



# Deep-sea nematodes (Nemata, Prochaetosomatinae): new taxa from hydrothermal vents and a polymetallic nodule formation of the Pacific (East Rise; North Fiji and Lau Basins; Clarion–Clipperton fracture zone)

WILFRIDA DECRAEMER and NICOLE GOURBAULT

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*Dinetia nycterobia* gen. et sp. n. (Draconematidae, Prochaetosomatinae) is described from a hydrothermal site of the East Pacific Rise. The new genus is characterized by body annulation reaching lip region and including spiral amphids, cuticle not thickened in head region, cephalic adhesion tubes without expanded base located in cervical region, pharynx with terminal bulb provided with a thick cuticularized lumen wall, and posterior adhesion tubes with bell-shaped end. *Dinetia nycterobia*, the type species, is characterized by the number of cephalic adhesion tubes (19 in male, 15 in female) and of the 4 rows of posterior adhesion tubes (5 tubes lateral, 14–19 subventral in male, 10–15 lateral, 13–20 subventral in female) and the shape and size of the spicules. *Cephalochaetosoma pacificum notium* subsp. n. from the Fiji deep-sea closely resemble *C. pacificum* from Philippines deep-sea but differs in male by the number of sublateral posterior adhesion tubes, the shape and size of the spicules, the number of cloacal setae, the structure of the testis and in both sexes by the spiny cuticular ornamentation, the shorter labial setae and morphometric data. A new genus and new species of Draconematidae is provisionally described, based on the observation of juvenile specimens from the polymetallic nodule formation.

Wilfrida Decraemer, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Vautierstraat 29, B.1000 Brussels, Belgium.

Nicole Gourbault, Muséum national d'Histoire naturelle, D.0699 CNRS, Biologie des Invertébrés marins, 57 rue Cuvier, F.75231 Paris Cedex 05, France.

## Introduction

Thiel (1983: 186) noticed in his synthesis of the meio- (and nano-) benthos from the deep-sea that “Most publications on deep-sea environments discuss meiofauna abundance on the level of higher taxa”. This is true, even for nematodes which clearly dominate the metazoan community and become proportionately more abundant with increasing depth. Among the papers reporting on the abundance and biomass of meiobenthos (see Tietjen 1992; Vincx *et al.* 1994) very few deal with species composition and diversity of these groups. However, the rare descriptions of taxonomic compositions of the deep-sea nematode assemblages are limited to a few sites (Soetaert & Heip 1995).

As far as the Desmodoroidea are concerned, the family Desmodoridae is present in deep-sea sediments even if not often dominant; eleven species occurred in the samples from 4626 m depth at the base of Scotian Rise in the North Atlantic (Thistle & Sherman 1985). Also in the Western Atlantic, desmodorids were reported from different abyssal areas: off North Carolina between 400–1000 m and up to 2500 m, in the Venezuela Basin > 3400 m, in the Puerto Rico Trench at 2217 m and the Hatteras plain by 5411 m depth (Tietjen 1971 and 1976, 1984, 1989 respectively). In the Norwegian deep-sea they were collected at 970 and

3062 m depth (Jensen 1988); from the Eastern Atlantic zone they were recorded in the Bay of Biscay by 2756–2853 m (Dinet & Vivier 1979) and at 325 m along the Spanish Coast (Vanreusel *et al.* 1992). They were present in the Mediterranean by 350–580 m depth (Vitiello 1976) but in few numbers from 160 to 1220 m depth (Soetaert *et al.* 1995).

Data on the occurrence of the two other families of the Desmodoroidea, Epsilonematidae and Draconematidae, are very rare. The epsilonematid specimen recorded by Tietjen (1976) was in fact collected in quartz and algal sands at less than 100 m depth; a juvenile was noticed in the Iherya Ridge area at 1393 m depth (Shirayama 1992). At 820 and 990 m respectively a few juveniles of Draconematidae and Glochinematinae were recorded along a Mediterranean shelf-slope transect (Soetaert *et al.* 1995). From deep-sea off Philippines among fibrous coat of a broken coconut at 5551 m and off Peru by 4175 m, respectively Kito (1983) described two species of *Cephalochaetosoma* and Bussau (1993: doctoral dissertation) one species of a Draconematidae. From the Clarion Central Pacific (Renaud-Mornant & Gourbault 1990) two juveniles, closely resembling the draconematid from Bussau's dissertation, were collected by 4990 m depth and will be described here.

The notice (Dinet *et al.* 1988) of large numbers of

Epsilonematidae and Draconematidae in hydrothermal vents of the East Pacific was rather surprising. However, a closer inspection revealed that, the Epsilonematidae appear to correspond to three species of Desmodoridae which are described elsewhere (Verschelde *et al.* 1997) and from the Draconematidae specimens, only nine remain available for the study of a *Dinetia nycterobia* gen. n., sp. n. here described.

On the contrary, about one hundred specimens of *Cephalochaetosoma cf. pacificum* were collected during the North Fiji cruise and were compared with type specimens from Philippines. They will be described as a new subspecies with a detailed analysis of their fine structures.

The systematic position of these different genera within the family Draconematidae is treated in a synthese of the different taxa with a phylogenetic approach (Decraemer *et al.* 1997).

## Material and methods

Slides containing all specimens of *Dinetia* collected during the Oasis II mission (April 1982, with Alvin, Woods Hole Oceanographic Institution) and deposited in Alain Dinet's collections, were kindly put at our disposal by Dr. Dinet. The Draconematidae specimens were found in cores from soft sediments sampled at the base of the vents; they were associated with harpacticoids, mostly Ectinosomatidae; methodology are described in Dinet *et al.* (1988). The numerous specimens of *Cephalochaetosoma* were sorted in Banyuls after the BIOLAU cruise in Southwestern Pacific back-arc basins, the North Fiji and Lau Basins (Mai, 1989 with French submersible Nautile). The fluid temperature was low (5–17°C) above a field of brecciated rocks and minerals covered frequently with oxide deposits and bacterial mats (see Desbruyères *et al.* 1994).

Type specimens are deposited in the nematode collections of the Muséum national d'Histoire naturelle, Paris (MNHN) and the Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels (KBIN); one slide with paratype specimens of *C. pacificum notium* is deposited in the Smithsonian Institution, National museum of Natural History, Washington D.C., USA. (USNM).

## Family DRACONEMATIDAE Filipjev, 1918

Subfamily PROCHAETOSOMATINAE Allen and Noffsinger, 1978

## Genus *Dinetia* gen. n.

**Diagnosis.** Prochaetosomatinae. Pharynx with terminal bulb provided with a thick cuticularized lumen wall; body annulation reaching the lip region and surrounding the spiral amphids, cuticle not thickened in head region; buccal cavity narrow, unarmed; cephalic adhesion tubes without expanded base located in cervical region; posterior adhesion tubes with bell-shaped end.

Type species. *Dinetia nycterobia* sp. n.

**Relationships.** *Dinetia* gen. n. differs from all other genera of the Prochaetosomatinae by the absence of a helmet. It most closely resembles *Cephalochaetosoma* but differs from it mainly by the narrow, unarmed buccal cavity vs buccal cavity well developed, armed with a dorsal and two small subventral teeth.

## *Dinetia nycterobia* sp. n. (Figs 1, 2; Table I)

**Type material.** Holotype male, slide BN 281 (MNHN). Paratypes: 1 ♂, 1 ♀ and same slide; 1 ♂ and 1 ♀, slide BN 282; 2 ♂♂ and 2 ♀♀, slide RIT 488 (KBIN).

**Type locality.** Hydrothermal site of the East Pacific Rise (Oasis II, April 1982): 21°N–108°O, 2600 m depth.

**Etymology.** The generic name is dedicated to Dr Alain Dinet; the species name is in accordance with the habitat, from greek *nycterobios* = who lives in the night.

**Males.** Body small, stout and sigmoid to epsilonematid, clearly tapered at both ends. Pharyngeal region swollen, mid-body about as swollen as in female (Fig. 1 A). Body cuticle annulated and ornamented with scattered small spines after the first curvature; annules very fine in anterior body part, extending far anteriorly and beyond the amphids (Fig. 2A). No differentiation of a helmet. Somatic setae in eight longitudinal rows in pharyngeal region, of two predominant length (32 and 19 µm in holotype) and with a few very small setae (2 µm); longest somatic seta subdorsally just anterior to tail. Labial sensorial sensilla not observed. Four cephalic setae 5 µm long, at level of anterior border of amphids. Amphideal fovea small (2.2–3.3 µm), unispiral. 19 cephalic adhesion tubes (CAT) without expanded base and with distal tip rounded, more or less arranged on three longitudinal rows on each side: 4 laterodorsal and twice 2 lateral tubes, plus one dorsal row with 3 tubes. Posterior adhesion tubes (PAT) with developed bell-shaped tip, all located anterior to anus and arranged on 4 longitudinal rows: in holotype, 5 sublateral tubes and 14 (right side), 19 (left side) subventral tubes, the latter intermingling with somatic setae. In paratypes 4–5 sublateral and 14–19 subventral tubes. Stoma narrow unarmed, pharynx mostly cylindrical with a slight mid-swelling and terminal bulb with tripartite, thick, cuticularized lumen wall (Fig. 1A). Intestine dorsal to reproductive system.

Male reproductive system typical of Draconematidae. Single testis reaching first body curvature; short spicules slightly curved with a round knob-like capitulum and velum; paired plate-like gubernaculum (Fig. 1D). Two pairs of cloacal setae.

Tail with numerous fine annules, tapering gradually; non-annulated ring finely vacuolated with 2 subventral and one latero dorsal setae. Caudal glands extending anteriorly to cloacal opening.

**Females.** Similar to males in most respect (Fig. 1B, 2D–E). Head region retracted in all specimens. Amphideal fovea spiral 1 turn 1/4, diameter 2 µm. 15 CAT arranged in 3 longitudinal rows on each side: 3 dorsal, 3 dorsolateral and 2 lateral (left side), 2 subdorsal, 3 dorsolateral and 2 lateral (right side). PAT arranged in four longitudinal rows as in male: 10–15 sublateral and 13–20 subventral setae.

Reproductive system didelphic-amphidelphic, with reflexed ovaries; spermathecae not distinct. Vagina short, bipartite with sclerotized distal part. Anal flap present. Tail with non-annulated end provided with one long subdorsal somatic seta on each side.

**Juveniles.** First, second and third stage not observed.

**Fourth stage juvenile female** (Fig. 1C, 2B). Similar to adults. Spiny cuticular ornamentation less obvious. Nine

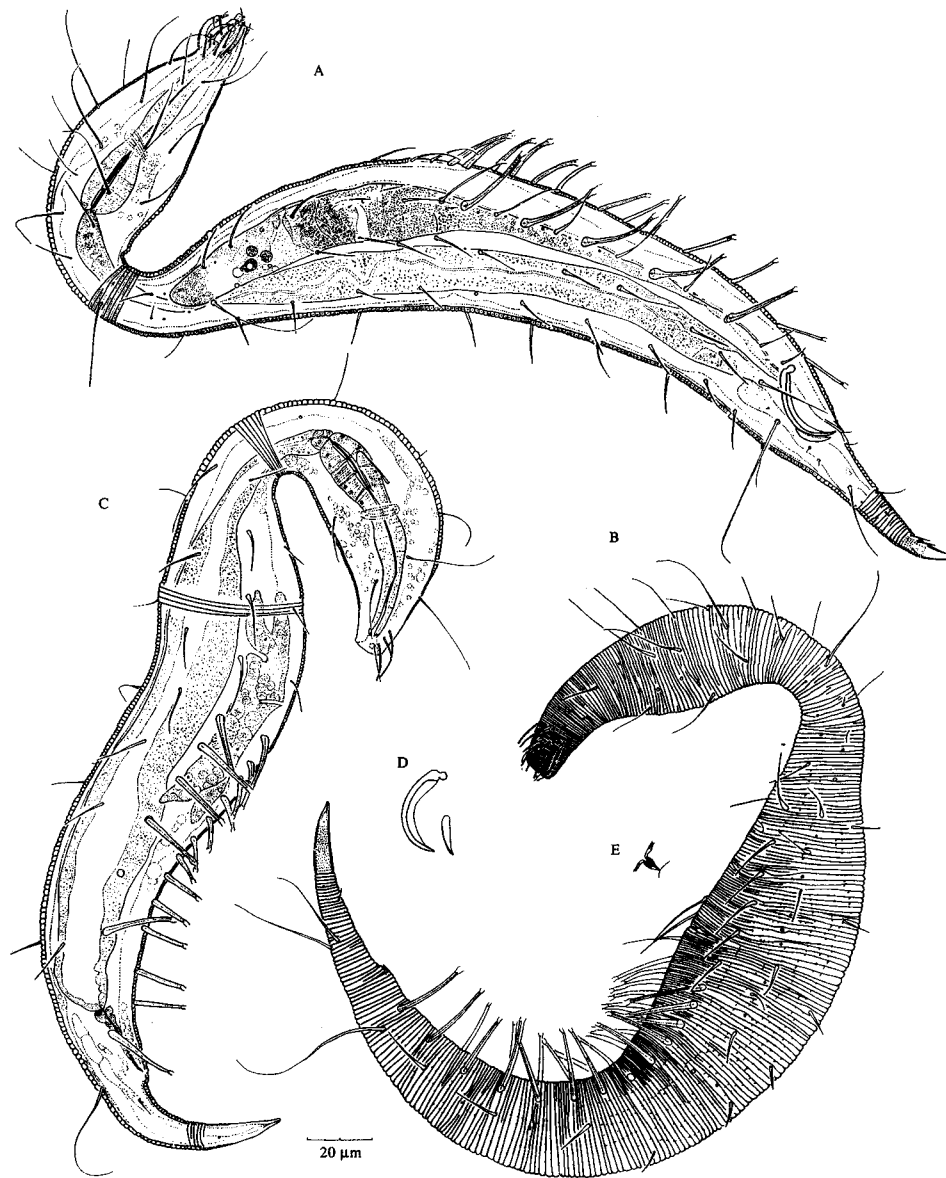


Fig. 1. *Dinetia nycterobia* sp. n. –A. Total male (holotype) longitudinal optical section with detail of body cuticle and tail in surface view. –B. Total female (paratype) surface view. –C. Total view of fourth stage juvenile female (paratype) with details of body cuticle in surface view. –D. Copulatory apparatus (paratype male). –E. Detail of vagina.

CAT on 2 rows on each side: 1 subdorsal and 3 (right)–4 (left) laterodorsal. PAT arranged in three rows: a sublateral pair with 7 tubes with bell-shaped end and a ventral row with 12. Female reproductive system nearly fully developed, 83  $\mu$ m long with extended ovaries.

**Diagnosis.** *Dinetia nycterobia* sp. n. is characterized by its habitus (short and stout), its annulated cuticle with minute scattered spines; the number of CAT (19 in  $\delta$ , 15 in  $\phi$ ) and PAT (sublateral rows with 5 setae in  $\delta$ , 10–15 in  $\phi$ ; subventral rows with 14–19 setae in  $\delta$  and 13–20 in  $\phi$ ), small about unispiral amphids, the length of spicules (31–36  $\mu$ m), the presence of two pairs of short cloacal setae in male and of an anal flap in female.

***Cephalochaetosoma pacificum notium* subsp. n.** (Figs 3–6; Table II)

**Type material.** Holotype male, slide BN 283 (MNHN). Paratypes

11  $\delta$ , 8  $\phi$ , 16 juv. BN 283–290; 6  $\delta$ , 6  $\phi$ , 5 juv. RIT '489–492 (KBIN); 1  $\delta$ , 1  $\phi$ , 2 juv. slide nos 172 811–172 814 (USNM).

**Type locality.** Hydrothermal site Lau-Fidji bassin (Biolau) Hine Hina 22°32'OS, 176°43'OW; maximum depth 1707 m.

**Etymology.** In agreement with the geographic localisation, from greek notios = southern.

**Males ( $n=25$ ).** Body shorter and slenderer than in type specimens. Cuticle annulated, anterior annules finer; annule edges with small spiny ornamentation (Fig. 7E: SEM of female), not developed in nominal subspecies. Somatic setae on eight longitudinal rows in pharyngeal region; setae of three predominant length (very long: 43–66  $\mu$ m, medium-sized: 18  $\mu$ m and minute: 3  $\mu$ m). Labial region usually retracted upto the external labial sensilla. External labial setae less pronounced and shorter (3  $\mu$ m vs 4.5  $\mu$ m) than in nominal specimens. Four cephalic setae 7.5  $\mu$ m long at mid level of amphids. Amphideal fovea small (2.5–3.5  $\mu$ m, 15–24% of head diameter), open spiral, located at the base of the rostrum (Fig. 6E). Usually 22 CAT without expanded base but with a blunt open end

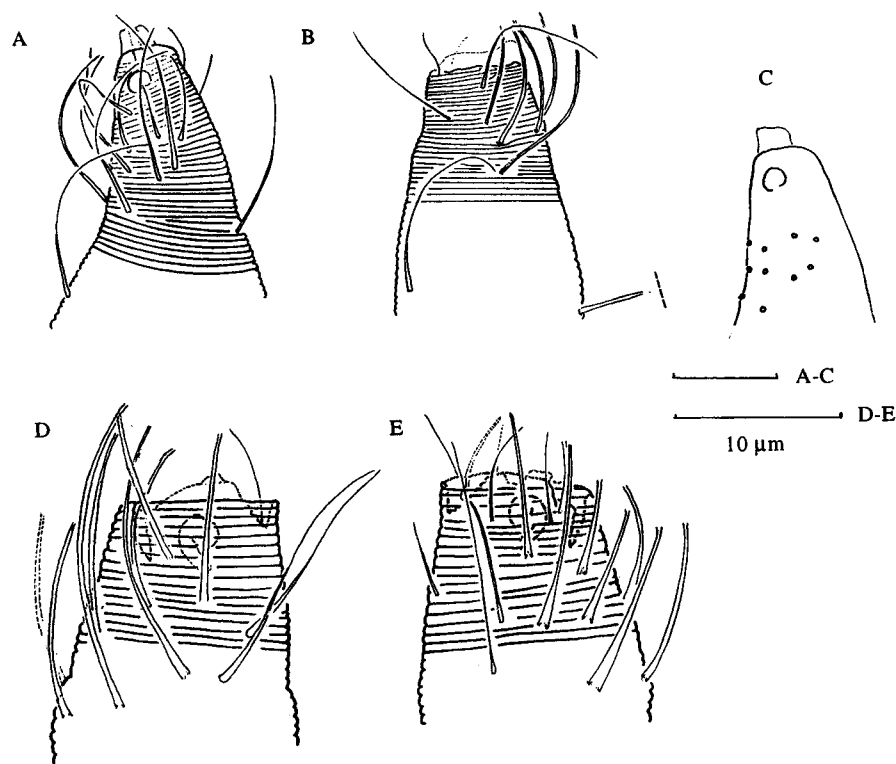


Fig. 2. *Dinetia nycterobia* sp. n., head region, surface view.—A. Holotype male.—B. Fourth stage juvenile female.—D–E. Female paratype, right and left side respectively.—C. Schematic representation of the insertion sites of cephalic adhesion tubes in holotype male, right side.

(Fig. 6A, ♀), arranged roughly in three longitudinal rows on each side with 2–3 dorsal, 4–5 dorsolateral and 3–4 lateral tubes. This pattern can display some variation in number (19–21) and location (from ventrosublateral to dorsal): 20 tubes: 3,4,3,2 right side and 3,4,3 left side). Sublateral setae 16.5–36 μm long and subventral setae 17–28.5 μm long. Fiji specimens with a smaller number of CAT than nominal subspecies.

PAT with developed bell-shaped tip, all located anterior to cloacal opening and arranged on four longitudinal rows; 2 sublateral with 5–7 tubes vs 11–16 in nominal specimens and 2 subventral with 15–24 comparable with nominal

specimens with 17–27, intermingling with more or less long somatic setae. No longer somatic setae observed precloacally in between the subventral rows of ambulatory setae.

Cardia 10 μm long; rectum 44 μm long, proximal part surrounded by a well developed sphincter.

Male reproductive system remarkable (Fig. 3B): the anterior part (= testis and vesicula seminalis) enveloping ventrally the intestine by two “wings”. Testis with a short germinal zone, a growth zone with large globular spermatids (8 μm) followed by a clear region (not in original description of nominal subspecies) with empty cells where rarely a package of sperm remains. Vesicular seminalis

Table 1. *Morphometric data (in μm) of Dinetia nycterobia gen. et sp. n., type specimens*

	Holotype Male	Paratypes Males (3)			Females (3)			Juv (1)
L	415	435	490	320	410	420	480	365
mbd	48	50		36	50	55	44	45
(mbd)	18	17		19	19	19	20	21
mbd ph	35.5	35		31	30	32	30	35
ph	75	82		77		81	87	75
abd	15.5	17		16	14.5	12	13.5	16
t	51	54	58	56	63	57	64	53
tmr%	29.4	27.8		28.6	38.1	40.4	35.9	43.3
spic	34	31	36.5	34				
gub/v	11	12	11	11	196	187	218	
SIAT1	28	26		24	24	23	28	23
SIATn	26	27		27	25	23.5	26.5	23.5
SvAT1	23	24		22.5	21.5	20	21.5	18
SvATn	16	18		16.5	17.5	18	18.5	16
ratios								
a	8.6	8.7		8.9	8.2	7.6	10.9	8.1
b	5.5	5.3		4.2		5.2	5.5	4.9
c	8.1	8.1	8.4	5.7	6.5	7.4	7.5	6.9
c'	3.3	3.2		3.5	4.3	4.8	4.7	3.3
V					47.8	44.5	45.4	
mbd/(mbd)	2.7	2.9		1.9	2.6	2.9	2.2	2.1

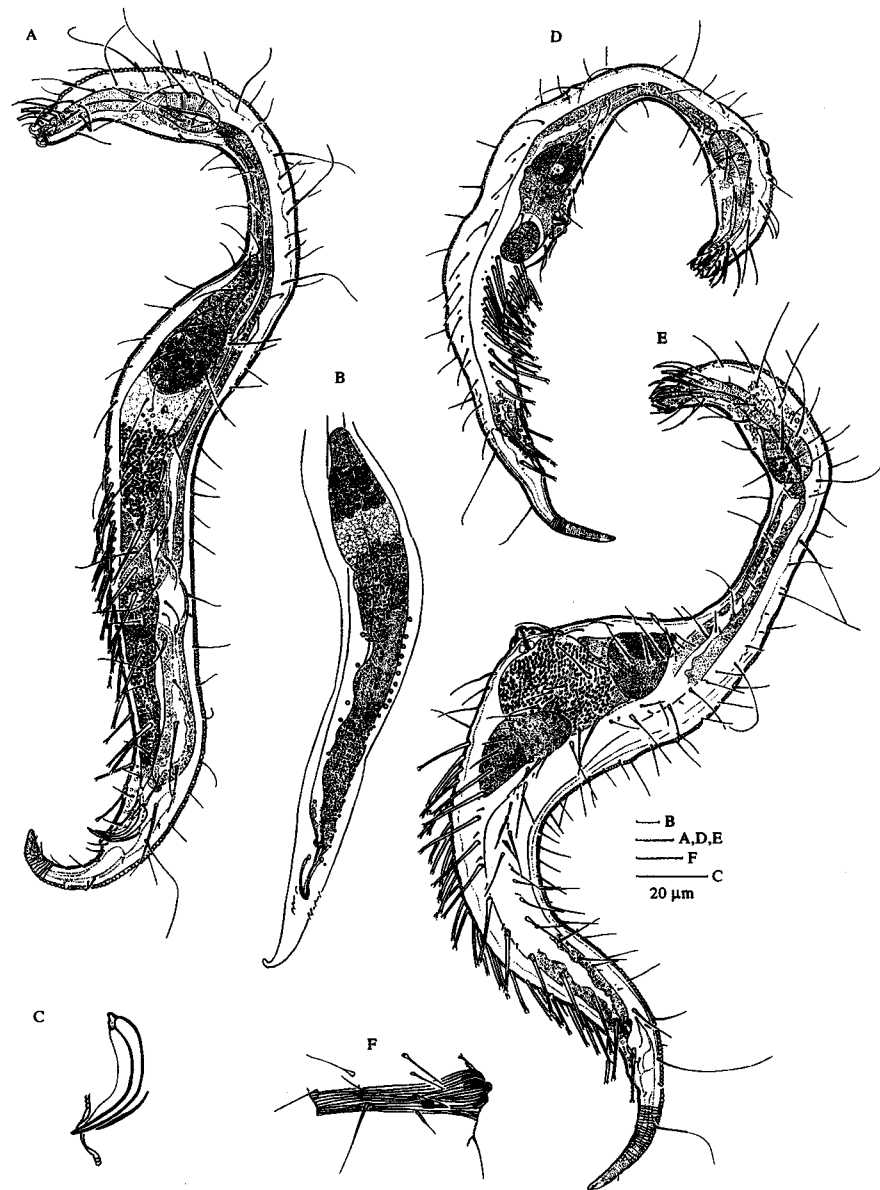


Fig. 3. *Cephalochaetosoma pacificum notium* subsp. n., total view in longitudinal optical section and tail end in surface view.—A. Holotype male.—D. Aberrant female.—E. Paratype female.—B. Male reproductive system (paratype).—C. Copulatory apparatus (paratype).—F. Vulval region, surface view.

filled with a mass of minute ( $2.7\ \mu\text{m}$  long) ovoid sperm cells, grouped in packages; the posterior edges of vesicula seminalis overlaps protrude more or less (= depending of the developmental stage of the system) laterally along the beginning of the vas deferens (Fig. 3B, arrow). Vas deferens narrow, granular. Spicules arcuate,  $47\ \mu\text{m}$  (45–50) long, knob-like capitulum and corpus with velum; gubernaculum parallel to spicules; its posterior wall refractive (i.e. sclerotized). Anal flap present. Short cloacal setae: two pairs posterior and two anterior to cloacal opening instead of two pairs in original description of nominal subspecies.

Tail with numerous annules (33–44), last ones incomplete; short non-annulated endring (19% of tail, mean value) finely vacuolated with one pair of subventral setae. Caudal glands reaching the rectal sphincter.

**Females ( $n=21$ ).** Similar to males in many respects but with pronounced conical enlargement at level of vulva; vulval cone usually partly retracted in fixed specimens.

Labial sensorial sensilla arranged in two crowns: 6 minute internal labial papillae and 6 short external labial setae. Four cephalic setae as in male. Amphideal fovea clearly spiral and slightly larger than in male ( $4.5\ \mu\text{m}$ ). 18–23 CAT  $27.5\text{--}32\ \mu\text{m}$  long, variable in number and arrangement (from sublateral to dorsal: eg. 22 tubes: 3,5,2 left side and 3,5,4 right; 18 tubes: 3,4,3 left and 3,2,3 right). PAT: 12–15 sublateral tubes (similar to nominal subspecies: 12–14), 22–27 subventral tubes each side vs 19–23 in nominal subspecies.

Reproductive system didelphic-amphidelphic and reflexed ovaries, single uterine chamber filled with a mass of minute ovoid sperm cells; no separate spermathecae. Up to eight eggs (four in each branch) present in a single female specimen. Vulva located on a conically protruding region with the small distal end usually retracted; vagina  $15.5\ \mu\text{m}$  long

Non-annulated tail ring longer than in male, with one pair of tiny subdorsal somatic setae.

Similar to the original description of the nominal

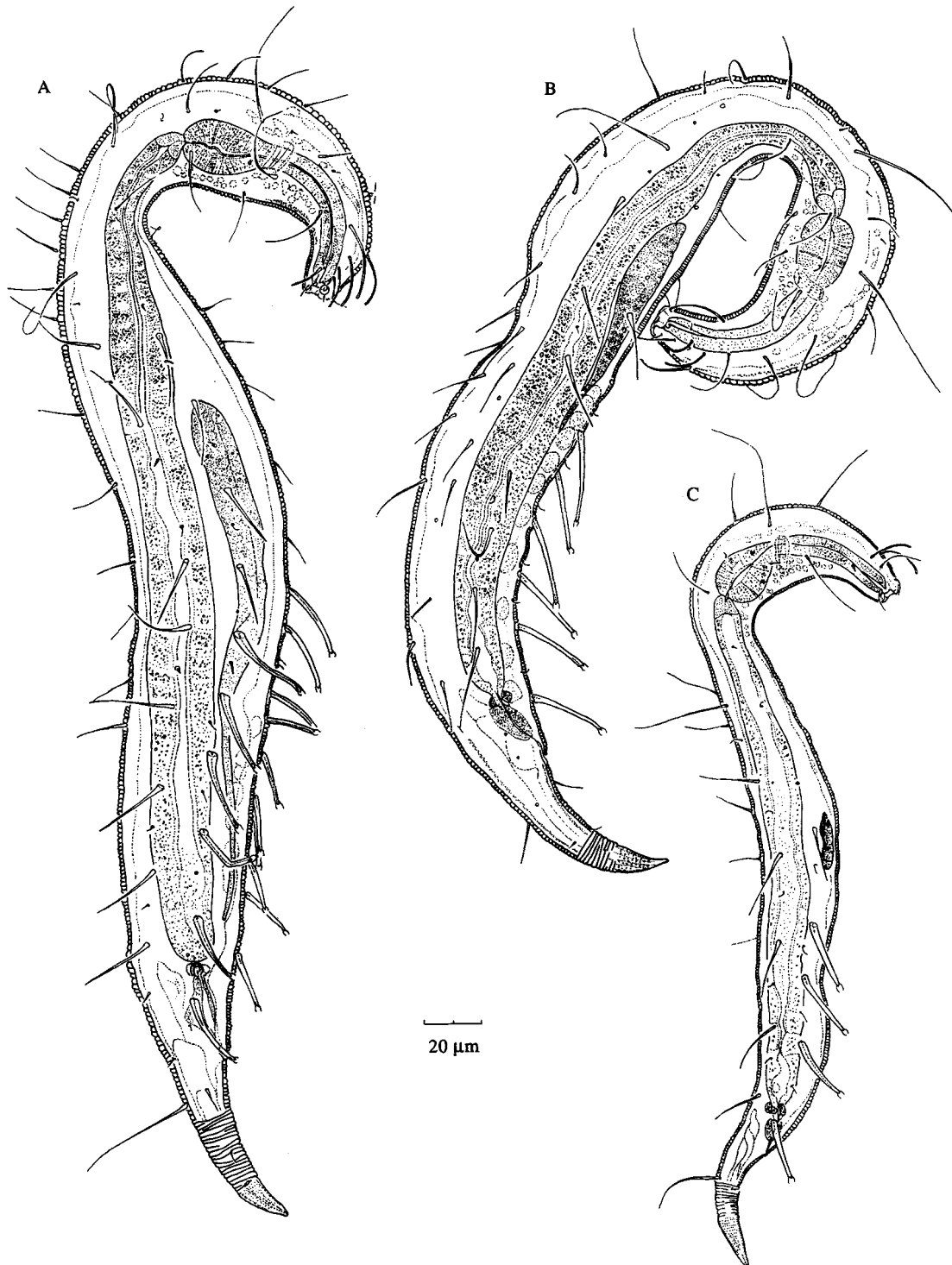


Fig. 4. *Cephalochaetosoma pacificum notium* subsp. n., total view.—A. Fourth stage juvenile male.—B. Third stage juvenile male.—C. Second stage juvenile.

subspecies from the Philippines, an aberrant female specimen was found with a smaller body length, a loop-shaped amphid (Fig. 5D), a smaller number of subventral posterior adhesion tubes (16), a less pronounced vulval cone and without sperm in the uterus. The other morphological features correspond with the former description.

*Juveniles (Fig. 4). First stage not found*

*Second stage juvenile (n = 5).* Amphids spiral, no spiny cuticular ornamentation; 3 CAT; two rows of 4 sublateral

PAT. Reproductive system 22 μm long. Tail with 26 annules in one specimen.

*Third stage juvenile male (n = 1).* Eight CAT on 2 rows, each side with 1 subdorsal and 3 dorsolateral tubes; two rows of 7 sublateral PAT intermingled with short somatic setae. Spiculum primordium 20 μm long. Tail with 33 annules.

*Fourth stage juveniles (n = 28).* Habitus similar to adults, spiny cuticular ornamentation present on the posterior body region. CAT as in stage III. Three rows of PAT: 6 (exceptionally 7) tubes on two sublateral rows, and 11 tubes (rarely 10 or 12) on single ventral row. Reproductive

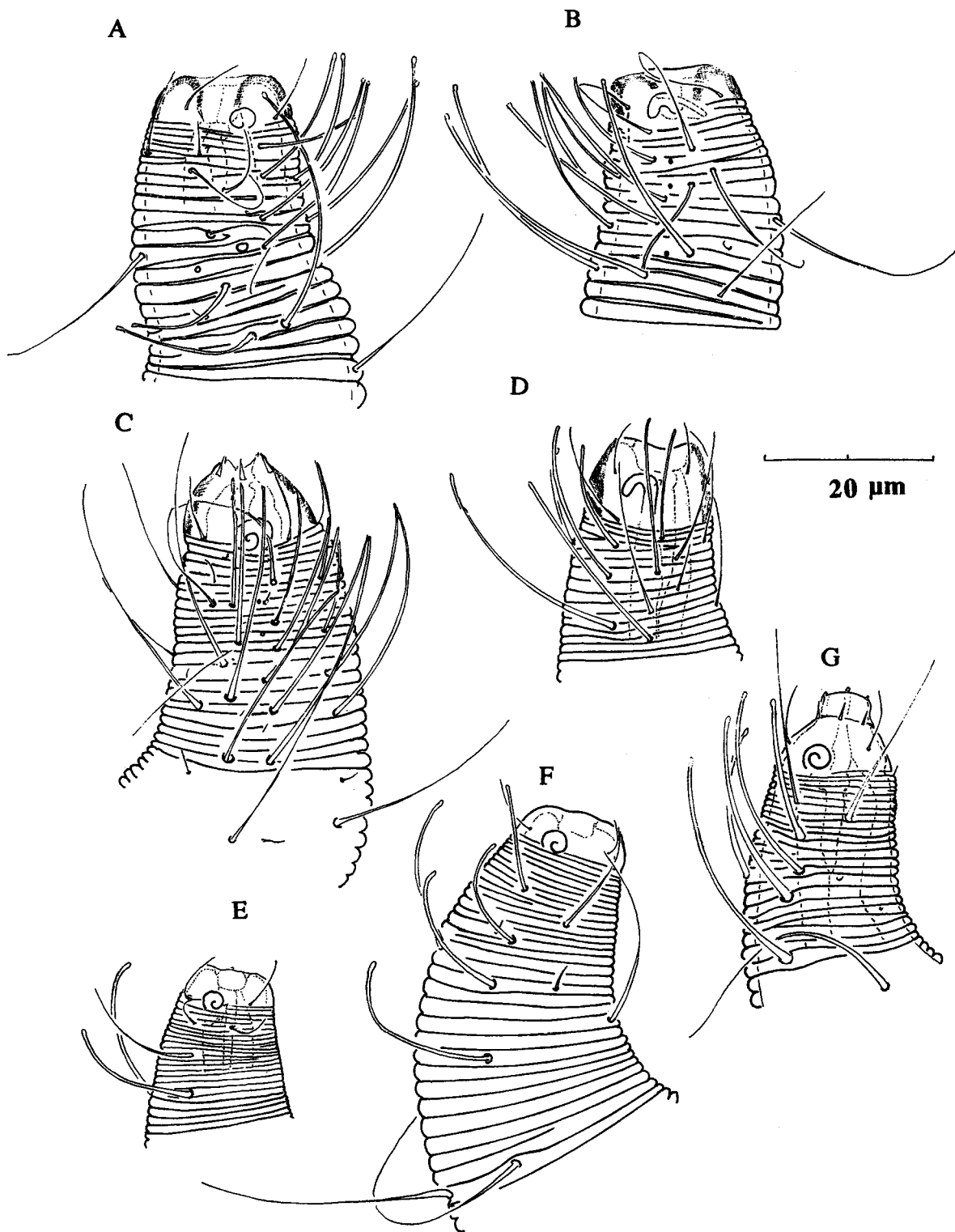


Fig. 5. *Cephalochaetosoma pacificum notium* subsp. n., head region in surface view.—A–B. Holotype male, left and right side respectively.—C. Female paratype.—D. Aberrant female.—E. Second stage juvenile.—F. Third stage juvenile male.—G. Fourth stage juvenile female.

system 34–125 (mean 79)  $\mu\text{m}$  long in juvenile females, from little to almost completely developed with indication of vagina at 43.3–47% of total length. Two of the three juvenile males with spicules completely formed, 40–41  $\mu\text{m}$  long. Tail with 28–34 annules.

**Differential diagnosis.** *Cephalochaetosoma pacificum notium* subsp. n. is closely related to the specimens from the Philippines by the large number of cephalic adhesion

tubes (19–22 in ♂, 18–23 in ♀) located posterior to the helmet, the size and shape of the spiral amphids. But, in the male, it differs by the number of sublateral posterior adhesion tubes (5–7 vs 11–16 in nominal subspecies), the shape and size of the spicules (40–50  $\mu\text{m}$  vs 64–66  $\mu\text{m}$ ; curvature of corpus and capitulum more pronounced), the number of cloacal setae (4 vs 2 pairs), the structure of the testis (with a clear patch, absent in Philippine population), and in both sexes by the spiny cuticular ornamentation, the

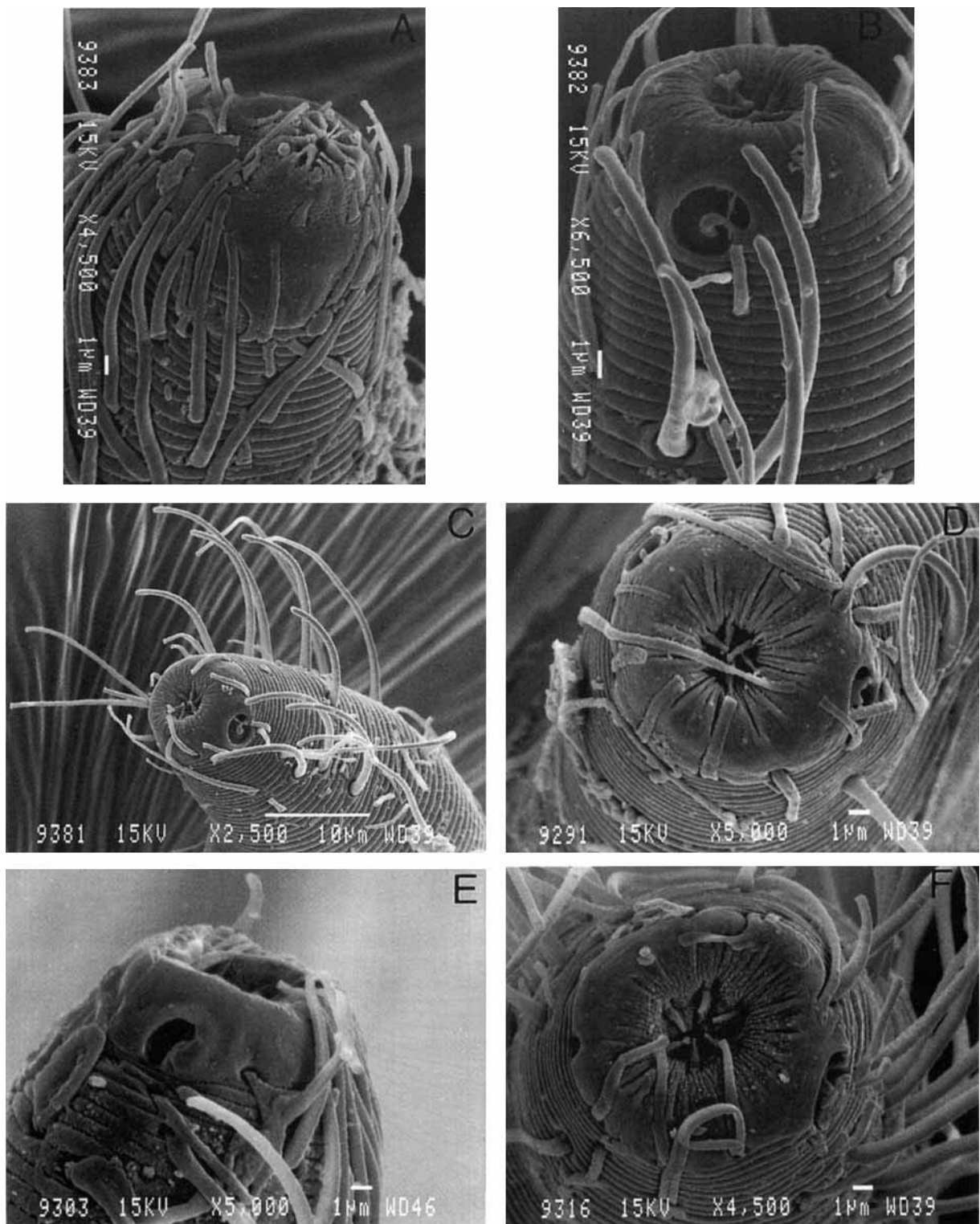


Fig. 6. *Cephalochaetosoma pacificum notium* subsp. n., SEM pictures.-Females. A, F. oblique en-face view and front view respectively.-Fourth stage juvenile.-B-D. Lateral view and en-face view.-Male.-E. Lateral view. Scales 1 µm: A, B, E-G; 10 µm: C.

shorter labial setae and slenderer body (smaller "a"). However, none of these characters which are often subject to variation, appears sufficient to allow the separation into two different species.

**Remarks.** Kito (1983) presumes that these aberrant females might represent a separate species. Because males appeared homogeneous, the aberrant females were considered a polymorphic variant. Similar variants were

observed among third and fourth stage juveniles. Since we found a single specimen only, we follow Kito (1983) and place it temporarily under *C. pacificum notium*.

**Draconematidae, unnamed genus and species** (Fig. 8; Table III)

syn. *Eudraconema dracocephalum* nom. nud.



Table II. *Morphometric data (in  $\mu\text{m}$ ) of Cephalochaetosoma pacificum notium*

	Males n = 10			Females n = 10			f(*)	Juv Male IV n = 3			Juv Female IV n = 10			J $\delta$ III n = 1	Juv II n = 3		
	Min-Max	Mean	S.D.	Min-Max	Mean	S.D.		Min-Max	Mean	S.D.	Min-Max	Mean	S.D.		Min-max	Mean	S.D.
L	575-770	684	60	660-850	727	64	500	540-560	583	48	450-675	559	61	530	320-405	368	30
mbd	50-77	61	8.5	92-121	105.9	12.9	55.0	58-67	61.7	3.9	45-69	52.8	10.2	53	28-37	33.0	3.7
(mbd)	26-29	27	0.9	23-29	25.7	2.4	19.0	27-29	28.3	0.9	19-31	25.7	3.1	27	23-28	25.3	2.1
mbd ph	36-42	38	2.3	38-42	40.5	1.6	35.5	37-44	39.7	3.1	34-45	40.2	3.2	42	23-33	29.0	4.3
ph	110-127	118	6.9	114-142	125.8	8.0	94.0	106-127	113.0	9.9	93-125	104.8	9.4	98	72-100	84.0	11.8
abd	21-27	23	1.8	16-21	17.8	1.5	14.0	21-25	22.7	1.7	16-21	18.8	1.5	23	16-18	17.3	0.9
t	67-85	76	4.8	65-89	76.3	6.6	64.0	71-79	73.7	3.8	54-77	67.5	6.3	69.5	43-56	50.3	5.4
tmr %	15-20	19	1.9	29-57	38.0	8.6	47.0	19-39	30.0	8.3	20-36	27.5	5.6	23.5	21-26	22.7	2.4
spic	45-50	47	1.9					40-41	40.5	0.5							
gub/v	18-21	20	0.8	272-390	349.4	35.2	262.0				253-322	215.5	132.0				
SIAT1	35-50	42	4.1	37-42	40.3	1.9	29	34-45	38.3	4.8	34-39	35.7	1.5	39	27-37	30.7	4.5
SIATn	32-36	34	1.3	27-33	29.8	2.2	26	26-29	27.0	1.4	22-32	28.7	2.7	31	22-26	24.0	1.6
SvAT1	32-39	36	2.1	29-37	33.7	2.3	45	28-32	29.3	1.9	28-34	32.0	3.1				
SvATn	22-30	24	2.2	23-29	25.5	2.0	19		15.3	11.0	20-23	22.7	0.5				
ratios																	
a	9.7-14.3	11	1.2	6-7.8	6.9	0.5	9.1	9.3-9.7	9.4	0.2	9.1-13.6	10.9	1.3	10.0	10.9-11.4	11.2	0.2
b	5-6.6	6	0.4	5.4-6.4	5.8	0.3	5.3	5.1-5.3	5.2	0.1	4.6-5.6	5.3	0.4	5.4	4.1-4.8	4.4	0.3
c	8.1-10.3	9	0.7	8.4-11.6	9.5	1.0	7.8	7.6-8.2	7.9	0.3	8.1-9.3	8.8	1.0	7.6	7.2-7.5	7.3	0.1
c'	3-4	3	0.3	3.8-4.8	4.3	0.3	4.9	3.2-3.4	3.3	0.1	3.1-3.9	3.5	0.3	3.0	2.6-3.1	2.9	0.2
V				40.3-51.3	48.1	3.2	52.5				47-48.3	47.7	0.5				

(\*) = aberrant female

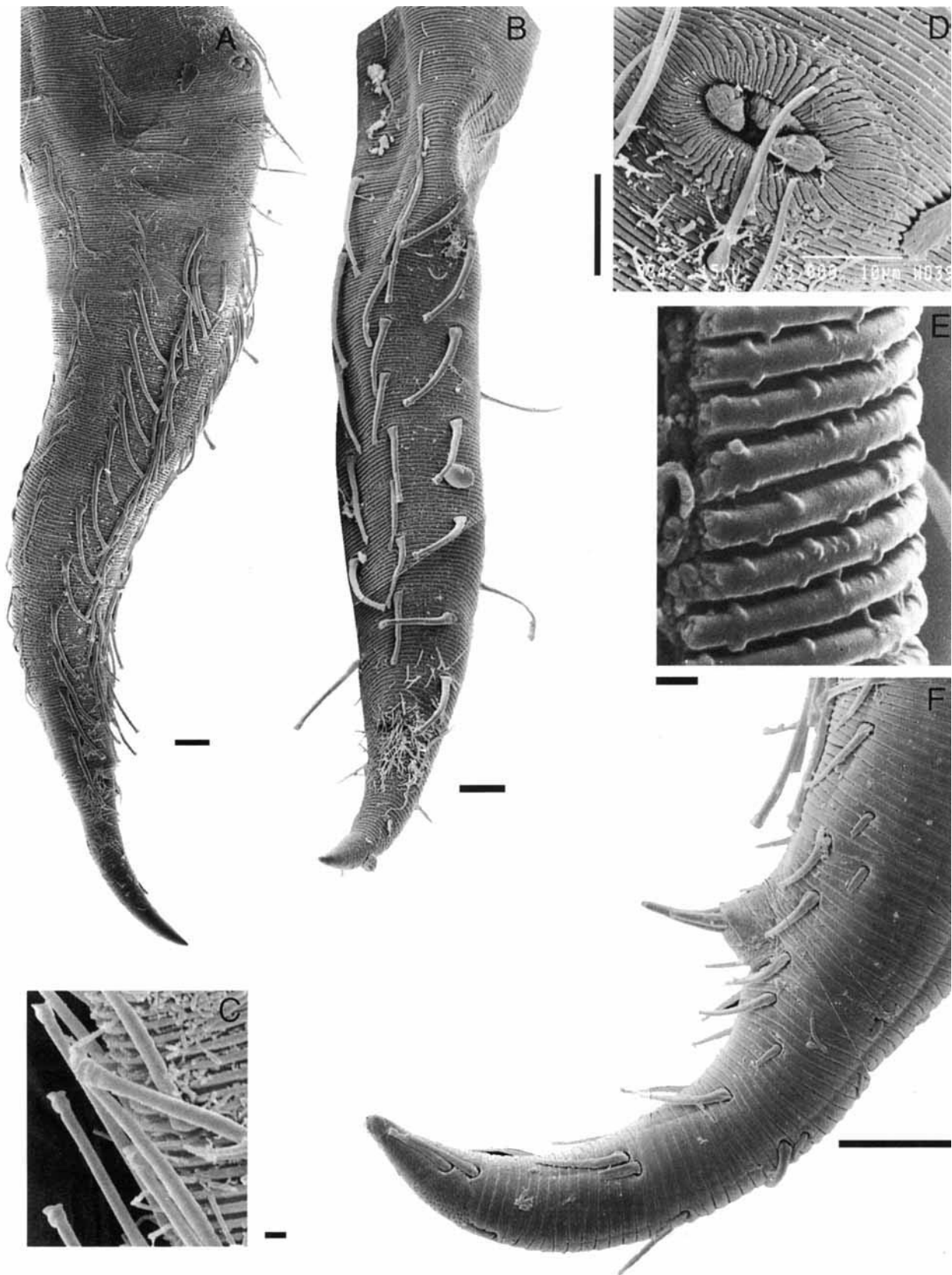


Fig. 7. *Cephalochaetosoma pacificum notium* subsp. n. SEM pictures. -Female. -A. Posterior body region, slightly oblique lateral view. -D. Vulva, ventral view. -E. Detail of body cuticle, mid-body region. -Male. -C. Detail of posterior adhesion tubes. -F. Cloacal region with protruding spicules and tail, side view. -Fourth stage juvenile. -B. posterior body region. Scales 10  $\mu\text{m}$ : A-D, F; 1  $\mu\text{m}$ : E.

*Material studied:* two juveniles on slide BN 109.

*Locality.* Abyssal plain interrupted by some low volcanoes hills, in the Clarion-Clipperton fracture zone; st. 47007 (NIXO 47 cruise): 14°06.85; 130°53.56; 4990 m depth. Occurrence of polymetallic nodules; bottom water temperature = 1°C.

Only a fourth stage juvenile female and a second stage moulting to a third stage are available.

*Fourth stage juvenile* (Fig. 8A). Habitus relatively slender with slightly enlarged pharyngeal region. Helmet well differentiated, cuticle thickened. Labial sensillae arranged in two crowns: six minute inner labial papillae and six small outer labial setae at border of helmet; four cephalic setae in posterior head region; amphids 1 1/2 spiral located

just posterior to mid-helmet. Cephalic adhesion tubes long, with wider base, tapered to a blunt tip, and arranged on a single transverse row: 2 lateral, 2 subdorsal tubes. Posterior adhesion tubes, long flexible, widened at base, non-differentiated at tip, arranged on three longitudinal rows: 2 lateral with 5 tubes and one medioventral with ten; insertion site well marked from body cuticle. Reproductive system well anterior to posterior adhesion tubes.

*Second stage juvenile, moulting to third stage. (Fig. 8B).* Largely similar to fourth stage. Cephalic adhesion tubes absent. Three CAT visible posterior to the helmet in future third stage specimen. PAT arranged in two longitudinal sublateral rows of 3 setae each.

Table III. Morphometric data (in  $\mu\text{m}$ ) of juveniles *Prochaetosominae*

	Juv IV	Juv II–III
L	565	650
mbd	28	36
(mbd)	27	28
mbd ph	34	45
ph	75	123
abd	15	23
t	85	107
tmr %	49	42
SIAT1	63	70
SIATn	62	83
SvAT1	50	—
SvATn	40	—
a	20.2	18.1
b	7.5	5.3
c	6.6	6.1
c'	5.7	4.7
mbd/(mbd)	1.0	1.3

### Remarks

Former specimens represent an undescribed genus and species, co-specific with the male and three juvenile specimens described in the doctoral dissertation of

Bussau (1993). The latter were mainly differentiated from the other genera of the subfamily *Prochaetosomatinae* by the absence of cephalic adhesion tubes. However, these descriptions have not been published and the genus and

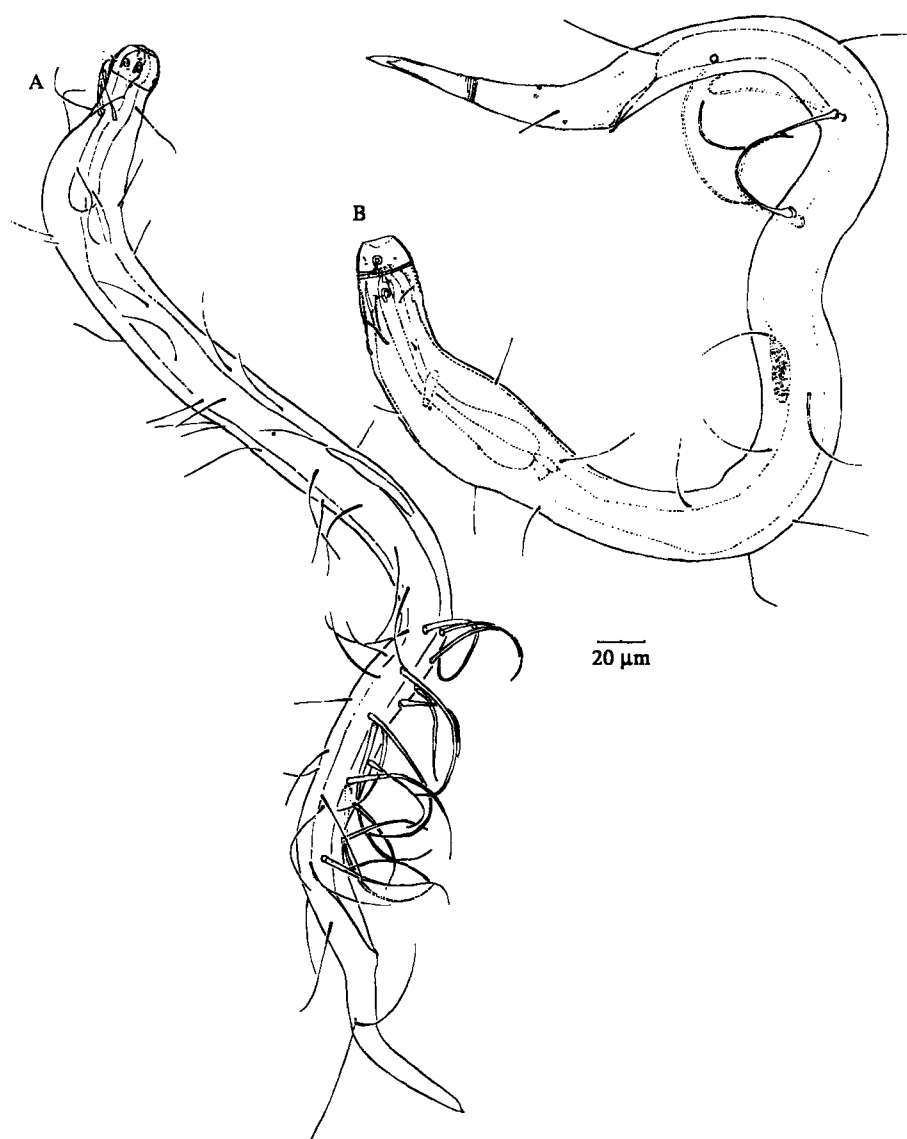


Fig. 8. *Draconematidae*, unnamed genus and species, total view.—A. Fourth stage juvenile female.—B. Second stage juvenile, moulting.

species names cited in Bussau (1993) are considered *nomina nuda*. The observation of NIXO deep-sea specimens from a similar habitat (manganese modules) showed the presence of true cephalic adhesion tubes with enlarged insertion base and narrow rounded open tip, contradicting the original observation. Based on the observation of the NIXO juvenile specimens and the drawing of the male specimen in Bussau's dissertation, the number of CAT appears to be less than 8.

Due to availability of juvenile specimens only, the impossibility to get any answer from Bussau and the fact that the material is not available (personal communication Dr. F. Riemann), the genus and species is not named.

*Provisional diagnosis of the new draconematid genus.* Prochaetosomatinae. Pharynx with terminal bulb with cuticularized lumen wall. Well differentiated helmet with thickened cuticle, spiral amphids, buccal cavity with well developed dorsal tooth and two small subventral teeth. Cephalic adhesion tubes with expanded insertion base, long, ending on a blunt tip, located well posterior to helmet. Posterior ambulatory tubes very long, flexible, without differentiated tip.

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