

## Two new species of *Morlaixia* gen. n. (Nematoda, Diplopeltidae) with a subterminal ventral mouth

by Magda VINCX and Nicole GOURBAULT

**Abstract.** — A new genus of the Diplopeltidae, *Morlaixia* gen. n., is described; species are characterized by an asymmetrical anterior end, which is caused by the subventral position of the mouth opening and the buccal cavity; that feature is unique for the group. Two new species, *M. contusa* sp. n. and *M. obscura* sp. n., are described from fine sands and silty sediments in the Bay of Morlaix.

**Résumé.** — Création d'un genre nouveau de Diplopeltidae, *Morlaixia* gen. n., nématode remarquable par l'asymétrie de son extrémité antérieure, liée à la position subventrale de la bouche et de la cavité buccale, phénomène unique pour ce groupe. Description de *M. contusa* sp. n. et *M. obscura* sp. n., présents dans les sables fins et vaseux du chenal de la baie de Morlaix.

M. VINCX, *Institute of Zoology, Marine Biology Section, K.L. Ledeganckstraat, 35, B-9000 Gent, Belgium.*  
N. GOURBAULT, *Muséum national d'Histoire naturelle, URA 0135 CNRS, Biologie des Invertébrés marins, 57, rue Cuvier, F-75231 Paris cedex 05, France.*

During the ecological survey in the Bay of Morlaix (GOURBAULT, 1981, 1987), two species of a new genus were found. These species are unique within the phylum of the Nematoda because of the presence of a ventrally displaced buccal cavity. Nematodes with a subterminal mouth cavity are only known from the Diplopeltidae (see LORENZEN, 1981 for a review).

### MATERIAL AND METHODS

Nematodes were collected in 1979, 1981, 1983 and 1984 in the lower part of the Morlaix estuary mostly. Specimens were fixed in neutral formalin and mounted in glycerine after dehydration. Drawings were made with the aid of a drawing tube on a Leitz Diaplan microscope with interference contrast equipment.

All measurements are in  $\mu\text{m}$ ; curved structures are measured along the arc. Values in the formula are as in VINCX *et al.* (1982).

Holotype male and one paratype female of each species are in the type collection of the Muséum national d'Histoire naturelle, Paris (MNHN). Other paratypes are in the nematode collection of the Institute of Zoology, Gent (RUG).

## DESCRIPTIONS

### MORLAIXIA gen. n.

GENERIC DIAGNOSIS : Diplopeltidae Filipjev, 1918. Diplopeltinae Filipjev, 1918. Cuticle annulated. Amphideal fovea spiral, loop-shaped with circular outline. Anterior end asymmetrical : mouth opening and buccal cavity displaced to the ventral body side. One ovary anterior and outstretched.

TYPE SPECIES : *Morlaixia contusa* sp. n.

OTHER SPECIES : *Morlaixia obscura* sp. n.

### *Morlaixia contusa* sp. n.

(Figs 1-2)

MATERIAL STUDIED : Six males, four females, two juveniles.

TYPE SPECIMENS : Holotype ♂<sub>1</sub> and one paratype female on slide AN 668 (MNHN); other paratype slides are AN 669 to 671 (MNHN) and 10253 to 10257 (RUG).

TYPE LOCALITY : Bay of Morlaix, stations B and C, 15 and 12 m depth respectively in the estuary (cf. GOURBAULT, 1987).

ETYMOLOGY : From latin *contundere* = to bruise (or contuse).

#### MEASUREMENTS :

Holotype male : ♂<sub>1</sub> :  $\frac{155}{15} \frac{M}{32} \frac{1270}{35} \frac{1325}{36} \mu\text{m}$ ; a = 39.6; b = 8.9; c = 12.0.

Paratype males (n = 4); L = 1 530 (1 400-1 655)  $\mu\text{m}$ ; a = 43.5 (34.4-50.0); b = 8.4 (8.1-8.9); c = 12.9 (12.5-13.7); spic. = 30 (29-31)  $\mu\text{m}$ .

Paratype females : ♀<sub>1</sub> :  $\frac{210}{15} \frac{1050}{35} \frac{1380}{45} \frac{1495}{35} \mu\text{m}$  a = 33.2; b = 7.1; c = 13.0; V = 70.9. (n = 3): L = 1 480 (1 400-1 500)  $\mu\text{m}$ ; a = 34.3 (32.9-35.9); b = 7.9 (7.0-8.5); c = 12.2 (11.9-12.9); V = 72.4 (67.5-76.5).

#### *Males*

Body long and slender with an asymmetrical head end and a conical tail.

Cuticle very faintly annulated, from head end to tail tip. Each annule about 1.5  $\mu\text{m}$  wide.

The six internal labial sensilla only visible in apical view (fig. 2D); they are papilliform and are moved to ventral 'side' of anterior end, surrounding the ventrally located mouth opening. The six external labial sensilla only slightly moved to the ventral body side; the ventrosublateral ones are situated more posteriorly and are somewhat longer (3-4  $\mu\text{m}$ ) than the two other pairs (2-3  $\mu\text{m}$ ) (lateral and dorsosublateral). The cephalic setae are 8-9  $\mu\text{m}$  long, and are situated at the anterior border of the amphideal fovea. Four cervical setae at the posterior level of the amphid (3  $\mu\text{m}$ ). Somatic setae very scarce, except on the ventral side of the tail (fig. 2H). The amphideal fovea is spirally loop-shaped and ventrally wound, 7  $\mu\text{m}$  in diameter (i.e. 40 % of the corresponding head diameter).

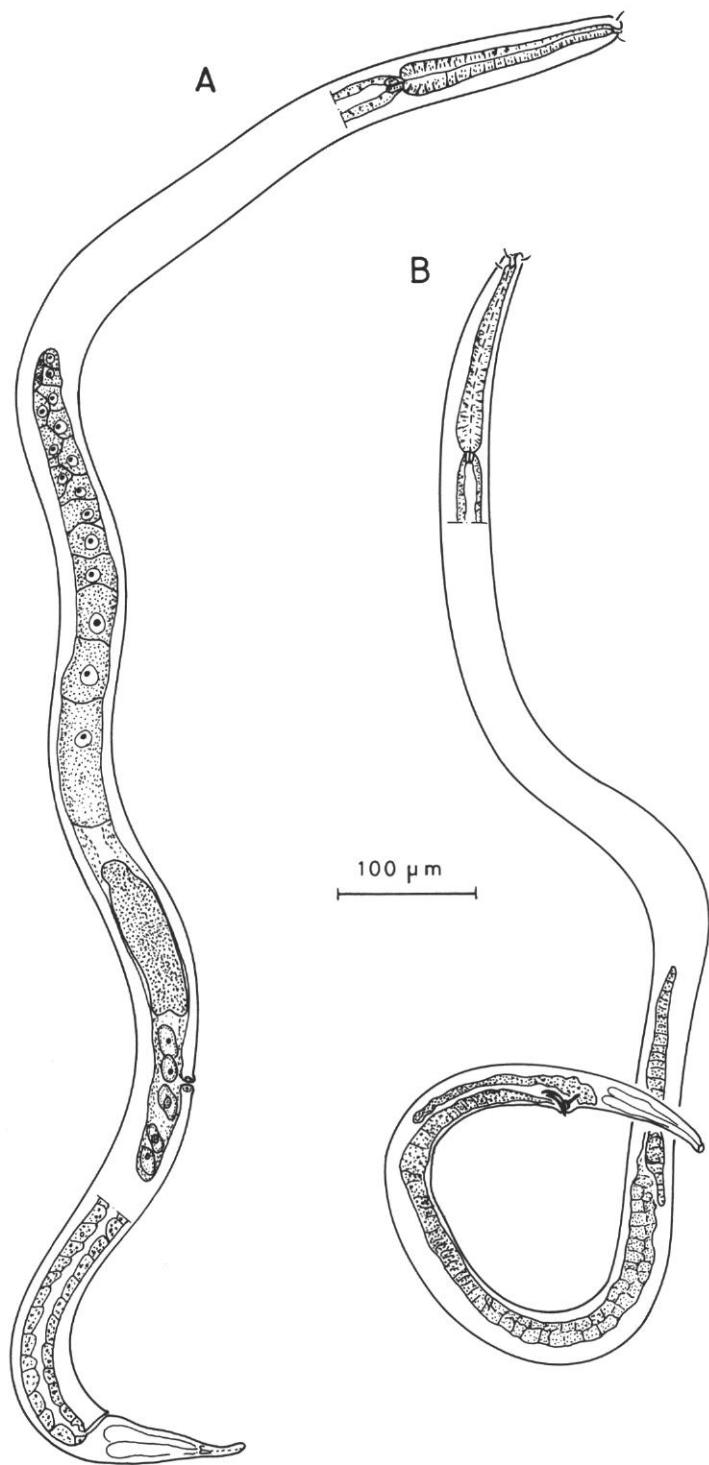


FIG. 1. — *Morlaixia contusa* sp. n. : A, total view ♀<sub>1</sub>; B, total view ♂<sub>1</sub>.

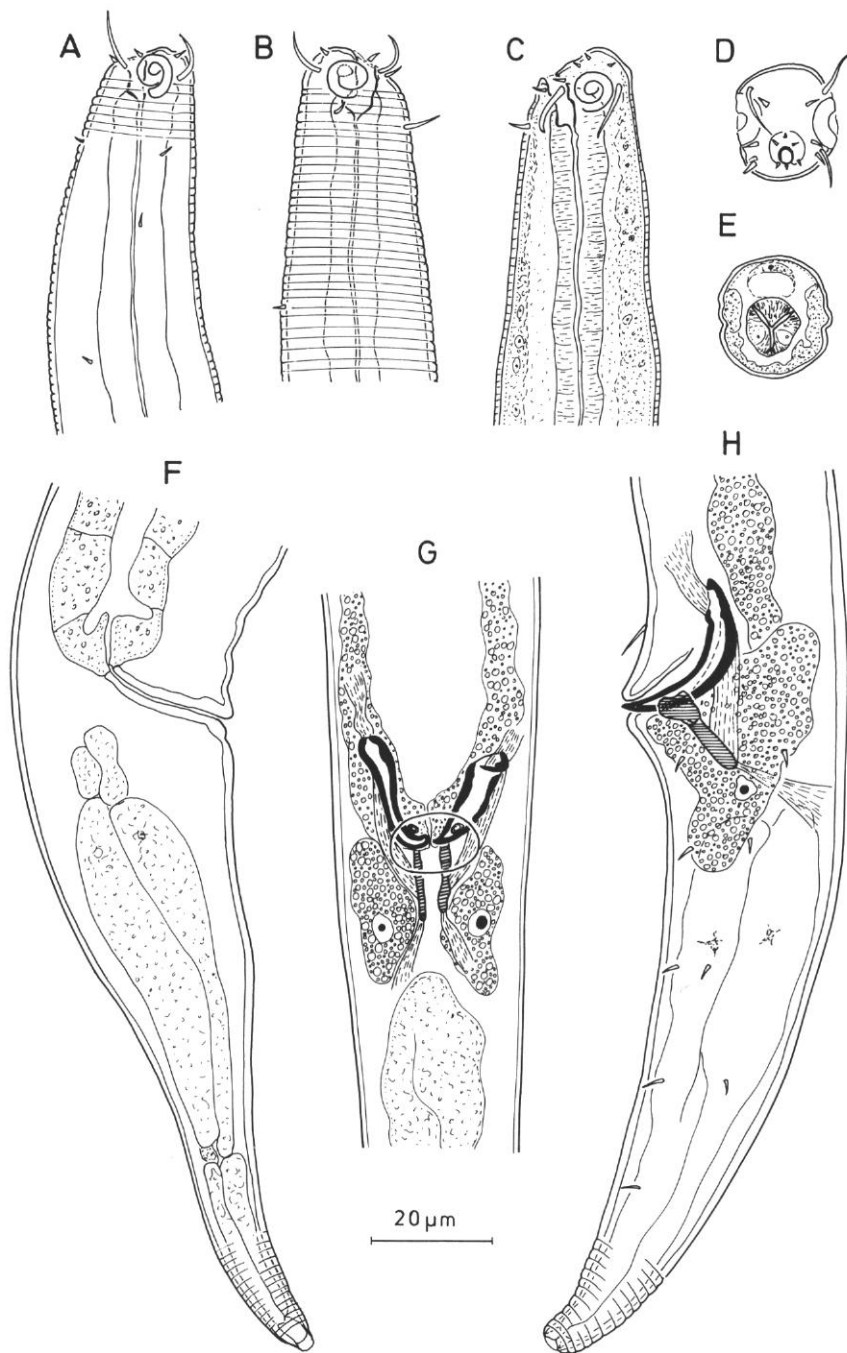


FIG. 2. — *Morlaixia contusa* sp. n. : A, head end ♀<sub>1</sub>; B, head end holotype ♂<sub>1</sub>, right side; C, head end holotype ♂<sub>1</sub>, left side; D, apical view male; E, cross section at the level of the pharynx, same male as in D; F, tail ♀<sub>1</sub>; G, ventral view male copulatory apparatus; H, copulatory apparatus and tail (lateral view) holotype ♂<sub>1</sub>.

Mouth opening moved to the ventral body side. Buccal cavity unarmed, asymmetrical and ventrally moved, only partly surrounded by pharyngeal tissue.

Pharynx slightly dorsally plicated in its anterior part (fig. 2A-C), with a weakly developed terminal bulb (fig. 1B). Cardia 11  $\mu\text{m}$  long. Ventral gland and nerve ring not obvious. Three caudal glands.

Diorchic, with opposed testes; the anterior one at the left, the posterior one at the right of intestine (except  $\sigma_2$ ). Large spermatogonia (10  $\mu\text{m}$ ) and globular granulated sperm cells (27  $\mu\text{m}$  long) (these especially obvious in females).

Spicules regularly curved, with heavily sclerotized shaft. Gubernaculum in two parts with two well developed dorso-caudally oriented apophyses (14  $\mu\text{m}$ ). One prominent, ventral preanal seta (7  $\mu\text{m}$ ) (fig. 2H). Musculature obvious. The copulatory apparatus is surrounded by several granular cells. Two very large cells reach up to 120  $\mu\text{m}$  anteriorly from the cloacal opening (fig. 1B, 2G, H).

### Females

Similar to the males, except slightly longer cephalic setae (10  $\mu\text{m}$ ), narrower tail and absence of granular cells in the posterior region. Very large outstretched anterior ovary, situated at the right of the intestine. Eggs 120  $\mu\text{m}$  long. Sperm cells present in posterior part of the uterus and in a posterior spermatheca (rest of the posterior tract of the genital system) (fig. 1A).

DIAGNOSIS : *Morlaixia contusa* sp. n. is characterized by round ovoid-shaped amphids, pharynx without a prominent bulb; conical tail, presence of cervical setae, strongly sclerotized spicules and gubernaculum with two well developed apophyses surrounded by granular accessory glands. Similar glands are up to now found in *Diplopeltula sundensis* Jensen, 1978, only.

### *Morlaixia obscura* sp. n.

(Fig. 3)

MATERIAL STUDIED : Two males, ten females and two juveniles.

TYPE SPECIMENS : Holotype male and two paratypes females on slide AN 668 (MNHN); other paratypes on slide AN 672-674 (MNHN) and on slide n° 10258-10259 (RUG).

TYPE LOCALITY : Bay of Morlaix, stations B and C, 15 and 12 m depth respectively in the estuary.

### MEASUREMENTS :

Holotype male :  $\sigma_1$  :  $\frac{110}{8} \frac{M}{18} \frac{915}{18} \frac{15}{15}$  985  $\mu\text{m}$ ; a = 54.7; b = 8.9; c = 14.01; spic. = 17  $\mu\text{m}$ .

Paratype  $\sigma_2$  : L = 1040  $\mu\text{m}$ ; a = 52.0; b = 8.8; c = 13.0; spic. = 18  $\mu\text{m}$ .

Paratype females :  $\varphi_1$  :  $\frac{110}{9} \frac{625}{20} \frac{940}{25} \frac{16}{16}$  1030  $\mu\text{m}$ ; a = 41.2; b = 9.3; c = 11.4; V = 60.6 %.  
(n = 5) : L = 1025 (960-1150)  $\mu\text{m}$ ; a = 41.4 (34.9-49.5); b = 8.9 (8.2-9.8); c = 11.2 (10.4-12.1); V = 60.6 (57.9-62.2) %.

### Males

Body slender, with a slightly asymmetrical head end and a conico-cylindrical tail. Tail elongated, 4.5-5 times the length of the body diameter at anal level.

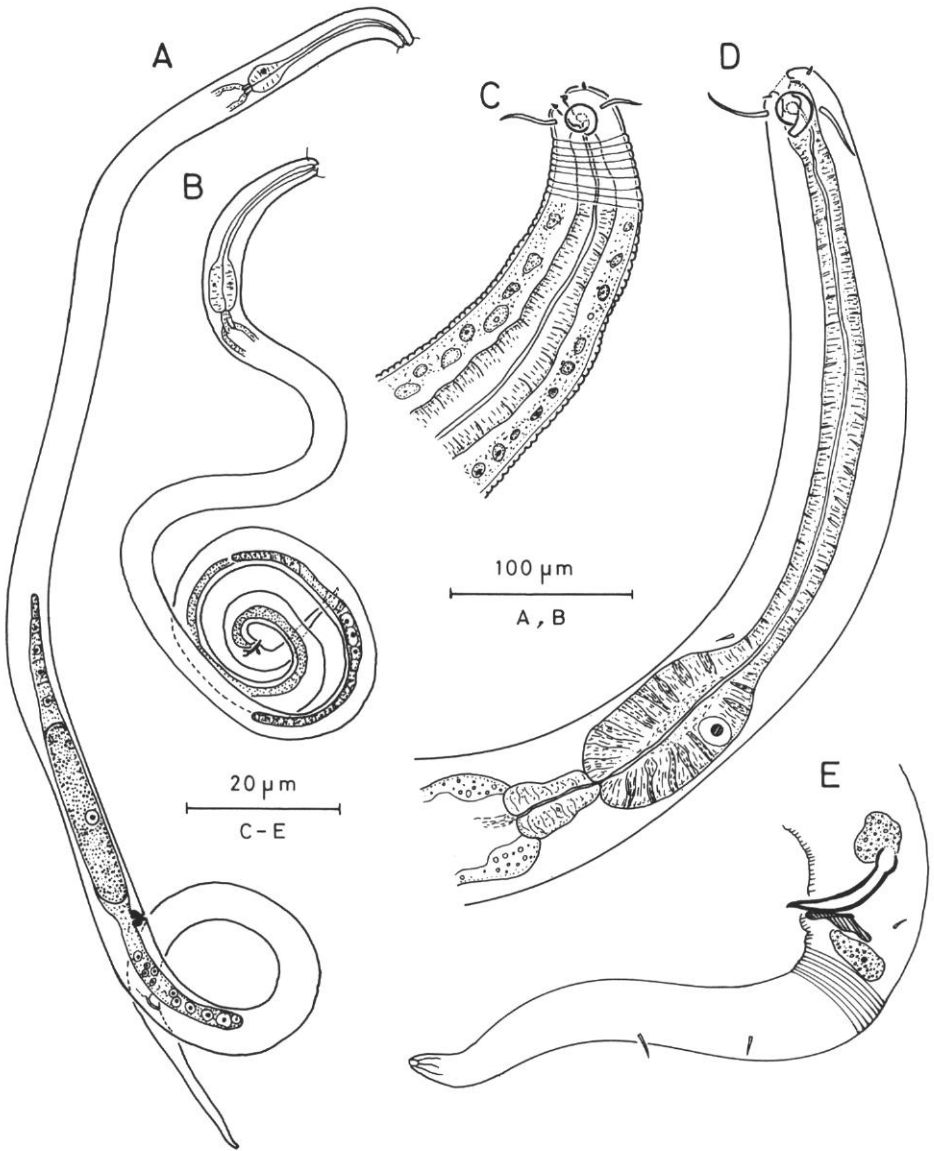


FIG. 3. — *Morluixia obscura* sp. n. : A, total view ♀<sub>1</sub> ; B, total view holotype ♂<sub>1</sub> ; C, head end ♀<sub>1</sub> ; D, pharyngeal region holotype ♂<sub>1</sub> ; E, tail region and copulatory apparatus holotype ♂<sub>1</sub>.

Cuticle obviously annulated ( $1.5\mu\text{m}$ ). Mouth opening subterminal, ventrally displaced. Internal labial sensilla not found. The six external labial papillae are  $1.5\text{--}2\mu\text{m}$  long; the four cephalic setae, situated at the mid-amphideal level, are  $11\mu\text{m}$  long (1.3 times the corresponding head diameter) (fig. 3D).

Somatic setae very scarce, except on the subdorsal side of the tail (fig. 3E).

The amphideal fovea is loop-shaped, ventrally wound with a diameter of  $6\mu\text{m}$  (*i.e.* 57 % of the corresponding head diameter).

Buccal cavity unarmed; narrow cylindrical pharynx ending in a pyriform ( $25\mu\text{m}$ ) bulb. Cardia  $13\mu\text{m}$  long. Ventral gland anterior to the pharyngeal bulb.

Diochric : opposed testes, on the right and ventrally from the intestine. Spicules simple and slightly bent ( $18\text{--}20\mu\text{m}$  long), with capitulum slightly differentiated. Gubernaculum weakly sclerotized; apophyses hardly visible. Two small granular cells are present at the level of the spicular capitulum and at the posterior level of the gubernaculum respectively.

### Females

Similar to the males, but with a longer tail.

Monodelphic : outstretched anterior ovary very short and situated at the left of the intestine. One of the eggs is  $100\mu\text{m}$  long. A posterior spermatheca (with sperm cells) is present.

DIAGNOSIS : *Morlaixia obscura* sp. n. is characterized by the well developed, pyriform terminal bulb of the pharynx, the shape of spicules and gubernaculum, the short female reproductive system.

### DISCUSSION

Occurrence of a subventrally located buccal cavity has never been reported in the phylum Nematoda. The subterminal position of the mouth opening has been recorded for the genera *Campylaimus* Cobb, 1920, *Diplopeltula* Gerlach, 1950 *partim* and *Pararaeolaimus* Timm, 1961 *partim*, but in all these cases the mouth opening is dorsally displaced. However, COBB (1920) described the anterior region of *Campylaimus inaequalis* Cobb, 1920, as follows : "The mouth is a simple, unarmed, conoid depression on the ventral side of the head a little behind the anterior extremity". We think that in this particular case, the orientation of the animal is misinterpreted, because, looking at the shape of the amphideal fovea in figure 4 on p. 232, the mouth is displaced dorsally and not ventrally as COBB mentioned.

The circular outline of the amphideal fovea of *Morlaixia* gen. n. is as in *Araeolaimus* de Man, 1888 *partim*, *Cylindrolaimus* de Man, 1880 *partim* and *Metaraeolaimodes* De Coninck, 1936.

All the Diplopeltidae previously described are known to be didelphic. Only two species of the freshwater *Cylindrolaimus* : *C. monhystera* Schneider, 1937, and *C. obtusus* Cobb, 1916, are monodelphic. They share this feature with *Morlaixia* gen. n.; but *Campylaimus* species have a well-developed, long and cylindrical buccal cavity.

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