

# ONE NEW SPECIES OF THE GENUS *HIRSCHMANNIELLA* LUC AND GOODEY, 1963 AND NEW HOST RECORD FROM MANIPUR, INDIA

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## ABSTRACT

During a survey of nematodes associated with citrus plants in Manipur, revealed the presence of one new species of the genus *Hirschmanniella* Luc and Goodey, 1963. The new species was recovered from the soil around the *Citrus maxima* (Lemon) plant, which is a new host record. *Hirschmanniella* is distinguished by having longer stylet, oesophagus and longer tail length with a single mucro in both male and female species.

## INTRODUCTION

Species of the genus *Hirschmanniella* Luc and Goodey, 1963 are widely distributed in India especially in association with paddy. Das (1960) reported *H. mucronata* from paddy and pearl millet from Hyderabad while *H. maxima* was found around paddy roots from Madras and *H. magna* from grasses in Moradabad. But Sher (1968) reported *H. mana* as a synonym of *H. mucronata* (Das, 1960). Shakil Ahmad (1972) has described *H. shamimi* and *H. indica* from paddy in Uttar Pradesh. Jabiha Sultana (1978) reported *H. orycrena* and *H. oryzae* (Salt-Wedel, 1889). Luc and Goodey, 1963 found associated with vegetable crops from Hyderabad. The present work includes the description of one new species *Hirschmanniella citruini* from *Citrus maxima* from Manipur as a new host record. The detail descriptions and illustration are provided.

## MATERIALS AND METHODS

The soils were collected from the rhizosphere of different types of citrus plants from various localities of the state, properly labelled and brought to the laboratory for further processing. The collected soil were processed for the extraction of nematodes by Cobb's (1918) Sieving and Decanting method followed by modified Baermann's funnel technique. The extracted nematodes were dehydrated by Seinhorst's (1959) rapid glycerine method and mounted permanently on slides using dehydrated glycerine as mountant. Then they were observed under a compound microscope, measured using ocular micrometer and diagrams were drawn with a camera lucida. Ratios were calculated according to De Man's (1884) formula and De Griss's (1964) symbols.

## RESULTS AND DISCUSSION

### *Hirschmanniella citruini* n. sp.

**Female:** Body ventrally arcuate or open c-shape upon death in both sexes (Table 1, Fig. 1). Lateral field areolated with four incisures. Lip region marked with 4-5 striae, slightly marked off from the body by a faint constriction in body cuticles. Excretory pores in front of the oesophago-intestinal junction, 0.142-0.160 mm from the anterior end of the body, spear 0.035-0.037mm from anterior end of the body. Nerve ring 0.098-0.100mm from the anterior end of the body. Spermatheca rounded or slightly elongated with or without sperms. Ovaries with many oocytes. Gonads typical of the genus. Intestine distinctly overlapping to the rectum. Tail 0.081-0.089 with a blunt tip accompanied by a single mucro about 0.001-0.002mm long, plasmid 0.040-0.042mm above tail tip.

**Male:** Similar to female in general body morphology except for the sexual differences (Table 2 Fig. 1). Spicule 0.010-0.012mm. Gubernaculum small triangular 0.008-0.010 mm. Caudal alae 0.052-0.054 mm. long.

### Type specimens

Collected on 27<sup>th</sup> August, 2011; Holotype on slide no. L<sub>2</sub> N<sub>1</sub> (♀) and L<sub>2</sub> N<sub>5</sub> (♂). *Hirschmanniella citruini* n. sp. deposited in Department of Zoology, Parasitology Section, Manipur University, Canchipur, Imphal.

### Type Host and Locality

Collected from soil around the roots of *Citrus maxima* from Langmeidong, Kakching, Thoubal District, Manipur.

### Diagnosis and relationship

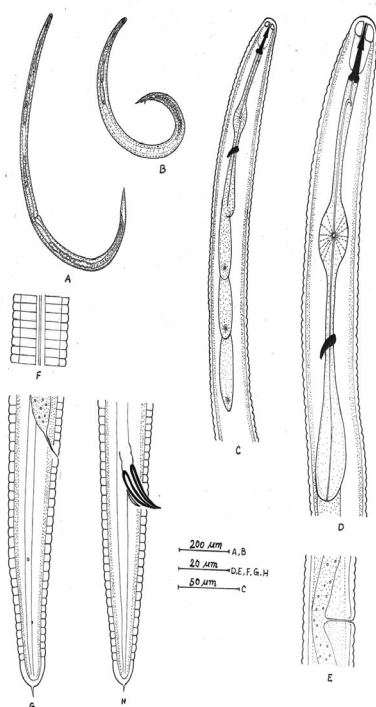


Figure 1: *Hirschmanniella citruini* n. sp.; (A). Entire body of female; (B). Entire body of male; (C). anterior end of female; (D). anterior end of male; (E). Valval region; (F). Lateral line; (G). posterior region of female and (H). posterior region of male.

Table 1: Morphometric data of the female of *Hirschmanniella citruini* n. sp

Character	Holotype	Paratype
B(L)	1.295	1.295 – 1.435 (1.36 ± 0.05)
B(W)	0.022	0.022 – 0.024 (0.02 ± 0.00)
Stylet	0.035	0.035 – 0.037 (0.03 ± 0.00)
M. Bulb	0.083	0.083 – 0.087 (0.08 ± 0.02)
Nerve Ring	0.098	0.098 – 1.000 (0.09 ± 0.00)
Oesophagus (L)	0.160	0.147 – 0.160 (0.15 ± 0.001)
Vulva	0.600	0.600 – 0.700 (0.67 ± 0.041)
Anus	1.150	1.151 – 1.155 (1.15 ± 0.00)
Tail	0.081	0.081 – 0.089 (0.08 ± 0.00)
ABD	0.013	0.013 – 0.014 (0.01 ± 0.00)
a	58.86	58.41 – 65.227 (60.67 ± 2.70)
b	8.093	8.093 – 9.761 (8.88 ± 0.63)
c	15.987	14.88 – 16.89 (16.33 ± 1.05)
c'	6.230	6.230 – 6.384 (6.29 ± 0.07)

In morphology, the new species come close to *Hirschmanniella oryzae* (Soltwedel, 1889) Luc and Goodey, 1963, *H. shamimi* Ahmad, 1972 and *H. orycrena* Sultana, 1979 but the body length is shorter in the male and longer in case of female. These new species differ from them in having a longer stylet and oesophagus in both species. Tail length is longer in females but is shorter in male species when compared with *H. shamimi* Ahmad, 1972 and *H. orycrena* Sultana, 1979. Presence of single mucro in both sexes.

By considering the above characteristics, the present species is accommodated under the genus *Hirschmanniella* Luc and Goodey, 1963 by giving a new species name *Hirschmanniella citruini* n. sp. deriving its name from the host plants name *Citrus maxima* and reported as a new host record from Manipur.

Table 2: Morphometric data of the male of *Hirschmanniella citruini* n. sp

Character	Holotype	Paratype
B(L)	0.910	0.845 + 0.910 ( 0.88 ± 0.02)
B(W)	0.022	0.021 + 0.022 ( 0.21 ± 0.00 )
Stylet	0.037	0.032 + 0.037 ( 0.34 ± 0.00)
M. Bulb	0.087	0.085 + 0.087 ( 0.08 ± 0.00)
Nerve Ring	0.102	0.100 + 0.102 ( 0.01 ± 0.00)
Oesophagus (L)	0.158	0.155 + 0.158 ( 0.15 ± 0.00)
Anus	0.892	0.889 + 0.892 ( 0.89 ± 0.00)
Spicule	0.024	0.010 + 0.024 ( 0.01 ± 0.00)
Tail	0.060	0.058 + 0.061 ( 0.56 ± 0.00)
ABD	0.012	0.010 + 0.0120 ( 0.01 ± 0.00)
a	41.363	40.23 + 44.75 ( 42.11 ± 1.92)
b	5.759	5.450 + 5.759 ( 5.63 ± 0.13)
c	15.166	14.06 + 15.166(14.62 ± 0.45)
c'	5.000	5.000 + 5.200 ( 5.09 ± 0.08)

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