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Fusion of the genera *Boeckella* and *Pseudoboeckella* (Copepoda) and revision of their species from South America and sub-Antarctic islands

Fusión de los géneros *Boeckella* y *Pseudoboeckella* (Copepoda) y revisión de sus especies procedentes de América del Sur e islas subantárticas

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ABSTRACT

In considering the taxonomy of calanoid copepods from non-marine (mainly fresh) waters, the genus *Pseudoboeckella* Mrázek 1901 is placed in synonymy with the genus *Boeckella* de Guerne and Richard 1889. Sixteen species (none of them new) from South America and sub-Antarctic islands are recognised, and a key to the males of 15 of them presented. Of the sixteen species, 14 occur in South America and two (*B. brevicaudata* and *B. vallentini*) are restricted to sub-Antarctic islands. *B. poppei* occurs both in South America and on Antarctic islands. Descriptions and new figures of both sexes of all species are given, but doubts remain on the structure of the male of *B. longicauda.* Distribution maps are provided for all species occurring in South America.

Key words: planktonic Crustacea, Calanoida, Centropagidae, fresh water.

RESUMEN

Teniendo en cuenta la taxonomía de copépodos del orden calanoidea de aguas no-marinas (principalmente dulces), el género *Psudoboeckella* Mrázek 1901 es puesto en sinonimia con el género *Boeckella* de Guerne y Richard 1890. Se reconocen dieciséis especies (ninguna de las cuales nueva) de América del Sur y de las islas sub-antárticas, y se cita una clave para los machos de 15 especies. De las dieciséis especies, 14 se encuentran en América del Sur y dos *(B. brevicaudata* y *B. vallentini)* están restringidas a las islas Sub-antárticas. *B. poppei* existe tanto en América del Sur Como en las Islas Antárticas. Se incluyen descripciones y nuevos dibujos de ambos sexos de todas las especies, pero permanecen dudas sobre las estructuras del macho de *B. longicauda.* Se incluyen también mapas de distribución de todas las especies que se encuentran en América del Sur.

Palabras claves: Crustáceos planctónicos, Calanoida, Centropagidae, agua dulce.

INTRODUCTION

Boeckellid* calanoids occur in athalassic waters both fresh and saline. Except for *Boeckella triarticulata,* whose distribution includes Mongolia, and an isolated, introduced population in northern Italy (see Ferrari *et al.,* 1991), the boeckellids are restricted to the Southern Hemisphere. The boeckellids of Australia and New Zealand are treated comprehensively by Bayly (1964, 1979).

In this paper I deal comprehensively with the remainder of the boeckellid species which are distributed in sub-Antarctic islands and in South America. The purpose of this paper is to remove considerable taxonomic and nomenclatural confusion and to provide a sound framework into which species yet to be discovered may be incorporated. This revision deals with some 40 names but recognises only 16 species. It

* The term "boeckellid" is used for convenience and does not imply the existence of a corresponding family separate from the Centropagidae Sars. Although Brehm (1936, p. 485) referred to "die Familie der Boeckelliden", he gave no description or definition of such a family. I specifically reject any suggestion that the calanoids treated in this paper belong to a family other than the Centropagidae.

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should be stressed that centropagids other than those dealt with in this revision occur in the fresh waters of South America and sub-Antarctic islands. These are *Parabroteas sarsi* (Daday), one of the largest freshwater calanoids in the world (usually over 5 mm in length), and a form described as *Boeckella kinzeli* by Löffler (1955) that is regarded by me as belonging to a new genus which I shall describe in a separate paper.

One of the chief problems encountered in my revision has stemmed from the substantial involvement of Vincenz Brehm in the taxonomy of boeckellids. Brehm's work, including his illustrations, is generally of inadequate quality. He regarded it as adequate to examine only one or two adult individuals from a sample rather than a series. Additionally, he sometimes drew appendages in inappropriate orientations for proper comparison with previously published drawings. Finally, Brehm did not designate, keep in a private collection, or deposit in a public institution, type material of forms he described as new. As a consequence, it has proved easier for me to assess the status of Daday's species described in 1901 and 1902 (and for which type material was deposited in the Budapest Museum) than that of the several South American boeckellid nomina published by Brehm from 1926 to 1958. During the latter period Brehm described nine new species (plus several new sub-species or "varieties"), but in this revision I have found it necessary to place seven of these "species" in synonymy with other species and to treat two as incertae sedis. In marked contrast, the work carried out by G.O. Sars from 1894 to 1912 on the boeckellids of Australia and New Zealand is of high quality judged even by present day standards.

Methods, terminology and conventions

Lengths given under "Specimens Examined" are mean lengths from the measurement of five individuals (n = 5) unless otherwise indicated (e.g., n = 2). "Length" means the length of a straight line from the anterior extremity of the prosome to the distal extremity of the caudal rami; arc-lengths are not given. Whenever two (mean) lengths are given consecutively under "Specimens Examined", the first stated length (almost invariably the larger) is always that of the female. Lengths were measured with an eye-piece micrometer inserted in a Wild M5 stereo-microscope at magnifications of 25X or 50X. Specimens that were examined but not measured are indicated by "n.m.".

The fifth pair of legs (P5) of the adult male are of key importance in the taxonomy of boeckellids and the terminology and abbreviations used in describing the structure of this appendage are shown in Fig. 1A. The generalized structure, terminology and abbreviations used for the corresponding appendage (P5) of the adult female are given in Fig. 1B.

Appendages such as fifth pairs of legs, and whole female urosomes, were dissected off and mounted in PVA-lactophenol mountant. All drawings were made using a *camera lucida* attached to a Wild M20 microscope. Structures were studied under both bright field and phase-contrast illumination.

The symbol "X" (e.g. 0.3 X) in descriptions should be interpreted as meaning "times" or "multiplied by".

Under "Specimens examined" lake or laguna is always abbreviated to "L.".

ORDER CALANOIDA
Family Centropagidae Sars
Genus *BOECKELLA* de Guerne & Richard

Boeckia Thomson, 1883, pp. 93-4

Boeckella de Guerne and Richard, 1889, p. 151-2. Sars, 1894, pp. 48-9. Ekman, 1905b, pp. 601-2. Jolly, 1957, p 856. Ringuelet, 1958a, p. 58. Bayly, 1964, p. 185. Bayly and Arnott, 1969, p 194.

Pseudoboeckella Mrázek, 1901, p.5. Ekman, 1905b, pp. 599-601. Ringuelet, 1958a, p. 58.

Boeckellopsis Mrázek, 1901, pp. 6-7.

Paraboeckella Mrázek, 1901, p. 8.

Boeckellina Mrázek, 1901, p. 11.

Pseudoboeckella Daday, 1902, p. 218. [Originally in a sense synonymous with that of *Boeckella* de Guerne & Richard, not with that of *Pseudoboeckella* Mrázek.]

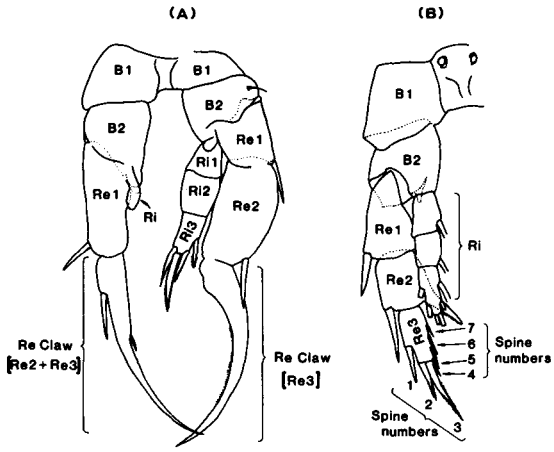

Fig. 1: Abbreviations used for parts of the fifth legs of adult *Boeckella*. A, male fifth pair of legs (P5) [of *B. brasiliensis*]; B1 and B2, proximal and distal segments, respectively, of the basipodite (or protopodite); Ril-Ri3, segments of the endopodite (or inner ramus - Ri); Rel, first (proximal) segment of the exopodite (or outer ramus - Re); Re claw, transformed third (distal) exopodite segment (on right) or transformed second (middle) plus third exopodite segment (on left). B, female fifth leg (half of symmetrical P5) [of *B. poppei*]; abbreviations as for male, but numbering system for spines on (non-transformed) Re3 indicated.

Abreviaciones usadas para la quinta pata del adulto *Boeckella*. A, quinto par de patas del macho (P5) [de *B. brasiliensis*]; B1 y B2, artejos proximales y distales, respectivamente, del basípodo (o protópodo); Ril-Ri3, artejos del endópodo (o ramus –Ri interno); Rel, primer (proximal) artejo del exópodo (ramus –Re externo); Gancho Re, tercer (distal) artejo exópodo transformado (derecho) o segundo (central) más tercer artejo exópodo transformado (izquierdo). B, quinta pata de la hembra (mitad de P5 simétrica) [de *B. poppei*]; abreviaciones como para el macho, pero el sistema numérico para espinas en (no transformado) Re3 indicado.

Boeckella Daday, 1902, p. 234. [Originally in a sense synonymous with that of *Pseudoboeckella* Mrázek, not with that of *Boeckella* de Guerne & Richard.]

Metaboeckella Ekman, 1905b, p. 603.

Discussion of generic synonymy

Definitions of the genus *Boeckella* de Guerne & Richard have already been given by Bayly (1964) and Bayly and Arnott (1969).

The genus *Pseudoboeckella* was erected by Mrázek (1901, p.5) and given the following definition, "Segmentation of the anterior part of the body as in *Boeckella*, last thoracic segment of the female only with outer extensions. First and second segments of endopod of maxilliped with four setae each. Second basal segment of fifth pair of legs of the female with a button-shaped projection, endopod of right fifth male leg (still) segmented (if also indistinctly) and bearing setae". He included within this genus *Pseudoboeckella brasiliensis* (Lubbock) [the type species] and *P. poppei* Mrázek. The other boeckellid genera erected by Mrázek (1901), *Boeckellopsis*, *Paraboeckella* and *Boeckellina*, were not recognized (at the generic level) by subsequent authors and the species originally included in them were allocated to either *Boeckella* de Guerne & Richard or *Pseudoboeckella* Mrázek.

Daday (1902, p. 234), by his inclusion of *brasiliensis* (Lubbock) and other closely related species, made an apparently independent attempt to define the same genus *(Pseudoboeckella)* that had been described one year earlier by Mrázek but he erroneously called it *"Boeckella* (Guerne et Rich.)". [At the same time he incorrectly gave *Boeckella* (containing *triarticulata* (Thomson), the type species of this genus, and closely related species) the supposedly new (but in fact homonymous) name *"Pseudoboeckella".*] In his definition of what was really *Pseudoboeckella* Mrázek, Daday (1902, p. 234) emphasised that, "the right endopod is 3-segmented, the last segment with 3-4 setae; this ramus is as long as, or somewhat longer than, the first segment of the exopod". [Translation from German]. He further stated that, "In this genus, the most important characteristic of which is the fact that the endopod of the right P5 of the male is 3-segmented and with 3-4 setae on the terminal segment, belong the following species: *B.* [*P.*] *brasiliensis* (Lubb.), [*P.*] *brevicaudata* (Brady), [*P.*] *dubia* Dad., [*P.*] *Entzii* Dad., [*P.*] *Poppei* mihi, [*P.*] *longicauda* Dad. and [*P.*] *silvestrii* Dad.".

Ekman (1905b, p. 599) reinforced the views of the above authors by stating that *Pseudoboeckella* Mrázek differs from *Boeckella* in that, "the right endopod of

P5 of the male is always 3-segmented and bears terminal setae". He reduced *Paraboeckella* Mrázek (containing *brevicaudata* (Brady)) to a subgenus of *Pseudoboeckella* Mrázek. Reasons why *Metaboeckella* Ekman (1905b) should be placed in synonymy with *Boeckella* de Guerne & Richard have already been given by Jolly (1957) and Bayly (1964) and will not be further discussed here.

Marsh (1924) separated *Pseudoboeckella* from *Boeckella* by using the following couplet in his key to the genera of freshwater Centropagidae:

Endopodite of right fifth foot of male rudimentary, 1-3-segmented, without setae ..... *Boeckella* de Guerne & Richard.

Endopodite of right fifth foot of male 3-segmented, with setae ..... *Pseudoboeckella* Mrázek.

Brehm (1936, p. 485) questioned the separateness of these two genera with his comment, "die Trennung der Gattungen *Boeckella* und *Pseudoboeckella* recht problematisch ist".

Ringuelet (1958a) separated *Pseudoboeckella* from *Boeckella* by using (in translation) the following couplet:

Endopods of male P5 small and more or less reduced, composed of 1 to 3 segments, without setae or spines. Females relatively less robust, with long antennules reaching up to the furcal rami or setae, rarely shorter and only up to the second segment of the urosome ..... *Boeckella* de Guerne & Richard.

Right endopod of male P5 well developed, with setae or spines, nearly always 3-segmented; the left endopod reduced, nearly always smooth or with [only] 1 seta. Females robust, with antennules relatively short, not exceeding the metasome, exceptionally up to the second segment of the urosome..... ..... *Pseudoboeckella* Mrázek.

Although making this formal distinction, Ringuelet (1958a, pp. 58-9) conceded that severe difficulties might arise in trying to distinguish the two genera.

I now examine critically the validity of attempted distinctions between the genera *Boeckella* and *Pseudoboeckella*. First, the supposed distinction based on the length of the female antennules (and of the male left or non-geniculate antennule) relative to that of the body (see Ringuelet's couplet above) may be considered. It was pointed out by Bayly (1964, pp. 197, 199 and 226) that in the Australian species *B. robusta* Sars and *B. major* Searle, female (and male left) antennules extend only to the end of the prosome [or "metasome" sensu Bayly (1964)]. These are two exceptionally large species inhabiting small, shallow bodies of water. *B. pseudochelae* Searle, another shallow-water species, also has relatively short antennules (Sars, 1912, pl. viii, fig. 10). Furthermore, Timms (1979) has clearly shown for four genera of Australian freshwater calanoids that pond and littoral species have stouter bodies and shorter antennules compared with limnetic species. I consider it well established that large boeckellids inhabiting small water bodies (or sometimes the littoral of lakes), irrespective of their existing placement in *Boeckella* or *Pseudoboeckella*, suffer reduction in the relative length of their antennules. On this evidence, I reject antennule length relative to that of the body as a valid generic distinction.

Only one claimed distinction between the two genera remains for consideration: the structure of the male fifth right endopod. In *Boeckella* this ramus is supposed to be 1-3-segmented and without terminal setae or spines. Difficulties that arise in attempting to apply this distinction to the species [*B.?*] *occidentalis* Marsh have already been pointed out by Marsh (1906), Löffler (1955) and Ringuelet (1958a, p. 59). Although conceding that the endopod of this species is only 1-segmented, Ringuelet transferred it to *Pseudoboeckella* apparently because he considered it to have a terminal spine (it sometimes has several inner spinules as well). Most other authors have placed it in *Boeckella*. Difficulties in generic assignment also exist for [*P.?*] *brevicaudata* (Brady), [*P.?*] *vallentini* Scott and [*P.?*] *gibbosa* Brehm [? = *vallentini* Scott] (Löffler 1955).

The requirement that the male fifth right endopod of *Boeckella* should lack

setae or spines is violated by at least two species currently placed in that genus: *B. geniculata* Bayly (1964) and *B. bispinosa* Bayly (1967). In the former this ramus is 3-segmented and terminates in two setae, in the latter it is 2(or 3)-segmented and terminates in two or three spines. Additionally, in *B. montana* Bayly this ramus is usually indistinctly 3-segmented and has a spine-like termination. No author has recorded *Pseudoboeckella* from Australia, and at the time I described these three species the possibility that they should have been referred to that genus or any other than *Boeckella* was not considered. To have separated any of these 3 species at the generic level from all the remaining Australian boeckellids on such a trivial character seemed unreasonable then and no more reasonable in retrospect; it would have created a highly artificial division within a natural group of species. Conversely, the requirement that the male fifth right endopod of *Pseudoboeckella* should bear setae or spines is also occasionally violated. Thus, although Ekman (1905b) and most subsequent authors have placed *brevicaudata* (Brady) in *Pseudoboeckella*, this ramus sometimes (Figs 2B and 7A) bears no setae, this feature being subject to intraspecific variation. Strict application of the supposed distinction between these two genera would require us to place some forms of this species in *Pseudoboeckella* and others in *Boeckella*. The male fifth right endopod of some species referred to *Pseudoboeckella* bears four terminal spines but is not 3-segmented. This is so with *calcaris* Harding, in which this ramus is 2-segmented, and *palustris* Harding, where it is 1-segmented. Finally with respect to this male endopod we encounter the almost insurmountable practical difficulty of deciding whether setae or spines have been retained as a primitive character or developed secondarily as a new feature.

In summary, I believe that the attempt to separate *Pseudoboeckella* from *Boeckella* creates numerous practical problems, is likely to produce unnatural groupings and is best abandoned. If *Pseudoboeckella* has any validity at all it would have to be restricted to those species in which the male fifth right endopod is invariably distinctly 3-segmented and bears setae (or spines). There are possibly four such species: *brasiliensis, poppei* [but some forms of this species have only 1 spine on this ramus], *longicauda* and *silvestrii*. I regard these four species as being merely a species group.

KEY TO SPECIES

[*Based on the structure of the male fifth legs and using the abbreviations shown in Fig. 1*].

Note. *B. longicauda* Daday is not included in the following key because of doubt concerning the structure of the fifth legs in the male. The female of *B. longicauda* has a urosome [meaning the entire urosome to the end of the caudal rami] which is approximately 3.5 times as long as the maximum width (at the genital segment) viewed in precise dorsal or ventral aspect, and is thus distinctively long. The only other species included in this revision in which the female urosome is of comparable relative proportions are *B. gracilipes* and *B. meteoris*. In all other species the female urosome is less than 3.0 times as long as the maximum width.

1 Right B1 with prominent projection at inner distal corner (see arrow in Fig. 2C) . . . *bergi* Richard
Right B1 with no projection at inner distal corner 2

2(1) Distance between inner edges of right and left B2 at proximal attachment considerably greater than proximal width of either right or left B2 (see arrows in Fig. 4A) . . . . . *gracilis* (Daday)
Distance between inner edges of right and left B2 at proximal attachment less than (or at most equal to) proximal width of either right or left B2 3

3(2) Right Rel with 2-pronged, fork-like process on inner edge; left Rel with semicircular laminar expansion at right angles to posterior face of

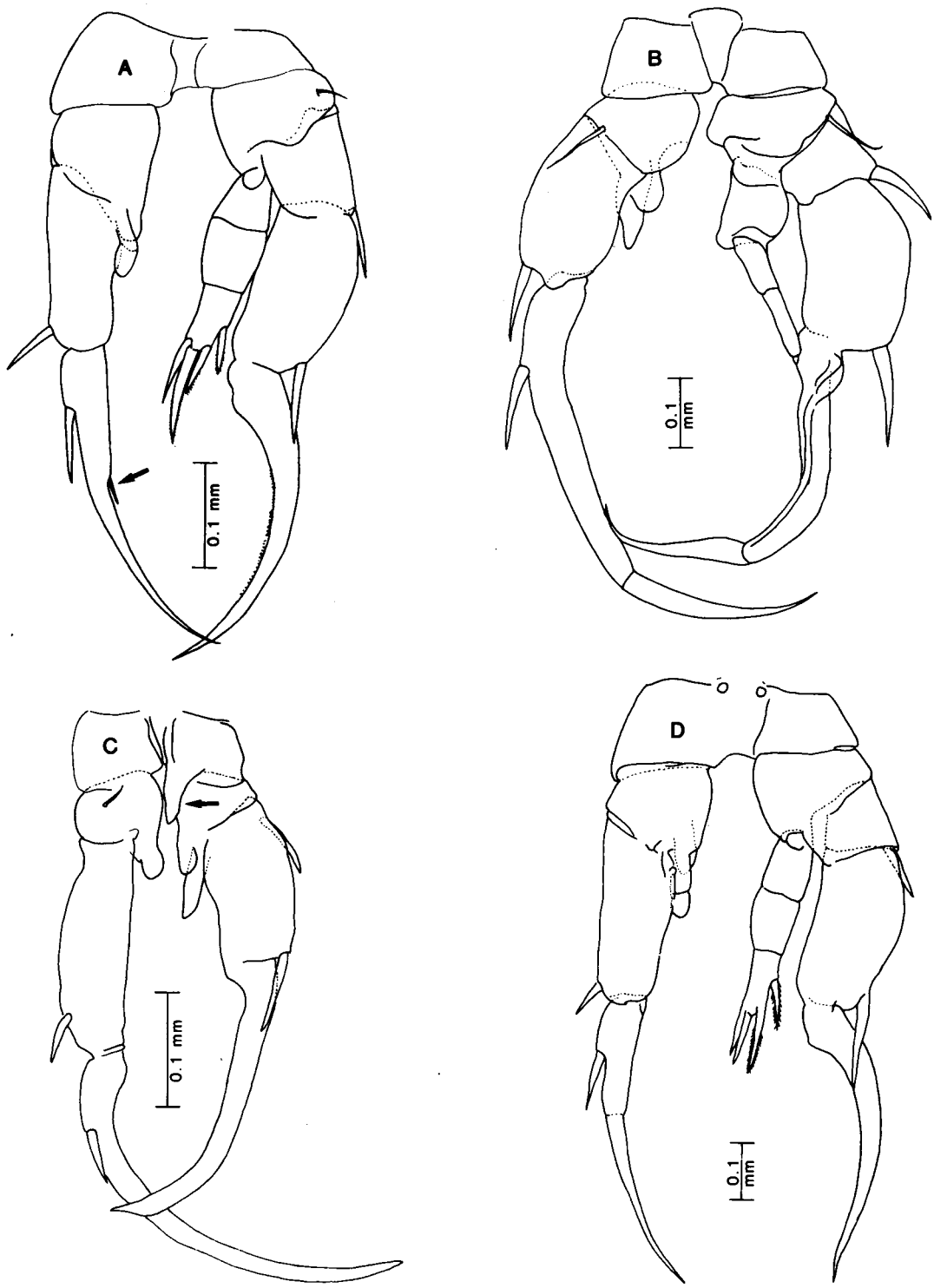

Fig. 2: Male fifth legs, posterior aspect. A, *Boeckella brasiliensis* (Lubbock) [drawn from Daday's type material of *B. setosa*]; B, *B. brevicaudata* (Brady) [Macquarie Island material]; C, *B. bergi* Richard; D. *B. poppei* (Mrázek) [Signy Island material].

Quinta pata del macho, aspecto posterior. A, *Boeckella brasiliensis* (Lubbock) [dibujado del material sobre *B. setosa* de Daday]; B, *B. brevicaudata* (Brady) [datos de Isla Macquarie]; C, *B. bergi* Richard; D, *B. poppei* (Mrázek) [datos de Isla Signy].

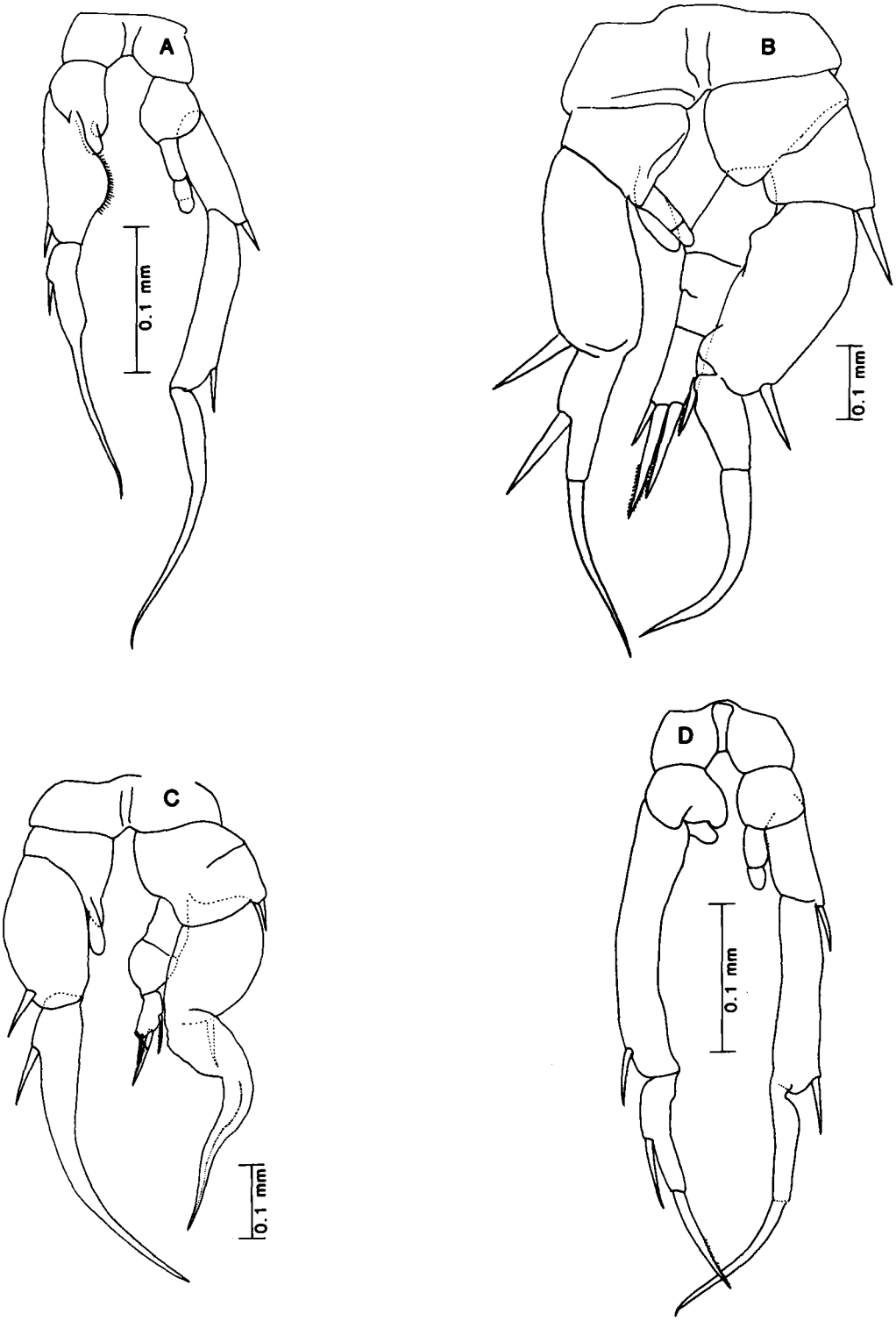

Fig. 3: Male fifth legs, posterior aspect. A, *Boeckella michaelseni* (Mrázek); B, *B. longicauda* Daday [drawn from Daday's microslide labelled "*B. longicauda* Dad. ♀♂ 1203 Patagonia Amenkelt St Cruz"]; C, *B. silvestrii* Daday; D, *B. gracilipes* Daday.

Quinta pata del macho, aspecto posterior. A, *Boeckella michaelseni* (Mrázek); B. *B. longicauda* Daday (dibujado de platinas clasificadas "*B. longicauda* Dad. ♀♂ 1203 Patagonia Amenkelt Sta. Cruz"]; C, *B. silvestrii* Daday; D, *B. gracilipes* Daday.

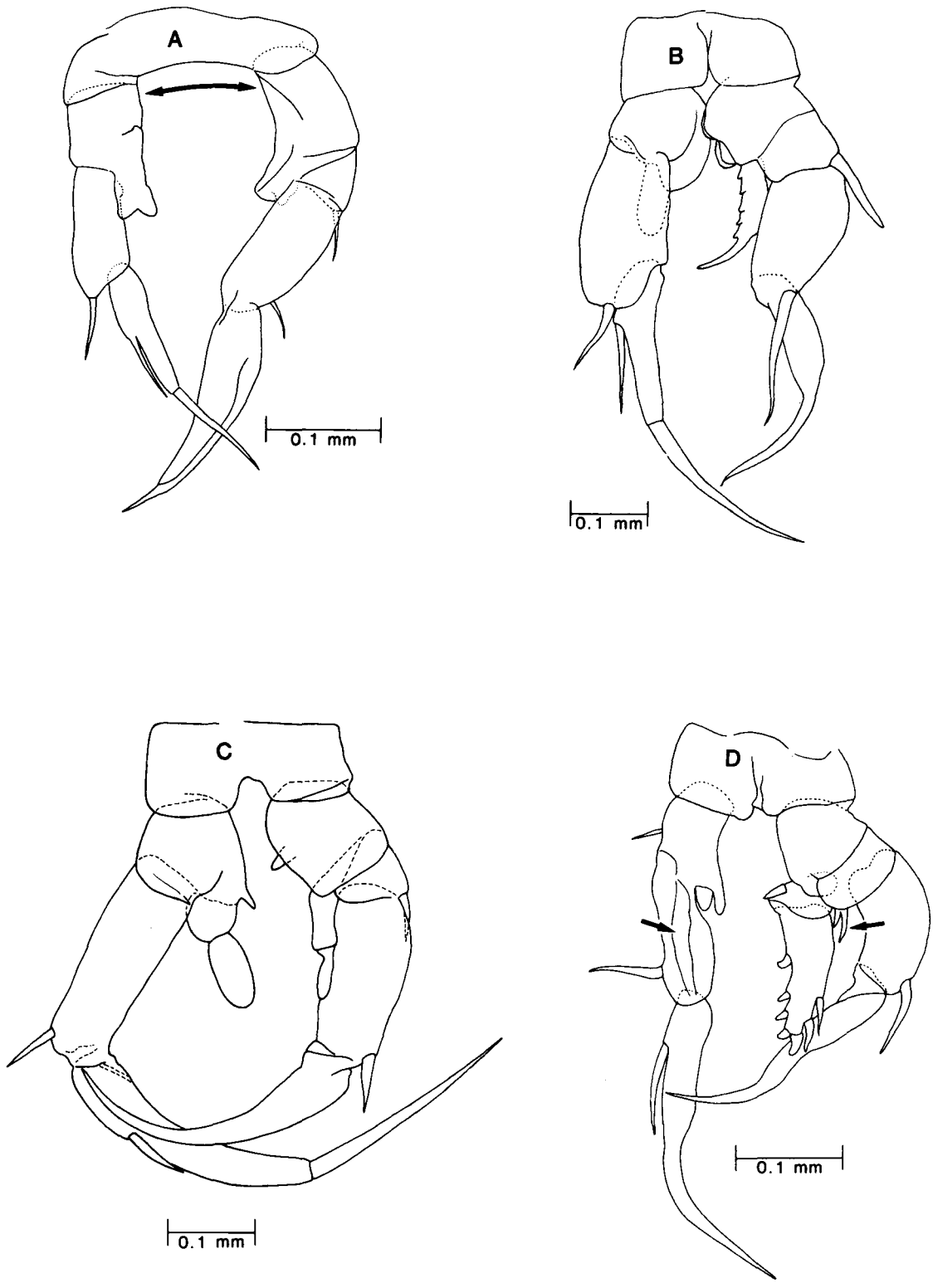

Fig. 4: Male fifth legs, posterior aspect. A, *Boeckella gracilis* (Daday); B. *B. occidentalis* Marsh; C, *B. poopoensis* Marsh; D, *B. vallentini* (Scott).

Quinta pata del macho, aspecto posterior. A, *Boeckella gracilis* (Daday); B, *B. occidentalis* Marsh; C, *Boeckella poopoensis* Marsh; D, *B. vallentini* (Scott).

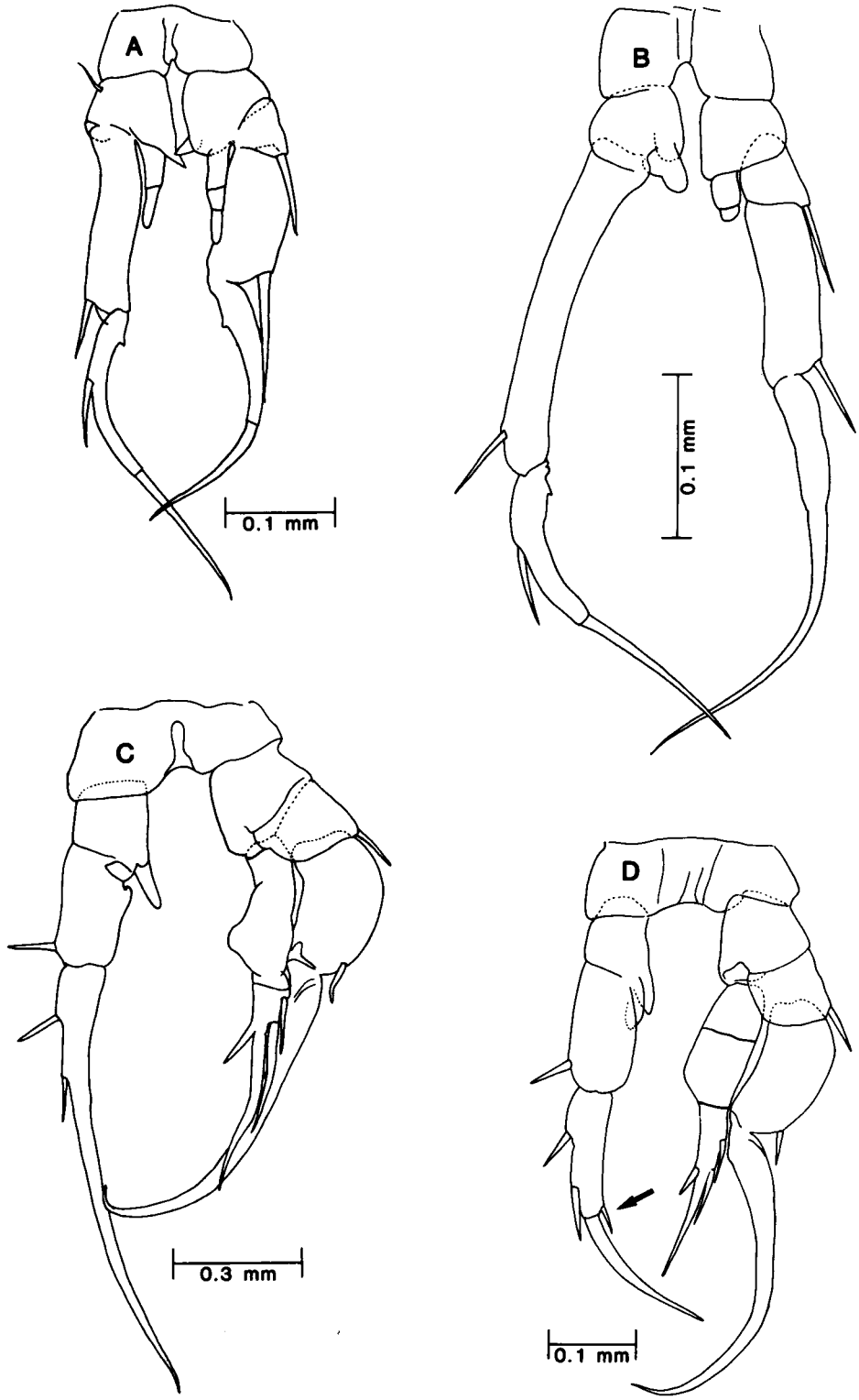

Fig. 5: Male fifth legs, posterior aspect. A, *Boeckella meteoris* Kiefer; B, *B. titicacae* Harding; C, *B. calcaris* (Harding); D, *B. palustris* (Harding).

Quinta pata del macho, aspecto posterior. A, *Boeckella meteoris* Kiefer; B, *B. titicacae* Harding; C, *B. calcaris* (Harding); D, *B. palustris* (Harding).

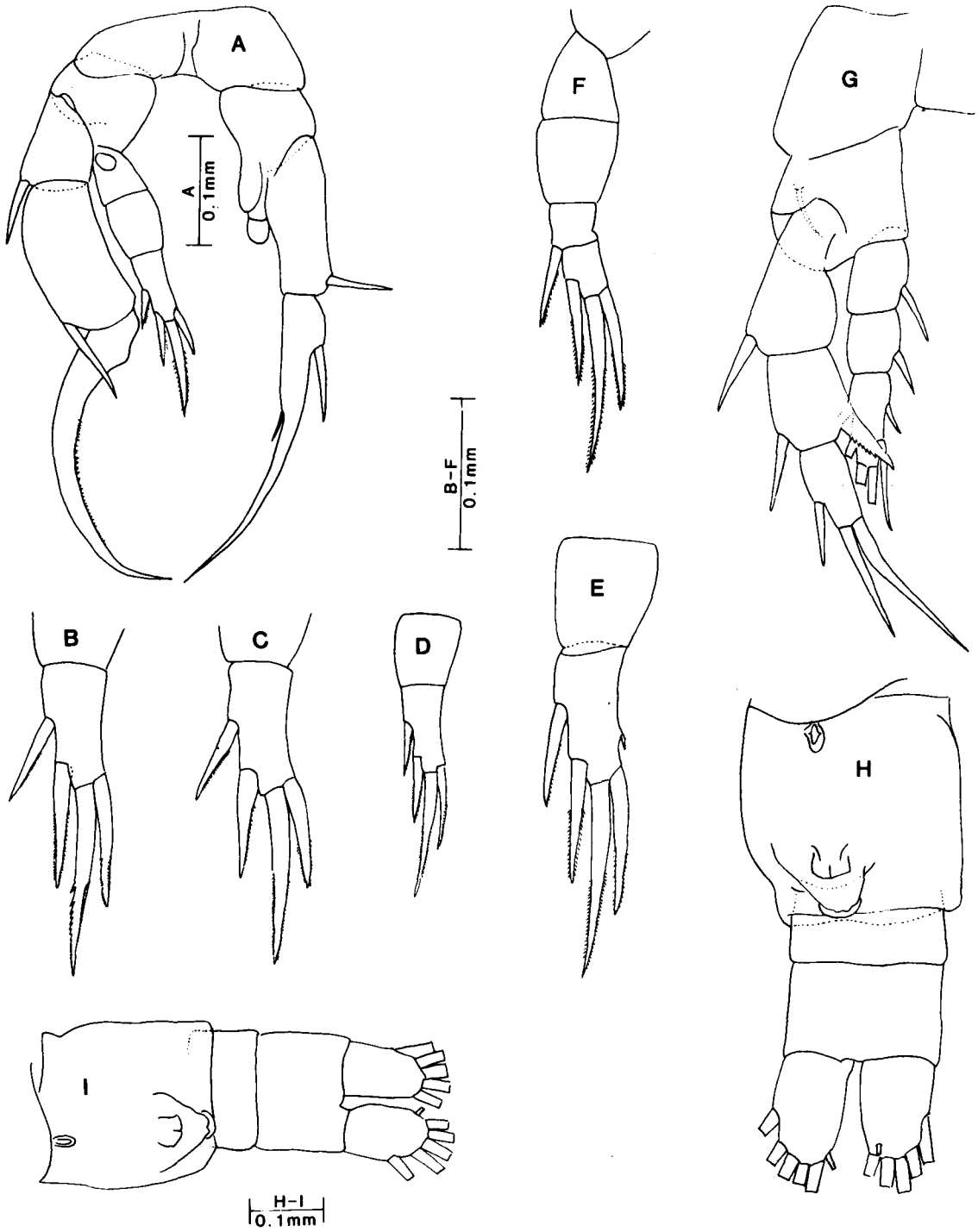

Fig. 6: Boeckella brasiliensis (Lubbock). A, male fifth legs, anterior aspect [drawn from Daday's type material of *B. setosa*]; B-F, male fifth right endopod (in part or whole); E, showing minute supernumerary fifth spine on inner edge; F, showing anomalous 4-segmented condition; G, female fifth leg; H-I, female urosomes, ventral aspect.

Boeckella brasiliensis (Lubbock). A, quinta pata del macho, aspecto anterior [dibujados de datos de Daday sobre *B. setosa*]; B-F, quinto endópodo derecho del macho (en parte o entero); E, demostrando una quinta espina supernumeraria en el borde interior; F, demostrando condición anómala de 4-artejos; G, quinta pata de la hembra; H-I, cuerpo posterior de la hembra, aspecto ventral.

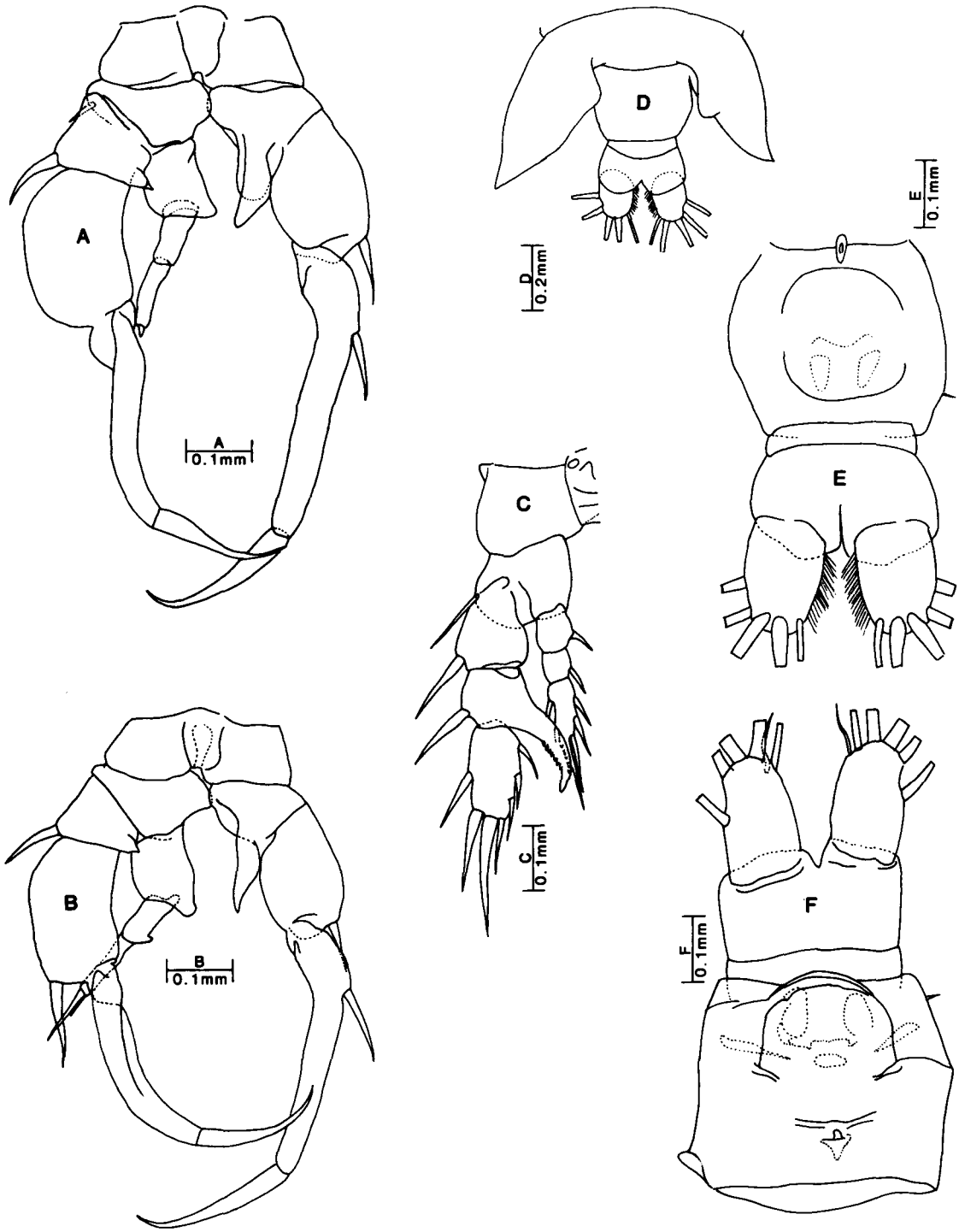

Fig. 7: Boeckella brevicaudata (Brady). A, male fifth legs, anterior aspect (Macquarie Island material); B, male fifth legs, anterior aspect (Heard Island material); C, female fifth leg (Macquarie Island material); D, last prosomal segment and urosome of female, dorsal aspect; E and F, ventral aspect of urosome of female (two different preparations).

Boeckella brevicaudata (Brady). A, quinta pata del macho, aspecto anterior (datos de Isla Macquarie); B, quinta pata del macho, aspecto anterior (datos de Isla Heard); C, quinta pata de la hembra (datos de Isla Macquarie); D, último artejo prosomal y cuerpo posterior de la hembra, aspecto dorsal; E y F, aspecto ventral del cuerpo posterior de la hembra (dos preparaciones diferentes).

segment (see arrows in Fig. 4D) ..... *vallentini* (Scott)
Right Rel without projections on inner edge; left Rel without laminar expansion on posterior face of segment 4

4(3) Right Re2 with outer distal spine extending more than halfway along right Re claw .. *occidentalis* Marsh
Right Re2 with outer distal spine not extending more than halfway along right Re claw 5

5(4) Right Ri extending to distal extremity of right Re2 or beyond 6
Right Ri not extending to distal extremity of right Re2 11

6(5) Left Re claw with inner spine (see arrows in Figs 2A and 5D) 7
Left Re claw lacking inner spine . 8

7(6) Left Re claw with only 1 outer spine ..... *brasiliensis* (Lubbock)
Left Re claw with 2 outer spines... ..... *palustris* (Harding)

8(6) Right Ri 2-segmented, extending well beyond distal extremity of right Re2 ..... *calcaris* (Harding)
Right Ri 3-segmented, not extending well beyond distal extremity of right Re2 9

9(8) Right Ril much wider than right Ri2 (or Ri3) . *brevicaudata* (Brady)
Right Ril not wider than right Ri2 (and Ri3 bearing spines - typically 4) 10

10(9) Right Re claw strongly thickened proximally and bent almost through right angle ..... *silvestrii* Daday
Right Re claw not strongly thickened proximally and smoothly curved (not bent almost through right angle) ..... *poppei* (Mrázek)

11(5) Right Ri extending more than half way along right Re2 12
Right Ri not reaching distal edge of right Rel or barely extending past line of segmentation between right Rel and Re2 13

12(11) Right Ri 3-segmented .... *meteoris* Kiefer
Right Ri 2-segmented .... *poopoensis* Marsh

13(11) Left Rel with semi-circular expansion on inner edge .... *michaelseni* (Mrázek)
Left Rel without semi-circular expasion on inner edge 14

14(13) Junction between left Re claw and left Rel almost directly opposite junction between right Re claw and right Re2; left Rel 5.5-6.0 times as long as mean width .... *gracilipes* Daday
Junction between left Re claw and left Rel directly opposite a point distinctly distal to junction between right Re claw and right Re2; left Rel 6.0-7.5 times as long as mean width ..... *titicacae* Harding

BOECKELLA BRASILIENSIS (LUBBOCK)
(Figs. 2A, 6A-I, 22)

Diaptomus brasiliensis Lubbock, 1855, pp. 237-40, pl. xv, figs 3-8.
Boeckella brasiliensis (Lubbock). De Guerne and Richard, 1889, pp. 100-2, figs 54-6. Daday, 1902 (in part, pp. 247-51, pl. vii, figs 1-5).
Pseudoboeckella brasiliensis (Lubbock). Mrázek, 1901, pp. 5-6, pl. i, figs 11 and 13, p. ii, figs 24 and 30. Ekman, 1905b, p. 600. Brehm, 1936, p. 484.
Boeckella setosa Daday, 1901, p. 347.
Pseudoboeckella braziliensis (Lubbock). Marsh, 1924, p. 19, fig. 27. Ringuelet, 1958a, pp. 75-6, 79-80.
Pseudoboeckella setosa (Daday). Marsh, 1924, pp. 23-4, fig. 32.
Non *Boeckella brasiliensis* (Lubbock). Poppe and Mrázek, 1895, pp. 135-8, figs 1-11. Giesbrecht and Schmeil, 1898, pp. 60-1, fig. 14 (misidentification of *Pseudoboeckella poppei* Mrázek). Da-

day, 1902 (in part, pl. vii, fig. 6) (misidentification of *Pseudoboeckella poppei* Mrázek).

Specimens examined

Argentina Four male P5 and two female P5 on three microslides labelled *"Boeckella brasiliensis* (Lubb.) 1203 Patagonia, St Cruz [50°08'S., 68°20'W.]" [part of Daday's collection]. Material from five vials all labelled *"Boeckella setosa* Dad. Typus 1203/1901 Patagonia Sylvestri" [unmounted syntypes of *Boeckella setosa* Daday (1901) collected by Sylvestri]: vial (1) 2.07 mm, 1.70 mm; vial (2) 1.64 mm, 1.29 mm (n = 3); vial (3) 1.85 mm, 1.45 mm; vial (4) 1.61 mm, 1.32 mm; vial (5) 2.08 mm (n = 3), 1.55 mm. Ten males from the preceding syntype series also dissected.

Chile Torres del Paine National Park (ca 51 S., 73 W.): October 1980; pond (1), 1.6 mm (n = 1), 1.25 mm (n = 2); pond (2), 2.0 mm (n = 1); coll. D. Soto; October 1986; L. Jovito, 1.89 mm (n = 4), 1.61 mm; L. Redonda, 1.9 mm (n = 2), 1.7 mm (n = 1); L. Larga, 1.75 mm, 1.59 mm; coll. D. Soto and S. Hurlbert.

Description of male

Size. Length 1.2-1.8 mm.
Fifth legs. Right Ri typically 3-segmented, extending (without considering distal spines) to distal extremity of right Re2 or slightly beyond, with maximum width at Ri2 [rarely (with developmental anomaly) 4-segmented (Fig. 6F)]; Ri3 typically with 4 spines – 1 terminal *(clearly longest and ca 1.5 X length of Ri3),* 2 subterminal and 1 ca halfway along outer edge [rarely (Fig. 6E) with minute fifth spine on inner edge]. *Left Re claw with small spine at ca 0.4X distance along inner edge* (see arrow in Fig. 2A). Left Ri 2-segmented, extending ca halfway along inner edge of left Re1.

Description of female

Size. Length 1.5-2.2 mm.
Fifth legs. Re3 with 3 spines, spine 3 at least twice as long as segment itself and with characteristic bend.

Urosome (Figs 6H&I). Length ca 2.1-2.2 X maximum width.

Remarks

This species has several features in common with *B. poppei* but may be distinguished by its smaller size and the presence of only 3 spines on the Re3 of the female P5. *B. brasiliensis* is also distinguishable from *B. poppei* in the male P5 by the inner spine on the left claw and the length dominance of the terminal spine on the right Ri.

BOECKELLA BREVICAUDATA (BRADY) *(Figs. 2B, 7A-F)*

Centropages brevicaudatus Brady, 1875, pp. 162; 1879, pp. 215-6, pl. xii, figs 11-19.
Paraboeckella brevicaudata (Brady). Mrázek, 1901, pp. 8-11, figs 6, 7, 12, 21, 26, 27, 29, 45, 46, 50 and 52.
Pseudoboeckella brevicaudata (Mrázek). Ekman, 1905b, pp. 600-1. Scott, 1914, pp. 4-5, pl. i, figs 1, 7 and 10. Marsh, 1924, pp. 20-1, fig. 28
Pseudoboeckella brevicaudata (Brady). Rühe, 1914, pp. 56-61, figs 20a-e, 21 a-d. Evans, 1970, pp. 43-57.
Boeckella vexillifera Ekman, 1905a, pp. 16-20, figs 7-12.
Pseudoboeckella brevicaudata (Mrázek), var. *vexillifera* Ekman, 1905b, p. 601.
Pseudoboeckella remotissima Brehm, 1953, pp. 643-50, figs 1-5.

Comment on synonymy

Brady's (1875, 1879) original description of this species from freshwater lakes on Kerguelen Island did not include the male, and his description of the female was inadequate to separate it from that of other closely related species. On the basis of the original description *alone,* therefore, Brady's name would have to be treated as a *nomen dubium.* However, the material described quite adequately by Rühe (1914) came from the same habitats (lakes near Observatory Bay) as those from which Brady's specimens originated. Rühe's des-

cription of topotypes therefore allowed the proper reconstruction of Brady's species and, unlike Marsh (1924), I have retained Brady as the authority. The only proper alternative (not adopted by Marsh or others giving authority to Mrázek) would be to give a new name to Mrázek's (1901) species.

The form described by Brehm (1953) under the name *P. remotissima* may be safely and simply regarded as a *brevicaudata* male that was damaged, distorted or abnormal in the region of the inner edge of the second basal segment (B2) and the basal endopod segment of the right fifth leg.

Specimens examined

Heard Island (53°07'S, 73°20'E). Pools between old ANARE Station and Rogers Head, 17.iii.1980, 1.87 mm [mean clutch (n = 4) 36], 1.66 mm, coll. R. Williams. Collections from the following seven localities were made by H. Burton and D. Eslake: Fairchild Beach, 26. x. 1985, 2.27 mm, 2.15 mm; Atlas Cove, 21. x. 1985, 2.11 mm, 1.98 mm; Atlas Cove, 27. x.1985, 2.05 mm, 1.86 mm; Winston Pond, 20. x. 1985, 2.14 mm1 2.07 mm; Green Valley, 1.80 mm (n = 3), 1.75 mm (n = 4); Dover's Moraine (a), 25. x. 1985, 1.91 mm (n = 4), 1.70 mm (n = 3); Dover's Moraine (b), 25. x. 1985, 2.45 mm (n = 3), 2.28 mm. Seal Pond, 14.i.1988, 2.23 mm, 2.12 mm; Winston Lagoon, 14.i. 1988, 1.83 mm, 1.73 mm; coll. R. Kirkwood.

Macquarie Island (54°38'S., 158°53'E). Storey Creek, 18.xii.1962, 1 female, 2 males, coll. A.J. Evans [British Museum No. 1963.10.3.13]. L. Tullock, 15.ii.1969, 1.67 mm, 1.79 mm; Waterfall L., 16.ii. 1969, 1.46 mm, 1.50 mm; Tiobunga L., 20.ii.1969, 1.50 mm, 1.57 mm, coll. S.R. Harris. Duck L., 8.xii.1986, 1.84 mm, 1.92 mm, coll. I. Norman. Collections from the following five localities made by P.A. Tyler, 25-27.xi.1970: Square L., 1.88 mm (n = 9), 1.92 mm (n =10); Tiobunga L., 1.35 mm (n = 8), 1.40 mm (n = 8); Major L., 1.37 mm (n = 8), 1.40 mm; Flynn L., 1.56 mm, 1.63 mm; Island L., 1.66 mm, 1.82 mm.

Description of male

Size. Length 1.4-2.3 mm.
Fifth legs. Right Ri 3-segmented, extending beyond distal extremity of right Re2; Ri1 with maximum width >2X that of Ri2 and meeting Ri2 unconformably along inner edge to form distinct shoulder; Ri2 sometimes with outgrowth from distal quarter of inner edge (Fig. 7B); Ri3 with variable termination [blunt tooth (Figs 2B and 7A), long spine, or long spine plus short one (Fig. 7B)]. Right Re1 with spine-like projection on anterior face near inner distal corner; right Re claw with clear line of segmentation ca 1/3 total length from distal extremity giving 4-segmented appearance to right Re. Left B2 with prominent expansion at inner distal corner on anterior face, extending at least halfway along inner edge of left Re1. Left Ri 1-segmented, extending ca halfway along inner projection of left B2 or ca 1/3 distance along inner edge of left Re1.

Description of female

Size. Length 1.3-2.5 mm.
Fifth legs. Re3 with 7 spines.
Urosome (Figs 7E&F). Length ca 1.7-1.8 X maximum width. Caudal rami fringed with fine hairs along inner edge.

Remarks

Of those species in the genus in which the male fifth right Ri is 3-segmented, this one may be distinguished by the fact that the first (or basal member) of these segments is much wider than the rest.

It is surprising that *brevicaudata* should have been described from collections from the Kerguelen Islands yet all five of the more recent collections from these islands that I have examined yielded *vallentini* only (see below). No one has recorded the co-occurrence of *brevicaudata* and *vallentini* from Kerguelen, and it is possible that these two species have completely allopatric distributions on this group of islands.

There are significant differences in the extent of sexual dimorphism in this species between Heard Island and Macquarie Island.

For Heard Island material the mean ratio of female : male length is 1.07 but for Macquarie Island specimens the corresponding value is 0.96. *B. brevicaudata* from Macquarie Island is unique within the genus in that for every population examined the males are on average *longer* than the females. However, this is not to say that the Macquarie Island males are on average *heavier* than the females. The unusually low intersexual length ratios quoted for this species are partially a consequence of sexual differences in the length of the urosome relative to that of the prosome; the specific name, *brevicaudata,* is very appropriate for the female.

BOECKELLA BERGI RICHARD
(Figs. 2C, 8A-E, 22)

Boeckella bergi Richard, 1897, pp. 321-5, fig. 2. Giesbrecht and Schmeil, 1898, p. 61. Sars, 1901, pp. 6-10, pl.I, figs 1-15. Ekman, 1905b, p. 602. Marsh, 1924, pp.4-5, fig. 2. Brian, 1925, p. 188, figs 17-18. Pesta, 1927, p. 71, fig. 2a. Brehm, 1935d, pp. 298-300, 304-5; 1936, pp. 485-6. Olivier, 1955a, tab. 2 [ad.p.299]. Ringuelet, 1958a, p.66.

Boeckellopsis bergi (Rich.). Mrázek, 1901, pp. 7-8.

Pseudoboeckella bergi (Rich.). Daday, 1902, pp. 220-4, tab. IV, figs 6-19.

Boeckella bergi var. *serrifera* Brehm, 1937c, pp. 301-3.

Boeckella bergi var. *cornuta* Brehm, 1937c, pp. 303-4.

Boeckella bergi conesae Brehm, 1954b, pp. 38-40, figs 4-8. Ringuelet, 1958a, pp. 64 and 68-9.

Boeckella bergi bergi Richard. Ringuelet, 1958a, pp. 64 and 66-7.

Specimens examined

Argentina 1.3 mm (n = 2) [clutch 14 (n = 6)]; 1.2 mm (n = 2) [British Museum, vial labelled *"Boeckella bergi* Rich. Argentina" in jar labelled *"Boeckella bergi* 1901-12-12. 346-351 Argentine coll. Sars."], 1.44 mm (n = 9), 1.31 mm (n = 6) [from Daday's collection in vial labelled *"Pseudoboeckella Bergi* 1203/1901 Patagonia Sylvestri"].

Description of male

Size. Length ca 1.2-1.3 mm (but wider range likely).

Fifth legs. Right B1 with large outgrowth from inner distal corner (see arrow in Fig. 2C), extending more than halfway along inner edge of right B2 (disregarding outgrowth from inner distal corner of this segment); right B2 with blunt outgrowth extending 0.25-0.30X distance along inner edge of right Re1 + Re2. Right Ri 1-segmented, extending 0.5-0.6X distance along inner edge of right Re1 + Re2. Right Re1 unusually short and sometimes not clearly delimited from Re2 on posterior face (Fig. 2C). Left B2 with blunt projection from inner distal corner, extending 0.15-0.20X distance along inner edge of left Re1. Left Ri minute, 1-segmented. Left Re1 elongated- ca 3.1 X as long as maximum width.

Description of female

Size. Length ca 1.3-1.4 mm (but wider range likely).

Fifth legs. Ri relatively short, extending a little more than halfway along length of Re2 (Fig. 8B); Re3 with 3 spines, spine 3 ca 1.2 X as long as segment itself.

Urosome (Figs 8C-E). Genital segment ca 1.0-1.2 X as long as maximum width in ventral view, with projecting hood or fornix (semi-circular in lateral view - see Figs. 8D, E) arising from the left side. Length entire urosome ca 2.1-2.4 X maximum width.

Remarks

This species is easily recognised by a generically unique feature: the presence on the male fifth right B1 of a prominent outgrowth from the inner distal corner (see arrow in Fig. 2C). The hood or fornix on the left side of the female genital segment (Fig. 8E) is also most distinctive.

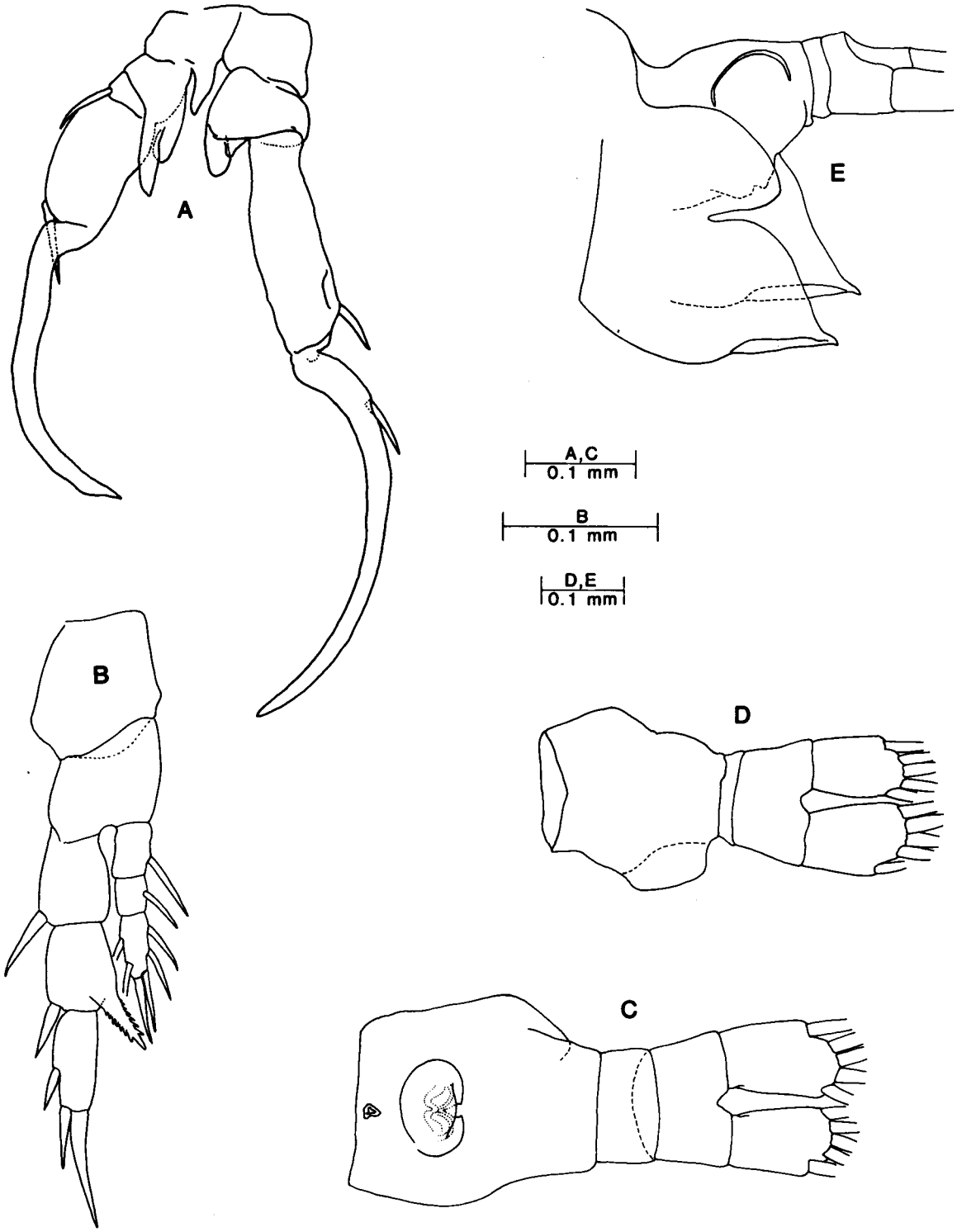

Fig. 8: Boeckella bergi Richard. A, male fifth legs, anterior aspect; B, female fifth leg; C, ventral aspect of female urosome; D, dorsal aspect of female urosome; E, left lateral view of female urosome and the last prosomal segment.

Boeckella bergi Richard. A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C, aspecto ventral del cuerpo posterior de la hembra; D, aspecto dorsal del cuerpo posterior de la hembra; E, vista lateral izquierda del cuerpo posterior de la hembra y el último artejo prosomal.

BOECKELLA POPPEI (MRÁZEK)
(Figs. 2D, 9A-J, 23)

Boeckella brasiliensis (Lubbock). Poppe and Mrázek, 1895, pp. 135-8, figs 1-11. Giesbrecht and Schmeil, 1898, pp. 60-1, fig. 14. Daday, 1902 (in part, pl. vii, fig. 6).

Pseudoboeckella poppei Mrázek, 1901, p.6. Ekman, 1905b, p.600. Scott, 1914, pp. 3-4, pl.i., fig. 9. Marsh, 1924, pp. 22-3, fig. 31. Kiefer, 1928, pp. 216 and 218, figs 1-3. Pesta, 1928, p. 77. Brehm, 1936, p. 484. Harding, 1941, p. 320. Ringuelet, 1955a, p.444; 1958a, pp.76 and 82-3. Pezzani-Hernandez, 1975, pp. 28-44, figs 2-3, tab. 1-3. Heywood, 1977. Paggi, 1983; 1987, pp. 15, 17-21.

Boeckella dubia Daday, 1901, p. 345.

Boeckella entzii Daday, 1901, pp. 345-6; 1902, pp. 239-43, pl. vi, figs 3-9.

Boeckella poppei Daday, 1902, pp. 234-6.

Boeckella entzi Daday. Ekman, 1905a, pp. 15-16, fig. 6; 1905b, p. 600.

Pseudoboeckella poppei (Daday). Sars, 1909, pp. 22-9, pl. iii, figs 1-16. Brehm, 1956b, pp. 87-9, figs 49-57. Weller, 1977.

Pseudoboeckella entzi (Daday). Ortmann, 1911, p. 639. Brehm, 1936, p. 484.

Pseudoboeckella silvestri Daday. Goodman, 1969. Heywood, 1970a, 1970b, 1972 [misidentification of *B. poppei*].

?Pseudoboeckella klutei Brehm, 1926, pp. 310-12, fig. 2; 1936, p. 484.

Non *Diaptomus brasiliensis* Lubbock, 1855, pp. 237-40, figs 3-8.

Non *Boeckella brasiliensis* (Lubbock). Daday, 1902 (in part, pl. vii, figs 1-5).

Comment on synonymy

Examination of Daday's type material of *entzii* confirms that it should be placed in synonymy with *poppei*.

Examination of Daday's type material of *dubia* shows that it is simply a teratological specimen of *poppei* in which the claw of the male fifth left exopod developed two spines instead of one (Fig. 9F). The appendage figured by Daday (1902, pl.vii, fig. 6) as a deformed ["deformirtes"] male fifth leg of *brasiliensis* (Lubb.) is, in fact, an anomalous leg of *poppei* (Fig. 9E) [compare with Bayly's (1964, fig. 5ZZ, p. 192) of a similarly deformed specimen of *B. triarticulata*]. The specimen with this deformed left leg also had 5 instead of the usual 4 spines on the terminal segment of the right endopod of the same appendage (cf. Fig. 9D).

Brehm (1926) admitted that the form he named *klutei* was closely related to *poppei*. Some of the characters he used to separate *klutei* from *poppei* are of doubtful value. The fifth pair of legs in the male were said to be longer and slimmer than those of *poppei*, but Brehm failed to figure them. *Klutei* is a possible synonym of *poppei*, but it must be admitted that it was collected from a locality, El Junco pond (north Patagonia, ca 40°S.), substantially north of the main area of distribution of *poppei*. The proper course is probably to treat *klutei* as a *nomen dubium*.

Specimens examined

Argentina Five males and 5 females from each of three vials all labelled *"Boeckella Entzi* Dad. Typus 1203/1901 Patagonia Sylvestri" [unmounted, undissected syntypes of *Boeckella entzi* Daday]: vial (1) 2.86 mm, 2.38 mm; vial (2) 2.86 mm, 2.42 mm; vial (3) 2.25 mm, 1.86 mm. Six female P5 and 9 male P5 mounted on slide labelled *"Boeckella Entzi* Dad.♀♂ 1203 Patagonia Amenkelt St Cruz" [dissected metatypes of *B. entzi* Daday]. One female P5 and 1 male P5 mounted on slide labelled *"Boeckella Entzi* Dad. ♀♂ 1203 Patagonia Missioneros? [difficult to read] St Cruz" [dissected metatypes of *B. entzi* Daday]. Santa Cruz, 50°08'S., 68°20'W.

Chile Torres del Paine National Park (ca 51°S., 73°W.), October 1980; pond (1), 3.32 mm, 3.00 mm; pond (2), 3.02 mm, 2.80 mm; coll. D. Soto. October 1986; L. Tehuelches Este, 3.17 mm, 2.70 mm (n = 3); L. Redonda, 2.8 mm (n = 1), 2.5 mm (n = 2); L. Larga, 2.59 mm, 2.47 mm; coll. D. Soto and S. Hurlbert.

Signy Island, South Orkney Islands (60°43'S., 45°37'W.). Two males, 2 females, coll. R.B. Heywood [British Museum material nos. 1966.10.9.1-2 labelled *"Pseudoboeckella silvestri* Daday"].

Description of male

Size. Length 1.9-3.0 mm.
Fifth legs. Right Ritypically 3-segmented (but sometimes apparently 2-segmented) extending (without considering distal spines) to distal extremity of right Re2 or slightly beyond, maximum widths of Ri1 and Ri2 about equal but distinctly greater than that of Ri3; Ri3 typically with 4 spines [but total number varying from 1 to 5 (supernumerary spine sometimes present on inner edge, see Figs 9C&D) and rarely 6] – 2 on outer edge with secondary spinules and 2 terminal smooth ones of subequal length (cf. *brasiliensis).* Left B2 with blunt outgrowth on anterior face near inner distal corner. Left Ri typically 2-segmented, extending 0.4 X distance along inner edge of left Re1. Left Re claw lacking an inner spine (cf. *brasiliensis*).

Description of female

Size. Length 2.2-3.3 mm.
Antennules. Not reaching beyond end of prosome (excluding wings on last prosomal segment).

Fifth legs. Re3 often with 7 spines [but total number commonly reduced to 6, 5 or even 4], 4 spines on inner edge very variable in extent of development relative to remaining 3 spines and to segment bearing them.

Urosome (Figs 9I&J). Length ca 2.1-2.4 X maximum width.

Remarks

This species has some resemblances to *B. brasiliensis* but may be readily distinguished using the criteria already given (see "remarks" under *brasiliensis*).

R.B. Heywood (pers. comm.), in a study of material from Signy Island to Alexander Island (70°48'S., 68°22'W.), has found that the number of spines (or setae) on the terminal segment of the male fifth right endopod may vary from 1 to 6 (typically it is 4). Additionally, he has observed that the number of spines on the inner edge of the terminal exopod segments of the female fifth legs may be reduced from the usual 4 to 3 or even 2. Heywood believes that this variation in spine number is related to the length of time the animal has available for growth from egg to adult; they usually carry a full set of spines in lakes which do not freeze solid and are completely ice-free for 2-4 months, but the number is commonly reduced in small pools which freeze solid for 8-9 months of the year.

Despite the use of "sub-Antarctic" in the title of this paper, Signy and Alexander Islands are more correctly described as Antarctic islands.

BOECKELLA MICHAELSENI (MRÁZEK) *(Figs. 3A, 10A-F, 23)*

Boeckellina michaelseni Mrázek, 1901, pp. 11-12, pl. i, figs 5, 10, 20, and 23, pl. ii, figs 31, 33 and 36, pl. iii, figs 47, 48 and 54.

Boeckella pygmaea Daday, 1901, pp. 349-50.

Pseudoboeckella pygmaea (Dad.). Daday, 1902, pp. 231-3, pl. v, figs 8-12.

Pseudoboeckella anderssonorum Ekman, 1905a, pp. 10-14, pl. i, figs 3-5.

Boeckella michaelseni (Mrázek). Ekman, 1905b, p. 603. Scott, 1914, pp. 2-3, pl. i, figs 4 and 5. Marsh, 1924, pp. 8-9, fig. 10. Pesta, 1928, pp. 77-8. Kiefer, 1933, p. 295. Brehm, 1936, p. 485. Thomasson, 1953, p. 194, fig. III(2a-c); 1955, pp. 197 & 199. Ringuelet, 1955a, p. 444; 1958a, pp. 65-6, 72-3. Brehm, 1956a, pp. 25-6.

Specimens examined

Argentina 0.79 mm (n = 6), 0.74 mm (n = 6) [Syntype material of *Boeckella pygmaea* Daday. Specimens in vial labelled "*Pseudoboeckella pygmaea* 1203/1901 Dad. Typus Sylv. Patagonia".]

Chile Torres del Paine National Park, October 1986, L. Jovito, 0.98 mm, 0.85 mm; L. Redonda, 0.97 mm, 0.83 mm; coll. D. Soto and S. Hurlbert.

Description of male

Size. Length 0.7-0.9 mm.
Fifth legs. Right Ritypically 3-segmented

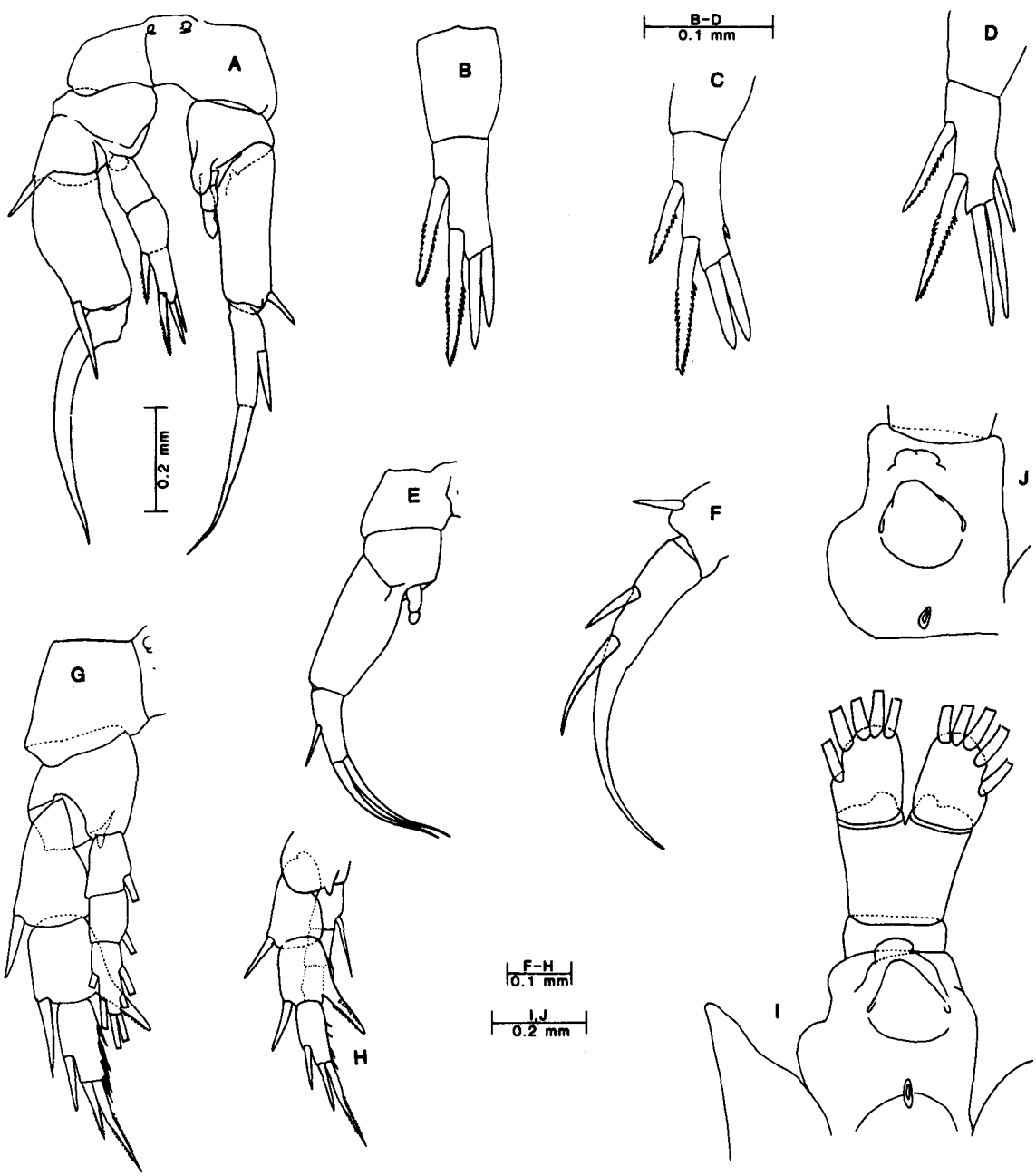

Fig. 9: Boeckella poppei (Mrázek). A, male fifth legs, anterior aspect (note that the proximal outer spine of the right Ri is in an abnormal position); B-D, terminal segment of right Ri showing armature (B typical condition, C small supernumerary inner spine, D large supernumerary inner spine); E, anomalous male fifth left leg [figured by Daday (1902, pl. vii, fig. 6) and incorrectly said to be of *B. brasiliensis*]; F, teratological male fifth left Re claw with two spines instead of one [drawn from type specimen of *B. dubia* Daday]; G, female fifth leg; H, part of female fifth leg showing highly reduced spines on inner edge of Re3, I, ventral aspect of female urosome; J, ventral aspect of female genital segment.

Boeckella poppei (Mrázek). A, quinta pata del macho, aspecto anterior (note que la espina proximal externa de la Ri derecha está en posición anormal); B-D, artejo terminal de Ri derecho demuestra armadura (B condición característica, C pequeña espina supernumeraria interna, D espina supernumeraria interna); E quinta pata izquierda del macho anómala [figurada por Daday (1902, pl. vii, fig. 6) y dicho incorrectamente como parte de *B. brasiliensis*]; F, quinto gancho Re izquierdo del macho teratológico con dos espinas en vez de una [dibujado de espécimen de *B. dubia* Daday]; G, quinta pata de la hembra; H, parte de la quinta pata de la hembra demostrando espinas sumamente disminuidas en el borde interior de Re3; I, aspecto ventral del cuerpo posterior de la hembra; J, aspecto ventral del artejo genital de la hembra.

but distal line of segmentation sometimes indistinct giving 2-segmented appearance, extending almost to distal extremity of right Re1. Right Re1 elongated (2.5 X as long as maximum width); right Re2 very elongated (5.0 X as long as maximum width); extremity of right Re claw reaching far beyond that of left Re claw. Left B2 with short rounded projection at inner distal corner on anterior face. Left Ri 1-segmented, extending ca 0.35 X distance along inner edge of left Re1. Left Re1 with well developed semicircular expansion on inner edge bearing row of small spinules, left Re claw narrowing fairly abruptly at point slightly less than 0.4 X entire length from proximal articulation.

Description of female

Size. Length 0.8-1.0 mm.
Fifth legs. Re3 with 3 spines, spine 3 shorter than segment itself and with characteristic bend.

Urosome (Fig. 10B). Genital segment about as long as maximum width in ventral view, genital operculum with projection from posterior margin divided into 2-5 finger-like processes near extremity (Figs 10C-E). Length entire urosome ca 2.8-3.0 X maximum width.

Remarks

As suggested by Daday's (1901, 1902) name *"pygmaea"* (a synonym of *michaelseni*), this is an exceptionally small boeckellid, being comparable in this respect with *B. gracilipes.* In addition to its small size, it is recognisable by the very elongate male fifth right exopod which (unlike that of *B. gracilipes*) *considerably exceeds in length the male fifth left exopod.*

BOECKELLA LONGICAUDA DADAY
(Figs. 3B, 11A-C, 23)

Boeckella longicauda Daday, 1901, pp. 346-7; 1902, pp. 243-7, pl. vi, figs 10-14 and 16.

Pseudoboeckella longicauda (Daday). Ekman, 1905b, p. 600. Ortmann, 1911, pp. 638-9. Marsh, 1924, pp. 21-2, fig. 30. Brehm, 1936, p. 484. Ringuelet, 1958a, pp. 75-6 and 81.

Specimens examined

Argentina. One female and one male mounted on slide labelled *"B. longicauda* Dad. ♀♂ 1203 Patagonia Amenkelt St Cruz [50°08'S., 68°20'W.]." [The word "typus" does not appear on the slide label but the writing is unmistakably that of Daday]. Vial labelled *"Boeckella longicauda* Dad. Typus 1203/1901 Patagonia. Sylvestri" [unmounted syntypes of *Boeckella longicauda* Daday (1901), P5 already dissected off the 3 males in this vial]: 2.85 mm, 2.36 mm (n = 3).

Comments on the male

Fifth legs (Fig. 3B). In general these are rather similar to those of *B. poppei* and there is a possibility that the material from which Fig. 3B was drawn should properly be referred to that species. Apparent, and possibly significant, differences between the material labelled *"longicauda"* and *poppei* are as follows:

(1) The two terminal spines on the right Ri3 are of much more unequal length than those of *B. poppei,* more closely resembling those of *B. brasiliensis.* Moreover, the longer terminal spine has secondary spinules like that of *B. brasiliensis.*
(2) The right Re claw has a clear segmentation line at about a third of its total length from the proximal articulation.
(3) The outgrowth from the inner distal corner of the left B2 on the anterior face is more prominent than in *B. poppei.*
(4) The spine at the outer distal corner of the left Re1 and that on the outer basal portion of the left Re claw are both more strongly developed than the corresponding spines in *B. poppei.*

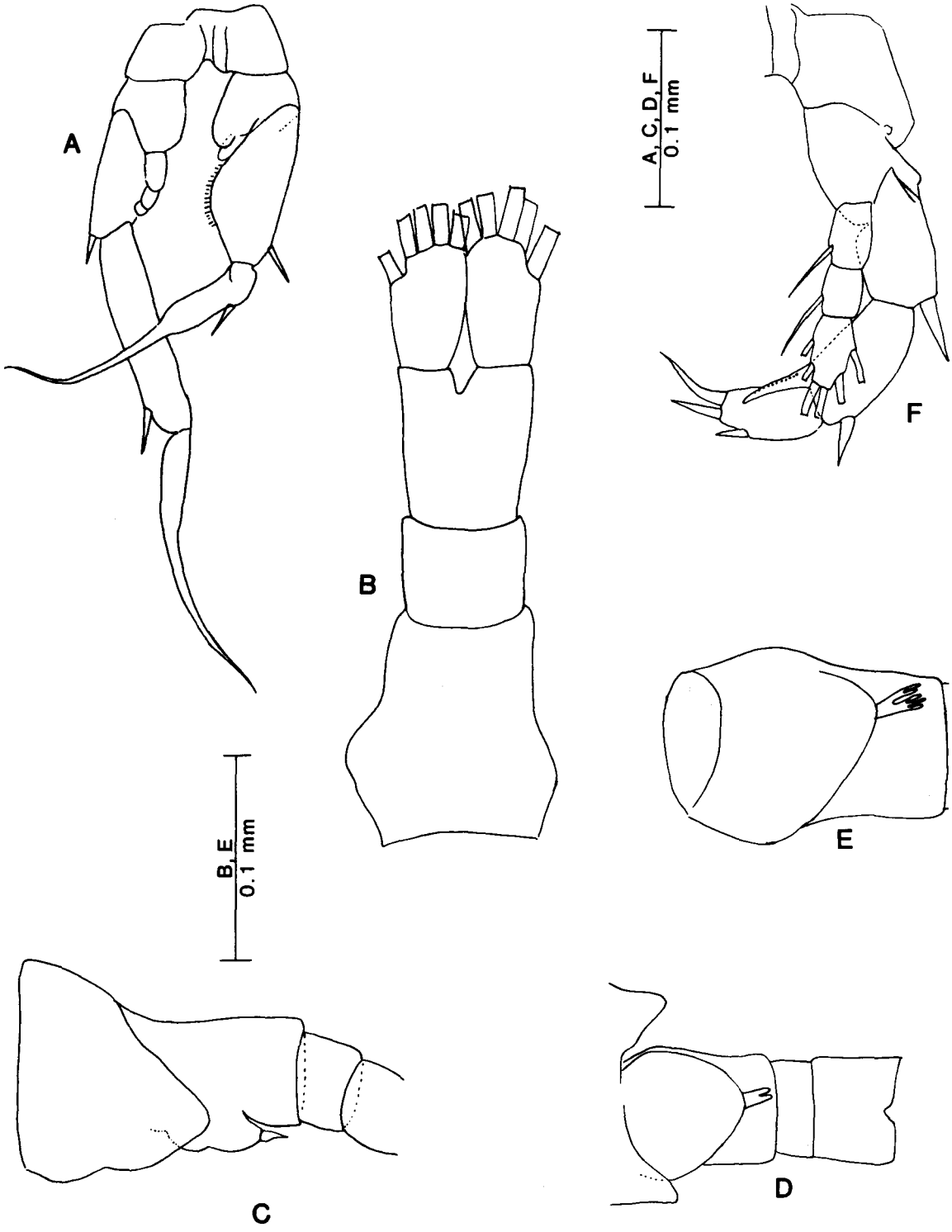

Fig. 10: Boeckella michaelseni (Mrázek). A, male fifth legs, anterior aspect; B, female urosome, dorsal aspect; C, last prosomal segment and part of female urosome, left lateral aspect; D-E, female genital segment, ventral aspect; F, female fifth leg.

Boeckella michaelseni **(Mrázek). A, quinta pata del macho, aspecto anterior; B, cuerpo posterior de la hembra, aspecto dorsal; C, último artejo prosomal y parte del cuerpo posterior de la hembra, aspecto lateral izquierdo; D-E, artejo genital de la hembra; F, quinta pata de la hembra.**

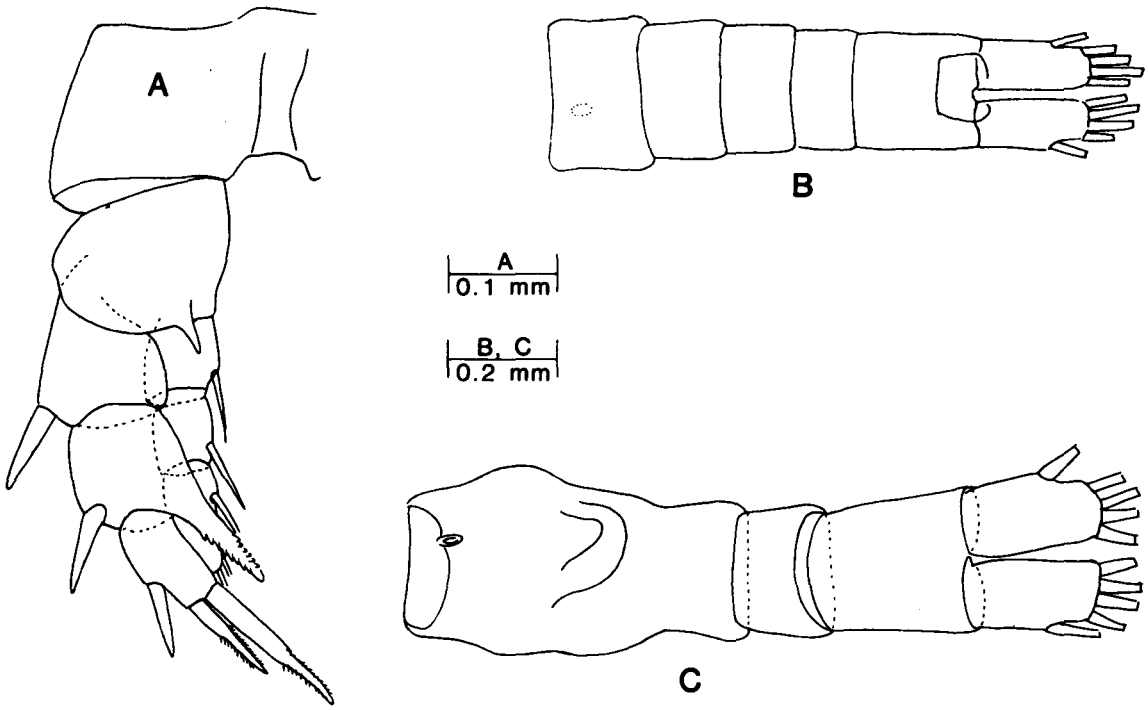

Fig. 11: Boeckella longicauda Daday. A, female fifth leg; B, male urosome, dorsal aspect; C, female urosome, ventral aspect.

Boeckella longicauda Daday. A, quinta pata de la hembra; B, cuerpo posterior del macho, aspecto dorsal; C, cuerpo posterior de la hembra, aspecto ventral.

Description of female

Size. Length ca 2.8 mm.
Fifth legs. Re3 with 3 spines, spine 3 ca 1.6 X as long as segment itself.

Urosome (Fig. 11C). Genital segment ca 1.6 X as long as maximum width in ventral view. Length entire urosome (to end of caudal rami) ca 3.5 X maximum width (of genital segment).

Remarks

There is a possibility that Daday combined two species under the nomen *"longicauda"*; the male may be a variant or abnormal specimen of *B. poppei.* However, as indicated by Daday's specific name, the female urosome of *longicauda* is unusually long and distinctive (and quite unlike that of *poppei*).

For the time being I want to refrain from defining this species in terms of Fig. 3B; I have retained *B. longicauda* as a separate species because of the nature of the female labelled with this name by Daday. New material of males accompanying females whose urosome corresponds with Fig. 11C is badly needed so that the correctness of assigning Fig. 3B to this species may be properly verified.

BOECKELLA SILVESTRII DADAY
(Figs. 3C, 12A-G, 23)

Boeckella silvestrii Daday, 1901, p. 348; 1902, pp. 251-5, pl. vii, figs 7-15.
Pseudoboeckella silvestri Daday. Marsh, 1924, p. 24, figs 33-4. Harding, 1941, p. 320.
Pseudoboeckella silvestrii Daday. Brehm, 1956b, pp. 89-90, figs 58-63. Ringuelet, 1958a, pp. 75-6 and 83-4.
?Pseudoboeckella erubescens Brehm, 1935c, pp. 121-3, figs 3a-c.

Comment on synonymy

Brehm (1935c) does not satisfactorily discriminate *erubescens* from *silvestrii* (or from *poppei* or *longicauda* for that matter); the alleged spine differences in the female fifth legs, especially the absence of spine 5 on Re3, appear insignificant. Further, he had only one male before him and, judging by his figure (Brehm, 1935c, fig 3c), this had an anomalous fifth right endopod (cf Figs 6F & 12D).

Specimens examined

Argentina Five male P5, one female P5 and one female urosome mounted on two microslidesboth labelled *"Boeckella Silvestrii* ♀♂ 1203 Patagonia, St Cruz" [metatypes of *Boeckella silvestrii* Daday (1901)]. Santa Cruz, 50°08'S., 68°20'W. Material from vial labelled *"Boeckella Sylvestrii* Dad. Typus 1203/1901 Patagonia Sylvestri" [unmounted undissected syntypes of *Boeckella silvestrii* Daday (1901) collected by Sylvestri]: 1.79 mm (n = 10), 1.43 mm (n = 10). Four specimens from this vial were dissected and mounted on microslides and designated as follows [the registration numbers assigned by the Hungarian Natural History Museum are given in parentheses]: lectotype (male) [III/P-378], paralectotypes (female) [III/P-379 & 380] and paralectotype (male) [III/P-381].

Description of male

Size. Length 1.3-1.5 mm.
Fifth legs. Right Ri 3-segmented, with maximum width at swollen middle segment, extending (without considering distal spines) slightly beyond distal extremity of right Re2; Ri3 with 4 spines (2 outer spines with secondary spinules and 2 smooth terminal spines), innermost spine smallest and commonly inclined outwards at angle to 2 neighbouring spines (Figs 3C, 12A, B and D), two terminal smooth spines more unequal in length than in *B. poppei*. Right Re claw with strong basal thickening and bent almost through right angle (cf smooth curvature of corresponding claw in *B. poppei*). Left B2 produced at inner distal corner on anterior face into pointed projection (sometimes more rounded). Left Ri 1-segmented, extending more than halfway (ca 0.6) along inner edge of left Re1. Left Re claw without spine on inner edge.

Description of female

Size. Length 1.5-1.9 mm.
Antennules. Reaching almost to distal edge of genital segment.

Fifth legs. Re3 with 3-5 spines (spines 6 and 7 on inner edge absent and spine 5 or spines 4-5 sometimes missing as well).

Urosome (Figs 12F-G). Length 1.5-1.8 X maximum width (at genital segment).

Remarks

Pezzani-Hernandez (1975) proposed *silvestrii* as a likely synonym of *poppei* but, after having examined the types of *silvestrii*, I am inclined to disagree. The Re claw of the male fifth right leg of *silvestrii* is bent almost through a right angle and is thus very different in shape to that of *poppei*. The Ri of the same leg is also different in shape in the two forms. The male fifth left leg Ri of *silvestrii* is longer relative to the left Re1 than that of *poppei*.

The only record of this species from outside South America is that of Harding (1941) from the South Shetlands. This record seems questionable (see Fig. 23).

BOECKELLA GRACILIPES DADAY
(Figs. 3D, 13A-E, 22)

Boeckella gracilipes Daday, 1901, pp. 348-9. Ekman, 1905b, p. 603. Brehm, 1936, pp. 485-6; 1956a, pp. 26-8 (in part, material from Leleque), figs 24, 27 and 28. Ringuelet, 1958a, pp. 60, 65-6, 70-1; 1958b, p.16. Thomasson, 1959, p. 43. Löffler, 1961, pp. 168-70 [partim], figs 74 and 75.

Pseudoboeckella gracilipes Daday, 1902, pp. 224-7, tab. V, figs 1-7.

Non *Boeckella gracilipes* (Daday). Löffler, 1955, pp. 731-2 and 741-5; 1961, pp. 168-70 [partim], figs 71 and 73.

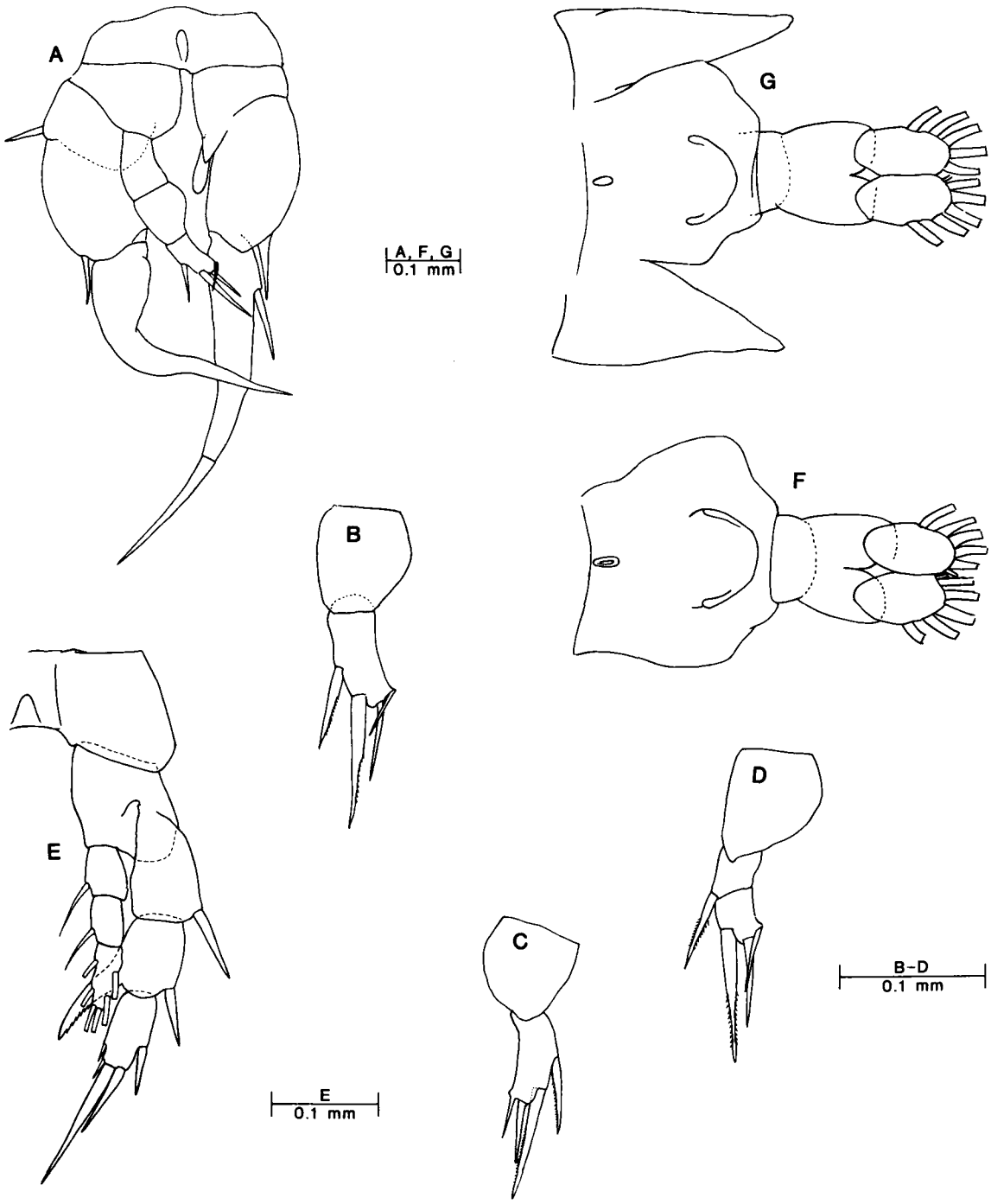

Fig. 12: Boeckella silvestrii Daday. A, male fifth legs, anterior aspect; B-C, segments 2 and 3 of male fifth right endopod showing details of the 4 terminal spines; D, portion of male fifth right endopod showing anomalous pattern of segmentation (division of terminal segment); E, female fifth leg; F, female urosome, ventral aspect; G, female urosome and wings of last prosomal segment, ventral aspect. [All drawings from Daday's syntypes.]

Boeckella silvestrii Daday. A, quinta pata del macho, aspecto anterior; B-C, artejos 2 y 3 del quinto endópodo derecho del macho demostrando detalles de las 4 espinas terminales; D, porción del quinto endópodo derecho demostrando diseño de segmentación anómalo (artejo termina dividido); E, quinta pata de la hembra; F, cuerpo posterior de la hembra, aspecto ventral; G, cuerpo posterior y alas del último artejo prosomal de la hembra, aspecto ventral [todos los dibujos obtenidos de sintipos de Daday].

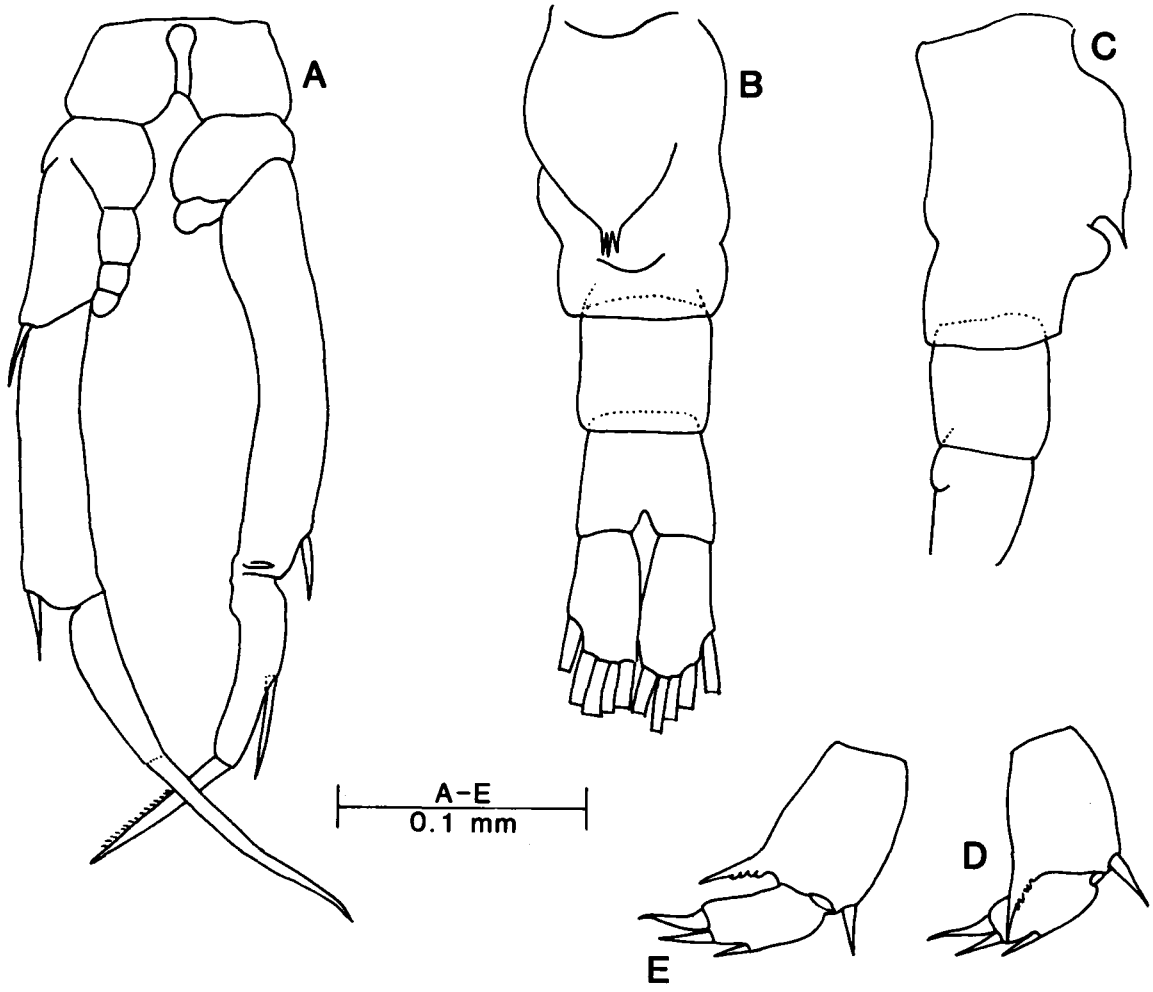

Fig. 13: Boeckella gracilipes Daday. A, male fifth legs, anterior aspect; B, female urosome, ventral aspect; C, part of female urosome including genital segment, right lateral aspect; D-E, female fifth Re segments 2 and 3.

Boeckella gracilipes Daday. A, quinta pata del macho, aspecto anterior; B, cuerpo posterior de la hembra, aspecto ventral; C, parte del cuerpo posterior de la hembra incluyendo artejo genital, aspecto lateral derecho; D-E, quinto artejos 2 y 3 de la hembra.

Specimens examined

Chile 17 females, 15 males [Syntype material of *Pseudoboeckella gracilipes* Daday. Specimens in three vials each labelled *"Pseudoboeckella gracilipes* Dad. Typus 1204/1901 Chile Sylvestri". Lengths as follows: vial 1, 0.82 mm, 0.78 mm (n = 3); vial 2, 0.79 mm (n = 10), 0.74 mm (n = 10)]. Torres del Paine National Park, ca 51°S., 73°W., coll. D. Soto & S. Hurlbert, October 1986; L. Morro, 1.16 mm, 1.01 mm; L. Cisnes, 1.33 mm, 0.99 mm (n = 3); L. Tehuelches Este, male 1.0 mm (n = 1); L. Redonda, n.m.; L. Larga, 0.93 mm, 0.81 mm.

Argentina 1 female, 2 males. [These three specimens mounted on a microslide labelled in Daday's handwriting *"Pseudoboeckella gracilipes* ♀♂ Dad. 1203. Patagonia St Cruz". All specimens dissected and fifth legs of each in excellent condition]. Santa Cruz, 50°08'S., 68°20'W.

Description of male

Size. Length 0.7-1.0 mm.
Fifth legs. Right Ri typically 2-segmented and not reaching distal edge of right Re1 (cf. *titicacae*), occasionally 3-segmented and reaching distal edge of Re1 (Fig. 13A). Right Re1 almost twice as long as wide (cf. *titicacae*); right Re2 elongated, more than 4.5 X as long as mean width (cf. *titicacae*). Left B2 with prominent semicircular expansion from inner distal edge. Left Ri small, 1-segmented, extending no more than 0.1 X distance along inner edge of left Re1. Left Re1 very elongated, 5.5-6.0 X as long as mean width. Left Re claw clearly segmented into 2 portions of subequal length, distal portion with serrations along distal half of inner edge. Right Re1 plus right Re2 as long as or slightly longer than left Re1 (cf. *titicacae*).

Description of female

Size. Length 0.8-1.3 mm.
Fifth legs. Re3 with 3 spines, spine number 3 curved and not as long as segment itself (Figs 13D&E) (cf. *titicacae*).

Urosome (Fig. 13B). Genital segment about 1.4 X as long as maximum width in ventral view, genital operculum with spine-like processes projecting from posterior extremity (Figs 13B&C). Length entire urosome ca 3.2 X maximum width.

Remarks

The potential for confusing this species with *titicacae* may be avoided by using the characters that are specifically contrasted in the above description. Additionally, there is a tendency for *gracilipes* to be smaller than *titicacae.*

BOECKELLA GRACILIS (DADAY) *(Figs. 4A, 14A-D, 24)*

Pseudoboeckella gracilis Daday, 1902, pp. 227-31, tab. ix, figs 1 and 9-17.

Boeckella gracilis (Daday). Ekman, 1905b, p. 602. Marsh, 1924, p.8, fig. 7. Brehm, 1936, pp. 485-6. Cordini, 1938, p. 31. Olivier, 1955a, tab. 2 (ad. p. 299). Löffler, 1955, pp. 727-8, 741-2, and 745. Brehm, 1956a, pp. 22-5, figs 11-17; 1958a, pp. 156-8. Ringuelet, 1958a, pp. 60, 63-4, 66 and 71-2; 1958b, pp. 17 and 20-4. Löffler, 1958, pp. 16, 19 and 20, fig. 1 (p. 17); 1961, pp. 166-7, figs 64-70; 1963, p. 207 (and Zu S. 197), figs 6a-61. Gaviria, 1989, pp. 128-32, pl. 6, figs A-Q, pl. 7, figs A-U.

Boeckella schwabei Brehm, 1937a, pp. 304-7, figs 1-5; 1938, p. 206. Thomasson, 1959, pp. 45, 47 and 55.

Boeckella camjatae Harding, 1955, pp. 221-3, figs 1-6.

Boeckella bilobata Brehm, 1958a, p. 158, figs 1-3.

Comment on synonymy

There has been much discussion (see, e.g., Brehm 1958a) about Daday's (1902) description of *B. gracilis,* but hitherto no one has taken the simple and direct approach of examining some of Daday's numerous syntypes. Löffler's (1955) belief that *B. camjatae* Harding (1955) is a synonym of *B. gracilis* (Daday) is upheld after examination of the types of both nomina.

Brehm (1958a), in discussing the *B. gracilis* species group, used the new name *"bilobata"* both in the text and in the caption to a series of four figures for what he apparently regarded as a new species. He did not, however, properly designate *B. bilobata* as a new species by adding the usual "sp. nov." or equivalent. Instead he promised a further description of *B. bilobata* in a future paper which, however, did not appear. I have little doubt from Brehm's (1958a) figures that *B. bilobata* is based merely on a female of *B. gracilis* that happened to have a 3-segmented endopod, (cf. Fig. 14B) and that *B. bilobata* is a synonym of *B. gracilis.* The name *B. bilobata* does not appear in the Zoological Record for 1958 or subsequently.

I agree with Löffler's (1955, 1961) opinion that *B. schwabei* Brehm is identical with *B. gracilis* Daday. Brehm (1958a) discussed the relationship between *B.*

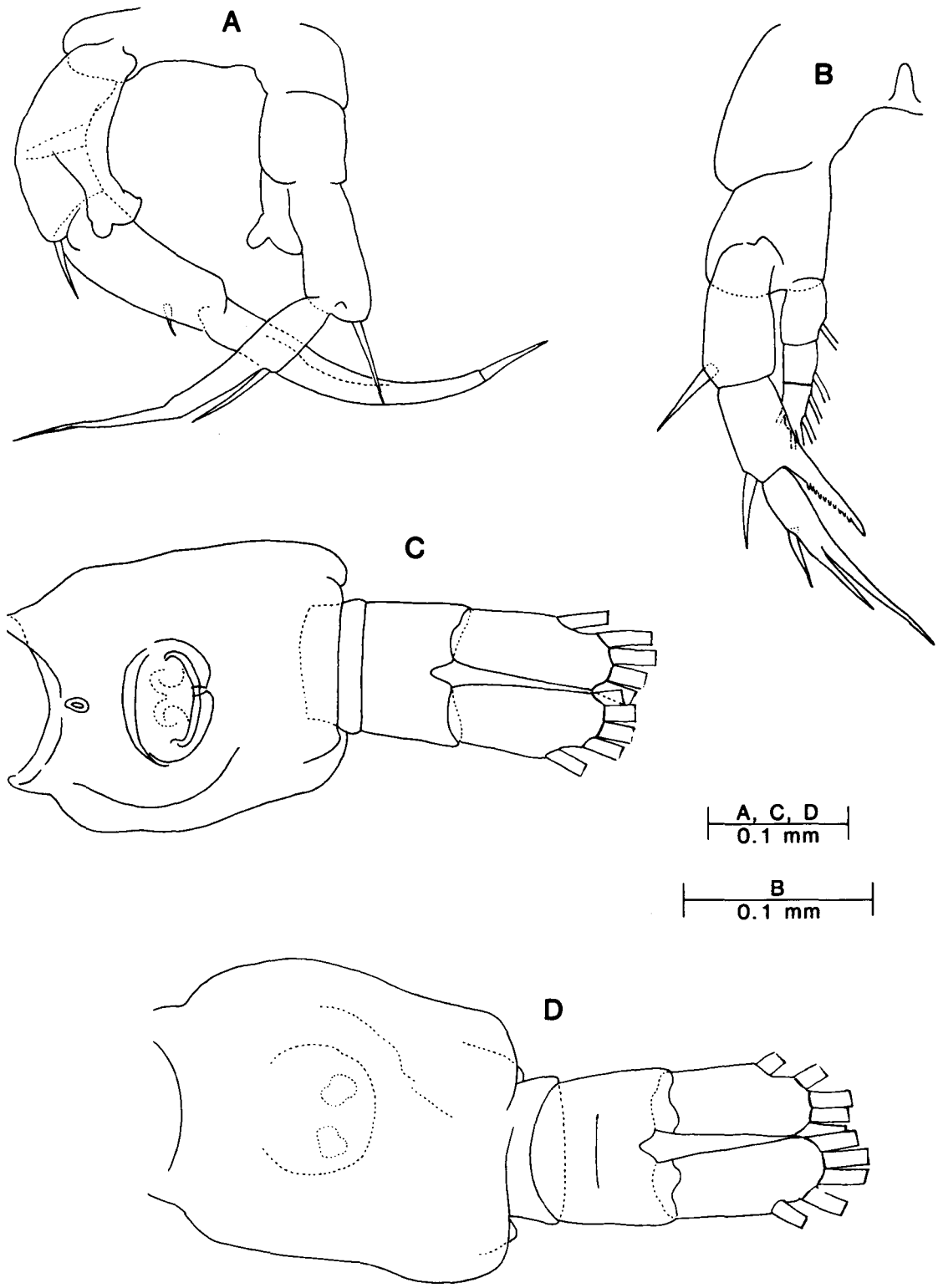

Fig. 14: Boeckella gracilis (Daday). A, male fifth legs, anterior aspect; B, female fifth leg; C, female urosome, ventral aspect; D, female urosome, dorsal aspect.

Boeckella gracilis (Daday). A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C, cuerpo posterior de la hembra, aspecto ventral; D, cuerpo dorsal de la hembra, aspecto dorsal.

schwabei and *B. bilobata* but in doing so produced no good criterion for the maintenance of *B. schwabei* as a distinct taxon. *B. schwabei* is considered to represent nothing more than a male of *B. gracilis* whose fifth legs had an unusually well developed inner lobe on the right endopod, and the left endopod rotated into such a position that it appeared to have a single instead of a double lobe.

Specimens examined

Argentina 6 females, 12 males [Syntype material of *Pseudoboeckella gracilis* (Daday). Specimens in two vials each labelled "*Pseudoboeckella gracilis* Dad. Typus. 1203/1901 Patagonia Sylvestri"]. 1 ♀, 2 ♂♂ [Each of these three specimens mounted separately on microslides labelled by Daday "*Pseudoboeckella gracilis* Dad. 1204. Patagonia Puerto Madryn Chubut [River?]". [Puerto Madryn is at lat. 42°45'S., long. 65°02'W.].

Perú Pond on Capachica Peninsula (projecting into Lake Titicaca) near Camjata, ca 15°37'S., 69°50'W., 1.44 mm (n = 10) [mean clutch 9.9 (n = 10)], 1.10 mm (n = 10) [Paratype material of *B. camjatae* Harding in British Museum. Specimens in vial labelled "PFH 52/2" in jar labelled "246 *Boeckella camjatae* Harding Types 1946.11.26.1-20. Titicaca Expedition"].

Description of male

Size. Length ca 1.1 mm.
Fifth legs. *Right and left B1 broadly expanded at right angles to long axes of legs, holding legs unusually far apart at proximal attachments* (see arrows in Fig. 4A); right B2 produced into bilobed structure extending ca 0.25 X distance along inner edge of right Re2. Right Ri vestigial. Left Ri 1-segmented, bilobed at extremity, extending ca 0.5 X distance along inner edge of left Re1. Left Re1 produced at outer distal corner to overshoot proximal attachment of left Re claw.

Description of female

Size. Length 1.4-1.5 mm.
Fifth legs. Ri relatively short, typically 3-segmented, sometimes 2-segmented. Re3 with 3 spines (invariably), spine 3 > 1.5 X as long as segment itself.

Urosome (Figs 14C&D). Genital segment subrectangular, not more than 1.1 X as long as maximum width in ventral view. Length entire urosome ca 2.1 X maximum width (at genital segment).

Remarks

This species is characterized by the wide spacing between the two legs of the male fifth pair at their proximal attachment (see arrows in Fig. 4A).

BOECKELLA OCCIDENTALIS MARSH
(Figs. 4B, 15A-D, 25)

Boeckella occidentalis Marsh, 1906, pp. 179, 180 and 183, pl. 18, figs 1 and 3-6; 1924, pp. 11-2, fig. 15. Brehm, 1924, pp. 15-21, figs 20-6; 1936, tab. II, p. 485. Harding, 1955, pp. 223-30, figs 7-12. Löffler, 1955, pp. 734-44, figs 20-9; 1958, fig. 1 (p. 17). Kiefer, 1957, p. 128, figs 1-5. Ringuelet, 1958a, pp. 59-62. Löffler, 1963, p. 207-8 (and Zu S. 197), fig. 7a. Gilson, 1964, p. 121, Uéno, 1967, pp. 550-2, 563-5, figs 63-9. Widmer *et al.*, 1975, p. 1508. Richerson *et al.*, 1977, p. 43. Haney and Trout, 1985, p. 151. Gaviria, 1989, pp. 125-8, pl. 5, figs A-Q.

Pseudoboeckella godeti Delachaux 1928, pp. 50-1, pl. i, figs 2-6, pl. ii, figs 7-9.

Pseudoboeckella occidentalis (Marsh). Ringuelet, 1958a, p. 77.

Comment on synonymy

As already pointed out by Löffler (1955), *P. godeti* Delachaux (1928) is clearly synonymous with *B. occidentalis* Marsh.

Specimens examined

Perú A locality of Harding (1955), 1937, 1.88 mm (n = 10) [mean clutch 23.3 (n = 10)], 1.57 mm (n = 10) [British Museum, vial labelled "PFH 129/2" in jar labelled "246 *Boeckella occidentalis* Marsh 1946-11-26. 21-30. Titicaca Exped."] Suches, 16°56'S., 70°24'W., 20.vi.1976 (n.m.); 21.xi.1976, 1.73 mm. 1.55 mm. Pampamarca, 14°08'S., 71°29'W., 23.vi.1976, 1.29 mm, 1.05 mm; 17.xi.1976 (n.m.). Colorada II, 15°22'S., 70°21'W., 25.vi. 1976, 1.6 mm (n = 1), 1.50 mm (n = 4). Saracocha, 15°47'S., 70°38'W., 25.vi. 1976, 1.46 mm, 1.17 mm; 19.xi.1976, 1.38 mm (n = 2), 1.1 mm (n = 1).

Bolivia Huancaroma, 17°40'S., 67° 30'W., 6.vii.1976, 1.92 mm (n = 8), 1.63 mm.

Chile Cotacotani, 18°14'S, 69°13'W., 1.vii.1976, 1.80 mm 1.54 mm. Chungara, 18°15'S., 69°09'W., 1.xii.1976, 1.69 mm, 1.42 mm.

Description of male

Size. Length 0.85-1.80 mm.

Fifth legs. Right B2 with rounded protuberance on inner edge. Right Ri 1-segmented and claw-like, curved and tapering continuously to extremity (terminal portion sometimes differentiated from rest of segment and spine-like), extending almost to distal extremity of right Re2, sometimes with small spines or serrations along inner edge (see Delachaux 1928, pl.i, fig. 5 and Kiefer 1957, fig. 5). Right Re2 with unusually strong and long spine at outer distal corner, extending more than halfway along right Re claw. Left B2 produced at inner distal corner, extending ca 0.3 X distance along inner edge of left Re1. Left Ri 1-segmented, bluntly rounded at extremity, extending ca 0.4-0.5 X distance along inner edge of left Re1. Left Re1 with distal extremity projecting beyond region of articulation of left Re claw.

Description of female

Size. Length 1.15-2.20 mm.

Fifth legs. Ri relatively short, extending only halfway along length of Re2 (Fig. 15B); Re3 with 3 spines.

Urosome (Figs 15C&D). Genital segment subrectangular, about 1.1 X as long as maximum width in ventral view, genital operculum with finger-like outgrowths on posterior margin. Length entire urosome ca 2.7 X maximum width.

Remarks

Harding (1955) commented that, "The size of the adults varies from one locality to another over an extraordinarily wide range". He recorded a total range of 1.15-2.20 mm for females and 0.85-1.80 mm for males. The ranges for the mean lengths of the specimens I examined was 1.3-1.9 mm (females) and 1.0-1.6 mm (males).

BOECKELLA POOPOENSIS MARSH
(Figs. 4C, 16A-D, 24)

Boeckella poopoensis Marsh, 1906, pp. 183, 184 and 187, pl. xvii, fig. 5, pl. xviii, fig. 2; 1924, p. 12, fig. 17. Harding, 1955, p. 230. Sewell, 1956, p. 160. Ringuelet, 1958a, pp. 60-6, 73-4. Bayly, 1972, p. 248.

Boeckella poopensis [Marsh]. Brehm, 1936, tab. II, p. 485; 1956a, pp. 28-30, figs 29-36; 1958a, pp. 152-6.

Boeckella pooponensis [Marsh]. Löffler, 1955, pp. 732-4, figs 16-19; 1958, p. 16, fig. 1.

Boeckella rahmi Brehm, 1935a, p. 280-3, figs 1-4; 1936, p. 485. Olivier, 1952, pp. 169, 173, 178 and 179; 1955a, tab. 2 (ad.p.299); 1955b, pp. 302 and 304. Ringuelet, 1955b, p.l.; 1958a, pp. 62-9. Sewell, 1956, p. 160. Brehm, 1958a, pp. 152-4. Löffler, 1958, fig. 1 (p. 17).

Boeckella birabeni Brehm, 1954b, pp. 40-2, figs 9-10 (p. 39). Ringuelet, 1958a, pp. 61-70; 1958b, pp. 17, 20-24. Bayly, 1964, p. 236; 1972, p. 248.

Comment on synonymy

Brehm (1958a) discussed the relationship between *B. poopoensis* Marsh and *B. rahmi*

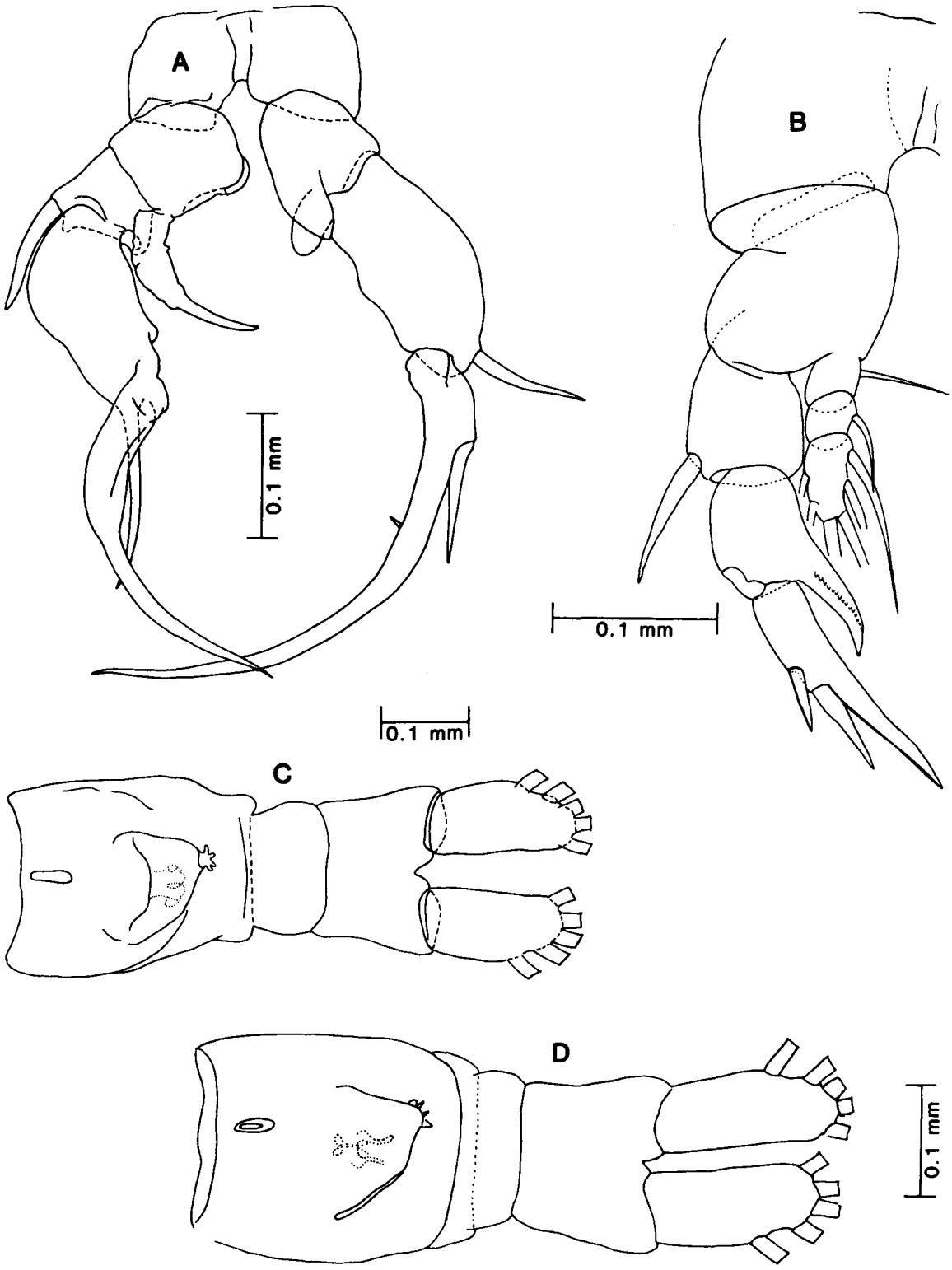

Fig. 15: Boeckella occidentalis Marsh. A, male fifth legs, anterior aspect; B, female fifth leg; C-D, female urosome, ventral aspect (2 individuals from different localities).

Boeckella occidentalis **Marsh. A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C-D, cuerpo posterior de la hembra, aspecto ventral (2 individuos de diferentes localidades).**

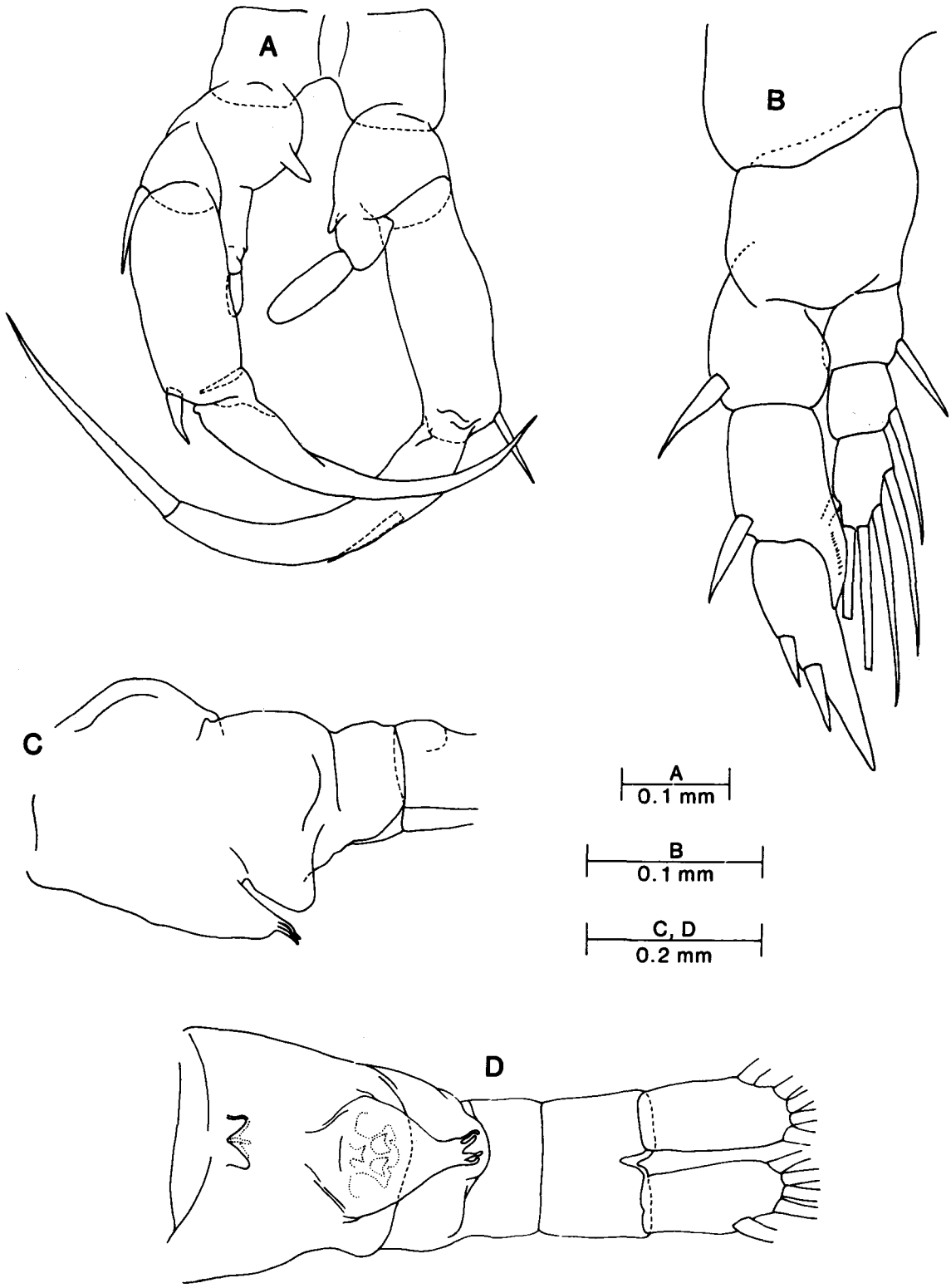

Fig. 16: Boeckella poopoensis Marsh. A, male fifth legs, anterior aspect; B, female fifth leg; C, female genital segment, ventro-lateral aspect; D, female urosome, ventral aspect.

Boeckella poopoensis Marsh. A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C, artejo genital de la hembra, aspecto ventrolateral; D, cuerpo posterior de la hembra, aspecto ventral.

Brehm (both were described from salt lakes) and agreed with Löffler's (1955) view that the two were identical. The male fifth right endopod of *B. poopoensis* was described as 2-segmented, and that of *B. rahmi* as 3-segmented, but the segmentation of this endopod is intraspecifically variable and may be 2- or 3-segmented.

Brehm (1954b) described *B. birabeni* as new, but his figures of the male fifth legs lie well within the range of variation observed within *B. poopoensis*, and it is doubtless synonymous with that species. The fact that Brehm (1958a) did not discuss *B. birabeni* along with *B. rahmi* and *B. poopoensis* is difficult to understand. Ringuelet (1958a) kept *B. birabeni* separate from *B. poopoensis*, but commented (loc. cit. p. 62) that it had a "sospechosas semejanzas" [suspicious resemblance] with *B. rahmi* and *B. poopoensis*. Ringuelet further (loc. cit. p.63) ventured the opinion that, "*B. birabeni* Brehm, 1954, is, at most, a simple geographical race of *B. poopoensis*, Marsh, 1906".

Specimens examined

For each locality the fifth legs of at least three males, and the fifth legs and urosome (for the genital segment) of at least two females, were dissected off and examined under a compound microscope.

Perú Loriscota, 16°52'S., 70°02'W., 20.xi.1976, 1.33 mm (n = 4), 0.98 mm. Collpacocha, 15°15'S., 70°03'W., 24.vi. 1976, 1.49 mm (n = 4), 1.36 mm (n = 4). Parinacochas, 15°17'S., 73°42'W., 28.vi. 1976, 1.68 mm, 1.29 mm.

Bolivia Soledad, 17°44'S., 67°22'W., 7.vii.1976, 1.49 mm (n = 4), 1.31 mm (n = 4). L. Verde, 22°48'S., 67°48'W., 11.xii. 1976, 1.77 mm, 1.73 mm; 3.xii.1977, 1.99 mm, 1.58 mm. Polques, 22°32'S., 67°37'W., 18.vii.1976, 1.96 mm (n = 3), 1.79 mm; 11.xii.1976, 1.93 mm, 1.76 mm; 6.ii.1979, 2.18 mm, 1.91 mm. Chulluncani, 21°32'S., 67°52'W., 12.xii.1976, females with two size modes, upper mode 2.06 mm, lower mode 1.54 mm, one mode only for males 1.42 mm. Ramaditas, 21°38'S., 68°05'W., 12.xii.1976, 1.71 mm; 1.50 mm; 23.ii.1979, 1.88 mm (n = 4), 1.95 mm (n = 2). Khara, 21°54'S., 67°52'W., 26.xi.1977, 1.66 mm, 1.56 mm. Chojllas, 22°22'S., 67°06'W., 30.xi.1977, 1.72 mm, 1.56 mm; 18.ii.1979, 1.67 mm, 1.49 mm. Herrera, 22°35'S., 67°33'W., 25.xii.1978, 2.36 mm, 2.16 mm. Río Puntas Negras, 22°23'S., 67°04'W., 18.ii.1979, 1.95 mm, 1.64 mm. Catalcito, 22°31'S., 67°15'W., 2.xii.1977, 1.72 mm, 1.47 mm. Este, 22°31'S., 67°29'W., 25.xii.1978, 2.2 mm (n = 1), 2.11 mm. Guâcha, 22°33'S., 67°31'W., 2.i.1979 (n.m.). Puripica Chico, 22°31'S., 67°30'W., 14.xii.1975, 2.05 mm, 1.80 mm. L. Poopo, 1937, 10 ovigerous females (mean length 2.21 mm, mean clutch 37.5), 10 males (mean length 1.86 mm) [British Museum, vial labelled "PFH 185" in jar labelled "246 *Boeckella poopoensis* Marsh 1946-11-26. 31-50. Titicaca Exped."].

Chile Calientes I, 23°08'S., 67°25'W., 15.i.1979 (n.m.). Calientes II, 23°31'S., 67°34'W., 5.xii.1974 (n.m.). Santa Rosa (Flamingo), 27°05'S., 69°10'W., 21.xi. 1975, 1.97 mm, 1.84 mm. Calientes III (Zlosilo), 25°00'S., 68°38'W., 29.xi.1975, 1.81 mm, 1.60 mm.

Argentina Hombre Muerto, 25°30'S., 66°51'W., 29.v.1977, 1.86 mm, 1.72 mm.

Description of male

Size. Length 1.02-2.2 mm.

Fifth legs. Right B2 with spine-like outgrowth about halfway along inner edge, varying considerably in extent of development. Right Ri 2- or 3-segmented, straight or bent, when straight extending ca 0.7 X distance along inner edge of right Re2. Right Rel short, triangular, with scarcely any inner edge, right Re claw variable in shape, sometimes strongly recurved. Left B2 with projection at inner distal corner, projection rather variable in shape and extent of development. Left Ri 2-segmented, basal segment hairy along outer edge and with maximum width about twice that of terminal segment, terminal segment about twice as long as basal segment. Left Rel with length 2.6-3.0 X mean width (cf *meteoris*).

Description of female

Size. Length 1.3-2.4 mm.
Fifth legs. Re3 with 3 spines, spine 3 unusually short and sometimes not clearly differentiated from the segment itself.

Urosome (Fig. 16D). Genital segment ca 1.1-1.2 X as long as maximum width in ventral view, genital operculum produced posteriorly with several finger-like processes at extremity. Length of entire urosome ca 2.4 X maximum width.

Remarks

This species is enormously variable in size and in several structural features of the male fifth legs.

The male fifth legs bear some similarity to those of *meteoris* but can be distinguished as follows:

(1) The length/width ratio of the left Re1 is lower.

(2) The basal segment of the left Ri is relatively much wider.

(3) The process on the inner edge of the right B2 is further from the point of attachment of the right Ri.

This is the only South American boeckellid that tolerates highly saline water; it is an halobiont species with a salinity range of at least 5-78 g l^{-1}.

BOECKELLA VALLENTINI (SCOTT)
(Figs. 4D, 17A-D)

Pseudoboeckella vallentini Scott, 1914, pp. 5-7, pl.i, figs 2, 8 and 11.
Pseudoboeckella volucris Kiefer, 1944, pp. 80-3, figs. 1-6. Kok, 1977, pp. 2 & 6. Kok and Grobbelaar, 1978. Jarvis, 1988.

Discussion of synonymy

Kiefer (1944, p. 83) admitted that the form he was describing as *volucris* had "an unmistakable similarity with... *vallentini*" [translation from German], but considered that the Marion Island material he examined should be described as a separate species. I disagree; although Scott (1914) did not indicate the lines of segmentation in the 2- or 3-segmented endopod of the male right fifth leg, his figure of this appendage is otherwise in excellent and detailed agreement with that of Kiefer (1944).

Specimens examined

Marion Island (46°55'S., 37°45'E.) 1.47 mm (n = 3), 1.31 mm [British Museum vial labelled "1971.6.9. 110-119" in jar labelled "1971.6.9.89-164. *Pseudoboeckella volucris* Kiefer. Marion Is. Expedition 1965-66"]; Gentoo L., 3.xii. 1977, 1.39 mm, 1.25 mm, Black lava lakelet near Junior's Kop, 29.xi.1977, 1.37 mm, 1.21 mm; coll. D.F. Toerien.

Price Edward Island (46°38'S., 37° 55'E.) Elephant seal wallow, 30.xi.1977, male only 1.4 mm (n = 2) coll. D.F. Toerien.

Crozet Islands (46°27'S., 52°00' E.) 1.35 mm (n = 6), 1.27 mm (n = 7) [British Museum, jar labelled "246.7 *Pseudoboeckella volucris* Kiefer, Pond, Baie Americaine, Possession Island, Crozet Islands 24.2.'68, recd 3.7.'68, L. Davies 1968.7.10.9"]; Lac Perdu, 18.ii.1973, 1.41 mm (n = 3), 1.27 mm, coll. L. Davies.

Kerguelen Islands (49°30'S., 69° 30'E.) L. 1 km N. Halage des Swains, 23.ii.1971, 1 male (n.m.); L. Bleu, Valley des Nuges, 25.ii.1971, male only 1.3 mm (n = 1); L. S.E. Isthme du lac, 8.iii.1971, female only 1.5 mm (n = 1) L. 0.75 km N. Port-aux-Français, 15.iii.1971, male only 1.3 mm (n = 1); L. 0.8 km N. Port-aux-Français, 26.iii.1971, 1.6 mm (n = 1), 1.30 mm (n = 3), all coll. G. Bratt.

Description of male

Size. Length 1.2-1.3 mm.
Fifth legs. Right Ri 2- or (occasionally) 3-segmented; basal segment short with long axis at right angles to that of whole Ri, with one stout spine on inner edge; distal portion with 7 stout spines, line of segmentation sometines present slightly distal to most proximal spine. Right Re1 with 2-pronged fork-like process on inner edge. Left B2 with projection at

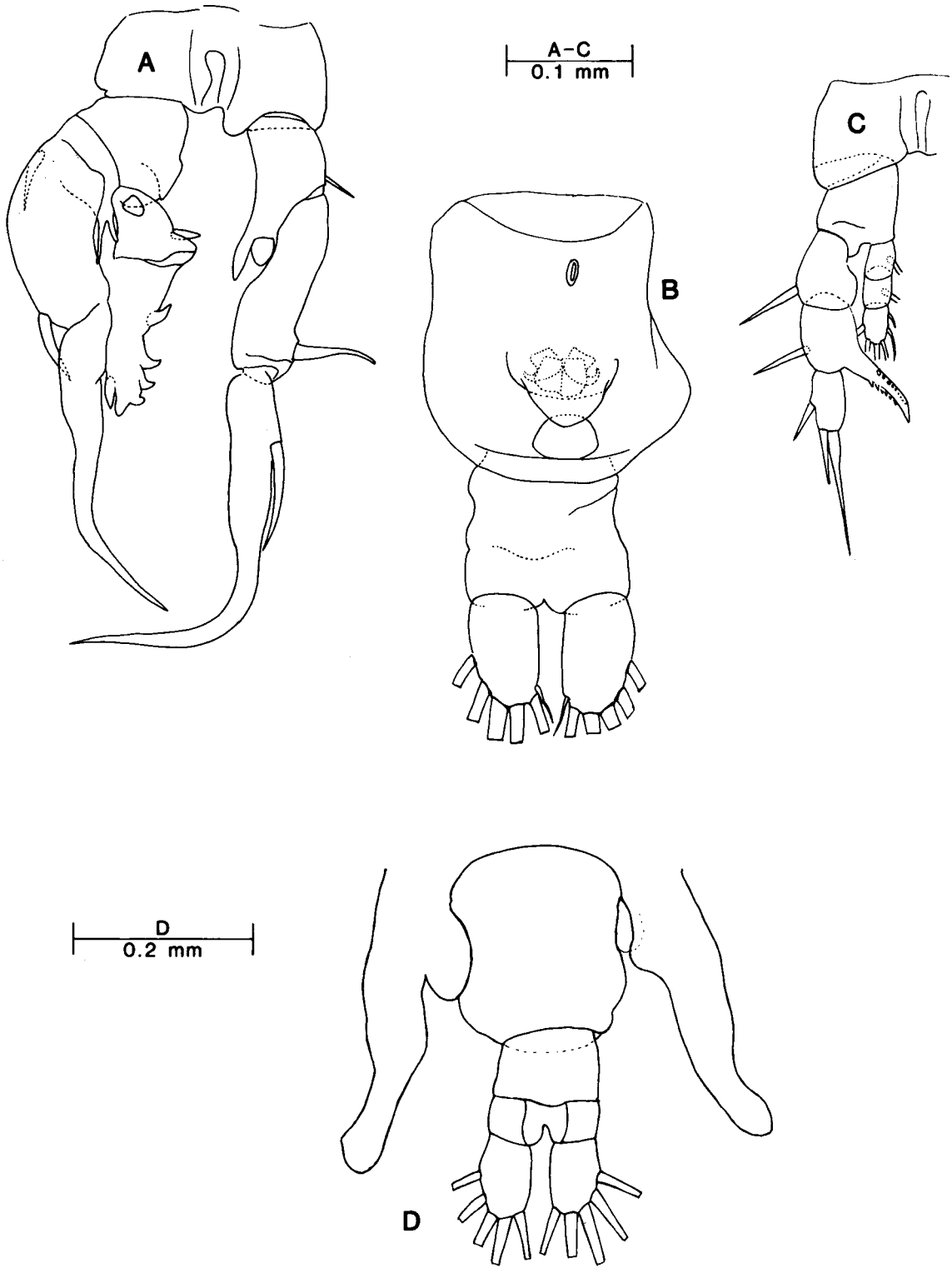

Fig. 17: Boeckella vallentini (Scott). A, male fifth legs, anterior aspect; B, female urosome, ventral aspect; C, female fifth leg; D, female urosome and wings of last prosomal segment, dorsal aspect.

Boeckella vallentini **(Scott). A, quinta pata del macho, aspecto anterior; B, cuerpo posterior de la hembra, aspecto ventral; C, quinta pata de la hembra; D, cuerpo posterior y alas del último artejo prosomal de la hembra, aspecto dorsal.**

inner distal corner as long as or longer than left Ri. Left Ri minute, 1-segmented. Left Re1 with strong, semicircular, laminar expansion at right angles to posterior face of segment.

Description of female

Size. Length 1.3-1.6 mm.
Prosome. Last segment with wings extending posteriorly to reach end of urosome segment 3 or beyond (Fig. 17D).

Fifth legs. Ri relatively short, extending only halfway along length of Re1 (Fig. 17C); Re3 with 3 spines.

Urosome (Fig. 17B). Genital segment about as long as maximum width in ventral view. Length entire urosome ca 1.8-1.9 X maximum width.

Remarks

The endopods on the female fifth legs of this species are relatively short as in *bergi* and *occidentalis.*

BOECKELLA METEORIS KIEFER
(Figs. 5A, 18A-C, 24)

Boeckella meteoris Kiefer, 1928, pp. 218-9, figs. 4-7. Brehm, 1936, p. 485. Löffler, 1955, p. 744; 1958, fig. 1 (p. 17). Ringuelet, 1958a, pp. 62, 65-6; 1958b, p. 16.

Boeckella dentifera Brehm, 1935b, pp. 73-77, figs. 1-3; 1936, p. 485. Löffler, 1955, p. 744. Ringuelet, 1958a, p. 62.

Boeckella meteoris meteoris Ringuelet, 1958a, pp. 60 and 72.

Boeckella meteoris dentifera Ringuelet, 1958a, p. 60.

Comment on synonymy

I agree with Löffler (1955, pp. 739 and 744) that *B. dentifera* Brehm (1935b) is identical with *B. meteoris* Kiefer (1928).

Specimens examined

Bolivia L. Pelada, 22°45'S., 67°10'W., 2.xii.1977, two distinct size modes present, upper mode females 1.51 mm, males 1.29 mm, lower mode 0.92 mm, 0.85 mm.

Argentina L. Pozuelos, 22°20'S., 66°00'W., 25.v.1977, 1.82 mm, 1.50 mm; 27.v.1977, 1.74 mm, 1.50 mm.

Chile Pond in Torres del Paine National Park (ca 51°S., 73°W.), October 1980, 1.14 mm (n = 2), 1.0 mm (n= 1), coll. D. Soto. Same Park, October 1986, L. Cisnes, 1.94 mm, 1.52 mm (n = 3), coll. D. Soto & S. Hurlbert.

Description of male

Size. Length 0.8-1.5 mm.
Fifth legs. Right B2 with pointed projection near inner distal corner. Right Ri 3-segmented, middle segment shorter than remaining ones, extending 0.7-0.8 X distance along inner edge of right Re2. Right Re1 triangular with very short inner edge. Left B2 with inner distal corner produced into pointed projection. Left Ri 2-segmented (segments subequal in length), extending ca 0.45 X distance along inner edge of left Re1. Left Re1 elongated with length/mean width ratio of 4.4-5.2 (cf. *poopoensis*), distal part of left Re claw resembling long straight spine (cf. curvature of most species).

Description of female

Size. Length 0.9-1.7 mm.
Fifth legs. Re3 with 3 spines.
Urosome (Fig. 18C). Genital segment without prominent lateral outgrowths, 1.2-1.4 X as long as maximum width in ventral view, genital operculum subtriangular with irregular processes arising from posterior apex. Length entire urosome 3.2-3.4 X maximum width.

Remarks

The male fifth legs bear some similarity to those of *poopoensis* but may be distinguished using the criteria given under "remarks" for the latter species.

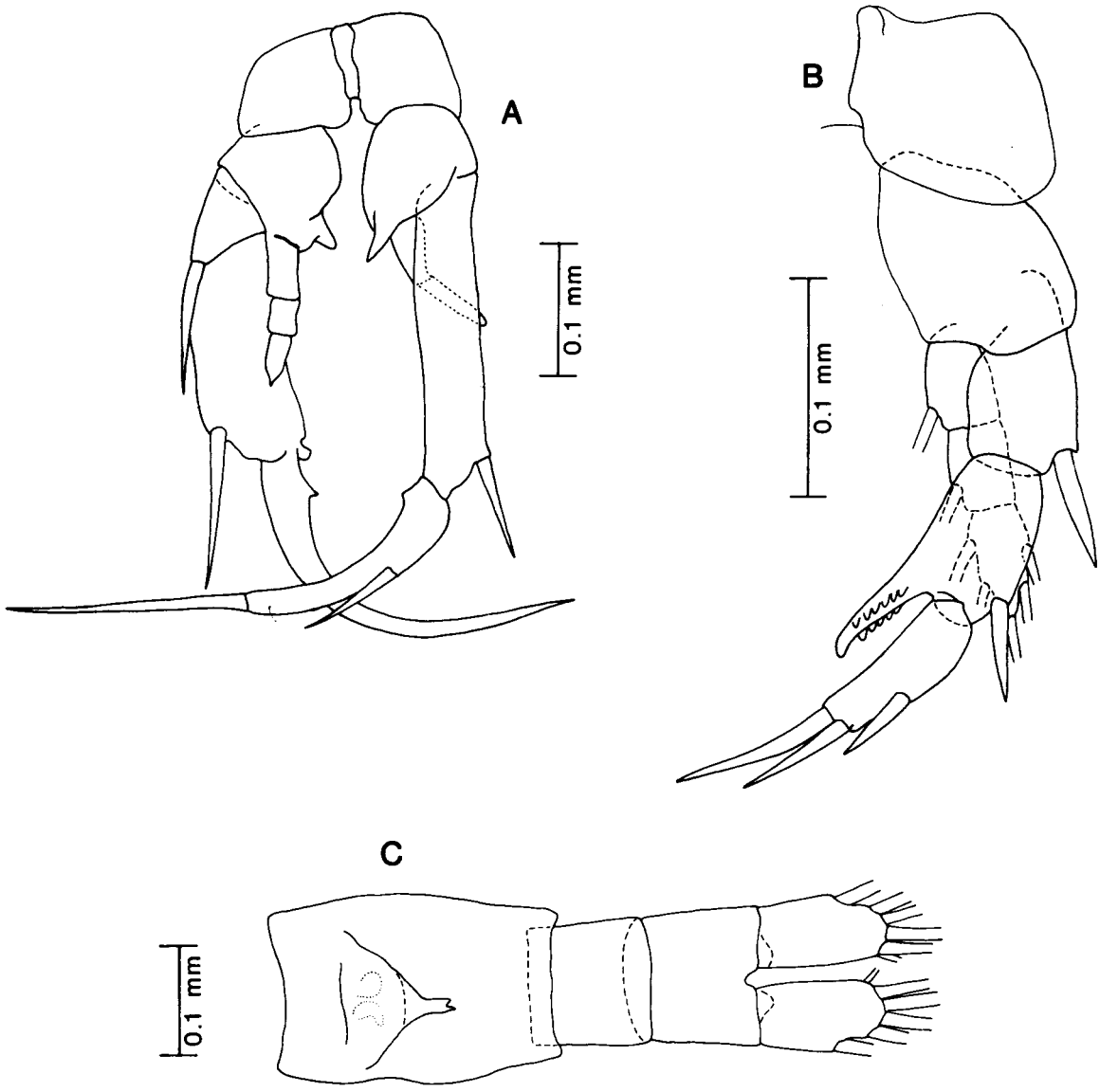

Fig. 18: Boeckella meteoris Kiefer. A, male fifth legs, anterior aspect; B, female fifth leg; C, female urosome, ventral aspect.

Boeckella meteoris Kiefer. A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C, cuerpo posterior de la hembra, aspecto ventral.

BOECKELLA TITICACAE HARDING
(Figs. 5B, 19A-E, 24)

Boeckella gracilipes Daday. Marsh, 1906, p. 183, pl. xvii, figs. 6-7; 1924, p. 7, figs. 5-6. Kiefer, 1959, pp. 53-5, figs. 1-3. Löffler, 1955, pp. 731-2, 741-3, 745; 1961, pp. 168-70 (in part), figs. 71 and 73.

Boeckella titicacae Harding, 1955, pp. 230-1, figs. 13-6. Kiefer, 1957, pp. 131-3, figs. 6-10. Gilson, 1964, p. 121. Uéno, 1967, pp. 550-2 and 563, figs. 54-62. Widmer *et al.*, 1975, p. 1506, fig. 4. Richerson *et al.*, 1977, p. 43. Haney and Trout, 1985, p. 150.

?Boeckella gracilipes Daday. Brehm, 1956a, pp. 26-7 (in part, material from Escondida), figs 19-21.

Non *Boeckella gracilipes* Daday, 1901, pp. 348-9.

Non *Pseudoboeckella gracilipes* Daday, 1902, pp. 224-7, tab. v., figs 1-7.

Comment on synonymy

Löffler (1955, p. 745; 1961, p. 168) considered this species to be a synonym of *B. gracilipes* Daday. However, having examined the types of both species I am unable to concur. On the basis of objective criteria described in detail below I regard *B. titicacae* as distinctly separable from *B. gracilipes*. Furthermore I consider that Löffler (1961, figs. 71-6) combined into the one sequence drawings of these two separate species.

Specimens examined

Perú/Bolivia Lake Titicaca, 1937, 10 ovigerous females (mean length 1.19 mm, mean clutch 2.9), 10 males (mean length 1.07 mm) [Paratype material of *B. titicacae* in British Museum. Specimens in vial labelled "PHF 162/2" in jar labelled "246 *Boeckella titicacae* Harding Types 1946-11-26. 51-100. Titicaca Exp."]

Perú Viscacha, 16°53'S., 70°14'W., 21.vi.1976, 1.36 mm, 1.17 mm. Loriponga, 16°50'S., 70°05'W., 21.vi.1976, 1.30 mm (n = 4), 1.12 mm; 20.xi.1976, 1.34 mm, 1.15 mm. Colorada II, 15°22'S., 70°21'W., 25.vi.1976, 1.44 mm, 1.14 mm (n = 2).

Bolivia Huancaroma, 17°40'S., 67° 30'W., 6.vii.1976, 1.27 (n = 4), 1.03 mm (n = 2). Penitas Blancas, 22°25'S., 67° 15'W., 29.xi.1977, 1.33 mm, 1.13 mm. "Conchostraca" pool, 22°18'S., 67°14'W., 1.xii.1977, 1.60 mm, 1.38 mm; 18.ii.1979, 1.52 mm, 1.19 mm. Campo Grande, 22° 33'S., 67°12'W., 2.xii.1977, 1.28 mm, 1.07 mm. Totoral, 22°32'S., 67°17'W., 1.ii.1979, 1.57 mm, 1.38 mm. Pool(a) nr Loromayu, 22°18'S., 67°13'W., 18.ii. 1979, 1.59 mm, 1.38 mm. Pool (b) nr Loromayu, 22°18'S., 67°13'W., 18.ii.1979, 2.03 mm, 1.53 mm. Pool nr Mama Khumu, 22°16'S., 67°05'W., 19.ii.1979, 1.54 mm, 1.22 mm (n = 2). Pool nr Colorada, 22°10' S.,67°47'W., 25.ii.1979, 1.26 mm, 1.13 mm.

Chile Cotacotani, 18°14'S., 69°13'W., 1.vii.1976, 1.37 mm, 1.23 mm.

Description of male

Size. Length 1.0-1.5 mm.

Fifth legs. Right Ri typically 2-segmented but not uncommonly 3-segmented, extending beyond distal edge of right Re1 (cf. *gracilipes*). Right Re1 no longer than wide (cf. *gracilipes*), right Re2 ca 3.0 X as long as mean width (cf. *gracilipes*). Left B2 with rounded expansion at inner distal corner. Left Ri small, 1-segmented, extending no more than 0.1 X distance along inner edge of left Re1. Left Re1 very elongated, 6.0-7.5 X as long as mean width. Right Re1 plus right Re2 0.7-0.8 X as long as left Re1 (cf. *gracilipes*).

Description of female

Size. Length 1.2-2.0 mm.

Fifth legs. Re with 3 spines, spine number 3 curved and 1.6-1.9 X as long as segment itself (cf. *gracilipes*).

Urosome (Fig. 19E). Genital segment ca 1.2 X as long as maximum width in ventral view. Length entire urosome ca 2.5 X maximum width.

Remarks

The potential for confusing this species with *gracilipes* may be avoided by using the characters that are specifically constrasted in the above description. Additionally, there is a tendency for *titicacae* to be larger than *gracilipes*.

BOECKELLA CALCARIS (HARDING)
(Figs. 5C, 20A-F, 25)

Pseudoboeckella calcaris Harding, 1955, pp. 232-3, figs 17-20.

Specimens examined

Perú. Tarn at San Antonio de Esquilache, ca 16° 15'S., 70°30'W., 4.14 mm (n = 10)

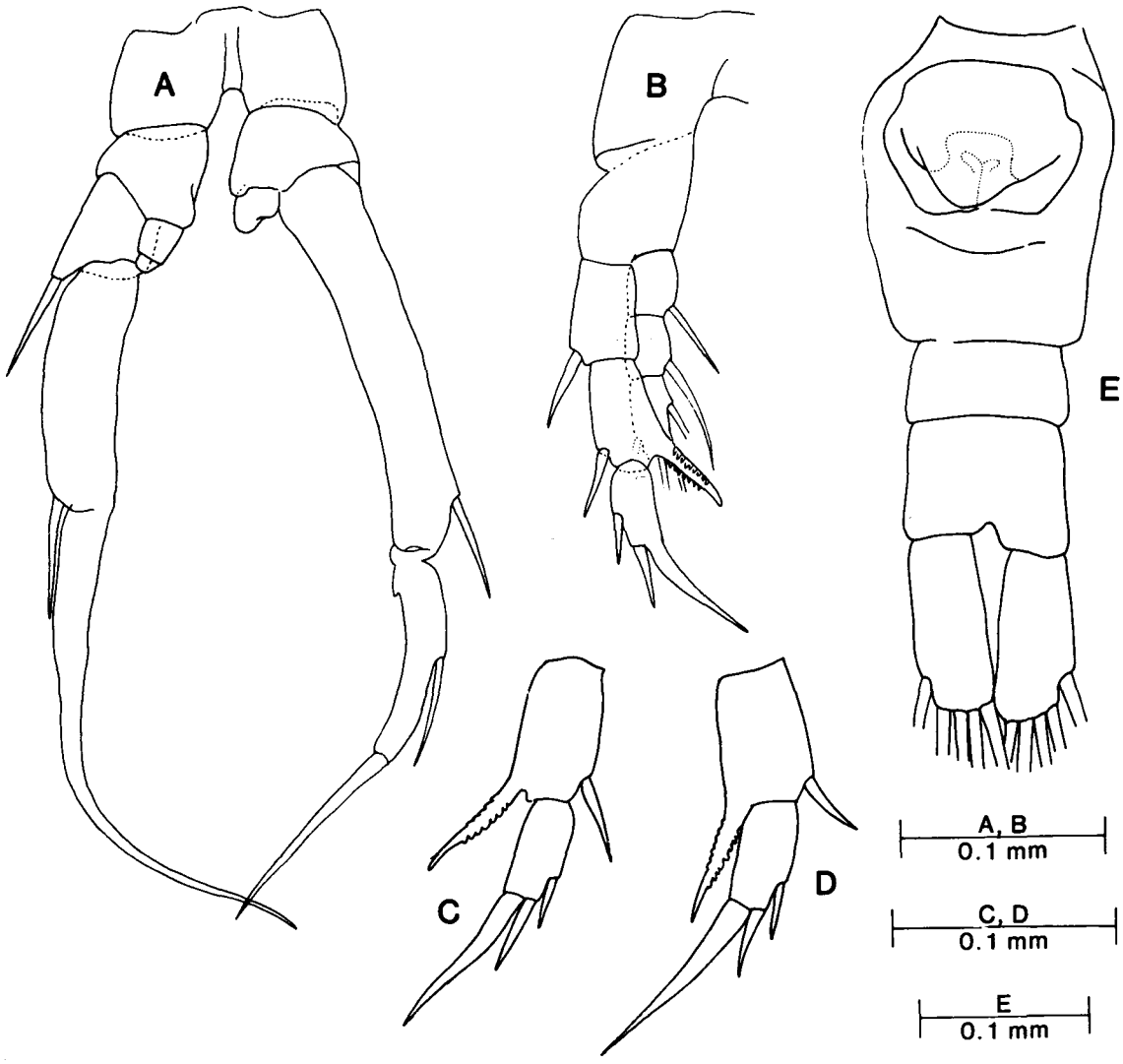

Fig. 19: Boeckella titicacae Harding. A, male fifth legs, anterior aspect; B, female fifth leg; C and D, Re2 and 3 of female fifth legs; E, female urosome, ventral aspect.

Boeckella titicacae Harding. A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C y D, Re2 y 3 de quinta pata de la hembra; E, cuerpo posterior de la hembra, aspecto ventral.

[mean clutch 63 (n = 10)], 3.68 mm (n = 10) [Paratype material of *B. calcaris* (Harding) in British Museum. Specimens in vial labelled "PHF 118" in jar labelled "246.7 *Pseudoboeckella calcaris* Harding Types 1946.11.26.101-120. Titicaca Expedition"] BOLIVIA "Conchostraca" pool, 22°18' S., 67°14'W., 1.xii.1977, 3.78 mm, 3.56 mm, coll. S.H. Hurlbert.

Description of male

Size. Length 3.5-3.8 mm (but greater range than this likely).

Fifth legs. Right Ri 2-segmented, extending well beyond distal limit of right Re2, basal segment considerably longer than terminal segment and with pronounced swelling reaching maximum thickness 2/3 distance along segment, terminal segment with 4 (sometimes 3) spines of which the terminal one is easily the longest and has a characteristic bend. Right Re claw hooked at extremity. Left B2 with projection at inner distal corner extending beyond extremity of left Ri. Left Ri minute, 1-segmented. Left Re claw ca 4 X as long as

left Re1, lacking an inner spine (cf. *palustris*).

Description of female

Size. Length 3.7-4.3 mm.
Antennules. Relatively short, not extending beyond the posterior limit of the prosome excluding the wings on the last prosomal segment.

Fifth legs. B2 with prominent lobe projecting over Ri1 on posterior face. Re3 with 3 spines.

Urosome (Fig. 20B). Genital segment with very large wing on left side, only ca 0.67 X as "long" as maximum "width" in ventral view. Length entire urosome ca 1.4 times maximum width.

Remarks

This species is probably the largest of the South American boeckellids (but is not as large as *Parabroteas sarsi*). Its large size and relatively short antennules correlate with its living in small bodies of water.

The large size of the lobes on the posterior face of B2 of the female fifth legs appears distinctive.

BOECKELLA PALUSTRIS (HARDING)
(Figs. 5D 21A-D, 25)

Pseudoboeckella palustris Harding, 1955, pp. 233-4, figs 21-24.
Pseudoboeckella peruviensis Löffler, 1955, pp. 724-7, figs 1-9.

Discussion of synonymy

There is a reasonably good agreement between Löffler's (1955, fig. 1) drawing of the male fifth legs and that of Harding (1955, fig. 23); apparent differences in the shape of the right Ri may be accounted for by differences in orientation. Harding's description was published on 29 July, 1955, whereas Löffler's description was not read until 13 October, 1955, and must therefore have been published after that date. It follows that Harding's name must take priority.

Specimens examined

Perú Shallow tarn near Lagunilla Lagunilla, ca 15°45'S., 70°45'W., 5 females, 7 males [Paratype material of *B. palustris* (Harding) in British Museum. Specimens in vial labelled "PHF 242" in jar labelled "246.7 *Pseudoboeckella palustris* Harding Types 1946.11.26. 121-140 Titicaca Expedition"]. L. Loripongo, 16°50'S., 70° 05'W., 21.xi.1976, 2.29 mm, 1.79 mm.
Bolivia. "Conchostraca" pool, 22°18'S., 67°14'W., 1.xii.1977, 2.82 mm, 2.28 mm. Pool (a) near L. Chojllas, 22°21'S., 67° 06'W., 18.ii.1979, 2.0 mm (n = 2), 1.62 mm. Pool (b) near L. Chojllas, 22°21'S., 67°06'W., 18.ii.1979, 2.02 mm, 1.48 mm. Pool (a) near L. Mama Khumu, 22°16'S., 67°05'W., 19.ii.1979, 2.5 mm (n = 2), 2.06 mm. Pool (b) near L. Mama Khumu, 22°16'S., 67°05'W., 19.ii.1979, 2.3 mm (n=2), 2.0 mm (n = 2).

Description of male

Size. Length 1.5-2.3 mm.
Fifth legs. Right B2 rather widely separated from left B2. Right Ri essentially 3-segmented (but lines of segmentation sometimes unclear with resultant 2-segmented or even unsegmented appearance), reaching well beyond distal limit of right Re2, terminal segment (or distal portion of endopod) with 4 spines (invariably in 20 legs examined). Left B2 with projection at inner distal corner not reaching to distal extremity of left Ri. Left Ri 1- or 2-segmented, extending ca 0.4-0.5 X distance along inner edge of left Re1. Left Re claw distinctly 2-segmented with inner spine (see arrow in Fig. 5D) almost invariably present near distal limit of proximal segment (this spine sometimes minute), claw as a whole less than 2.5 X as long as left Re1 (cf. *calcaris*).

Description of female

Size. Length 1.9-2.8 mm.

Antennules. Relatively short, not extending beyond posterior limit of prosome.

Fifth legs. Re3 with 3 spines.

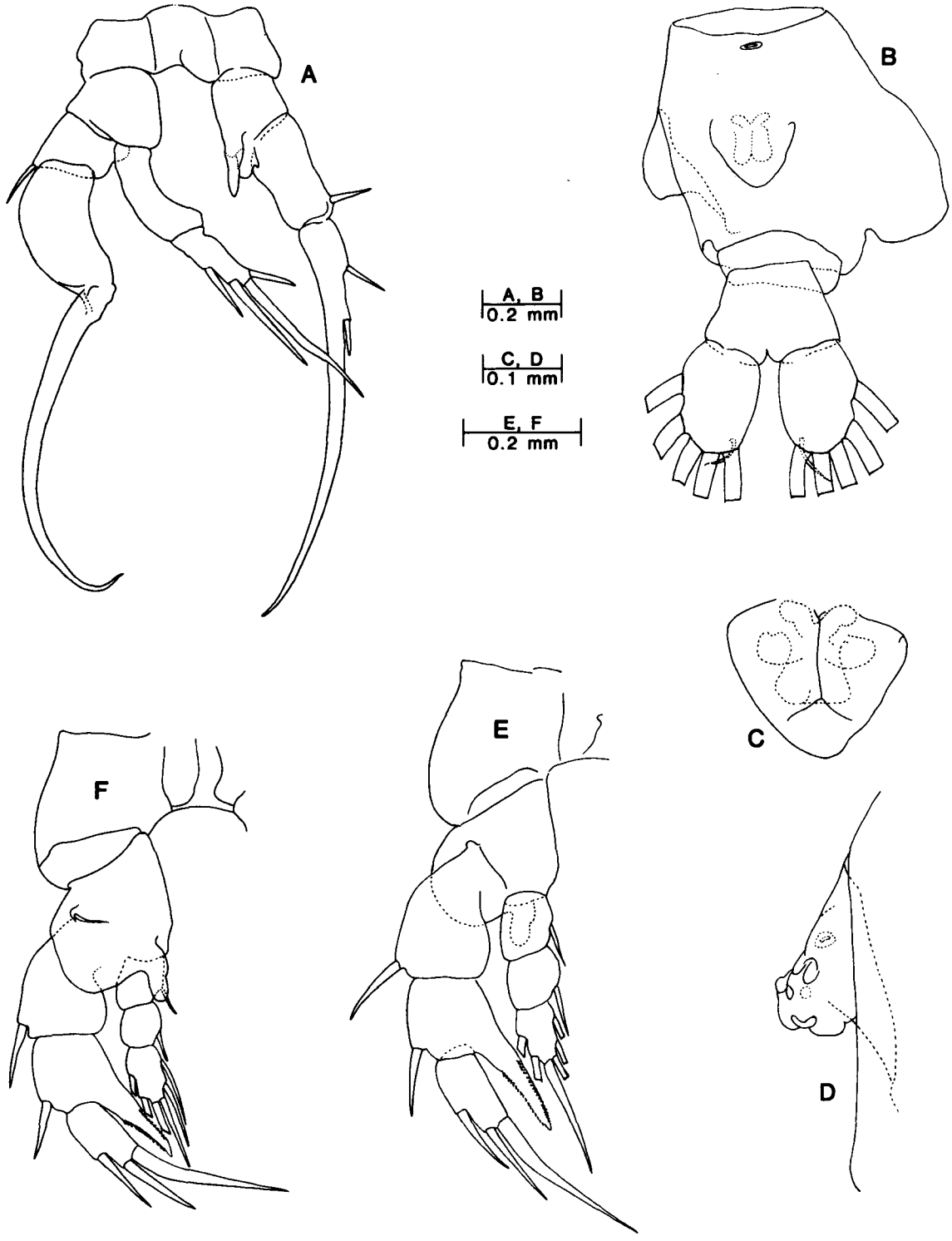

Fig. 20: Boeckella calcaris (Harding). A, male fifth legs, anterior aspect; B, female urosome, ventral aspect; C, details of female genital operculum (ventral); D, details of female genital operculum (lateral); E, female fifth leg, anterior face; F, female fifth leg, posterior face.

Boeckella calcaris (Harding). A, quinta pata del macho, aspecto anterior; B, cuerpo posterior de la hembra, aspecto ventral; C, detalles del opérculo genital de la hembra (ventral); D, detalles del opérculo genital de la hembra (lateral); E, quinta pata de la hembra, semblante anterior; F, quinta pata de la hembra, semblante posterior.

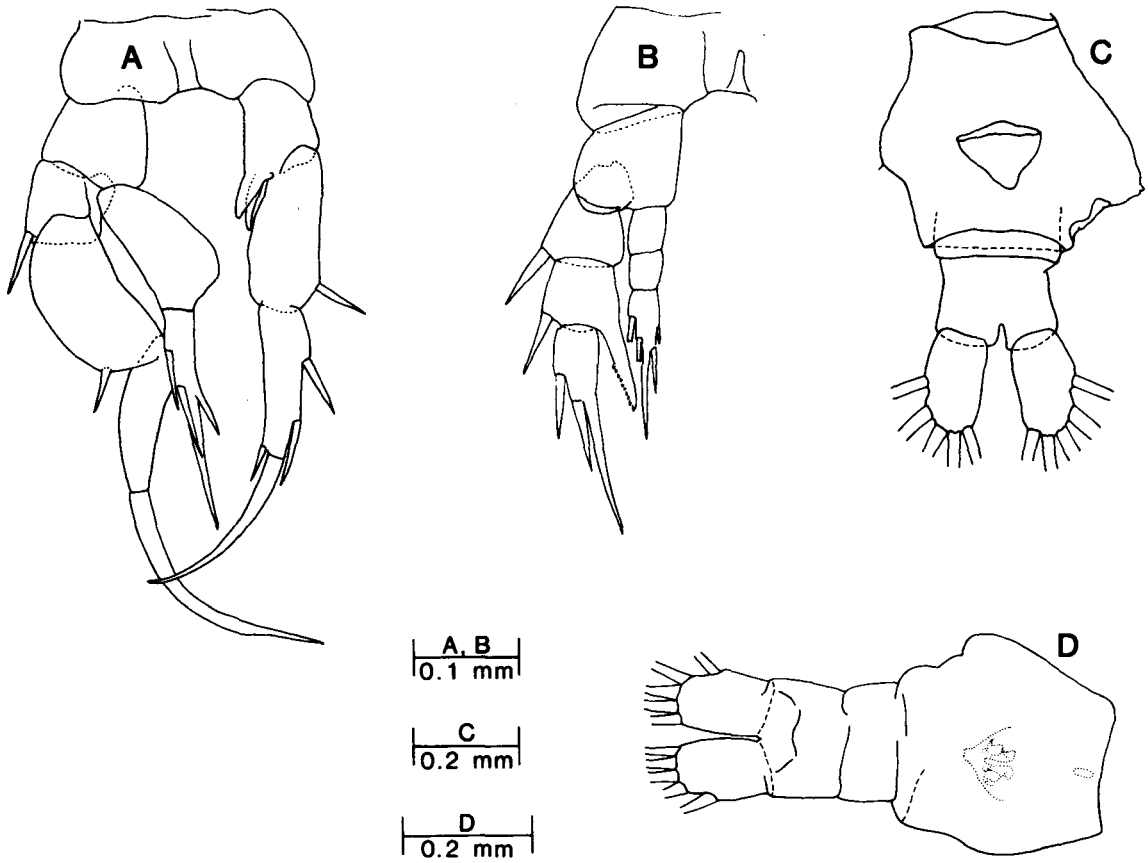

Fig. 21: Boeckella palustris (Harding). A, male fifth legs, anterior aspect; B, female fifth leg; C, female urosome, ventral aspect; D, female urosome, dorsal aspect.

Boeckella palustris (Harding). A, quinta pata del macho, aspecto anterior; B, quinta pata de la hembra; C, cuerpo posterior de la hembra, aspecto ventral; D, cuerpo posterior de la hembra, aspecto dorsal.

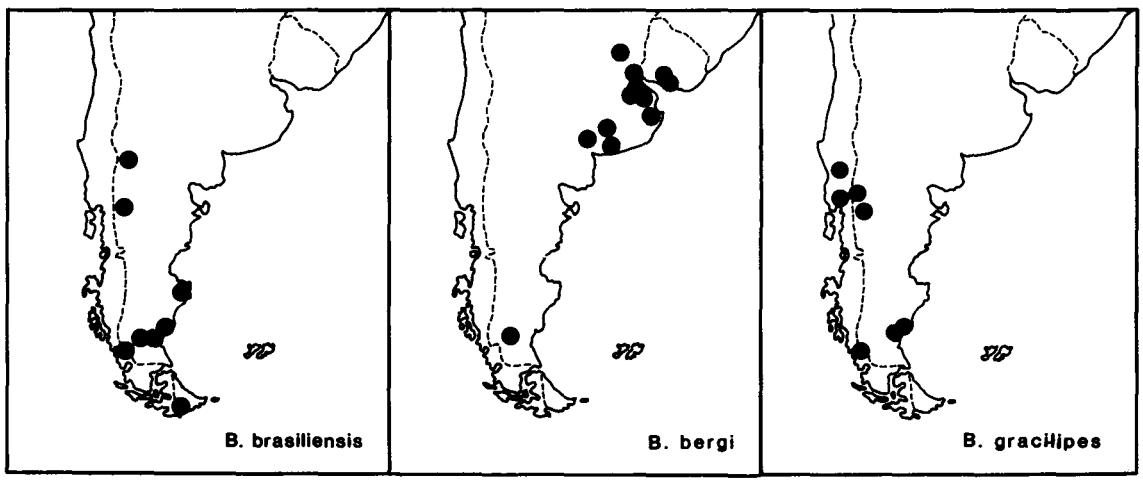

Fig. 22: Distribution maps for *Boeckella brasiliensis, B. bergi* and *B. gracilipes.*

Mapas de la distribución de *Boeckella brasiliensis, B. bergi* y *B. gracilipes.*

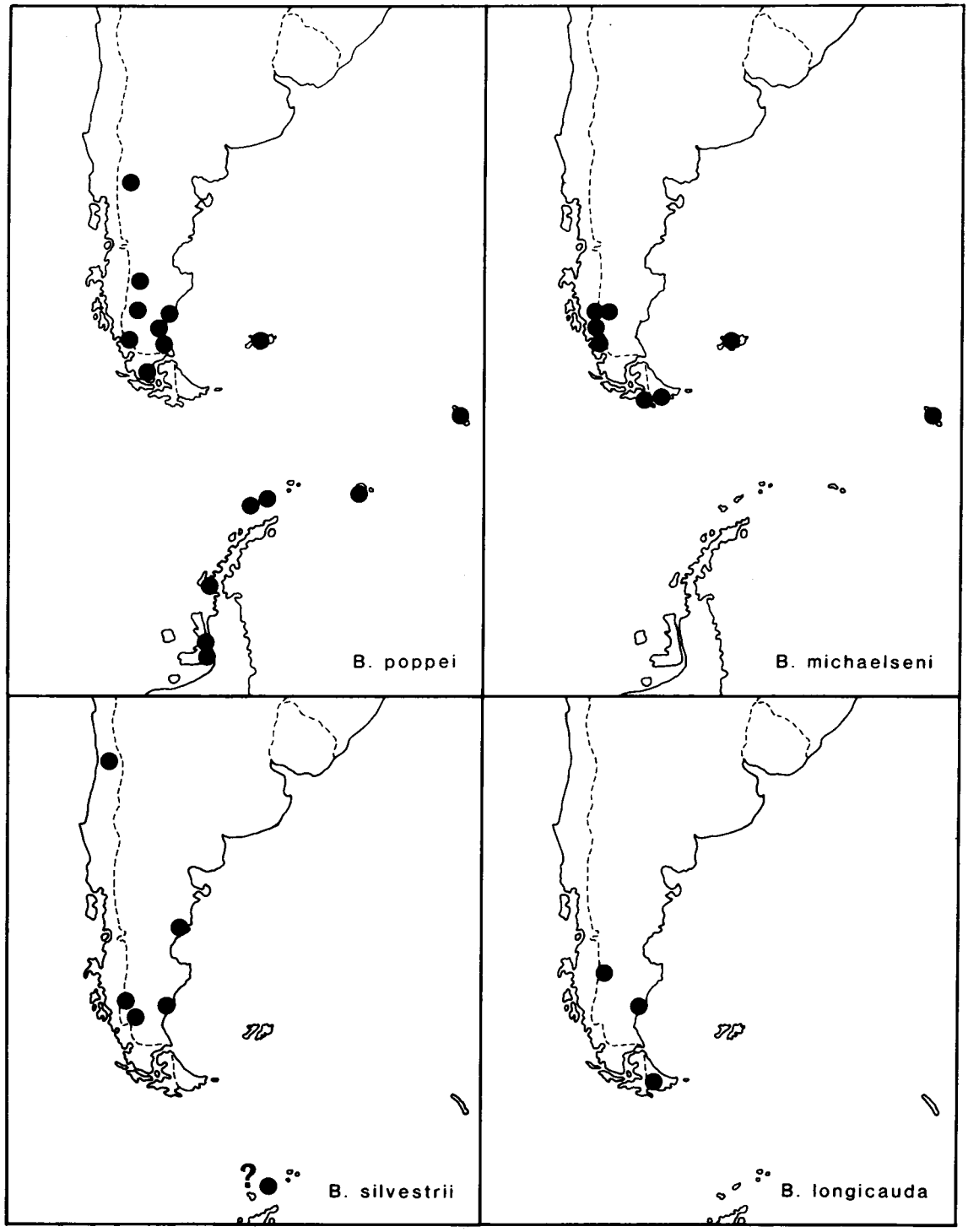

Fig. 23: Distribution maps for *Boeckella poppei, B. michaelseni, B. silvestrii* and *B. longicauda.*

Mapas de la distribución de *Boeckella poppei, B. michaelseni, B. silvestrii* and *B. longicauda.*

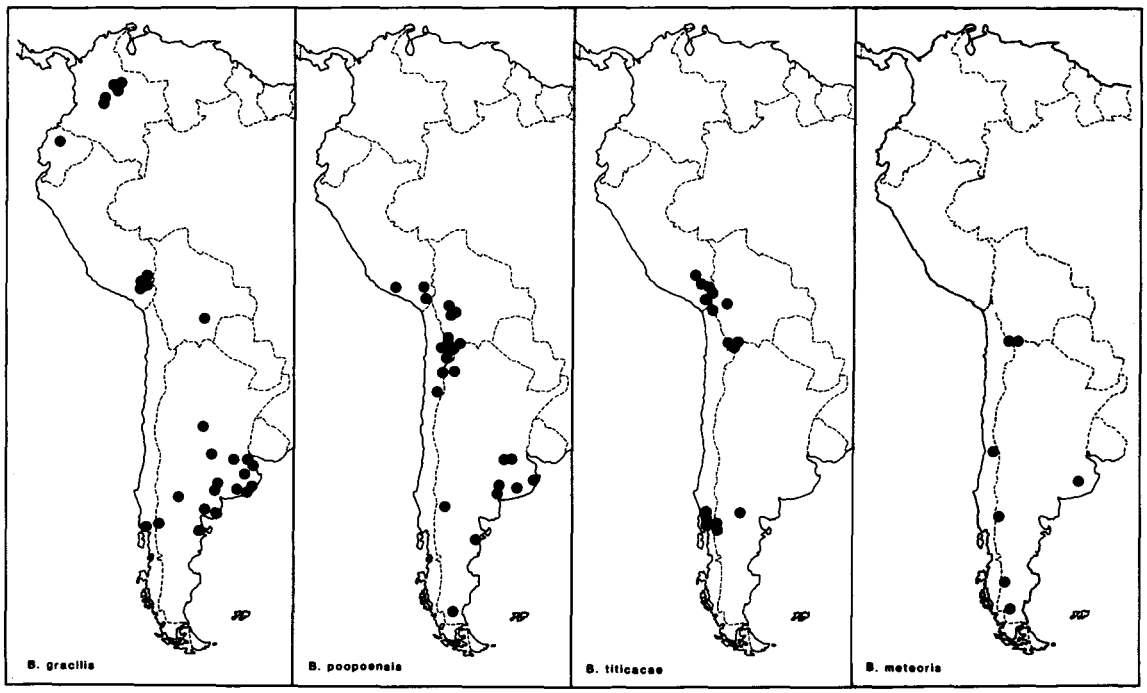

Fig. 24: Distribution maps for *Boeckella gracilis, B. poopoensis, B. titicacae* and *B. meteoris.*

Mapas de la distribución de *Boeckella gracilis, B. poopoensis, B. titicacae* y *B. meteoris.*

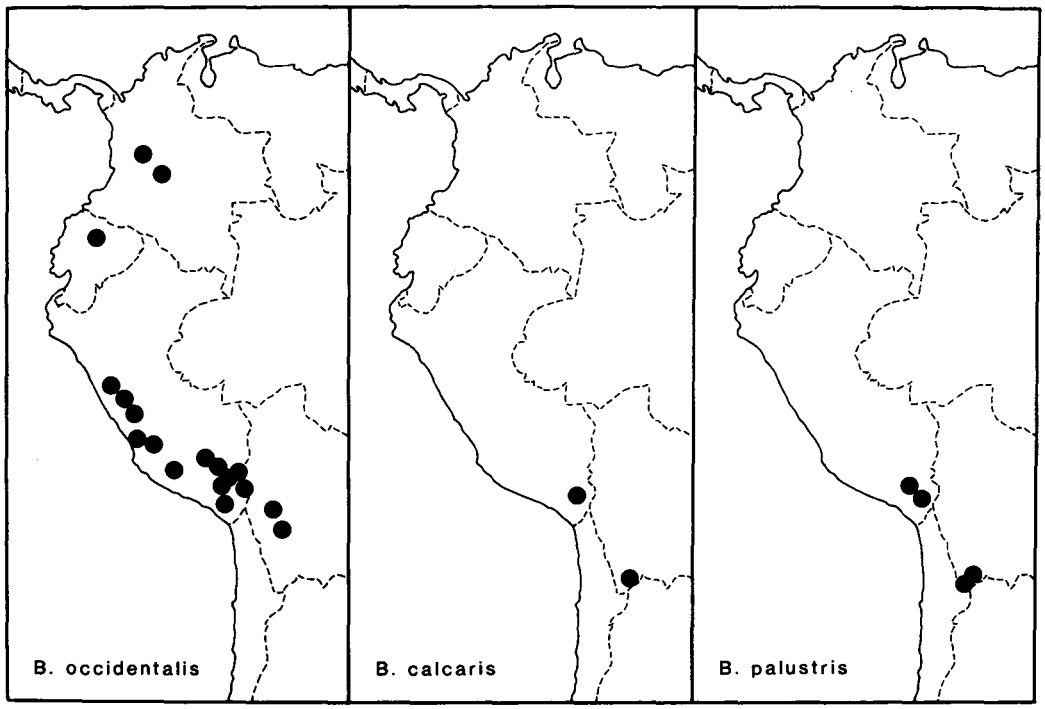

Fig. 25: Distribution maps for *Boeckella occidentalis, B. calcaris* and *B. palustris.*

Mapas de la distribución de *Boeckella occidentalis, B. calcaris* and *B. palustris.*

Urosome (Figs 21C&D). Genital segment with prominent bulge on left side, only ca 0.8 - 1.0 as "long" as maximum "width" in ventral view. Length entire urosome 1.6 - 2.0 X maximum width.

Remarks

Like *B. calcaris*, this species inhabits small, shallow bodies of water and has relatively short antennules.

TAXA INCERTAE SEDIS
Boeckella gibbosa (Brehm)

Pseudoboeckella gibbosa Brehm 1935c, pp. 117-20, figs 1a-d.

Comment

This form from Chile has some resemblance to *vallentini* but the terminal segment of the endopod of the male fifth right leg has three setae (or long spines) in positions which in *vallentini* are occupied by short, stout spines. Additionally, the shape of the female genital segment appears significantly different from that of *vallentini*. Furthermore, definite records of *vallentini* are presently restricted to sub-Antarctic islands. No boeckellid examined during this revision corresponded with Brehm's description of *gibbosa* which is not sufficiently good in itself to convincingly characterise a species. For the time being *gibbosa* should be treated as a name applying to a taxon of uncertain taxonomic position.

Boeckella thomseni (Brehm)

Pseudoboeckella thomseni Brehm 1937b, pp. 120-2, figs. 1a and b, and 2.

Comment

Brehm's description of the female of this form does not separate it differentially from many species of the genus. Brehm's (1937b, fig. 2) figure of the male fifth legs shows two features potentially useful for a diagnosis:

(a) the left Re claw has two outer spines on its basal portion and

(b) the right Ril has a peculiar outgrowth near its inner distal corner.

Regarding feature (a), this condition is sometimes the result of a developmental anomaly (cf. Fig. 9F) [but in *calcaris* and *palustris* it is not (cf. Figs 5C and D)].

In view of this, one wonders whether feature (b) might also represent an abnormality; it is not uncommon for a teratological male specimen to show abnormalities on both sides of the fifth pair of legs. Another suspicious feature of Brehm's description is that his drawing of the male fifth right leg has apparently been reconstructed from three separate, disarticulated parts.

As for *gibbosa*, no boeckellid examined during this revision corresponded with Brehm's description of *thomseni* which is not adequate in itself to be immediately acceptable at face value.

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