

Helminth Fauna of the Amami Islands, Japan
1. *Globocephalus longemucronatus* from a Wild Rat
***Diplothrrix legata* (Nematoda: Strongylidae)**

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This report deals with the morphology of *Globocephalus longemucronatus* (Mollin, 1861) from the small intestine of a wild rat *Diplothrrix legata*, which has an endemic distribution on Okinawa Island in the Okinawa Islands and on Amami-ohshima and Tokunoshima islands in the Amami Islands. The nematode species commonly occurs in swine of the southeastern parts of Asia.

Materials and Methods

We obtained a specimen of the wild rat *Diplothrrix legata* (Thomas) from the intestine of a yellow green habu snake *Trimeresurus flavoviridis*, which had been preserved in formalin at the Habu Ecological Institute belonging to the Nase Health Center in Amami-ohshima Island. From the small intestine of the rat specimen we obtained 3 males and 11 females of a strongylid nematode. All the nematode specimens were refixed in 4% formalin and then cleared in a diluted lacto-phenol solution. All the figures were drawn with the aid of a camera lucida.

Description

The nematodes small but moderately thick. Table 1 shows the measurements of different parts of body. Cuticle very thick and has conspicuous transverse striations. Well developed buccal capsule sub-infundibular or "balloon-shaped" and has thick wall. One or two annual chitinous thickenings present around oral aperture and supported by four "ribs". Oral aperture directed anterodorsally and has no denticles on its margin. Two triangular subventral buccal lancets weakly developed or rudimentary, so not clearly observed. Dorsal groove (gutter) of buccal capsule distinct and long, and almost reaches the margin of oral aperture, so the duct of esophageal gland opens near oral edge. Esophagus long and subcylindrical, and slightly dilated in the posterior half; three suboval valves present at the posterior end of esophagus. Nerve ring observed near the middle of esophagus. A pair of cervical papillae situated on the lateral side of body at a short distance behind nerve ring, protruding on cuticular surface and directed posterolaterally.

Male: In general, males smaller than females. Copulatory bursa consists of three lobes: two well-developed subtriangular

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Table 1 Measurements in mm of *G. longemucronatus* from *Diplothrix legata* (means)

| | Male | Female |
|--|-------------------------|---------------------|
| Body length | 3.40—5.40(4.70) | 3.80—6.00(5.61) |
| Body width | 0.25—0.30 | 0.32—0.36 |
| Buccal capsule* | 0.18—0.20×0.20—0.13 | |
| Distance | | |
| from head end to esophagointestinal junction | 0.40—0.90(0.60) | 0.80—1.10(0.90) |
| from head end to cervical papillae | | 0.30—0.60 |
| from head end to nerve ring | | 0.45—0.49 |
| from head end to vulva | | 2.40—4.00(3.34) |
| Width of esophagus | 0.15—0.17 | 0.17—1.21 |
| Tail length of female | | 0.73—0.75 |
| Vulva divides body length in ratio of | | 1.25—2.10(1.63) : 1 |
| Spicule | 0.60—0.67 | |
| Uterine eggs | 0.063—0.067×0.040—0.042 | |

* Measured laterally.

laterals and one small dorsal, and the dorsal not clearly discriminated from the laterals. A pair of prebursal papillae observed anterior to genital cone.

Lateral and ventral rays have a common trunk. The trunk branches into three lateral rays almost at the same level, and lateral rays slightly diverge toward the margin of bursa; of all the lateral rays the antero-lateral shortest. The common trunk gives rise to the ventral ray near the base; the ray further cleft into the latero-ventral and the ventro-ventral for about half of the length. The externolateral ray branches off from the dorsal ray about the midway. The dorsal ray divided into two branches, each of which further branches into three finer ones.

Spicules fine, almost equal in length or the right slightly longer than the left, provided with transverse fine annular striations except in their apical and proximal parts and curved at the tip. Gubernaculum elongate in shape, but not clearly defined in ill-fixed male specimens.

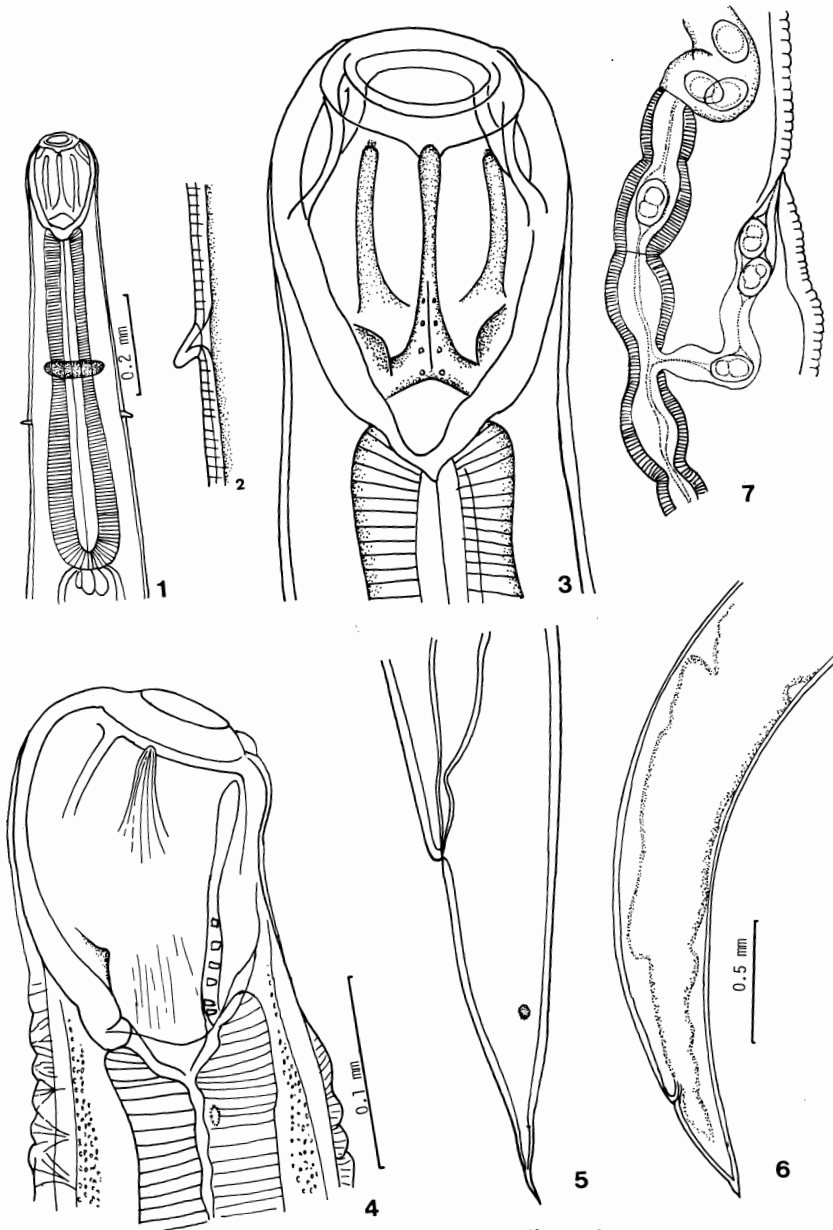
Female: Female reproductive system amphidelphic. Vulva opens at the level of about anterior two-thirds of body in average. Caudal end of body tapers distally and

occasionally terminated in a conical spike. Anus opens at some distance anterior to caudal end. Uterine eggs oval and thin-shelled, contain segmented cells, and measure 0.063—0.067×0.040—0.042 mm.

Discussion

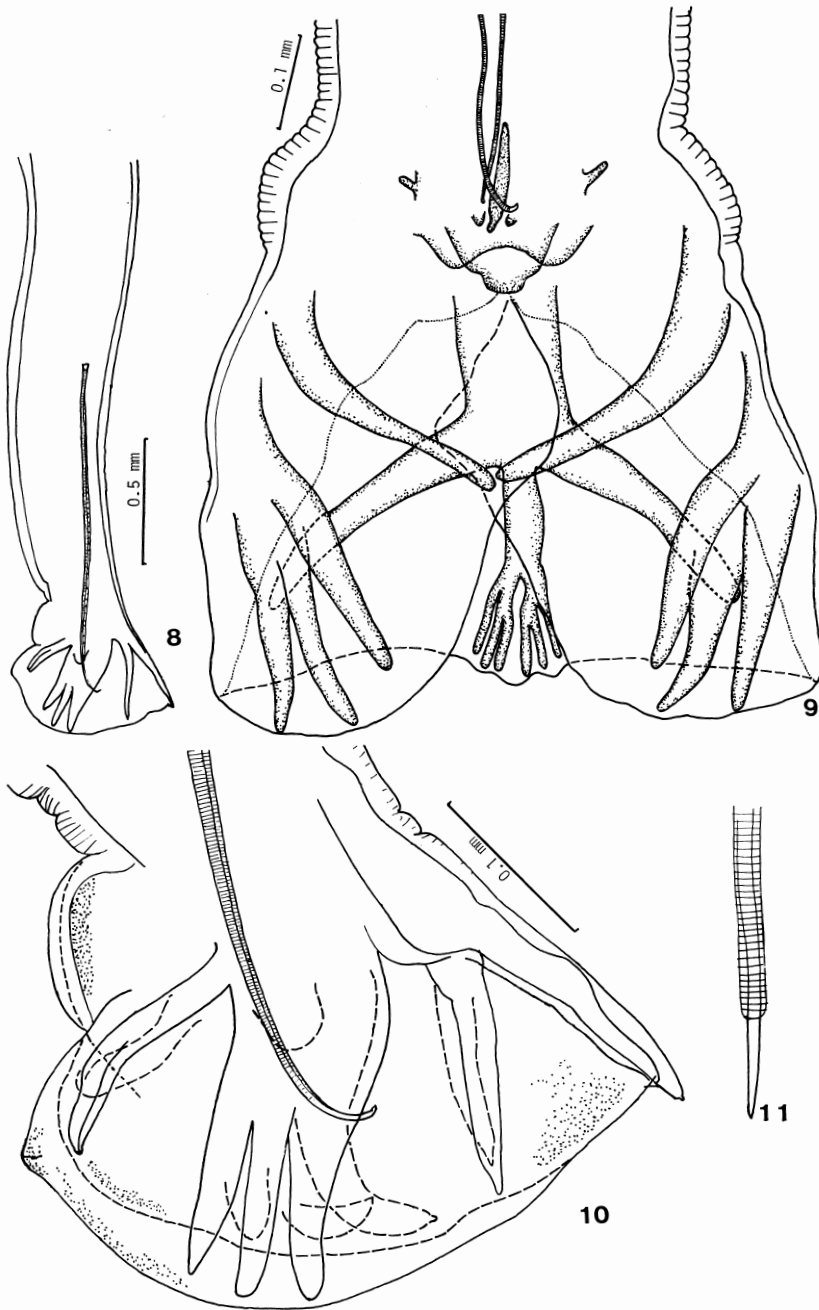
Popova (1955) listed seven species of *Globocephalus* with a doubtful species of *G. ciurcai* from a salmonoid fish, but he excluded *Characostomum asmilium* Railliet, Henry and Joyeux, 1913 from monkeys, which had been included in the genus *Globocephalus* by Yamaguti (1954), because of the absence of armament within the buccal capsule. Yamaguti (1954) described another species *G. simiae* from the small intestine of macaques at Macassar (Makassar) in Celebes Island.

The present specimens were identified as *G. longemucronatus* by the morphological features such as the shape of buccal capsule and subventral buccal lancets (teeth), the distribution of bursal rays and the length of dorsal groove (gutter) in buccal capsule and spicules. The measurements of the present specimens were almost identical with those of *G. longemucronatus* by Yama-



Explanation of Figures

- Fig. 1 Anterior part of body, showing esophagus, nerve ring, cervical papillae and suboval valves.
 Fig. 2 Cervical papilla.
 Fig. 3 Buccal capsule, dorsal view.
 Fig. 4 Buccal capsule, lateral view.
 Fig. 5 Female tail.
 Fig. 6 Posterior part of female.
 Fig. 7 Vulva and terminal part of female genital system.



Explanation of Figures

- Fig. 8 Posterior part of male.
 Fig. 9 Copulatory bursa of male, ventral view.
 Fig. 10 Copulatory bursa of male, ventral view.
 Fig. 11 Apical part of spicule, showing fine annular striations.

guti (1935). The ratio of head end-vulva to vulva-tail end distance was an average of 1.63 : 1 in the present female specimens and was 1.67–1.7 : 1 in *G. longemucronatus* from *Sus leucomystax* and *Sika nippon* by Yamaguti (1935). The difference in the ratios by us and Yamaguti (1935) may come from that in host species and also from the ill-fixed female specimens used by us.

The related species to *G. longemucronatus* are *G. amucronatus*, *G. connorfilli*, *G. urosubulatus* and *G. simiae*. The shape of buccal capsule is sub-infundibular or "balloon-shaped" in *G. longemucronatus*, *G. simiae* and *G. connorfilli*, while those of *G. amucronatus* and *G. urosubulatus* are subglobular. Smit and Ihle (1928) showed the buccal capsule of *G. amucronatus* to be elongate in their figures but Shoho and Machida (1979) delineated the buccal capsule to be subglobular. *G. similiae*, which was described by Yamaguti (1954) from the small intestine of macaques in Macassar, is very akin to *G. longemucronatus* and differs only in the greater length of body and spicule, the presence of several small horn-like projections on the genital cone and the ventral ray cleft to the base. The difference in body length may be caused by that of host species, so *G. similiae* might be synonymous with *G. longemucronatus*. *G. connorfilli* also can be discriminated from *G. longemucronatus* by the shorter spicules (about one half of those of *G. longemucronatus*) and the shorter dorsal groove (gutter) of buccal capsule which does not reach the oral edge. *G. amucronatus* can be sharply discriminated from *G. longemucronatus* by means of a long, stout common trunk which directed posteriorly (Smit and Ihle, 1928) and the subglobular buccal capsule.

Three species of the genus *Globocephalus* were reported in Japan: *G. longemucronatus* from the wild boar *Sus leucomystax* (Yamaguti 1935, Shiota *et al.* 1976) and the spotted deer *Cervus nippon* (Yamaguti 1935) in Kyoto, *G. amucronatus* from the wild

boar *Sus riukiuanus* in Iriomote Island (Shoho and Machida, 1979), and *G. samoensis* from the wild boar *Sus leucomystax* and the spotted deer in Kyoto (Yamaguti, 1935). All the hosts reported for the genus *Globocephalus* are mammals except for a salmonoid fish host of a doubtful species *G. ciurcai*. The mammalian hosts include domestic pigs, wild boars, otters, monkeys, spotted deer and marsupials. Recently, Singh and Chee-Hock (1971) reported a wild rat *Rattus sabanus* as a host of *G. connorfilli* in Malaya, and the present report will be the second on murine hosts of the genus. Consequently, the host species of *G. longemucronatus* are the domestic pig *Sus scrofa domestica*, wild boar *Sus leucomystax*, spotted deer *Cervus nippon* and a wild rat *Diplothrix legata*.

Summary

We described *Globocephalus longemucronatus* (Mollin, 1861) from the wild rat *Diplothrix legata* on Amami-ohshima Island in the Amami Islands and compared the nematode species with others of the genus. *D. legata* is the second murine host of the genus *Globocephalus*.

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奄美群島の蠕虫相

1. ケナガネズミ *Diplothrix legata* より得られた 線虫 *Globocephalus longemucronatus*

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沖繩島, 徳之島, 奄美大島特産のケナガネズミの小腸より円虫科 Strongylidae の *Globocephalus longemucronatus* が得られた。本線虫は豚の寄生虫として東南アジアに広く分布するが, わが国ではイノシシとシカから記録されている。本属の線虫の宿主としてネ

ズミ類が報告されたのはマラヤにおける *G. connorfilli* の宿主としての *Rattus sabanus* だけであって, 本報告は第2報と思われる。本報告では形態的特徴を記述するとともに, 近似種との差異を検討した。