

278
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PARASITIC
NEMATODA AND ACANTHOCEPHALA
COLLECTED IN 1925-1927

By
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CONTENTS

NEMATODA

| | |
|------------------------------|-----------------|
| Ascaridae | <i>page</i> 543 |
| Heterakidae | 550 |
| Trichostrongylidae | 550 |
| Philometridae | 550 |
| Spiruridae | 550 |
| Cucullanidae | 553 |

ACANTHOCEPHALA

| | |
|-----------------------------|-----|
| Echinorhynchidae | 555 |
| Rhadinorhynchidae | 557 |

PARASITIC NEMATODA AND ACANTHO- CEPHALA COLLECTED IN 1925-1927

By H. A. Baylis, M.A., D.Sc.

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Figures 1-16

THE present report deals with the earliest consignments of material belonging to these two groups obtained during the Discovery investigations, which were kindly submitted to the writer by Dr S. W. Kemp for determination. It is hoped that it may be followed by other reports from time to time, as further material is accumulated. The period now covered is approximately the same as that covered by the Station List for 1925-1927 (*Discovery Reports*, 1, pp. 1-140), in which the localities indicated only by letters and numbers will be found.

The collection is of considerable interest, including as it does at least five species of Nematoda and three of Acanthocephala which appear to be new to science, and throwing new light also on the distribution of many other forms in Antarctic and Sub-antarctic regions. Almost all the material was admirably preserved, and the members of the expedition are to be congratulated upon their success in dealing, often under very trying conditions, with these difficult groups.

NEMATODA

Order ASCAROIDEA

Family ASCARIDAE Sub-family ANISAKINAE

Anisakis similis (Baird, 1853)

This species occurred in large numbers in the stomach of a sea-elephant (*Mirounga leonina*) at North Bay, Ice Fjord, South Georgia, March 1926.

Anisakis typica (Diesing, 1860)

Two females and several larvae from the stomach of a dolphin (*Lagenorhynchus obscurus*), taken off South-west Africa, north of Saldanha Bay, are referred to this species.

Anisakis physeteris (Baylis, 1823)

This species was collected on three occasions from the stomachs of sperm whales (*Physeter catodon*). Localities: Durban, July 30, 1926; Saldanha Bay, South Africa, August 10, 1926; South Georgia.

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Anisakis catodontis, sp. n.

(Fig. 1)

Among specimens of *A. physeteris* in the stomach of a sperm whale (No. 932) at Saldanha Bay, South Africa (August 10, 1926), there were a single mature male and several immature forms of a different species.

The male is about 80 mm. in length and 1.3 mm. in thickness. The cuticular striations are coarse in the oesophageal region, where the interval between them is about 0.05 mm. In the middle region of the body, however, they are much finer, the interval being about 0.0075 mm. Each lip has a broad base and a narrow anterior lobe, deeply indented in the middle and provided with a prominent dentigerous ridge composed of coarse and irregular teeth. The oesophagus (measured from the extremity of the lips and excluding the ventriculus) is 4.5 mm. long. Its greatest thickness (near the posterior end) is 0.39 mm. The ventriculus is straight, and measures about 1.7 mm. in length and 0.4 mm. in greatest width (at its posterior end). The nerve-ring is situated at 0.6 mm., and the cervical papillae at 0.75 mm., from the anterior end.

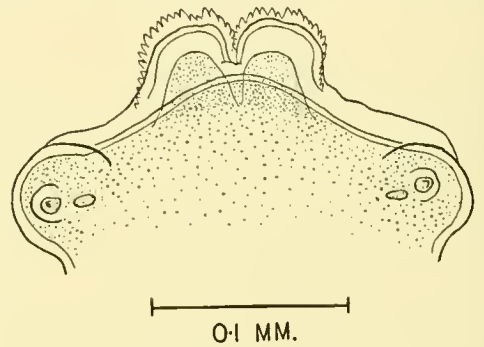


Fig. 1. *Anisakis catodontis*. Dorsal lip of male, external aspect.

The tail is bluntly conical and measures 0.25 mm. in length. It has only been possible to examine it in lateral view, and only a single pair of postanal papillae was observed. This was situated near the posterior end. There are numerous preanal papillae, arranged irregularly and extending forward for a considerable distance. The spicules are tubular and without alae. The left spicule measures 2.25 mm., the right 1.45 mm. in length. Their dorso-ventral diameter is about 0.03 mm.

The immature specimens measure up to about 47 mm. in length and 0.9 mm. in maximum thickness, and show the same oesophageal structure as the adult male.

Anisakis sp.

Several immature specimens of a species of *Anisakis* occurred in [the stomach of ?] a humpback (*Megaptera nodosa*) at Durban, July 29, 1926.

Porrocaecum falklandicum, sp. n.

(Fig. 2)

A pair of specimens, male and female, collected from a dotterel (*Eudromias (Zonibyx) modestus*) at Port Stanley, Falklands, March 28, 1927. This species is very closely related to *P. ensicaudatum* (Zeder, 1800) and *P. semiteres* (Zeder, 1800) from European birds. The male is 13.7 mm. long and 0.7 mm. thick, the female 23.5 mm. and 1.2 mm. respectively. The cuticular striations (in the female) are at intervals of about 0.017 mm.

The pulp of each lip has a pair of outwardly and posteriorly directed processes at its anterior corners, as in the other species mentioned. There are well-developed interlabia. The length of the oesophagus (including the ventriculus) is about 1.9 mm. in the male and 2.75 mm. in the female. The sub-globular ventriculus is about 0.2 mm. long in the male and 0.3 mm. in the female, while the intestinal caecum measures about 0.6 and 1 mm. respectively. The nerve-ring is situated at 0.42 mm. from the anterior end in the male, and at about 0.65 mm. in the female. Well-developed cervical alae are present, the species resembling in this respect *P. semiteres* rather than

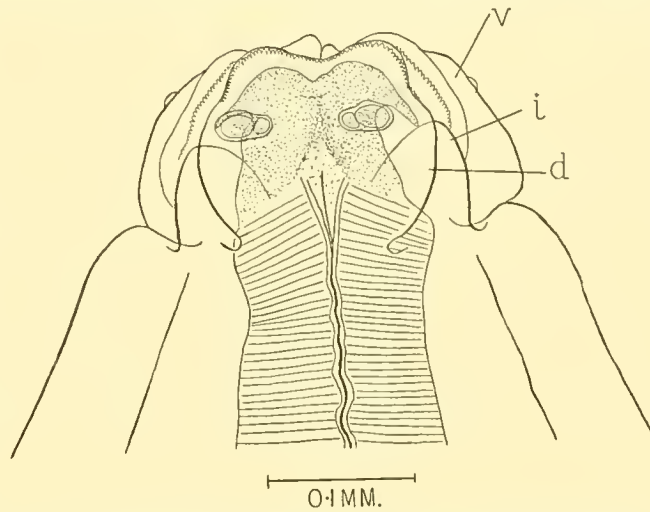


Fig. 2. *Porrocaecum falklandicum*. Anterior end of female, dorsal view. *d.*, dorsal lip; *i.*, interlabium; *v.*, ventro-lateral lip.

P. ensicaudatum.

The tail is conical in both sexes. In the male it is about 0.3 mm. long. There are apparently five pairs of very small postanal papillae (of which the most posterior but one is laterally situated) and some thirteen pairs of preanal papillae. The spicules are about 0.45 mm. long, and are apparently broadly alate, but they are retracted, and therefore difficult to see clearly. Their tips are blunt.

The tail of the female is 0.55 mm. long. The vulva is situated at 10.5 mm. from the anterior extremity. The eggs are ovoid and measure 0.1–0.11 mm. × 0.0675–0.07 mm.

Porrocaecum decipiens (Krabbe, 1878) (?)

A large number of larval forms of some species of *Porrocaecum*, probably *P. decipiens* ("*Ascaris capsularia*"), were collected on different occasions off South Georgia, the Falklands and the South Shetlands, from the peritoneum and mesenteries of various species of fish. The list of hosts is as follows:

| | |
|------------------------------------|--|
| <i>Chaenocephalus aceratus</i> | 10 collections; Stations 39, 45, 123, 149, 154, MS 68, etc |
| <i>Champscephalus esox</i> | Station WS 71 |
| <i>Merluccius</i> sp. | 3 collections; Stations WS 73, 77 |
| <i>Notothenia rossii</i> (?) | Station 174 |
| <i>Notothenia wiltoni</i> | Station WS 86 |
| <i>Notothenia ramsayi</i> | Station WS 94 |
| <i>Parachaenichthys georgianus</i> | Grytviken, S. Georgia |
| "Large fish" | Station 142 |

These larvae were frequently accompanied by those of *Contraecum* sp. in the same host. This occurred in *Champscephalus esox*, *Merluccius* sp., *Notothenia wiltoni* and *N. ramsayi*. In such cases it is noticeable that the *Porrocaecum* larvae are much longer

and whiter than the *Contracaecum* larvae, and are usually coiled up like watch-springs in disc-shaped or lenticular capsules (see Fig. 3 A), whereas the *Contracaecum* larvae,

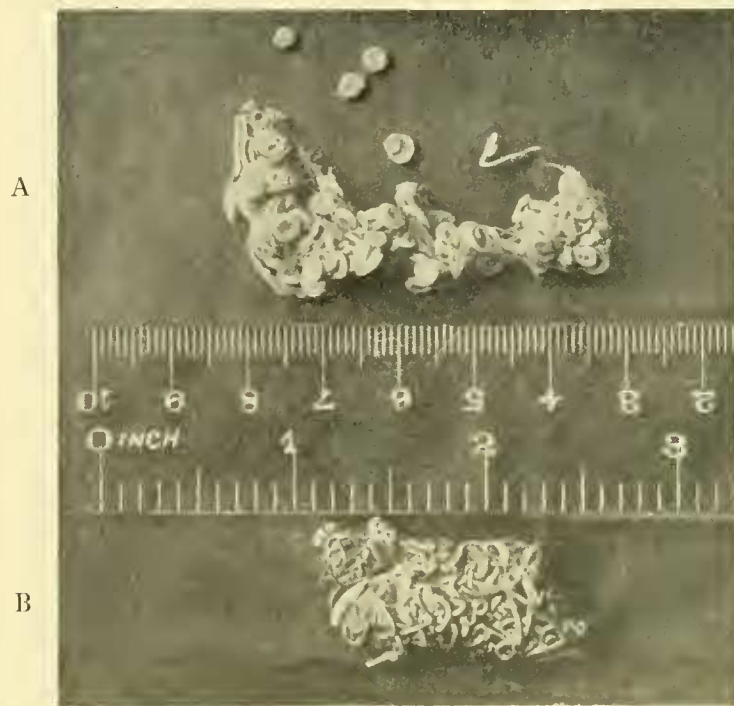


Fig. 3. A, part of a mass of *Porrocaecum* or *Anisakis* larvae from *Macruronus magellanicus*; B, part of a mass of *Contracaecum* larvae from *Notothenia wiltoni*.

though enclosed in sheaths consisting partly of old cuticles and partly of pigmented peritoneal tissue from the host, are not usually coiled.

Porrocaecum or *Anisakis* sp.

Larval forms having a ventriculus like that of the adults of these two genera, but without an intestinal caecum, occurred in similar situations in the following fishes:

| | |
|--------------------------------|---|
| <i>Gadus</i> sp. | Station WS 99, off the Falklands, together with <i>Contracaecum</i> larvae |
| <i>Cottoperca gobio</i> | Station WS 95, off the Falklands, together with <i>Contracaecum</i> larvae |
| <i>Coryphaena</i> sp. | Atlantic Ocean, 24° 05' N., 15° 46' W. |
| <i>Macruronus magellanicus</i> | A large mass of specimens, with which a few <i>Contracaecum</i> larvae were mixed. Station WS 92, off the Falklands |
| <i>Thyrssites atun</i> | Station 4, off Tristan da Cunha |

Two similar larvae, possibly of two species, were found in the stomach of a slender-beaked dolphin (*Steno rostratus*), taken in the Atlantic Ocean, off the West African coast not far from Cape Verde, October 27, 1925.

Contracaecum spiculigerum (Rud., 1809)

A large number of specimens of this extremely common and cosmopolitan species were collected from the stomach of a cormorant (*Phalacrocorax magellanicus*) at St Martin's Cove, Hermite Island, Cape Horn (Station 222).

Contracaecum clavatum (Rud., 1809)

Adult or immature specimens which are referred to this species were collected on about six occasions from the stomach or intestine of *Merluccius* sp. at various places off the Falkland Islands (Stations WS 73, 90, 96, 99).

These worms are rather small, as compared with specimens of *C. clavatum* from hake and cod in northern latitudes, and the males have shorter spicules, but a specific distinction does not seem justifiable.

A single small male, apparently of the same species, occurred in the intestine of *Stromateus* sp. at Station WS 78, and an immature specimen in the stomach of *Gadus* sp. at Station WS 99 (both off the Falklands).

Contracaecum rectangulum (v. Linstow, 1907)

A number of specimens of this species, of various ages, occurred among the stomach contents (chiefly Cephalopod remains) of a sea-leopard (*Hydrurga leptonyx*) in the South Sandwich region, January 22, 1928.

Immature forms, probably also of this species, were collected from the intestine of another sea-leopard at Station 184, March 15, 1927, and from the stomach of a crab-eater seal (*Lobodon carcinophagus*) at Station 187, March 18, 1927. Both these stations were in the Palmer Archipelago.

Contracaecum zenis, sp. n.

(Fig. 4)

Four adult females from *Zeus capensis* off South-west Africa, July 8, 1927. The worms are stated to have been found in the body-cavity, but had probably escaped from the alimentary canal. The length of the specimens varies between 55 and 70 mm., and the maximum thickness reaches 1.5 mm. The cuticular striations are fine (about 0.005 mm. apart). The dorsal lip has wide cuticular expansions laterally, and the anterior lobes of the pulp have inwardly-directed processes. There are deep incisions at the bases of the lips. The cervical alae are well developed. The oesophagus is 7 mm. long. The ventriculus measures, in the largest specimen, about 0.25 mm. in length and 0.3 mm. in width. In this specimen, the intestinal caecum extends forward to a point about 2.5 mm. from the anterior extremity, and the oesophageal appendix is about 2.3 mm. long. The cervical papillae are situated at 1.1 mm., and the nerve-ring at 0.9 mm., from the anterior

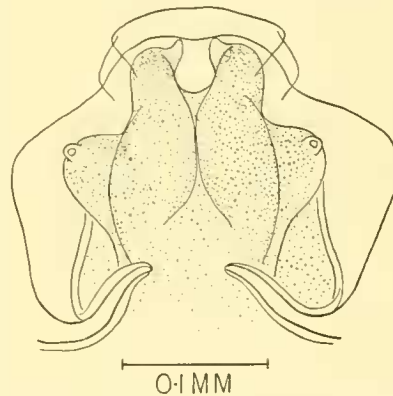


Fig. 4. *Contracaecum zenis*. Dorsal lip of female, external aspect.

end. The tail is 0.55 mm. long, conical and sharply pointed, and terminates in a small spike. The body is considerably thickened in the posterior half, to which the genital organs are confined. The vulva is situated at about the middle of the body, and the coils of the uterine branches and ovaries extend from this level to within about 2 mm. of the anus.

This species differs markedly from *C. fabri* (Rud., 1819), which occurs in *Zeus faber*, in the length of the intestinal caecum (see Baylis (1923 a), p. 5).

Contracaecum sp.

Some immature specimens of a species of *Contracaecum* occurred in the stomach of a fin whale (*Balaenoptera physalus*), at South Georgia, March 24, 1927.

Contracaecum spp.

Larval forms of undetermined species of *Contracaecum* were found very abundantly in various fishes, in the peritoneal lining and mesenteries, and more particularly on the surface of the liver. The list of hosts in which such larvae occurred is as follows:

| | |
|---|---|
| <i>Merluccius</i> sp. | Several collections, off the Falkland Islands; Stations WS 73, 76, 77, 80, 94 |
| <i>Champscephalus esox</i> | Off the Falklands; Station WS 71 |
| <i>Chaenocephalus aceratus</i> | Grytviken, S. Georgia |
| <i>Gadus</i> sp. | Off the Falklands; Station WS 99 |
| <i>Notothenia ramsayi</i> | Off the Falklands; Station WS 94 |
| <i>Notothenia wiltoni</i> | Several collections, off the Falklands; Stations WS 76, 77, 86 |
| <i>Cottopeca gobio</i> | 2 collections, off the Falklands; Stations WS 94 and 95 |
| <i>Parachaenichthys georgianus</i> | Stromness, S. Georgia |
| "Crocodile fish"—probably <i>Parachaenichthys georgianus</i> | 2 collections, off South Georgia |
| <i>Macruronus magellanicus</i> | Off the Falklands; Station WS 92 |

The general differences in appearance between these *Contracaecum* larvae and the *Porrocaecum* larvae with which they are often associated have already been noticed. The larvae of *Contracaecum* frequently occur in large, tangled masses (see Fig. 3 B), in which many of the individual worms, though enclosed in sheaths, do not appear to have been definitely confined in capsules to one spot, but may have had a certain power of movement.

The specimens from *Merluccius*, *Champscephalus* and *Chaenocephalus* appear probably to belong to one and the same species. Those from *Notothenia wiltoni* and *N. ramsayi* probably include more than one species.

Acanthocheilus quadridentatus (Molin, 1858)

(Figs. 5 and 6)

A single specimen (an immature female) taken from the stomach of *Mustelus vulgaris* at Simonstown, South Africa, October 18, 1926, is referred somewhat doubtfully to this species. Molin's (1858, 1861) description of *A. quadridentatus* is very brief, and his

figures are evidently very diagrammatic. He records the species from the small intestine of *Mustelus plebejus* (= *M. vulgaris*). Örley (1885 *a*) gives a somewhat fuller description of material from *M. vulgaris* and *M. laevis*, but this is unfortunately in Hungarian, and his German summary (1885 *b*) contains only the statements that the spicules of the male are short and slender, and that there are 16 pairs of caudal papillae.

The length of the present specimen is 24.5 mm., and its maximum thickness about 0.65 mm. The cuticular striations are too fine and faint to measure. The oesophagus is just over 2 mm. long, including a spherical, posterior, non-muscular ventriculus measuring 0.23 mm. in diameter. The muscular oesophagus proper is club-shaped. It

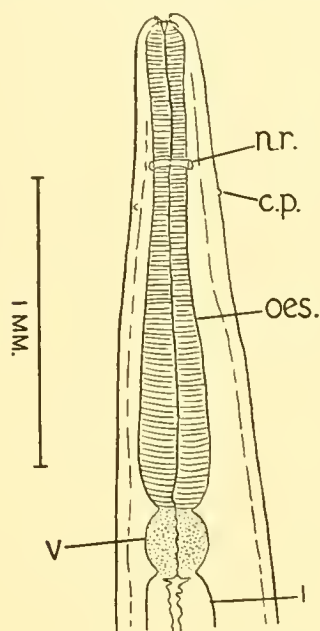


Fig. 5. *Acanthocheilus quadri-dentatus*. Anterior end of female, dorsal view. *c.p.*, cervical papilla; *i.*, intestine; *n.r.*, nerve-ring; *oes.*, oesophagus; *v.*, ventriculus.

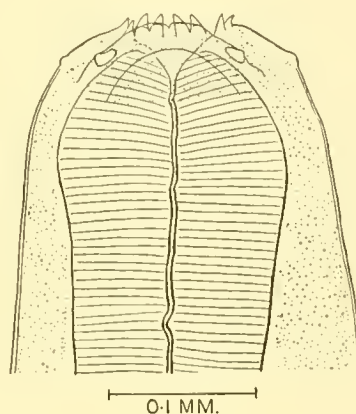


Fig. 6. *Acanthocheilus quadri-dentatus*. Anterior end of female, dorsal view.

is surrounded by the nerve-ring at 0.55 mm. from the anterior extremity. There is no intestinal caecum running forward by the side of the oesophagus, nor is such a structure mentioned by Molin or by Örley, though in another species, *A. nidifex* Linton, 1900, such a caecum is said to be present. At a point 0.67 mm. from the anterior end there is a pair of small, button-like cervical papillae. The excretory pore is probably close to the base of the ventro-lateral lips.

Molin describes each of the three lips as having a single median papilla, while Örley also appears to refer only to three cephalic papillae. In the present specimen the dorsal lip bears a pair of lozenge-shaped papillae, while on each ventro-lateral lip one such large papilla is present towards the ventral border. It is uncertain whether or not there is a smaller papilla near the lateral border. Each lip bears on its inner surface the

four sharp, forwardly-directed teeth mentioned in the earlier descriptions. These are not, however, arranged in two widely separated pairs, as in Molin's figures, nor is there a blunt, median projection between the two pairs of teeth, as indicated by Örley.

The tail is rapidly tapering and conical, with a minute terminal button. It is about 0.3 mm. long, and has a pair of small, sessile papillae at about its middle. The anus is conspicuous, but its lips are not very prominent. The vulva is situated at about 10 mm. from the anterior end. The vagina is stout and muscular, and runs posteriorly from the vulva. There are two uterine branches, which run parallel in a posterior direction. One of the ovarian tubes ends posteriorly, the other turning forward to end in the anterior region. No eggs are present in this specimen.

Family **HETERAKIDAE** Sub-family **HETERAKINAE**

Heterakis dispar (Schrank, 1790)

A few specimens of this species were collected from the rectum of an upland goose (*Chloëphaga magellanica*) at Teal Inlet, Falklands, March 5, 1927.

Order **STRONGYLOIDEA**

Family **TRICHOSTRONGYLIDAE** Sub-family **TRICHOSTRONGYLINAE**

Nematodirus spathiger (Railliet, 1896)

Numerous specimens of this species occurred in the small intestine of a sheep at Port Stanley, Falklands, March 9, 1927.

Order **FILARIOIDEA**

Family **PHILOMETRIDAE**

Philometra globiceps (Rud., 1819)

A single female worm, about 170 mm. long, found in the gonad of a Percoid fish at Station 274, off St Paul de Loanda, Angola, W. Africa, August 4, 1927, is doubtfully referred to this species. The characteristic swelling of the anterior end of the oesophagus is present, though not very pronounced. The oesophagus is almost exactly 1 mm. long. The colour of the worm, when fresh, was "red, with black centre".

Family **SPIRURIDAE** Sub-family **ACUARIINAE** (?)

Crassicauda crassicauda (Creplin, 1829)

A number of specimens of this species were collected from the penis of fin whale No. 796 (*Balaenoptera physalus*) at Saldanha Bay, South Africa, June 26, 1926.

Sub-family THELAZIINAE
Spinitectus guntheri, sp. n.
 (Figs. 7-9)

One male, three mature and two immature females of this form were found among a haul of fishes from a depth of 1000 metres at Station 86, off South-west Africa, June 24,

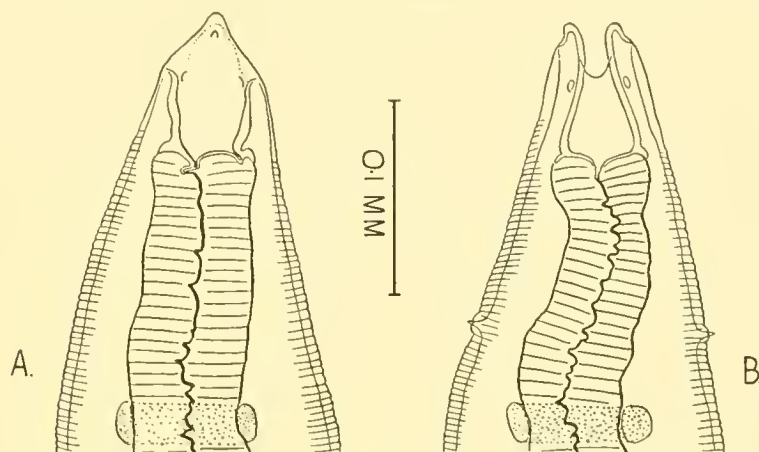


Fig. 7. *Spinitectus guntheri*. Anterior end of female: A, lateral view; B, dorsal view.

1926. It is probable that, as often happens with fishes brought to the surface from considerable depths, some of them had been so badly damaged as to allow the parasites to escape. It is unfortunately impossible to state from what species of fish they came.

The length of the male is 17.75 mm., that of the mature females varying between 19.8 and 23.3 mm. The body is slender in the oesophageal region, and much stouter in the posterior region, which contains the genital organs. The maximum thickness in the male (near the posterior end of the body) is 0.29 mm., in the female 0.45-0.5 mm. The oesophagus has an anterior, muscular portion which is usually much contracted and sinuous, and measures about 1-1.5 mm. in length, and a long, granular, posterior portion. The total length of the oesophagus is 6-8.1 mm. The cuticular striations are

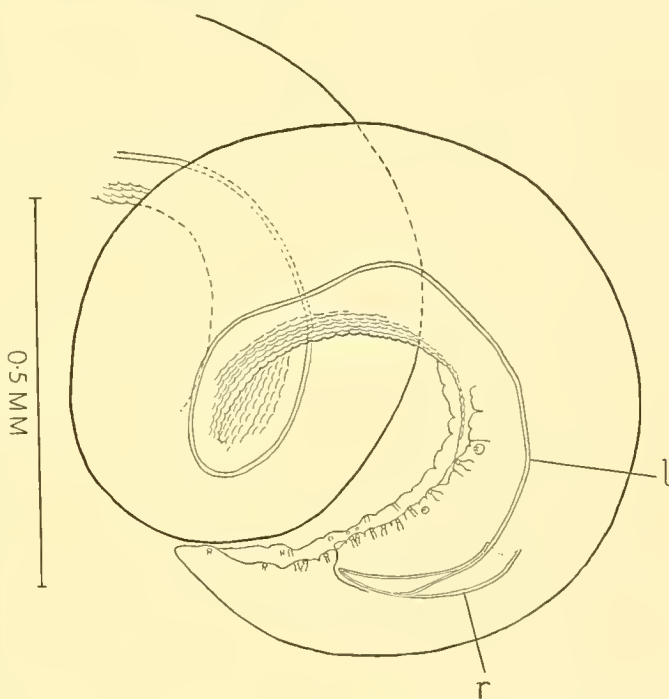


Fig. 8. *Spinitectus guntheri*. Posterior end of male, lateral view. L, left spicule; r., right spicule.

relatively coarse in the oesophageal region, where they have prominent posterior edges, giving the outlines of the body a saw-like appearance in optical section. The interval between the striations in this region is about 0.01 mm. in the male and 0.015 mm. in the female. More posteriorly the striations are much finer and less prominent. The cuticular spines which are so conspicuous a feature in other species of the genus, forming complete circles on the posterior edges of the cuticular rings, are here represented by very small spines confined to the ventral surface of part of the oesophageal

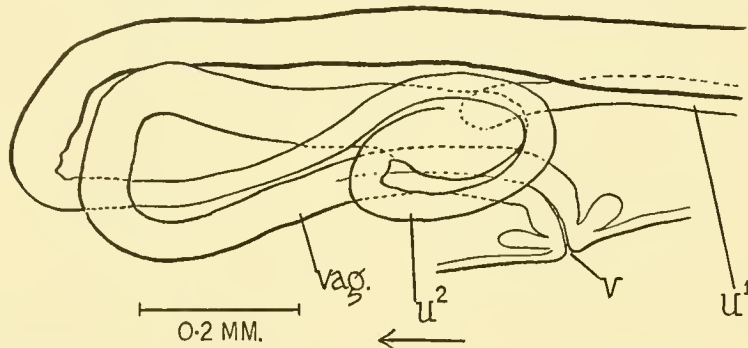


Fig. 9. *Spinitectus guntheri*. Part of the female genital organs, in lateral view. (The arrow points towards the anterior end.) u^1 , u^2 , the two uterine branches; v ., vulva; $vag.$, vagina.

region. They do not extend forward much beyond the level of the junction of the two portions of the oesophagus, or backward as far as its posterior end.

The paired lateral lips are conical, and each appears to be provided with three papillae, one near the apex and two at the base. The lateral walls of the buccal capsule are formed by a continuation of the thickened cuticle of the lips, while its dorsal and ventral walls begin at the level of their bases. There is a pair of prominent cervical papillae, situated, in the female, at about 0.17 mm. from the anterior extremity. The nerve-ring is situated at about 0.2–0.21 mm., and the excretory pore at about 0.25–0.29 mm., from the anterior end.

The posterior end of the male is spirally coiled. The tail is about 0.23 mm. long, and is conical. There are slight lateral alae, into which project ten pairs of preanal and five pairs of postanal papillae. The cuticle of the ventral surface, for some distance from the posterior end, is raised into numerous longitudinal series of rectangular plates or tubercles. These doubtless correspond to the more restricted number of rows of "plates", "tubercles" or "ridges" described in other species (four rows in *S. cristatus* Railliet and Henry, 1915 (= *Filaria serrata* Linton, 1901) and *S. ranae* Morishita, 1926; four to eight rows in *S. gracilis* Ward and Magath, 1916). The left spicule is long and filiform, measuring about 2.5 mm. in length. The right spicule is very stout and measures only about 0.25 mm. in length. There is no accessory piece.

In the female, the tail, which is rapidly tapering and pointed, is 0.23–0.27 mm. long. The vulva is situated at 6.2–6.7 mm. from the posterior end. The vagina runs forward at first from the vulva, but soon doubles back again, and at about the level of the vulva expands into a small oval swelling, which gives off at right angles to itself the two uterine

branches. One of these has a tendency to turn forward at first, but ultimately turns posteriorly parallel to the other. Both turn forward again at a short distance from the anus, and the ovaries lie in the prevulvar region. The eggs are small (0.04–0.045 mm. \times 0.025–0.03 mm.) and oblong-oval. They have thick shells, apparently without the polar filaments described for the genotype.

Owing to the absence of a full description of the genotype of *Spinitectus*, the systematic position of this genus is somewhat doubtful. If the present species is correctly assigned to *Spinitectus*, the detailed examination of it which it has been possible to make leaves little doubt that the genus belongs to the sub-family Thelaziinae, in an appendix to which it was placed by Baylis and Daubney (1926).

Family CUCULLANIDAE

Cucullanus fraseri, sp. n.

(Figs. 10 and 11)

This species occurred in the rectum of *Chaenocephalus aceratus* (four collections, including types) off South Georgia (Stations 45, 154, MS 68 and Grytviken), and of *Trematomus hansonii* (one collection, off South Georgia, Station 154).

The male (of which there is only a single specimen) is 5 mm. in length and 0.29 mm. in maximum thickness. Mature females are 6–7 mm. long and about 0.4 mm. thick. The cuticular striations are at intervals of about 0.0025 mm. The opening of the mouth is slightly tilted dorsally. The cuticle of the cervical region is relatively very thick. There is a pair of prominent cervical papillae at 0.33 mm. in the male, and about 0.4 mm. in the female, from the anterior end. The expanded anterior portion of the oesophagus contains paired, latero-ventral thickenings within its muscular walls. At about the level of the cervical papillae the oesophagus becomes very narrow, and at a point a little behind them (0.4–0.45 mm. from the anterior extremity) is surrounded by the nerve-ring. Behind this point the oesophagus increases again in

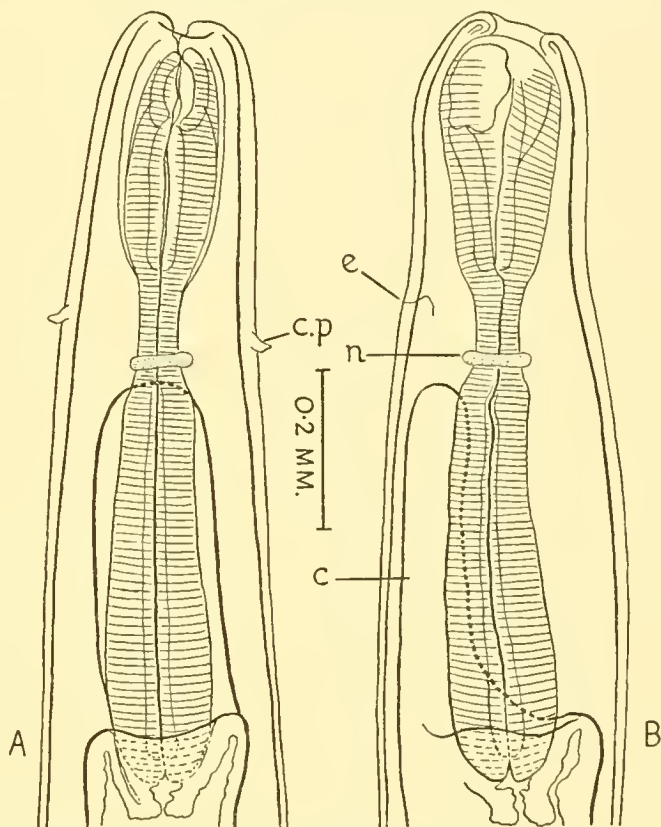


Fig. 10. *Cucullanus fraseri*. Anterior end of female: *A*, dorsal view; *B*, lateral view. *c.*, intestinal caecum; *c.p.*, cervical papilla; *e.*, excretory pore; *n.*, nerve-ring.

diameter, its posterior portion being club-shaped. Its length is 0.9–1 mm. There is a large intestinal caecum, which runs forward ventrally to the oesophagus almost as far as the nerve-ring. The excretory pore is situated at 0.35–0.37 mm. from the anterior extremity of the worm.

The caudal end of the male is curved ventrally. The tail is conical and sharply pointed, and measures 0.21 mm. in length. The usual preanal sucker-like organ is present. There are ten pairs of caudal papillae, of which five are preanal. Their arrangement is indicated in Fig. 11. The spicules are about 0.85 mm. long, and the accessory piece about 0.1 mm.

The tail of the female is straight and conical, measures 0.2–0.22 mm. in length and is usually tilted dorsally at an obtuse angle. The vulva, which has very prominent lips, is situated at 2.3 mm. from the posterior end in a specimen 6.3 mm. long. The vagina and the common trunk of the uterus run anteriorly from it. At a point slightly in front of the middle of the body the common trunk divides into two branches. One of these runs straight forward, and the coils of its ovary extend as far as the junction of the oesophagus and intestine. The other branch almost immediately turns posteriorly, and the coils of its ovary extend nearly as far as the anus. The eggs measure about 0.09 mm. \times 0.05 mm.

This species would fall into the genus *Dichelyne* Jägerskiöld, 1902, as recently re-defined by Gendre (1927, p. 261). This genus was suppressed by the writer (1923 b, p. 233) as a synonym of *Cucullanus*. The only real character which can be adduced to separate it from the latter being the presence of an intestinal caecum, the revival of the genus *Dichelyne* does not appear necessary unless a further study of the contained species should reveal other important distinguishing characters.

Cucullanus fraseri, var. *nototheniae*, nov.

Examples of a form scarcely specifically distinct from that just described, but larger, occurred in the intestine of *Notothenia gibberifrons* off South Georgia (Station 123), December 15, 1926. The male measures nearly 7 mm., the females up to 9.6 mm., in length. The cervical papillae, instead of being in front of the nerve-ring, are some distance behind it (0.6 mm. from the anterior end in the male, 0.65–0.7 mm. in the female).

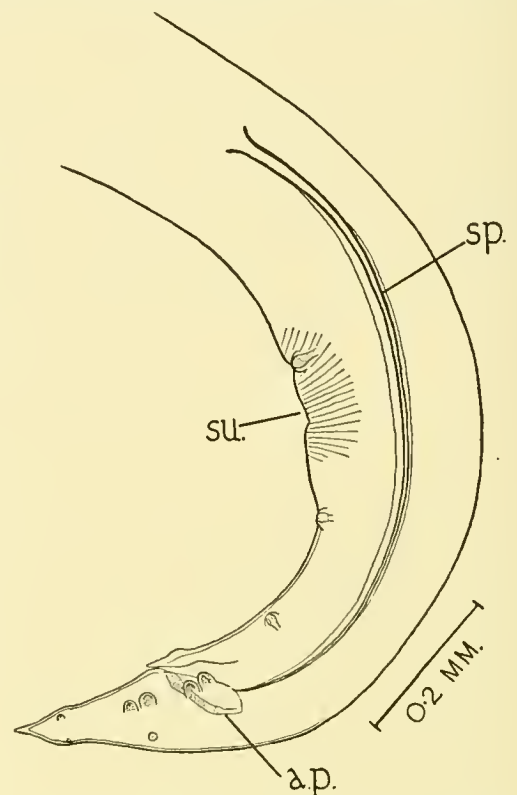


Fig. 11. *Cucullanus fraseri*. Posterior end of male, lateral view. *a.p.*, accessory piece; *sp.*, left spicule; *su.*, sucker-like organ.

ACANTHOCEPHALA

Family ECHINORHYNCHIDAE

Sub-family CENTRORHYNCHINAE

Corynosoma bullosum (v. Linstow, 1902)

One small, immature specimen of this species occurred in the intestine of a crab-eater seal (*Lobodon carcinophagus*) at Station 187 (Palmer Archipelago, between Anvers Island and Graham Land), March 18, 1927.

Larval forms, found encysted in the peritoneum of *Chaenocephalus ? aceratus* off South Georgia (Station MS 68), March 2, 1926, and in the mesentery of a "crocodile fish" (probably *Parachaenichthys georgianus*), also off South Georgia, April 30, 1925, are referred to this species. They differ from the larvae assigned to *C. hamanni* in the same characters as the adults of the two species—viz. in having a much longer and more slender posterior portion, and in the fact that the body-spines do not extend along the whole of the ventral surface.

Corynosoma hamanni (v. Linstow, 1892)

Numerous larval forms which are referred to this species occurred encysted on the outside of the intestine of *Notothenia rossii* off Deception Island, South Shetlands (Station 174), February and March 1927. Similar larvae also occurred, mixed with those of *C. bullosum*, in a "crocodile fish" (probably *Parachaenichthys georgianus*) off South Georgia, April 30, 1925.

Bolbosoma brevicolle (Malm, 1867)

This species was collected on at least six occasions from the intestines of blue whales (*Balaenoptera musculus*) at Durban and Saldanha Bay, South Africa, and at South Georgia. On one occasion (at Saldanha Bay, July 9, 1926) it was found in a fin whale (*B. physalus*), and the collector's label states that when fresh the worms in the small intestine were red, while those in the large intestine were white. The presence of an orange-red colour in Acanthocephala is not uncommon. The present observation suggests that it may be not an inherent property of the worms themselves, but an accident in some way connected with the food of the host.

Bolbosoma turbinella (Dies., 1851)

This species occurred on six occasions, at Durban, Saldanha Bay and South Georgia, in sei whales (*Balaenoptera borealis*), and it is noteworthy that it was not found in any other host. The fact that it did not occur in *Balaenoptera musculus* or *B. physalus*, whereas *Bolbosoma brevicolle* occurred in these two species and not in *B. borealis*, would seem to indicate the existence of some important difference between the habits of the sei whale and those of the other species.

Bolbosoma capitatum (v. Linstow, 1880)

A single immature specimen, probably referable to this species, occurred in the stomach of a slender-beaked dolphin (*Steno rostratus*) taken off the West African coast, not far from Cape Verde.

Bolbosoma hamiltoni, sp. n.

(Figs. 12-14)

A single male and several females of this form occurred in a fin whale (*Balaenoptera physalus*) at South Georgia, February 18, 1926. A single specimen was also found, together with *B. brevicolle*, in a blue whale (*Balaenoptera musculus*) at South Georgia. The species is very closely related to *B. capitatum* (v. Linstow, 1880), but the spines on the "bulb" are smaller and much more numerous than in that species. The proboscis-hooks are also more numerous, and their roots are less broad and flat than in *B. capitatum*.

The length of the male is about 60 mm., the females attaining about 64 mm. The maximum thickness of the male is 2.05 mm., that of the female 2.7 mm. The diameter of the "bulb" is 3.78 mm. in the male and 3.51 mm. in the female. The length of the proboscis (in the female) is about 0.9 mm., and its maximum diameter (near the base) about 0.6 mm. It bears apparently 26 longitudinal rows of hooks, each containing seven or eight. (In *B. capitatum* there are only 18(-20?) rows of hooks.) The more anterior hooks are slender and sharply pointed, and their tips show a slight tendency to curve outwards, while the blade is as long as the root. The length of the largest hooks (i.e. the second and third in each row from the anterior end), measured in a straight line from the tip to the point of insertion, is about 0.09 mm. in a female specimen. The roots of these anterior hooks have a very slight "heel", or suggestion of an anterior root. More posteriorly the hooks become gradually shorter, stouter and blunter, and the blades become shorter than the roots. The most posterior hooks are very small and thorn-like, with scarcely any root.

The spines on the bulb are very numerous, and the largest of them (those in the posterior rows) are less than 0.1 mm. in length, whereas in *B. capitatum* the posterior spines are about 0.24 mm. long.

The posterior testis of the male is just in front of the middle of the body. The eggs are spindle-shaped, and measure 0.112-0.137 mm. \times 0.027-0.03 mm.

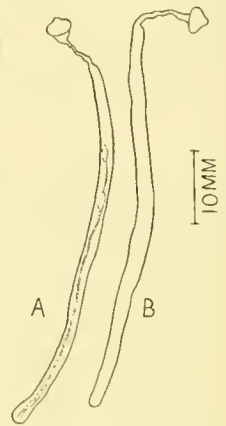


Fig. 12. *Bolbosoma hamiltoni*. Male (A) and female (B); natural size.

Sub-family ECHINORHYNCHINAE (?)

Echinorhynchus s.l.

An immature specimen of "*Echinorhynchus*" occurred in the intestine of *Parachaenichthys georgianus* at Stromness, South Georgia, January 7, 1927.

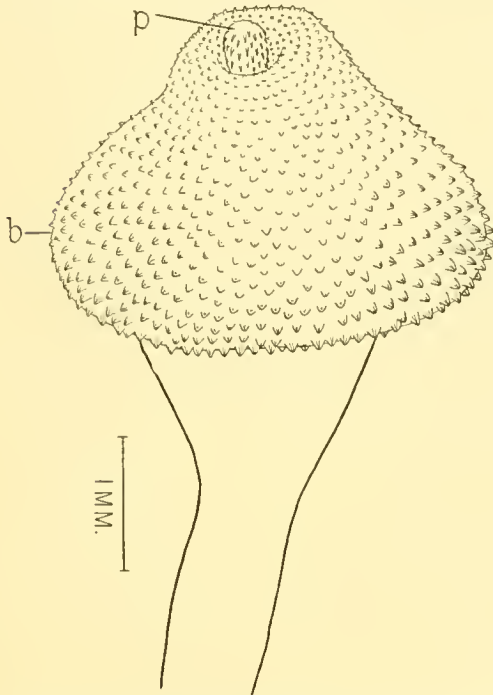


Fig. 13. *Bolbosoma hamiltoni*. Anterior end of female. *b.*, "bulb"; *p.*, proboscis.

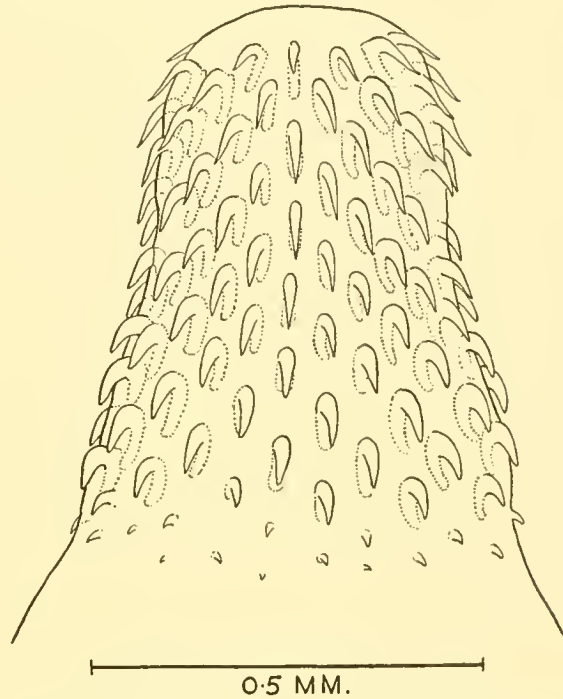


Fig. 14. *Bolbosoma hamiltoni*. Proboscis of female.

Family RHADINORHYNCHIDAE

Rhadinorhynchus wheeleri, sp. n.

(Fig. 15)

This species¹ occurred in the intestine (especially the rectum) of the following fish's:

| | |
|------------------------------------|---|
| <i>Notothenia rossii</i> | Stromness and Grytviken, S. Georgia, December 1926 and January 1927 |
| <i>Parachaenichthys georgianus</i> | Stromness, January 1927 |
| <i>Trematomus ? hansonii</i> | Cumberland Bay, South Georgia |

The collector's label in one tube (from *Notothenia rossii*, Stromness) says "Approximately 300 in one fish—many in rectum and extending right up the intestine. When fresh a yellow colour".

The worms measure 3–8 mm. in length and 1.4–2 mm. in maximum thickness. The

¹ Since this report was sent to press, an account has been published by Van Cleave (*Ann. Mag. Nat. Hist.* (10) IV, p. 229, August, 1929) of a form from "*Trematomus* or *Notothenia*" from the South Shetlands, which he names *Aspersentis austrinus*, gen. et sp. n. This form seems to approach very closely to *Rhadinorhynchus wheeleri*, though in certain details the two descriptions are not in complete agreement.

proboscis is about 0.7–0.9 mm. long and 0.3 mm. in diameter. It bears 14 longitudinal rows of 8–10 hooks each. As is characteristic of the genus, the hooks in the ventral rows

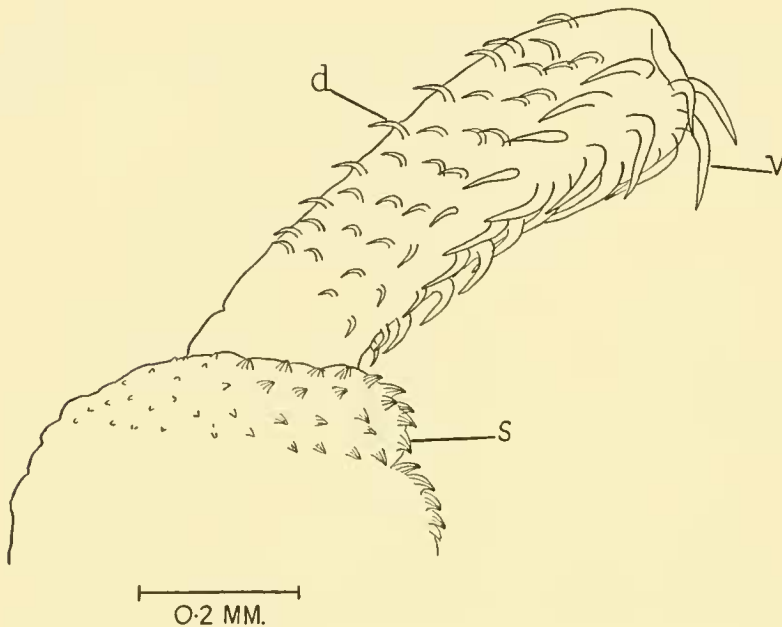


Fig. 15. *Rhadinorhynchus wheeleri*. Anterior end of female, lateral view. *d.*, dorsal proboscis-hook; *s.*, body-spine; *v.*, ventral proboscis-hook.

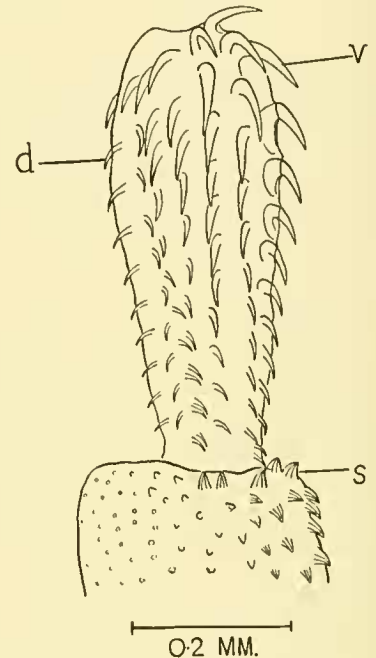


Fig. 16. *Rhadinorhynchus johni*. Anterior end of female, lateral view. *d.*, dorsal proboscis-hook; *s.*, body-spine; *v.*, ventral proboscis-hook.

are much larger than those in the dorsal rows. The former (measured in a straight line from tip to insertion) reach a length of about 0.15 mm., while the latter are only about 0.06 mm. long. The spines on the anterior portion of the body are small (0.025–0.03 mm. long), and are arranged in fairly regular transverse ventral rows, extending well round on to the lateral surfaces. The proboscis-sac is about 1–1.3 mm. long. The lemnisci are apparently short, oval sacs. The eggs measure about 0.09 mm. × 0.025 mm.

Of the species of *Rhadinorhynchus* already known, *R. pristis* (Rud., 1802), *R. horridus* (Lühe, 1912) and *R. tenuicornis* Van Cleave, 1918, are said to possess 14 longitudinal rows of hooks on the proboscis. The two first-mentioned species are much larger than the present form, while in all three the number of hooks per row is much larger (26 in *pristis*, about 26 in *tenuicornis*, 31 in *horridus*). Indeed, in no species of *Rhadinorhynchus* hitherto described, so far as the writer is aware, is the number of hooks in each row less than about 20.

Rhadinorhynchus johni, sp. n.

(Fig. 16)

This second species of *Rhadinorhynchus* occurred in the rectum of a hake (*Merluccius* sp.) off the Falklands (Station WS 73), March 7, 1927.

The worms are about 2.5–3.5 mm. in length and 0.4–0.7 mm. in maximum thickness. The proboscis is 0.6 mm. long in the male, and 0.7 mm. in the female. Its maximum diameter, in the male, is 0.18 mm., in the female 0.22 mm. It bears 14 longitudinal rows of hooks, each containing 12–14. The largest of the hooks on the ventral side are 0.0875 mm. in length (in a straight line from tip to insertion), while those on the dorsal side measure not more than 0.065 mm. The spines on the anterior region of the body are arranged in irregular transverse rows, which extend right round on to the dorsal surface, though here the spines become very minute. The largest of the body-spines, on the ventral surface, are about 0.03 mm. in length. In fully-extended specimens the spines extend back ventrally beyond the level of the middle of the proboscis-sac. This organ is about 0.7 mm. long in the male and 0.9 mm. in the female. The lemnisci are as long as, or a little longer than, the proboscis-sac. The eggs measure about 0.05 mm. × 0.015 mm.

This species is clearly very closely related to the last described, and differs in the same respects from previously-known forms.

Rhadinorhynchus sp.

Two immature specimens of a species of *Rhadinorhynchus* occurred in the intestine of *Naucrates ductor* off the Canary Islands, October 16, 1925. In both the proboscis is retracted.

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