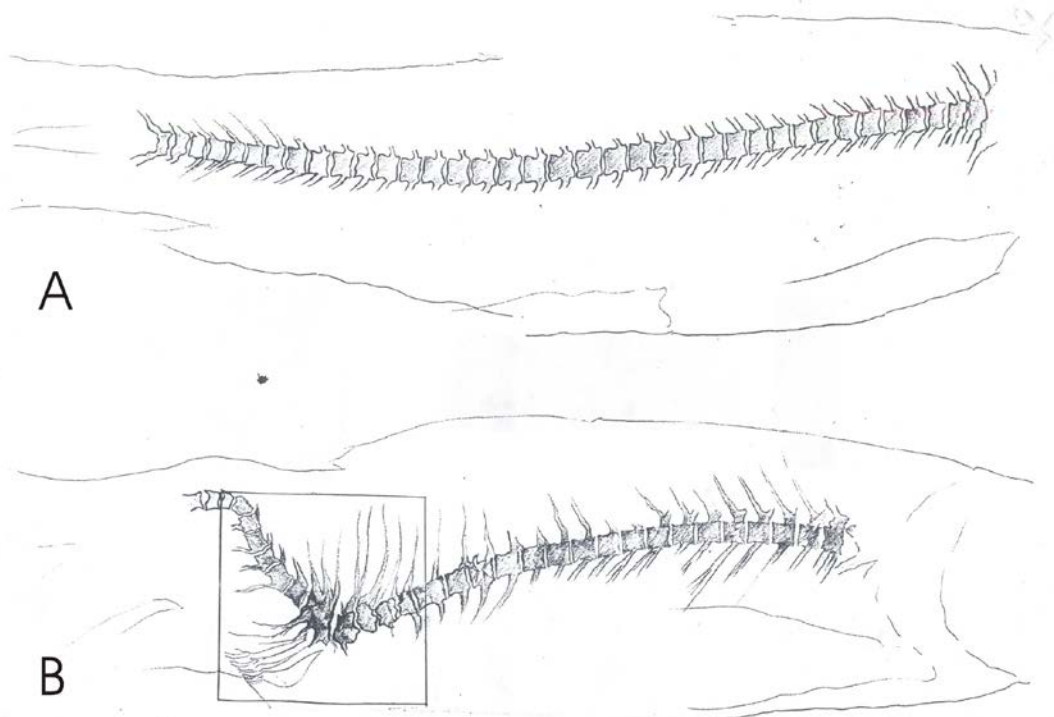


Fig. 2. Line drawing of normal (A) and abnormal (B) specimens of adult *Cirrhinus mrigala* (Hamilton) from the x-ray plate.

making the bone more fragile. In the fishes, exposed to an organophosphate insecticide, the vertebral abnormalities have been reported mostly at the junction of the trunk and tail region (Hirose and Kitsukaw, *Bull. Tokai Reg. Fish. Res. Lab.*, **84**: 11-20, 1976). This condition was believed to be the result of extreme contraction of the muscle tissues due to cholinesterase inhibition. The deformity in the present specimen is also similarly located but there is no trace of any such insecticides in the Keenjhar lake. The other causative factors evoking skeletal abnormalities include deficient nutrition, heredity, low dissolved oxygen, parasitic infestation, salinity and water temperature fluctuations, electric current and mechanical injuries during embryonic development (Hirose and Kitsukaw, *Bull. Tokai Reg. Fish. Res. Lab.*, **84**: 11-20, 1976).

Water pollutants such as chemical toxicants including organochlorine and organophosphate insecticides and heavy metals have been reported to cause several skeletal abnormalities (Hirose and Kitsukaw, *Bull. Tokai Reg. Fish. Res. Lab.*, **84**: 11-20, 1976). The present fish *C. mrigala* does not provide any evidence of being affected by chemical toxicants since it was out of a normal population, the members of which do not show any sign of such abnormality that could be caused by the environmental pollution in only one specimen. Seymour (*Trans. Am. Fish. Soc.*, **88**: 58-69, 1959) have attributed such type of abnormalities to unfavorable environmental conditions during embryonic development. Singh and Reddy (*J. Fish Biol.*, **34**: 963-964, 1989) have contended that in the same environment at the same time all the eggs and

embryos of a species and not only one would be exposed to the same conditions. They stuck to the opinion others like Raghunathan and Jayaram (*Indian J. Zool.*, **14**: 77-78, 1973) and Charles and Hixon (*Copeia*, 384-387, 1977) that such abnormalities are due to mechanical injuries during early embryonic development. Singh *et al.* (*J. Inland. Fish. Soc. India*, **23**: 87-79, 1991) reported that cranial and mandibular abnormalities in silver carp, *Hypophthalmichthys molitrix* caused by mechanical shocks. We too feel that this rare incidence may only be related with some kind of mechanical injury, which the fish might have felt at any time during its early embryonic stages of development, and it is not hereditary in origin or due to any toxicant activity. The results of the present findings accords with the findings of Khan and Siddiqui (*J. Inland. Fish. Soc. India*, **24**: 85-87, 1992) in case of *Cirrhinus mrigala* reported from River Yamuna, India. Therefore, it is concluded that the incidence of crooked vertebral column abnormality in the present specimen appears to be a cause of unfavorable environmental conditions during embryonic development.

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