

# Two new species of *Carcharolaimus* Thorne, 1939 (Nematoda : Dorylaimida)

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## SUMMARY

Two new species of *Carcharolaimus* Thorne, 1939 associated with gram (*Cicer arietinum*) from University Farm, Punjab Agricultural University, Ludhiana, Punjab, India are described and figured. *C. bediensis* n. sp. is characterized in having well offset lip region with heavily sclerotized pillars and teeth about the base of pharynx, 68-139 glandular bodies and cardia elongated, spheroid. This new species is close to *C. ramirezi* Thorne, 1967 and *C. dentatus* Thorne, 1939. *C. symmetricus* n. sp. is characterized in having offset lip region, sclerotized pillars and teeth about the base of pharynx, 113-170 glandular bodies and cardia elongated, spheroid. This new species is close to *C. lucidus* Sauer, 1967 and *C. pizai* Lordello, 1953. In both cases only females have been found.

## RÉSUMÉ

Deux nouvelles espèces de *Carcharolaimus* Thorne, 1939 (Nematoda : Dorylaimida)

Deux nouvelles espèces de *Carcharolaimus* Thorne, 1939, associées à *Cicer arietinum* à la ferme de l'Université Agricole du Punjab, Ludhiana, Punjab, Inde, sont décrites et figurées. *C. bediensis* n. sp. est caractérisé par une région labiale bien séparée du reste du corps avec des côtes internes fortement sclérotisées, des dents à la base du pharynx, 68-139 « corps glandulaires » et un cardia sphéroïde allongé. Cette nouvelle espèce est voisine de *C. ramirezi* Thorne, 1967 et *C. dentatus* Thorne, 1939. *C. symmetricus* n. sp. est caractérisé par une région labiale bien séparée du reste du corps, des côtes internes sclérotisées, des dents à la base du pharynx, 113-170 « corps glandulaires » et un cardia sphéroïde allongé. Cette nouvelle espèce est voisine de *C. lucidus* Sauer, 1967 et *C. pizai* Lordello, 1953. Dans les deux cas, seules des femelles ont été trouvées.

During a survey of Ludhiana district and its adjoining areas in India, two new species of *Carcharolaimus* Thorne, 1939 were recorded and are described herein.

Observations were made and measurements taken on specimens fixed in hot 4% formalin and processed to glycerine by the slow method.

### *Carcharolaimus bediensis* n. sp.

(Fig. 1, A-G)

#### MEASUREMENTS

*Paratypes* (10 ♀♀): L = 1.79 (1.69-1.90) mm; a = 37 (32-43); b = 4.1 (3.9-4.3); c = 70 (62-79); c' = 0.61 (0.60-0.87); V = <sup>12</sup>48<sup>13</sup> (<sup>10-14</sup>45-52<sup>10-16</sup>).

*Holotype*: L = 1.74 mm; a = 33; b = 3.9; c = 62; c' = 0.67; V = <sup>10</sup>47<sup>12</sup>.

#### DESCRIPTION

*Female*: Body cylindroid throughout. Cuticle smooth. Lateral chords distinct, about a quarter body-width wide near middle and provided with 68-139 glandular bodies, each connected to a lateral pore in its centre. The glandular bodies start right from the base of spear and terminate at the tail end. Lip region set off, 29-32 µm wide, slightly narrower than the neck base, heavily sclerotized. Lips large, angular in outline marked with many pillars. Numerous teeth about the base, and many minute denticles on the walls of the basket-like pharyngeal chamber. Amphids discoid, with 10-14 µm aperture. Odontostyle 19-24 µm long with an aperture occupying almost half its length. Spear extension about 31 µm long. Guiding ring single 34-48 µm from anterior end. Oesophagus with an anterior

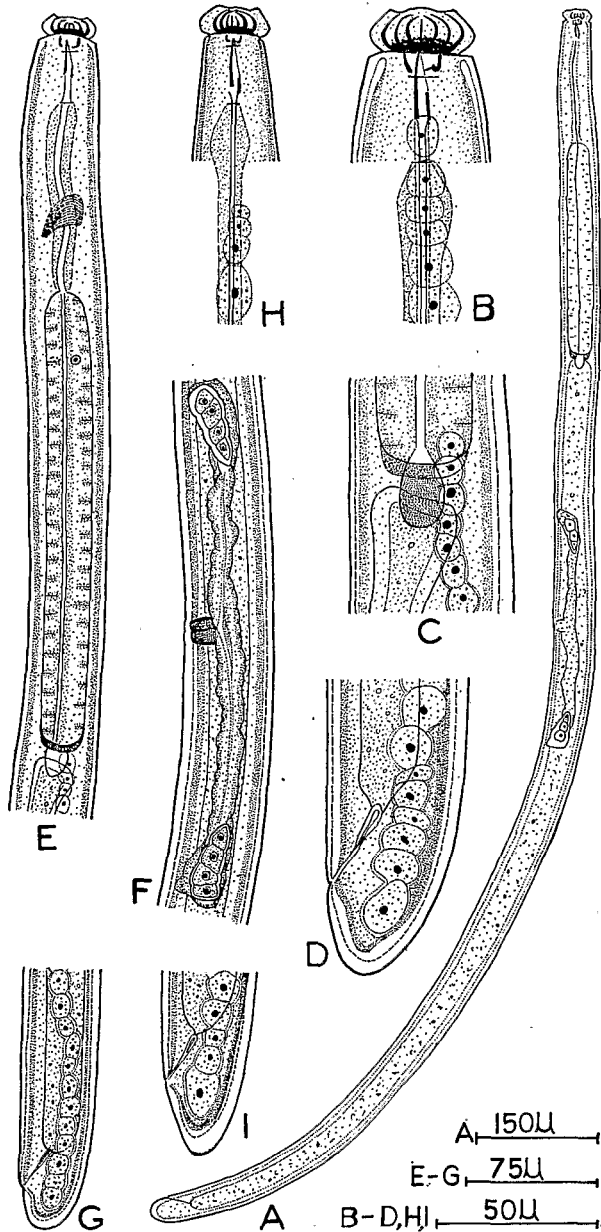


Fig. 1. A-G : *Carcharolaimus bediensis* n. sp. A : Entire female ; B : Anterior end ; C : Cardial Region ; D : Tail end ; E : Oesophageal region ; F : Gonads ; G : Tail end. H & I : *Carcharolaimus symmetricus* n. sp. H : Anterior end ; I : Tail end.

slender, non-muscular part and a basal, muscular expanded part which occupies 60-64% of the total length. Oesophageal lumen prominent, broader in the anterior slender part. Opening of the dorsal oesophageal gland conspicuous

about 216  $\mu\text{m}$  or 48% of the oesophageal length from the anterior end but the remaining openings obscure. Nerve ring encircling the oesophagus in the posterior half of the anterior slender part of oesophagus. Basal shield muscular cup-shaped, enveloping the terminal portion of oesophagus. Cardia elongate, spheroid, 16-22  $\mu\text{m}$  long and 12-18  $\mu\text{m}$  wide. Vulva transverse, vagina 14-16  $\mu\text{m}$  long, extending 1/3 across the body. Ovaries reflexed, short and as long as body-width. Pre-rectum well differentiated from the intestine and measures along with rectum 28-32  $\mu\text{m}$ . Tail rounded, shorter than anal body-width.

*Male*: not found.

TYPE HABITAT AND LOCALITY

Soil around roots of gram (*Cicer arietinum*) from University Farm, Punjab Agricultural University Campus, Ludhiana, India.

TYPE SPECIMENS

*Holotype* on slide 1/*Carcharolaimus bediensis* n. sp./A<sup>1</sup>.

*Paratypes* on slides 1/*Carcharolaimus bediensis* n. sp. A<sup>2</sup>-A<sup>5</sup> deposited in the Section of Nematology, Department of Plant Pathology, Punjab Agricultural University, Ludhiana and two paratypes deposited in Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

DIAGNOSIS

*Carcharolaimus bediensis* n. sp. comes close to *C. ramirezi* Thorne, 1967 and *C. dentatus* Thorne, 1939. From the former it differs in having a shorter body, pillars not extending back to guiding ring, longer and differently shaped spear, shorter amphid aperture, smooth oesophageal lumen, shorter and differently shaped basal shield and cardia, longer vagina and a shorter tail (body 2.2 mm long, six strong sclerotized pillars extending back to the guiding ring, spear 20  $\mu\text{m}$  and concave on dorsal side, amphid 1/3 head-width long, oesophageal lumen

finely ribbed, cardia elongated, conoid, vagina 1/4 across the body and tail more than one anal body-width in *C. ramirezi*). From *C. dentatus* the new species differs in having a shorter and thinner body, longer spear, oesophagus, gonads and tail (body 2.2 mm long,  $a = 40$ , spear less than 20  $\mu\text{m}$  long,  $b = 5$ ,  $G_1 = 13$ ,  $G_2 = 15$  and  $c = 83$  in *C. dentatus*).

The new species is named after Dr. Parduman Singh Bedi, Professor of Epidemiology and Head, Dept of Plant Pathology, Punjab Agricultural University, Ludhiana, India.

### *Carcharolaimus symmetricus* n. sp.

(Fig. 1, H. & I)

#### MEASUREMENTS

*Paratypes* (10 ♀♀):  $L = 1.69$  (1.54-1.84) mm;  $a = 47$  (44-51);  $b = 4.2$  (3.9-4.6);  $c = 76$  (70-84);  $c' = 1.0$  (1.0-1.3);  $V = 1253^{12}$  ( $11-1351-56^{9-13}$ ).

*Holotype*:  $L = 1.68$  mm;  $a = 44$ ;  $b = 4.2$ ;  $c = 76$ ;  $c' = 1.2$ ;  $V = 1352^{13}$ .

#### DESCRIPTION

*Female*: Body cylindroid, tapering towards the extremities. Cuticle smooth. Lateral chords distinct, about a quarter body-width wide in the middle and provided with 113-170 glandular bodies, each connected to a lateral pore in its centre. The glandular bodies start from the middle of the anterior slender part of oesophagus and terminate at the tail end. Lip region off set, 21-25  $\mu\text{m}$  wide, wider than the neck base, heavily sclerotized. Lips large, angular in outline, marked with many pillars. Numerous teeth about the base of, and many minute denticles on the walls of the basket-like pharyngeal chamber. Amphids discoid, with aperture 6  $\mu\text{m}$  wide. Odontostyle 12-14  $\mu\text{m}$  long with an aperture occupying more than half its length. Guiding ring single, 22-24  $\mu\text{m}$  from anterior end. Oesophagus with an anterior slender, non-muscular part joining the basal expanded, muscular part which occupies 57-60% of the total length. Oesophageal lumen prominent. Opening of the dorsal oesophageal gland 184-234  $\mu\text{m}$  or 47-50% of the oesophageal length

from anterior end. The remaining openings obscure. Nerve ring in the middle of anterior slender part of oesophagus. Basal shield muscular, cup-shaped enveloping the terminal portion of oesophagus. Cardia elongate, spheroid, 12-16  $\mu\text{m}$  long and 8-12  $\mu\text{m}$  wide.

Vulva transverse, vagina 8-16  $\mu\text{m}$  long, extending about 1/3 across the body. Ovaries reflexed, short and as long as body-width. Pre-rectum 10-12  $\mu\text{m}$  long and rectum almost 10  $\mu\text{m}$  long. Tail conical, longer than anal body-width.

*Male*: not found.

#### TYPE HABITAT AND LOCALITY

Soil around roots of gram (*Cicer arietinum*) from University Farm, Punjab Agricultural University Campus, Ludhiana, India.

#### TYPE SPECIMENS

*Holotype* on slide 1/*Carcharolaimus symmetricus* n. sp./b<sub>1</sub>.

*Paratypes* on slides 1/*Carcharolaimus symmetricus* n. sp./b<sub>2</sub>-b<sub>5</sub> deposited in the section of Nematology, Department of Plant Pathology, Punjab Agricultural University, Ludhiana and two paratypes deposited in Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

#### DIAGNOSIS

*Carcharolaimus symmetricus* n. sp. comes close to *C. lucidus* Sauer, 1967 and *C. pizai* Lordello, 1953. From the former it differs in having more slender body, spear aperture more than half the odontostyle length, anterior non-muscular part of oesophagus slender, oesophageal lumen smooth, pre-rectum almost equal to rectum,  $c = 70-84$  and no males ( $a = 34-43$ , spear aperture half the odontostyle length, anterior slender part of oesophagus with a small muscular bulb, lumen of posterior expanded oesophagus heavily sclerotized, pre-rectum 1 1/2 times the rectum,  $c = 48-61$ , and males present in *C. lucidus*). From *C. pizai* the new species differs, in addition to other characters, in having more slender body, labial region

wider than the neck base and the glandular bodies present throughout the body ( $a = 65$ ; labial region not broader than the neck base and glandular bodies absent in *C. pizai*).

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Accepté pour publication le 16 janvier 1981.