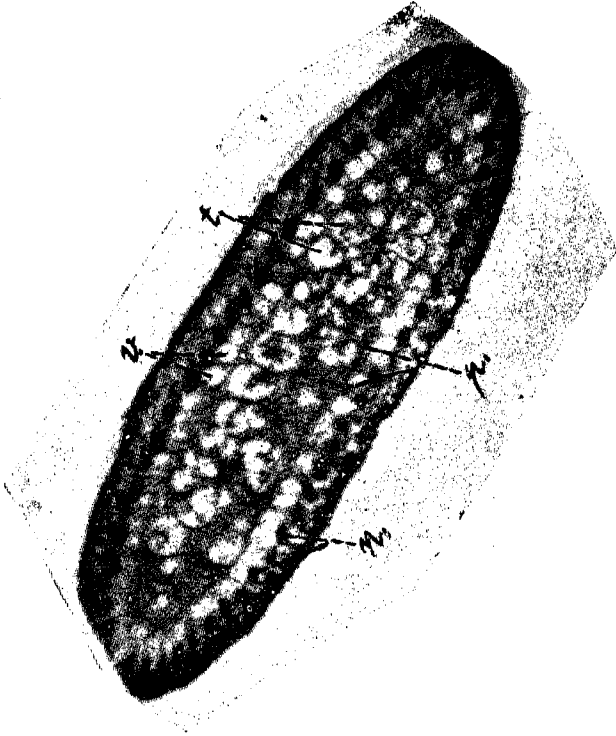


The Nervous System of a Proglottid of  
*Tentacularia macropora*

THE nervous system of Cestodes was first discovered by J. Muller<sup>1</sup> in *Tetrarhynchus attenuatus*. But in spite of the attempts of Lang,<sup>2</sup> Lönnberg,<sup>3</sup> Pintner<sup>4</sup> and Johnstone<sup>5</sup> the arrangement of the nerves in the proglottides in Tetrarhynchids is even now not known. The supposition is that there should be two lateral nerve cords running the whole length of the proglottid chain. The difficulty experienced by the students of the nervous system of invertebrates is more marked in the case of Cestodes. Most of the previous investigators seem to have either not employed the silver methods or have failed to obtain a sufficiently satisfactory impregnation of the fibres. This may probably be due to non-availability of sufficient material.

In March and July 1940 I obtained a number of *Tentacularia macropora* (Shiple and Hornell, 1906) from the spiral valve of *Stegostoma tigrinum*. After repeated experiments with the Bielchowsky technique I have obtained

some good impregnations of the nerve fibrils in the proglottides. The results are rather interesting. The nervous system is constituted in the proglottid by a large number of nerve cords all of which seem to be of equal thickness. Photo-micrograph is a transverse section of a maturing proglottid. It will be seen



that there are about 60 nerve cords (*n*). They lie outside the circular row of vitelline glands and fibres leaving these could be seen proceeding towards the cuticle as well as the organs in the medulla. Some of the fibres going towards the cuticle seem to innervate the sub-cuticular longitudinal muscles, while others end on the cuticle itself. The fibrils which proceed to innervate the organs in the medulla present a very curious arrangement. There is a fibrillar plexus (*p*) between the vitelline glands (*v*) and the testicular vesicles (*t*). This is formed by the individual fibrils of bundles leaving the nerve cord, separating after passing between the vitelline glands and forming a complex network. The plexus is thicker on the sides of the two large lateral excretory vessels than in the other regions. Innervation of the various organs is not by branches from the nerves but by fibrils from this plexus. Due to the formation of a plexus it is almost

impossible to trace the nerve fibrils from the nerve cords to the tissue or organ innervated. Transverse sections show that some fibrils from the plexus also end in the cuticle.

From longitudinal sections it appears that the plexus is well marked only in the anterior half of the proglottid where testicular vesicles are present in the medulla. In the posterior half of the segment, the medulla has the appearance of a meshwork due to the presence of innumerable intercrossing fibrils. The ovary is innervated by bundles of fibrils proceeding directly from the nerve cords. Near the outer margin of the organ the fibrils separate and proceed to the various regions of the gland.

It will be seen that the nervous system is remarkably complex and not what was supposed to be the case by the previous authors. The nerve cords are not compact and neither do they appear to possess sheaths. There are no ganglionic enlargements and the ganglionic cells that occur are mostly bipolar. Considering the uniform environment in which these worms live and the strictly limited necessity for co-ordinated movement, the complex arrangement of nerve fibrils is rather surprising.

M. K. SUBRAMANIAM.

Department of Zoology,  
University of Madras,  
Triplicane, Madras,  
October 20, 1940.

---

Magification of Photomicrograph  $\times$  ca 100.

<sup>1</sup> Muller, J., *Muller's Archiv. f. Anat. Phys. Jahr.*, 1836.

<sup>2</sup> Lang, A., *Mith d. Zool. Stat. Neapel*, Bd. II, 1881, 372-400.

<sup>3</sup> Lönnberg, E., *Bihang Till K. Svenska. Vet. Akad. Handl.*, 1889, 15.

<sup>4</sup> Pintner, Th., *Arb. a d. Zool. Inst. d. Univ. Wien*, 1881; *Abstract in Jour. Roy. Micr. Soc.* (2), 1881, 1, 458-60.

<sup>5</sup> Johnstone, J., *Parasitology*, 1911, 4, 364-416.

---