

DEPARTMENT OF AGRICULTURE AND TECHNICAL  
INSTRUCTION FOR IRELAND.

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REPORT

ON THE

SEA AND INLAND FISHERIES OF IRELAND

FOR

1902 AND 1903.

IN TWO PARTS.

PART I.—GENERAL REPORT.

PART II.—SCIENTIFIC INVESTIGATIONS.

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**PART II.—SCIENTIFIC INVESTIGATIONS.**

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Presented to both Houses of Parliament by Command of His Majesty.

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## ii.—NOTE ON A GENUS OF EUPHAUSID CRUSTACEA.

BY

W. T. CALMAN, D.Sc.

## PLATE XXVI.

The genus *Nematodactylus* was established by the present writer in 1896 for a new species of Euphausid crustacean, of which a single imperfect specimen had been obtained by the Royal Irish Academy Expedition of 1888 from deep water off the South-West of Ireland.

Five specimens of the same species have now been detected among the Euphausiidae collected by Dr. G. H. Fowler on the "Research" Expedition off the Bay of Biscay, and entrusted to Mr. E. W. L. Holt for examination. I am indebted to Dr. Fowler and Mr. Holt for the opportunity of examining these specimens and thereby extending and correcting the account which I formerly gave of the species. It is necessary, unfortunately, to give a new name to the genus since, as Dr. Theodore Gill has pointed out to me, *Nematodactylus* is preoccupied for a genus of fishes.

GENUS *Nematobrachion*, nom. nov.

*Nematodactylus*, Calman, Trans. Roy. Irish Acad. xxxi., p. 16, 1896; non *Nemadactylus*, Richardson, Proc. Zool. Soc., London, 1839, p. 98; corrected to *Nematodactylus*, Gill, Proc. Acad. Nat. Sci., Philadelphia, 1862, p. 121.

*Nematobrachion boöpis*.

*Nematodactylus boöpis*, Calman, Trans. Roy. Irish Acad. xxxi., p. 17, pl. ii., fig. 19-28, 1896.

The carapace is marked by a shallow cervical groove, in front of which is a median dorsal keel running forwards to the short rostrum and slightly elevated about the middle of its length. The pleural plates ("epimera") of the third, fourth, and fifth abdominal somites have the lower margin slightly sinuate.

The eye is not quite correctly described as globose. On the outer surface is a short groove which, according to the position of the eye, may be horizontal or nearly vertical, and which divides the corneal area into a large fronto-dorsal and a much smaller lateral part. As this groove is confined to the lateral surface and does not encircle the eye, it does not give, when viewed from the side, the appearance of constriction which is so characteristic of the eyes in related forms. In the other species which I have referred to this genus, *N. flexipes* (Ortmann), the eye is divided by a marked constriction, and the two parts are nearly equal in size. In the present species there is a luminous organ (not mentioned in the original description) on the ocular peduncle, immediately behind the lateral division of the eye, and just above it the integument of the peduncle forms a slight ridge outside and parallel to the margin of the corneal area.

In the specimen formerly described the flagella of antennules and antennae were wanting. In a female, 20 mm. in length, in the present collection the flagella of the antennule, though not quite complete, measure 13 mm. from the distal end of the peduncle and the flagellum of the antenna 19 mm.

The antennal scale (fig. 2) is incorrectly represented in the figure formerly given (*l.c.* pl. II., fig. 20). It reaches to the middle of the third segment of the antennular peduncle, and is five times as long as broad. The outer margin is nearly straight, its distal tooth very minute, and the apex of the scale is rounded.

As regards the mouth-parts, dissection of one of the specimens enables me to confirm, on all essential points, the account already given. The form of the maxillula ("first maxilla") is very characteristic, the outer plate (the so-called "exognath") being absent, as in *Stylocheiron*, and the palp unusually narrow.

The third thoracic limb (second leg of Sars' terminology and of the original description) has the ischium slightly longer than the merus. There are five (not six) "harpoon-like" spines on the dactylus, four of them terminal and one inserted on the inner side a little way from the distal end.

The penultimate thoracic limb, as already pointed out, presents the full number of segments, as in *Bentheuphausia* and *Thysanopoda*.

The last thoracic limb (fig. 3) differs in shape from those of the allied genera, and resembles more closely that of *Thysanopoda* as figured by Sars (Challenger Rep. Schizopoda, pl. xvii., fig. 17a). The movable leaflet has the form of an exopod divided into a proximal and a distal portion, the latter fringed with setae. The basal lobe with which the exopod articulates bears six long and stout plumose setae on its inner edge.

There is no epipod on the first thoracic limb. The gills of the second and third have only a single branch, the five remaining gills have a ventral, or inner branch, as in *Nematoscelis*. In the first six gills the axis of the outer or dorsal branch is not so distinctly bifurcate as in that genus.

Two of the specimens obtained are adult females, each carrying a single ovoid spermatophore attached by a long slender neck to the region of the genital apertures. The single male specimen is much mutilated, but appears not to differ in general characters from the female. The outer flagellum of the antennule is dilated close to the base. The sexual appendages of the first and second pleopods are figured (fig. 4 and 5) for comparison with those of related forms. That of the first pair is much more complex than the corresponding appendages of *Stylocheiron* (Sars, Rep. Challenger Schizopoda, pl. xxvi., fig. 25 and 26) or *Nematoscelis* (Chun, Bibl. Zool. vii., Heft 19, pl. xii., fig. 7 and 8).

The following is a list of the specimens:—

No. 32p,	. . . . .	1 adult ♀, 20 mm. in length.
No. 35p,	. . . . .	1 immature.
No. 36g,	. . . . .	1 do.
No. 36h,	. . . . .	1 adult ♂.
No. 36i,	. . . . .	1 adult ♀.

It may be useful to recapitulate in the form of a key the leading characters of those genera of *Euphausiidae* which are distinguished by the elongation of one of the pairs of thoracic appendages.

A. Second pair of thoracic limbs elongated. Maxillula with outer plate ("exognath").

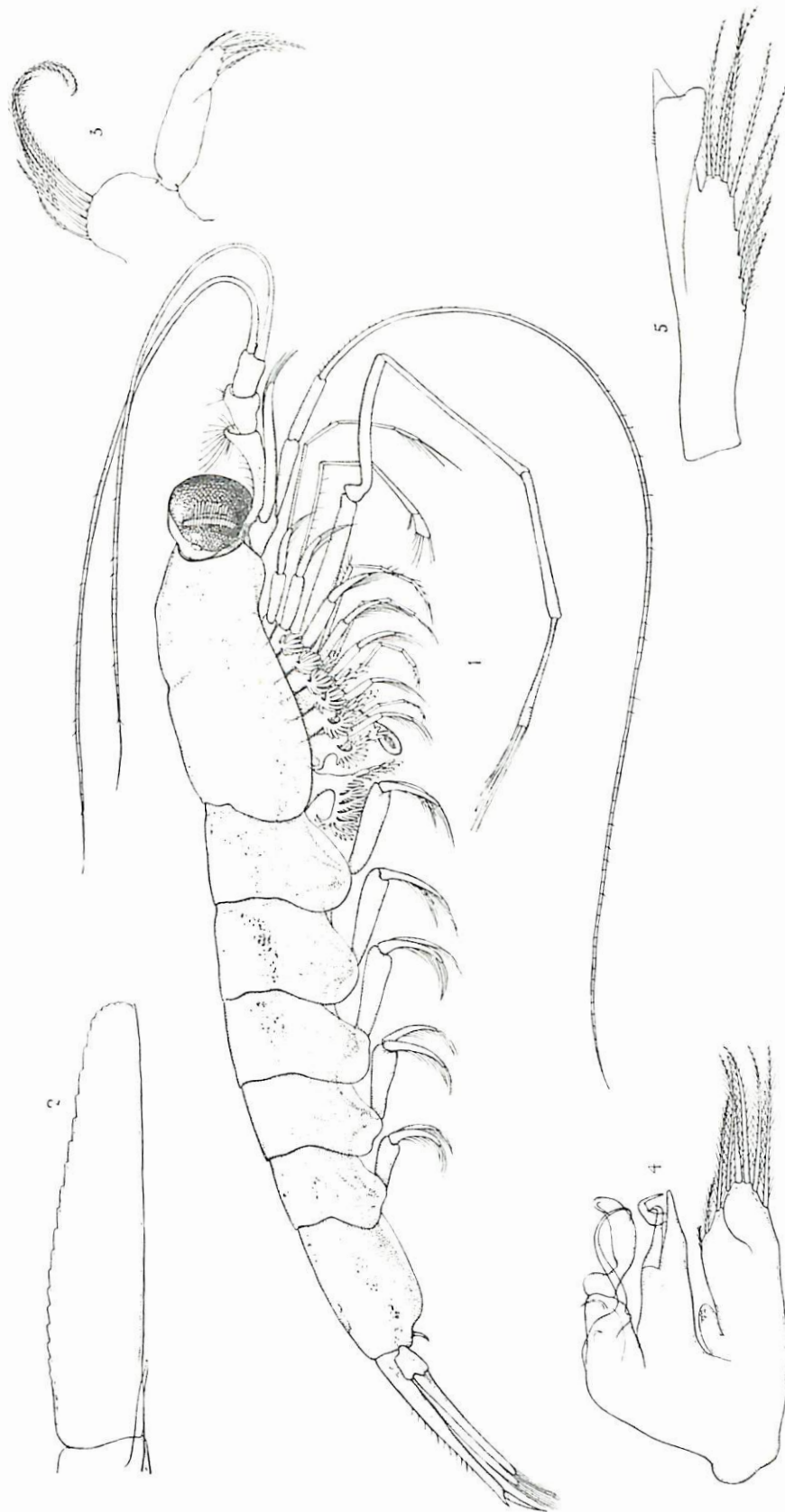
(a.) Second thoracic limbs moderately elongated, the distal segments with marginal setae. Last three pairs of gills two-branched.

*Thysanoëssa*, Brandt.

(b.) Second thoracic limbs greatly elongated and slender, with a terminal group of spines. Last five pairs of gills two-branched.

*Nematoscelis*, G. O. Sars.

Pl. XXVI.



*Nematoscelis boöpis*.

W. T. C. & G. M. W. del.

B. *Third* pair of thoracic limbs elongated. Maxillula without outer plate.

- (a.) Third thoracic limbs with terminal group of spines resembling those of second thoracic limbs of *Nematoscelis*. Penultimate thoracic limbs with endopod of five segments. Mandibles with palp. Luminous organs, one pair on eyestalks, two pairs thoracic and four unpaired abdominal. Gills well developed, last five pairs two-branched.

*Nematobrachion*, Calman.

- (b.) Third thoracic limbs with more or less perfect chela. Penultimate thoracic limbs with endopod of two segments. Mandibles without palp. Luminous organs, one pair thoracic and one unpaired abdominal. Gills much reduced, only the last pair two-branched.

*Stylocheiron*, G. O. Sars.

A problem of some interest is suggested by the close resemblance which exists between the raptorial *third* thoracic limb of *Nematobrachion* and the similarly modified *second* thoracic limb of the closely allied *Nematoscelis*. In both the limb is tipped with a group of long slender harpoon-like spines which are serrated by a series of annular ridges not completely encircling the spine, but leaving a smooth space along one side. It is possible that this peculiar armature may have arisen independently in the two genera, and, indeed, this is assumed if the key given above be taken as representing the natural affinities of the various forms, but the case is very suggestive of that form of variation to which Mr. Bateson\* has given the name of "homœosis," or rather, perhaps, of what Prof. E. Ray Lankester† has termed "translation of heterosis." The correlative change in the other appendages, however, does not quite meet the requirements of Prof. Lankester's definition, since the *first* thoracic limb of *Nematoscelis* is not exactly similar to the *second* of *Nematobrachion*. On either hypothesis it would be a difficult matter to construct a reasonably probable phylogenetic "tree" to express the relationships of the four genera above referred to.

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#### EXPLANATION OF PLATE XXVI.

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- Fig. 1. *Nematobrachion boëpis*, adult female.  
 Fig. 2. " " antennal scale of adult male.  
 Fig. 3. " " last thoracic limb of adult female  
 Fig. 4. " " endopod of first pleopod of adult male.  
 Fig. 5. " " endopod of second pleopod of adult male.

\* Materials for the Study of Variation, p. 85.

† Encycl. Brit. XXV., p. 692 (1902), and Quar. Jour. Micr. Sci. XLVII., p. 535 (1904).