



Hemicriconemoides serpentinae sp. nov. from *Rauwolfia serpentina* from West Bengal, India

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ABSTRACT

Hemicriconemoides serpentinae sp. nov. a new ring nematode of the family Criconematidae is described in this paper from rhizosphere of the medicinal plant, Sarpagandha (*Rauwolfia serpentina*) cultivated at the medicinal plant garden of Ramakrishna Mission Ashrama Narendrapur, West Bengal, India. Illustrations and images are included. The new species is distinct from other known species of the genus in having small body length, larger body width, anteriorly indented stylet knobs, vulva without lateral cuticular flaps, lesser number of body annules and conoid tail shape.

KEYWORDS : *Hemicriconemoides serpentinae* sp. nov. , ring nematode, description , medicinal plant, *Rauwolfia serpentina*, West Bengal.

INTRODUCTION

The genus *Hemicriconemoides* was described by Chitwood and Birchfield (1957) with the type species *Hemicriconemoides wessonni*. Chitwood and Birchfield (1957) proposed the genus *Hemicriconemoides* to include those species which fit neither with the present concept of *Criconemoides* Taylor (1936) nor that of *Hemicycliophora* de Man (1921). Thus it was proposed as an intermediate genus with *H. wessonni* as its type species. Goodey (1963) placed the genus *Hemicriconemoides* in synonymy with *Hemicycliophora*. But Siddiqi and Goodey (1963) reinstated the former as a valid genus. The genus *Hemicriconemoides* is cosmopolitan in nature and 52 valid species have been described under it so far. In this paper we describe a new species from the soil of Sarpagandha (*Rauwolfia serpentina*), cultivated at the medicinal plant garden of Ramakrishna Mission Ashrama, West Bengal, India which do not fit with the key of Siddiqi (2000) or the descriptions of any species known from the world.

MATERIALS AND METHOD

Nematodes were extracted from soil sample, collected from rhizosphere of the medicinal plant, Sarpagandha (*Rauwolfia serpentina*) by Cobb's Sieving Technique and decantation followed by Modified Bearmann's Funnel Method (Christie & Perry, 1951); fixed with hot (90°-100°C) FA (Formalin : Acetic acid 4:1) solution (Seinhorst, 1966); mounted in anhydrous glycerin (Seinhorst, 1959). Drawings were made with the help of camera lucida and photomicrographs taken with Zeiss trinocular research microscope having attached digital CCD camera. The abbreviations used for the description of the present species (Table 1) are - L- total body length; a - body length divided by greatest body width; b- body length divided by distance from anterior end to junction of oesophagus and intestine; c- body length divided by tail length; c' - tail length divided by body width at anus or cloaca; MB-Maximum breadth of the body ; V- distance of vulva from anterior end X 100 divided by body length; G1- overall length of anterior gonad X 100 divided by body length; R- total body annules; Rst - number of body annuli opposite the stylet; Rex- number of annuli from the anterior end to the excretory pore; Roes - total body annules between labial disc and oesophago-intestinal valve; Rv - number of body annuli between the vulva and the tail terminus; Ran - number of body annuli between the anus and tail terminus; Orifice of DOG -

Orifice of dorsal oesophageal gland (Table. 1).

DESCRIPTION**Systematic position**

Family Criconematidae Taylor, 1936
Subfamily Criconematinae Taylor, 1936
Genus *Hemicriconemoides* Chitwood and Birchfield, 1957

Hemicriconemoides serpentinae* sp. nov. (Table 1, Fig. 1 & 2)*Diagnostic features**

Female: Body small (length = 316.8 – 332.1 µm), cylindrical and ventrally curved at anterior and post vulval portion. Cuticle with two discernible layers fitting closely on anterior part and well separated on curved, narrow tail. Outer cuticle sheath-like, attached to body at head, vulva and tail tip; annules of sheath and body flat and round lacking scales or spines. Lips with 2-3 annules, sclerotized and continuous with the body. Stylet small with anteriorly indented stylet knobs. Excretory pore located posterior to oesophago-intestinal junction. Vulva posterior, closed without lateral cuticular flaps; gonads single, anterior, outstretched, with rounded (11-12 µm) spermatheaca, oocytes arranged in a single row. Tail conoid.

Male: Not found.

Host Plant: Sarpagandha (*Rauwolfia serpentina*)

Deposition of Specimens: Holotype (♀) and paratypes (12 ♀♀) are deposited to the National Zoological Collection of Zoological Survey of India, Kolkata, West Bengal under the Registration No. WN 1449.

Date of Collection : 10.07.2014

DISCUSSION

The present species *Hemicriconemoides serpentinae* sp. nov. is characterized from all other known valid species of this genus by its small body length, larger body width, anteriorly indented stylet knobs, vul-

va without lateral cuticular flaps, lesser number of body annules and conoid tail shape. It closely resembles with *Hemicriconemoides minor* Brzeski & Reay (1982) regarding its body length, value of b, stylet length, lip shape and number of lip annules; but it differs regarding its number of body annules (vs R=112-125), shape of stylet knobs (vs rounded), vulval shape and position (vs open, V=91-94) and tail shape (vs dorsally curved).

The proposed new species also shows similarities with *Hemicriconemoides coronatus* Reay & Colbran (1986) regarding its body length, shape of stylet knobs, maximum width and oesophageal length but differs from the known species in having shorter stylet length (vs 67-74 µm), lesser number of body annules (R=110-142), anteriorly located vulva (vs V=92-94) and tail shape (vs hemispherical).

The species also resembles with *Hemicriconemoides rotundus* Rathour *et al.* (2003) regarding its stylet length, shape of stylet knobs, number of lip annules and tail shape, but differs from it in having smaller body length (vs 410-640 µm), value of a, b (vs a=15.8-20, b=4-5.1), anteriorly located vulva (vs V=91-94) and number of annules in vulval region (vs Rv=8-12).

Etymology : Named after the species name of the host plant *Rauvolfia serpentina*.

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Table 1. Measurements of *Hemicriconemoides serpentinae* sp. nov. (all measurements are in µm)

Morphometric characters	Holotype female	Paratype females (n=12)	Mean ± SD
L	323.4	316.8 – 332.1	328.7 ± 16.52
a	9.8	9.4 – 9.8	9.56 ± 0.87
b	2.97	2.9 – 3.2	2.98 ± 0.03
c	10.96	10.1 – 11.3	10.78 ± 1.13
c'	1.27	1.24 – 1.32	1.29 ± 0.87
MB	22.4	21.5 – 24	23.7 ± 1.57
V	89	84 – 89	87 ± 2.3
G1	65	64 – 68.5	66.4 ± 2.34
R	81	81-85	83 ± 2.76
Rst	15	14 – 15	15 ± 1.31
Rex	22	20-22	22 ± 0.37
Roes	23	23-24	23 ± 0.58
Rv	6	6-7	7 ± 0.04
Ran	5	5 – 6	5 ± 0.32
Height of lip	3.5	3.5 – 4.75	3.62 ± 0.85
Lip width	13.2	12.75 – 13.5	12.83 ± 0.63
Stylet conus	36	35 – 37.5	35.13 ± 2.31
Stylet shaft	30	28 – 30	28.67 ± 1.18
Stylet knob	3.3	3 – 3.7	3.33 ± 1.15
Stylet base to orifice of dorsal gland	6.6	6 – 6.6	6.5 ± 0.54
Orifice of DOG	72.47	72.47 – 74.6	73.02 ± 2.05
Nerve ring	85.8	84 – 87.5	86.5 ± 1.12
Maximum width	33	33-35	33 ± 2.18
Oesophageal length	108.9	104.5 – 111	105.5 ± 1.32
Median bulb length	24.5	24.5 – 28	26.33 ± 1.76
Median bulb width	19.6	19.6 – 22	20.53 ± 1.29
Anterior end to centre of median bulb	72.6	71.5 – 78.4	75.63 ± 2.51
Basal bulb length	19.8	18.33 – 22.5	21.5 ± 3.03
Basal bulb width	13.2	12.75 - 14.5	14.1 ± 1.24
Basal bulb length/width	1.5	1.5-1.75	1.63 ± 0.78
Anterior end to oesophageal gland	112.2	110.5-115	111.3 ± 1.55
Excretory pore	82.5	82.5-85	83.5 ± 1.87

Anterior end to vulva	287.95	267.95 – 291.4	278.2 ± 12.54
Vulval body width	29.4	29.4 – 30.5	30.01 ± 0.15
Vaginal length	10	10 – 14.7	12.4 ± 2.35
Vaginal width	2.5	-	2.5 ± 0
Anterior gonad	211.2	202.5 – 227.3	216.83 ± 15.3
Anal body diameter	23.1	22.5-25	23.7 ± 0.87
Rectum	10	10 – 12.5	12.75 ± 1.25
Anterior end to anus	293.7	287.3 – 301.7	287.37 ± 3.87
Tail length	29.5	28 – 33	27.17 ± 1.86

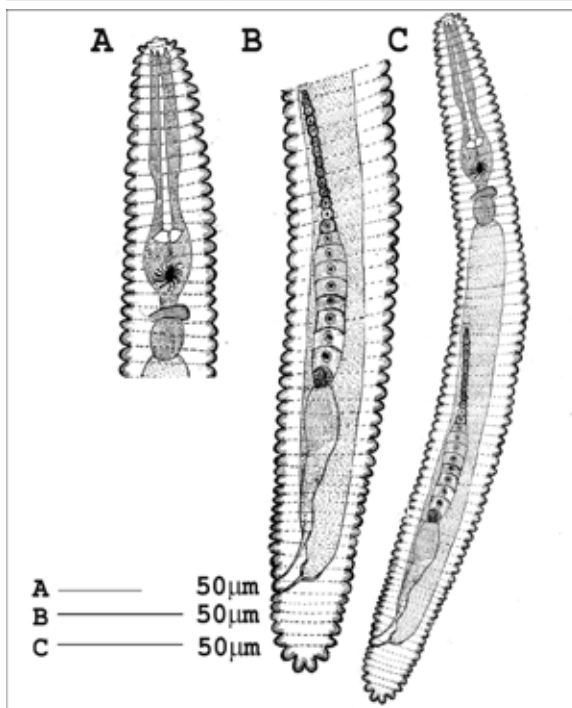


Figure 1. Camera lucida drawings of *Hemicriconemoides serpentinae* sp. nov. : A. Anterior region showing oesophagus; B. Posterior region of the body; C. Entire body

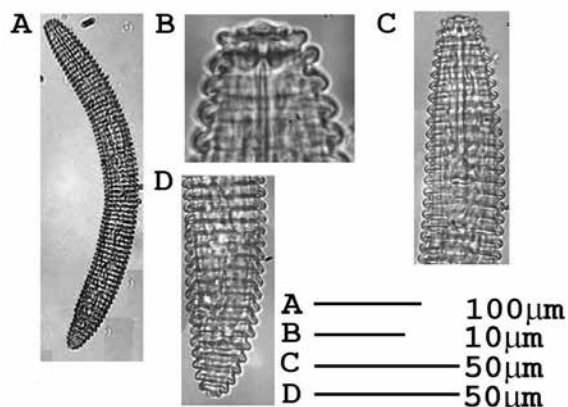


Figure 2. Photomicrographs of *Hemicriconemoides serpentinae* sp. nov. : A. Entire body; B. Head region; C. Anterior region showing oesophagus; D. Posterior region of the body

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