Three Species of *Crassicauda* (Nematoda, Spirurida) from Cetaceans in Japanese and Adjacent Waters

By

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**Abstract** Three species of the genus *Crassicauda* (Nematoda, Spirurida) were obtained from cetaceans in Japanese and adjacent waters: *C. boopis* from the blubber of *Phocoenoides dalli*, *C. giliakiana* from the kidney of *Berardius bairdi*, and *C. grampicola* from the nasal cavity and air sinus of *Grampus griseus*. They are briefly redescribed and discussed.

This report deals with three species of the genus *Crassicauda* from cetaceans in Japanese and adjacent waters: *C. boopis* from the blubber of *Phocoenoides dalli*, *C. giliakiana* from the kidney of *Berardius bairdi*, and *C. grampicola* from the nasal cavity and air sinus of *Grampus griseus*. The cetaceans were incidentally caught by salmon gill-nets or caught by commercial whalers. Morphological and taxonomical descriptions of *Crassicauda* species have not been made from Japanese waters.

Most nematodes were preserved in 5% formalin and cleared in Gater’s solution. Some were dehydrated with alcohol series, dried by critical point drying method with liquid CO₂ and examined in a SEM (JEOL-T 220). The specimens are deposited in the National Science Museum, Tokyo (NSMT).

Our special thanks are due to Prof. N. MIYAZAKI of Tokyo University and Prof. K. SHIMAZAKI of Hokkaido University for giving us opportunities to examine the cetacean parasites.
Order Spirurida
Family Crassicaudidae

*Crassicauda boopis* Baylis, 1920

(Figs. 1–6)

*Material examined.* Some mature male and female fragments from blubber of *Phocoenoides dalli* (Phocaenidae) caught in the northern North Pacific in 1987 (NSMT-As 2324, 2326, 2327 & 2330).

*Description.* Mouth opening a dorsoventral slit, with two small lateral lips, each of them bearing a prominent papilla-like projection. Four submedian cephalic papillae and two lateral amphids. Buccal cavity 0.12–0.13 mm long, with well developed chitinous wall, compressed laterally. Esophagus composed of two portions: the anterior muscular and the posterior glandular. Anterior esophagus 1.24–1.73 mm long. Nerve ring, cervical papillae and excretory pore 0.33–0.42 mm, 0.52–0.54 mm and 0.45–0.58 mm from head end, respectively.

*Male.* Caudal end coiled spirally. Caudal papillae 10 pairs. Spicules absent. Tail 0.60 mm long.

*Female.* Caudal end knob-shaped, with a distinct genital constriction. Vulva and anus 2.08 mm and 0.23 mm from tail end, respectively. Eggs thick-shelled, lar-
vated, 52–58 × 33–35 μm.

Remarks. Walker (1987) revealed geographic variation in incidence of Crassicauda sp. in the blubber of Phocoenoides dalli in the northern North Pacific and Bering Sea, but he did not identify the Crassicauda species. Our fragment specimens are most similar to C. boopis in the number of caudal papillae in the male, but our observation is based on several anterior, one male and one female posterior portions. We are provisionally placing our specimens in C. boopis, and they can be placed in its proper position when adequate material is examined.

Crassicauda giliakiana Skrjabin et Andreeva, 1934

(Figs. 7–15)


Description. Anterior portion intricately coiled in the nodule developed in the renal tissue of the host and the remaining portion lying free within the renal ductwork. Some individuals in permanent copulation, with male winding the caudal end round female genital constriction.

Anterior end narrow, somewhat compressed laterally. Mouth opening a dorsoventral slit, with two lateral lips, each of them has a papilla-like projection. Four submedian cephalic papillae and two lateral amphids. Buccal cavity 0.16–0.19 mm long, with well developed chitinous wall, compressed laterally. Esophagus composed of two portions: the anterior muscular 1.11–1.89 mm long and the posterior glandular more than 13.1 mm long. Nerve ring, cervical papillae and excretory pore 0.27–0.32 mm, 0.33–0.40 mm and 0.34–0.40 mm from head end, respectively.

Male. Caudal end coiled spirally. Caudal papillae 7–8 pairs; 3 pairs preanal

and 4–5 pairs postanal. A pair of phasmids near tail end. Spicules very small, almost similar in shape and size, 0.09–0.13 mm long. Tail 1.16–1.54 mm long.

**Female.** Caudal end knob-shaped, with a distinct genital constriction. Vulva opening ventrally on anterior margin of genital constriction, 3.39–4.18 mm from tail end. A pair of phasmids near tail end. Anus 0.52–0.62 mm from tail end. Eggs thick-shelled, larvated, 48–53 × 30–33 µm.

**Remarks.** In the genus *Crassicauda*, *C. crassicauda* (Creplin, 1829), *C. giliakiana* Skrjabin et Andreeva, 1934, and *C. anthonyi* Chabaud, 1962, have spicules in the male. *Crassicauda crassicauda* is distinguishable from the other two by having larger spicules. The other features such as cervical or cephalic structure or caudal structure in the female are almost the same among *Crassicauda* species. *Crassicauda anthonyi* and *C. giliakiana* may be conspecific because they resemble each other except for body length and host.

The swelling in the anterior portion of body varies among individuals and sometimes it looks like degenerated. It seems to be caused by host reaction during the stay in the nodule.

There appears to be a misprint in the original description: the location of the anus in the female, as illustrated, should be 0.5 mm rather than 0.05 mm from the tail end, as given in the text.
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**Crassicauda grampicola** Johnston et Mawson, 1941  
(Figs. 16–24)

*Material examined.* Multiple mature male and female fragments, a complete immature male and a complete immature female from nasal cavity and air sinus of *Grampus griseus* (Grampidae) caught off Taiji, Pacific coast of southern Japan (XI–1990; NSMT–As 2339, 2343, 2347 & 2350).

*Description.* Anterior portion of body intricately coiled in the nodule developed
Table 1. Dimensions of *Crassicauda grampicola* in comparison to those by RAGA.

<table>
<thead>
<tr>
<th>Author</th>
<th>Present authors</th>
<th>RAGA (1987)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Multiple mature male and female fragments</td>
<td>Complete immature male</td>
</tr>
<tr>
<td>Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body (mm)</td>
<td>96.0</td>
<td>79.0</td>
</tr>
<tr>
<td>Buccal cavity</td>
<td>0.13–0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>Total esophagus</td>
<td>9.53</td>
<td>11.24</td>
</tr>
<tr>
<td>Anterior esophagus</td>
<td>1.00–1.59</td>
<td>1.23</td>
</tr>
<tr>
<td>Posterior esophagus</td>
<td>8.30</td>
<td>10.00</td>
</tr>
<tr>
<td>Tail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>0.69–0.79</td>
<td>0.57</td>
</tr>
<tr>
<td>female</td>
<td>0.20–0.30</td>
<td></td>
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<tr>
<td>From head end</td>
<td></td>
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<tr>
<td>Nerve ring</td>
<td>0.36–0.37</td>
<td>0.27</td>
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<tr>
<td>Cervical papillae</td>
<td>0.42–0.46</td>
<td>0.59</td>
</tr>
<tr>
<td>Excretory pore</td>
<td>0.49–0.52</td>
<td>0.54</td>
</tr>
<tr>
<td>Caudal papillae (pairs)</td>
<td>11–15</td>
<td>15</td>
</tr>
<tr>
<td>From tail end</td>
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<tr>
<td>Vulva</td>
<td>1.57–3.18</td>
<td>1.30</td>
</tr>
<tr>
<td>Eggs (μm)</td>
<td>40–48 × 28–30</td>
<td>40–45 × 28–30</td>
</tr>
</tbody>
</table>

in the mucosa of pterygoid sinus and the remaining portion lying free in the nasal cavity or air sinus of the host. Some individuals in permanent copulation, with male winding the caudal end round female genital constriction. The swelling in anterior portion of body not observed in the immature specimens.

General features are the same as the above, *C. giliakiana*.


The measurements are shown in Table 1 in comparison to those by RAGA (1987).

**Remarks.** We place our specimens in *C. grampicola* because they possess 11–15 pairs of caudal papillae in the male.

In our specimens, the convoluted anterior portion was enveloped by thick connective tissue in the mucosa of the pterygoid sinus, and the pterygoid bone was more or less eroded. The erosion of pterygoid bone caused by *Crassicauda* has been reported by many authors (Robineau, 1975; Dailey & Stroud, 1978; Raga et al., 1982; etc.). Our observation showed that the worm did not break through the thick nodule to invade the brain of the host.
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References


