BATHYEURYSTOMINA, A NEW GENUS OF FREELIVING MARINE NEMATODES (ENCHELIDIIDAE) FROM THE ROCKALL TROUGH

by

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Résumé

Bathyeurystomina gen. nov. (Enchelidiidae, Eurystomininae) contient deux nouvelles espèces de Nématodes libres marins inféodés aux sédiments profonds du Rockall Trough. Des remarques générales sur les genres de la sous-famille des Eurystomininae sont incluses. Nous proposons aussi quelques petits changements dans la nomenclature de ces genres. Une clé de détermination est donnée pour les genres valables de la sous-famille.

Introduction and methods

The specimens described in this work were obtained from box-core samples collected on cruise 12B/75 of the RRS *Challenger* in September 1975 at a depth of 2875 metres in the southern Rockall Trough by Dr J.D. Gage who has described the sea bed environment (Gage, 1977). Specimens belonging to the new genus were extracted from samples taken within the area 55°03'—55°04'N and 12°02'—12°06'W. The formalin-fixed specimens were transferred to glycerine for examination and preservation.

The generic placement of these nematodes presented some problems and entailed an exhaustive examination of the literature relating to the Eurystomininae together with type material held at the Natural History Museum, London. As a result, a brief discussion of the subfamily and some nomenclatural alterations are presented.

DESCRIPTION

BATHYEURYSTOMINA gen. nov.

Generic diagnosis

Enchelidiidae, Eurystomininae. Relatively large, slender and anteriorly attenuated. Ocelli absent. Cuticle smooth. Six labial setae. Six longer and four shorter cephalic setae in one circle.

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Tome XX - 1979 - pp. 371-380

Somatic setae short. Stomatal opening surrounded by complex flap-like lips. Buccal denticles not organised into definite rows. Large right subventral tooth only. Oesophageal bulbs absent. Anterior quarter of tail conical, remainder flagellate. Caudal glands absent. Gubernaculum with a well developed apophysis. Two cuticularised tubular precloacal supplements surmounted by a distinct cap. Additional small cuticularised body situated between posterior supplement and cloacal opening.

Type species: *Bathyeurystomina valeriae* gen. nov., sp. nov.

BATHYEURYSTOMINA VALERIAE gen. et **sp.** nov.
(Fig. **1, a-g)**

Material studied: **2** ♂♂, **1** ♀, deposited at the British Museum (Natural History) with the following registration numbers:

Holotype — ♂ **1,** BM(NH) **1977: 7463.**

Paratypes — ♂ **2,** BM(NH) **1977: 7465;** ♀ **1,** BM(NH) **1977: 7464.**

Measurements (mm)

	♂ 1	♂ 2	♀ 1
Length	8.770	7.780	7.056
Maximum width	0.090	0.092	0.099
Oesophagus **length**	1.990	1.800	1.915
Tail length	0.500	0.436	0.413
Nerve ring from anterior	0.500	0.449	—
Head width	0.036	0.035	0.037
Longer cephalic setae length	0.011	0.014	0.013
Shorter cephalic setae length	—	0.006	0.008
Labial setae length	0.004	0.004	0.005
Amphid width	0.012	0.012	—
Buccal cavity length	0.040	0.039	0.040
Buccal cavity maximum width	0.028	0.027	0.029
Large tooth length	0.018	0.018	0.018
Vulva from anterior	—	—	4.784
Spicule length (arc)	0.139	0.134	—
Anterior supplement from cloaca	0.235	0.235	—
Posterior supplement from cloaca	0.160	0.171	—
Precloacal **body** from cloaca	0.095	0.107	—
De Man Ratios **: a**	97.4	84.6	71.3
De Man Ratios **: b**	4.4	4.3	3.7
De Man Ratios **: c**	17.5	17.8	17.1
Vulva **p. 100**	—	—	68

Description

Body large, slender, anteriorly attenuated and colourless. Ocelli absent. Cuticle smooth, except in the anterior cephalic region where fine diagonal striations occur. Cuticle surrounding the mouth has

a corrugated appearance (Fig. 1, a) presumably to allow for expansion. Inverted 'V'-shaped structures are located in the cuticle posterior to the mouth but their function is not clear (Hopper, 1963). Six labial setae appear to be present, although these were difficult to

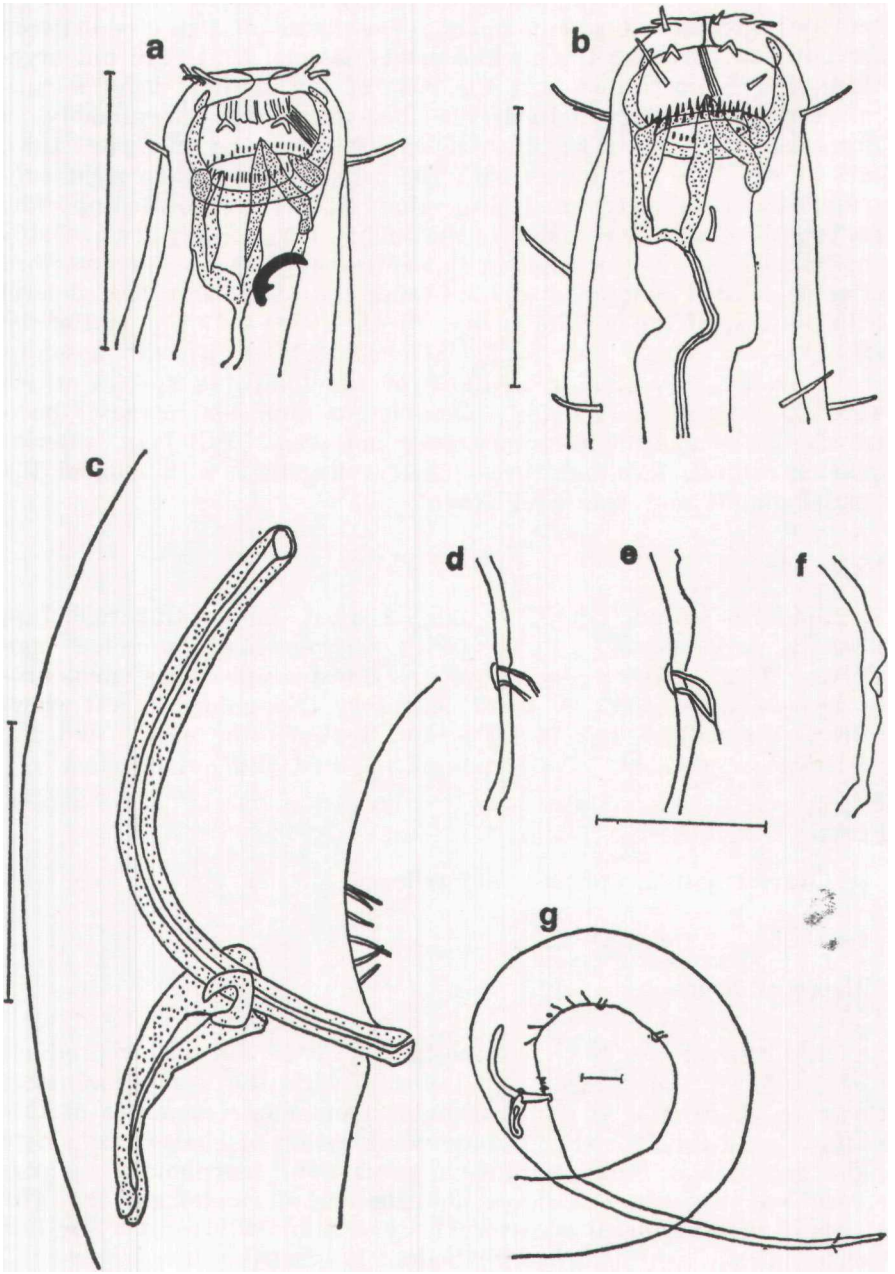

Fig. 1
Bathyeurystomina valeriae sp. nov.
a: head of male; b: head of female; c: spicule and gubernaculum; d: anterior precloacal supplement; e: posterior precloacal supplement; f: triangular precloacal body; g: tail of male.
Scale: 0,05mm.

distinguish from the complex flap-like lips. Some cephalic setae were missing (presumably due to handling damage) but from those remaining a single circle of six long and four short setae could be deduced as normal. Short somatic setae located anterior to nerve ring, in precloacal region and on the tail. Buccal cavity large, heavily cuticularised and complex. The band of denticles between the anterior part and the onchial cavity (Inglis, 1964) are not organised into distinct rows. At the base of the denticle band a cuticularised thickening encircles the buccal cavity; presumably a strengthening bar. The onchial cavity forms an elongate tube, part of which is continuous with the broad-based hollow right subventral tooth. Two (?) small projections (teeth?) are located opposite the large tooth at the entrance to the onchial cavity: they are probably not homologous to the smaller subventral or dorsal teeth described in some related genera. Amphids faint, crescentic and located level with the base of the onchial cavity. In the type (á 1), one end of the crescent was clearly seen to be 'notched' (Fig. 1, a): the amphids are probably very similar to those of the following species which were observed in more detail. Oesophagus diameter increases posteriorly; bulbs absent. Excretory pore not seen. Tail long, anterior quarter conical, terminal three-quarters flagellate with conical tip. Caudal glands and spinneret absent.

Male

Spicules paired, equal, arcuate, 2 a.b.d. long. Gubernaculum strongly cuticularised, complex with dorso-caudally directed apophysis. Two tubular cuticularised precloacal supplements surmounted by a distinct cap. A small accessory triangular (lateral view) refractive structure was found located between the cloaca and the posterior supplement. Testes paired, opposed and outstretched.

Female

Ovaries paired, opposed and reflexed.

Differential diagnosis

The general morphology of the buccal cavity and male reproductive structures indicates a relationship with the Eurystomininae. However, *B. valeriae* is distinguishable from other members of this subfamily by the following unique combination of characters: single right sub-ventral tooth, denticle organisation, morphology of precloacal supplements, tail shape and absence of caudal glands. The status of the precloacal accessory body remains equivocal. For this species, a new genus *Bathyeurystomina* is erected.

BATHYEURYSTOMINA ROCKÁLLENSIS sp. nov.
(Fig. 2, a-f)

Material studied: 1 *S*, deposited at the British Museum (Natural History) with the following registration number:
Holotype—♂ 1, BM(NH) 1977: 7466.

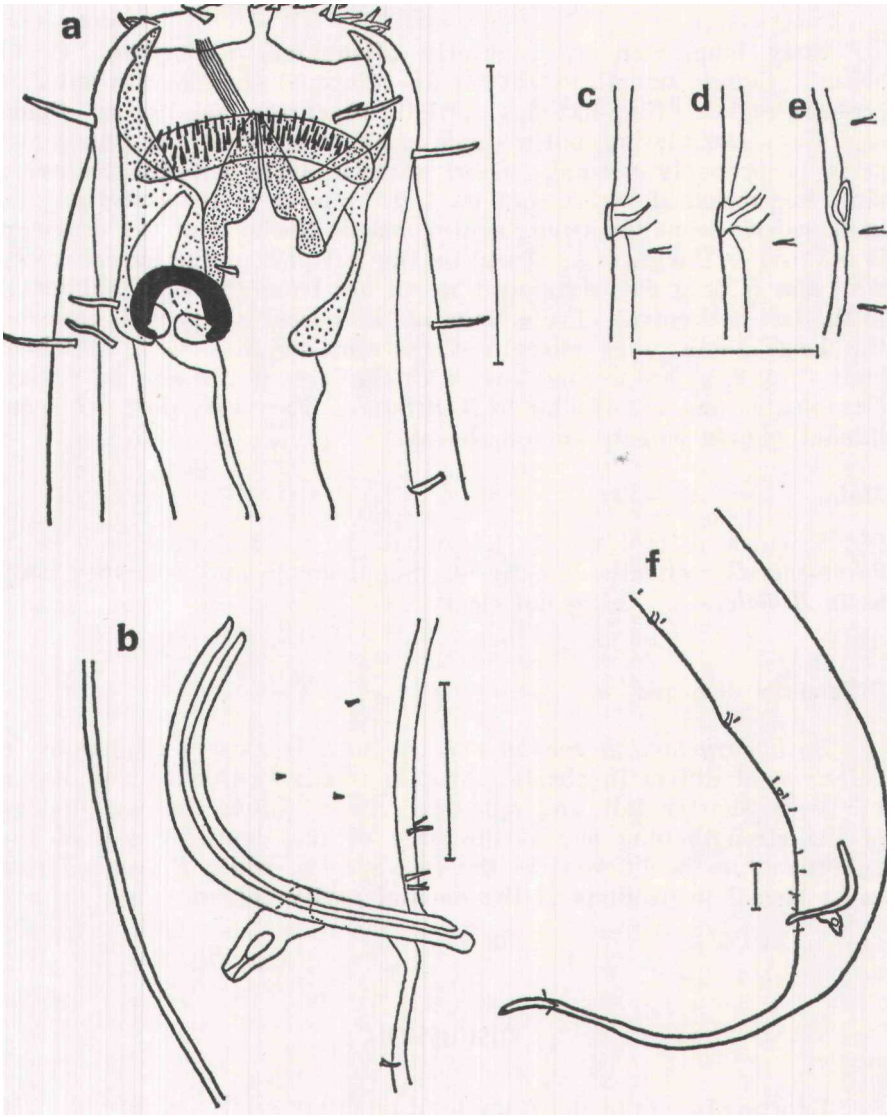

FIG. 2
Bathyeurystomina rockallensis sp. nov.

a: **head;** b: **anterior** precloacal supplement; c: posterior precloacal supplement; d: triangular precloacal body; e: spicule and gubernaculum; **f:** tail.
Scale: 0,05mm.

Measurements (mm)

Length, 10.480; maximum width, 0.140; oesophagus length, 2.240; tail length, 0.450; nerve ring from anterior, 0.863; head width, 0.058; longer cephalic setae, 0.012; shorter cephalic setae, 0.006; labial setae, 0.006; amphid width, 0.018; buccal cavity length, 0.056; buccal cavity maximum width, 0.049; tooth length, 0.026; spicule length (arc), 0.147; anterior supplement from cloaca, 0.385; posterior supplement from cloaca, 0.240; precloacal body from cloaca, 0.138; De Man ratios: a, 74.9; b, 4.9; c, 23.3.

Description

Body long, slender, anteriorly attenuated, colourless. Ocelli absent. Cuticle smooth except for fine diagonal striations in anterior cephalic region. Flap-like lips partially obscuring labial setae. Some cephalic setae missing, but a single circle of six long and four short setae is probably normal. Short somatic setae anterior to nerve ring, in precloacal region and on tail. Buccal cavity essentially as in *B. valeriae,* but the strengthening bar at the base of the denticles is reduced in thickness or absent on the left part of the buccal cavity wall and is only well developed in an arc from the right subdorsal to the left subventral. Projections of the buccal cavity wall opposite the large tooth were absent. Crescentic amphids with 'notched' ends (Fig. 2, a) are located level with the base of the onchial cavity. Oesophagus and tail similar to *B. valeriae.* Excretory pore not seen. Caudal glands and spinneret absent.

Male

Spicules paired, equal, 1.6. a.b.d. long. Gubernaculum with dorso-caudally directed apophysis. Supplements and accessory body as in *B. valeriae.* Testes not clear.

Differential diagnosis

Bathyeurystomina rockallensis sp. nov. is closely related to *B. valeriae* but differs in absolute size, is relatively thicker and has a relatively shorter tail and spicules. In addition, the morphology of the strengthening bar at the base of the denticles and of the gubernaculum is different in the two species, while *B. rockallensis* lacks buccal projections at the onchial cavity entrance.

DISCUSSION

Representatives of the Eurystomininae are relatively infrequently reported, poorly known and show a high degree of infra-generic variation. The group clearly needs considerable revision based on more hard data, but we present at this stage some salient points in the hope of promoting discussion and further investigation.

Male specimens are critical to a taxonomic analysis of the group (Inglis, 1962). Indeed, an important division of the Enchelidiidae into the subfamilies Eurystomininae and Enchelidiinae is based on the sexual dimorphism of the latter-hence the confusion that exists between *Belbolla* and *Polygastrophora.* This being so, we consider all taxa of the Eurystomininae described without a male as *species dubiae* and for convenience we list below those species not previously so designated.

Gerlach and Riemann (1974) erected a new subfamily Thoonchinae for the genera *Ditlevsenella* and *Thoonchus,* due to the greater resemblance these bear to the Oncholaimidae than other genera (Riemann, pers. comm.) : they lack precloacal cuticularised supplements and possess a more oncholaimid arrangement of the buccal armature. However, in that the presence or absence of supplements is currently accepted as a variable infrageneric character among the Eurystomininae (cf *Belbolla)* and that species can be transferred from *Ditlevsenella* to other genera on the basis of a single character (cf *Eurystomina cassiterides* (Warwick, 1977) comb. nov.: see below), perhaps there may not be a significant discontinuity between *Ditlevesenella-Thoonchus* and the others. Therefore, we would question whether the erection of this new subfamily is not rather premature.

Lyranema Timm, 1961 and *Megaeurystomina* Luc and De Coninck, 1959 are both represented by single species possessing unusual characters making their systematic position uncertain. Since males are unknown in these genera, we consider them doubtful.

Belbolla Andrassy, 1973 is a heterogeneous grouping of species having in common the possession of multiple oesophageal bulbs while *Ledovitia* Filipjev, 1927 and *Thoonchus* Cobb, 1920 are rather poorly known genera, existing descriptions of which do not always indicate the status of salient generic characters.

Ditlevsenella Filipjev, 1927 is represented by two valid species lacking denticles and cuticularised supplements but apparently differing in the position of the longest tooth (Hopper, 1963; Riemann, 1966). *Ditlevsenella cassiterides* Warwick, 1977 was re-examined using differential interference contrast microscopy, which showed denticles present in the buccal cavity, so the species is transferred to *Eurystomina.* This discovery perhaps highlights the difficulties inherent in attempting to evaluate descriptions of species not supported by type specimens.

Eurystomina Filipjev, 1921 represented by several species having rows of buccal denticles, cuticularised precloacal suplements and functional caudal glands, is the most well known of the genera. Inglis (1962) considered the gubernaculum shape of great importance in distinguishing species, but more recent analyses have allowed of a greater degree of variation (Wieser and Hopper, 1967; Yeates, 1967). If, as Inglis (1962, p. 252) himself points out in discussing the precloacal supplements, some degree of artistic licence can be attributed to rather weak early descriptions, then this argument can presumably be extended to the gubernaculum and other structures. Therefore, perhaps the status of *E. spectabilis* (Marian, 1870), *E. tenuis* (Marian, 1870) and *E. filiformis* (De Man, 1888) as separable from *E. ornata*

(Eberth, 1863) should now be questioned. We would suggest that these taxa should be treated as a single species-complex pending further evidence, rather than following Inglis' (1962) views. Likewise, Inglis' (1962) renaming of Chitwood's (1951) redescription of *E. americana* Chitwood, 1936 as *E. chitwoodi* should be rejected, as indicated by Wieser and Hopper (1967).

The validity of many other *Eurystomina* species have been questioned by Wieser (1953) and Inglis (1962) mainly on the grounds of inadequate description. We support these opinions and suggest that those considered *species inquirendae* and *species incertae sedis* by these authors be treated as *species dubiae.* To this list we would add *E. abyssalis* Micolctzky, 1930 (female only) and *E. tenuicaudata* Allgen, 1962 (inadequate description) which Inglis (1962) accepted as valid.

Pareurystomina Micoletzky, 1930 is distinguished by the presence of buccal denticles, absence of caudal glands and a conical tail with a needle-point tip. The value of flattened cervical setae as a consistant generic character (Hopper, 1970) has yet to be substantiated. Blome (1974) recently redescribed *P. acuminata* (De Man, 1889) but made no mention of flattened setae. Wieser (1959) described two species, *P. pugatensis* and *Eurystomina repanda,* which were similar in overall dimensions, shape of male genital apparatus, general organisation of the buccal cavity and possession of flattened cervical setae but differed only in tail shape. Since Wieser (pers. comm.) maintains that the material was not well preserved (and has subsequently been lost) it is conceivable that the tail tip of *E. repanda* had broken off and the two species are synonymous, minor differences being attributable to intraspecific variation or age. P. *tenuicaudata* Stekhoven, 1950 was poorly described and important information on the buccal cavity is wanting. Wieser (1959) questions the inclusion of the species in *Pareurystomina:* we consider it dubious.

TABLE 1

Tabular key to the genera of the Eurystomininae.

Character	Genus						
	Bathyeurystomina	*Belbolla*	*Ditlevsenella*	*Eurystomina*	*Ledovitia*	*Pareurystomina*	*Thoonchus*
Rows of denticles	1 (band)	—	—	1-5	1	2-5	4-6 irregular
Oesophagus bulbs	—	7-10	—	—	—	—	—
Cervical setae	short	short or long	short	short	long	short	short
Cuticularised precloacal supplements	2	0-3	0	2	2	2	0
Caudal glands	—	+	+	+	+	—	+
Tail shape	posterior 3/4 flagellate	elongate conical	short conical	short conical	long conical or cylindrical	conical sharp tip	short cylindrical

Reviews based primarly on the available literature are clearly rather unsatisfactory, a point made by Inglis (1962). However, we hope that the nomenclatural alterations suggested here will help clear the ground for a more thorough revision of this complex and heterogeneous group based on hard data. In the interim, we present the following tabular key to the valid genera of the Eurystomininae.

Summary of proposed changes

Bathyeurystomina valeriae = new genus and species.
B. rockallensis = new species.
Lyranema Timm, 1961 = genus dubius.
Magaeurystomina Luc and De Coninck, 1959 = genus dubius.
Ditlevsenella cassiterides Warwick, 1977 = *Eurystomina cassiterides* (Warwick, 1977) comb. nov.
Eurystomina filiformis (De Man, 1888) = *E. ornata* **(Eberth,** 1863) syn. **nov.**
E. spectabilis (Marian, 1870) = *E. ornata* (Eberth, 1863) syn. nov.
E. tenuis (Marian, 1870) = *E. ornata* (Eberth, 1863) syn. nov.
E. chitwoodi Inglis, 1962 = *E. americana* Chitwood, 1936 syn. nov.
E. repanda Wieser, 1959 = *Pareurystomina pugatensis* Wieser, 1959 syn. nov.
Parenrystomina tenuicaudata Stekhoven, 1950 = species dubia.

List of species considered dubious on the grounds of being described without males

Ditlevsenella filipjevi Hopper, 1963.
D. tertia Wieser, 1953.
Eurystomina abyssalis Micoletzky, 1930.
E. bilineata Wieser, 1953.
Ledovitia longiseta (Micoletzky, 1930).
L. profunda (Micoletzky, 1930).
L. simplex Kreis, 1963.
Lyranema speciosum Timm, 1961.
Megaeurystomina combensi Luc and De Coninck, 1959.
Pareurystomina armorica Luc and De Coninck, 1959.
P. filicaudata Allgen, 1934.
P. *flagellicaudata* Stekhoven, 1946.
P. *micoletskyii* Filipjev, 1946.
P. *parapugetensis* Vitiello, 1970.

Acknowledgements

We would like to express our thanks to Dr J.D. Gage of the Scottish Marine Biological Association for supplying the material and to Dr R.M. Warwick of the Institute for Marine Environmental Research, Plymouth for helpful discussion and criticism of the manuscript.

Summary

Bathyeurystomina gen. nov. (Enchelidiidae, Eurystomininae) is erected for two new species of freeliving marine nematodes from deep sediments in the Rockall Trough. The subfamily Eurystomininae and its constituent genera are briefly discussed and several minor nomenclatural alterations are suggested. A tabular key is given to distinguish the valid genera of the Eurystomininae.

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Note: References to all literature prior to 1973 may be found in Gerlach and Riemann (1973-1974).

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