

Short Communication

Description of *Oionchus sindhicus* n. sp., and Morphometric Data on *O. paraobtusus* Jairajpuri and Khan, 1982 and *O. obtusus* Cobb, 1913 (Nematoda: Mononchida) from Pakistan

Uzma Ishaq¹, Shahnaz Dawar², Nasira Kazi¹, Erum Iqbal^{1*} and Saboohi Raza³¹National Nematological Research Centre, University of Karachi, Karachi²Department of Botany, University of Karachi, Karachi³Department of Agriculture and Agribusiness Management, University of Karachi, Karachi, Pakistan

ABSTRACT

Oionchus sindhicus n. sp., is described from specimens collected from soil around the roots of cotton (*Gossypium hirsutum* L.) from Umerkot, Sindh, Pakistan. The new species is characterized by having a combination of characters: body length of female 0.7-1.0 mm, vulva at 56-59 percent of body length, anterior part of buccal cavity 5-7 µm wide, pharynx 198-238 µm long, tail 30-33 µm long, post uterine sac 10-16 µm in length, apex of dorsal tooth 3-5 µm from anterior end. Morphometric and morphological data of *O. paraobtusus* Jairajpuri and Khan, 1982 and *O. obtusus* Cobb, 1913 are also given. These species are described and redescribed for the first time from Pakistan.

Article Information

Received 10 September 2020

Revised 21 October 2020

Accepted 28 October 2020

Available online 16 July 2021

(early access)

Published 28 January 2022

Authors' Contribution

UI conducted the survey, sample collection and processing. SD wrote the manuscript. NK performed identification of specimens. EI did line photography. SR critically reviewed the manuscript.

Key words

Mononchids, *Oionchus*, Soil nematodes, Morphology, Taxonomy

The genus *Oionchus* Cobb, 1913 belong to the family Mononchulidae De Coninck, 1965 of the suborder Bathydontina Coomans and Loof, 1970 according to Ahmad and Jairajpuri (2010). The family Mononchulidae is characterized by buccal cavity strongly sclerotized with long anterior subventral tooth and 2-6 rows of transverse denticles, pharynx with five gland nuclei with anterior one dorsal, located about middle of pharynx far posterior to gland orifice. The family contain two genera *Mononchulus* Cobb, 1918 and *Oionchus* Cobb, 1913. The genus *Oionchus* includes predatory soil nematodes which have buccal cavity encircled by pharyngeal tissues. Metastome sclerotized with a very large, grooved tooth on right or left ventro-sublateral side. Telostome elongate. Amphids near or slightly posterior to tip of tooth. Three cardiac glands present. Vulva posterior to mid body. Tail short, hemispherical with caudal glands and a terminal or slightly dorsally subterminal spinneret.

Currently this genus has three normal species (Ahmad and Jairajpuri, 2010) *O. obtusus* Cobb, 1913 as type species, *O. obtusicaudatus* (Kreis, 1932) Thorne, 1935 and *O. paraobtusus* Jairajpuri and Khan, 1982. In this paper a new species of *Oionchus sindhicus* is described along with two known species as a new record from Pakistan.

Materials and methods

Nematodes were isolated from soil samples by Cobb's wet sieving technique (Cobb, 1918) followed by a modified Baermann funnel method (Baermann, 1917). Extracted nematodes were killed by gradual heat, fixed in TAF and mounted in dehydrated glycerine (Siddiqi, 1986). Illustrations were made by using a drawing tube attached to the compound microscope. Nikon Eclipse E400 and photographed with a Nikon DS-Fi1 Camera, attached to the same microscope, and edited by Adobe Photoshop. The classification of mononchs given by Ahmad and Jairajpuri (2010) was followed here.

Oionchus sindhicus new species (Fig.1 A-D, Table I)

Description

Female: Body stout, almost straight upon fixation. Cuticle smooth under light microscope, 2-4 µm thick at mid body and 4-5 µm on tail. Lip region separated from adjacent body by weak depression 3-4 times as wide as high (a'=54-64). Lips and labial papillae prominent. Amphidial aperture 2-3µm wide, located at 2-4 µm from anterior end of body, slightly anterior to the tooth apex. Pharynx nearly cylindrical muscular, slightly thickening posteriorly 23-26% of body length. Buccal walls strong. Anterior wider part of buccal cavity 13-14 µm long, 5-7 µm diameter. Buccal cavity encircled by pharyngeal tissues. Tooth large,

* Corresponding author: erum_i@yahoo.com
0030-9923/2022/0002-0993 \$ 9.00/0
Copyright 2022 Zoological Society of Pakistan

subventral walls bearing two transverse rows of denticles. Nerve ring located at 60-66 μm from anterior and or at 30-44% of neck length. Three cardiac glands present, 8-10 μm diameter. Distance between posterior end of pharynx and vulva equal to 2.2-2.7 pharyngeal length. Female reproductive organs mono-prodelphic, rather short and simple occupying 10-12% of body length. Posterior branch represented by a small post uterine sac, measuring 10-16 μm , less than corresponding body diameter long. Gonad 2.1-2.4 body width long. No mature eggs observed. Vulva somewhat posterior to middle 56-59%. Sphincter not present at oviduct-uterus junction. Vulva-anus distance as long as 8-13 times tail. Tail hemispheroid 30-33 μm long, 35-41% of entire body length. Rectum 16-20 μm long less than one anal body width. Caudal glands well developed, arranged in grouped, spinneret opening terminally.

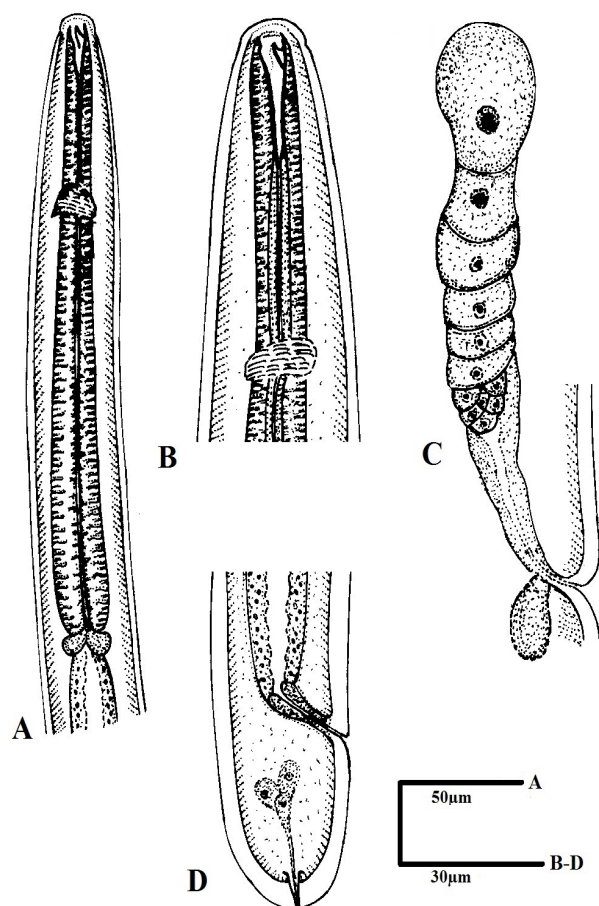


Fig. 1. A-D. *Oionchus sindhicus* n. sp. Female: A, Pharyngeal region; B, Anterior region; C, Female genital system; D, Tail region.

Male: Not known.

Table I. Morphometric data of *Oionchus sindhicus* n. sp. All measurements are in μm except L are shown as Mean \pm SD (range).

Characters	Female	
	Holotype	Paratypes (n=10)
L	0.76	0.82 \pm 0.73 (0.76-1.0)
a	17.7	19.8 \pm 1.36 (17.7-21.2)
b	3.8	3.88 \pm 0.07 (3.8-4.0)
c	23	24.8 \pm 1.16 (23-27)
c'	1.1	1.18 \pm 0.03 (1.1-1.3)
V	56	58.4 \pm 0.95 (56-59)
G ₁	88	90.4 \pm 5.8 9 (85-106)
Lip region diameter	13	13.7 \pm 0.91 (13-15)
Anterior buccal cavity width	5	6.2 \pm 0.60 (5-7)
Posterior buccal cavity width	3	4.1 \pm 0.56 (3-5)
Tooth from anterior end	3	3.77 \pm 0.78 (3-5)
Amphid aperture from anterior end	2	3.12 \pm 0.78 (2-4)
Nerve ring from anterior end	62	63 \pm 2.0 (60-66)
Pharynx length	208	212.4 \pm 11.4 (198-238)
Vulva from anterior end	456	490 \pm 46.9 (446-580)
Body diameter: Neck base	40	40.5 \pm 1.16 (39-42)
Body diameter: Mid body	40	40.9 \pm 1.49 (39-43)
Body diameter: Anus	25	26 \pm 0.89 (25-27)
Rectum length	18	18 \pm 1.41 (16-20)
Tail length	31	31.8 \pm 1.09 (30-33)
Tail length as % of total body length	3.9	3.8 \pm 0.33 (3-4.1)
Post uterine sac	12	12.6 \pm 2.0 (10-16)

L, body length; a, body length/body width; b, body length/oesophagus length; c, body length/tail length; c', tail length/anal body width; V, vulval length/body length \times 100; G₁, Anterior ovary/body length \times 100

Type habitat and locality

The specimens were recovered from soil around the roots of cotton (*Gossypium hirsutum* L.) at Umerkot, Sindh, Pakistan.

Type material

Holotype female and nine paratypes female deposited in the Nematode Collection of National Nematological Research Centre, University of Karachi, Karachi, Pakistan.

Etymology

The specific epithet refers to the locality where the species has been recovered.

Diagnosis and relationship

Oionchus sindhicus n.sp., has females with 0.7-1.0 (0.82) mm long body; vulva at 56-59 (58.4) percent of body length, anterior part of buccal cavity 5-7 (6.2) μ m wide; pharynx 198-238 μ m long. Tail 30-33 (31.8) μ m or 1.1-1.3 times anal body width long. Post vulval uterine sac 10-16 (12) μ m long; apex of dorsal tooth 3-5 (3.7) μ m from anterior end.

Oionchus sindhicus n. sp., comes close to *O. paraobtusus* [Jairajpuri and Khan, 1982](#), but differs in the thicker body (a = 17.7-21.2 vs 23-30) in slightly greater 'b' values (b = 3.8-4.0 vs 3.2-3.7), in more anteriorly located vulva and nerve ring. (V = 56-59 vs 60-64; nerve ring = 60-66 vs 80-90 μ m), smaller tail (30-33 vs 33-40 μ m) and opening of caudal gland ducts (terminally vs sub ventral position of spinneret).

Oionchus paraobtusus [Jairajpuri and Khan, 1982](#)
(Table II)

Description

Female: Body comparatively short, slightly ventrally arcuate upon fixation. Cuticle smooth 3-4 μ m thick at mid body. Lip region slightly offset with neck 12-15 μ m wide and 4-5 μ m high (a'=61.7-79.1). Body at posterior end of oesophagus 2.5-2.6 times as wide as head region. Amphids apertures slit like, slightly anterior to the tooth apex. Anterior wider part of buccal cavity 5-6 μ m wide, 14-16 μ m long. Nerve ring 66-70 μ m from head end. Female genital system monoprodelphic, posterior branch represented by a small sac, 8-10 μ m less than corresponding body diameter. Sphincter indistinct at oviduct-uterus junction. Tail short, hemispheroid 33-40 μ m or more than anal body diameter long. Caudal glands arranged in group. Spinneret terminal.

Male: Not known.

Remarks

Specimens for the present study were obtained from around the roots of cotton (*Gossypium hirsutum* L.) from Umerkot, Sindh. Measurements and morphological characters are quite similar to those given by [Jairajpuri and Khan, 1982](#). Only difference was found in terminal spinneret against spinneret subterminal ventrally.

Oionchus obtusus [Cobb, 1913](#)
(Table II)

Table II. Morphometric data of *Oionchus paraobtusus* [Jairajpuri and Khan, 1982](#) and *O. obtusus* [Cobb, 1913](#). All measurements are in μ m except L are shown as Mean \pm SD (range).

Characters	<i>O. paraobtusus</i> Females (n=7)	<i>O. obtusus</i> Female (n=4)
L	0.97 \pm 0.06 (0.86-1.07)	0.80 \pm 0.03 (0.75-0.84)
a	26.7 \pm 1.90 (23.7-29.5)	25.3 \pm 0.46 (24.7-26.0)
b	3.8 \pm 0.21 (3.5-4.2)	3.81 \pm 0.05 (3.74-3.9)
c	29 \pm 2.10 (25.7-30)	46.6 \pm 0.28 (46.2-47.0)
c'	1.41 \pm 0.21 (1.23-1.6)	0.81 \pm 0.02 (0.8-0.85)
V%	61.5 \pm 2.00 (59-64.1)	58.7 \pm 0.14 (58.6-59.0)
Maximum body width	38 \pm 4.1 (30-42)	33.5 \pm 0.5 (33-34)
Lip width	14.2 \pm 1.1 (12-16)	9.5 \pm 0.5 (9-10)
Lip height	4.3 \pm 0.44 (4-5)	2.5 \pm 0.5 (2-3)
Amphid aperture from anterior end	5.5 \pm 0.41 (5-6)	-
Anterior buccal cavity width	5.4 \pm 0.49 (5-6)	4.37 \pm 0.41 (4-5)
Anterior buccal cavity length	14.5 \pm 0.33 (14-15)	5.5 \pm 1.11 (4-7)
Tooth from anterior end	3.5 \pm 0.38 (3-4)	2.3 \pm 0.41 (2-3)
Nerve ring from anterior end	66 \pm 2.20 (66-70)	49.25 \pm 0.82 (40-50)
Pharynx length	256.4 \pm 22.2 (228-290)	217.2 \pm 0 (214-220)
Tail length	34 \pm 2.87 (33-40)	18.37 \pm 0.41 (18-19)
Anal body width	23.8 \pm 2.69 (19-27)	21.5 \pm 0 (21-22)
Post uterine sac	9.1 \pm 0.65 (8-10)	11.5 \pm 1.65 (10-14)

Description

Female: Body short, straight to slightly ventrally curved when relaxed by heat, cuticle smooth 2 μ m thick at mid body. Lip region 9-10 μ m wide and 2-3 μ m high. Buccal cavity encircled by pharyngeal tissue. Anterior wider part of buccal cavity 4-5 μ m wide and 4-7 μ m long. Pharynx 214-220 μ m long, cylindrical, slightly thickening posteriorly. Cardiac glands present. Nerve ring at 48-50

µm from head end. Reproductive system monoprodelphic with posterior branch represented by a small sac 10-14 µm or less than on vulval body diameter. Ovary reflexed. Sphincter indistinct. Vulva slightly posterior to mid body. Rectum 14 µm or less than one anal body width long. Tail short hemispheroid, less than one anal body width long. Caudal gland present. Spinneret subterminal dorsally.

Male: Not found.

Remarks

Specimens of *O. obtusus* Cobb, 1913 were collected from soil around the roots of cotton (*Gossypium hirsutum* L.) from Umerkot Sindh Pakistan. Morphometric characters are quite similar to those given by Ahmad and Jairajpuri (2010).

Statement of conflict of interest

The authors have declared no conflict of interest.

References

Ahmad, W. and Jairajpuri, M.S., 2010. *Nematol. Monogr. Perspect.*, 7: 298.

- Baermann, G., 1917. *Tijdschr. Nederland*, **57**: 131-137.
- Cobb, N.A., 1913. *J. Washington Acad. Sci.*, **3**: 432-444. <https://doi.org/10.5962/bhl.part.20323>
- Cobb, N.A., 1918. *Contrib. Sci. Nematol.*, **7**: 189-212.
- Coomans, A. and Loof, P.A.A., 1970. *Nematologica*, **16**: 180-196. <https://doi.org/10.1163/187529270X00199>
- De, Coninck, L.A.P., 1965. Systematique de nematodes. In: *Traite de Zoologie, Anatomie, Systematique, Biologie* (ed. P.P. Grasse). Masson Cie 4, Paris, France. pp. 586-681.
- Jairajpuri, M.S. and Khan, W.U., 1982. *Predatory nematodes (Mononchida)*. Associated Publishing, New Delhi, India. pp. 131.
- Kreis, H.A., 1932. *Z. Parasitenkund.*, **5**: 184-194. <https://doi.org/10.1007/BF02120641>
- Siddiqi, M.R., 1986. *Tylenchida: Parasites of plants and insects*. Common wealth Agricultural Bureaux, Farnham Royal, Slough, UK. pp. 646.
- Thorne, G., 1935. *Proc. helminthol. Soc. Washington*, **2**: 96-98.