

*Gachua*, also had higher lactic acid contents in their blood as compared to the rest of the species which had mild infection (*Myxus seenghala* and *Notopterus notopterus*) or poor (*M. vittatus*) as evidenced by the presence of trypanosomes in the stained blood smears of these fishes.<sup>9</sup> Except in the case of *M. vittatus* and *M. seenghala*, (P 0.05) the rise in blood lactate contents was found statistically significant (Table 1). Highly significant variation was noted in ( $p < 0.001$ ) *C. batrachus*, *C. punctatus* and *C. gachua*, as compared to other species.

Such intraspecific rise in the lactic acid contents of fish blood, under usually identical eco-physiological conditions, would definitely be due to the presence of the trypanosomes in their circulating blood. This is perhaps due to anaerobic mode of respiration and carbohydrate metabolism of trypanosomes or due to anemic conditions of the fishes<sup>9</sup> following trypanosomiasis, which would have lowered the oxygen carrying capacity of RBC's in these fishes. It can be cited here that Kligler *et al.*<sup>2</sup>, and Andrews *et al.*<sup>3</sup>, were of the opinion that such a hyperlactimic conditions may arise either due to change in Hb/O<sub>2</sub> relationship or due to aggregation of trypanosomes in blood vessels of mammalian hosts. However, the latter condition is not likely to be there in these fishes, as the population of piscine trypanosomes was never so dense as to clog the blood vessels of these fishes.

A minimum rise in normal lactic acid contents was in the fish *M. vittatus*, which had about 12.0% higher value in the infected fishes as compared to the uninfected ones. On the other hand *C. gachua* had highest difference of 60.6% in the diseased fish against the normal value of  $8.9 \pm 0.01$  mg/100 ml in the healthy fish. In general it can be concluded that due to trypanosomiasis all the fishes showed a prominent hyperlactimia in their blood, which varied interspecifically on the intensity of infection.<sup>10</sup>

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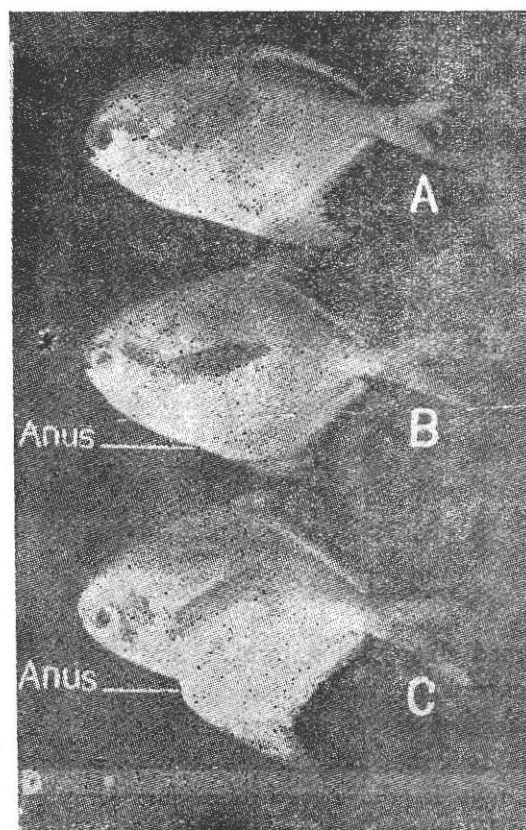
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- 1 T. Von. Brand. The Biochemistry of Parasites, ( Academic Press, London ). ( 1966 )
- 2 I. J. Kligler, A. Geiger, & R. Comaroff, *Ann. Trop. Med. Parasitol.*, **23**, 325, 1929.
- 3 J. Andrews, C. M. Jhonson & V. J. Dornal, *Ann. J. Hyp.*, **12**, 381, 1930.
- 4 I. J. Kligler, & A. Geiger, *Proc. Soc. Exptd. Biol. Med.*, **26**, 229, 1928.
- 5 G. Schiff, *Biochem. Z.*, **2**, 309, 1928.
- 6 T. Von Brand, P. Regendanz & W. Weise, *Zentr. Bakteriol. Parasitenk., Abst. I: Org.*, **125**, 461 1932.
- 7 R. S. Tandon & B. D. Joshi, *Z. Wiss. Zool.*, Leipzig; **185** ( 3/4 ), 207, 1973,
- 8 B. L. Oser, Ed. In : Hawks Physiological chemistry. XIV ed., ( Mcgraw Hill Publication ). ( 1965 )
- 9 B. D. Joshi, In : Studies on the blood of fresh water fishes of India. Ph. D. thesis, ( 1973 ), ( Unpublished ) : Univ. of Lucknow, Lucknow.
- 10 B. D. Joshi, *Proc. Ind. Acad. Sci. (B)* ( In Press ). ( 1978 ).

### A note on abnormality of the Pomfret, *Stromateus cinereus* (Bloch)

While observing the trawler catch of the off-shore Govt. of India trawler, when the author was on board, two abnormal pomfrets, one with a deformed dorsal fin and another with a bulge in the ventral body margin were found. A photograph of abnormal (A & C) and normal (B) pomfrets are given below.

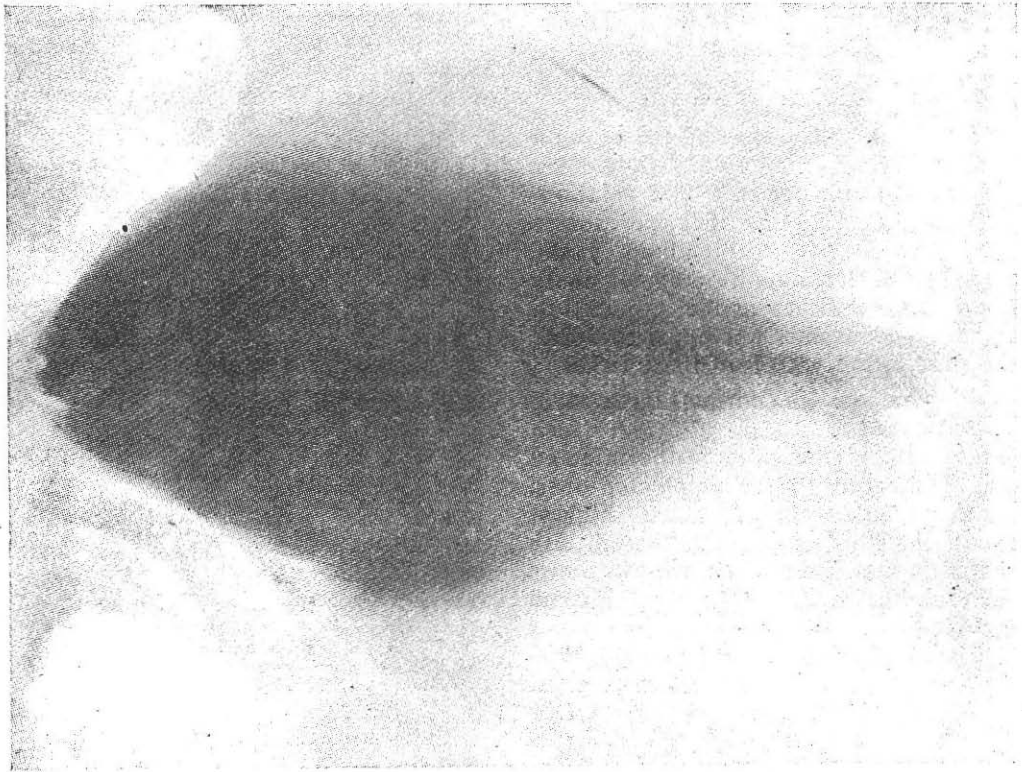


Even though the instances of caudal deformities are common, the reported instances of deformities in Indian fishes are limited<sup>1-6</sup>. These deformities are presumed to be the result of injuries caused by accidents or attack by predators on the young or adult fishes. Singh<sup>7</sup> described the deformity of caudal fin in *S. cinereus*. Apart from this no abnormalities have been reported from this species. The present note deals with the deformity of dorsal and ventral fins of *S. cinereus*.

The specimen (A) shows the deformity of dorsal fin measuring 31.4 cm in total length obtained 70<sup>1</sup>/<sub>2</sub> knotical miles from Bombay (Area 19-71, subarea 2E, Lat. 19°-15' N, Long. 71°-45' E) on 27. 11. 72. An X-ray examination has shown a V

assess the nature of deformity. The height of the first 17 fin rays of the deformed dorsal fin was about half the height of the normal ones. The distance between the dorsal fin and lateral line has reduced compared with the normal specimen (Photograph A) and the shape in between the snout and dorsal fin also differed from the shape of the normal specimen and this was probably due to injury caused with high pressure. The injury did not bring any changes in the 37 vertebrae of the vertebral column.

The second specimen (C) measuring 30.9 cm in total length with abnormal anal fin was obtained 75 knotical miles away from Bombay (Area 18-71, subarea 6D, Lat. 18°-55' N, Long. 71°-35'E) on



shaped deep injury which most probably occurred in the dorsal fin in the early stages of development of the fish and retarded the normal growth of the first 17 rays in the dorsal fin. The length of the 17 fin rays were measured and compared with those of the normal specimen to

29. 11. 72. An X-ray examination has shown similarity in anal fin supporting structure in the normal and abnormal specimens. Hence it seems that fish had an injury in front of the anus at an early stage, during which the structure supporting the anal fin might have been dis-

placed ventrally. During the process of healing L shaped curvature is formed. The anus opening is taken along the angular point of this curvature.

Morphomeric measurements of abnormal and normal specimens of the same length did not show much differences.

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1 B. G. Kapoor and H. L. Sarkar, *Labeo rohita* (Hamilton). *Proc. Nat. Sci. India* 21, 129-136, 1955.

2 H. L. Sarkar and B. G. Kapoor, *J. Zool. Soc. India*, 8, 157-164, 1956.

3 H. L. Sarkar and N. K. Kaushik, *Cirrhinia mrigala* (Hamilton). *Proc. Zool. Soc. India*, 11 (1), 39-45, 1958.

4 P. S. B. R. James and M. Badrudeen, *J. Mar. Biol. Ass. India*, 10 (1), 107-113, 1968.

5 V. S. Murty and J. Murty, *J. Mar. Biol. Ass. India*, 9 (2), 323-326, 1967.

6 P. Nammalwar and S. Krishna Pillai, *Sci. & Cult.*, 43 (7), 326-329, 1977.

7 S. P. Singh, *J. Mar. Biol. Ass. India*, 10 (1), 175-177, 1968.

### Dipeptidase Activity in the Larval Alimentary Canal of *Athalia proxima* Klug. (Tenthredinidae: Hymenoptera)

The dipeptidases capable of hydrolysing L-leucyl glycine was found in the midgut tissue extracts of the fourth-instar larvae of *Athalia proxima* Klug. These enzymes are not only intracellular but are also secreted in the midgut lumen indicating that final hydrolysis of protein to liberate amino acids may occur in the midgut lumen prior to the absorption. However, dipeptidases hydrolysing glycyl glycine could not be detected in any part of the alimentary canal.

There is no much information about the dipeptidase activity in digestive organs of insects. Schlottke<sup>4</sup> in carabids and Shinoda<sup>5</sup> in *Bombyx mori* observed that the dipeptidases are intracellular enzymes of digestive tract, suggesting that complete hydrolysis of protein in gut lumen is not essential before absorption. Khan<sup>1</sup> observed a dipeptidase capable of hydrolysing DL-alanyl glycine distributed in the midgut tissue, contents of midgut lumen and also in salivary glands of *Locusta migratoria* and *Dysdercus fasciatus*, indicating that final hydrolysis of protein to liberate amino acids might occur in the gut lumen. In *Utetheisa pulchella*, Khatoon<sup>8</sup> reported that dipeptidases capable of hydrolysing L-alanyl glycine and L-leucyl glycine were not only intracellular enzymes in the midgut but these enzymes were also secreted in midgut lumen. However, Khan and Ford<sup>2</sup> did not observe dipeptidase capable of hydrolysing glycyl glycine in the digestive tract of *Dysdercus fasciatus* but found a polypeptidase. With a view to highlighting certain aspects of digestive physiology, hitherto unknowns in plant feeding hymenopterous insects, the present study was undertaken on distribution and activity of dipeptidases in the alimentary canal of the fourth-instar larvae of *A. proxima*, a serious pest of cruciferous crops.

The larvae of *A. proxima* were reared in the laboratory on raddish leaves at  $24 \pm 1^\circ\text{C}$ . About 24-hr-old fourth-instar larvae were selected for determining the dipeptidase activity by paper partition chromatography in the extracts of tissue and lumen contents of the different regions of the alimentary canal.

For preparation of enzyme extracts, the selected fourth-instar larvae were starved for 24 hr. and dissected to take out their alimentary canal in Ringer's solution. The fore-mid-and hind guts were