MALE DESCRIPTION AND ADDITIONAL MORPHOMETRICAL DATA FOR FEMALES OF *OGMA TENUICAUDATUM* (SIDDIQI, 1961) SIDDIQI, 1986 (NEMATODA: CRICONEMATIDAE)

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Summary. Male specimens of *Ogma tenuicaudatum* (Siddiqi, 1961) Siddiqi, 1986 were present among the nematodes extracted from soil samples collected from around the rhizosphere of chir pine (*Pinus roxburghii* Sarg.) in Himachal Pradesh, India. As the male of this species had not been reported earlier, it is herein described and illustrated. Additional data of female specimens are also given.

Keywords: Criconematidae, *Pinus roxburghii*, India.

During a survey of nematodes associated with conifers in Himachal Pradesh (India), male and female specimens of *Ogma tenuicaudatum* (Siddiqi, 1961) Siddiqi, 1986 were encountered in the soil samples collected around the rhizosphere of chir pine (*Pinus roxburghii* Sarg). As the male had not been reported earlier, it is described here for the first time.

MATERIALS AND METHODS

The nematodes were extracted by the sugar centrifugal flotation technique (Caveness and Jensen, 1955), killed and fixed in hot 4% formalin and processed to anhydrous glycerine by the slow method. They were then measured with the help of an ocular and stage micrometers and photomicrographs were taken. Line drawings were prepared with the aid of a camera lucida. Specimens of *O. tenuicaudatum* were found together with *Crossonema fimcivatum* Khan *et al.*, 1976 and *Hemicriconemoides cocophilus* (Loos, 1949) Chitwood *et* Birchfield, 1957 in the soil sample collected at Anji (Solan), where the males were found.

RESULTS

OGMA TENUICAUDATUM
(Siddiqi, 1961) Siddiqi, 1986
(Figs 1, 2)

Measurements

Females from P. roxburghii*, Mecleodganj, Dharamshala, population*. N = 4; L = 0.47 ± 0.02 (0.45-0.49) mm; a = 9.3 ± 0.29 (9.0-9.7); b = 3.4 ± 0.1 (3.3-3.5); V = 86.6 ± 0.59 (86-87.3)%; stylet = 112.8 ± 0.16 (112-113.6) μm; R (total number of body annules) = 58 ± 1.0 (57-59); Res (number of annules in oesophageal region) = 19 ± 1.54 (18-21); Rex (number of annules between anterior end of body and excretory pore) = 24 ± 0.5 (24-25).

Females from P. roxburghii*, Anji (Solan) population*. N = 3; L = 0.45 ± 0.02 (0.42-0.48) mm; a = 9 ± 0.29 (8.7-9.4); b = 3.2 ± 0.22 (3.0-3.5); V = 85.8 ± 1.09 (85-87.3)%; stylet = 108.8 ± 1.13 (108-110.4) μm; R = 58 ± 0.94 (57-59); Res = 20.3 ± 0.47 (20-21); Rex = 24 (n = 1).

Females from P. roxburghii*, Ghrogh, Ghannahti (Shimla) population*. N = 7; L = 0.43 ± 0.02 (0.40-0.45) mm; a = 8.8 ± 0.45 (8.2-9.3); b = 3.1 ± 0.18 (2.9-3.3); V = 86 ± 1.31 (85-87)%; stylet = 112.1 ± 1.49 (110-113.6) μm; R = 59 ± 0.93 (58-60); Res = 19 ± 1.51 (18-21); Rex = 24 ± 0.66 (24-25).

Males from P. roxburghii*, Anji (Solan) population*. N = 5; L = 0.33 ± 0.01 (0.32-0.35) mm; a = 15.3 ± 1.15 (13.6-16.9); b = 4.4 ± 0.26 (4.1-4.8); c = 8.6 ± 0.8 (8-10); Spicule = 33 ± 0.60 (32.0-33.7) μm; gubernaculum = 5.7 ± 0.76 (4.8-6.5) μm.

Description

Female. Body slightly ventrally arcuate, tapering from oesophageal base to head and posteriorly rather abruptly behind vulva to tail terminus. Body annuli retrorse, bearing a discontinuous fringe of spines having rounded ends on posterior margins. Spines arranged in groups of 2-3 forming fourteen longitudinal bands. Head distinctly set off from body, comprising two modified annuli; the first cephalic annulus anteriorly expanded to form a broad, membranous cup 20.0-22.1 μm wide, enclosing the dome-shaped lip region. The second annulus simple, rounded, 16.0-16.5 μm in width. Stylet 108.0-113.6 μm long (metenchium = 95.0-97.2 μm; telenchium = 16.5-18.3 μm) with anchor-shaped knobs. Isthmus short and broad. Oesophagus extending through 18-22 body annuli. Nerve ring encircling isthmus. Oocytes arranged

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in single row. Ovary single, prodelphic. Vulva open, a transverse slit, located on the 9-11th annuli from the posterior end of body. Vulval lips distinct from the body annuli. Anus located on the 5-6th annuli from posterior terminus. Tail attenuated.

Male. Body cylindrical, ventrally curved. Body annuli smooth, distinct, 102-112 in number. Lateral field with three incisures. Lip region broadly rounded. Oesophagus degenerated, slender. Excretory pore located at 104-106 μm from anterior end of body. Testis single, out-

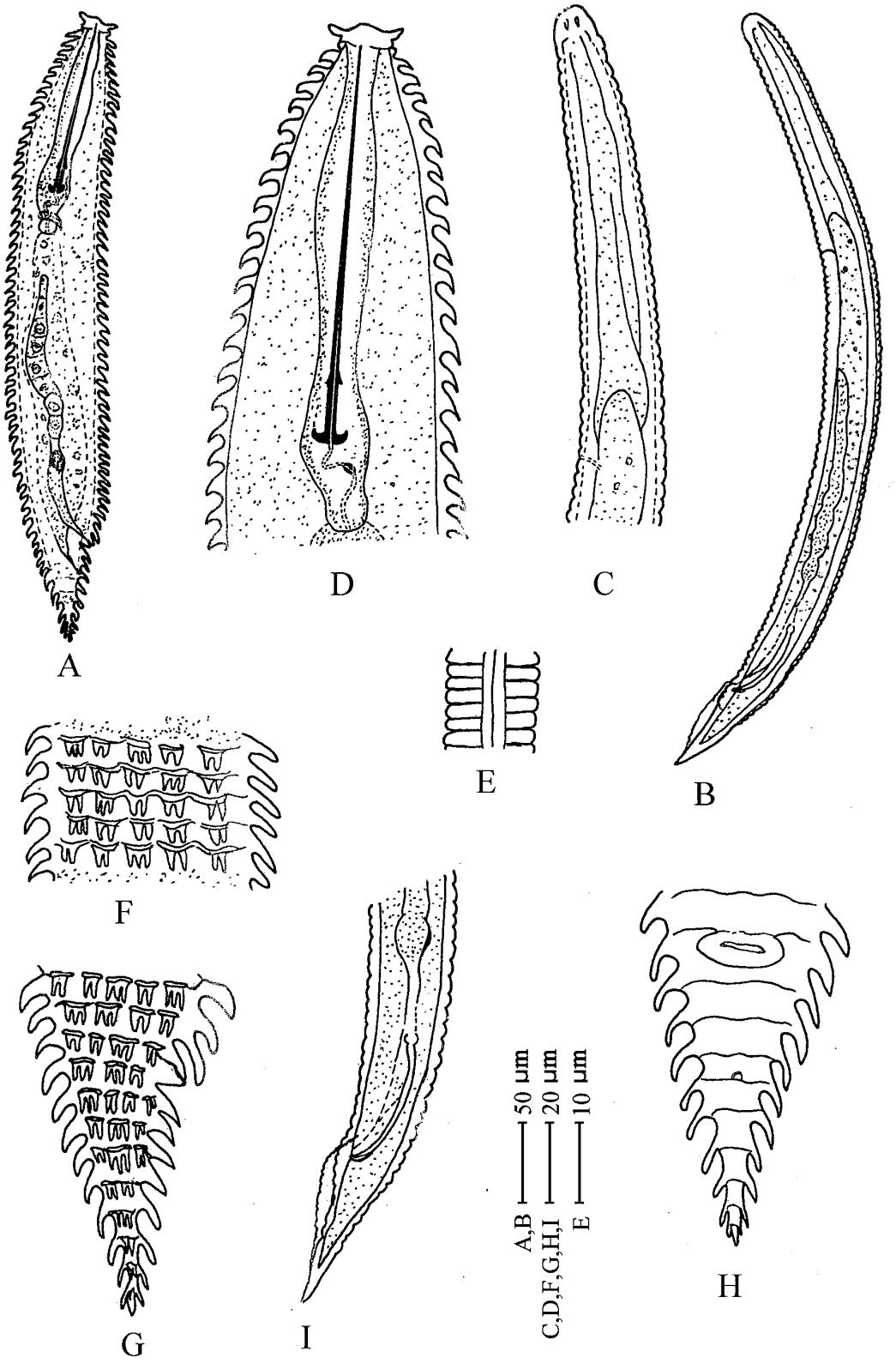

Fig. 1. *Ogma tenuicaudatum*. A, entire female; B, entire male; C, male oesophageal region; D, female oesophageal region; E, male lateral fields; F, female mid-body cuticle; G, female posterior region, lateral view; H, female posterior region, ventral view; I, male cloacal region, lateral view.

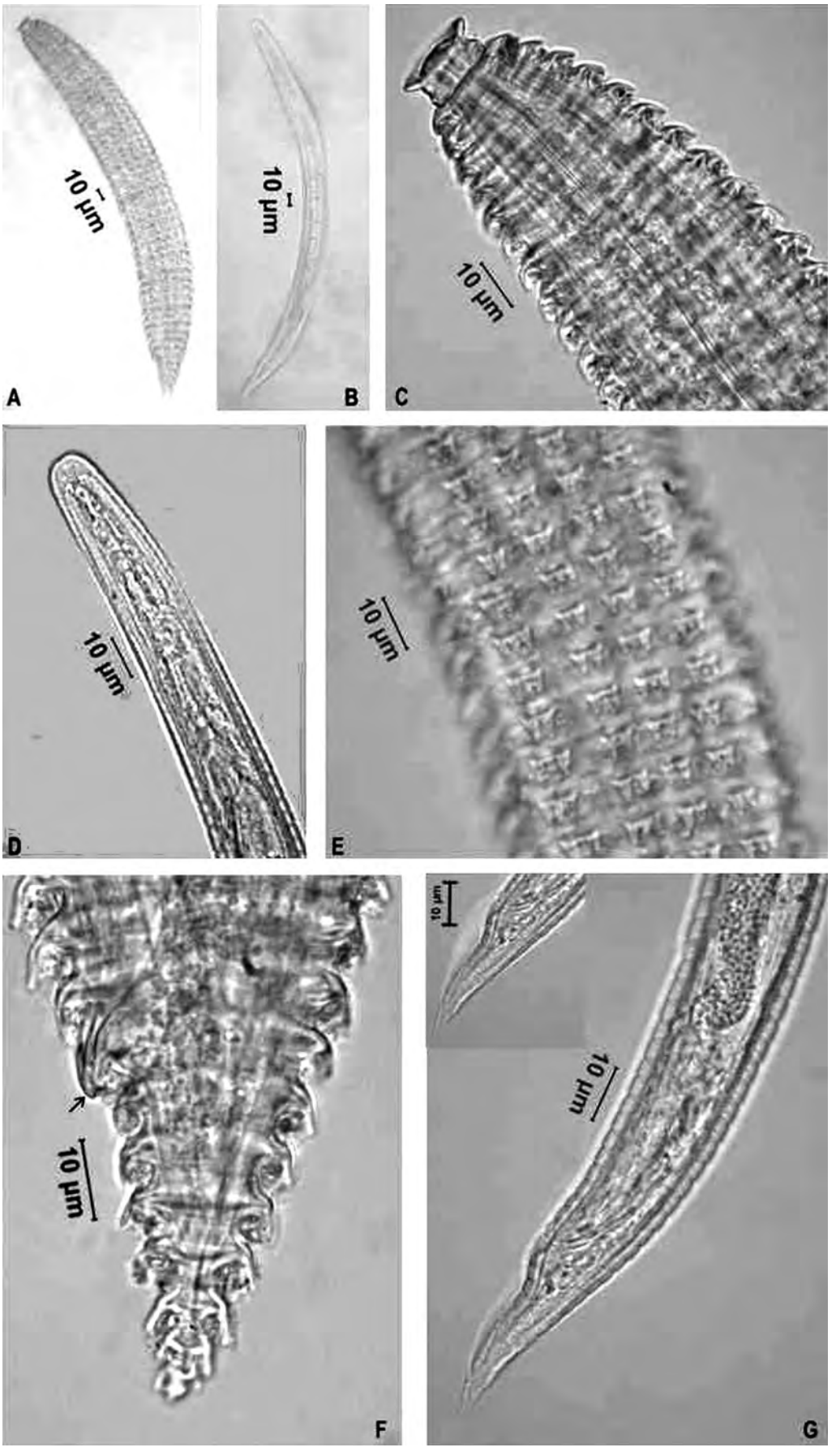

Fig. 2. Photomicrographs of *O. tenuicaudatum*. A, entire female; B, entire male; C, female anterior region enlarged; D, male anterior region; E, female mid-body cuticle; F, female vulval region, lateral view; G, male cloacal region, lateral view, insert shows the caudal alae.

stretched; sperm large, round; cloacal prominence small. Spicules 32.0-33.6 µm long, arcuate. Gubernaculum simple, arc-shaped, 4.8-6.4 µm long. Cuadal alae beginning from cloaca and ending just near tail terminus. Tail elongated, conical with pointed terminus.

Host and localities. Soil around the roots of *P. roxburghii* from i) Mecleodganj, Dharamshala; ii) Anji, Solan; iii) Ghrogh (Ghannahti) Shimla.

Specimen designation. one male specimen deposited in the collection of the Department of Nematology, CCS Haryana Agricultural University, Hisar; three male and female specimens at the Department of Biosciences, Himachal Pradesh University, Shimla; one male and one female specimens at the Institute of Forest Protection, Nanjing Forestry University, China.

Remarks. *Ogma tenuicaudatum* was originally described by Siddiqi (1961) as *Criconema tenuicaudatum*. Siddiqi (1986) transferred it to *Ogma*. The present female population is similar to those of the original description given by Siddiqi (1961). The variations found in female specimens are in the slightly longer stylet, arrangement of spines and presence of males (stylet = 106-110 µm, spines arranged in groups of 2-3, rarely 4, forming fourteen longitudinal bands, and absence of males in the specimens described by Siddiqi, 1961). The original description of *O. tenuicaudatum* (Siddiqi, 1961) Siddiqi, 1986 was based on females only. Males were collected recently from the rhizosphere of chir pine (*P. roxburghii*) at Anji, Solan, Himachal Pradesh, India, and are described here for the first time. The males of *O. tenuicaudatum* were compared with those of *O. floridense* Vovlas *et al*. (1991) and *O. cobbi* (Micoletzky, 1925) Siddiqi, 1986 described by Handoo and Golden (1988). However, the male of *O. tenuicaudatum* differs from those of the other two species in the presence of caudal alae. The females of *O. tenuicaudatum* differ from those of *O. cobbi* in number of annuli between posterior end of body and vulva, position of vulva and shape of scales [V = 80-85%, RV = 11-14, majority of scales simple, only some furcate, 2- or 3-pointed in *O. cobbi* described by Andrássy (1979) while Handoo and Golden (1988) described male specimens only].

Vovlas *et al*. (1991) described a male of *O. floridense* from soil around the roots of *Liquidamber styraciflua* L. in swamps in the Aucilla wildlife management area northwest of Perry, Taylor County, Florida. However, the observations were based on a specimen enclosed in its fourth-stage cuticle. The males of *O. tenuicaudatum* differ in smaller body length, value of 'c', position of excretory pore, spicules size and number of lateral lines (L = 460 µm, c = 15, excretory pore = 126 µm from anterior end, spicules = 42 µm, 4 longitudinal lines in *O. floridense*). The females of *O. tenuicaudatum* differ from those of *O. floridense* in having relatively longer stylet and different total number of body annuli and number of annuli in the oesophageal region (stylet = 87-98 µm, R = 52-57, Res = 15-18 in *O. floridense*).

Handoo and Golden (1988) described the males of *O. cobbi*, including a moulting one, from a green-house culture reared on *Betula nigra* L. (river birch) at Beltsville, Maryland, USA. The males of *O. tenuicaudatum* differ in the position of the excretory pore and spicules size (excretory pore = 112-118 µm from anterior end, spicules = 35.0-42.5 µm in *O. cobbi*).

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Accepted for publication on 18 October 2010.