TWO NEW SPECIES OF *PARATURBANELLA: P. CUANENSIS* AND *P. EIREANNA*

by

Catherine **Maguire**

Queen's University, Marine Biology Station, Portaterry, Co. Down. Northern Ireland.

Résumé

Deux nouvelles espèces de *Paraturbanella* — *P. cuanensis* et *P. eireanna* — de la côte du County Down (Irlande du Nord) sont décrites ici : *P. cuanensis* est caractérisée par son grand orifice buccal dépourvu de pièces cuticulaires et par la présence d'une structure interprétée soit comme une bursa soit comme un pénis. *P. eireanna* porte des tubules latéraux et ses tubules caudaux sont rangés irrégulièrement. Cette espèce est récoltée dans les cinq centimètres supérieurs du sable mais *P. cuanensis* peut occuper la zone de sable gris inférieure et survivre dans un milieu pauvre en oxygène.

Introduction

Two new species of Gastrotricha belonging to the genus *Paraturbanella* were recorded during a survey of intertidal sandy beaches in the Strangford Lough area of Co. Down, Northern Ireland. These are described below and have been given the names P. *cuanensis*—after the old Irish name for Strangford Lough, Lough Cuan—and P. *eireanna.* These species occur at different depths in the sand column, P. *eireanna* being a surface dwelling form whilst P. *cuanensis* inhabits the deeper grey sand zone. P. *cuanensis* can survive long periods of storage in sealed jars of sand and so is obviously adapted to lower oxygen and high sulphide levels in its habitat.

PARATURBANELLA EIREANNA

Description

The body is ribbon-like, length 500 - 600 µm and tapers towards the head end. The head bears two pairs of stiff setae on each side of the mouth and a single long flexible sensory hair on each side of the head. There are tufts of cilia arising from small lateral depressions, but piston pits were not observed. The ventral ciliation is arranged in two bands extending the length of the body.

The anterior tubules are usually five or six in number, and are rather narrow. The adhesive organs are inserted posterior to these.

CAHIERS DE BIOLOGIE MARINE
Tome XVII - 1976 - pp. 405-410

No lateral tubules were observed in the pharynx region, five were present along the rest of the body, the posterior pair being slightly longer than the rest. No sensory hairs were observed arising from the tubules or the body surface. The posterior tubules are arranged in a rather peculiar fashion, there are seven in number on each caudal lobe, arranged in groups of two outer, two middle and three inner, shorter tubules. (Fig. I,4). There is no median cone visible.

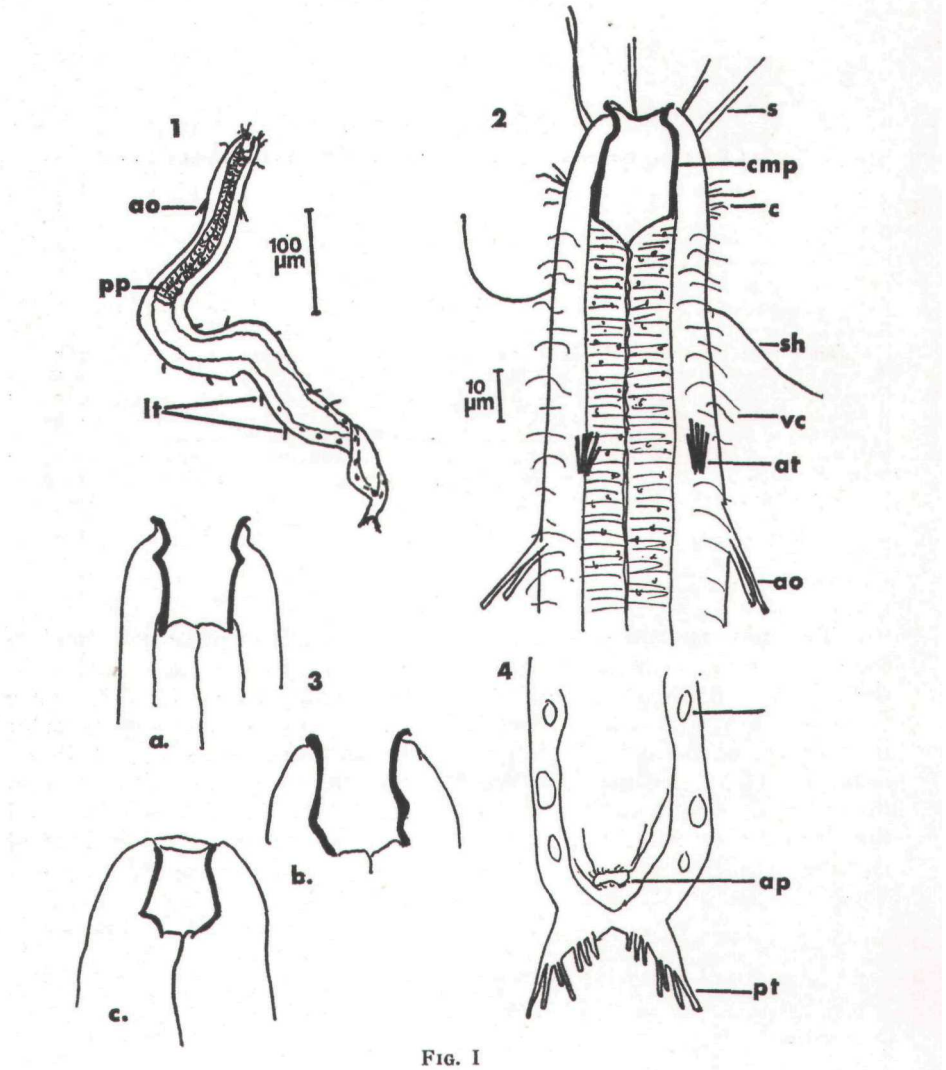


FIG. I

Paraturbanella eireanna

1. Dorsal view of whole animal.

ao: adhesive organs; pp: pharyngeal pores; lt: lateral tubules.

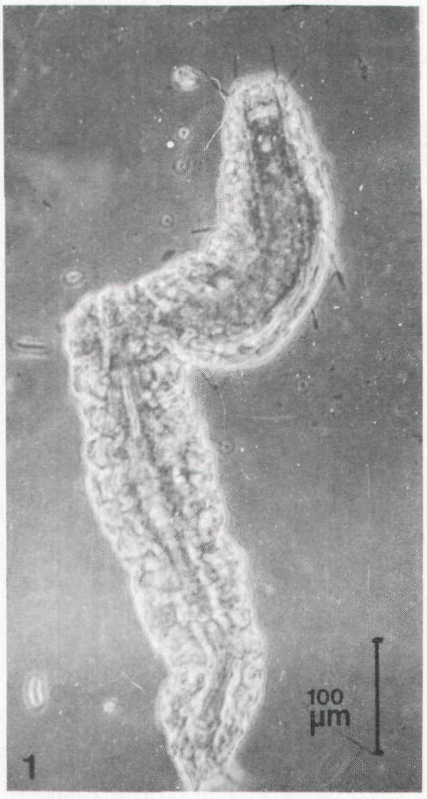
2. Ventral view of anterior end.

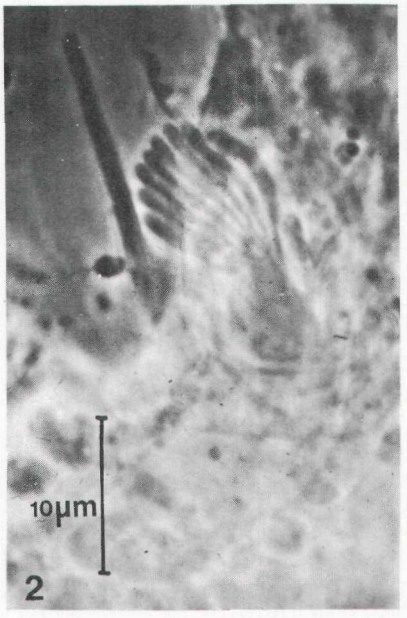
s: setae; cmp: cuticularized mouth plates; c: cilia; sh: sensory hairs; vc: ventral cilia; at: anterior tubules; ao: adhesive organs.

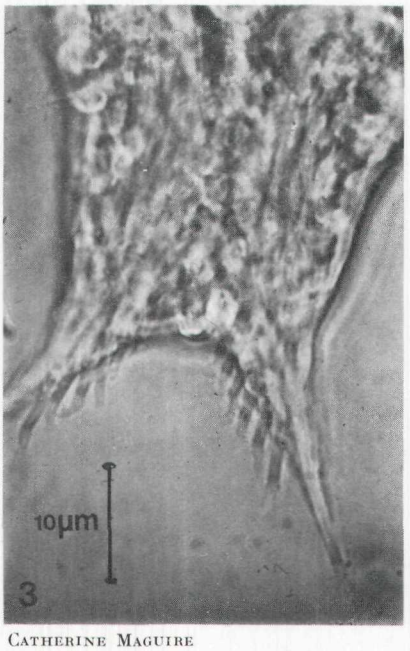
3. a, b, c: different shapes of cuticular mouth plates.

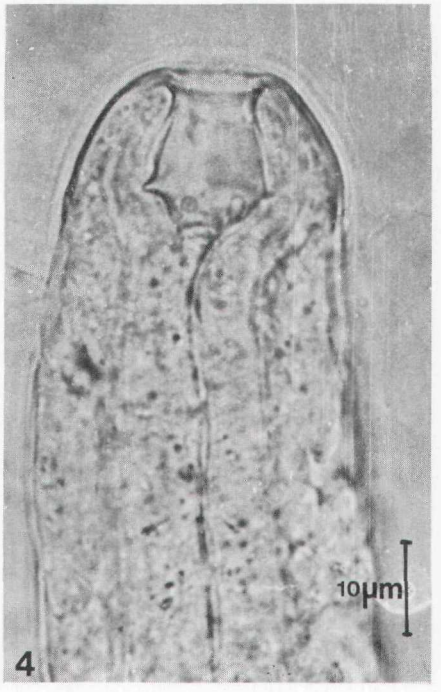
4. Ventral view of posterior end to show arrangement of tubules on caudal lobes.

ap: anal pore; pt: posterior tubules.









CATHERINE MAGUIRE

PLATE I

Paraturbanella *eireanna*

1: dorsal view of whole animal; 2: anterior tubules and adhesive **organ;** 3: posterior tubules; 4: head of *P. cuanensis* to show cuticularized mouth cavity.

The mouth opens terminally and is heavily cuticularized, with the lips of the cuticular plates projecting from the body surface. (Fig. I, Plate I, 4). The shapes of the plates seem to vary considerably in different individuals. (Fig. I, 3 a, b, c). The pharynx is narrow and muscular and extends to U35 - 40. The pharyngeal walls do not extend up around the mouth cavity. The gut is simple and ends in a well defined anal pore just anterior to the tail. There are very distinct epidermal glands present in the posterior part of the body.

Discussion

The presence of lateral tubules in this species distinguishes it from almost all other previously described *Paraturbanella* species with the exception of *Paraturbanella armoricana* (Swedmark 1954, previously *Turbanella),* and *Paraturbanella intermedia* Wieser 1957. It can be distinguished from P. *armoricana* mainly by the presence of the heavily cuticularized mouth plates, which are absent in the latter species. P. *armoricana* also bears two rows of small dorso-lateral tubules, and the caudal lobes, which are very large and distinct in shape, bear double rows of tubules. P. *armoricana* does however show the same concentration of dorsal glands towards the posterior part of the body, as in P. *eireanna.*

This species is obviously much closer to P. *intermedia* with which it shows many similarities e.g. the structure of the buccal plates shown in Wieser's drawing is almost identical to some of those observed in specimens of P. *eireanna,* however the differences between the two are sufficient to establish a new species. No piston pits or lateral body setae were observed in P. *eireanna* but these are present in P. *intermedia.* The numbers of anterior, lateral and posterior tubules are much reduced in P. *eireanna;* there are 5-6 anterior tubules as opposed to 11 or 12 in P. *intermedia,* only five lateral tubules instead of 8-14 and no setae were observed arising from them, and the posterior tubules number only seven instead of ten to thirteen. The irregular arrangement of these posterior tubules and the absence of a median cone are further differences.

PARATURBANELLA CUANENSIS

Description

The body is a flattened band shape, its length varying from about 380 µm, in young specimens, to between 650 and 750 µm in mature adults (Plate I, 1). The body width is 70 - 75 *p.m.* and is fairly uniform along the length of the animal, except in specimens bearing mature eggs. The body tapers slightly towards the head end to a width of 45 - 55 µm and more sharply at the hind end, anterior to the caudal lobes (Fig. II,1**).** The head bears several pairs of sensory hairs, two long pairs, about 27 µm are directed anteriorly and one long pair laterally (Fig. II,2) ; besides these, there are shorter hairs and suffer lateral setae which also extend laterally along the length of the body. There are no piston-pits or "seitensinnesorgan" visible on the head.

The ventral cilia are 11-12 µm long and are arranged in two broad bands extending the length of the body on each side of the gut. The epidermis contains yellowy-green glands of a slightly granular appearance; these are also at least ten pairs of dorsal glands which are a clear green colour.

Each anterior "foot" bears 7 or 8 narrow adhesive tubules which are 9 - 10 µm long (Plate I, 2). The adhesive organs lie just posterior

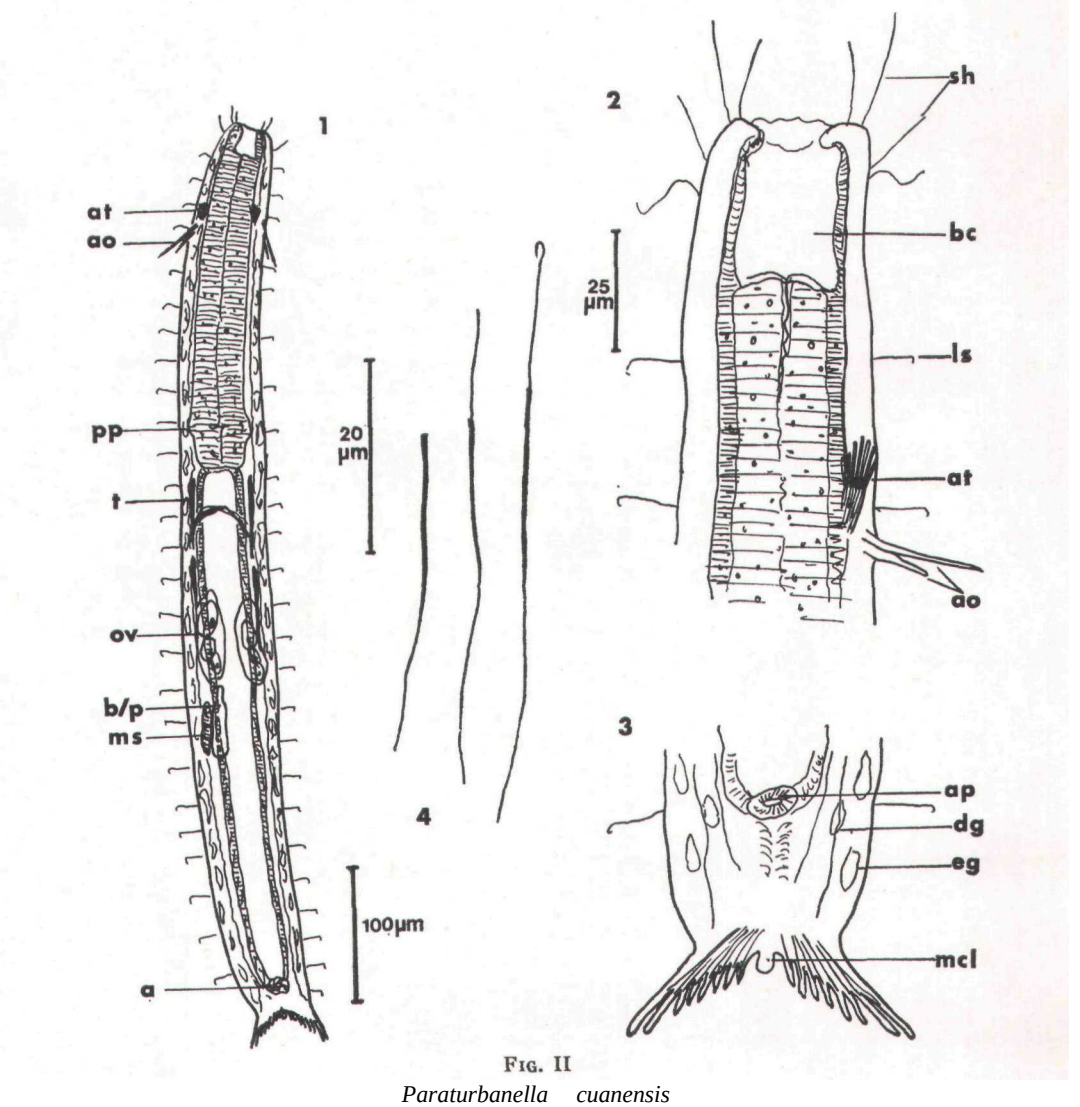


FIG. II

Paraturbanella cuanensis

1. Ventral view of whole animal.
at: anterior tubules; ao: adhesive organs; pp: pharyngeal pores; t: testis; ov: ovary; b/p: bursa or penis; ms: muscular sac; a: anus.
2. Ventral view of head.
sh: sensory hairs; be: buccal cavity; Is: lateral seta; at: anterior tubules; ao: adhesive organs.
3. Ventral view of posterior end.
ap: anal pore; dg: dorsal gland; eg: epidermal gland; mcl: median caudal lobe.
4. Sperm.

to the foot, the longer one is about 25 µm long, the shorter one about 12 µm (Fig. II, 2). There are 7-9 posterior tubules on each caudal lobe; the outer two are usually slightly longer than the rest. There is a rounded median caudal lobe (Plate I, 3; Fig. II, 3). There are no lateral or dorso-lateral tubules present.

The mouth cavity is very large (about 18 µm wide) and square in shape; it is not cuticularized (Fig. II, 2). It opens into a muscular pharynx which contains many small round green inclusions. The pharyngeal pores are obvious; these open at about 40 µm from the gut/pharynx junction. The gut walls are distinct, appearing a greyish colour, and they end at a muscular anal pore in a depression on the ventral surface at about U93 - 95.

Reproductive system

The testes are paired and extend from the gut/pharynx junction to about U50. There are two sperm bundles on each side, each about 40 µm length and, at least, one bundle crosses the gut ventrally at about U40. No male pore was observed. Individual sperm vary between about 50 µm and 85 µm in length. The longer ones consist of a thread-like tail, a thicker section and another thread like extension from the "head" end. The shorter sperm appear to have lost this "head extension" (Fig. II, 4). The ovaries are paired and lie dorsally one either side of the gut, posterior to the testes. Each contains up to 4 oocytes, the ripest being the most anterior.

Lying just behind the left hand ovary is a bottle shaped structure, about 35 µm long, which could be either a penis or a bursa. This appears as a refractive body under phase contrast lighting and is transluscent, rather than having a muscular or glandular appearance. No sperm have been observed inside this structure. Adjacent to this, on the outer side, there is sometimes a small muscular body, 25 - 30 µm long which could be a bursa, but its function is still undetermined.

Discussion

This species is unusual in that it does not have any cuticular mouth plates as do the majority of *Paraturbanella* species. P. *armoricana* Swedmark 1954, and P. *dohrni* Remane 1927 are the only other exceptions.

The species can be distinguished from P. *armoricana* by the absence of lateral tubules, the smaller size and different shape of the caudal lobes and by the different arrangement of the posterior tubules. The species is much closer to P. *dohrni,* but there are important differences. There is no "seitensinnesorgan" or "stempelgrube" on the head and the animal is larger than specimens of P. *dohrni.* Remane does not give details of length, but specimens recorded by Thane - Fenchel (1970) were about 340 µm long and those recorded by Schrom (1966), about 350 µm long, although D'Hondt (1968) and Swedmark (1956) record specimens 600 - 700 µm length. Although there is no mention of cuticularized mouth parts in the original description, Wieser (1957) states that the buccal cavity is heavily cuticularized

and Schmidt (1974) implies that it is cuticularized by comparing it with *P. pallida,* s. sp. *pacifica.*

Remane does not give much detail of the reproductive organs, except for the testes, which show only one sperm bundle in each.

In view of these differences between other *Paraturbanella* sp. and the present form, the latter must be regarded as a new species.

Summary

Two new species of *Paraturbanella* — P. *cuanensis* and *P. eireanna* — from the Co. Down coast, Northern Ireland, are described.

P. cuanensis is distinguished by its very large uncuticularized mouth cavity and by the presence of a bursa/penis structure; *P. eireanna* bears lateral tubules and the caudal tubules are arranged in an irregular fashion. This latter species is almost always found in the top five centimetres of the sand column, whilst P. *cuanensis* occurs deeper down in the grey sand zone and can withstand fairly low oxygen levels.

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