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Epsilonematidae, marine nematodes, from a sandy salt marsh in France.

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Abstract : From a sandy salt marsh predominantly covered by *Halimione portulacoides,* at the northern coast of Bretagne (France), *Bathyepsilonema spinulosum* sp. n. is described and *Epsilonema lasium* Lorenzen 1973 is redescribed. These are the first records of epsilonematid species from a salt marsh. *E. lasium* is the first epsilonematid species to be recorded from both sides of the Atlantic.

Résumé : Description de *Bathyepsilonema spinulosum* sp. n. et redescription *d'Epsilonema lasium* Lorenzen 1973 récoltés dans un pré salé à *Halimione portulacoides,* d'un estuaire sableux de la côte nord de Bretagne (France). Des epsilonemtidés sont récoltés pour la première fois dans un pré salé, et *E. lasium* en est la première espèce signalée des deux côtés de l'Atlantique.

INTRODUCTION

Epsilonematidae are small free-living marine nematodes which are bent like an epsilon and crawl caterpillars -like over solid surfaces. Actually, about 60 epsilonematid species are known which are accommodated in 12 genera and 3 subfamilies. Most of these species occur in eu- and sublitoral sandy biotopes, some (about a dozen species known up to now) in various epistrats including byssus threads of mussels or habitats between algae. Epsilonematids are unknown from muddy sediments.

In a survey of the nematode fauna of a salt marsh in a sandy estuary of the small river Ilet in Sables-d'Or-les-Pins (northern Bretagne, France) which is predominantly covered by *Halimione portulacoides* (Chenopodiaceae), two epsilonematid species were found. These are the first records of epsilonematids from salt marshes. Both species occurred exclusively in sandy horizontal layers of the salt-marsh and were absent in the adjacent muddy layers and elsewhere in the estuary. One of these species, *Bathyepsilonema spinulosum*, is new, the other, *Epsilonema lasium*, is the first epsilonematid species to be recorded from both sides of the Atlantic. Both species are described and redescribed, respectively, in the present paper.

MATERIAL AND METHODS

Samples and subsamples were taken from sandy and muddy facies of the salt marsh located in the sandy estuary of the small river Ilet in Sables-d'Or-les-Pins, at 54°02,5'N,

05°18,5'W, on 15 July 1986 and 4 August 1991. Living nematodes and debris were extracted from the sand by a combination of decantation and sieving ; the mesh width of the sieve employed was 55 µm. The sieve covered by the nematodes and debris retained was placed about 3 mm above the bottom of a petri dish filled with seawater. The nematodes crawled through the meshes to the bottom of the petri-dish, were collected from there during a period of three days, fixed and preserved in 4 % sea-water formalin and slowly transferred into glycerin for microscopical examination. The holotype of the new species and further specimens are deposited in the nematode collection of the Institute of Polar- and Marine Biology (NSIMB).

In the measurements, L refers to the total body length, R to the number of body annules counted in the subdorsal body region, D to the relation of smallest to largest body diameter, Spic. to the length of the spicules measured as the chord rather than the curve, and V to the position of the Vulva behind the anterior end in % of the total body length.

DESCRIPTIONS

Bathyepsilonema spinulosum sp. n.

(Fig. 1a-c)

Material studied : δ_1 (holotype, NSIMB n° 511a), φ_1 (same slide as holotype), 1 further φ, 2 juv. : 4 August 1991, Sables-d'Or-les-Pins (northern coast of Bretagne, France), salt marsh predominantly covered by *Halimione portulacoides*, sandy layer in about 5 cm depth.

Measurements :

δ_1 : L = 360 µm, 176 R, D = 18 µm : 27 µm = 1 : 1,5, Spic. = 28 µm

φ_1 : L = 315 µm, 179 R, D = 18 µm : 30 µm = 1 : 1,7, V = 65 %

φ_2 : L = 325 µm, 179 R, D = 18 µm : 30 µm = 1 : 1,7, V = 66 %

The body is provided with 176 to 179 annules. The anterior part of the body is more coarsely annulated than the posterior. Each annule is provided with a single row of vacuoles (Fig. 1b). The outer layer of the annules is directed forwardly in the anterior and backwardly in the posterior part of the body ; the direction changes where the body is bent most sharply (see arrows in Figs 1a and b). The annules of the middle and posterior body region are provided with tiny spines (Figs 1a and b). 8 rows (4 subdorsal, 4 subventral) of 3-27 µm long somatic setae are present. At the beginning of the second large curve of the epsilon, the 4 subventral rows of somatic setae are transformed into 6 rows with each 7-9 ambulatory setae of 11-13 µm length ; the innermost rows are very close together. Like all setae, the ambulatory ones project from sharply circumscribed insertion spots. The somatic setae posterior to the external rows of ambulatory setae are not transformed into supporting setae.

The head capsule is provided with 4 cephalic and 8 subcephalic setae of 7-8 µm length. In preserved specimens, the lip region is withdrawn. The amphids are unispiral, 5 µm wide, and do not display sexual dimorphism. No teeth could be observed in the buccal cavity. The pharynx is provided with a strong posterior bulb. Spicules are equally shaped, the guberna-

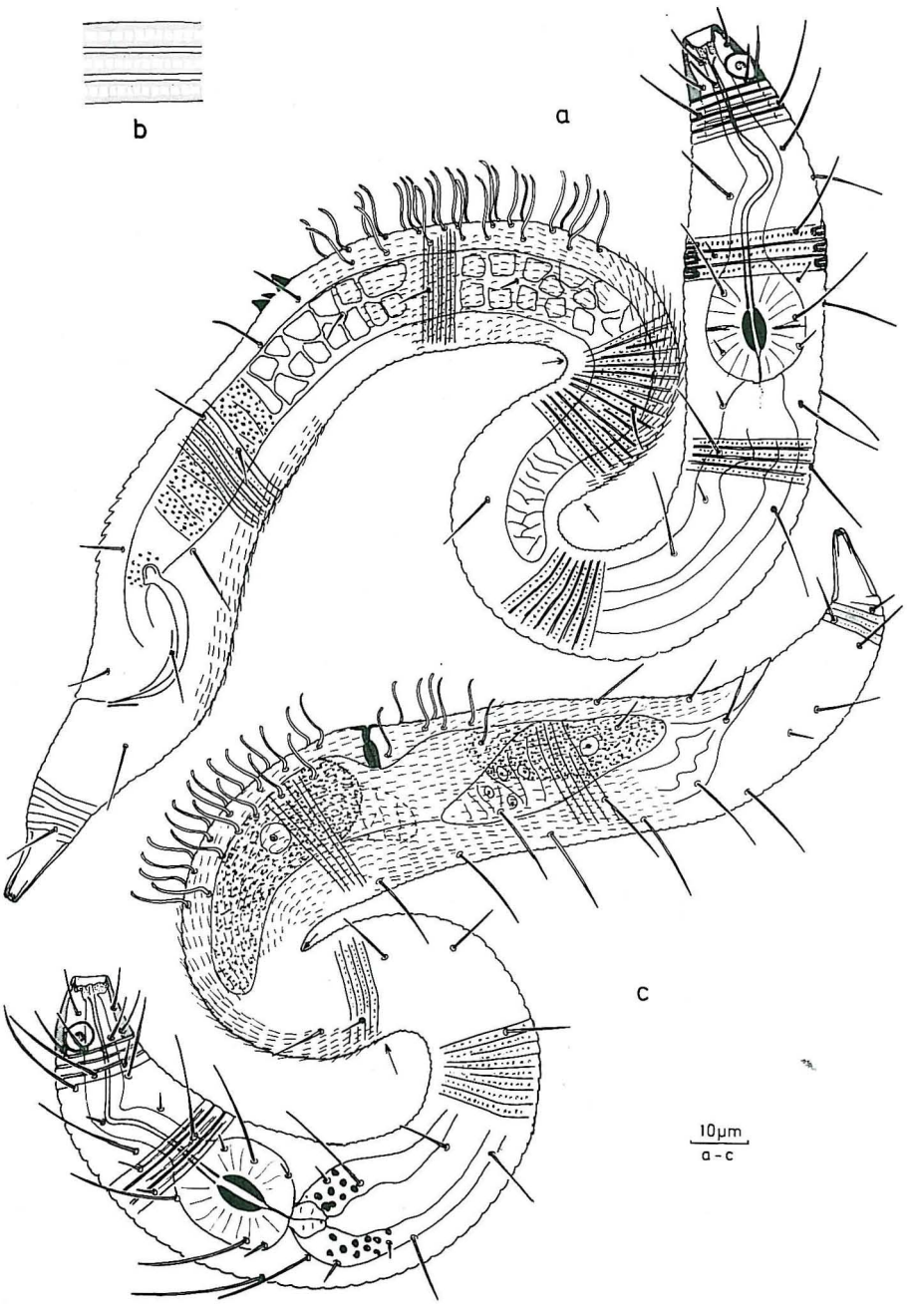

Fig. 1 : *Bathyepsilonema spinulosum*. - a. Total view of ♂$_1$ (holotype) ; b. annules at the level of the pharyngeal bulb of ♀$_1$; c. total view of ♀$_1$.

culum is small. Three preanal ventral copulatory thorns are present in the male. Males are provided with one testis, females with two antidromously reflexed ovaries ; the anterior ovary is bent to the left, the posterior to the right.

Discussion : within the subfamily Epsilonematinae, 6 rows of ambulatory setae occur in the genera *Bathyepsilonema* Steiner 1927, *Leptepsilonema* Clasing 1983 (innermost rows mostly fused together), *Akanthepsilonema* Gourbault & Decraemer 1991, and *Triepsilonema* Decraemer 1982 (for references see Lorenzen 1973, Decraemer 1982, Clasing 1983, Gourbault & Decraemer 1987 and 1991, Verschelde & Vincx 1992). The known species of the former three genera are provided with 84 to 126 body annules, the only species of *Triepsilonema, T. tripapillata*, with 195-198, whereas the present species is provided with 176-179 annules. The present species is included in *Bathyepsilonema*, as all subcephalic setae originate from the posterior margin of the head capsule and as no prominent spines occur in the dorsal region of the middle and posterior part of the body (as in *Akanthepsilonema*) and as the tail does not terminate in three papillae.

Epsilonema lasium Lorenzen, 1973
(Fig. 2a-e)

Material studied : 12 ♂♂, 20 ♀♀, 2 juv. : 15 July 1986, Sables-d'Or-les-Pins (northern coast of Bretagne, France), salt marsh predominantly covered by *Halimione portulacoides*, sandy layer from about 5 cm depth.

$♂_1$ - $♂_4$, $♀_1$ - $♀_3$($♂_1$ and $♀_1$ on NSIMB N° 511b), $juv._1$, additional 12 ♂♂, 15 ♀♀, 12 juv. : 4 August 1991, the same habitat.

Measurements :

$♂_1$: L = 265 µm, 184 R, D = 16 µm : 22 µm = 1 : 1,4, Spic. = 25 µm
$♂_2$: L = 295 µm, 175 R, D = 15 µm : 21 µm = 1 : 1,4, Spic. = 27 µm
$♂_3$: L = 275 µm, 188 R, D = 15 µm : 20 µm = 1 : 1,3, Spic. = 27 µm
$♂_4$: L = 290 µm, 179 R, D = 15 µm : 20 µm = 1 : 1,3, Spic. = 26 µm
$♀_1$: L = 275 µm, 173 R, D = 15 µm : 23 µm = 1 : 1,5, V = 66 %
$♀_2$: L = 260 µm, 172 R, D = 15 µm : 23 µm = 1 : 1,5, V = 65 %
$♀_3$: L = 275 µm, 178 R, D = 15 µm : 25 µm = 1 : 1,7, V = 65 %
$juv._1$ (III) : L = 225 µm, 186 R, D = 14 µm : 19 µm = 1 : 1,4

Remarks : The present specimens agree in most respects with those of the original description (Lorenzen 1973), which were collected from sandy beaches of Charleston, South Carolina, and Bermuda, and with those of the redescription by Decraemer & Gourbault (1987), which were collected from littoral sandy habitats of Guadeloupe. Clasing (1984) recorded the species from the Galapagos islands. The present specimens differ from those of previous descriptions in the following details :

- Only 5 rather than 6 subcephalic setae are present : one dorsal and four sublateral ones.

Fig. 2 : *Epsilonema lasium*. - a. Total view of ♀$_1$; b. total view of ♂$_1$; c. total view of juv.$_1$; d. copulatory apparatus of ♂$_3$; e. protruded labial region of ♂$_2$.

- Most males are provided with only three pairs of prominent copulatory thorns ; five pairs are rarely present. Additionally, some small thorns are present. In the males from the American side of the Atlantic, four to five pairs of prominent copulatory thorns are common, whereas the occurrence of only three pairs seems to be the rare, and additional small thorns are absent.

- Anal thorns are absent, whereas American males are provided with two.

- The number of body annules (172-188) is somewhat higher than in American specimens (146-164).

All setae, ambulatory setae included, project from small, sharply lined insertion spots, whereas all spines and thorns do not, as they are modifications of the body annules. In most preserved specimens, the lip region is withdrawn.

The differences between the American and European specimens are regarded as too insignificant as to justify erection of a new species for the latter.

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