HEMICRICONEMOIDES VARIABILIS SP. N. AND TWO KNOWN SPECIES
OF HEMICRICONEMOIDES FROM INDIA

by
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Summary. Hemicriconemoides variabilis sp. n. is characterized by 142-154 body annules, two lip annules, labial plate modified into semicircular projections, stylet 85-95 μm long and conical tail. Measurements of various populations and SEM illustrations are provided for Hemicriconemoides cocophilus and H. mangiferae.

Hemicriconemoides cocophilus (Loos, 1949) Chitw. et Birchfield, 1957 and H. mangiferae Siddiqi, 1961 occur frequently in soil samples in India. In this article additional morphometric features of these two species, and the description of H. variabilis, in our opinion a hitherto undescribed species, are provided.

Materials and methods

Specimens for light microscopy were killed and fixed in hot 4% formalin, dehydrated by the slow method and mounted in anhydrous glycerine. Measurements were made with an ocular micrometer. For scanning electron microscopy, formalin fixed specimens were processed by Eisenback’s (1985) method; some glycerine infiltrated specimens were processed by the method of Sher and Bell (1975). Specimens were coated with 30 nm gold and observed in a Hitachi S-2300 scanning electron microscope at 15 kV.

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\text{Descriptions}
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**HEMICRICONEMOIDES VARIABILIS sp. n.**
(Figs. 1 and 2)

**Holotype female:** L = 440 μm; a = 17.4; b = 4.2; c = 12.9; c' = 2.8; V = 86.5; stylet = 84 μm; conus = 72 μm; tail = 34.5 μm; R = 144; Rst = 29; Roes = 36; Rex = 42; RV = 18; Rvan = 6; Ran = 12; VL/VB = 2.85; st%L = 18.9

**Paratype females** (n=10): L = 390-450 (430±20) μm; a = 16.0-17.5 (17.1±0.6); b = 3.9-4.2 (3.9±0.14); c = 9.7-12.9 (11.0±1.7); c' = 2.0-3.0 (2.4±0.16); V = 86.0-88.0 (87.2±0.47); stylet = 85.0-95.0 (89.0±4.0) μm; conus = 72.0-85.0 (77.5±4.7) μm; tail = 33.0-46.5 (39.4±4.3) μm; R = 142-154; Rst = 28-32; Roes = 34-43; Rex = 40-44; RV = 17-21; Rvan = 5-6; Ran = 12-16; VL/VB = 2.4-2.9 (2.7±0.18); st%L = 18.9-20.8 (20.0±0.8).

**Paratype male:** L = 370 μm; a = 27.5; b = 4.7; c = 9.5; c' = 3.0; tail = 36.0 μm; spicules = 30.0 μm; gubernaculum = 4.5 μm.
Fig. 1 - *Hemicronemoides variabilis* sp. n., A, entire female; B, entire male; C, female anterior end; D, female oesophageal region; E, female gonad; F, male tail; G, female posterior end.


**Type material.** Holotype female and paratype male on slide *Hemicironemoides variabilis* n. sp./1 deposited in the nematode collection of the Department of Zoology, Aligarh Muslim University, Aligarh. Paratype females on slides *Hemicironemoides variabilis* sp. n./2-8 deposited in the nematode collection of the Department of Zoology, Aligarh Muslim University, Aligarh. A paratype female on slide *Hemicironemoides variabilis* sp. n./9 deposited at the Istituto di Nematologia Agraria, C.N.R., Bari, Italy.

**Differential diagnosis and relationship.** *Hemicironemoides variabilis* sp. n. is characterized by two lip annules, labial plate modified to semi-circular sheath-like projections, stylet 85-95 μm long, tail conical with finely rounded terminus, R = 142-154.

The new species resembles *H. chitwoodi*us Esser, 1960; *H. varionodus* Choi et Geraert, 1972; *H. gaddi* (Loos, 1949) Chitwood et Birchfield, 1957 and *H. alexis* Vovlas, 1980 in having two lip annules, equal number of body annules and similar type of tail. However, it differs from them in having an oval lip region with modified labial plate. It also differs from the closely related *H. chitwoodi*us in having a shorter body, in the shape of first lip annule and stylet knobs, and larger number of post-vulval annules (L = 480-590 μm, labial disc elevated and round at tip, labial plate not modified, stylet knobs round, post-vulval body with 12-15 annules in *H. chitwoodi*us). It differs from *H. varionodus* in having differently shaped lip region, slender metenchium, in the shape of spear knobs, anteriorly located vulva and larger number of annules in post-vulval region (lip region with round annules, labial disc slightly elevated or inconspicuous, labial plate not modified, spear knobs with sloping anterior surfaces, V = 91-93; post-vulval annules 11-15 in *H. varionodus*). It differs from *H. alexis* in having a smaller body, longer stylet and greater number of annules in oesophageal region (L = 480-560 μm, labial disc elevated, labial plate not modified, stylet 65-77 μm long and Roes = 26-28 in *H. alexis*). The

**Type habitat and locality.** Rhizosphere of peach (*Prunus persica* Stokes) from Haflong, Assam, India.
Fig. 2 - SEM micrographs of *H. variabilis* sp. n., A and B, anterior ends; C, enface view; D, excretory pore; E, vulva and anal region; F, female posterior end (Scale: bar = 10 μm in A, E, F; 3 μm in B and C; 4 μm in D).
new species can be differentiated from *H. gaddi* in having a partially set off lip region, labial plate modification and a more slender tail (lip region continuous, labial region round with slightly elevated labial disc, labial plate not modified and tail conoid in *H. gaddi*).

**Remarks.** Decraemer and Geraert (1992) described four types of lip regions in the genus *Hemicriconeoides*. The present species represents a fifth type with a narrow, dorso-ventrally located oral disc, two slit-like amphidial apertures below the oral disc and labial plate with two semicircular projections laterally.

**HEMICRICONEMOIDES COCOPHILUS**  
(Loos, 1949) Chitw. et Birchfield, 1957 (Fig. 3)

**Kurnool, Andhra Pradesh population**

**Females** (n=18): L = 330-380 (360±20) μm; a = 13.0-14.5 (13.9±0.5); b = 4.0-4.5 (4.3±0.19); c = 13.0-19.4 (16.9±2.1); V = 92.0-93.9 (92.7±0.71); stylet = 45-51 (49.2±2.4) μm; conus = 37.5-43.5 (41.1±2.0) μm; tail = 18.0-25.5 (21.6±2.6) μm; R = 122-138; Rst = 16-18; Roes = 25-30; Rex = 25-35; RV = 9-10; Rvan = 1-2; Ran = 8-9; VL/VB = 1.0-1.4 (1.2±0.14); st%L = 12.7-15.3 (13.6±0.9).

**Sabaranpur, Uttar Pradesh population**

**Females** (n=20): L = 380-470 (410±28) μm; a = 14-17 (15.7±0.99); b = 4.4-5.3 (4.9±0.34); c = 15-23 (18.6±2.5); V = 89-94 (91.2±1.5); stylet = 49-63 (57.5±4.4) μm; conus = 42-58 (51.5±5.4) μm; tail = 20.0-27.5 (24.7±2.4) μm; R = 100-120; Rst = 16-17; Roes = 22-26; Rex = 21-31; RV = 8-10; Rvan = 1; Ran = 7-9; VL/VB = 1.3-1.7 (1.5±0.13); st%L = 13.5-16.4 (15.4±0.88).

**Jalna, Maharashtra population**

**Females** (n=15): L = 350-420 (387±24) μm; a = 15-18 (16.6±0.95); b = 4.5-5.6 (4.9±0.34); c = 14-18 (15.9±1.4); V = 92-94 (93.0±0.74); stylet = 53-58 (56.0±1.6) μm; conus = 48-53 (50.3±1.78) μm; tail = 22-30 (25.6±2.4) μm; R = 115-128; Rst = 15-17; Roes = 23-26; Rex = 27-31; RV = 10-11; Rvan = 1-3; Ran = 7-9; VL/VB = 1.4-1.7 (1.5±0.96); st%L = 12.0-14.5 (13.2±0.87).

**Host and localities.** Rhizosphere of sun flower (*Helianthus annuus* L.) from Kurnool, Andhra Pradesh; guava (*Psidium guajava* L.) from Sabaranpur, Uttar Pradesh; sweet pea (*Pisum sativum* L.) from Jalna, Maharashtra, India.

**Remarks.** Loos (1949) first described this species from Sri Lanka. Decraemer and Geraert (1992) redescribed it with the help of SEM observations. The present specimens closely agree with the previous descriptions and measurements. SEM observations showing a round labial region, circular, raised oral disc with a fine rim-like collar, a slit-like oral aperture and slit-like amphidial apertures behind oral disc without protruding plugs as indicated by Decraemer and Geraert (1992).

**HEMICRICONEMOIDES MANGIFERAE**  
Siddiqi, 1961 (Fig. 4)

**Chikmagalur, Karnataka population**

**Females** (n=15): L = 400-470 (450±20) μm; a = 16.0-18.7 (17.0±0.8); b = 4.1-5.3 (4.8±0.4); c = 18.4-22.8 (20.5±1.2); V = 91.6-92.9 (92.2±0.45); stylet = 61.5-69.0 (65.0±3.1) μm; conus = 52.5-60.0 (57.0±2.8) μm; tail = 19.5-24.0 (21.7±1.3) μm; R = 157-166; Rst = 21-23; Roes = 28-34; Rex = 30-36; RV = 12-13; Rvan = 4-5; Ran = 8; VL/VB = 1.3-1.6 (1.4±0.08); st%L = 13.9-15.4 (14.5±0.53).

**Siddharth Nagar, Uttar Pradesh population**

**Females** (n=15): L = 470-610 (530±40) μm; a = 17.6-21.6 (19.3±1.3); b = 4.4-5.3 (4.9±0.3); c = 15.2-24.1 (19.2±2.6); V = 91.1-93.0 (92.1±0.7); stylet = 67.5-75.0 (71.3±2.1) μm; co-
Fig. 3 - SEM micrographs of *H. cocophilus*, A and B, anterior ends; C, enface view; D and E, tail ends (Scale: bar = 5 μm in B).
nus = 60-64 (62.7±1.7) μm; tail = 24-30 (28.5±3.0) μm; R = 148-165; Rst = 23-24; Roes = 31-37; Rex = 30-34; RV = 13-16; Rvans = 3-5; Ran = 9-12; VL/VB = 1.37-1.91 (1.7±0.17); st%L = 12.1-15.1 (13.2±0.98).

Rishikesh, Uttar Pradesh population

Females (n=20): L = 460-550 (497±28) μm; a = 17.0-19.5 (18.2±0.8); b = 4.5-5.3 (4.8±0.2); c = 18.2-22.3 (19.9±1.3); V = 92-93 (92.5±0.38); stylet = 63-77 (70.5±4.0) μm; conus = 56-65 (60.7±2.9) μm; tail = 21.0-28.5 (24.6±2.4) μm; R = 124-148; Rst = 17-20; Roes = 25-32; Rex = 31-37; RV = 11-15; Rvans = 3-5; Ran = 7-10; VL/VB = 1.8-2.7 (2.2±0.34); st%L = 13.0-14.5 (13.6±0.5).

Host and localities. Rhizosphere of coffee (Coffea arabica L.) from Chikmagalur, Karnataka; guava (Psidium guajava L.) from Siddharth Nagar, Uttar Pradesh; plum (Prunus communis Huds.) from Rishikesh, Uttar Pradesh, India.

Remarks. SEM observations of H. mangiferae show similarities in structure of tail shape and vulva and annules between vulva and anus as given by Vovlas et al. (1990) and Decraemer and Geraert (1992). The labial structures showing a rectangular oral disc directed posteriad on dorsal and ventral sides with slit-like aperture, two kidney-shaped plugs on amphidial apertures located on lateral sides of oral disc, circular labial plate and round first head annule are as described by Decraemer and Geraert (1992).

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Literature cited


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