BULLETIN DE L'INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE, BIOLOGIE, 59 : 25-38, 1989
BULLETIN VAN HET KONINKLIJK BELGISCH INSTITUUT VOOR NATUURWETENSCHAPPEN, BIOLOGIE, 59 : 25-38, 1989

Marine nematodes from Guadeloupe. IX. The genus *Metepsilonema* (Epsilonematidae)

by Wilfrida DECRAEMER and Nicole GOURBAULT

Summary

Three new species of the genus *Metepsilonema* STEINER are described from the Guadeloupe littoral marine interstitial habitats - *M. magdae* sp.n. is significantly characterised by the pearl-like ornamentation of the distal edge of the posterior annules and by the shape and sexual dimorphism of the amphids - *M. clasingae* sp.n. displays a noteworthy cuticular ornamentation with long posterior subdorsal spines, far more pronounced in juveniles - In *M. glutinosum* sp.n. the ambulatory setae are glued together, even in juveniles - *M. bermudae* LORENZEN described from Bermuda and reported from Galapagos, has been collected rather frequently in Lesser Antillae.
Keywords : *Metepsilonema*, taxonomy, Guadeloupe.

Résumé

Description de trois espèces nouvelles de l'interstitiel marin du littoral guadeloupéen appartenant au genre *Metepsilonema* STEINER - *M. magdae* sp.n. est caractérisé essentiellement par l'aspect perlé de la bordure distale des anneaux postérieurs et par la forme et le dimorphisme sexuel des amphides -*M. clasingae* sp.n. présente une remarquable ornementation cuticulaire en longues épines subdorsales postérieures, beaucoup plus marquées chez les juvéniles -chez *M. glutinosum* sp.n., les sois ambulatoires sont collées les unes aux autres, même chez les juvéniles - *M. bermudae* LORENZEN, connu des Bermudes puis des Galapagos est assez fréquent aux Petites Antilles.
Mots-clefs : *Metepsilonema*, taxonomie, Guadeloupe.

Introduction

In addition to a series of papers on representatives of the family Epsilonematidae from the Caribbean region (GOURBAULT & DECRAEMER, 1986, 1987, 1988 ; DECRAEMER & GOURBAULT, 1987), this study deals more precisely with the genus *Metepsilonema* STEINER, 1927.

In his revision, LORENZEN (1973) recognized eight species in the genus *Metepsilonema* : the type species *Metepsilonema hagmeieri* (STAUFFER, 1924) and seven new ones : *M. bermudae, M. callosum, M. cuspidatum, M. emersum, M. laterale, M. leptalum* and *M. limbatum*. Since then, two species have been added : *M. acanthum* CLASING, 1984 and *M. chilotum* CLASING, 1986.

Eight species of this genus have been found in large numbers in sediment samples from intertidal sandy sites of Guadeloupe and its satellite islands. Six of the Guadeloupe species are new to science, three of them : *M. magdae* sp.n., *M. clasingae* n.sp., *M. glutinosum* n.sp. are described, and additional data are given on *M. bermudae* ; this last species together with *M. callosum* being very abundant in our samples. Three new species allied to *M. callosum* were described separately (DECRAEMER & GOURBAULT, in press).

Material and Methods

The sites and sediments of the sampling area were geomorphologically described in previous papers (RENAUD-MORNANT & GOURBAULT, 1981 ; GOURBAULT *et al.*, 1985).

In the Caribbean Islands sublittoral, *Metepsilonema* specimens were quite numerous among the Epsilonematidae collected with the Karaman Chappuis-holes and elutriation-washing technique. They were mounted on slides in anhydrous glycerin, and drawings were made with a Reichert Polyvar camera lucida.

Type specimens were deposited in the nematode collections of the Muséum national d'Histoire naturelle, Paris (MNHN) and the Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel (KBIN).

Abbreviations used in the text

abd, body diameter at level of anus ; A sl, length of anteriormost ambulatory seta of external subventral row ; amph (%), diameter of amphid as a percentage of the corresponding head diameter ; cs, length of cephalic setae ; gub, length of gubernaculum ; hl. length of head ; hw, maximum head width ; L, body length ; mbd, maximum body diameter posterior body region ; (mbd), minimum body diameter, mbd ph, maximum body diameter in pharyngeal region ; mbd/(mbd), maximum body diameter related to minimum body diameter ; N, number of body rings ; ph. length of

pharynx ; spic, length of spicules measured along the median line ; SS, length of anteriormost supporting seta ; SSph, length of subdorsal somatic setae in pharyngeal region ; subc s, length of subcephalic seta ; t, tail length ; tmr, length of non-annulated tail region ; tmr/t, non-annulated tail region related to tail length ; V, position of the vulva as a percentage of the total body length from anterior ; a, b, c, proportions of DE MAN ; c', tail length related to body width at anus or cloaca. All measurements are in μm. Mean value between brackets.

Descriptions

Family Epsilonematidae Steiner, 1927
Subfamily Epsilonematinae Steiner, 1927
Genus *Metepsilonema* Steiner, 1927

Metepsilonema magdae sp.n.
(Fig. 1)

Type specimens :
Holotype (1 ♂), slide BN34 (MNHN). Paratypes : slides BN34-37, BN44-45, BN55, AN599, AN634-635 (MNHN); slides RIT230-234 (KBIN).

Type locality :
Guadeloupe, Grande-Terre, Anse Laborde: station 2, sample 55, 04.1979 (1 ♂), sample 23 (2 ♂ ♂, 1 ♀), sample 25 (1 ♂), sample 45, 12.1982 (1 ♂, 1 juv) and sample 323, 11.1984, (3 juv.).

Other localities :
Quadeloupe, Grande-Terre : Anse de la Gourde : station 6, sample 154, 12.1983 (1 ♂, 3 ♀ ♀), sample 306, 11.1984 (1 ♂), Anse des Chateaux : station 7, sample 44, 04.1979 (1 ♂) ; Basse-Terre, la Grande Anse-Deshaies : station 22, sample 212, 04.1984 (5 ♂ ♂, 1 ♀, 8 juv.). La Désirade : Anse du Souffleur, station 2, sample 181, 12.1983 (13 ♂ ♂, 6 ♀ ♀) ; Anse Petite Rivière, station 3, sample 38, 12.1982 (1 ♂, 3 ♀ ♀, 1 juv.), sample 179, 12. 1983 (2 ♂, 1 ♀), sample 254, 05. 1984 (2 ♀ ♀). Iles des Saintes : Plage de Pompierre, station 1, sample 35, 04. 1979 (1 ♂) ; Grosse Pointe, station 2, sample 37, 04.1979 (8 ♂ ♂, 10 ♀ ♀).

Habitat :
Marine, in sandy beach interstitial waters. Medium but also coarse sand 250<Md<580 μm, calcareous (90-92% CaCO3) and well sorted So=1.2-1.3, in medium to high energy beaches.

Etymology :
The species is named after our friend Dr. Magda Vincx.

MEASUREMENTS

Holotype male (♂ 1).
L= 250, N= 97, cs= 6, subc s= 8, hw= 14, w amph= 6.5, amph (%)= 43, SSph = 13, SS= 12, ph= 56, mbd= 27, (mbd)= 12, mbd ph= 23, mbd/(mbd)= 2.2, spic= 32, gub= 7, abd= 18, t= 31, tmr= 15 ; a= 9.2, b= 4.5, c= 8.1, c'= 1.7.

Paratype males (n=8).
L=220-275 (235), N=94-97 (96), cs=4-6, hw=12-15, w amph=5.5-7, amph (%)=43-54 (47), SSph=13, SS=13-15, ph=50-58 (54), mbd=23-27 (25), (mbd)=10-13 (12), mbd ph=22-25 (23), mbd/(mbd)=1.8-2.4 (2.1), spic=-26-32 (28), gub=6-7 (6.4), abd=14-18.5 (16), t=28-33 (31), tmr=12-16 (14) ; a=8.1-11.5 (9.6), b=4.0-5.0 (4.4), c=7.0-9.2 (7.8).

Paratype females (n=3).
L=210-245, N=92-93, cs=5-5.5, hw=13-14, w amph=-5-6, amph (%)=38-46 (43), SSph=10-15, SS=13-18, ph=49-56 (51.5), mbd=30-37 (34), (mbd)=11-12.5, mbd ph=24-25, mbd/(mbd)=2.3-3.2 (2.9), abd=16-22 (18), t=27-37 (30.5), tmr=14-16, V=67.5-69.5% (68.5%) ; a=5.7-8.2 (6.9), b=4.2-4.9 (4.5), c=6.5-9.1 (7.7).

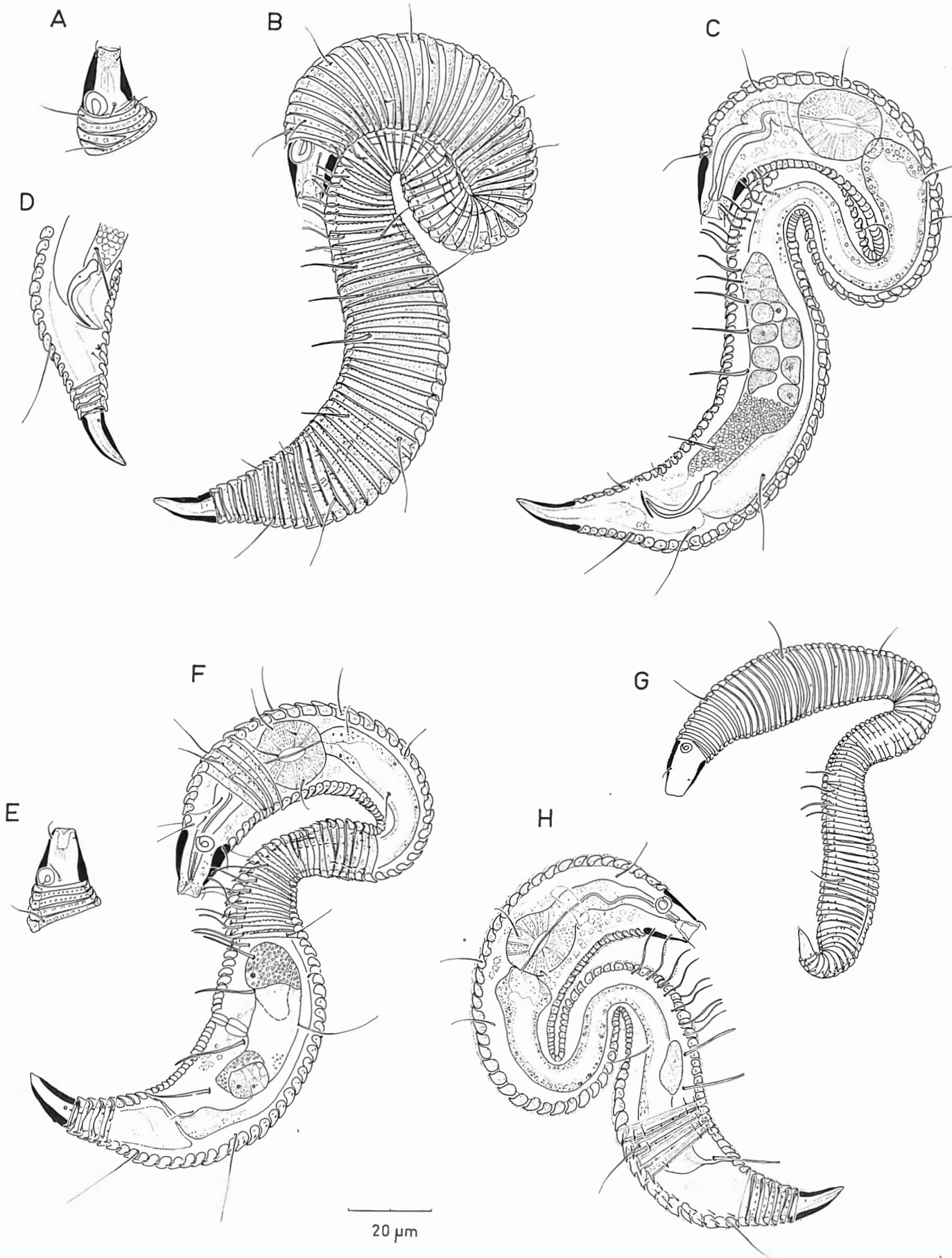
Paratype juveniles fourth stage (n=7).
L=175-215 (200), N=88-92 (90), cs=3-4, hw=11-15, w amph=4-5, amph (%)=27-42 (38), SSph=10-13, SS=-11-16, ph=40-64 (51), mbd=21-24 (22.5), (mbd)=10-12, mbd ph=19-25 (22), mbd/(mbd)=1.8-2.5 (2.1), abd=11-18 (15), t=23-34 (29), tmr=10-12 ; a=8.0-9.3 (8.7), b=3.4-5.1 (4.0), c=5.8-8.9 (6.8).

Paratype juvenile second stage (n=1).
L=160, N=97, hw=12, w amph=3, amph (%)= 30, SSph=8.5, SS=10, ph=28, mbd=15, (mbd)=10, mbd ph=18, mbd/(mbd)=1.8, abd=12, t=25, tmr=7 ; a=8.8, b=5.7, c=6.4.

Other specimens :
from la Désirade :
Males (n=4).
L=200-230 (210), N=90-92, cs=4.5-6, w amph=5-6, amph (%)=42-50 (46), SSph=10-13, SS=12-18, ph=-50-57, mbd=23-25, (mbd)=10-11, mbd ph=21-22, mbd/(mbd)=2.1-2.4, spic=24-32 (26), gub=6-7 ; a=8.0-9.6 (8.7), b=3.9-4.0, c=6.1-7.9 (7.1).

Females (n=2).
L=205-210, N=92-93, cs=5, hw=13-14, w amph=5-5.5, amph (%)=37-38, SSph=11, SS=13, ph=47-49, mbd=28, (mbd)=10, mbd ph=22, mbd/(mbd)=2.8, abd=16, t=31, tmr=13-16, V=69% ; a=7.3-7.5, b=4.2-4.5, c=6.6-6.8.

Fig. 1. Metepsilonema magdae *n.sp. : A, surface view of head (♂ paratype) ; B, habitus of holotype (♂ 1) ; C, entire specimen in longitudinal optical section (♂ 1) ; D, male copulatory apparatus and tail (paratype) ; E, surface view of head (♀ paratype) ; F, female specimen with midbody region in surface view (paratype) ; G, second stage juvenile (paratype) ; H, fourth stage juvenile in longitudinal optical section (paratype).*


A
B
C
D
E
F
G
H
20 µm

from Les Saintes :
Males (n=3).
L=240-260 (250), N=90-92, cs=4.5-5, hw=11-16, w amph=6-7, amph (%)=50-55 (53), SSph=11, SS=13-16, ph=54, mbd=23-25, (mbd)=10-11, mbd ph=21-23, mbd/(mbd)=2.3, spic=22-23, gub=8-9 ; a=9.6-11.3, b=4.4-5.0, c=7.5-9.3 (8.4).

Females (n=1).
L=235, N=90, cs=5.5, hw=12, w amph=4.5, amph (%)=37.5, SSph=12, ph=53, mbd=26, (mbd)=14, mbd ph=22, mbd/(mbd)=1.9, abd=14, t=31, tmr=17, V=68.5% ; a=9.0, b=4.4, c=7.6.

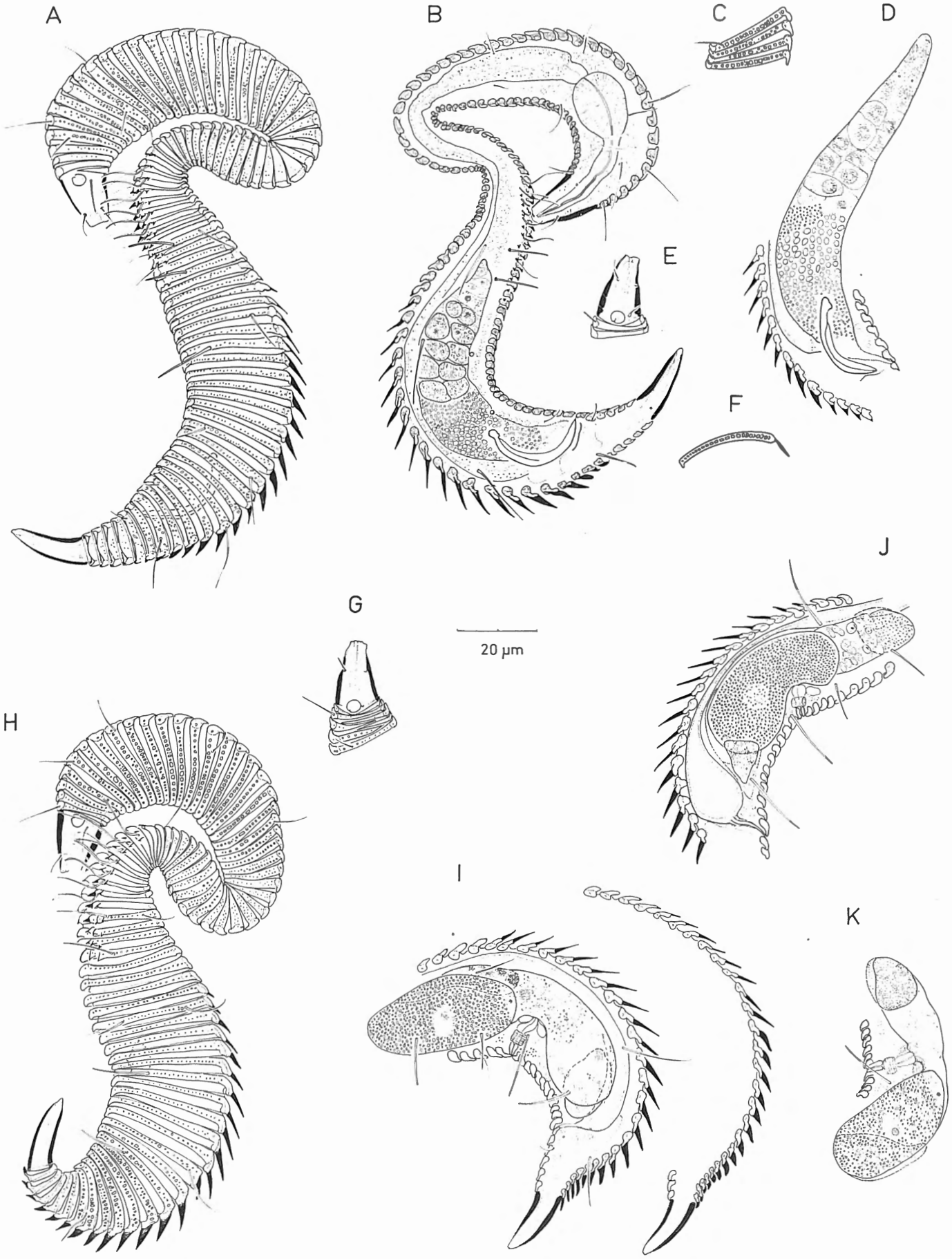
Description

Males
Body small, Σ-shaped with swollen pharyngeal and posterior regions. Cuticle with 96 annules (94-97 in type specimens, 90-92 in specimens from La Désirade and Les Saintes), overlapping by a well developed hyaline outerlayer with change in direction ventrally at the dorsal curvature, dorsally at the ventral bend. In anterior swollen body region, annular ornamentation of a transverse row of irregular vacuoles ; at narrow mid-region in between both body curvatures, vacuoles lacking laterally, appearance of longitudinal rows of cuticular bars with minute spiny projections, displayed all over the rings : more pronounced and extending slightly further anteriorly and posteriorly ventrally to ventrolaterally than dorsally-laterodorsally. Behind the ventral body curvature, annules with posteriorly directed spiny hyaline border (visible as a pearl-like ornamentation) ; inner annular layer thinwalled, visible as a narrow lumen, no vacuoles ; ventrally, in between the ambulatory setae, spiny projections usually well developed. Posterior tail rings smooth or finely vacuolated. Somatic setae fine and rather long (15-18 μm), with more or less marked cuticular collar ; arranged in eight longitudinal rows in the pharyngeal region. Ambulatory setae, proximally bent, in five rows : about seven setae on the inner subventral rows, eight-nine setae on the outer lateroventral rows, followed by a series of five thicker supporting setae.
Cephalic capsule 16 μm long, 14 μm wide (holotype), labial region usually withdrawn into the anterior tapering part of the helmet. Four cephalic setae ; a lateroventral pair of subcephalic setae (8 μm long in ♂ 1) near the amphids. Amphidial fovea inverted U-shaped, ventrally wound, joining the first annule (Fig. 1 A, B).
Buccal cavity apparently toothless. Pharynx 50-58 μm long, ending in a rounded muscular bulb with strong cuticularized lumen wall. Male reproductive system restricted to the posterior body region behind the ventral curve and situated largely ventrally and partly left of the intestine. Monorchic outstretched testis with large sperm cells and short granular vas deferens. Paired, regularly arcuated spicules, 26-32 μm long, relatively slender, proximally enlarging towards a marked capitulum ; short and plate-like gubernaculum, 6-7 μm. On both sides of the body, a subventral row of five to six small copulatory thorns, the posteriormost thorn at five annules from the cloacal opening ; additionally, one or two small subventral thorns flanking the cloacal opening (Fig. 1B, D). The presence of copulatory thorns is often obscured, except for specimens mounted in a dorsoventral position.
Tail conical, with 7 to 8 annules. The caudal glands usually rather obscure, extending anteriorly beyond the cloaca.

Females.
Similar to males in habitus but amphids display sexual dimorphism : ventrally wound spiral, 43% (mean value) of head diameter (Fig. 1E). Cuticle with 92-93 annules (90 in a specimen from Les Saintes), ornamented as in male except for the presence of more pronounced spiny projections dorsally in the posterior body region (Fig. 1F). Reproductive system didelphic and amphidelphic, with reflexed ovaries : anterior branch to the right side, posterior branch to the left side (Fig. 1F), largely ventral to the intestine. Two spermathecae, only marked when filled with sperm cells. Vagina bipartite, with a well cuticularized outer part (3.5 μm long) and a slightly larger, more weakly cuticularized inner part (5 μm long, ♀ from Les Saintes). Vulva lying in posterior body half, at 68.5% (mean) of the total body length from anterior.

Juveniles.
Two stages have been found.
Fourth stage juveniles (Fig. 1H).
Habitus similar to adults. Cuticle with 88 to 92 rings, ornamented as in adult ; spiny projections dorsally and ventrally in posterior body region well developed in some specimens (Fig. 1H). Head with four cephalic setae, 3-4 μm long ; subcephalic setae absent. Amphids ventrally wound spirals, just over one whirl, 38% (mean value) of corresponding head diameter. Ambulatory setae arranged in four longitudinal rows : the inner rows with three to five setae, the outer rows with six to seven setae, followed by two or three supporting setae. Reproductive system rather short, 12-16 μm. Tail with 8-9 annules.

Fig. 2. Metepsilonema clasingae *n.sp. : A, habitus holotype male ; B, paratype male in longitudinal optical section ; C, detail of body cuticle at level of annules 10 to 13 (paratype ♂) ; D, male reproductive system (paratype) ; E, surface view of head (♂ paratype) ; F, detail of preanal ring (paratype ♂) ; G, surface view of head female (paratype) ; H, habitus paratype female ; I, female reproductive system and detail of spiny ornamentation dorsal body wall in two specimens (paratypes) ; K, female reproductive system (paratype).*


A
B
C
D
E
F
G
20 µm
H
I
J
K

Second stage juvenile (Fig. 1G).
Σ-shaped body with anterior and posterior regions less swollen than in adult and fourth stage juveniles ; cuticle with a higher number of rings (97). Annular ornamentation with faint vacuoles in anterior swollen region, at narrow midbody consisting of longitudinal rows of cuticular bars (except laterally), continuing posteriorly in spiny projections up to the endring (Fig. 1G). Head and amphids as in fourth stage juveniles ; head capsule less sclerotized. Ambulatory setae in two subventral longitudinal rows of four setae each ; one pair of supporting setae. Tail with thirteen annules.

Diagnosis.
Metepsilonema magdae sp.n. is mainly characterized by : a) the shape of the amphids in male (inverted U-shaped, joining the first body annule), and the display of sexual dimorphism (amphids smaller spirals, restricted to the head in female and juveniles), and b) the pearl-like cuticular ornamentation in the posterior body region formed by the short spiny projections at the posterior hyaline border of the annules. To a certain extent, the new species can also be distinguished in males, by the shape of the copulatory apparatus and by the presence of a subventral row of five to six small precloacal copulatory spines and one or two small subventral postcloacal thorns.

Metepsilonema clasingae sp.n.
Figs. 2-3

Type specimens :
Holotype ♂ 1, slide BN38 (MNHN). Paratypes : slides BN39-43, BN46-48, AN636, AN638, AN643, AN654 (MNHN) and slides RIT236-257 (KBIN).

Type locality :
Guadeloupe, Grande-Terre, Plage de Gosier : Station 9, sample 40, 04.1979 (3 ♂ ♂, 15 ♀ ♀, 162 juv.), sample 41, 04.1979 (9 ♂ ♂, 27 ♀ ♀, 43 juv.), sample 39, 04.1979 (1 ♀), sample 29, 12.1982 (5 ♂ ♂, 2 ♀ ♀, 7 juv.), sample 50, 03.1983 (2 ♂ ♂, 7 ♀ ♀, 16 juv.), sample 208, 04.1984 (4 ♂ ♂, 9 ♀ ♀, 5 juv.), sample 332, 11.1984 (3 ♂ ♂, 4 ♀ ♀, 2 juv.).

Other localities :
Guadeloupe, La grande Anse, station 14, 04.1979 (1 ♀) ; La Désirade, Anse d'Echelle, station 1, sample 33, 04.1979 (2 ♀ ♀).

Habitat :
Marine, in sandy beach interstitial waters. Fine to medium (185<Md<270 μm) calcareous (92-94% CaCO3, but in station 14 : 5-10%) and rather well sorted (So=1-1.6) sand. Weakly steeped and moderate energy beaches.

Etymology :
This species is named after Dr. ELENA CLASING who first discovered these animals.

MEASUREMENTS

Holotype male (♂ 1).
L=270, N=86, cs=6, subc s=9.5, hw=11, w amph=4, amph (%)=36, Asl=11, ph=50, mbd ph=23, (mbd)=11, mbd=27, mbd/(mbd)=2.5, spic=29, gub=5.5, t=35, abd=16, tmr=19, tmrw=7, SS=12 ; a=10.0, b=5.4, c=7.7, c'=2.2.

Paratype males (n=4).
L=220-275 (250), N=84-86 (85), cs=5.5-6, subc s=9.5-11, hl=17-18, hw=10-11, w amph=3.5-4.5, amph (%)=32-41% (38.5%), A sl=13-14, ph=47-50 (49), mbd ph=21-22, (mbd)=9.5-12 (10.5), mbd=25-26, mbd/(mbd)=2.1-2.6 (2.5), spic=29-30, gub=5-10 (7), t=31-34, abd=13-16, tmr=18-19, tmrw=6.5-8.5, SS=11-13 ; a=8.5-11.0 (10.0), b=4.4-5.9 (5.2), c=7.1-8.1 (7.8).

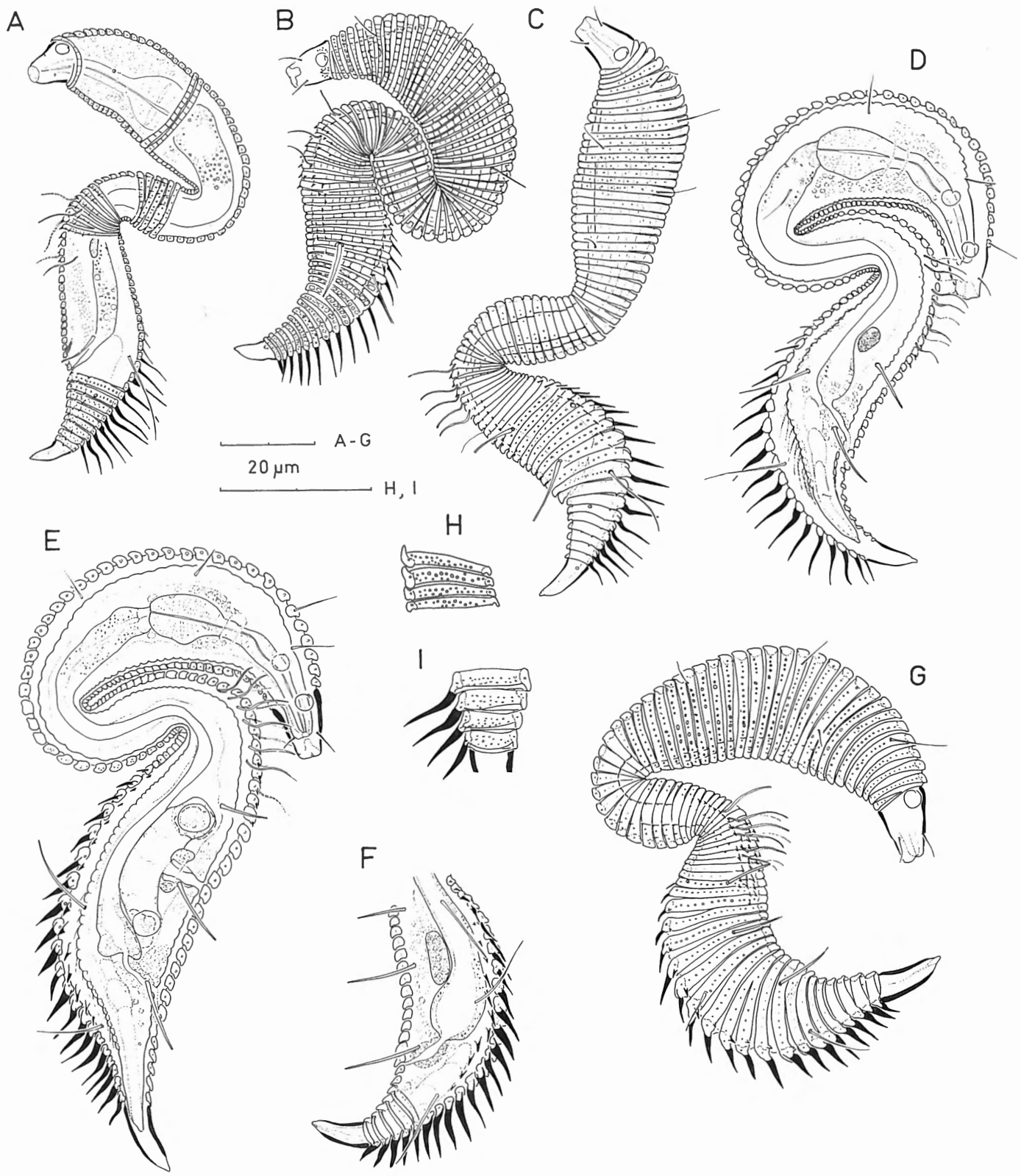
Paratype females (n=12).
L=210-285 (255), N=85-87 (86), cs=5-7, subc s=7-11, hl=14-20, hw=10-12, w amph=3-4.5, amph (%)=30-40% (34.5%), A sl=12-16 (14.5), ph=45-57, mbd ph=20-24, (mbd)=8.5-12, mbd=24-28, mbd/ (mbd)=-2.3-3.0 (2.6), t=30-38, abd=14-18, tmr=16-18, tmrw=-6-7.5, SS=11-14 (13), V=67-70% (68.5%) ; a=8.2-10.7 (9.4), b=4.5-5.7 (5.2), c=6.4-9.5 (7.9).

Paratype juveniles fourth stage (n=10).
L=170-255 (205), N=78-80 (78), cs=4.5-6, hl=11-17, hw=9.5-11, w amph=3-4, amph (%)=30-40% (34.5%), A sl=12/ ph=44-55, mbd ph=20-25, (mbd)=10-12, mbd=19-26, mbd/(mbd)=1.7-2.4 (2.1), t=26-34, abd=13-18, tmr=14-16, tmrw=5.5-6.5, SS=10-13 (11) ; a=7.7-11.1 (9.0), b=3.5-5.3 (3.9), c=5.3-8.0 (6.7).

Paratype female juvenile fourth stage, moulting specimen (n=1).
L=225, N=79, cs=5.5, hl=14, hw=11, w amph= 4.5, amph (%)=mbd ph=26, (mbd)=14, mbd=31, t=32, abd=16, tmr=15, tmrw=6, SS=10.

Paratype juvenile third stage (n=9).
L=160-200, N=79-82 (80), cs=4.5-5.5, hl=10-14, hw=9.5-10, w amph=3-4, amph (%)=32-42% (36%), A sl=9.5-21 (11.5), ph=42-46, mbd ph=22-24, (mbd)=-10-13, mbd=20-22, mbd/ (mbd)=1.4-2.4 (1.9), t=22-29, abd=12-19, tmr=8-11, tmrw=4.5-5, SS=9.5-12 (10.5) ; a=6.7-8.3 (7.5), b=3.6-4.0 (3.8), c=5.5-7.4 (6.4).

Paratype juvenile third stage, moulting specimens (n=10).
L=165-205 (190), N=80-82 (81), cs=3.5-5, hl=10-14, hw=8-10, w amph=3-3.5, amph (%)=30-38% (34.5%), A sl=9.5-11, mbd ph= 22-27, (mbd)=11-13, mbd=20-



25, t=24-31, abd=12-15, tmr=9.5-11, tmrw=4-5, SS=9.5-11 (10.5).

Paratype juveniles, second stage, moulting specimens (n=3).
L=130-165, N=88, cs=5.5, hl=10-12, hw=8.5-9.5, w amph=3, amph (%)=32-35%, A sl=9.5-10, mbd ph=20,

Fig. 3. Metepsilonema clasingae *n.sp. : juvenile type specimens : A, second stage juvenile with detail of body cuticle ; B, a moulting second stage juvenile ; C, a third stage juvenile ; D, a moulting third stage juvenile ; E, a young moulting female of the fourth stage in longitudinal optical section ; F, posterior body region of a young male specimen, fourth stage ; G, habitus fourth stage juvenile ; third stage juvenile : H, detail body wall at level of ring inversion ; I, detail body wall at posterior tail rings.*

(mbd)=13, mbd=17-18, t=18, abd=10, tmr=8, tmrw=4.5-5, SS=11-12.

Paratype juvenile, second stage (n=1).
L=160, N=85, hl=12, hw=9.5, a amph=3, amph (%)=31.5%, A sl=10, mbd ph=21, (mbd)=11, mbd=17, mbd/(mbd)=1.9, abd=14, t=24, tmr=8.5, SS=12 ; a=7.6, b=3.5, c=6.7.

DESCRIPTION

Males
Body Σ-shaped, small, slightly enlarged in pharyngeal region and more swollen in posterior body region. Cuticle with 84-86 annules ; annules with more or less developed hyaline outerlayer. Inversion in direction of the annules ventrally just anterior to the dorsal curvature (between rings 27-27, ♂ 1) ; dorsally the inversion occurs three times : anterior to the pharyngeal bulb (at ring 6, ♂ 1), at level of dorsal curvature (at ring 30, ♂ 1) and at level of ventral curvature (e.g. between rings 43-44, ♂ 1) (Fig. 2A). Body annules with vacuolar ornamentation varying from a single row of small to relative large quadrangular vacuoles or two rows to more or less irregularly dispersed, fine and large vacuoles ; the vacuolar ornamentation is faint or absent in the first annule, the posterior tail rings and at the level of both body curvatures. The body cuticle also shows a thorny or spiny ornamentation. In the region of the ambulatory setae, longitudinal rows of minute thorns (up to 7 rows) extend ventrally to ventrolaterally over 12-14 annules ; from the level of the testis on (ring 60, ♂ 1), the protruding hyaline outerlayer of the annules bears well developed spines arranged in two longitudinal subdorsal rows, with spines becoming longer posteriorly down to the spicular region, then shortening again up to the first postcloacal annule (ring 80, ♂ 1).
Scarce somatic setae (short and longer setae) are arranged in eight longitudinal rows in the pharyngeal region ; in 5 (?) rows posteriorly. Ambulatory setae fine, knicked, with bent tip, arranged in five longitudinal rows : the external subventral rows with 6 setae and the inner subventral rows with 6 to 7 setae, the midventral row with 7 to 9 setae. Four pairs of ventrosublateral supporting setae : the anterior two pairs (11-13 μm long), located close to one another in the region of the ambulatory setae, the longest third pair (17-18) μm) at the level of the vesicula seminalis, the fine and shortest (9.5-11 μm) fourth pair lies just in front of the level of the spicule head. Some of the supporting setae happen to be broken. Head capsule, 5-5.5 μm wide at rostrum, 10-11 μm wide at its base ; lipregion usually partly or totally withdrawn in fixed specimens. Four short cephalic setae (5-6.5 μm) ; two long ventrosublateral subcephalic setae (9-5-10 μm), inserted near the head base. Ampidial fovea, a small ventrally whorled spiral just over one coil, located dorso-laterally with diameter of 38% (average) of the maximum head width.
Buccal cavity shallow, without teeth, except for some rare indications of a small dorsal denticle. Pharynx narrow cylindrical, with a slight enlargement at mid-length, just at level of nerve ring and a strong muscular posterior bulb. Cardia short, 5 μm. Intestine finely granular, situated dorsally to the genital system and tapering posteriorly.
Male reproductive system typical of the family. The single testis may extend to the ventral curvature of the body ; in one specimen the anterior end of the testis was reflexed to the left side. Vesicula seminalis with large sperm cells (7 μm) and a large granular nucleus (4 μm) ; vas deferens large, coarsely granular. Spicules, 29-30 μm long, ventrally curved, with offset head. Gubernaculum, 5-10 μm long, a slightly curved cuticularized structure.
Tail short, conical, with 6 to 7 rings ; endring conical, with smooth cuticle, devoided of setae. Three caudal glands extending anteriorly beyond the cloacal region (Fig. 2B).

Female.
Similar to male in most respects. In the region of the ambulatory setae, 6 to 9 longitudinal rows of small thorns can be observed (Fig. 2H). Posterior to this region, the body cuticle bears on both sides a subdorsal longitudinal row of strongly developed spines. The latter are inserted on a marked extension (up to 2.5 μm high) of the hyaline cuticular outerlayer of the annules and differ in length and thickness according to the specimens (Fig. 2I : left specimen with long slender spines up to 7 μm long, right specimen with shorter stouter spines, up to 4.5 μm long). The well developed subdorsal spiny rows extend to the last annule. The conical endring bears no spines.
Ambulatory setae, usually arranged in five (rarely four) longitudinal rows : the external subventral rows with 6-7 setae ; the inner subventral rows with 7-9 ; the middle row, if present, with 5-7 setae. Four supporting setae on both sides : the anterior two setae (mean length: 13 μm) are shorter than the posterior setae (average length : 18-19 μm) ; the third seta inserted at the level of the vulva. One pre- or post anal seta (4.5 μm long) present. Head and sensorial organs as in male. No sexual dimorphism in the amphidial fovea.
Reproductive system typical of the family : didelphic and amphidelphic, with ovaries reflexed, both to the same side or to opposite sides. Large, no clearly defined spermathecae, filled with numerous large sperm cells. Usually one of the genital branches with a large egg cell (average diameter 36 by 18 μm). Vagina bipartite, with a short distal part (1.5-4 μm) and a longer non-cuticularized proximal part (3.5-10 μm long) ; the inner part is distally surrounded by a well developed sphincter muscle (Fig. 2I, K). Vulva situated at 68.5% (mean) of the total body length form anterior.

Juveniles.
Fourth stage juveniles (Fig. 3 E-G).
Similar to adult in many respects. Cuticle with less annules, than in adult (78-80). Structure of body annules as in adults, but vacuolar ornamentation may be more pronounced. Spiny ornamentation more developed than in adults : a) several rows of minute thorns in ambulatory region extending anteriorly into slender midbody region, b) in posterior body region, both longitudinal subdorsal rows with more strongly developed spines than in adult, are flanked laterally by a shorter subdorsal row of shorter spines (Fig. 3 E-G). Ambulatory setae arranged in four rows : both external subventral rows with six setae, the internal subventral rows with 5 to 6 setae. Three pairs of ventrosublateral supporting setae, becoming longer posteriorly. Head as in adult. Four short cephalic setae, no subcephalic setae. Amphidial fovea and digestive tract as in adult. Reproductive system relatively short (6-25 μm (14.5 μm) long). In young males, spicular primordium present (Fig. 3F). In a moulting young female, reproductive system completely developed, ovaries reflexed (Fig. 3E). Tail with seven or eight annules, with vacuolar ornamentation and subdorsal row of long spines, except for the smooth conical endring.

Third stage juveniles (Fig. 3 C, D, H, I).
Resembling adults in many respects. Cuticle with less annules than in adult (79-82). Hyaline outerlayer of body annules less developed than in adult and fourth stage juveniles ; inversions in direction less pronounced. Vacuolar ornamentation small and often obscure in anteriormost rings, in narrower midbody region and tail annules. In pharyngeal and swollen posterior body regions, annular ornaments with a single row of small or large vacuoles marked by bars, more pronounced ventrally to ventrolaterally ; annules with a minute spiny extension. In some specimens, the marked cuticular striae (bars) extend from posterior pharyngeal region as longitudinal rows into the midbody region (Fig. 3 C). Obvious subdorsal spiny ornamentation in posterior body region very similar to fourth stage juveniles. Minute spines are observed ventrally to ventrolaterally in the ambulatory region, as in fourth stage juveniles (Fig. 3 C).
Ambulatory setae in two subventral rows of six setae each. Two supporting seta on each side, the posterior seta longer than the anterior one. Head and sensorial organs as in fourth stage juveniles. Digestive system as in former stages. Reproductive system, poorly developed, 5.5 to 7 μm long. Tail with eight annules ; endring conical.

Second stage juveniles (Fig. 3A-B).
Largely agreeing with other stages. Cuticle with 88 annules, larger number than the average in adults. Hyaline outerlayer of the body annules hardly developed. Vacuolar and spiny ornamentation of the body annules as in third stage juveniles ; the external subdorsal rows of long spines beginning more posteriorly and extending over fewer rings than in other stages. The ventral to ventrolateral spiny ornamentation, obvious in the region of the ambulatory setae, continues posteriorly as minute spines ; in some specimens up to the last narrow annule. Ambulatory setae arranged in two subventral rows of three setae each. One supporting seta on each side. Tail with 10 annules.

First stage juveniles : not found.

Diagnosis
Metepsilonema clasingae sp.n., is characterized by : a) the vacuolar and obvious subdorsal spiny ornamentation in the posterior body region, the latter being more developed in juvenile stages than in adult ; b) the small body length and low number of annules ; c) the male spicular apparatus and d) the bipartite structure of the vagina in female.

Metepsilonema glutinosum sp.n.
Fig. 4

Type specimens :
Holotype ♂ 1, slide BN49 (MNHN). Paratypes : slides BN50-52, AN580 (MNHN) and RIT158, RIT234-235, RIT249, RIT262-263, RIT265, RIT268-269, RIT275-278, RIT281-282, RIT287, RIT313-315 (KBIN).

Type locality :
Guadeloupe, Anse à la Gourde, station 6, sample 45, 04.1979 (11 ♂ ♂,6 ♀ ♀, 4 juv.).

Other localities :
Guadeloupe, Pointe des Chateaux, station 7, sample 44, 04.1979 (1 ♂, 2 ♀ ♀) ; Porte d'Enfer, station 3, sample 56, 04.1979 (1 ♀) ; Anse Laborde, station 2, sample 247, 05.1984 (1 ♂).

Habitat :
Marine, in sandy beach interstitial waters. Coarse (Md=500-530 μm), calcareous (92-95% CaCO3), rather well sorted (So=1.3-1.4) sand.

Etymology :
Specific name from latin, glutinosus=sticky.

MEASUREMENTS

Holotype male (♂ 1).
L=280, N=90, cs=8.5, subc s=16, hw=15, hl=15, w amph=8, amph (%)=53, ph=60, mbd ph=36, (mbd)=13, mbd=40, mbd/(mbd)=3.1, spic=29, gub=12, t=27, abd=14, tmr=14, tmrw=7, SS=13 ; a=7.0, b=4.7, c=10.4, c'=1.9.

Paratype males (n=7).
L=285-325 (300), N=90-91, cs=5.5-9, subc s=13-17, hw=13-15, w amph=7-9, amph (%)=47-62 (54), ph=56-67, mbd ph=32-40, (mbd)=14-19, mbd=34-44, mbd/(mbd)=1.8-2.8 (2.5), spic=27-32, gub=8-13 (11), t=28-30, abd=14-16, tmr=12-15, tmrw=6.5-8, SS=15-18 ; a=6.6-9.0 (7.6), b=4.3-5.4, c=9.5-11.2, c'=1.9-2.1.

Paratype females (n=7).
L=215-280 (270), N=86-90, cs=6-8.5, subc s=13-18, hl=17-18, hw=13-14, w amph=6-7, amph (%)=39-50 (46), ph=55-61, mbd ph=32-41 (34), (mbd) =15-18, mbd=35-45, mbd/(mbd)=2.1-2.8, t=23-30, abd=12-14, tmr=12-15, tmrw=6-7, SS=14-15, V=65-72% (70%); a=6.1-7.4 (6.5), b=3.6-5.0 (4.6), c=9.0-12.0 (10.7), c'=1.7-2.1 (1.9).

Paratype juveniles fourth stage (n=3).
L=200-215, N=82-85, cs=6.5-7, hw=12, w amph=5, amph (%)=42, ph=50-51, mbd ph=35-37, (mbd)=15-16, mbd=28-33, mbd/(mbd)=2.2-2.5, t=23-27, abd=12-14, tmr=11-12, tmrw=5.5-6, SS=14-16 ; a=5.7-6.0, b=3.8-4.2, c=8.0-8.9, c'=1.9.

DESCRIPTION

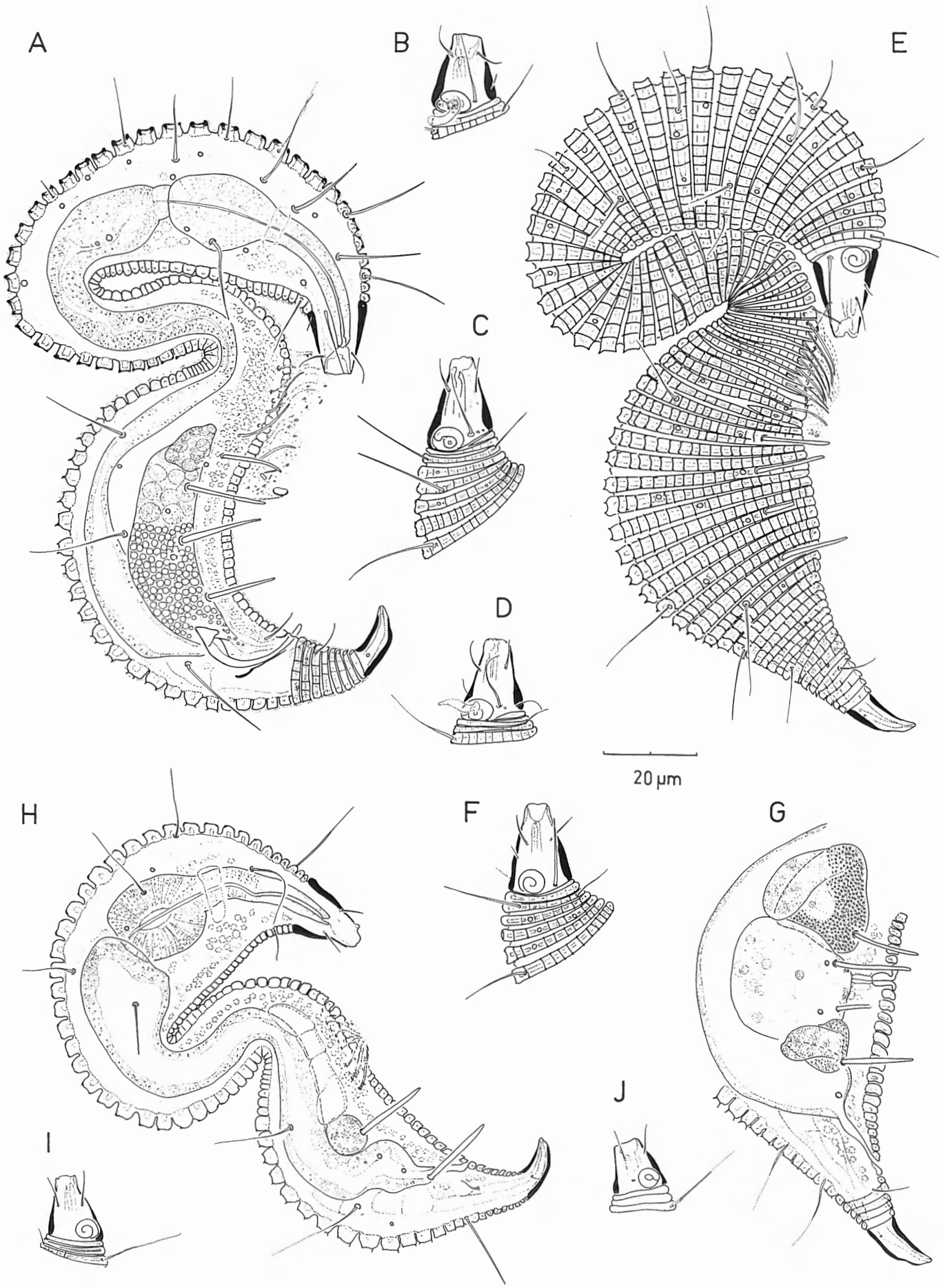
Males.
Body small, Σ-shaped, strongly bent and heavily built ; largely swollen in pharyngeal and posterior body regions. Cuticle with 90 or 91 annules, without overlapping of hyaline outerlayer. Annules with a thick-walled cuticle, ornamented with well developed ridges (their ends more or less protruding), except for the first annule and the posterior tail rings.
Somatic setae long and slender, arranged in eight longitudinal rows in the pharyngeal region, six rows posteriorly. Insertion of somatic setae with marked cuticular collar. Ambulatory setae fine, bent, arranged in four (?) longitudinal rows, glued in a mass of secretion ; the external subventral rows with 8 setae, the inner subventral rows apparently with 7 setae. Four ventrolateral supporting setae (13-18 μm long) on each side ; some setae happen to be broken.
Head with lipregion usually partly or totally withdrawn in the head capsule in fixed specimens. Four fine cephalic setae at one third from the anterior border of the helmet ; a pair of long (13-17 μm) ventrosublateral subcephalic setae inserted near the head base. Amphidial fovea, a flattened ventrally whorled spiral (shortly over one coil), with a sclerotized aperture and joining the first annule. Amphid diameter, 54% (mean) of the corresponding head width ; some specimens with a protruding corpus gelatum.
Buccal cavity shallow, without teeth. Pharynx narrow cylindrical, ending into a muscular posterior bulb ; nerve ring just anterior to bulb. Cardia short, not always well marked. Intestine fine granular, tapering posteriorly and then slightly widening near the cloacal region.
Male reproductive system short, clearly restricted to the swollen posterior body region. Testis with relatively large, nearly globular sperm cells (2 x 3 pm) ; vas deferens with large granules. Spicules, 27-32 μm long, curved; the corpus relatively slender but proximally widening with a ventral apophyses adjacent to the well marked capitulum. Gubernaculum, 8-13 μm long; proximal end bent (Fig. 4A). Tail short conical, 9 or 8 annules; endring conical with smooth well sclerotized cuticle. Caudal glands extending anteriorly beyond the cloaca.

Females.
Similar to male in most respects ; body cuticle with fewer annules (86-90). Amphids show sexual dimorphism : the amphidial fovea is a smaller (average diameter : 46% of the corresponding head width) spiral structure with almost circular outline and aperture not sclerotized as in male (Fig. 4 E, F).
Reproductive system didelphic and amphidelphic, with reflexed ovaries, both coiled to the same side (right side on Fig. 4G) or to opposite sides and with one of the branches more developed ; some specimens with a large egg cell (21 x 24 μm). No clearly defined spermathecae but small globular sperm cells observed. Vagina bipartite, the inner weaker cuticularized part surrounded by a vaginal sphincter muscle. Vulva situated at 70% (mean) of the total body length. Tail with seven annules.

Juveniles.
Only one juvenile from the fourth stage was found.
Fourth stage juveniles (Fig. 4 H-J).
Agreeing with adult in many characters. Cuticle with less annules than in adult (82-85), but with similar ornamentation. Amphids as in female. Ambulatory setae, apparently arranged in four rows, glued in secretion material as in adults, external subventral rows with 8 or 9 setae. Two stout supporting setae, 14-17 μm long, on each side. Reproductive system relatively short. Tail with eight or nine annules.

Differential diagnosis.
Metepsilonema glutinosum sp.n. is characterized by its habitus (stout body), by the number of annules (90-91 in ♂ ; 86-90 in ♀), by its conspicuous cuticular ridges ornamentation, by the structure of the amphids displaying sexual dimorphism (a flattened spiral with sclerotized aperture in male, a smaller rounded spiral without sclerotized aperture in female), by the glued

Fig. 4. Metepsilonema glutinosum *n.sp. : A, holotype male ; B, surface view of head holotype ♂ 1 ; C, anterior body region in surface view (paratype ♂); D, surface view of head (paratype ♂); E, habitus female (paratype) ; F, surface view of anterior body region in female (paratype); G, female reproductive system and tail (paratype) ; H, longitudinal optical section of a young moulting female (fourth stage, paratype); I, J, surface view of head of fourth stage juveniles (paratype).*


A
B
C
D
E
20 µm
F
G
H
I
J

ambulatory setae in all stages, and by the shape of the male copulatory apparatus.
The new species is most closely related to *M. cuspidatum* LORENZEN, 1973, the only other species of the genus possessing a similar crestlike cuticular ornamentation. *M. cuspidatum* differs however, from *M. glutinosum* in all other diagnostic features of the new species : habitus (slenderer with long narrow midbody), number of annules (higher), structure of amphids (smaller and different spiral shape, sexual dimorphism only in diameter of amphids), copulatory apparatus (spicules without apophysis), ambulatory setae never glued, and also in tail shape and number of tail rings (longer, slenderer, with a larger number of rings : 12).

Metepsilonema bermudae Lorenzen, 1973
Fig. 5

Material :
Specimens on slides AN615, BN35, BN37, BN45, BN50, BN56-59 (MNHN) and RIT55 (KBIN).

Localities :
Guadeloupe, Grande-Terre, Anse Laborde : station 2, sample 55, 04.1979 (6 ♂ ♂, 1 ♀, 2 juv.), sample 26, 12.1982 (7 ♂ ♂, 3 ♀ ♀, 2 juv.), sample 247, 05.1984 (1 ♂), sample 323, 11.1984 (1 ♂, 3 ♀ ♀, 3 juv.) ; Le Moule : station 4, sample 26, 04.1979 (14 ♂ ♂, 20 ♀ ♀, 2 juv.), sample 27, 04.1979 (1 ♂, 2 ♀ ♀, 1 juv.), sample 150, 12.1983 (3 ♂ ♂, 6 ♀ ♀, 3 juv.), sample 225, 05.1984 (1 ♂, 4 juv.) ; Anse de la Gourde : station 6, sample 12, 12.1982 (8 ♂ ♂, 2 ♀ ♀, 3 juv.), sample 13, 12.1982 (1 ♂, 2 ♀ ♀, 9 juv.), sample 78, 03.1983 (1 juv.), sample 154, 12.1983 (1 ♂, 2 ♀ ♀), sample 214, 04.1984 (5 ♂ ♂, 5 ♀ ♀, 3 juv.), sample 306, 10.1984 (3 ♂ ♂, 4 ♀ ♀, 7 juv.). La Désirade, Anse Petite Rivière : sample 82, 03.1983 (1 ♀), sample 85, 03.1983 (1 ♀), sample 179, 12.1983 (3 ♂ ♂, 2 ♀ ♀), sample 254. 05.1984 (2 ♂ ♂, 6 ♀ ♀, 4 juv.), sample 258, 05.1984 (2 ♂ ♂, 3 ♀ ♀, 1 juv.), Anse du Souffleur: sample 181, 12.1983 (3 juv.). Les Saintes, Plage de Pompierre, sample 35, 04.1979 (6 ♂ ♂, 7 ♀ ♀, 6 juv.), sample 37, 04.1979 (6 ♂ ♂, 7 ♀ ♀, 7 juv.). La Marie Galante, Capesterre, sample 9, 02.1981 (1 ♂).

Habitat :
Marine, in sandy beach interstitial waters. Medium to coarse (240<Md<530 μm), calcareous (92-95% CaCO3), well sorted (So=1.0-1.5) sand, in medium to high energy beaches.

MEASUREMENTS

Specimens from Guadeloupe
Males (n=13).
L=260-320 (290), N=92-95 (93), cs=4.5-6.5, hw=14-21, hl=19, w amph=5.5-6, amph (%)=37-54 (46), ph=56-66, mbd ph=23-27, (mbd)=11.5-15, mbd=23-27, mbd/(mbd)=1.5-2.3 (1.8), spic=24-31 (27), gub=7-10, t=26-42 (34), abd=14-18, tmr=15-20, SS=14-18 ; a=10.0-13.3 (11.2), b=4.5-5.2 (4.7), c=6.5-10.2 (8.4), c'=1.7-2.1 (2.0).

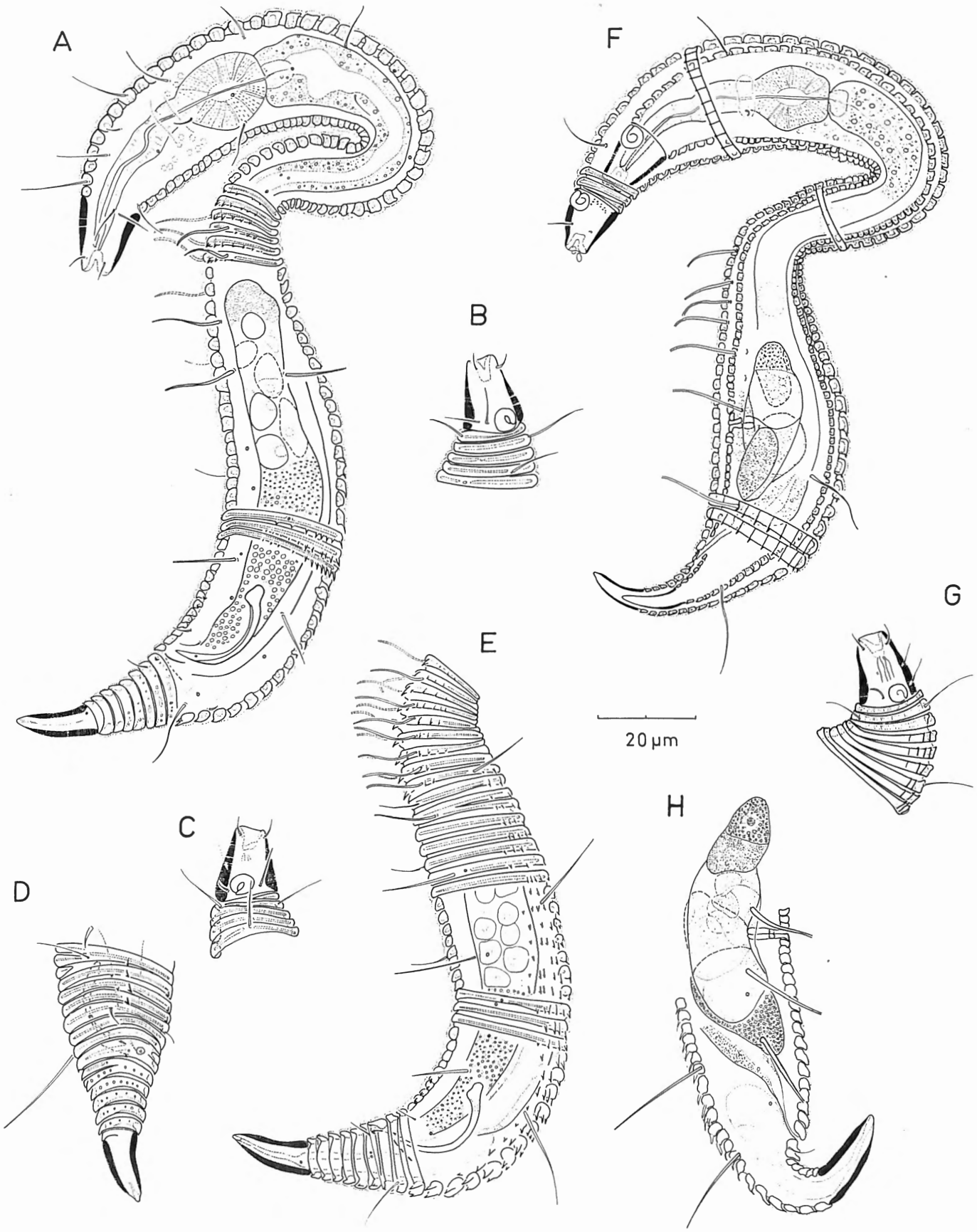
Females (n=6).
L=230-290 (265), N=92-96 (94), cs=4.5-5.5, hw=15-16.5, hl=15, w amph=4-5, amph (%)=32-40 (37), ph=52-65, mbd ph=24-27, (mbd)=11-16, mbd=29-32, mbd/ (mbd)=1.9-2.6 (2.1), t=26-35 (31), abd=15-18 (16), tmr=15-20, SS=15-20, V=67.8-72.4% (70.1%) ; a=7.9-9.0 (8.8), b=4.0-4.7 (4.4), c=7.4-9.7 (8.6), c'=1.7-2.2 (1.9).

Fourth stage juvenile moulting into female (n=).
L=250, N=86, cs=5, hw=15, w amph=4.5, amph (%)=32, ph=59, mbd ph=28, (mbd)=15, mbd=33, mbd/(mbd)=2.2, t=37, abd=18, tmr=15, SS=16, V=71.6% ; a=7.5, b=4.2, c=6.7, c'=2.0.

Fourth stage juveniles (n=6).
L=205-235 (215), N=84-90 (87), cs=4-5.5, hw=13-15, w amph=4-5, amph (%)=33-40 (36), ph=56-62 (58), mbd ph=21-26, (mbd)=12-14, mbd=23-27, mbd/(mbd)=1.7-2.2 (1.9), t=31-38 (35), abd=16-18 (17), tmr=11-15, SS=15-16 ; a=7.6-9.1 (8.7), b=3.5-3.9 (3.7), c=5.8-7.6 (6.2).

Additional information :
Specimens from Guadeloupe largely agree with previous descriptions. Measurements are in better accordance with LORENZEN (1973) than with CLASING (1980). Average size of males is larger than of females. Males seem however, to display a larger variability in spicule length. Our observations of CLASING's specimens of *M. bermudae* from Galapagos, mounted together with paratypes of *M. acanthum* (LORENZEN's courtesy), showed that longer spicules (up to 30 μm) also occur. Two subventral rows of 5 to 6 minute copulatory thorns, usually overlooked but clear in dorsoventrally mounted specimens, were observed. Male reproductive system with large sperm cells in testis (Fig. 5 A, E).
Female body cuticle in anterior body region dorsally ornamented with ridges with a slightly protruding spiny end (Fig. 5 G). Reproductive system didelphic and amphidelphic with reflexed ovaries, to opposite sides (Fig. 5 H) or to the same side. Large sperm cells present in the spermathecae, the latter not well marked. Vagina bipartite. Vulva situated at 70% (average) of the total body length.

Fig. 5. Metepsilonema bermudae *Lorenzen, 1973 : A, entire male specimen with detail of body wall ; B, C, surface view of head (♂) ; D, posterior body region of male, slightly dorso-ventrally orientated; E, posterior body region of male with detail of the body cuticle ; F, longitudinal optical section of a young moulting female, fourth stage, with details of the body cuticle ; G, surface view of anterior body region in female ; H, female reproductive system and tail.*


A
B
C
D
E
F
G
H
20 µm

Fourth stage juveniles.
Body cuticle ornamented as in female ; anteriorly, the ridges may be observed over the whole ring, posteriorly, the spiny ornamentation may also extend over the entire annule (Fig. 5 F). In a young moulting female, the reproductive system was completely formed, with reflexed branches and vagina (Fig. 5 F).

GENERAL REMARKS

The information on juvenile stages of *Metepsilonema* is limited. From the ten species described in the literature, no juveniles are known in *M. laterale, M. cuspidatum, M. emersum* ; juveniles are only known by the fourth stage in *M. lumbatum, M. leptaleum, M. acanthum.* Third and fourth stages are known in *M. hagmeieri* and *M. callosum*, but are difficult to discriminate (LORENZEN, 1973). First and fourth stage juveniles are known in *M. chilotum*, but in a few specimens (CLASING, 1986). *M. bermudae* is the only species of the genus of which all juvenile stages are known (CLASING, 1980). In the present contribution, juveniles of the second and fourth stages are described in *M. magdae* sp.n., second, third and fourth stages in *M. clasingae* sp.n. and only fourth stage in *M. glutinosum* sp.n.

Up to now, two species *(M. acanthum* and *M. clasingae)* are known to possess an obvious spiny subdorsal ornamentation in the posterior body region ; this being slightly more pronounced in female than in male and clearly better developed in juveniles. A similar observation is valid for cuticular striae (bars). Usually juvenile cuticular ornamentation and amphid structure look like those found in females. Cuticular ornamentation is more highly developed in all juvenile stages than in adults in *M. clasingae* sp.n., as illustrated by the large-sized subdorsal spines. However, similar observations are also known from terrestrial species belonging to the Criconematinae TAYLOR, 1936.
In most *Perepsilonema*, cuticular vacuoles are present in all juvenile stages whatever they occur or not in adults (GOURBAULT & DECRAEMER, 1988).

Acknowledgements

Financial support from the Museum national d'Histoire naturelle, Paris (Missions Muséum Antilles) and from the Ministère de l'Environnement, is gratefully acknowledged. The authors also wish to thank M.N. HELLEQUET for sorting the meiofauna samples and mounting the specimens.

References

CLASING, E., 1980. Postembryonic Development in Species of Desmodoridae, Epsilonematidae and Draconematidae. *Zoologische Anzeiger.*, Jena, 204, (5/6) : 337-344.

CLASING, E., 1984. Interstitielle Fauna von Galapagos. XXXII. Epsilonematidae (Nematodes). *Microfauna Marina*, 1 : 149-189.

CLASING, E., 1986. Epsilonematidae (Nematoda) from Chiloé (southern Chili), with descriptions of two new species. *Zoologica Scripta*, 15 : 295-303.

DECRAEMER, W. & N. GOURBAULT, 1987. Marine nematodes from Guadeloupe and other Caribbean Islands. VII. The genus *Epsilonema* (Epsilonematidae). *Bulletin van het koninklijk Belgisch Instituut voor Natuurwetenschappen.*, Biologie, 57 : 57-77.

DECRAEMER, W. & N. GOURBAULT, 1989. Nématodes marins de Guadeloupe. X. Trois nouvelles espèces du groupe *Metepsilonema callosum* (Epsilonematidae). *Bulletin du Muséum national d'Histoire naturelle,* Paris, 4 sér., sect. A (sous presse).

GOURBAULT, N. & W. DECRAEMER, 1986. Nématodes marins de Guadeloupe III. Epsilonematindae des genres nouveaux *Metaglochinema* n.g. (Glochinematinae) et *Keratonema* n.g. (Keratonematinae n.subfam.). *Bulletin de Muséum national d'Histoire naturelle*, Paris, 4e sér., 8, A, (1) : 171-183.

GOURBAULT, N. & W. DECRAEMER, 1987. Nématodes marins de Guadeloupe VI. Les genres *Bathyepsilonema* et *Leptepsilonema. Bulletin du Muséum national d'Histoire naturelle.* Paris, 4e sér. 9, A (3) : 603-629.

GOURBAULT, N. & W. DECRAEMER, 1988. Nématodes marins de Guadeloupe VIII. Le genre *Perepsilonema* (Epsilonematidae). *Bulletin du Muséum national d'Histoire naturelle*, Paris, 4e sér. 10, A, (3) : 535-551.

GOURBAULT, N., RENAUD-MORNANT, J. & HELLEQUET, M.N., 1985. Biotopes et peuplements méiofaunistiques des Petites Antilles (La Marie-Galante, les Saintes, la Désirade). Premières données. *Bulletin du Muséum national d'Histoire naturelle*, Paris, 4e sér. 7, A (2) : 419-432.

LORENZEN, S., 1973. Die Familie Epsilonematidae (Nematodes). *Mikrofauna Meeresboden*, 25 : 1-86.

RENAUD-MORNANT, J. & N. GOURBAULT, 1981. Premières prospections méiofaunistiques en Guadeloupe. I. Les biotopes et leurs peuplements. *Bulletin du Muséum national d'Histoire naturelle,* Paris, 4e sér. 3, A (4) : 1011-1034.

STEINER, G., 1927. Epsilonematidae, a new nemic family. *Journal of Parasitology.*, 14 : 65-66.

DECRAEMER, W.,
Koninklijk Belgisch Instituut
voor Natuurwetenschappen,
Vautierstraat 29,
B-1040 Brussels, Belgium.

GOURBAULT, N.
Muséum national
d'Histoire naturelle,
4A 699 CNRS, Biologie des
Invertébrés Marins,
57, rue Cuvier,
F-75231 Paris, France.