

## Redescription of three South African *Monhystera* species (Nematoda)\*

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Three South African *Monhystera* species, described by Joubert & Heyns (1980) (*M. magnacephala*, *M. gabaza* and *M. taaiboschiensis*) are redescribed and two of them figured in more detail, incorporating newer information about the morphology of the Monhysteridae.

Drie Suid-Afrikaanse *Monhystera* spesies wat deur Joubert & Heyns (1980) beskryf is, nl. *M. magnacephala*, *M. gabaza* en *M. taaiboschiensis*, word herbeskryf en twee van hulle meer volledig geïllustreer in die lig van nuwere gegewens omtrent die morfologie van die Monhysteridae.

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During the course of a monographic study of the Monhysteridae de Man, 1876 by the senior author (Jacobs 1988), the types and the other specimens of three South African *Monhystera* species described by Joubert & Heyns (1980) were re-examined and redescribed in more detail in the light of newer knowledge about the morphology of this group. The present paper presents these redescriptions and more detailed illustrations of two of the species.

### *Monhystera magnacephala* Joubert & Heyns, 1980 (Figures 1 and 2)

**Female:** L = 1,15 (1,08–1,28) mm; a = 25,5 (22–28); b = 5,46 (5,2–5,8); c = 7,15 (6,67–7,58); V = 67,4 (66,2–68,6); c' = 6,05 (5,5–6,7); V' = 78,4 (77,5–79,5); vulva-anus distance/tail 1,32 (1,25–1,47); tail = 161 (142–174)  $\mu$ m; egg 45 x 31  $\mu$ m.

**Male:** L = 1,12 (1,07–1,26) mm; a = 22,7 (20–27); b = 5,49 (5,1–5,8); c = 7,63 (7,00–7,96); c' = 5,07 (3,9–5,4); spicules = 95 (90,5–99)  $\mu$ m; tail = 147 (134–165)  $\mu$ m; tail/spicule = 1,54 (1,4–1,7); spicule/anal body diameter = 3,27 (2,8–4,0).

Anterior end of body not set off, but distinctly broadened between fovea and labial setae. Oral opening about 10  $\mu$ m wide, surrounded by peri-oral platelets. Cephalic setae shorter than labial setae, the latter 19–23% and 23–26% of the head diameter in females and males respectively. With a large number of short somatic setae distributed over the entire body, the most anterior of these situated at about one half head diameter posterior to fovea. Lateral chord field extending to just anterior of fovea. Fovea diameter 16–23% and 22–30% of corresponding body diameter in females and males respectively. Anterior rim of fovea 0,61–0,93 and 0,66–0,83 times the head diameter from anterior end in females and males respectively. Buccal cavity not more strongly sclerotized than lumen of pharynx. Stoma can be open bell-shaped so that outlet of dorsal pharyngeal gland lies in the base of the opened mouth cavity. Nucleus of dorsal pharyngeal gland situated halfway between nerve ring and base of pharynx; nuclei of two ventrosublateral pharyn-

geal glands near base of pharynx, at about the same level, with a large conspicuous sac-like cell body just anterior to the nuclei, filled with secretion and containing a centrally situated, refractive, nucleus-shaped structure/inclusion of unknown nature. Outlets of posterior ventro-sublateral glands at level of nerve ring. Just posterior to nerve ring a second pair of ventrosublateral nuclei can be seen, optically similar to the posteriorly located pair of gland nuclei. Pharynx subcylindroid, slightly broadening posteriorly, enveloping the stoma anteriorly. Pseudocoel not seen in neck region. Cardia mushroom-shaped. Hyaline, pericardial cells present. Without ocelli. Ventral gland situated subventrally just posterior to progaster. Position of excretory pore uncertain. First intestinal cells with flap-like protrusions into intestinal lumen.

Vaginal suspensor, vulva dilator and large vaginal sphincter distinct. Postvaginal gland? cell present. Ovary reaching to progaster area, accompanied anteriorly by one or two large, ovoid coelomocytes. Numerous spermatozoa in uterus. Uterus with two posteriorly situated, ventrolateral accompanying cells (coelomocytes?). Oviparous.

Spicules long, slender, evenly curved; spicule diameter 2,8–4,1% of the spicule length; capitulum small, distinctly offset from corpus. Gubernaculum well developed, the apodeme appearing yellowish, strongly sclerotized and hook-shaped (horse-head-shaped), the dorsal apophysis longer than the gubernaculum, hyaline and sometimes indistinctly demarcated. Two pairs of large ejaculatory glands, with two accompanying cells (coelomocytes?) between both glands. Several dorsal cloacal gland cells open into cloaca.

Rectum 86–103% the anal body diameter, with dorsal rectal gland cell.

Tail of female stubby, elongate-conoid, with the terminal  $\frac{1}{5}$ – $\frac{1}{3}$  filiform and ventrally or dorsally bent; with large, spindle-shaped spinneret. Tail of male more slender, sigmoid-shaped with the elongate-conoid part ventrally and the filiform part dorsally bent; spinneret spindle-shaped but with the base of the spinneret narrower in relation to the maximum diameter of the spinneret than in the female.

**Distribution:** Benthic, Vaal River System. Endemic in South Africa.

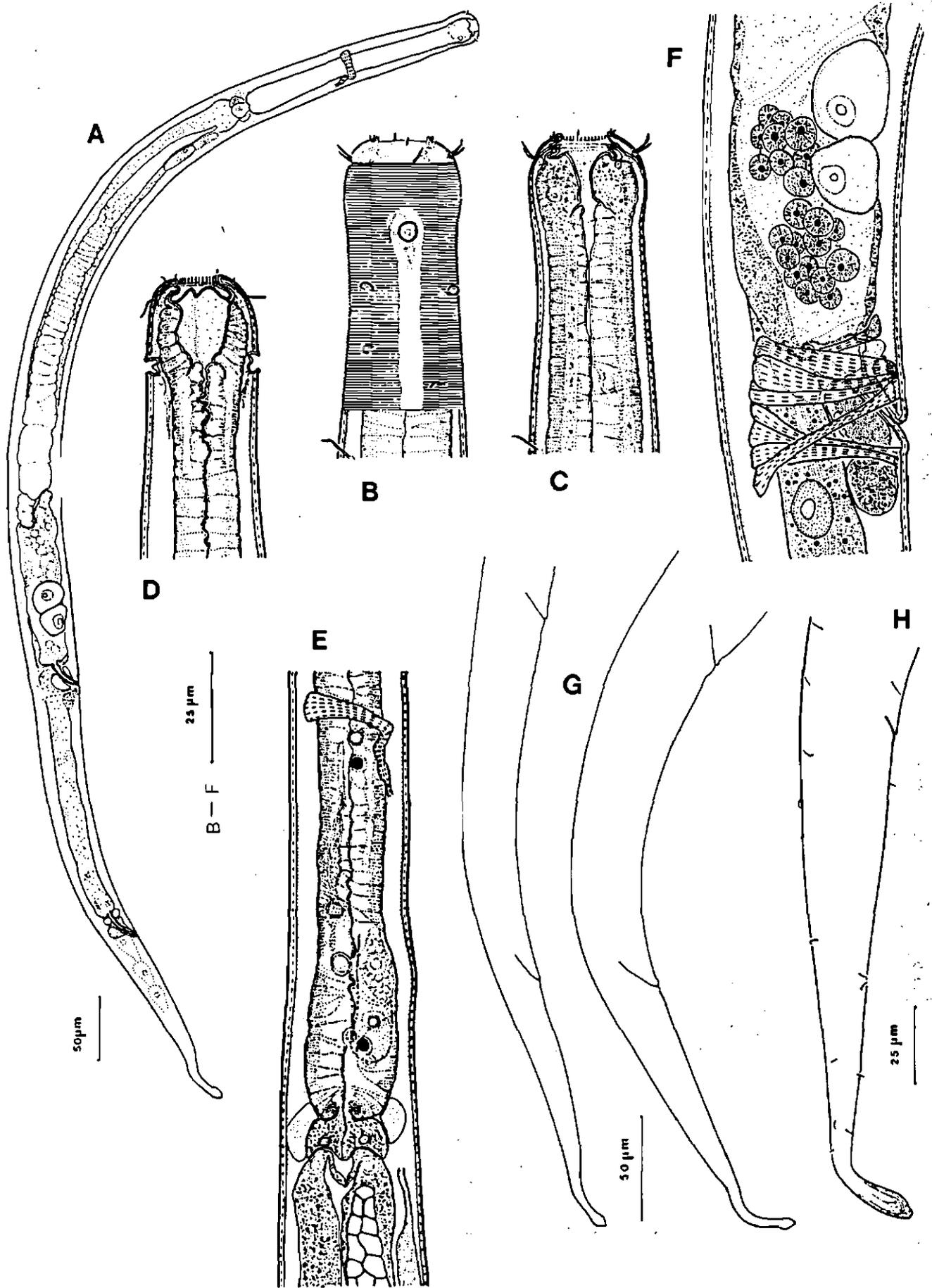
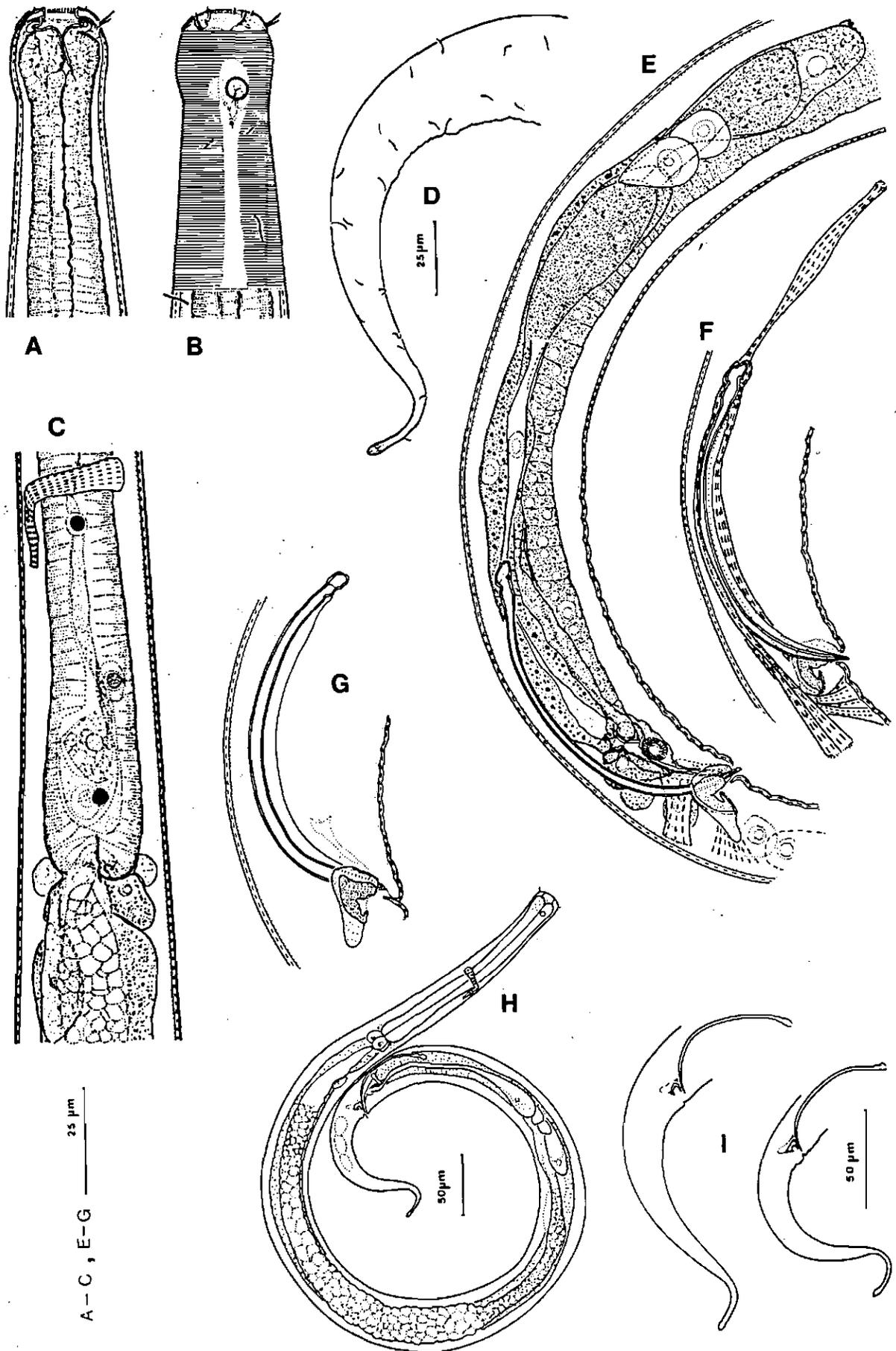


Figure 1 *Monhystera magnacephala*. Type population, female. A: entire body; B & C: head region; D: dorso-ventral view of head; E: basal part of pharynx and cardia; F: vaginal region. G: vulva-anus region and tail; H: somatic setae on tail.



**Figure 2** *Monhystra magnacephala*. Type population, male. A & B: head region; C: basal part of pharynx and cardia; D: somatic setae on tail; E: spicule, gubernaculum, ejaculatory glands and coelomocytes; F: spicule, gubernaculum and associated muscles; G: spicule and gubernaculum; H: entire body; I: tail with spicule and gubernaculum.

***Monhystera gabaza* Joubert & Heyns, 1980**

**Female:** L = 0,91 (0,71–1,00) mm; a = 24,3 (20,1–29,7); b = 6,0 (5,5–6,6); c = 5,8 (4,9–6,3); V = 62 (60–64); c' = 7,9 (6,8–9,0); vulva-anus distance/tail = 1,20 and 1,32; tail = 157  $\mu$ m.

**Male:** L = 0,75 (0,74–0,77) mm; a = 21,2 (16,5–27,2); b = 5,85 (5,8–5,9); c = 6,4 (6,0–7,0); c' = 4,4 and 4,1; spicules = 70 (60–80)  $\mu$ m; tail = 117 (106–125)  $\mu$ m; tail/spicule = 1,71 and 1,77; spicule/anal body diameter 2,4 and 3,0.

Anterior end of body conoid, not set off. Cephalic setae shorter than or as long as labial setae, 2,0–2,5  $\mu$ m in female, 2,0–3,0  $\mu$ m in male, i.e. 19–25% of head diameter. Fovea diameter 3,0–3,5  $\mu$ m and 4,0–6,0  $\mu$ m in female and male respectively, or 37–38% and 57% of the corresponding body diameter respectively. Anterior rim of fovea 0,28–0,45 and 0,75 times the head diameter from anterior end in female and male respectively. Peri-oral plates present. Cheilostome cylindroid. Buccal ring at 33% of the head diameter from anterior end. Stoma V-shaped with what appears as small sclerotizations at its base; dorsal pharyngeal gland opening at base of stoma. Nucleus of dorsal pharyngeal gland halfway between nerve ring and base of pharynx. Nuclei of ventrosublateral glands 0,5 times pharynx diameter from base of pharynx. A second pair of smaller ventrosublateral nuclei can be seen at the level of the nerve ring similar to posterior pair of gland nuclei, but it is not clear whether they are gland nuclei. Pharynx subcylindroid, slightly broadened posteriorly. Cardia mushroom-shaped. Two subdorsal ocelli, one behind the other, situated at 3–5 times the body diameter from the anterior end. Ventral gland about one corresponding body diameter long, situated posterior to progaster. Excretory pore halfway between nerve ring and anterior end of body.

Vagina about one body diameter long, with a dorsal gland cell opening into lumen of vagina at about one third its length from the vulva. No postvaginal gland cell. Ovary not reaching progaster area. Uterus small, always with two large, ovoid hyaline accompanying cells posteriorly, on the right hand side. Oviparous.

Spicules evenly curved, slender, their diameter 3% of their length. Capitulum rectangular, weakly differentiated. Gubernaculum with well developed, yellowish apodeme and large hyaline dorsal apophysis, longer than gubernaculum and 50–77% of the anal body diameter. Gubernaculum 18–20% of the length of the spicules. With one pair of ejaculatory glands.

Rectum length about equal to anal body diameter. Rectum with large dorsal gland cells.

Elongate-conoid part of tail about half tail length in female, about two thirds tail length in male. In the male the filiform part of the tail is always dorsally bent or recurved. Spinneret spindle-shaped.

**Distribution:** Benthic in reedbeds, Taaiboschspruit, Vaal River System. Endemic in South Africa.

***Monhystera taaiboschiensis* Joubert & Heyns, 1980**  
(Figures 3–5)

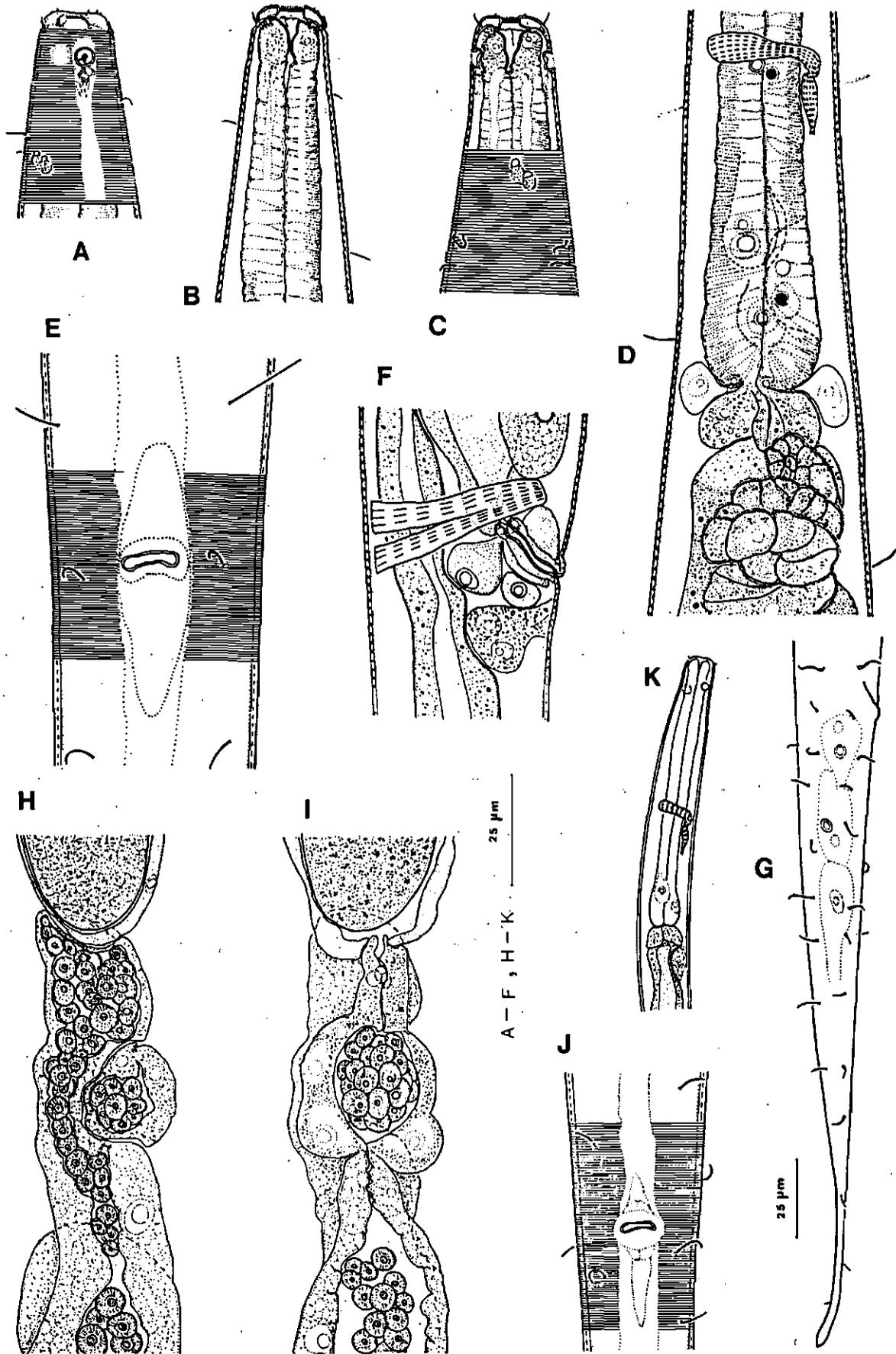
**Female:** L = 1,11 (0,79–1,30) mm; a = 18,5 (16–22); b = 6,4 (5,5–7,3); c = 5,8 (5,3–6,2); V = 64 (61–66); c' = 8,0 (7,1–9,1); V' = 77,6 (74–80); vulva-anus distance/tail = 1,05 (1,0–1,11); tail = 193  $\mu$ m.

**Male:** L = 0,95 (0,81–1,04) mm; a = 22,6 (17,1–28,6); b = 6,1 (5,4–6,5); c = 5,6 (5,3–5,9); c' = 6,9 (6,0–8,3); spicule = 85,4 (79–90)  $\mu$ m; tail 168  $\mu$ m; tail/spicule = 1,98 (1,6–2,2); spicule/anal body diameter = 3,58 (3,2–4,3).

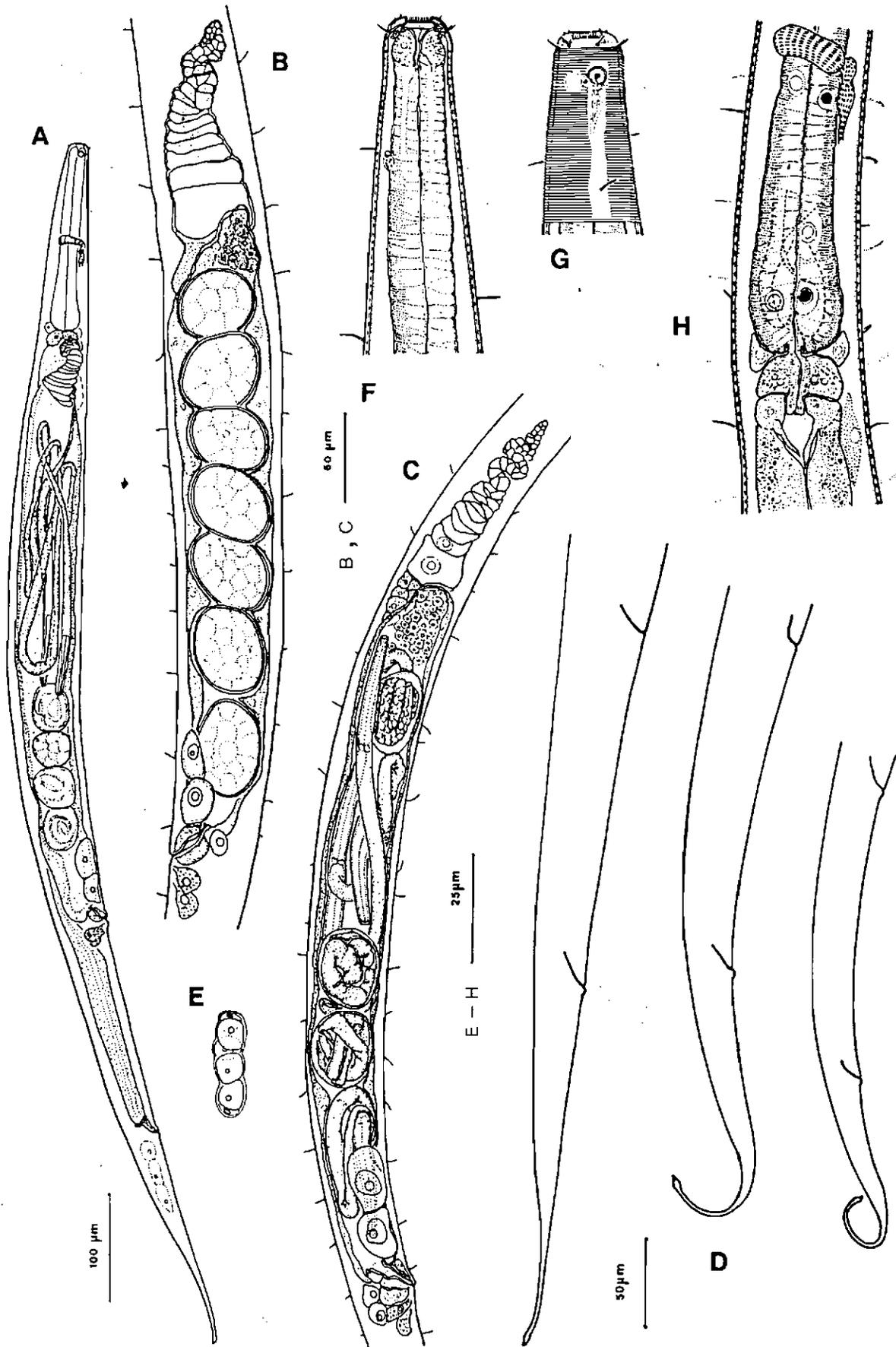
Anterior end confluent with body, sometimes slightly broadened, but not set off by constriction. Female about 15% longer than male. With about 15 striae per 10  $\mu$ m on cuticle. Cephalic setae shorter than labial setae, the latter 3,1  $\mu$ m, or 21% the head diameter. A large number of somatic setae scattered over the body, but more concentrated in the neck and tail regions. Diameter of fovea 4,8 (4,0–5,4)  $\mu$ m, or 26,5 (21–36)% of the corresponding body diameter in the female. In the male the respective figures are: 4,5 (4,2–4,9)  $\mu$ m and 28,6 (26–33)%. Anterior rim of fovea 0,46 (0,4–0,6) and 0,56 (0,4–0,7) times the corresponding body diameter from the anterior end. Oral opening about 3,5–6,5  $\mu$ m wide. Peri-oral plates present. Buccal ring well developed, about 8,5  $\mu$ m wide, or 60% of the head diameter. Stoma V-shaped, with the pharyngeal lumen behind the stoma slightly broadened. Pore of dorsal pharyngeal gland sclerotized, located in dorsal sector of base of stoma, with similar sclerotizations in the ventro-sublateral sectors. Nuclei of ventro-sublateral pharyngeal glands near base of pharynx; dorsal nucleus situated  $\frac{1}{2}$ – $\frac{2}{3}$  the distance between nerve ring and base of pharynx; two further ventro-sublateral nuclei visible at level of nerve ring, smaller but similar to the pair of posteriorly situated gland nuclei. Pharynx subcylindroid, markedly broadened posteriorly. Cardia mushroom-shaped, surrounded by six large, hyaline pericardial cells. First intestinal cells with thin, valve-like extensions into lumen. Two subdorsal ocelli situated about twice the head diameter from the anterior end; colour of pigment unknown but in fixed material visible as large black granules. Ventral gland small, about 0,8 times the corresponding body diameter, at level of progaster. Excretory pore not seen.

Vaginal sphincter large; postvaginal, V-shaped gland(s?) yellowish, with large granules consistently present. Ovaries of young females long, extending to progaster area, in gravid females compressed to convoluted, meandriiform or reflexed and reaching only 10% of length of reproductive system; oviduct short, subdorsal of uterus; uterus long, in gravid females containing up to seven eggs and five juveniles. Posterior part of uterus always accompanied by two large, hyaline cells, situated on right hand side.

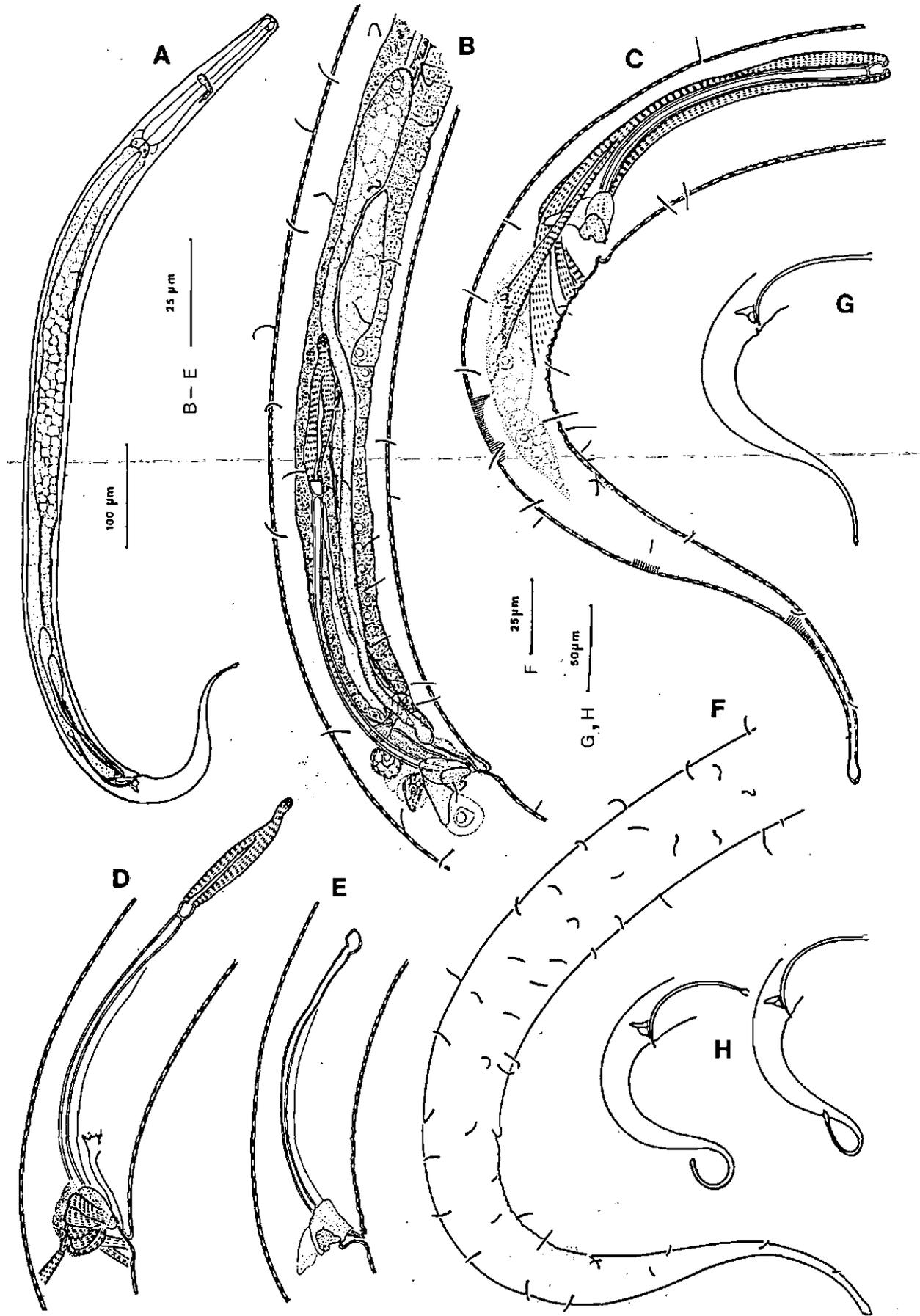
Spicules long and slender, ventrally curved, the spicule diameter 3,2 (2,8–3,6)% its length. Capitulum small, spherical. Gubernaculum well developed with a hook-shaped, yellowish, refractive apodeme and a hyaline, thumb-shaped



**Figure 3** *Monhystera taaiboschiensis*. Type population, female. A & B: head region; C: dorso-ventral view of head; D: basal part of pharynx and cardia; E: ventral view of vulva; F: vaginal region; G: somatic setae on tail; H & I: oviduct region of young female with respectively receptaculum seminis and oviduct filled with spermatozoa; J: ventral view of anus; K: anterior part of intra-uterine juvenile.



**Figure 4** *Monhystera taiboschiensis*. Type population A-D female. A: entire body; B&C: reproductive system with eggs (B), and developing eggs and juveniles (C), in uterus; D: vulva-anus region and tail. E: genital primordium in intra-uterine juvenile. F-H male. F&G: head region; H: basal part of pharynx and cardia.



**Figure 5** *Monhystra taiboschiensis*. Type population, male. A: entire body; B: spicule; gubernaculum and ejaculatory glands; C: spicule, gubernaculum, associated muscles, and caudal glands; D & E: spicule and gubernaculum; F: somatic setae on tail region; G & H: Tail with spicule and gubernaculum.

dorsal apophysis. Two pairs of ejaculatory glands present, opening close to anterior end of cloaca; cloacal gland cells opening dorsally into the cloaca.

Basal two thirds of tail elongate-conoid, distal one third filiform. Elongate-conoid part, especially in the male, ventrally curved, and the distal filiform part always dorsally curved. Spinneret spindle-shaped.

*Distribution:* Benthic in the Vaal River System: Taaiboschspruit and Loch Vaal. Endemic in South Africa.

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