

Thalassogenus shamimi n. sp. (Nematoda : Thalassogeneridae) a nematode predator from India

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Summary — *Thalassogenus shamimi* n. sp. is described and illustrated. It has 1.5-2.3 mm long body, a = 22-32; b = 3.9-5.4; c = 19-31; V = 56-67, buccal cavity 39-58 µm long and 18-27 µm wide and is closely related to the two previously described species. However, it differs from *T. paradoxus* Andrassy, 1973 in having slit-like amphidial aperture, smaller buccal cavity, presence of four cardiac glands and a longer tail. It differs from *T. archaeops* Orton Williams & Jairajpuri, 1984 in the shape of lip region and longer tail. Observations made on the gut contents suggest that it possesses a high predatory potential.

Résumé — *Thalassogenus shamimi* n. sp. (Nematoda : Thalassogeneridae), un nématode prédateur provenant de l'Inde — *Thalassogenus shamimi* n. sp. est décrit et illustré. Il présente les caractéristiques suivantes : L = 1,5-2,3 mm, a = 22-32; b = 3,9-5,4, c = 19-31, V = 56-67, cavité buccale longue de 39-58 µm et large de 18-27 µm. Cette espèce est très proche des deux autres espèces du genre. Toutefois, elle diffère de *T. paradoxus* Andrassy, 1973 par l'ouverture amphidienne en fente, une cavité buccale plus petite, la présence de quatre glandes associées au cardia et une queue plus longue. Elle se sépare de *T. archaeops* Orton Williams & Jairajpuri, 1984 par la forme de la région labiale et une queue plus longue. Les observations faites sur le contenu du tube digestif suggèrent que cette nouvelle espèce possède une capacité prédatrice élevée.

Key-words : *Thalassogenus*, predator.

Andrassy (1973) described an interesting nematode species *Thalassogenus paradoxus* from Papua New Guinea. Because of the presence of an eye spot, generally found only in marine nematodes, Andrassy considered it to be a marine residual form. Orton Williams and Jairajpuri (1984) described a closely related species, *T. archaeops*, from Western Samoa. They made detailed observations on the morphology of both the species, discussed their systematic position and proposed a new family Thalassogeneridae under Pelagonematoidea (Enoplida) for this genus. Regarding the systematic position of this genus we concur with Orton Williams and Jairajpuri (1984). Its placement in the family Thalassogeneridae (Pelagonematoidea : Oncholaimina : Enoplida) seems more appropriate than in Mononchina as done by Lorenzen (1981) or in Tryploidina.

During 1989-90 we collected two populations of this genus from tropical rain forests in India. A detailed light microscopic and SEM study of these specimens revealed that they represent a new species closely related to the previous two known species. Observations were also made on the gut contents of these specimens in a bid to understand their predatory ability.

Materials and methods

Specimens for light microscopy were killed, and fixed in hot 4 % formalin, dehydrated by the slow method, mounted in glycerine and measurements were made with an ocular micrometer. For SEM, specimens were fixed in 3 % glutaraldehyde, washed in buffer, dehy-

drated in alcohol series and critical point dried using CO₂. Dried specimens were mounted on aluminium stubs, coated with 30 nm gold and observed in a Hitachi S 2300 SEM.

Thalassogenus shamimi n. sp. (Figs 1, 2)

MEASUREMENTS

See Table 1.

DESCRIPTION

Female : Body ventrally curved upon fixation, tapering slightly anteriorly and more towards posterior extremity. Cuticle very finely transversely striated appearing smooth under light microscope, 3-4 µm thick at midbody and 6-7 µm at tail. Lip region continuous with body 32-42 µm wide, truncated, narrowing slightly anteriorly near oral aperture to become crater-shaped. Lips marked with six to eight longitudinal ridges (furrows) running from tip to the base which may help in widening the oral aperture. Labial and cephalic papillae distinctly setose, projecting outwards and are arranged in characteristic pattern of 6 + 6 + 4. Each papilla projecting from a circular cavity with a thickened rim. The six outer labial papillae are always larger than the inner and cephalic papillae. Inner and outer labial papillae 4 µm apart while outer and cephalic papillae 6 µm apart. Amphidial apertures small, elliptical slits about 2.5 µm wide. Three lateral cervical papillae

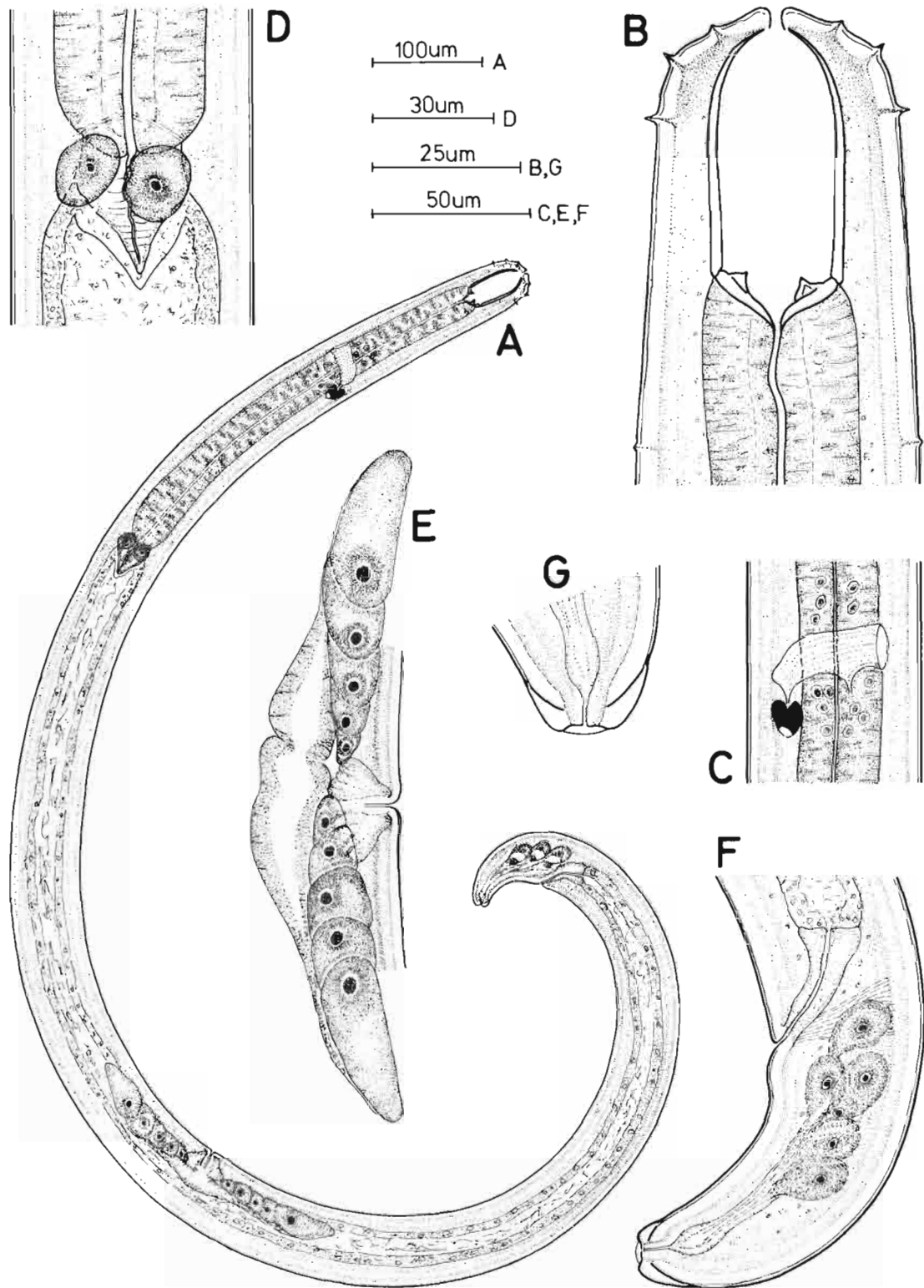


Fig. 1. *Thalassogenus shamimi* n. sp. A: Entire body; B: Anterior region; C: Nerve ring and eye spot; D: Oesophago-intestinal junction; E: Gonad; F: Tail; G: Tail tip.

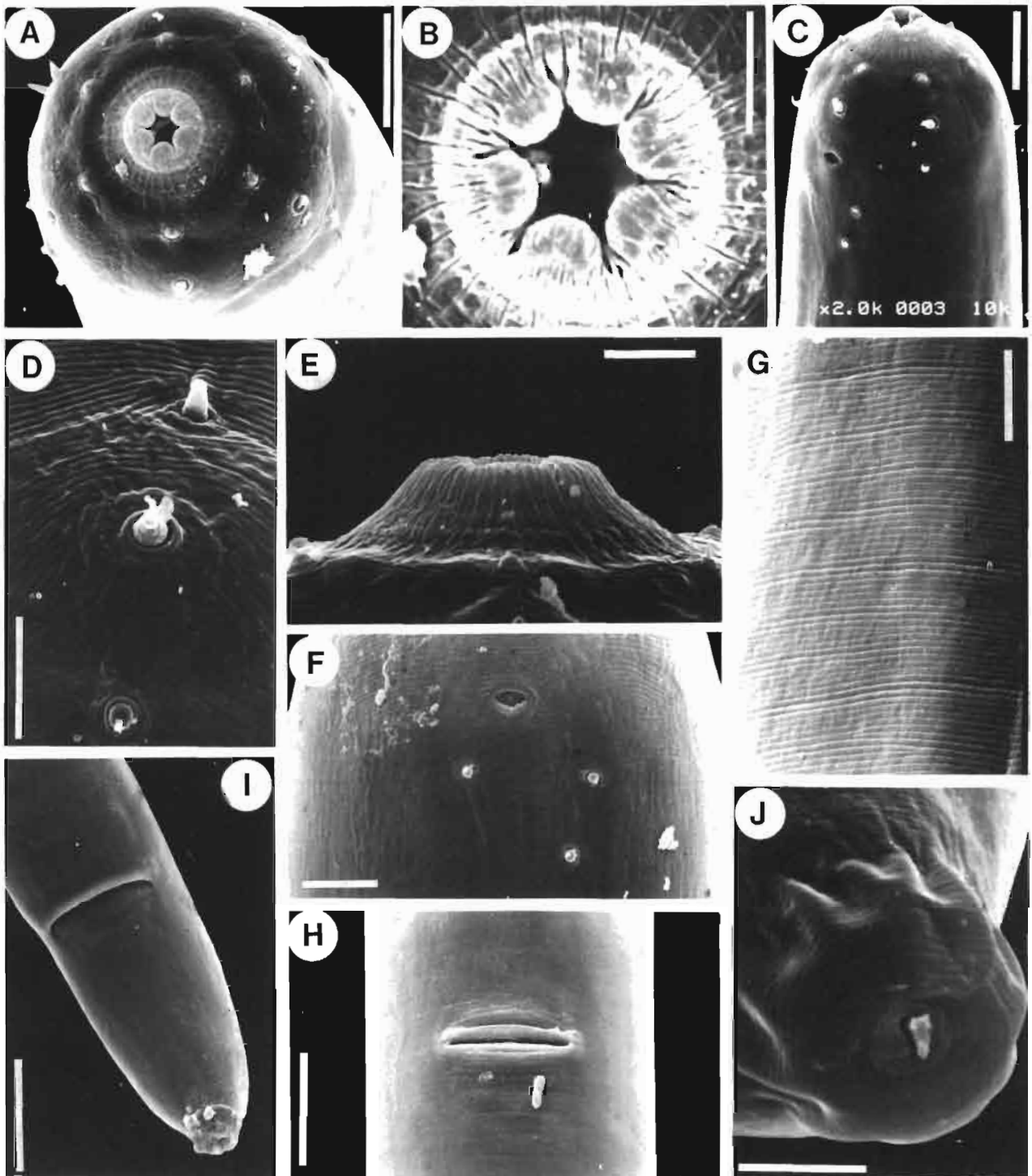


Fig. 2. *Thalassogenus shamimi* n. sp. A : En face view; B : Lips showing ridges; C : Anterior end; D : Labial and cephalic papillae; E : Lips (lateral view); F : Amphids and cervical papillae; G : Transverse striations; H : Vulva; I : Tail; J : Tail tip. (Bar = 10 μ m in A, C; 4 μ m in B, D, E, G, J; 5 μ m in F; 20 μ m in H, I.)

Table 1. Measurements and diagnostic features of females of *Thalassogenus* species.

	<i>Thalassogenus shamimi</i> n. sp.			<i>T. paradoxus</i> * <i>T. archaeops</i> **			
	Paratypes		Holotype	Itanagar population			
n	14		1	9	2	4	
L (mm)	1.68-2.3	(1.94 ± 0.28)	2.1	1.51-2.1	(1.79 ± 0.19)	2.3-2.5	1.66-1.9
Diameter	55.5-84.0	(67.7 ± 10.9)	75.0	54-75	(61.3 ± 5.68)	—	—
a	25.5-29.3	(28.8 ± 3.10)	28.0	22.5-32.0	(29.2 ± 2.37)	28-31	29-34
b	4.3-5.4	(4.7 ± 0.37)	4.8	3.9-4.8	(4.5 ± 0.27)	4.5-4.6	4.3-4.7
c	19-31	(24.2 ± 3.0)	25.0	23.9-30.4	(27.3 ± 2.1)	30-36	34-37
c'	1.6-2.3	(1.9 ± 0.21)	1.81	1.64-1.80	(1.69 ± 0.11)	1.3-1.7	0.9-1.3
V	56-67	(59.8 ± 3.01)	59.71	56.1-62.0	(59.8 ± 1.95)	57-60	59-62
G 1	4.4-6.5	(5.4 ± 0.85)	6.14	3.5-7.4	(4.8 ± 1.34)	—	—
G 2	2.5-5.7	(4.1 ± 0.78)	5.7	3.1-5.6	(4.1 ± 0.89)	—	—
Bucc. cav. length	45.0-58.5	(51.28 ± 4.01)	52.5	39-43.5	(41.5 ± 3.44)	61-63	41-47
Bucc. cav. width	21-27	(24.3 ± 2.46)	27.0	18-24	(19.1 ± 1.95)	25	22-24
Dorsal tooth from base of bucc. cav.	9-13.5	(12.0 ± 1.5)	10.5	9.0-10.5	(9.5 ± 1.06)	—	9-11
Cardia	30-42	(38.2 ± 5.45)	37.5	21-49	(30.0 ± 10.25)	—	38-48
Rectum	21.0-40.5	(32.7 ± 7.03)	40.5	30-42	(30.0 ± 4.45)	—	30-36
Tail	72-102	(83.04 ± 11.13)	84.0	57-72	(65.5 ± 4.4)	—	39-53
ABD	37.5-51	(41.6 ± 3.95)	46.5	37.5-42.0	(38.8 ± 1.84)	—	38-45

All measurements in μm , except L.; * from Andr ssy (1973); ** from Orton Williams and Jairajpuri (1984).

present just below the amphidial aperture in a characteristic pattern of 2 + 1. Stoma barrel-shaped, 18-27 μm wide and 39-58 μm long, composed of a set of three large vertical and a set of three small oblique plates. The vertical plates are 32-48 μm long, unarmed and sloping anteriorly to form the stomal aperture 7.5-10.5 μm across below the oral aperture. The basal oblique plates bear a tooth on each plate at about 9.0-13.5 μm from base of buccal cavity. Oesophagus 326-520 μm long, cylindrical, anteriorly surrounding oblique plates and posteriorly terminating in a muscular cardia. Oesophageal glands opening through dorsal tooth. Neither glands nor orifices visible in the oesophagus. Oesophageal lumen strongly sclerotized. Nerve ring at 142-147 μm from anterior end connected by means of a short commissure to an eye spot. Eye spot 7.5-10.5 μm wide and 9.0-13.5 μm long, heart shaped, located mid-ventrally at about 25-34 μm from anterior edge of nerve ring and 160-218 μm from anterior end of body. The structure of eye spot similar to that described by Orton Williams and Jairajpuri (1984). Cardia muscular with four large, almost spherical glands arranged sublaterally around the oesophago-intestinal junction. Anal opening a large slit almost covering entire ventral side of anal region. Vulva a transverse slit, 22 μm wide; vagina short, 9-14 μm across. Gonad amphidelphic, both branches ventrally situated; genital branches small, ovaries reflexed with few oocytes, usually extend upto or beyond vulva. Tail conoid, ventrally curved, 57-102 μm long, tip cap-like with a slit-like opening (spinneret). Caudal glands large, prominent arranged in tandem in two sets

of three each. These glands open in a sac which leads to the exterior through the spinneret.

Male : Not found.

TYPE MATERIAL

Holotype : Deposited in the nematode collection of Zoology Department, Aligarh Muslim University, Aligarh.

Paratypes : 14 females. Two females deposited in the following collections : Mus um national d'histoire naturelle, Laboratoire des Vers, Paris, France; National Nematode Collection, IARI, New Delhi and National Zoological Collection, Zoological Survey of India, Calcutta, India and rest in the nematode collection of Zoology Department, Aligarh Muslim University, India.

TYPE HABITAT AND LOCALITY

Soil around roots of wild tree from Silent valley (altitude 1500 m), Malaparum, Kerala State, India. Collected in December, 1989.

Other habitat and locality : Soil around roots of banana, *Musa paradisiaca* (L) from near Ganga Lake, Itanagar (altitude 500 m) Arunanchal Pradesh, India. Collected in March, 1990.

DIAGNOSIS AND RELATIONSHIP

Thalassogenus shamimi n. sp. comes very close to *T. paradoxus* Andr ssy, 1973 because of the shape of lip region and tail. However, it differs from it in having a shorter body, slit-like amphidial apertures, smaller buc-

cal cavity, in the presence of four cardiac glands and a longer tail (amphidial aperture pore-like and three cardiac glands in *T. paradoxus*). It differs from *T. archaeops* Orton Williams & Jairajpuri, 1984 in the shape of lip region and a longer and differently shaped tail (labial region almost flat and inner ring of labial papillae inwardly directed, tail not ventrally curved in *T. archaeops*).

OBSERVATIONS ON GUT CONTENTS

The analysis of intestinal contents of *T. shamimi* suggests that it is predaceous in nature and possesses a high predatory potential. A total of 26 specimens were analysed and 22 of them had prey either intact or in semidigested condition in their intestine. A large variety of prey nematodes viz species of *Helicotylenchus*, *Tylenchorhynchus*, *Hemicriconemoides*, *Pratylenchus*, *Dorylaimellus*, *Mesodorylaimus*, *Aporcelaimellus*, *Nygellus*, *Oriverutus*, *Thornenema*, *Xiphinema*, *Trichodorus* and *Mononchus* besides the trophi of rotifers were encountered in the intestine of these predators. More dorylaims were present than tylenchs. Predators consumed species of *Tylenchorhynchus*, *Xiphinema* and *Aporcelaimellus* in maximum numbers and species of *Dorylaimellus*, *Oriverutus*, *Mononchus* and *Pratylenchus* in least numbers (Table 2). The presence of the trophi of rotifers in fourteen specimens indicate that they were also preferred by the predators. The cuticular parts of the prey nematodes such as the stylet, spear, spicules, etc., were frequently encountered in the gut of *T. shamimi* n. sp. besides many unidentified (semidigested) species of prey nematodes.

Table 2. Analysis of the gut contents of *Thalassogenus shamimi*. Total number of specimens analysed = 26. Total number of specimens containing prey = 22.

Prey	Total number of specimens containing intact prey	Total number of specimens containing unidentified prey	Total number of specimens containing cuticular parts
Dorylaims	14	9	13
Tylenchs	11	7	11
Longidorids	2	1	0
Mononchs	4	1	0
Rotifers	0	0	14

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