Uttar Pradesh J. Zool. 25(1) : 105-106, 2005 ISSN 0256-971X

STUDIES ON THE TORUS LONGITUDINALIS IN TWO TELEOSTS

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The present work has been focussed on the comparative aspects of the torus longitudinalis in *Therapon jarbua*, a visual feeder with that of *Glossogobius giuris*, a bottom feeder. Torus longitudinalis is a mesencephalic structure which hangs into the midbrain ventricle and it can influence the brain structure especially midbrain to a great extent.

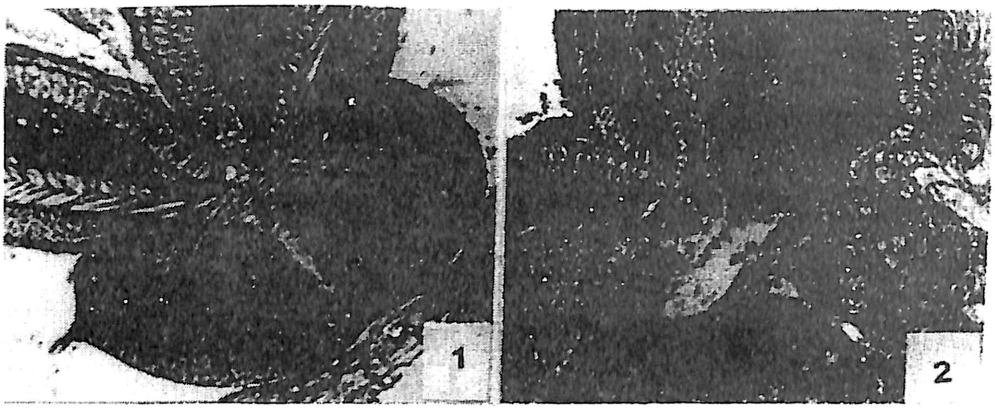
The pattern of midbrain in fishes varies according to feeding habits. Midbrain or mesencephalon mainly constitutes optic lobes including optic tectum and tegmentum. The optic tectum forms the superior border of the third ventricle and the tegmentum forms the inferior border. From the medial border of the tecta into the mesencephalic ventricle hangs the torus longitudinalis. This structure can influence the feeding habits of fishes to a great extent. Optic tectum supplies fibre tracts to the torus longitudinalis. Studies conducted in this field were restricted to those of Ramsey (1901), Trojan (1906), Franz (1912), Kudo (1923), Charlton (1933), Shaklin (1935), Ohta (1959), Singh (1970), Dhillon & Tandon (1987) and Sherly & Azis (1993).

The material for the present study was collected from natural water bodies and they were brought to the laboratory in live condition. For histological studies serial sections were cut at 8μ thickness and for staining, Cajal's (1910) silver impregnation methods were followed.

Torus longitudinalis shows structural variations in these two fishes. It is a median line structure partially occupying the space between the two tecti (Fig. 1). It follows a curve of the tectum caudodorsally but does not reach as far as caudally as does the tectum. The shape of the torus is almost rectagular with flat ends. The diameter of the torus varies from 622-630μ in length and 220-223μ in width. It received a number of nerve fibres from the posterior commissure. Neurons are continuously distributed in the torus. Optic tectum also sends fibres to torus.

Glossogobius giuris being a bottom feeder the torus logitudinalis is poorly developed compared to *Therapon jarbua* (Fig. 2). The diameter of the torus varies from 220-222μ in length and 121-125μ in width. Each torus consists of darkly stained neurons distributed throughout. It is oblong and triangular shaped. The cells of the torus resemble those of the optic tectum cells.

Discussion : The highly developed torus longitudinalis in *T. jarbua* appeared to be connected with vision due to its visual feeding nature, when compared to *G. giuris*, a bottom feeder possessing poorly developed vision. The visual ability is again proved as it is small in blind fishes (Franz, 1912). This fully agrees the findings in *G. giuris*. This structure was highly developed according to Charlton (1933) in the blind fishes. Similar observations were revealed by Ramsey (1901) and Trojan (1906) in cave fishes and deep sea fishes indicated that they may have functions other than photostatic and gravistatic. Shanklin (1935) noticed well developed tori in a deep sea fish cyclothone rule out practically the direct role in photostatic function. Perhaps it might have other roles than photostatic. Dhillion & Tandon (1987) noticed the function of torus had been described by many workers including Franz (1912) and Ohta (1959). But Kudo (1923) has suggested it to be related to the gravistatic functions of the midbrain roof.



Figs. 1-2 : Torus longitudinalis. **1.** *Therapon jarbua* x 80; **2.** *Glossogobiuas giuris* x 40.

According to Singh (1970) torus may be regarded as a correlation centre between photostatic and gravistatic functions. The present observation in *T. jarbua* fully favours the views of Singh (1970). Bur the size of the torus longitudinalis depends upon the size of optic tectum (Shanklin, 1935; Lighissa, 1955; Tandon & Sharma, 1964). In the present study the volume of the torus longitudinalis could not always be compared to that of the optic tectum. The size of torus longitudinalis never depends on the size of the optic tectum in *G. giuris.* In this fish the tectum was better developed even though torus longitudinalis was poorly formed. Singh (1970) objected this hypothesis as it did not appear to be true in all species studied by him. Similar observations were reported by Yashiki *et al.* (1956) and Ohta (1959).

ACKNOWLEDGEMNTS

The author is thankful to Dr. P.K. Abdul Azis, Department of Aquatic Biology and Fisheries, University of Kerala for the valuable suggestions and guidence.

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