FAMILY NORDIIDAE JAIRAJPURI & SIDDIQI, 1964

**Diagnosis:** Body 0.4-7.0 mm long. Cuticle finely striated. Lip region continuous or offset by depression or constriction; lips amalgamated or well separated; labial papillae often raised or setiform. Amphids stirrup-shaped with slit-like aperture. Odontostyle slender, attenuated, long, with narrow lumen and aperture. Guiding ring distinct, single or ‘double’. Odontophore elongated, rod-like or with basal swellings or flanges. Pharynx muscular; expanded posterior to mid-length. Vulva transverse; vagina usually distally sclerotized. Female reproductive system mono-opisthodelphic or amphidelphic. Tail similar in sexes; hemispherical to long, filiform.

**Type subfamily:** Nordiinae Jairajpuri & A.H. Siddiqi, 1964.

**Other subfamilies:**

- Cephalodorylaiminae Jairajpuri, 1967
- Pungentinae Siddiqi, 1969
- Helmabinae Siddiqi, 1971
- Actinolaimoidinae Jairajpuri & Ahmad, 1992

**Key to subfamilies of Nordiidae**

1. Labial papillae enlarged, rising significantly above lip contour................................................................. 2.
2. Labial papillae not enlarged................................................................. 3.
2. Cuticle with longitudinal and transverse groove-like striations forming lamelliform pattern on body.......................................................... Helmabiinae

Cuticle smooth, groove-like striations absent ...... Cephalodorylaiminae

3. Odontophore usually flanged ........................................... Pungentinae

Odontophore not flanged................................................................. 4

4. Body usually robust; odontostyle three to five lip region widths long ........

................................................................. Nordiinae

Body usually slender; odontostyle generally not more than two lip region

widths long ...................................................... Actinolaimoidinae
Genus *Echinodorus* Siddiqi, 1995

Siddiqi (1995) proposed a monotypic genus *Echinodorus*, for the nematodes having stump-like anterior labial sensilla; attenuated odontostyle; three distinct glandular bodies at pharyngeo-intestinal junction and mono-opisthodelphic reproductive system and designated *Echinodorus tersus* Siddiqi, 1995 as the type species.

In the present study samples collected from Costa Rica yielded another species of the genus which is being described in the following.

**Diagnosis:** Cephalodorylaiminae. Cephalic region continuous; lips amalgamated; inner labial sensilla raised, thick stump-like; posterior labial and cephalic sensilla short, conical about half as high as the inner one. Amphids large, stirrup-shaped. Odontostyle symmetrical, attenuated, with narrow lumen and smooth base, 18-20 μm long with aperture less than one-third of its length. Odontophre simple, rod-like. Pharynx long, enlarging behind its middle. Cardia small, with three glandular bodies. Vulva small, transverse, premedian. Vaginal sclerotization indistinct. Monodelphic-opisthodelphic. Tail elongate-conoid. Spicules large, dorylaimoid. Ventromedian supplements few, well spaced.

**Type species:** *Echinodorus tersus* Siddiqi, 1995

**Other species:**

*E. saccatus* sp. n

**Echinodorus saccatus** sp. n.

(Fig.21)

**Measurements:** See table 21

**Description:**
Female: Body slightly curved ventrad upon fixation. Cuticle finely striated, 1.0-1.5 μm thick at mid body and 3.0 μm at tail. Lateral chords about one-third of body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region continuous with body, slightly tapering anteriorly, about one-third as wide as body width at neck base; inner labial sensilla raised, stump-like; posterior labial and cephalic sensilla also raised. Amphids with stirrup-shaped fovea, their aperture occupying about half of the corresponding body width. Odontostyle slender, attenuated, needle-like, with narrow lumen and aperture, 1.7-2.2 times lip region widths long. Guiding ring single, at 0.8 lip region width from anterior end. Odontophore simple, rod-like, slightly widened at base. Nerve ring at 43-44% of neck length from anterior end. Expanded part of pharynx occupying 39-44 % of neck length. Cardia short, conoid, with three glandular bodies, about one-fourth corresponding body width long. Pharyngeal gland nuclei and their orifices are located as follows:

$$\begin{align*}
DO &= 63 - 64 \\
DN &= 65 - 66 \\
DN &= 65 - 66 \\
DN &= 65 - 66 \\
DN &= 65 - 66
\end{align*}$$

Reproductive system mono-opisthodelphic; anterior genital branch represented by a sac, measuring 10-30 μm; posterior genital branch well developed. Ovaries reflexed, measuring 99-131 μm with oocytes arranged in a single row except near tip. Oviduct joins the ovary subterminally, 48-49 μm long. Uterus a wide tube, measuring 48-49 μm. Sphincter present at oviduct-uterus junction. Vagina extending inwards about half of the corresponding body width. Vulva transverse. *Pars proximalis vaginae* 9-11 μm long and 9-10 μm wide with straight walls encircled by circular musculature. *Pars refringens*
vaginae absent. Pars distalis vaginae, 4-5 μm long with curved walls. Prerectum 3.0-3.8 anal body widths long. Rectum 1.5-1.7 anal body width long. Tail elongate, conoid to a finely rounded terminus, slightly arcuate ventrally in anterior three-fourth than almost straight, 4.7-5.3 anal body widths long, with a pair of caudal pore on each side.

**Male:** Not found.

**Diagnosis and relationship:**

_Echinodorus saccatus_ sp. n. is characterized by having small sized, slender body; cephalic region with raised, thick stump-like inner labial sensilla; 15.5-16.5 μm long, attenuated odontostyle; mono-opisthodelphic reproductive system with anterior genital branch represented by a small sac and tail elongate conoid, slightly ventrally arcuate then straight.

The new species differs from the type and only species of the genus _Echinodorus tersus_ Siddiqi 1995 in having shorter odontostyle (vs. 18-20 μm); in the presence of anterior uterine sac (vs. anterior genital branch completely absent) and in the shape of tail (vs. tail dorsally bent near tip).

**Type habitat and locality:**

Corcovado National Park, Agujas Biological Station. Primary forest; soil gathered between 5-10 cm depth; Golfo Bulce Forest Reserve, Osa Conservation Area (ACOSA), Costa Rica.

**Type specimens:**

Holotype female on slide _Echinodorus saccatus_ sp.n. /1; paratype females on slide _Echinodorus saccatus_ sp.n. /2-3; deposited in the nematode collection of the Institut Nacional de Biodiversidad, Costa Rica.
Genus *Actinolaimoides* Meyl, 1957


During course of present study several populations of an *Actinolaimoides* species were recorded from Costa Rica which on detailed study were found to represent a new species that is being described in the following.


**Type species:** *Actinolaimoides tobleri* (Micoletzky, 1925) Meyl, 1957

**Other species:**

- *A. peruvianus* Andrássy, 1995
A. shamimi sp. n.

**Actinolaimoides shamimi** sp. n.
(Fig. 22)

**Measurements:** See table 22

**Description:**

**Female:** Body slightly curved ventrad upon fixation, tapering towards both the extremities. Cuticle finely striated, about 1.0 μm thick at mid body and 2-3 μm on tail. Lateral chords about one-third of body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region narrow, offset by slight depression, about 1/4th-1/3rd as wide as body width at neck base. Amphids narrow with slit-like aperture. Stoma bulboid, with slight labial and post-labial thickenings. Odontophore dorylaimoid, attenuated, 1.5-1.8 times lip region widths, its aperture about 1/7th-1/6th of its length. Guiding ring single, posteriorly bulboid, 0.5-0.8 lip region widths from anterior end. Odontophore simple rod-like, 1.8-2.0 times odontostyle length. Nerve ring at 46-52% of the neck length. Expanded part of pharynx occupying about 35-39% of total pharyngeal length. Cardia short, conoid, sub-digitate, about one-third of the corresponding body width. Pharyngeal gland nuclei and their orifices are located as follows:

\[
\begin{align*}
DO &= 66-68 \\
DN &= 72-73 \\
S1N1 &= 77-78 \\
S1N2 &= 81-82 \\
S2N &= 91-92 \\
DN &= 72-73 \\
S1N2 &= 81-82 \\
S2O &= 93-94
\end{align*}
\]
DO-DN = 5-6

Reproductive system mono-opisthodelphic; anterior branch completely absent. Ovary reflexed, 43-100 μm long; oocytes arranged in a single row except near its tip; oviduct 10-52 μm long, joining the ovary subterminally. Vulva a large pore; vagina extending inwards about half of the corresponding body width; sclerotization absent. Pars proximalis vaginae 7-8 μm long and 10 μm wide. Pars distalis vaginae 3-4 μm in length with curved walls taking vulva in to a depression. Prerectum 3.3-3.5 anal body widths long. Rectum 1.3-1.4 times anal body widths long. Tail elongate-conoid with dorsally bent pointed terminus, 4-5 anal body widths long, with a pair of caudal pores on each side.

Male: Not found

Diagnosis and relationships:

Actinolaimoides shamimi sp. n. is characterized by having a small sized body (L = 0.61-0.70 mm), slender body; 9-10 μm long, attenuated odontostyle; bulboid spear guide; small amphid; large pore-like vulva; mono-opisthodelphic gonad and elongate-conoid, slightly dorsally bent tail.

In the shape of its tail, the new species comes close to A. thornei (Baqri & Jairajpuri, 1976) Siddiqi, 1982 and A. peruvianus Andrássy, 1995 but differ from the former in having distinct thickening in the lip region; shorter odontostyle; bigger cardia; comparatively posterior position of vulva; in the shape of vulva and vagina and longer tail (vs. lip region without thickening; odontostyle 10-11; V = 30-35; vulva transverse in A. thornei ).
The new species differs from *A. peruvianus*, a species from same region in having smaller odontostyle, comparatively anterior and differently shaped vulva and vagina and in the absence of anterior uterine sac (vs. odontostyle 16 µm; V = 38-39; vulva a transverse slit and a short anterior uterine sac present).

In the characteristic shape of its vulva and vagina the new species comes close to *A. tobleri* (Micoletzky, 1925) Meyl, 1957 and *A. angolensis* (Andrássy, 1963) Siddiqi, 1982 but both these species have ventrally arcuate tail.

**Type habitat and locality:**

Fresh water sample, gravel and sand; collected in Colorado river, Rincon de la Vieja National Park, Guanacaste Conservation Area, Costa Rica.

**Other habitats and localities:**

1) Primary cloudy forest; epiphyte mosses growing on tree trunk; Tapanti National Park; La Amistad Pacific Conservation Area, Costa Rica.

2) Primary tropical rain forest; mosses growing on tree trunk, Agujas Biological Station, Golfo Dulce Forest Reserve, Osa Conservation Area, Costa Rica.

**Type specimens:**

Holotype female on slide *Actinolaimoides shamimi* sp. n./ 1; paratype females on slides *Actinolaimoides shamimi* sp.n. /2- 6; deposited in the nematode collection of the Institut Nacional de Biodiversidad, Costa Rica. Two paratype females deposited with the Nematode Collection of the Department of Zoology, Aligarh Muslim University, India.
Genus *Oriverutus* Siddiqi, 1971

The genus *Oriverutus* was proposed by Siddiqi, 1971 for species having attenuated odontostyle, abnormally large amphids, widely separated anterior subventral pharyngeal gland nuclei and few ventromedian supplements, and designated *O. sundarus* (*Eudorylaimus sundarus* Williams, 1964) as its type species. He (i.e.) also transferred some species from *Longidorella* Thorne, 1939 and *Tylencholaimus* De Man, 1876 to this genus and described a new species *O. lobatus* from Nigeria. Baqri (1980, 1991); Ahmad & Jairajpuri (1982, 1987) added several species from India, transferred *Enchodelium asaccatum* Dhanachand & Jairajpuri, 1980 to *Oriverutus* and also provided a key for the identification of the species. Peña-Santiago & Peralta (1995) described a new species from Spain and also provided a diagnostic compendium for the identification of the species under this genus. Andrássy (1995) added a new species *O. maturitatis* while Ahmad & Siddiqi (1997) added four new species and also synonymized the genus *Paroriverutus* Carbonell & Coomans, 1982 with *Oriverutus*. Recently, Ahmad & Ahmad (2002) added a new species from India and Ahmad & Araki (2002) added two species from Japan.

During course of present study, specimens of *Oriverutus* were received from Nicaragua and Costa Rica, which on detailed study were found to represent a new species each, and, are being described in the following.

**Diagnosis:** Actinolaimoidinae. Body small-sized, about 1 mm long. Cuticle finely striated. Lip region well marked with prominent papillae. Amphids abnormally large. Oral opening and pharynx circular. Odontostyle attenuated, with narrow lumen and sharply pointed tip. Guiding ring usually indistinct. Pharynx gradually enlarging near
middle; duct of dorsal gland long, its nucleus small and located at some distance from gland opening. Opening of anterior pair of ventrosub-lateral glands widely separated from each other and located in anterior half of pharyngeal enlargement; opening of posterior pair close-set and at some distance from base of pharynx. Cardia rounded, usually surrounded anteriorly by prominent glandular tissues. Vulva transverse, pore or slit-like. Female reproductive system mono-opisthodelphic or amphidelphic. Males with dorylaimoid spicules, lateral guiding pieces and two-six spaced mammiliform ventromedian supplements. Tail elongated-conoid, with tip dorsally or venterally directed; similar in sexes.

**Type species:** *O. sundarus* (Williams, 1964) Siddiqi, 1971

**Other species:**

*O. anisi* Ahmad & Jairajpuri, 1987
*O. arcuatus* Baqri, 1980
*O. arcuicaudatus* Ahmad & Araki, 2002
*O. hastulatus* (Siddiqi, 1964) Siddiqi, 1971
*O. hastus* Ahmad & Jairajpuri, 1982
*O. impar* (Khan & Khan, 1964) Siddiqi, 1971
*O. labiatus* Ahmad & Jairajpuri, 1987
*O. lobatus* Siddiqi, 1971
*O. longicaudatus* Ahmad & Siddiqi, 1997
*O. longistylus* Ahmad & Jairajpuri, 1987
*O. mamillatus* (Darekar & Khan, 1982) Jairajpuri & Ahmad, 1992
*O. maturitatis* Andrássy, 1995
*O. microdorus* Ahmad & Siddiqi, 1997
*O. occidentalis* Peña-Santiago & Peralta, 1995
*O. pagarus* Ahmad & Jairajpuri 1987
$O.\ papillatus$ Ahmad & Siddiqi, 1997\n$O.\ parangulatus$ Baqri, 1991
$O.\ parahastus$ Ahmad & Siddiqi, 1997
$O.\ parvus$ Ahmad & Araki, 2002
$O.\ pseudohastus$ Ahmad & Ahmad, 2002
$O.\ sturhani$ sp. n.
$O.\ tropicus$ sp. n.

$O.\ riverutus\ sturhani$ sp. n.
(Fig.23)

Measurements: See table 23

Description

Female: Body slightly curved ventrad upon fixation, tapering towards both extremities. Cuticle finely striated 1.0 – 1.5 μm thick at mid body, 1.5- 2.0 μm on tail. Lateral chords about one-third of body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region distinctly offset, about twice as wide as high and about one-third as wide as body width at neck base. Lips lobe-like, with distinct labial papillae. Amphids stirrup-shaped, their aperture occupying almost the entire lateral width. Odontostyle dorylaimoid, attenuated, 1.8-2.0 times lip region widths long, its aperture about 1/5th of its length. Guiding ring single, 0.65-0.75 lip region width from anterior end. Odontophore simple rod like, 0.85-0.95 times the odontostyle length. Nerve ring at 40-43% of neck length from anterior end. Pharyngeal expansion gradual; expanded part highly granular, occupying about 41-45% of total neck length. Cardia short, bluntly conoid; cardiac glands distinct. Pharyngeal gland nuclei and their orifices are located as follows:
Reproductive system monodelphic-opisthodelphic. Anterior genital branch represented by a small sac, measuring 9-12 μm. Posterior branch well developed. Ovary reflexed, measuring 70-84 μm with oocytes arranged in a single row. Oviduct joins the ovary subterminally. Uterus small, undifferentiated tube, measuring 37-43 μm. Sphincter present at oviduct-uterus junction. Vagina extending inwards about half of the corresponding body width. *Pars proximalis vaginae* 8-9 μm long, and 9-10 μm wide with almost straight walls encircled by circular musculature. *Pars refringens vaginae* with two drop shaped, cuticularised pieces, measuring 2.5-3.0 x 1.5-2.0 μm and a combined width of 5-7 μm. *Pars distalis vaginae* measuring 1-2 μm with curved walls. Prerectum 2.1-5.3 anal body widths long. Rectum 1.1 -1.3 anal body width long. Tail elongate conoid, dorsally bent, 2.7-4.5 anal body widths long, and with a pair of caudal pores on each side.

**Male:** Not found

**Diagnosis and relationships:**

*Oriverutus sturhani* sp. n. is characterized by having small (L = 0.75-0.89 mm) slender body; distinctly offset lip region; lobe-like lips with distinct labial papillae; 17-19 μm long, attenuated odontostyle; monodelphic-opisthodelphic gonad and elongate conoid dorsally bent tail.

The new species is most closely related to *O. lobatus* Siddiqui, 1971 but differ in having longer odontostyle (vs. 16-17 μm), in having transverse vulva with distinct

\[
\begin{align*}
DO &= 63-64 & S_1N_1 &= 76-78 & S_2N &= 89-91 \\
DN &= 66-68 & S_1N_2 &= 82-84 & S_2O &= 90-92 \\
\end{align*}
\]
vaginal sclerotization (vs. pore-like vulva without vaginal sclerotization), in the presence of an anterior uterine sac (vs. absent) and more V value (vs. V = 37-40).

The new species also resembles *O. longistylus* Ahmad & Jairajpuri, 1987 and *O. occidentalis* Peña-Santiago & Peralta, 1995, but differs from the former in having a comparatively longer and slender body (vs. L = 0.61-0.73 mm, a = 24-30); shorter odontostyle (vs. 19-26 μm average 24 μm); in the absence of basal thickening of odontophore (vs. odontophore with basal thickening); well developed cardiac glands (vs. poorly developed cardiac glands) and more c' value (vs. c' = 10-12).

From *O. occidentalis* Peña-Santiago & Peralta, 1995, the new species differ in being much smaller in size (vs. L = 1.08-1.26 mm); narrower lip region; shorter odontostyle and odontophore (vs. odontostyle 20-22 μm, odontophore 22-25 μm), and in having well-developed cardiac glands (vs. cardiac glands obscure).

**Type habitat and locality:**

Blue fields, Nicaragua, rhizosphere of Cocos palm on island in lagoon. Collected by Dr. D. Sturhan in December 1977.

**Type specimens:**

Holotype female on slide *Oriverutus sturhani* sp. n./1; paratype females on slides *Oriverutus sturhani* sp. n./2-5. Holotype and five paratypes deposited in the German Nematode Collection, Institute fur Nematology, Munster, Germany. Two paratypes deposited in the nematode collection of the University of Jaen, Spain and rest of the paratypes with the nematodes collection of the Department of Zoology, Aligarh Muslim University, India.
Oriverutus tropicus  sp. n.
(Fig. 24)

Measurements: See table 24

Description

Female: Body curved ventrad upon fixation. Cuticle finely striated, 1–2 μm thick at mid body and 2-3 μm on tail. Lateral chords about one-third of body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region offset by constriction, about twice as wide as high and about one-third as wide as body width at neck base; lips separated; labial papillae slightly projecting. Amphids cup-shaped, their aperture 0.5-0.65 times the corresponding body width. Odontostyle dorylaimoid, 1.8 lip region widths long, its aperture about one-fourth of its length. Guiding ring single, at 0.62-0.66 lip region widths from anterior end. Odontophore simple rod-like, about as long as odontostyle. Nerve ring at 36-37% of the neck length from anterior end. Pharyngeal expansion gradual; expanded portion occupying 40-42% of total neck length. Cardia elongate conoid, about one-third of the corresponding body width; glandular structures near cardia asymmetrically placed.

Pharyngeal gland nuclei and their orifices are located as follows:

DO = 60-61 \quad S_1N_1 = 72-74 \quad S_2N = 87-88
DN = 66-67 \quad S_1N_2 = 79-80 \quad S_2O = 88-89
DO-DN = 6-7

Reproductive system amphidelphic; both the sexual branches almost equally developed. Ovaries reflexed, measuring 40-112 μm (anterior) and 37-110 μm (posterior) with oocytes arranged in a single row except near its tip. Oviduct joins the ovary subterminally, measuring 66-71 μm (anterior) and 41-70 μm (posterior). Sphincter
present at oviduct-uterus junction. Uterus a wide tube, measuring 29-50 μm (anterior) and 23-63 μm (posterior). Vagina extending inwards about half of the corresponding width. *Pars proximalis vaginae* 9-11 μm long and 13-15 μm wide with straight walls encircled by circular musculature. *Pars refringens vaginae* with two trapezoid sclerotization, measuring 5-5 x 2.5-3.0 μm and a combined width of 8-9 μm. *Pars distalis vaginae* measuring 1.5-2.0 μm with curved walls. Prerectum 2.3-3.0 anal body widths long. Rectum 1.3 -1.4 anal body widths long. Tail elongate conoid, ventrally curved with straight to slightly dorsally bent terminus, 2.3-2.8 anal body widths long, and with a pair of caudal pores two on each side.

**Male:** Not found

**Diagnosis and relationships:**

*Oriverutus tropicus* sp. n. is characterized by having 0.97-1.0 mm long, slender body; lip region offset with comparatively compact lips but with projecting labial papillae; 15.0-16.5 μm long odontostyle; asymmetrical glandular structure near cardia; amphidelphic gonad, and elongate, ventrally curved tail with straight to slightly dorsally bent tip.

In the shape of lip region, the new species comes close to *O anisi* Ahmad & Jairajpuri, 1987 and *O. sundarus* (Williams, 1964) Siddiqi, 1971 but differs from the former in having shorter odontostyle (vs. 18 μm), in the nature of glandular structure at cardia (vs. glandular structure rounded symmetrical), differently shaped vaginal sclerotization (vs. vaginal sclerotization drop-shaped), less posterior vulva (vs. V =55), differently shaped tail (vs. more ventrally arcuate tail) and in the absence of males. From
O. sundarus, the new species differs in being amphidelphic (vs. monodelphic-opisthodelphic).

In the nature of its characteristic glandular structure near cardia, the new species resembles O. papillatus Ahmad & Siddiqi, 1998 but distinctly differ in the shape of lip region (vs. lips region more distinctly set off with lobe-like lips) and shorter odontostyle (vs. 24-25 μm) O. tropicus sp. n. also resembles O. maturitatis Andrássy, 1995 but differs in the shape of lip region and labial papillae (vs. lips well separated with prominent labial papillae); in having longer odontostyle (vs. 13 –14 μm) and in the nature of glandular tissue near cardia (vs. cardia with three distinct glands).

Type habitat and locality:

Soil and root samples path to Gandoca; Gandoca Manzanillo Wildlife refuge; La Amistad Caribe Conservation Area, Costa Rica. Collected by Alejandro Esquivel.

Type specimens:

Holotype female on slide Oriverutus tropicus sp. n/1; paratype females on slides Oriverutus tropicus sp. n./2-3; deposited with the nematode collection of the Institut Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica.
Genus *Ecanema* Gen. n.

**Diagnosis:** Actinolaimoidinae. Small sized nematodes. Lip region distinctly offest; lips separate with distinctly projecting labial papillae. Amphids stirrup-shaped. Odontostyle attenuated with narrow lumen; its aperture about $1/5_\text{th} - 1/4_\text{th}$ of its length. Guiding ring single. Odontophore rod-like. Pharynx divisible into three regions; an anterior narrow non-muscular slender part; a short middle conical part which suddenly expands to form a highly muscular, glandular basal bulb; second and third part together constitute about two-fifths of the total neck length. DN and $S_1N_1$ well developed, almost equal in size. Cardiac glands distinct. Female genital system amphidelphic. Males with dorylaimoid spicules, lateral guiding pieces and regularly spaced ventromedian supplements beginning within the range of spicules. Tail short, conoid-arcuate; similar in both sexes.

**Type species:** *Ecanema ecae* gen. n., sp. n.

**Relationships:**

*Ecanema* gen. n. is closely related to *Oriverutus* Siddiqi, 1970 and *Inbionema* Loof & Zullini, 2000, but differs from the former in the characteristic nature of its pharynx (vs. pharynx not divisible into three parts and the pharyngeal expansion gradual); in having $S_1N_1$ as developed as DN (vs. DN distinctly larger than $S_1N_1$) and ventromedian supplements in males beginning within the range of spicules (vs. ventromedian supplements beginning from beyond the range of spicules). From *Inbionema*, the new genus differs in having much smaller odontostyle (vs. odontostyle very long, 39-66 µm); in the nature of pharynx (vs. pharynx not divisible into three parts and pharyngeal...
expansion gradual); in the nature of $S_1N_1$ (vs. $S_1N_1$ smaller than DN); in the presence of cardiac glands (vs. cardiac glands absent).

The new genus and species is named in recognition of the contributions of Escuela de Ciencias Agrarias of the Universidad Nacional, Heredia for the INBIO Biodiversity Projects, Costa Rica.

**Ecanema ecae gen. n., sp. n.**

(Fig. 25 & 26)

**Measurements:** See table 25

**Description:**

**Female:** Body short, robust, slightly curved ventrad upon fixation. Cuticle finely striated, 2.0-2.5 μm thick at mid body and 4-6 μm on tail. Lateral chords about one-fourth of body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region offset by constriction, about twice as wide as high and about one-third as wide as body width at neck base. Labial papillae distinctly projecting above labial contour. Amphids stirrup-shaped, their apertures about two-thirds of the corresponding body width wide. Odontostyle dorylaimoid, attenuated with narrow lumen, about 1.6 times lip region widths long, its aperture about $1/4^{th}$-$1/5^{th}$ of its length. Guiding ring single, about 0.6 lip region widths from anterior end. Odontophore simple, rod like, about as long as odontostyle length. Nerve ring at 44-47% of the neck length from anterior end. Pharynx divisible into three regions; an anterior narrow, non muscular slender part; a middle conical part measuring 15-18 μm which suddenly expands to form highly muscular, glandular basal bulb. Second and third parts together constitute about 36-41% of total neck length. DN and $S_1N_1$ well developed, almost equal in size. DN measuring 7
-7.6 x 4.5 – 5.5 μm with its nucleus 2.5 μm in diameter; S₁N₁ measuring 6.5 – 7.6 x 3.8 – 4.4 μm with its nucleus 2.0-2.5 μm. S₁N₂ close to S₁N₁. Cardia elongate-conoid, about one-third of the corresponding body width long. Pharyngeal gland nuclei and their orifices are located as follows:

DO = 67-69  \quad S₁N₁ = 80-81  \quad S₂N = 90-91
DN = 71-74  \quad S₁N₂ = 83-84  \quad S₂O = 92-93
DO-DN = 4.5-6.0

Reproductive system amphidelphic; both the sexual branches almost equally developed. Ovaries reflexed, measuring 68-149 μm (anterior) and 65 –152 μm (posterior) long with oocytes arranged in a single row except near tip. Oviduct joining the ovary subterminally, measuring 49-115 μm (anterior) and 38-118 μm (posterior). Uterus a wide tube, measuring 34-186 μm (anterior) and 32-114 μm (posterior); uterine eggs measuring 47-55 x 27-29 μm. Sphincter present at oviduct-uterus junction. Vagina extending inwards about half of the corresponding body widths deep. Vulva transverse slit. Pars proximalis vaginae 11.5-12.5 μm long; and 12.5-13.5 μm wide, with straight walls encircled by circular muscles. Pars refringens vaginae with two drop-shaped scelerotized pieces, each measuring 6.5 x 2.5-3.0 μm and with a combined width of 12-13 μm. Pars distalis vaginae 2.5-3.0 μm long with curved walls. Prerectum 1.2-1.4 times anal body widths long. Rectum 0.8-0.9 anal body widths long. Tail short conoid, with acute terminus, 0.8-1.0 times anal body widths long with hyaline portion occupying 33-46% of total length.

Male: Supplements, an adanal pair and 11 regularly spaced ventromedian. Spicules massive, dorylaimoid about 1.3 anal body width long. Lateral guiding pieces about one –
third spicules length. Prerectum short, terminating at level with fifth supplement, 2.4 anal body widths long. Rectum 0.9 anal body width long. Tail short, convex-conoid, 0.9 anal body width long with blunt tip.

**Type habitat and locality:**

Primary tropical rain forest; mosses on the tree branches; sample collected at two meter height above ground, Path Zamiaca, Agujas Biological Station.

**Type specimens:**

Holotype female on slide *Ecanema ecae* gen. n., sp. n./ 1; paratype females and male on slide *Ecanema ecae* gen. n., sp. n./ 2-5; deposited in the nematode collection of the Institut Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica. A paratype female deposited with the nematode collection of the Department of Zoology, Aligarh Muslim University, India.