

***Adelonema camerunense* gen. et sp. n. (Araeolaimida: Diplopeltidae) from rain forest in Cameroon**

Oleksandr Holovachov* and Dieter Sturhan**

*Department of Zoology, Biological Faculty, L'viv National University, Grushevsky str. 4, L'viv 79005, Ukraine,

**Biologische Bundesanstalt für Land- und Forstwirtschaft, Institut für Nematologie und Wirbeltierkunde, Toppheideweg, 88, 48161 Münster, Germany.

Accepted for publication 18 June 2003

Summary. *Adelonema camerunense* gen. et sp. n. (Araeolaimida: Diplopeltidae) from rain forest in Cameroon is described on the basis of light microscopy. The new genus is tentatively placed in the Diplopeltidae and distinguished from all other genera in the family by the following characters: cuticle with ten longitudinal ridges; ocelli, lateral field, epidermal glands, body pores, somatic setae and deirid absent; cephalic sensilla setiform; amphid a transverse slit; excretory pore posterior to nerve ring; stoma tubular; pharynx cylindrical with weak cardiac bulb; tail elongate conoid with filiform terminus; caudal glands and spinneret absent; female gonads monodelphic, prodelphic; ovary branch outstretched; spermatheca an offset pouch; postvulval uterine branch present; male reproductive system diorchic; testes opposed; spicules arcuate; gubernaculum platelike; midventral precloacal setiform sensillum present.

Key words: *Adelonema camerunense* sp.n., Cameroon, Diplopeltidae, morphology, new genus, taxonomy.

From two soil samples collected from natural forest in Cameroon by the second author a remarkable nematode species was isolated, which is described here as a representative of a new genus. Nematodes were extracted from about 500 ml soil each using the centrifugation-flotation method with MgSO₄. The nematode suspensions were fixed with hot TAF, transferred to glycerine by a slow evaporation method and specimens of the new species were mounted in dehydrated glycerine on permanent slides.

DESCRIPTION

***Adelonema* gen. n.**

Diagnosis. Araeolaimida. Diplopeltidae. Cuticle coarsely annulated, with ten longitudinal ridges. Ocelli, lateral field, epidermal glands, body pores, somatic setae and deirid absent. Outer labial sensilla papilliform. Cephalic sensilla setiform. Amphid a transverse slit. Secretory-excretory system present, excretory pore located closely posterior to nerve ring. Stoma weakly cuticularized, tubular.

Pharynx cylindrical with weak cardiac bulb. Dorsal gland orifice at stoma base. Cardia conoid, glandular. Tail elongate conoid with filiform terminus; caudal glands and spinneret absent. Female reproductive system monodelphic, prodelphic; ovary branch outstretched. Spermatheca an offset pouch, located on right side at oviduct-uterus junction. Vagina straight. Postvulval uterine branch long and empty. Male reproductive system diorchic; anterior testis outstretched, posterior testis reflexed. Spicules arcuate, gradually narrowing distally, with manubrium appearing oval in lateral view. Gubernaculum platelike. Male copulatory apparatus with a single midventral precloacal setiform sensillum.

Relationships. In having an outstretched ovary, setiform cephalic sensilla, toothless tubular stoma and cylindrical pharynx with weak cardiac bulb, the new genus shows similarities to the two nematode families Leptolaimidae Örley, 1880 and Diplopeltidae Filipjev, 1918, following the classification of Lorenzen (1981). Character states such as absence of somatic setae, body pores, hypodermal and caudal glands are probably a results of a

reduction process and occur fairly often in many different groups of nematodes. The only character that separates *Adelonema* from Leptolaimidae is the presence of an outstretched ovary. But since the outstretched condition of the ovaries has probably occurred repeatedly within the nematodes, its value as proof of holophyly for a taxon is not very great (Lorenzen, 1981).

Adelonema gen. n. fits within the diagnosis of Diplopeltidae by the following characters: labial sensilla papilliform, cephalic sensilla setiform; stoma narrow tubular, lacking teeth or denticles; ovary outstretched; presence of two opposed testes. An additional character, which was not mentioned by Lorenzen (1981), but present at least in some Diplopeltidae species (e.g. *Morlaxia contusa* Vincx & Gourbault, 1988), is the presence of a precloacal setiform sensillum in the males. The new genus differs, however, from all Diplopeltidae as well as from all Monhysterida as understood by Lorenzen (1981) in the shape of the amphids (a transverse slit vs spiral, loop-shaped or round). Most Monhysterida have somatic setae at least in males, whereas they are absent in the new genus. We consider it justified to place *Adelonema* gen. n. tentatively within the family Diplopeltidae, however further studies may necessitate the transfer of the genus to another family or the establishment of a new family group for it.

Type and only species: *Adelonema camerunense* sp. n.

Adelonema camerunense sp. n.
(Fig. 1)

Morphometrics: See Table 1.

Adult. Body slender, cylindrical, gradually narrowing posteriorly on tail; slightly curved ventrad, more so in posterior part in male. Cuticle coarsely annulated; annules 1.2-1.6 μm wide at midbody. Each annule interrupted by deep and wide longitudinal incisures, forming ten longitudinal ridges: two lateral, two dorsosublateral, two subdorsal, two ventrosublateral, two subventral in position. Ocelli, lateral field, crystalloid bodies, epidermal glands, body pores, somatic setae and deirid absent; hemizonid not seen. Labial region truncate. Inner labial sensilla undiscernible, outer labial sensilla papilliform. Cephalic sensilla setiform, directed forward. Amphid a transverse slit, located on first body annule. Nerve ring encircling pharynx at its middle. Secretory-excretory system present, with unicellular gland, located ventrally, opposite to

basal part of pharynx, opening outside via excretory pore, which is located somewhat posterior to nerve ring. Stoma weakly cuticularized, uniformly tubular; fully enveloped by muscular pharyngeal tissue. Pharynx cylindrical anteriorly, slightly widening posteriorly forming weak cardiac bulb; heavily muscularized; with uniformly thickened lumen. Dorsal gland orifice penetrating pharyngeal lumen immediately at stoma base. Cardia conoid, glandular. Intestine with uniformly thickened walls. Tail gradually narrowing anteriorly, almost cylindrical posteriorly, with 3-9 μm long filiform terminus. Caudal glands and spinneret absent.

Female. Reproductive system monodelphic, prodelphic; ovary branch outstretched, located on right side of intestine in four and on left side in eight females. Oviduct gradually extending into uterus near ovary tip. Spermatheca an offset pouch, located on right side at the oviduct-uterus junction. Vagina straight; vaginal sphincter not seen. Postvulval uterine branch long and empty. Intrauterine eggs not observed. Rectum short.

Male. Reproductive system diorchic; anterior testis outstretched, posterior testis reflexed. Spicules arcuate, gradually narrowing, with oval manubrium. Gubernaculum platelike. Male copulatory apparatus composed of only a single midventral precloacal setiform sensillum.

Type locality and habitat. Cameroon, southern part of the country, near settlement Mbode, about 30 km south of Kribi, in northern part of Campo Reserve. Virgin rainforest about 3 km east of coastal line, with almost no undervegetation and sandy soil covered by fallen leaves, and second site with sandy soil and mainly ferns as undervegetation. Two soil samples collected 26 March 1994 by D. Sturhan.

Type specimens. Holotype and paratypes deposited in the German Nematode Collection (DNST), Biologische Bundesanstalt, Münster, Germany. Additional paratypes at Gent University, Institute of Zoology, Belgium and in the collection of the first author.

Etymology. The genus name is derived from the Greek word "ádelos" meaning "uncertain, unknown" plus "nema"; the specific epithet refers to the provenance of the species.

Diagnosis. With the characters of the genus, as described above.

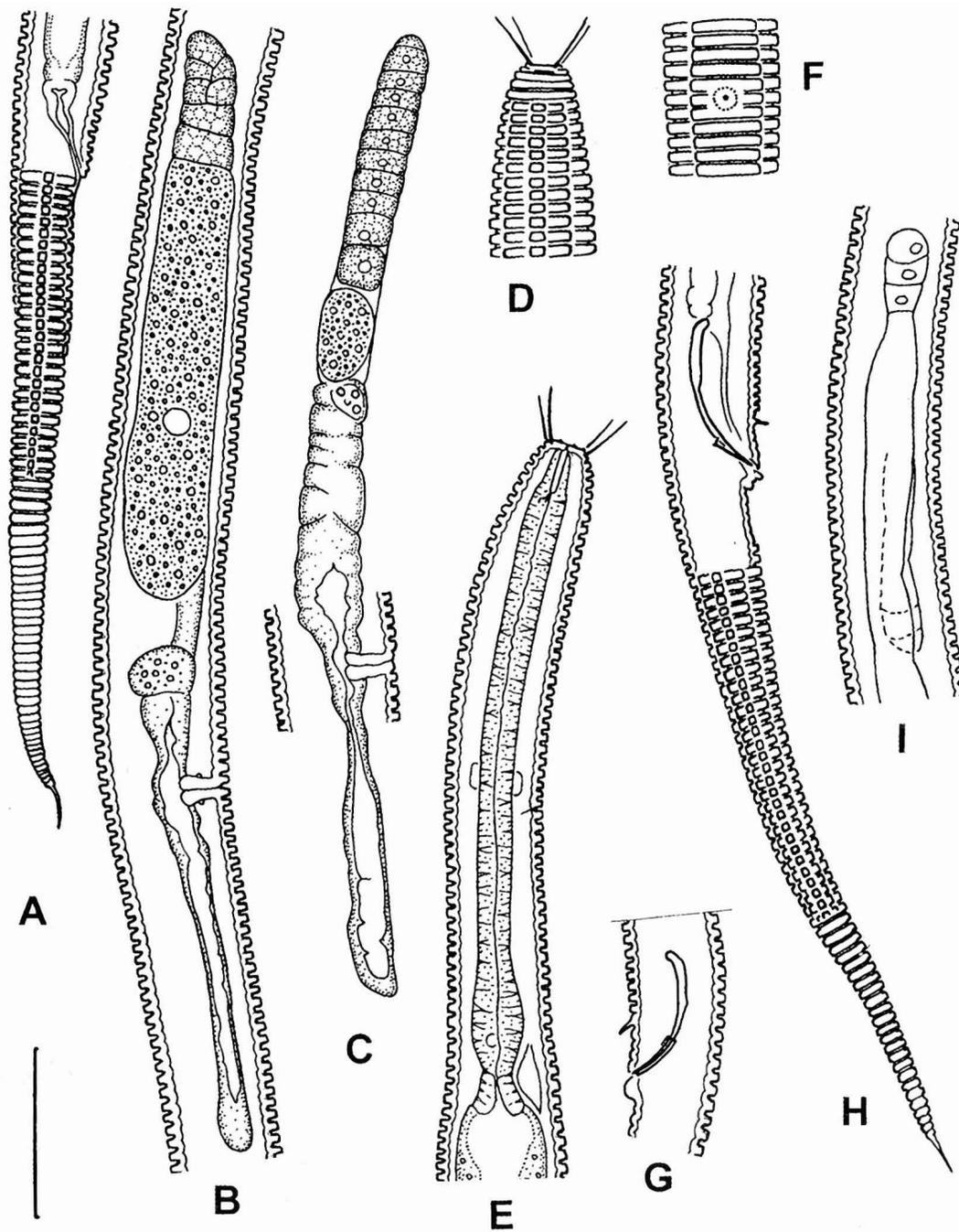


Fig. 1. *Adelonema camerunense* gen. et sp. n. Holotype (A, B, D, E). Paratype female (C, F). Paratype male (G, H, I). A: Female tail; B-C: Female reproductive system; D: Anterior end; E: Pharyngeal region; F: Vulva apical; G: Male cloacal region; H: Male caudal region; I: Male testes. Scale bar: 20 μ m.

Table 1. Measurements (in μm) and ratios of *Adelonema camerunense* gen. et sp. n. (dimensions of paratype females given as mean \pm standard deviation and range, for males – as mean and range).

Character	Holotype	Paratype females	Paratype males
n	1	11	4
Body length	448	458 \pm 38.5 (407-537)	456.8 (438-480)
Body diameter (BD)	14.5	14.3 \pm 1.1 (12-15.5)	12.6 (12-14.5)
Neck length	77	78.5 \pm 6.0 (70-72)	78.4 (75.5-83)
Tail length	75.5	78.2 \pm 8.4 (63-93)	83.4 (77-89)
Anal or cloacal body diameter	9	9.2 \pm 0.5 (9-10)	10.5 (10-11)
a	31.0	31.6 \pm 3.5 (28.2-40.3)	35.8 (33.2-37.5)
b	5.8	5.8 \pm 0.2 (5.6-6.2)	5.9 (5.5-6.2)
c	5.9	5.9 \pm 0.3 (5.5-6.4)	5.5 (5.1-5.7)
c'	8.5	8.5 \pm 1.1 (6.3-10.5)	7.9 (7.5-8.9)
Labial region diameter	4.5	5.2 \pm 0.6 (4.5-5.5)	5.3 (4.5-5.5)
Cephalic setae length	7	5.8 \pm 0.5 (5.5-7)	6.5 (5.5-8)
Stoma length	5.5	6.8 \pm 0.8 (5.5-8)	6.6 (5.5-7)
Cardia length	4.5	6.7 \pm 0.5 (5.5-8)	6.9 (5.5-8)
Nerve ring	42	39.4 \pm 2.4 (37-43)	39.5 (38-41)
NR (%)	55.1	50.6 \pm 3.4 (44.6-54.5)	50.4 (49.3-51.4)
Excretory pore	44.5	47.2 \pm 2.1 (44.5-50)	46.0 (42-48)
EP (%)	58.0	60.7 \pm 4.6 (50.6-66.2)	58.5 (55.9-60.9)
V (%)	50.6	51.5 \pm 1.6 (50-54.9)	–
G1 (%)	19.4	16.7 \pm 1.2 (14.3-18.1)	–
Postvulval uterine sac length (PUS)	44.5	36.4 \pm 4.9 (27-45.5)	–
PUS/VBW	3.1	2.5 \pm 0.3 (2.1-2.9)	–
Vagina length	5.5	6.2 \pm 0.8 (4.5-7)	–
Rectum length (R)	12	13.2 \pm 1.2 (12-15.5)	–
R/ABD	1.4	1.4 \pm 0.2 (1.2-1.8)	–
T-ratio (%)	–	–	40.8 (35.8-44.7)
Spicula arc length	–	–	17.3 (17-18)
Gubernaculum length	–	–	5.3 (4.5-5.5)
Precloacal sensillum – cloaca	–	–	6.3 (5.5-7)

REFERENCES

- Filipjev, I. 1918.** Free-living marine Nematodes of the Sevastopol area. *Trudy obovoi zoologicheskoi laboratorii i Sevastopol'skoi biologicheskoi stantsii Rossiiskoi Akademii Nauk* 2: 1-350.
- Lorenzen, S. 1981.** Entwurf eines phylogenetischen Systems der freilebenden Nematoden. *Veröffentlichungen des Instituts für Meeresforschung*

Bremerhaven, Supplement 7: 472 pp.

- Örley, L. 1880.** Az anguillulidák magánrajza. (Monografie der Anguilluliden.) *Természetráji Füzetek* 4: 1-165.
- Vincx, M. & Gourbault, N. 1988.** Two new species of *Morlaxia* gen. n. (Nematode, Diplopeltidae) with a subterminal ventral mouth. *Bulletin de Musee national d'Histoire naturelle, Paris, 4-e ser.* 10: 711-718.

Holovachov O., Sturhan D. Описание *Adelonema camerunense* gen. et sp. n. (Araeolaimida: Diplopeltidae) из тропического леса в Камеруне.

Резюме. На основании данных световой микроскопии в семействе Diplopeltidae описан вид *Adelonema camerunense* gen. et sp. n. Для нового рода характерно наличие следующих признаков: кутикула с десятью продольными гребнями; головные сенсиллы щетинковидные; амфид в форме поперечной щели; выделительная пора позади нервного кольца; стома трубчатая; пищевод цилиндрический со слабым кардиальным бульбусом; хвост удлинненно-конический с нитевидным терминусом; глазки, боковое поле, гиподермальные железы, кутикулярные поры, соматические щетинки и дейриды, хвостовые железы и спиннерета отсутствуют; женская половая система непарная, продольная; яичник прямой; имеется сперматека и поствulварный мешок; мужская половая система парная; семенники супротивные; спикулы дугообразные; рулек пластинчатый; преклоакальная щетинковидная сенсилла присутствует. По этим признакам новый род может быть дифференцирован от всех известных родов семейства.