

QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

DIVISION OF PLANT INDUSTRY BULLETIN No. 593

STUDIES OF PLANT AND SOIL NEMATODES. 16.
EIGHT NEW SPECIES OF SPIRAL NEMATODES
(NEMATODA : TYLENCHOIDEA) FROM
QUEENSLAND

By SUSAN P. PHILLIPS, B.Sc.

SUMMARY

Eight new species of spiral nematodes are described. These are *Helicotylenchus regularis* n. sp., *Helicotylenchus tumidicaudatus* n. sp., *Helicotylenchus variabilis* n. sp., *Scutellonema clariceps* n. sp., *Scutellonema insulare* n. sp., *Scutellonema incisicaudatum* n. sp., *Scutellonema laeviflexum* n. sp. and *Scutellonema impar* n. sp.

I. INTRODUCTION

The eight species described in this paper were collected from virgin soil. Specimens were killed and fixed in F. A. 4 : 1 and processed to glycerin by Seinhorst's glycerol-ethanol method. Measurements of the spicules and gubernaculum were made across their arcs.

37. *Helicotylenchus regularis* n. sp.

(Figure 1)

Females (12).—L = 556 (479–623) μ ; a = 24 (21–28); b = 5.2 (4.5–5.8); b¹ = 3.9 (3.6–4.6); c = 45 (35–53); c¹ = 1.0 (0.8–1.3); V = 65 (61–71); stylet = 24 (23–26) μ .

Female (holotype).—L = 623 μ ; a = 24; b = 5.8; b¹ = 4.6; c = 45; c¹ = 1.0; V = 65; stylet = 24 μ .

Body in spiral shape. Lip region hemispherical, not set off, four indistinct annules. Stylet knobs slightly indented on anterior surfaces. Dorsal oesophageal gland orifice 10 μ behind stylet. Hemizonid one annule anterior to excretory pore. Spermathecae round, not offset, with sperms. Phasmids 7 annules anterior to anus. Tail slightly more curved dorsally, 10 annules; terminus broadly rounded, striations regular, similar to or slightly coarser than other tail annules.

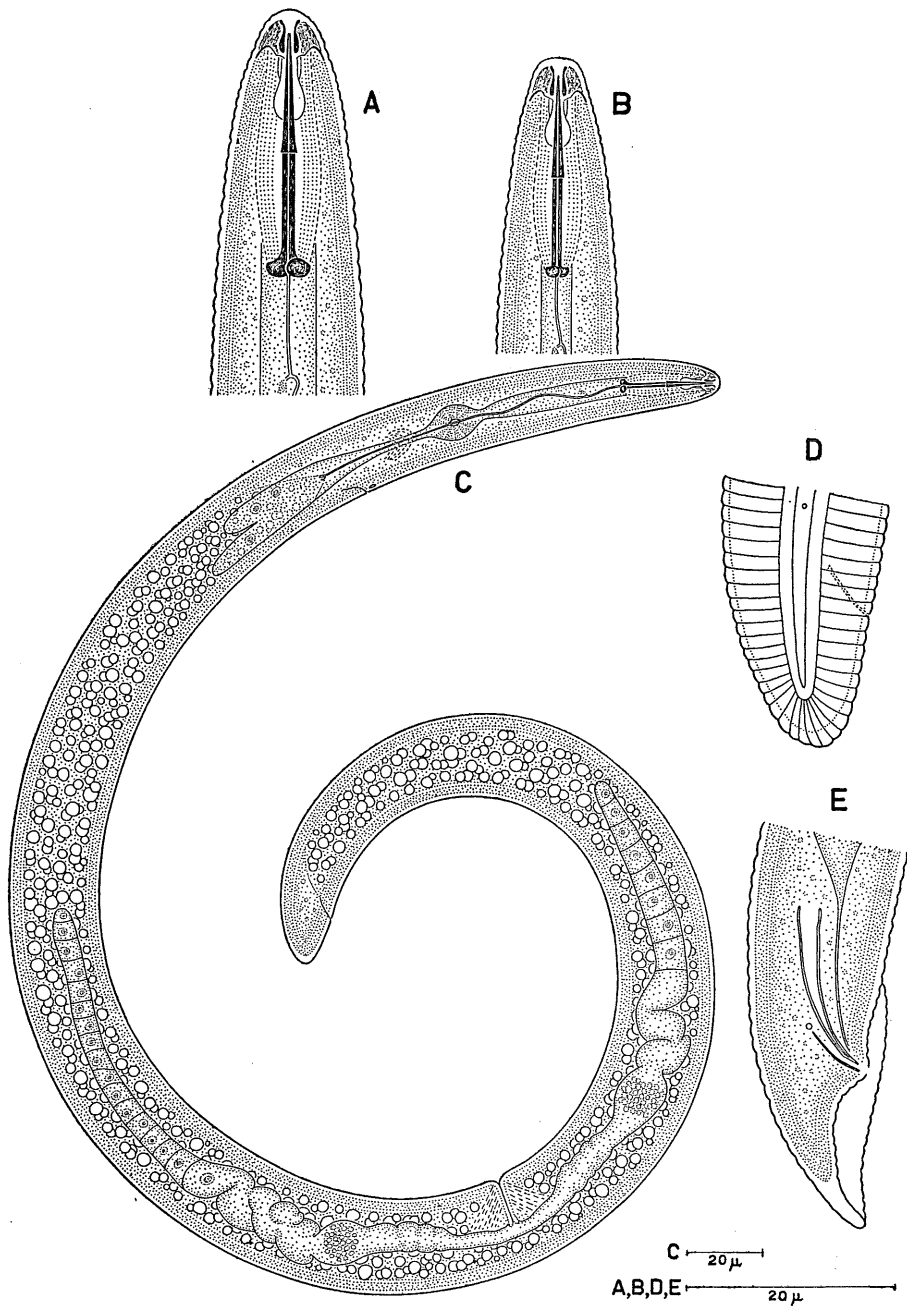


Fig. 1.—*Helicotylenchus regularis* n. sp. A, female head; B, male head; C, female; D, female tail; E, male tail.

Males (12).—L = 490 (439–542) μ ; a = 28 (25–31); b = 4.9 (4.4–5.6); b¹ = 3.7 (3.5–4.1); c = 31 (27–37); stylet = 20 (18–21) μ ; spicules = 19 (17–20) μ ; gubernaculum = 6 (5–7) μ .

Male (*allotype*).—L = 515 μ ; a = 27; b = 5.4; b¹ = 4.1; c = 29; stylet = 20 μ ; spicules = 17 μ ; gubernaculum = 6 μ .

Body C-shaped. Lip region high, hemispherical, not set off, four indistinct annules. Stylet knobs slightly indented on anterior surfaces. Dorsal oesophageal gland orifice 7 μ behind stylet. Excretory pore slightly anterior to level of oesophago-intestinal valve. Hemizonid one annule anterior to excretory pore.

Types.—Holotype (female) slide Reg. No. G.5492 and allotype (male) slide Reg. No. G. 5493 in the Queensland Museum; paratypes (65 ♀ ♀, 22 ♂ ♂, 4 juveniles) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by R. C. Colbran in August 1966.

Type habitat.—Alluvial soil in wet sclerophyll forest beside Coochin Creek.

Type locality.—Queensland: H. Fullerton's farm, Beerwah.

Differential diagnosis.—*Helicotylenchus regularis* n. sp. most closely resembles *H. exallus* Sher, from which it is distinguished by the broadly-rounded tail, shorter body in both sexes and shorter spicules and gubernaculum in the male.

In female paratypes the phasmids are 1–7 annules anterior to the anus and tails have 8–12 annules.

Other records.—*Helicotylenchus regularis* n. sp. has also been found in soil around *Pinus elliotii* Engelm. (slash pine) at Beerwah and in virgin soil from Elimbah and Lamington National Park.

38. *Helicotylenchus tumidicaudatus* n. sp.

(Figure 2)

Females (7).—L = 805 (718–896) μ ; a = 27 (24–31); b = 6.9 (6.3–7.6); b¹ = 5.5 (5.0–6.0); c = 58 (38–76); c¹ = 0.7 (0.5–1.0); V = 63 (60–67); stylet = 27 (25–28) μ .

Female (*holotype*).—L = 803 μ ; a = 27; b = 6.6; b¹ = 5.2; c = 56; c¹ = 0.7; V = 67; stylet = 27 μ .

Body C-shaped. Lip region hemispherical, not set off, annulation indistinct. Stylet knobs rounded, slightly indented on anterior surfaces. Dorsal oesophageal gland orifice 12 μ behind stylet. Hemizonid four annules anterior to excretory pore. Spermathecae ovoid, not offset, with sperms. Phasmids 11 annules anterior to anus. Tail hemispherical, 12 annules, striations less distinct near terminus.

Males (7).—L = 749 (625–851) μ ; a = 33 (28–38); b = 6.8 (5.9–7.1); b¹ = 5.2 (4.5–5.6); c = 35 (30–39); stylet = 24 (22–25) μ ; spicules = 25 (23–26) μ ; gubernaculum = 9 (8–10) μ .

Male (*allotype*).—L = 851 μ ; a = 30; b = 7.1; b¹ = 5.2; c = 36; stylet = 25 μ ; spicules = 25 μ ; gubernaculum = 9 μ .

Body C-shaped. Lip region hemispherical, not set off, annulation indistinct. Stylet knobs slightly indented on anterior surfaces. Dorsal oesophageal gland orifice 12 μ behind stylet knobs. Excretory pore slightly anterior to level of oesophago-intestinal valve. Hemizonid one annule anterior to excretory pore.

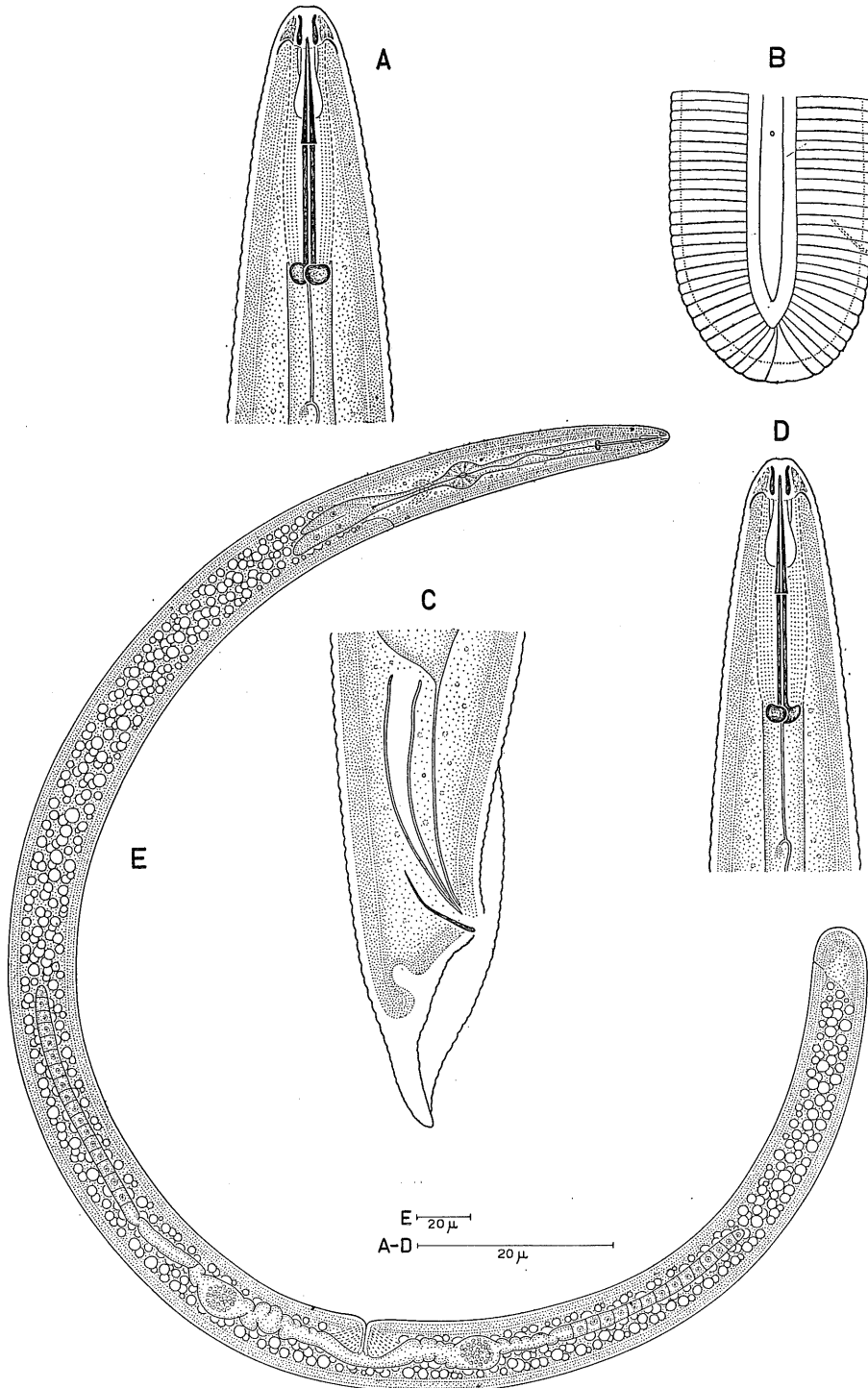


Fig. 2.—*Helicotylenchus tumidicaudatus* n. sp. A, female head; B, female tail; C, male tail; D, male head; E, female.

Types.—Holotype (female) slide Reg. No. G. 5494 and allotype (male) slide Reg. No. G. 5495 in the Queensland Museum; paratypes (7 ♀♀, 6 ♂♂, 5 juveniles) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by A. McDonald in December 1966.

Type habitat.—Clay loam soil from open grassland.

Type locality.—Queensland: Retro Siding.

Differential diagnosis.—*Helicotylenchus tumidicaudatus* n. sp. closely resembles *H. retusus* Siddiqi and Brown, from which it is distinguished by the presence of sperms in the spermathecae.

In female paratypes the hemizonid is 1–4 annules anterior to the excretory pore, phasmids 5–12 annules anterior to the anus and tails have 8–18 annules.

39. *Helicotylenchus variabilis* n. sp.

(Figure 3)

Females (12).—L = 621 (505–723) μ ; a = 25 (23–29); b = 5.7 (5.1–6.6); b¹ = 4.4 (3.8–4.8); c = 46 (35–53); c¹ = 1.0 (0.8–1.4); V = 63 (56–66); stylet = 25 (23–26) μ .

Female (holotype).—L = 660 μ ; a = 25; b = 5.1; b¹ = 4.2; c = 39; c¹ = 1.3; V = 60; stylet = 24 μ .

Body in loose spiral shape. Lip region conoid-truncate, not set off, without distinct annules. Stylet knobs slightly indented on anterior surfaces. Dorsal oesophageal gland orifice 11 μ behind stylet. Hemizonid immediately anterior to excretory pore. Spermathecae round, not set off, with sperms. Phasmids 10 annules anterior to anus. Tail more curved dorsally, 12 annules; terminus broadly rounded, striations regular.

Males (12).—L = 624 (540–684) μ ; a = 30 (25–37); b = 5.7 (5.0–6.1); b¹ = 4.4 (3.7–4.9); c = 33 (25–39); stylet = 22 (21–23) μ ; spicules = 22 (20–23) μ ; gubernaculum = 8 (6–9) μ .

Male (allotype).—L = 684 μ ; a = 33; b = 6.1; b¹ = 4.8; c = 39; stylet = 23 μ ; spicules = 21 μ ; gubernaculum = 8 μ .

Body curved ventrally. Lip region conoid, anterior margin rounded, without distinct annules. Stylet knobs indented on anterior surfaces. Dorsal oesophageal gland orifice 14 μ behind stylet. Excretory pore anterior to level of oesophago-intestinal valve. Hemizonid four annules anterior to excretory pore. Phasmids anterior to anus.

Types.—Holotype (female) slide Reg. No. G. 5496 and allotype (male) slide Reg. No. G. 5497 in the Queensland Museum; paratypes (52 ♀♀, 19 ♂♂, 3 juveniles) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by T. E. O'Sullivan in April 1970.

Type habitat.—Clay loam soil from open grassland.

Type locality.—Queensland: Retro Siding.

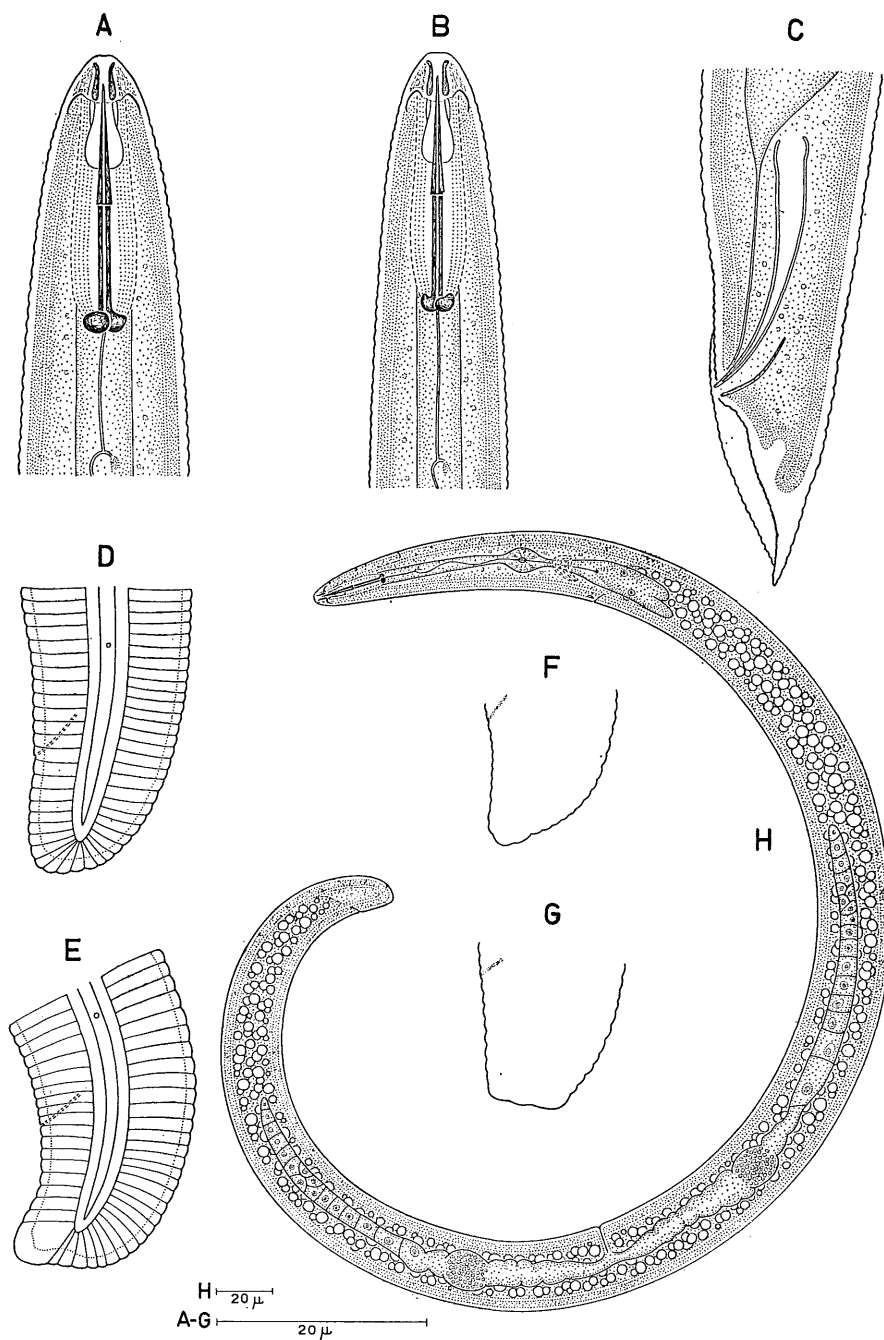


Fig. 3.—*Helicotylenchus variabilis* n. sp. A, female head; B, male head; C, male tail; D, female tail (holotype); E, F, G, female tails (paratypes); H, female.

Differential diagnosis.—*Helicotylenchus variabilis* n. sp. resembles *H. clarkei* Sher and *H. martini* Sher, from which it is distinguished by the position of the phasmids. It is further distinguished from *H. clarkei* by the less conspicuous labial disc and from *H. martini* by the tail shape and tail length in relation to anal body width.

In female paratypes the phasmids are 5–10 annules anterior to the anus and tails have 8–14 annules. Tails show considerable variation in shape and regularity of the terminal striations.

40. *Scutellonema clariceps* n. sp.

(Figure 4)

Females (4).—L = 778 (660–851) μ ; a = 25 (23–26); b = 6.8 (5.8–7.7); b¹ = 5.9 (5.0–6.4); c = 51 (48–54); c¹ = 0.7 (0.6–0.8); V = 59 (57–63); stylet = 29 (26–31) μ .

Female (holotype).—L = 771 μ ; a = 23; b = 7.7; b¹ = 6.4; c = 48; c¹ = 0.8; V = 57; stylet = 26 μ .

Body a loose spiral. Lip region hemispherical to subconical, set off, four annules; basal annule with 14–15 longitudinal lines. Lateral fields with four incisures; bands areolated in oesophageal region and near scutella. Stylet knobs rounded. Dorsal oesophageal gland orifice 5 μ behind stylet. Hemizonid immediately anterior to excretory pore. Spermathecae large, with sperms. Epiptygma double. Scutella 5 (4–6) μ in diameter, adanal. Tail broadly rounded, 12 annules; terminal striations coarse.

Males (8).—L = 683 (585–736) μ ; a = 28 (25–29); b = 6.6 (6.2–7.1); b¹ = 5.4 (5.1–5.8); c = 37 (33–41); stylet = 27 (26–28) μ ; spicules = 25 (24–25) μ ; gubernaculum = 13 (11–14) μ .

Male (allotype).—L = 705 μ ; a = 25; b = 7.1; b¹ = 5.8; c = 40; stylet = 27 μ ; spicules = 24 μ ; gubernaculum = 13 μ .

Body C-shaped. Lip region hemispherical, set off, four annules. Stylet knobs rounded, with flattened anterior surfaces. Dorsal oesophageal gland orifice 7 μ behind stylet. Excretory pore opposite posterior end of oesophageal glands. Hemizonid immediately anterior to excretory pore. Lateral fields areolated anteriorly and posteriorly. Scutella 4.0 (3.1–4.6) μ in diameter, adanal. Gubernaculum with swollen distal portion.

Types.—Holotype (female) slide Reg. No. G. 5498 and allotype (male) slide Reg. No. G. 5499 in the Queensland Museum; paratypes (3 ♀♀, 7 ♂♂, 1 juvenile) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by the author in November 1966.

Type habitat.—Alluvial soil around the roots of *Eucalyptus tereticornis* Sm. (blue gum).

Type locality.—Queensland: James Sharp Memorial Park, Canungra.

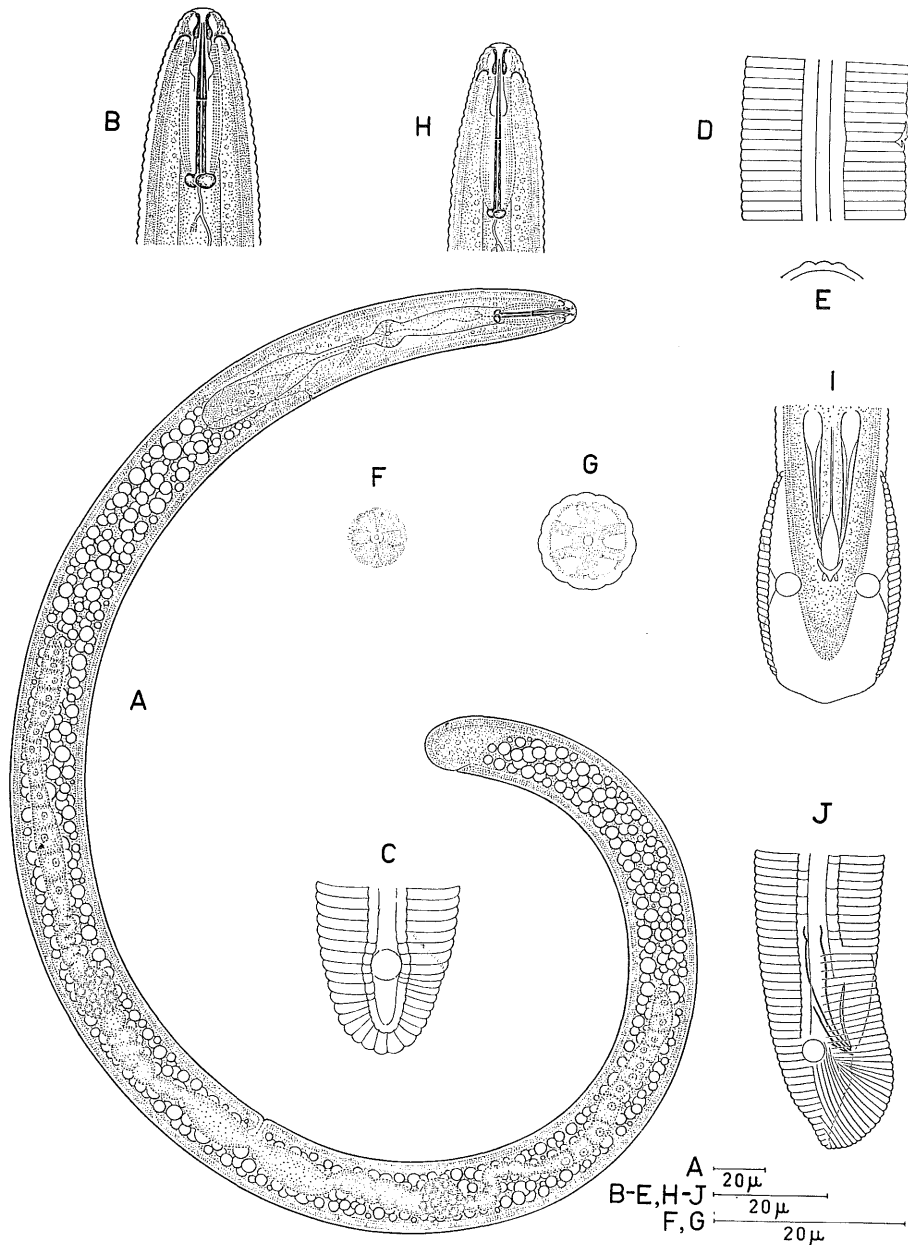


Fig. 4.—*Scutellonema clariceps* n. sp. A, female; B, female head; C, female tail; D, female lateral field and epiptygma; E, female, transverse section of lateral field; F, female, en face view; G, female, transverse section through basal annule of lip region; H, male head; I, male, ventral view of tail; J, male tail.

Differential diagnosis.—*Scutellonema clariceps* n. sp. most closely resembles *S. brachyurum* (Steiner) and *S. unum* Sher. It is distinguished from the former by the greater number of longitudinal lines on the basal lip annule and presence of sperms in the spermathecae and from *S. unum* by the offset lip region and presence of sperms in the spermathecae.

In female paratypes the phasmids are 3 annules posterior to one annule anterior to the anus and tails have 8–12 annules.

Other records.—*Scutellonema clariceps* n. sp. has also been found in soil around the roots of *Dianella caerulea* Sims (a blue flax lily) on Moreton Island (Battery Hill), and in soil from Beerwah, Burrum Heads, Stradbroke Island (Point Lookout), Torquay and Urangan.

41. *Scutellonema insulare* n. sp.

(Figure 5)

Females (7).—L = 558 (515–596) μ ; a = 22 (22–23); b = 6.0 (5.3–6.7); b¹ = 4.6 (4.1–5.1); c = 37 (30–47); c¹ = 1.2 (0.9–1.5); V = 61 (57–65); stylet = 23 (22–24) μ .

Female (holotype).—L = 536 μ ; a = 23; b = 6.0; b¹ = 4.3; c = 32; c¹ = 1.4; V = 60; stylet = 23 μ .

Body in spiral shape. Lip region hemispherical, not set off, four annules; basal lip annule without longitudinal lines. Stylet knobs rounded, with flattened anterior surfaces. Dorsal oesophageal gland orifice 7 μ behind stylet. Hemizonid one annule anterior to excretory pore. Spermathecae without sperms. Epiptygma not seen. Scutella 1.9 (1.8–2.1) μ ; in diameter, 3 annules anterior to anus. Lateral fields areolated in oesophageal region and near scutella, occasional areolation of outer bands in mid-body. Tail broadly rounded, slightly more curved dorsally, 12 annules; terminal striations similar to other tail annules.

Male.—Unknown.

Types.—Holotype (female) slide Reg. No. G. 5500 in the Queensland Museum; paratypes (5 ♀ ♀) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by R. C. Colbran in November 1967.

Type habitat.—Sandy soil in scrub dominated by *Banksia integrifolia* L.f.

Type locality.—Queensland: hill above Frenchman's Beach, Point Lookout (Stradbroke Island).

Differential diagnosis.—*Scutellonema insulare* n. sp. most closely resembles *S. minutum* Sher, from which it is distinguished by the absence of sperms in the spermathecae and regular annulation on the tail.

In paratypes the phasmids are 0–11 annules anterior to the anus and tails have 7–13 annules.

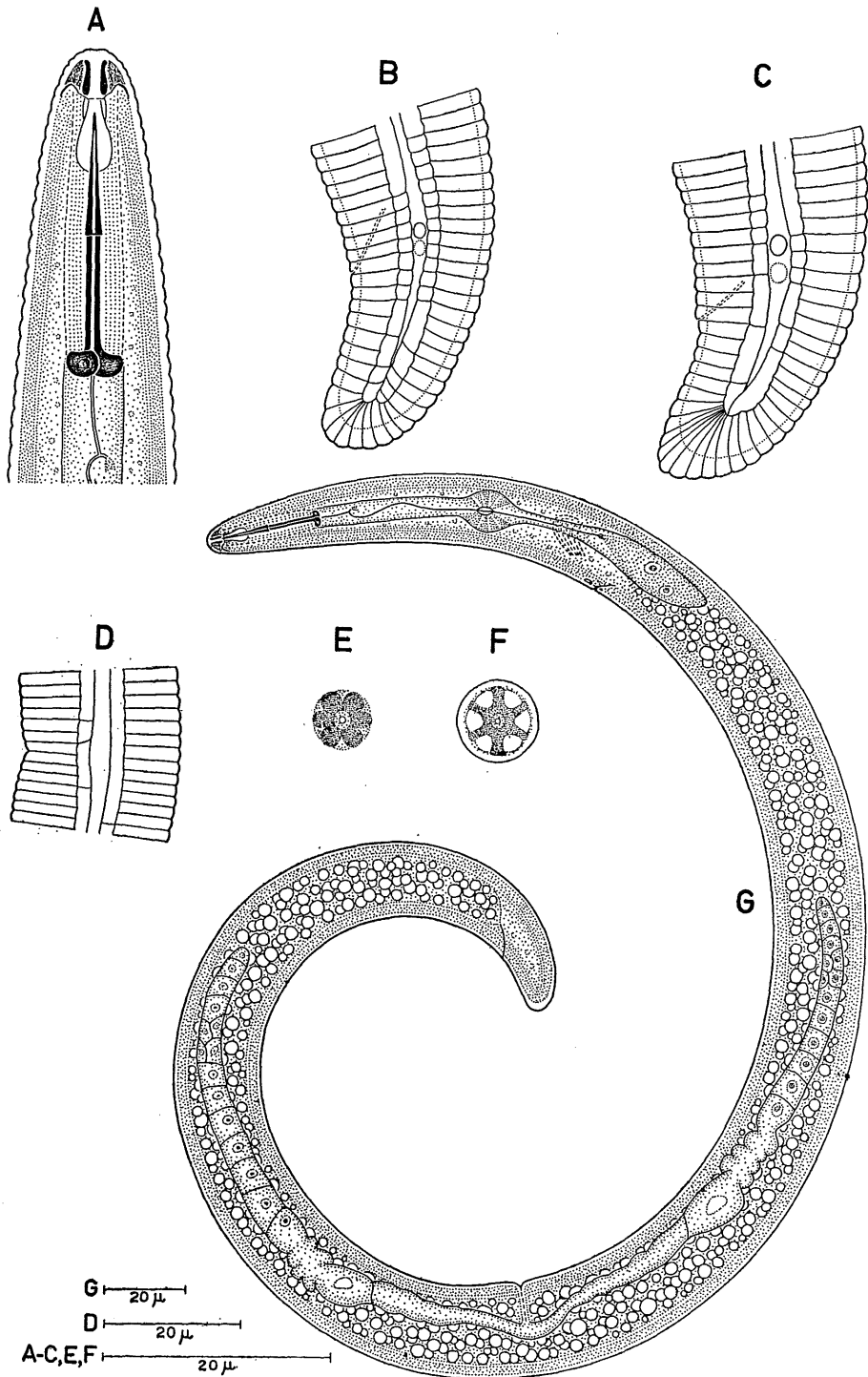


Fig. 5.—*Scutellonema insulare* n. sp. A, female head; B, C, female tails; D, female, lateral field near vulva; E, female, *en face* view; F, female, transverse section through basal annule of lip region; G, female.

42. *Scutellonema incisicaudatum* n. sp.

(Figure 6)

Females (22).—L = 593 (488–718) μ ; a = 25 (22–28); b = 5.6 (5.0–6.1); b¹ = 4.5 (4.0–5.0); c = 37 (27–43); c¹ = 1.3 (1.0–1.6); V = 64 (60–67); stylet = 22 (20–24) μ .

Female (holotype).—L = 574 μ ; a = 28; b = 5.6; b¹ = 4.3; c = 39; c¹ = 1.2; V = 61; stylet = 22 μ .

Body in loose spiral shape. Lip region hemispherical, not set off, three or four indistinct annules; labial disc prominent, basal annule without longitudinal lines. Stylet knobs rounded. Dorsal oesophageal gland orifice 5 μ behind stylet. Hemizonid two annules anterior to excretory pore. Hemizonion six annules posterior to excretory pore. Spermathecae without sperms. Epiptygma not seen. Scutella 1.5 (1.2–2.0) μ in diameter, 5 annules anterior to anus. Lateral fields areolated in oesophageal region. Tail more curved dorsally, 7 annules; terminus indented.

Male.—Unknown.

Types.—Holotype (female) slide Reg. No. G. 5501 in the Queensland Museum; paratypes (21 ♀♀, 1 juvenile) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by G. W. Ernst in June 1967.

Type habitat.—Soil from eucalypt forest.

Type locality.—Queensland: G. Ernst's farm, Kandanga.

Differential diagnosis.—*Scutellonema incisicaudatum* n. sp. most closely resembles *S. minutum* Sher and *S. insulare* n. sp. from which it is distinguished by the tail shape and reduced areolation near the scutella. It is further distinguished from *S. minutum* by the absence of sperms in the spermathecae.

In paratypes the scutella are 0–7 annules anterior to the anus and as much as 7 annules apart on one female. Tails have 7–12 annules.

Other records.—*Scutellonema incisicaudatum* n. sp. has also been found in soil around the roots of *Cenchrus ciliaris* L. (buffel grass) at Longreach and in virgin soil from Emerald.

43. *Scutellonema laeviflexum* n. sp.

(Figure 7)

Females (7).—L = 761 (699–840) μ ; a = 33 (31–34); b = 6.9 (6.6–7.5); b¹ = 5.3 (5.0–5.6); c = 54 (47–66); c¹ = 1.1 (0.8–1.3); V = 62 (58–66); stylet = 24 (23–24) μ .

Female (holotype).—L = 718 μ ; a = 33; b = 6.8; b¹ = 5.0; c = 47; c¹ = 1.3; V = 64; stylet = 24 μ .

Body C-shaped. Lip region hemispherical, slightly set off, 6 annules; labial disc prominent, basal annule without longitudinal lines. Stylet knobs rounded, with flattened anterior surfaces. Dorsal oesophageal gland orifice 6 μ behind stylet. Hemizonid three annules anterior to excretory pore. Spermathecae without sperms.

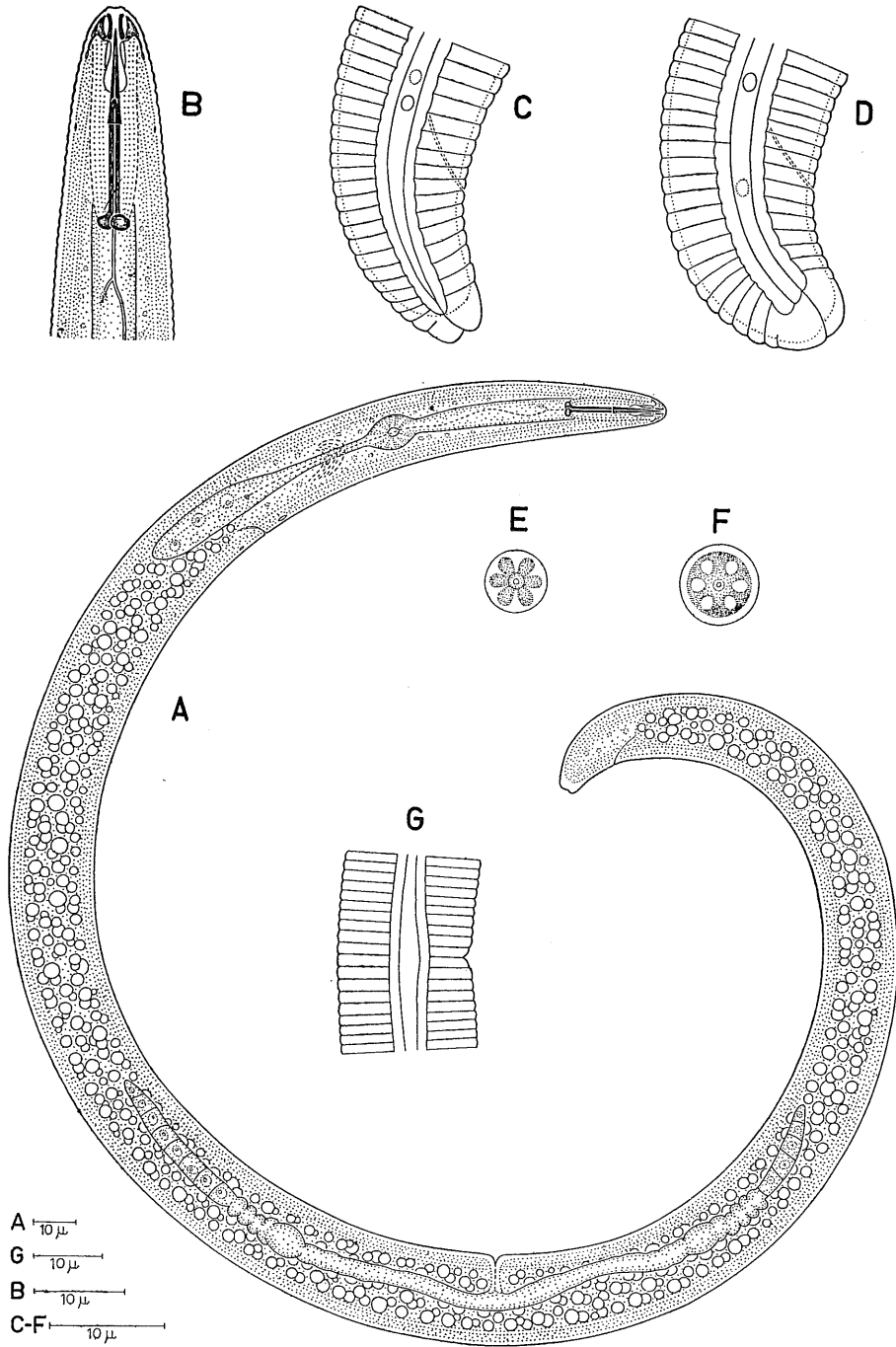


Fig. 6.—*Scutellonema inciscaudatum* n. sp. A, female; B, female head; C, D, female tails; E, female, en face view; F, female, transverse section through lower portion of lip region; G, female, lateral field near vulva.

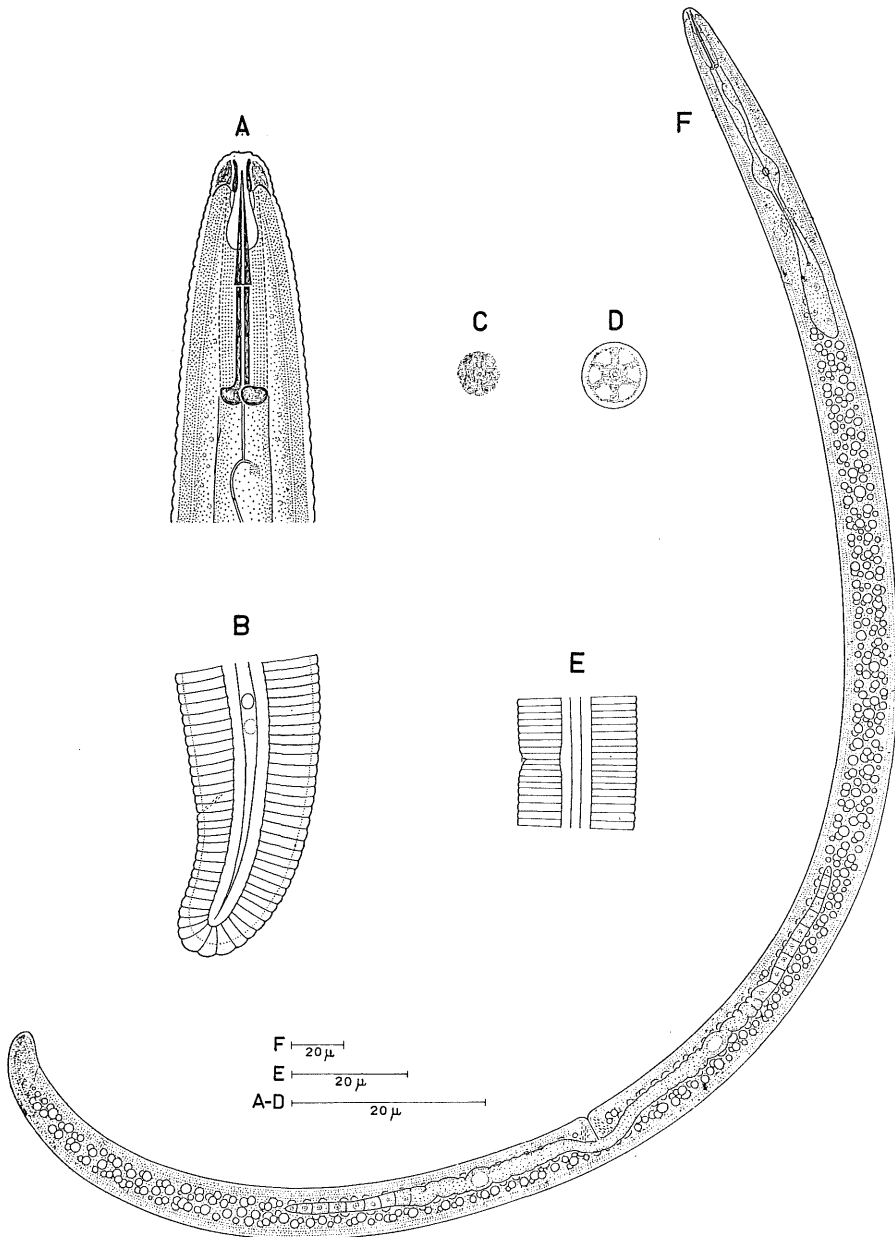


Fig. 7.—*Scutellonema laeviflexum* n. sp. A, female head; B, female tail; C, female, *en face* view; D, female, transverse section through basal annule of lip region; E, female, lateral field near vulva; F, female.

Epiptygma single, inconspicuous. Scutella $1.6 (1.5-1.8)\mu$ in diameter, 8 and 10 annules anterior to the anus. Lateral fields areolated in oesophageal region; a few cross-lines in outer bands near scutella. Tail broadly rounded, slightly more curved dorsally, 14 annules; terminal striations similar to other tail annules.

Male.—Unknown.

Types.—Holotype (female) slide Reg. No. G. 5502 in the Queensland Museum; paratypes (6 ♀♀, 2 juveniles) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by P. W. Reynolds in May 1970.

Type habitat.—Clay loam.

Type locality.—Queensland: Winton railway yards.

Differential diagnosis.—*Scutellonema laeviflexum* n. sp. most closely resembles *S. clathricaudatum* Whitehead and *S. impar* n. sp. It differs from the former in tail shape, position of the scutella and reduced aeration near the scutella and from the latter by the shape and annulation of the lip region and tail.

In paratypes the hemizonid is 3 to 5 annules anterior to the excretory pore, the scutella are 2 to 12 annules anterior to the anus and tails have 10 to 14 annules.

44. *Scutellonema impar* n. sp.

(Figure 8)

Females (6).— $L = 730 (683-759)\mu$; $a = 32 (30-36)$; $b = 7.1 (6.7-7.7)$; $b^1 = 5.3 (5.0-5.6)$; $c = 52 (41-60)$; $c^1 = 1.0 (0.9-1.1)$; $V = 63 (61-66)$; stylet = $24 (23-24)\mu$.

Female (holotype).— $L = 759\mu$; $a = 31$; $b = 7.7$; $b^1 = 5.1$; $c = 60$; $c^1 = 0.9$; $V = 66$; stylet = 24μ .

Body C-shaped. Lip region subconical, anterior margin truncate, three or four indistinct annules; basal annule without longitudinal lines. Stylet knobs rounded, with flattened anterior surfaces. Dorsal oesophageal gland orifice 6μ behind stylet. Hemizonid immediately anterior to excretory pore. Spermathecae without sperms. Epiptygma not seen. Scutella $1.5 (1.5-1.8)\mu$ in diameter, 7 annules anterior to anus. Lateral fields areolated in oesophageal region and near scutella. Tail arcuate, more curved dorsally, 7 annules; terminus broadly rounded, striations on distal ventral portion indistinct.

Male.—Unknown.

Types.—Holotype slide Reg. No. G. 5503 in the Queensland Museum; paratypes (4 ♀♀, 2 juveniles) in the Queensland Department of Primary Industries Nematology Collection. The types were collected by K. Middleton in August 1967.

Type habitat.—Clay loam.

Type locality.—Queensland: Winton.

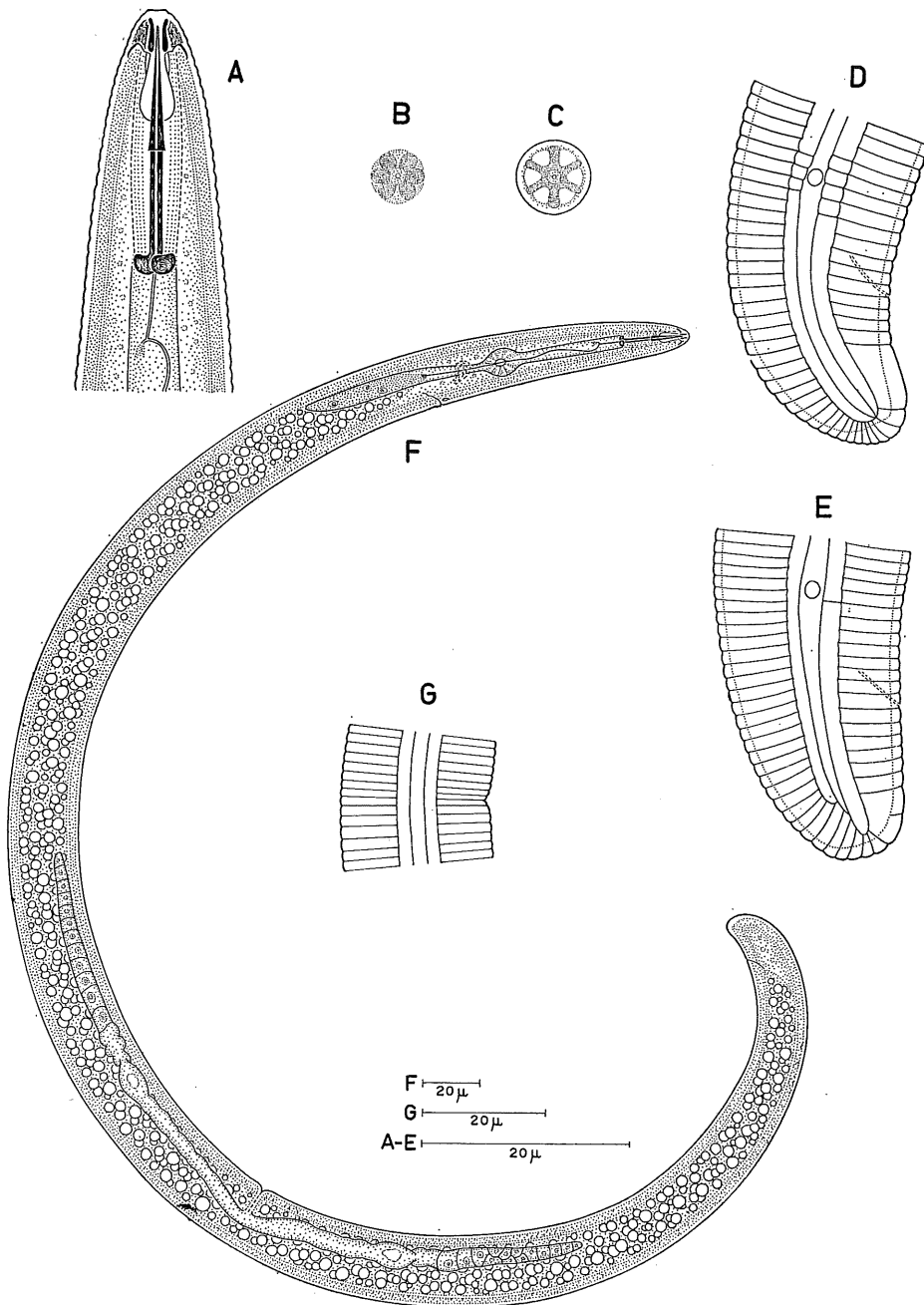


Fig. 8.—*Scutellonema impar* n. sp. A, female head; B, female, *en face* view; C, female, transverse section through basal annule of lip region; D, E, female tails; F, female; G, lateral field near vulva.

Differential diagnosis.—*Scutellonema impar* n. sp. most closely resembles *S. laeviflexum* n. sp., from which it is distinguished by the shape and annulation of the lip region and tail.

In paratypes, the scutella are 5 to 8 annules anterior to the anus and tails have 5 to 10 annules.

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The author was formerly an officer of the Entomology Section, Queensland Department of Primary Industries, and was stationed at the Science Laboratories, Indooroopilly.