

*LONGISTRIATA INDICA* SP. NOV. (HELIGMOSOMATIDAE :  
TRICHOSTRONGYLOIDEA : NEMATODA) FROM A  
HARE FROM INDIA

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*Longistriata indica* n. sp. is described from a hare, *Lepus ruficaudatus*, and compared with the already known species of the genus. The various characters of systematic importance are discussed and it is concluded that the creation of subgenera, *Longistriata*, *Brevispiculoides* and *Srivastavanema*, is not justified and hence all subgenera are suppressed.

INTRODUCTION

One hare, *Lepus ruficaudatus*, was shot on the night of 31st December, 1965, and examined the following day when a large number of very small, live red parasites were recovered from the intestine. They on examination proved to belong to a new species of *Longistriata* Schulz, 1926, and are described here as such. Though a large number of specimens of both the sexes were studied, only six of each sex selected at random were measured. The figures in parentheses refer to the average of all the specimens measured. The live parasites were tightly coiled and, even when fixed in hot alcohol, most of them remained much coiled.

*Male*: The male parasites measure 3.48-4.76 (4.26) mm in length and 0.084-0.104 (0.095) mm in maximum breadth. The lips are rather small and inconspicuous but the papillae are easily seen. The cephalic inflation is quite prominent, measuring 0.048-0.078 (0.063) mm in length, and is well marked off from the rest of the body by an annular ring. The cuticle in the cephalic region is about 0.005 mm wide and shows striations, about six anterior ones being rather wide apart followed by 16-17 striations which are near to one another. The buccal capsule is very small. There are 12 longitudinal ridges which extend from the annular ring up to the prebursal region. The oesophagus is simple and measures 0.268-0.324 (0.288) mm in length. The nerve ring is situated at 0.13-0.21 (0.16) mm from the anterior end and is not always easily seen. The excretory pore is situated at 0.224-0.324 (0.27) mm from the anterior end and may be either anterior or posterior to where the oesophagus joins the intestine.

The copulatory bursa consists of two well-developed and symmetrical lobes, rather tightly inrolled. The dorsal lobe is absent and the prebursal papillae are present. The ventral rays have a common stem but they soon diverge, though both of them are directed somewhat anteriorly. The latero-ventral ray is slightly stouter than the ventroventral and pushes the edge of the bursa in a conspicuous manner. The other rays do reach up to the edge of the bursa but they do not push the edge in the same manner. The lateral rays have a common stem and are stouter than the ventrals, and of these the anterolateral is the stoutest. The anterolateral ray runs parallel and close to the mediolateral but in the distal region it sharply diverges from it and is directed anteriorly while the mediolateral continues in the lateral direction. The posterolateral ray is divergent from the mediolateral and is directed posteriorly. The dorsals arise from a common stem but soon the two externo-dorsal rays branch off and invariably the right branch takes off a little more distally than the left. The externodorsal rays are as stout as the ventrals and extend right up to the edge of the bursa. The dorsal ray bifurcates almost midway along its length into two simple branches which extend up to the edge of the bursa. The branches show a very small tubercle-like process in some specimens only. The two spicules are simple, filament-like and sub-equal. The left spicule, which is longer, measures 0.42–0.44 (0.43) mm in length and the right spicule 0.38–0.43 (0.41) mm. The gubernaculum is well cuticularized, 0.024–0.036 (0.032) mm long, and appears as a high-walled gutter, supporting the spicules on their dorsal and lateral sides. The telamon is present on the ventral side and is 0.05–0.062 (0.058) mm long, extending right up to the end of the genital cone. The telamon is clearly seen only in the lateral view for it is not as well cuticularized as the gubernaculum and is not discernible either in the dorsal or the ventral view. The genital cone is well marked though only 0.01–0.02 (0.016) mm high.

*Female:* The female parasites measure 4.32–5.15 (4.78) mm in length and 0.084–0.11 (0.095) mm in maximum breadth. The cephalic inflation measures 0.058–0.064 (0.063) mm in length. The oesophagus is 0.31–0.36 (0.33) mm in length. The nerve ring present is 0.13–0.196 (0.164) mm and the excretory pore 0.224–0.298 (0.263) mm from the anterior end. The general morphology is similar to that of the male described above.

The posterior end of the body is tapering and is almost always turned ventrally. The tail is 0.07–0.074 (0.072) mm long. The vulva is present a little anterior to the anus, being 0.142–0.166 (0.151) mm from the posterior end. It leads into a comparatively short though muscular vagina, 0.17–0.196 (0.18) mm in length. The muscular ovejector is 0.024–0.04 (0.33) mm in length. It passes into a single uterus and an ovary. There are comparatively few eggs present in the uterus which are thin-shelled, oval and measure 0.06–0.068 × 0.034–0.038 (0.064 × 0.036) mm.

## DISCUSSION

Travassos (1937) and Skrjabin *et al.* (1954) have listed and described the various species of the genus, and more recent lists have been given by Yamaguti (1961) and Mawson (1961). Since then, the following species have been described: *L. myopotami* Petrov and Sadikhov, 1959, from *Myopotamus coypus* from Azerbaidzhan, *L. thomasi* Desportes and Chabaud, 1961 (nom. nov. for *depressa sensu* Thomas, 1953), originally described from *Sorex aranaeus* from the Inner Hebrides, *L. melomyos* Mawson, 1961, *L. uromyos* Mawson, 1961, *L. brachybursa* Mawson, 1961, and *L. polyrhabdote* Mawson, 1961, all from several species of rats from Queensland (Australia), *L. neomi* Lyubarskaya, 1962,\* from *Neomys fodiens* from Russia, *L. longispicularis* Singh, 1962a, from *Petaurista petaurista albiventer* and *L. brevispicularis* Singh, 1962b, from *Rattus norvegicus*, both from India, *L. dollfusi* Diaz-Ungria, 1963, from *Mus musculus* from Venezuela, *L. hokkaidensis* Chabaud, Rausch and Desset, 1963, from *Apodemus sylvaticus argenteus* and *L. yamashitai* Chabaud, Rausch and Desset, 1963, from *Sorex unguiculatus*, both from Japan. The present species is the third to be described from the Indian region.

The various species of the genus are usually separated on the comparative length of the spicules, presence or absence of gubernaculum and telamon and the nature of the dorsal ray. The following species possess a dorsal ray which is entire and not divided: *L. depressa* (Dujardin 1845), *L. caudabullata* Dikmans, 1946, *L. gamma* (Travassos 1918), *L. didas* Thomas, 1953, *L. confusa* Desportes and Chabaud, 1961, *L. yamashitai* Chabaud, Rausch and Desset, 1963, and *L. longispicularis* Singh, 1962a.

The present species differs from all these thus: from *L. depressa* in size of the body, comparative size of dorsal and mediolateral rays and presence of telamon; from *L. caudabullata* in nature, comparative size and disposition of the ventral rays, presence of telamon, and absence of papillae from the genital cone; from *L. gamma* in comparative size of the body and the spicules, disposition of ventroventral and mediolateral rays, in the dorsal rays having a common stem, and in the presence of well-defined gubernaculum and telamon; from *L. didas* (as described by Thomas 1953) in having stouter ventral rays and a simple dorsal ray and in the presence of gubernaculum; from *L. confusa* in the symmetry and shape of the bursa which has stouter rays and the nature of mediolateral and dorsal rays; from *L. yamashitai* in size of the body, in having 12 longitudinal ridges, and in the presence of well-defined gubernaculum and telamon; from *L. longispicularis* in comparative size of body and spicules, number of longitudinal ridges and nature of ventral rays. Accordingly, the present material is considered to belong to a new species of the genus.

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\* Description not available,

Thomas (1953) considered *L. caudabullata* to be a synonym of *L. depressa* but Desportes and Chabaud (1961) have shown that specimens identified by Thomas as *L. depressa* belong to a new species. I agree with Desportes and Chabaud. Also, Desportes and Chabaud redescribed *L. didas* and their description was much different from that of Thomas. (Incidentally, Thomas has used the term ventrolateral for a ray of the ventral system.)

Travassos (1937) described a species which he called *zetta*, and some subsequent authors (Skrjabin *et al.* (1954), Mawson (1961), Yamaguti (1961)) corrected the spelling to *zeta*. But, according to the International Code of Zoological Nomenclature (Stoll 1961), incorrect transliteration cannot be considered as an inadvertent error. Hence, the correct name of this species remains *L. zetta* Travassos, 1937.

The name *Longistriata* was given by Schulz for a subgenus of *Viannaiia* Travassos, 1914, and raised to the generic rank by Travassos and Darriba (1929). Subsequently Travassos (1937) recognized four subgenera, *Longistriata*, *Heligmonella*, *Carolinensis* and *Vexillata*, mainly on the ratio between the width of the body and the length of the spicule and the nature of the rays

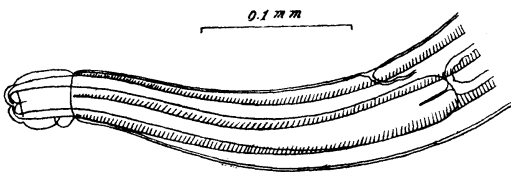


FIG. 1. *Longistriata indica* n. sp.  
Male, anterior end.

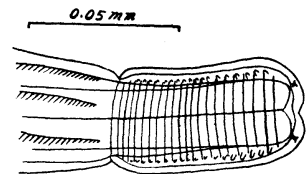


FIG. 2. *Longistriata indica* n. sp.  
Female, anterior end.

of the dorsal system. Ortlepp (1939) suppressed the name *Heligmonella* and proposed *Brevispiculoides* instead. Most workers recognize only two subgenera, *Longistriata* and *Brevispiculoides*. Singh (1962a) created a new subgenus *Srivastavanema* mainly on these two characters. Accordingly, the single most important character which separates the subgenera is the comparative length of the spicules: in *Longistriata* they are said to be '... more than 2-3 times as long as width of body', in *Brevispiculoides* '... less than 2-3 times as long as body width', though Ortlepp had said that it had '... short spicules where length is only about twice the body width'. In *Srivastavanema* they are about six times as long as the body width.

The ratio between the spicule length and body width of the various species is not a well-defined character, for body width may mean the maximum breadth of the parasite or the breadth of the body immediately anterior to the bursa as presumed by Mawson (1961), and may include the inflated cuticle also. This ratio shows a gradation between the various species, and hence the character is of little value by itself even in separating the individual species,

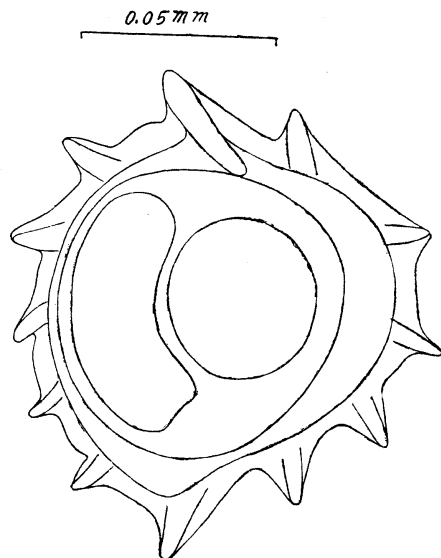


FIG. 3. *Longistriata indica* n. sp. Female, transverse section through posterior region of body.

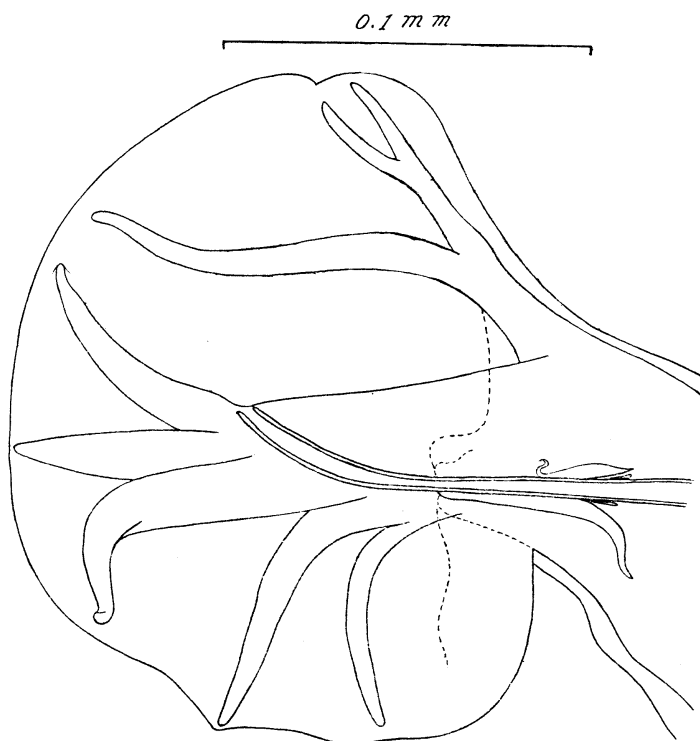


FIG. 4. *Longistriata indica* n. sp. Male, bursa, lateral view.

leave alone the subgenera. Moreover, Mawson (1961) found considerable variations in this index in a population of the same species. She used the following characters for grouping (see her Fig. 1) the various species of the genus (without assigning them to any subgenera): comparative length of dorsal ray, symmetry of bursa, and the presence and symmetry of alae.

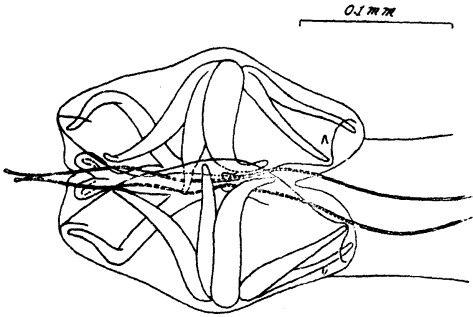


FIG. 5. *Longistriata indica* n. sp. Male, bursa, ventral view.

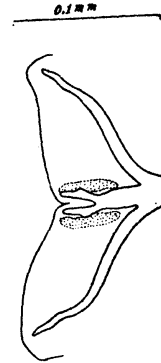


FIG. 6. *Longistriata indica* n. sp. Male, dorsal rays of bursa, dorsal view.

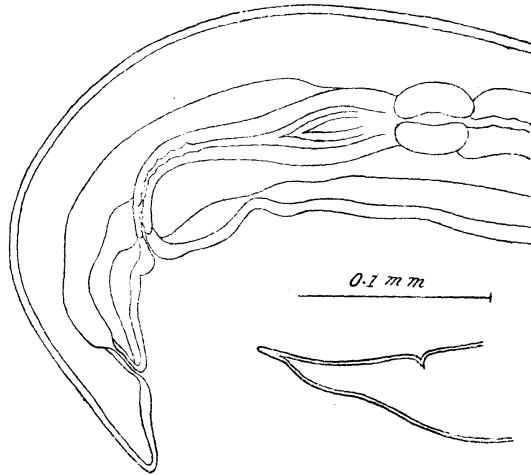


FIG. 7. *Longistriata indica* n. sp. Female, posterior end, lateral view.

(N.B.—Figs. 1–7 drawn with the aid of camera lucida).

According to her system, for example, *epsilon*, *capensis*, *cristata*, *pusillaspirura* and *adunca* belong to one assemblage though their spicule length/body width index varies from 1.7 in *epsilon* to 7.1 in *cristata*. Unfortunately, the characters selected by her are either equally unreliable or difficult to determine categorically. It is, therefore, proposed to suppress all the subgenera and for

the present all the species are included under the genus *Longistriata*, without dividing it into any subgenera.

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#### REFERENCES

- Chabaud, A. G., Rausch, R. L., and Desset, M. G. (1963). Nematodes parasites de Rongeurs et Insectivores Japonais. *Bull. Soc. zool. Fr.*, 87, 489-512.
- Desportes, C., and Chabaud, A. G. (1961). Deux Trichostrongyloides parasites de Musaraignes a Richelieu (Indre et Loire). *Annls Parasit. hum. Comp.*, 36, 402-408.
- Diaz-Ungria, C. (1963). Nematodes parasites, nouveaux ou interessants, du Venezuela. *Annls Parasit. hum. Comp.*, 38, 893-913.
- Dikmans, G. (1946). A new nematode, *Longistriata caudabullata* n. sp. (Nematoda, Vianiinae), from the short-tailed shrew, *Blarina brevicauda*. *Proc. helm. Soc. Wash.*, 13, 14-16.
- Lyubarskaya, O. D. (1962). The nematode fauna of *Neomys fodiens*. *Zool. Zh. Ukr.*, 31, 833-839. (In Russian).
- Mawson, P. M. (1961). Trichostrongyles from rodents in Queensland, with comments on the genus *Longistriata* (Nematoda: Heligmosomatidae). *Aust. J. Zool.*, 9, 791-826.
- Ortlepp, R. J. (1939). South African helminths. Part VI. Some helminths, chiefly from rodents. *Onderstepoort. J. Vet. Sci. Anim. Ind.*, 12, 75-101.
- Petrov, A. M., and Sadikhov, I. A. (1959). *Longistriata (Brevispiculoides) myopotami* n. sp. from the intestine of *Myopotamus coypus* in Azerbaidzhan. *Dokl. Akad. nauk zaerb. SSR*, 15, 725-729. (In Russian).
- Singh, K. S. (1962a). Parasitological survey of Kumaun Region. Part II. *Longistriata longispicularis* n. sp. (Heligmosomidae: Trichostrongyloidea: Nematoda) from a flying squirrel. *Indian J. Helminth.*, 14, 24-30.
- (1962b). Parasitological survey of Kumaun Region. Part XI. Four nematodes from the rat, *Rattus norvegicus*. *Indian J. Helminth.*, 14, 98-111.
- Skrjabin, K. I., Shikhobalova, N. P., and Schulz, R. S. (1954). Principles of nematodology. Edited by K. I. Skrjabin. Vol. IV. Dictyocaulidae, Heligmosomatidae and Ollulanidae of animals. (In Russian) Moscow: *Izdat. Akad. nauk SSR*, 1-323.
- Stoll, N. R. (Chairman) (1961). International Code of Zoological Nomenclature adopted by the XVth International Congress of Zoology. *Int. Trust Zool. Nomenclature, London*, 1-176.
- Thomas, R. J. (1953). On the nematode and trematode parasites of some small mammals from the Inner Hebrides. *J. Helminth.*, 27, 143-168.
- Travassos, L. (1937). Revisao da familia Trichostrongylidae Leiper, 1912. *Monografias Inst. Oswaldo Cruz*, 1, 1-512.
- Travassos, L., and Darriba, A. (1929). Notas sobre *Heligmosominae*. *Sci. Med.*, 7, 432.
- Yamaguti, S. (1935). Studies on the helminth fauna of Japan. Part 13. Mammalian Nematodes. *Jap. J. Zool.*, 6, 433-457.
- (1961). *Systema Helminthum*. Vol. III. The Nematodes of Vertebrates. Parts 1 and 2, 1-1261. New York-London, Interscience Publishers.