

ON THE SYNONYMY BETWEEN *SPINITECTUS INDICUS* VERMA AND AGARWAL, (1932) AND *S. MUELLERI* GUPTA AND VERMA (1927)

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Spinitectus indicus Verma and Agarwal (1932), a nematode belonging to the genus *Spinitectus* Fourment, 1946 (Spinitectinae S. krjabin, 1946) is parasitic in fish hosts like *Pseudotropius garua*, *Eutropiichtys vacha*, *Wallago attu* and *Notopterus notopterus* and is distributed to Allahabad, Lucknow (U.P.) and Dacca (Bangladesh). In the year 1977 Gupta & Verma reported another species *S. muelleri* from *Notopterus notopterus* at Lucknow. The latter species was given an independent status by Gupta & Verma (1977). Soota (1983) though said that the above two nematodes are synonyms but failed to give any plausible reason in such a synonymy. The present authors have consulted the original papers of Verma & Agarwal (1932) and Gupta & Verma (1977), and have compared the different parameters of two nematodes under study. The authors have definite reason in considering *S. muelleri* Gupta & Verma (1977), a synonym of *S. indicus* Verma & Agarwal (1977).

INTRODUCTION

The genus *Spinitectus* was established by Fourment (1883) with *S. oviflagellis* as its type species. Since then a number of Indian species have been described by various authors. Some of the species were erected on minor variations as a result of which they have fell into synonymy. Several authors have given keys to the species of the genus *Spinitectus* namely Sahay (1970), Gupta & Verma (1977) and Soota (1983). The present authors have reasons for synonymising *S. muelleri* with *S. indicus*.

MATERIALS AND METHODS

Original articles have been consulted, a comparative chart was made to categorically assess if the above referred species are synonyms. For such an attempt following parameters have been taken into consideration : Body length and body width, number of spiny annulations, vestibule length, oesophagus, nerve ring and excretory pore, caudal papillae and spicules. All measurements are given in millimeters.

OBSERVATIONS

Body length and body width : On comparing the males of *S. indicus* and *S. muelleri* a difference of 1.22 in length and 0.10 in breadth is observed, whereas the difference is to the tune of 5.4 in length and 0.17 in breadth in female.

The authors feel the difference in length should not be criteria for species separation as it is dependent upon the nourishment that parasite procures from its habitat. The growth is also dependent upon the inter-and intraspecific competitions. The growth of a nematode is a discontinuous process in that they moult during the development, increase in size during moult

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and in majority of cases, they stop growing (lengthwise) just before during and just after moult. The period of lethargus is variable in different species except in *Ascaridia galli* (in chickens) which grows continuously without any sign of lethargus (Ackert, 1931). Other parasitic nematodes have definite period of growth, lethargus and ecdysis (Sommerville, 1963).

Rogers & Sommerville (1963) held that there is an interval of quiescence often associated with ecdysis (moult) and particularly upon reaching the infective stage, this period of arrested development may be prolonged pending entry into the host (Rogers & Sommerville, 1961). The prolonged period of arrest occurs during inhibited development within a host, that too is generally associated with the moult and may be viewed as an intended lethargus.

Roger (1963) opined that growth is dependent upon triggering of ecdysis and the sequence of events leading to the production of ex-sheathing fluid. This triggering is set into motion on the receipt of neuroendocrine substance (a signal from the host/parasite which help in releasing lytic enzymes which facilitate the cuticle burst. Davy (1970) supported the idea whereas Samiloff (1973) opines that while ecdysis is regulated by organ system in the area of nerve ring, general growth is under the control of systems located in the region of hind gut.

Bradley (1974) feels that intra-specific competitions or crowding effect too is responsible in affecting the growth rate, parasite size, survival and mortality. Roberts (1966) reported stunting of *Hymenolepis diminuta* when intra-populations densities were high, that length, weight and egg production decreased for cysticercoid-derived and egg derived infections of the cestode *Hymenolepis nana*. Halverson & Anderson (1974) observed in hamsters and gulls, the length to be smaller at higher intra population densities in case of *Diphyllbothrium dendriticum*. Homes (1961) found in case of *Hymenolepis diminuta* reduced length and weight, in densities as low as 10 worms per host.

Besides, the age of the parasite could be a factor in bringing about variation in length.

Number of spiny annulations : The authors feel that there is a remarkable difference in the number of spiny annulations in males to a tune of 118-122 in males, but it is 120-132 in females. The authors opine that in the genus *Spinitectus* the spiny annulations are a must. But the number of spiny annulations are generally added with the growth of the parasite and can not be used for specific determination. This argument may not seem to be convincing because in a worm measuring 6.0-7.32 the number has been shown to be 150, whereas in worms measuring 7.22-7.32 the number of spiny annulations have been shown to be 28-32 in case of *S. indicus* and *S. muelleri* males. On the other hand the number of spiny annulations in *S. indicus* and *S. muelleri* have been shown to be 150 and 18-32 in females respectively.

The basic function of the spines or spiny annulations is to cling or adhere to tissues to avoid expulsion out of the gut. So from functional point of view there is hardly any difference. This could be on account of genetic factor too, besides to view a spine which has not taken stain is rather difficult and it could be an observational mistake.

A difference of 9-15 in the number of spines in the 1st row is observed when *S. indicus* and *S. muelleri* is compared. Normally the spines in annulations should be counted in two focus in a microscope if the number of spines in the 1st focus is X, then in the 2nd focus it should be X-2, and lastly the total should be made. This however, is not the normal practice instead by changing the focus an author estimates the total number. Taking this as the basic principle, this character of number of spines is bound to show variation and should not therefore, be given specific value.

Vestibule length : The annexed comparative chart depicts a difference of 0.09 in length of *S. indicus* and *S. muelleri* males and a difference of 0.01 in females. The differences are too small to be attached any importance in species separation.

Oesophagus : A difference of 0.13-0.16 is observed when *S. indicus* and *S. muelleri* males are compared. This difference is too small to be attached any importance. However, in females the differences do exist to an extent of 1.16-1.27. This difference could be on account of the amount of meal taken by the parasite. The authors, however, advocate that the ration between the muscular and glandular oesophagus should be given importance in species separation. Unfortunately the data of the muscular and glandular oesophagus is not available, therefore, the authors are not in a position to forward any argument.

Caudal papillae : The total number of caudal papillae in males of *S. indicus* is 8-9 pairs whereas in *S. muelleri* it is 8 pairs. A difference of one pair could be an observational mistake or on account of age factor. Had the age of the above two referred species been same, the difference of one pair would have not existed.

Spicules : A difference of 0.09 in and left and right spicules of *S. indicus* and *S. muelleri* exists. The difference is too meager to be attached any importance. However, in both the above referred species, spicules are equal and similar, the ration being 1 : 1.

Vulva : In both the species, the vulvae are post-equatorial however a difference of 5.04 is on account of length factor which has already been negated.

Conclusion : *S. muelleri* Gupta & Verma (1977) is a synonym to *S. indicus* Verma & Agarwal (1932).

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