

CRICONEMOIDES KAMALIEI n. sp. (CRICONEMATIDAE: NEMATODA) FROM SIND REGION

HANIF AHMAD KHAN *

Department of Zoology, University of Karachi, Karachi 32

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Criconemoides kamaliei n. sp. is new to science having peculiar shape of the body, poorly marked anatomiasis and double rows of oöcytes. A revised key of its species is also given for further investigation of the new species.

During survey of Malir area some nematodes of the genus *Criconemoides* were collected. These nematodes from Sind region were not studied earlier.

The taxonomy of genus *Criconemoides* Taylor¹ and *Criconema* Hofmann and Menzel² creates some problems. Taylor separated these two genera on the absence of cuticular outgrowth.

In *Criconemoides* body annules not divided into retroses in case of *Criconema*. Various forms described by various workers e.g. Fassuliotis and Guiran,^{3,4} the worms appear to show intermediate forms, because only, variable character is the presence or absence of cuticular outgrowth.

In *Criconemoides* four sublateral lobes are present in face view, which is an additional character. It is difficult to place it into new genus, because the larvae of *Criconemoides* contain scales and spines and these points suggest that *Criconemoides* have neotenic forms that *Criconema* which attains sexual maturity at an early stage of evolution and retained scales or spines that were shown by some larvae of *Criconemoides*.

Some of the newly described species by Kirajnova⁵ were three of the genus *Ogma* and seven from genus *Criconema*. Chitwood⁶ converted first three into genus *Criconema* and seven species described by Kirajnova in genus *Criconema* to genus *Criconemoides*.

It is interesting to note that *Hoplolaimus zavadskii* described by Tulaganov⁷ resemble closely *Criconemoides parvum*. Raski⁸ has transferred it in genus *Criconemoides zavadskii*. Most of the specimens were not available for comparative studies, but descriptions and illustrations provide sufficient morphological basis to distinguish the species of *Criconemoides* in Pakistan. The name of the species is given in honour of Dr. Ahmad Kamal, Director of PCSIR Laboratories, Karachi.

Criconemoides kamaliei n. sp.

Female L, 0.68 mm; a=10.2; b=6.3; c=14.3 v=90%; spear 102 μ . Female (holotype) L=0.91 mm; a=18.9; b=6; c=17.8; v=87.6%; spear=112 μ .

Body of the killed specimens curved slightly. Head not offset, labial disc elevated and second annule slightly large in comparison to first one. Well-marked irregularities on margin; first two annules not retrose while third annules is larger than the second, retrose small; sublateral lobe present.

Spear 102–112 μ , spear base about 16 μ , extending up to the 10th body annules. Oesophagus about 0.108 mm. Excretory pore is situated in 28th annule from the anterior region and total number of the annules about 80 retrose. Anastomiasis poorly developed. Amphidal aperture well marked. Vulva situated at 10th annule like transverse slit, corresponding less than half of

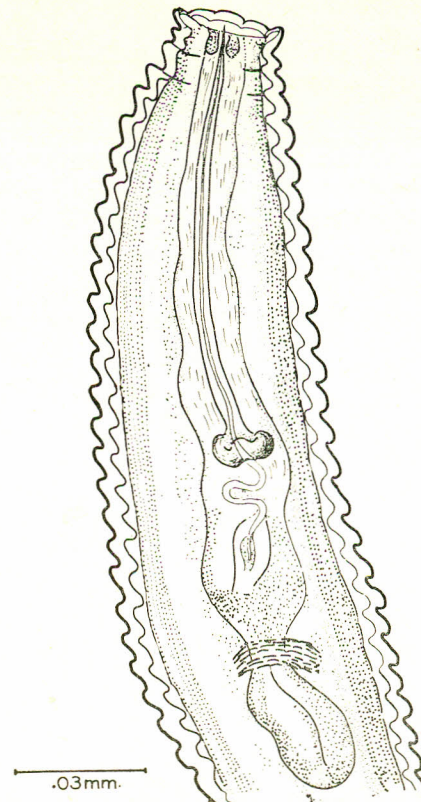


Fig. 1.—Head region showing guiding ring.

*Now at PCSIR Laboratories, Karachi 39.

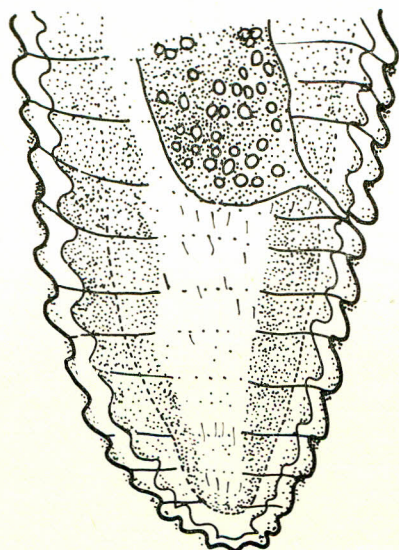


Fig. 2.—Tail region.

the 5th annules of the body diameter, one specimen showed anterior vulval flap without lobe. Ovary out-stretched with double rows of cells. Mature specimens contain out-stretched ovary, the free end of the ovary extends behind the basal bulb developing massive ova with small spermatheca. Anus situated on 5th annules. Caudal terminus blindly rounded.

Discussion

Criconeimoides kamaliei n. sp. is very much close to *Criconeimoides bakri*,^{9,10} *C. neocixeste*¹¹ and *C. curvatum*⁸ but differs with *C. bakri* in shape of the body, in number of annules and poorly-marked anastomiasis. It also differs from *C. curvatum* in having long spear and concave basal knobs. Excretory pore in *C. kamaliei* n. sp is situated at 28th annule whereof in *C. curvatum* it is situated about 110 μ from the anterior portion of the body.

C. curvatum contains single row of oöcytes while in *C. kamaliei* double rows of oöcytes were present. *Criconeimoides kamaliei* n. sp. differs from *C. citri*¹² in having greater length of the body and anteriorly located vulva. *C. kamaliei* n. sp has some variation with *C. neoaxeste* in having long spear,¹¹ the location of vulva, double rows of oöcytes and in shape of oesophagus which is not amalgamated into procorpus. *C. kamaliei* n. sp. has also differentiation in ratio of 'b' (maximum length/oesophageal length) with *C. neoaxeste*.

Holotype female: Collected Dec. 1968; slide S-33, in author's personal collection.

Paratype: Same as holotype, collected around the roots of Bouganvilla (glory of the garden).

Type locality: Malir area, Sind region.

Key to the species of *Criconeimoides*

- Spear length, 100 μ or more.....1
- Spear length, 10 μ or less.....2
- 1. Number of annules, 50–56.....2
- Number of annules, 95 or more.....3
- 2. First annules set of collar like.....
-annulefer (deMan 1921).
- First annules not set of collar like.....
-Stygia (Andrassy 1959).
- 3. Length 27–30 and spear less than $\frac{1}{3}$ body length.....macrodorum (Taylor 1936).
- 4. Spear length 105 μ annules 140 and body length 88 mm.....
- Annulatum unpublished cobb (Taylor 1936).
- Spear length 122 μ ; annules 95–103; body length 0.46 mm.....
-Sphagni (Micoltzky: Taylor 1936).
- 5. Tail pointed.....6
- Tail rounded.....11
- 6. Total body annules 110 or more.....7
- Total body annules less than 80.....8
- 7. Length 0.70 mm, vulva 16–17 segment from sterminus Puntamacus
- Body annules 138–40 Komaberensis (Imamura) (Taylor 1936).
- Length 0.55–59 mm vulva or 8 annules from terminus.....Morgense (Taylor 1936).
- 8. Total annules 65.....heideri (Taylor 1936).
- Total annules 70.....or more.....9.
- 9. Vulva on 7th annules from terminus; total.....annules 79.....Pervense (Taylor 1936).
- Vulva on 19th annules from terminus; total annules 80.....Kamaliei n.sp.
- Vulva on 12th to 15th annules; total annules 70–76.....10
- 10. Length 0.70 mm first annules than second caroteloïdes.
- Length 0.40–49 mm first annules smaller than second.....demani (Taylor 1936).
- 11. Joints on lateral line except anterior end of body.....12
- No. point on lateral line, annules unbroken except occasional anastomiasis.....14
- 12. Lateral line with simple breaks and spear 50 μcitri (Steiner 1949);
- Lateral line with simple breaks 57 μ or more.
- 13. Length 30–5 spears 57 μ annules 72. sphaerocephalum (Taylor 1936).
- Length 0.50 mm; spear 85 μ ; annules 89....
-C. cylindricum (Raki 1958).
- 14. Total body annules 142 or more; spear 0.25–41 μ15
- Total body annules 115 or less; spear 86 μ ...16
- 15. Total body annules 142–156 omeqular from terminus.....C. parvum (Raski 1952).
- Body annules 200, edges rounded; vulva on 7–9th annules from terminus. Zavadskii (Talaganov 1941) Raski 1952.
- 16. Body annules 40 approximately.....
-boettgeri (Meyl 1954).

- Body annules 60 or more17
17. Total body annules 60-6518
Total body annules 70 or more.....19
18. First annule irregular in out line or divided into 4 indefinite sublateral lobes; anus located on 3rd and 4th annules from terminusinforme (Taylor 1936).
Lips 6; large anus on last annule, very near to terminus.....anura (Raski 1968).
19. Spear length...70-86 μ20
Spear length.....48-67 μ25
20. Sublateral lobe present.....21
Sublateral lobe absent.....22
21. Head bluntly rounded; amphids small, slit like.....xenoplax (Raski 1952).
Head tapering sharply with rounded and small amphid 8..quadricorne (Raski 1958)
22. Total body annules...90-113.....23.
Total body annules..73-84; length 53.72. 24
23. Length 550-650 μ ; vulva with two ventrolateral posteriorly projected lips.....
.....simile (Chitwood 1949).
Length 340-420 μ . vulva simple oval in out line.....tere (Raski 1952).
24. Length 0.53 mm; annules 73.....
Congolense (Shucermans Stekhover and Teunissen 1938) (Goodey 1951).
Length 0.72 mm annules 84.....
.....beljaevae (Raski 1958).
25. Sublateral lobe prominent, flattened anteriorly with truncated head.....26.
Sublateral lobe absent, if present not prominent and flattened anteriorly.....27.
26. First annule retrose; spear 51-55 μ with 99-107 annuleslobatum (Raski 1952).
First annule distinctly set off from second, divided into halves by lateral incisures; stylet 45 μ ; annules 93-95. Ferniae (Luck 1959)
27. First annule well set off, cuticle of the larvae provided with rows of spines.....
.....mutabile (Taylor 1936).
28. First annule not well set off.....28.
Length 60 mm; head and tail both blunt truncate.....Rusticum (Taylor 1936).
Length 30-45; head and tail not blunt truncate.....29
29. Sublateral lobe present.....30
Sublateral lobe absent.....32
30. Anterior flap and vulva form two definite points.....ornatum (Raski 1958).
Anterior flap of vulva bilobed, rounded..31
31. Stylet 40-45 μ ; annules 125 or more on this (Luck 1959).
Stylet 43-67 μ ; annules 78-101.....
.....curvatum (Raski 1952).
Stylet 68-78 μ ; annules 41; head pame work confined into the first segment; excretory pore at 15 annules.....aberranus,
.....(Jairajpuri, Siddiqui 1963).
32. Lip region plain amphids small and round indistinct.....32
Head with six indefinite lips; amphids large oval; spear 53 μ annules 70 tulaganovi (Raski 1958).
33. Gonads single; vulva on fifth-sixth annule from terminus, amphids indistinct.....
.....Pullum (Raski 1958)
Gonads paired vulva on 8th annule from terminus; amphids small and rounded on second-third annule.....
.....Tenincutis (Raski 1958);
Gond single; vulva on 8th annules from posterior end, single row of oöcytes...
...neoaxeste (Jairajpuri and Siddiqui 1963)
34. Vulva transverse slit like on 6th annule from the posterior end; oöcytes in a single row amphids slit like located on labial disc. .35.
35. Spear 63 μ ; excretory pore on 23 annule; spear extending though 13 annules and consisting two unequal parts.....
.....macrolabatus (Jairajpuri 1963)
36. First annules 14.5 μ wide, spear 57.3 μ extending up to nine to eleven annule. .37.
37. First annule very small; 10-112 extending through 14-16 annules.. *C. bakri* (W. 1965).
38. Excretory pore one to three annules; uterus with prominent spermatia.....
.....*obtusicaudatum* Heyn 1962.
Excretory pore on 6-9 annules; vulva transverse slit, anterior vulval lip simple, inconspicuous..... 38
39. Spear length 84.5-102.5 μ extending through 21-26 annules from anterior end; total annules 132-153.....
.....rotundicaudatus (W. 1965).
Spear length 68-92.5 μ extends through 21-38 segments. Anus on 5th annule... 39
40. Free end of ovary reaching near of the median bulb to impart pheri caudatum (Wu 1965).
Head with 2 annules first annule with 6 prominent lips-surrounding the labial disc; body surface without accumulations of foreign particles.....40
41. Vulva wide occupying complete of annule; ventral aspect of the flap projected backward from the lateral aspect.....
.....*C. queasidemani*.

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References

1. A.L. Taylor, Trans. Am. Microscop. Soc., 55, 391 (1936).

2. B. Hofmanner and R. Menzel, Zool. Anz., **44**, 80 (1914).
3. G. Fassauliotis, *Manual of Plant Nematology* (Cornell University, 1957), p. 9.
4. G.D. Gueran, Rev. Pathol. Vegetale Entomol. Agr. France, **42**, 1 (1963).
5. E.S. Kirjanova, Pamyati Akad. Seraj Alex. Zernova Akad. Nauk SSR., 346-458 (1914).
6. B.G. Chitwood, Proc. Helminthol. Soc. Wash., **16**, 90 (1957).
7. A. Tulaganov, Rep. Uzbek State Univ. n.s. 16 Biol, 11, Tashkent, SSR(1941).
8. D. J. Raski, Proc. helmr. Soci Wash., **19**, 85 (1952).
9. D. J. Raski, and A.M.A. Golden, Nematologica., **11**, 501 (1965).
10. Y.L. Wu, Can. J. Zool., **43**, 204(1965).
11. S.M. Jairajpuri and M.R.Z. Siddiqui, f. Parasitekunde, **23**, 343 (1963).
12. G. Steiner, Proc. Soil Soc. Fla., 4B (1942): 72-117 (1944).