

The results of chromosomal analysis show that the two inversions of the third chromosome are tightly linked as only one recombinant chromosome out of the 456 chromosomes analysed was observed. An extreme linkage between inversions observed during the present study can be suggested to the suppression of crossing over. This is based on the results of crossing-over studies by the present authors<sup>15</sup> who found that delta and eta inversions when heterozygous strongly suppress crossing over between them.

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## NEUROANATOMY OF FURCOCERCOUS, *CERCARIA MILLERI*

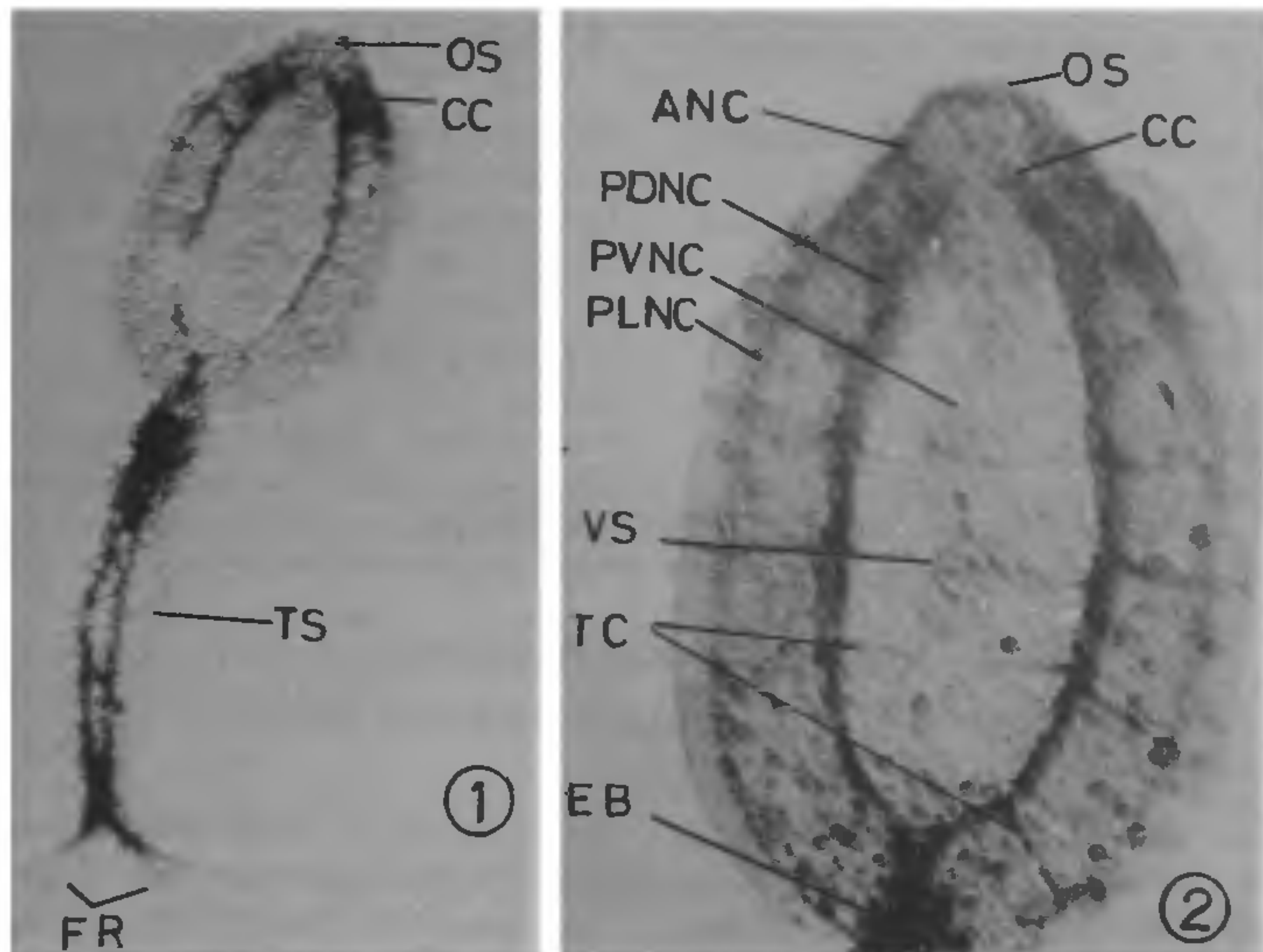
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THE neuroanatomy of certain adult trematode species<sup>1-2</sup> as well as their larvae<sup>3-7</sup> has been studied by several workers. Recently, neuroanatomy of certain trematode cercariae (Monostome, Amphistome, Echinostome and Xiphidio) and rediae has also been described<sup>8</sup>. However, studies on neuroanatomy of Furcocercous are scanty. The present study describes the neuroanatomy of furcocercous cercaria by histochemical localization of acetylcholinesterase.

The snail species, *Vivipera bengalensis* (L.) were collected from the freshwater habitats of Dungarpur and Udaipur districts. The rearing of snails and the method for collection of their trematode larvae are described elsewhere<sup>9,10</sup>. The Furcocercous cercariae, *Cercaria milleri* recovered<sup>11</sup> from the *V. bengalensis* were repeatedly washed in physiological saline and immediately fixed in chilled, 10% neutral formalin. After suitable fixation periods (6 min) the cercariae were processed for localization of acetylcholinesterase<sup>1</sup>. Simultaneously, control whole mounts were also prepared<sup>1</sup>.

Cholinesterase activity was most pronounced in the entire nervous system (figure 1). The use of  $10^{-4}$  M eserine inhibited the cholinesterase activity in the whole of the nervous system. The nervous system in the main cercarial body (figure 2) composed of two cerebral ganglia connected with each other by a transverse commissure to form a cerebral complex, lies immediately posterior to oral sucker, 3 pairs of anterior and 3 pairs of posterior longitudinal nerve trunks originate from the lateral sides of each ganglia. Three pairs of nerve trunks could be differentiated according to their position, lateral, ventral and dorsal in the anterior and posterior, respectively. The anterior dorsal, ventral and lateral nerves and their numerous fine branches encircle and innervate the oral sucker and pharynx regions. The posterior dorsal nerve trunks are the largest, stout and prominent as compared to posterior ventral and lateral nerve cords. These, on their way towards the ventral sucker innervate the gut, genital rudiments, excretory bladder and also give fine branches to the tegument. Each posterior lateral nerve cord unites with its fellow, dorsal and lateral nerves by transverse connectives to form 10-15 transverse commissures in ring form immediately after commencement of the posterior



**Figures 1 and 2.** 1. Nervous system in the main body and tail region of *C. milleri*; 2. Enlargement of cercarial body showing arrangement of nerves. [ANC, Anterior nerve cords; CC, cerebral complex; EB, excretory bladder; FR, furcal rami; OS, oral sucker; PDNC, posterior dorsal nerve cord; PLNC, posterior lateral nerve cord; PVNC, posterior ventral nerve cord; TC, transverse connections; TS, tail stem; VS, ventral sucker.]

region of cercarial body. The number of transverse commissures was not fixed but depended on the length of the cercarial body. Each commissure gives off several fine nerve branches distributed all over the body in the form of network. The pattern of such a nervous system in the main body of other cercariae and metacercariae has been described by several workers<sup>3-8</sup>. But the nervous system or arrangement of nerves in the tail stem of different trematode cercariae has been rarely reported<sup>7</sup> and is still controversial. Since certain cercarial species revealed the nervous system in their tail stems (such as *C. granulosa*, *C. udaipuriensis* and *C. gurayai*) other species (*C. buckleyi*, *C. pigmentata*, *C. komiyai*, *Cercaria* sp. VII and VIII Kerla, *C. talensis* and *C. indicae* XVII) have not shown the nerve arrangement in their tail stem<sup>7,8</sup>. In the tail stem of the present cercaria, *C. milleri*, there are two nerve ganglia, one located at the anterior end and the other at the posterior end of the tail stem (figure 1). From the anterior ganglion, a pair of nerves, dorsal and ventral proceeds to posterior region of the tail till it joins the posterior ganglion (figure 1). Two pairs of nerves again originate from the posterior ganglion of the tail stem to enter each lateral sides of furcal rami. Eight to twelve and 4-6

transverse commissures in ring forms were observed in tail stem and furcal rami respectively. But the number of transverse commissures varied from specimen to specimen and it was found that they depended upon the length of the tail stem and furcal rami. Similar observations have been reported in other furcocercous cercariae<sup>8</sup>, *C. udaipuriensis* and *C. gurayai* and echinostome cercariae, *C. granulosa*<sup>8,12</sup>. However, the earlier studies<sup>3-5</sup> could not reflect the proper nerve arrangement in the tail region of their experimental cercariae. The present findings prove the proper and clear neuroanatomy of tail stem, furcal rami along with the main body of furcocercous cercaria, *C. milleri*.

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## ANNOUNCEMENTS

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### NUTRITION SOCIETY OF INDIA

[National Institute of Nutrition, Hyderabad 500 007]

The XXI Annual Meeting of the Nutrition Society of India will be held on 24–25th November 1988 at the National Institute of Nutrition, Hyderabad. On this occasion, symposia and special lectures will be arranged on the following subjects:

Symposium-I: "Lipids in Nutrition"; Symposium-II: "Drought and Nutrition"; Special Lecture-I: " $\beta$ -Carotenes"; Special Lecture-II: "Riboflavin Carrier Protein".

#### AWARD FOR RESEARCH PAPERS

Cash Awards for best papers in Community Nutrition and Experimental Nutrition respectively will be presented at the XXI Annual Meeting of the Society to be held on 24–25th November, 1988 at the National Institute of Nutrition, Hyderabad. The conditions for awards are as follows:

(a) The awardee should be 40 years of age or less; (b) He/she should be member of the Society for at least one year; (c) He/she should be the Primary Author of the paper; (d) The work done should be original in content and directly or indirectly related to nutritional problems of national importance; (e) The author should indicate whether the paper should be considered for Community Nutrition or Experimental

Nutrition, and (f) He/she should obtain a certificate from the Head of the Institute or the Department, that the work was primarily carried out by the applicant. The paper should not have already been published in any academic journal. However, there is no objection to the paper being published elsewhere after the presentation, provided mention is made that the paper was presented at the Annual Meeting of the Nutrition Society of India. Only the abstract of the paper will be published in the Proceedings of the Society.

The competitors must send *four copies* of their manuscripts along with the Abstract to the *Joint Secretary, Nutrition Society of India, National Institute of Nutrition, PO-Jamai Osmania, Hyderabad 500 007 before 1 August 1988*. Entries received after this date will not be entertained. There will be a preliminary screening of the papers by a panel of 3 judges. TA & DA for attending the annual meetings will be given to the candidates selected in this preliminary screening provided their own Institution is unable to support their travel for the meeting. A certificate from the Head of the Institution to this effect should be provided. Final selection for the prizes will be done on the basis of the presentations made during the meeting.

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