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A REVISION OF THE STILIPEDIDAE (AMPHIPODA)

BY

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INTRODUCTION

As defined by J. L. Barnard (1969) the Stilipedidae were a small family of amphipods, containing only two genera (*Alexandrella* Chevreux and *Stilipes* Holmes) and 4 known species. During our studies of the Amphipoda from the "Scotia Arc" (Watling & Holman 1980; 1981; in press) we encountered specimens attributable to the genera *Alexandrella* and *Bathypanoploea*. The latter was of particular interest since J. L. Barnard (1969) had suggested it to be an acanthonotozomatid with transitional characters to the Paramphithoidae and presumably caused a union of the two families in Karaman & Barnard (1979). We found, in fact, that the specimens on which the genus *Bathypanoploea* was based actually represented the two afore-mentioned genera. In the present paper we show *Alexandrella* and *Bathypanoploea* to be members of a new subfamily, the Alexandrellinae, thus removing the ambiguity between the acanthonotozomatids and the paramphithoids. The Stilipedidae are further revised to include the Astyridae.

STILIPEDIDAE Holmes, 1908

Stilipedidae Holmes, 1908: 535.

Astyridae Pirlot, 1934: 9.

Diagnosis. — Slight carina always present on urosomite 1; coxa 1 expanded anterodistally; coxa 2 slender, often proximally expanded; antenna 1 shorter than antenna 2; antenna 1 peduncle short, accessory flagellum rudimentary to absent, at most uniarticulate; mandible without crushing molar, palp 3-articulate; maxilla 2 inner and outer plates setose, usually expanded medially; gnathopods similar, simple to weakly subchelate, never feeble nor exhibiting sexual dimorphism; uropods biramous; uropod 3 peduncle short with at least one ramus 3-4 times length of peduncle; telson only slightly longer than wide but exceeding uropod 3 peduncle.

Subfamily Stilipedinae, Holmes, 1908 (new rank)

Diagnosis. — Coxa 1-4 long relative to corresponding pereonites, coxae 1-3 longer than coxa 4; eyes present (contrary to Holmes, 1908: 536); accessory

flagellum absent; upper lip asymmetrically lobed, left lobe longer than right; mandible incisor wide, smooth, with lacinia mobilis on left side only, lacking setal row and molar; lower lip without inner lobes, outer lobes acute distally; maxilla 1 palp article 2 broadly expanded distally, outer plate broad and flap-like with up to 25 short spines in a single row along distal margin, inner plate small with few setae; maxilla 2 plates circularly expanded, with short setae along outer, distal, and medial margins; maxilliped outer plate not overlapping inner, palp much longer than outer plate, article 4 without small teeth on inner margin; gnathopods simple, each with carpus slightly expanded, dactyls without small teeth on posterior margin.

Component species: *Stilipes distincta* Holmes, 1908; *S. lacteus* (Barnard, 1932); *S. sanguineus* (Hurley, 1954).

Subfamily Astyrinae Pirlot, 1934 (new rank)

Diagnosis. — Pereonites 1-4 equal to or deeper than corresponding coxae; coxa 4 as long as or longer than coxae 1-3; eyes absent; upper lip entire to emarginate; mandible incisor strongly toothed, twisted relative to rest of mandible body, nontritulative molar and setal row present; lower lip with or without inner lobes, outer lobes widely spaced; maxilla 1 palp not expanded, inner plate moderately to widely expanded; maxilla 2 plates usually somewhat expanded medially, with setae of moderate length on distal and medial margins; maxilliped outer plate shorter than 4-articulate palp and overlapping inner plate, article 4 of palp with small teeth on inner margin; gnathopods simple to weakly subchelate, small teeth on posterior margin of dactyls.

Component species: *Astyra abyssi* Boeck, 1871, (see Sars, 1895); *A. zenkevitchi* Birstein & Vinogradov, 1955; *A. bogorovi* Birstein & Vinogradov, 1955; *A. longipes* Stephensen, 1933; *A. gardineri* (Walker, 1909) (see Pirlot, 1934; = *Parastyra longidactyla*).

Subfamily Alexandrellinae new subfamily

Diagnosis. — Body variably carinate; pereonites deeper than corresponding coxae, coxa 4 as long as or longer than coxae 1-3; eyes absent; accessory flagellum uniarticulate; upper lip asymmetrically lobed, right side longer than left; mandible incisor broad, toothed or not, lacinia mobilis and setal row present on both left and right sides, molar absent; maxilla 1 palp expanded distally, inner plate well-developed, setose along distal and medial margins as well as on inner face; maxilla 2 inner and outer plates expanded medially but not rounded, heavily setose; maxilliped outer plate exceeds palp and overlaps inner plate, palp 4-articulate, article 4 with small teeth along inner margin; gnathopods 1 and 2 simple or weakly subchelate, gnathopod 1 slightly more robust.

Component species:

Alexandrella dentata Chevreux, 1912

A. australis (Chilton, 1912)

A. mixta (Nicholls, 1938)

A. subchelata n. sp.

Astyroides carinatus Birstein & Vinogradova, 1960

Bathypanoploea schellenbergi n. sp.

Remarks. — It is proposed that the Stilipedidae be expanded to include the Astyridae but be subdivided into 3 subfamilies, the Stilipedinae, the Alexandrellinae, and the Astyrinae. Previously, the Stilipedidae included only what is herein referred to as the Stilipedinae and a portion of Alexandrellinae, both groups possessing a mandible with no molar and a broad, smooth incisor, expanded maxilla 1 palp, expanded and setose maxilla 2, and a similar body shape. A more detailed examination of their mouthparts suggests that many of these similarities may be superficial. A closer relationship probably exists between the Alexandrellinae and Astyrinae, based on the expansion and redefinition of the Alexandrellinae given in this paper.

The Stilipedinae and Alexandrellinae both have asymmetrical upper lips, although in *Stilipes* the left lobe is the larger whereas in the Alexandrellinae the right lobe is longer. The Astyrinae, with their entire to emarginate upper lip, provide a transition between these two extremes. The broad, smooth mandible incisor found in *Stilipes* is very close to that of *Alexandrella australis*. However, the broad, heavily dentate mandible incisor of *Astyroides* and *Bathypanoploea* is similar to that figured for *Astyra abyssii*. In addition, all species within the Astyrinae and Alexandrellinae have a setal row on both mandibles, whereas this is lacking in *Stilipes*. Neither the Stilipedinae nor Alexandrellinae have a mandible molar. A molar in the Astyrinae is present although not strongly developed and should be considered as not radically different from the condition of the molar in the other two subfamilies. The form of the lower lip is quite variable within the Alexandrellinae and Astyrinae; for example, the lower lip of *Astyroides* is not typical of the Alexandrellinae but also does not differ strongly from those species lacking inner lobes within the Astyrinae. The lower lip of *Stilipes* appears to have a closer affinity with those in the Astyrinae than with the typical lower lip of the Alexandrellinae. Aside from the expanded condition of the palp, the construction of maxilla 1 of *Stilipes* is distinctly different from that of either the Alexandrellinae or Astyrinae. In *Stilipes*, the outer plate is wide and flap-like with a single distal row of 25 short spine-setae, whereas the Alexandrellinae and Astyrinae have an outer plate of normal depth with distal spine-setae arranged in short rows. The maxilla 2 inner plate in all species of *Stilipes* is small and weakly setose, not unlike that found in some *Astyra* species but quite different from that of the Alexandrellinae. The inner plates of both *Astyra zenkevitchi* and *A. bogorovi*, however, are broad, well-developed, and carry

moderately long setae distally, virtually indistinguishable from the second maxilla inner plates characteristic of the Alexandrellinae. The predominant difference between the maxilliped of *Astyra abyssii* and *Alexandrella* is one only of the proportion of palp to outer plate, the setation and remaining construction being approximately the same. In contrast, the inner and outer plates of the maxilliped in *Stilipes* do not overlap, but are situated laterally to one another and are setose along both the medial and outer margins. The Astyrinae and the Alexandrellinae have small teeth along the inner margin of the fourth palp article of the maxilliped and on the gnathopod dactyls; *Stilipes*, however, does not. The Stilipedinae and Alexandrellinae also differ in the proportionate lengths of the coxal plates. In *Stilipes*, the first several coxae are considerably longer than the corresponding pereonites while just the opposite is true for the Alexandrellinae and the majority of the Astyrinae. The length of the coxal plates of *Astyra abyssii* (cf. Sars, 1895, pl. 73) appears to be intermediate between these two extremes.

The above comparison shows that the Stilipedidae would not be a cohesive family if it included only the Stilipedinae and Alexandrellinae, although these two subfamilies do share a number of features. The combination of asymmetrical upper lip, broadened mandible incisor, and expanded maxilla 1 palp has developed in other, independent families (e.g., Acanthonotozomatidae, see later discussion) suggesting that the similarity in these features may be due only to convergent development and should not be used to justify placing them within the same family. Nevertheless, the similarity in overall body and head shape, form of antennae, and coxal plate shape suggests an evolutionary affinity between the two groups. The inclusion of the Astyrinae provides a transition for several of the character states which differ between the other two subfamilies.

With the inclusion of all three subfamilies, no one feature serves to distinguish the family. However, the overall body shape, rudimentary accessory flagellum, tendency toward medially expanded maxilla 2 inner and outer plates, and weakly subchelate to simple gnathopods (not feeble nor exhibiting sexual dimorphism) distinguish this family from the majority of others. The broad mandible incisor, expanded maxilla 1 palp and asymmetric upper lip of the Stilipedinae and Alexandrellinae are features that either singly or in combination are present in various other families such as the Acanthonotozomatidae, Pardaliscidae, and Stegocephalidae. *Maxilliphimedia longipes* K. H. Barnard, in the Acanthonotozomatidae, has all three of these character states but its chelate gnathopods, paired dorsal processes, and the general construction of the remaining mouthparts are clearly different from those of the Stilipedidae (see also remarks under *Alexandrella australis*). The remaining members of the Acanthonotozomatidae have their mouthparts in a conical bundle, show no tendency toward medial expansion of maxilla 2, and have a prominent rostrum. Members of the Stegocephalidae frequently have broaden-

ed mandible incisors but are easily distinguished from the Stilipedidae by the absence of a mandible palp and by having, at most, only one plate of maxilla 2 expanded. *Pardalisca marionis* Stebbing possesses an expanded maxilla 1 palp, slightly asymmetrical upper lip and moderately broadened, though dentate mandible incisor. This species and the remaining Pardaliscidae, however, usually have well-developed accessory flagella, extremely short coxae, reduced inner plates of the maxilliped, and slender plates of maxilla 2. The Hyperiopidae have a claviform maxilla 1 palp, similar in some respects to that of the Alexandrellinae, but are distinctive in their well-developed accessory flagella and elongate fourth articles of pereopods 3 and 4. The Stilipedinae resemble the Synopiidae in having coxa 4 shorter than coxa 3. The well-developed inner plate of maxilla 1, setose maxilla 2 and the proportionate size of the plates and palp of the maxilliped of the synopiids are very similar to those of some of the Astyrinae. Synopiids, however, generally have well-developed accessory flagella, strongly downturned rostrums, elongate telsons, and crushing molars.

J. L. Barnard (1969) suggested the genus *Epimeriella* (Paramphithoidae) should be included within the Astyrinae because of similarities in mouthparts, gnathopods, uropods, and telson. Considerable similarities do exist and it is likely that there is a strong association between the Astyrinae and the Paramphithoidae, at least through the genus *Epimeriella*. The problem is confounded by questionable synonymies within both *Astyra* and *Epimeriella* as well as incomplete illustrations of all members of both genera. More specifically, we view the synonymization of *Eclysis* into *Epimeriella* (Karaman & Barnard, 1979) with some skepticism, largely because of the absence of eyes, and the shape of the gnathopods and first coxal plate of the former, features which might suggest a closer relationship to members of *Astyra*. In actuality, there may be stronger ties between the Paramphithoidae and the Alexandrellinae and Astyrinae than between the latter two subfamilies and the Stilipedinae. At this point, however, we are considering the Stilipedidae to be distinct from the Paramphithoidae, *Epimeriella* in particular, in not possessing the "paramphithoid" lower lip, lacking distally acuminate coxal plates, and differing generally in overall body shape.

Bousfield (1978) defined the new superfamily Pardaliscoidea to include the families Pardaliscidae, Stilipedidae, Hyperiopidae, Astyridae, and Vitjazianidae. Several of the features which he listed as characteristic of this superfamily do not apply to the Stilipedidae as originally defined, nor as presently redefined. For example, stilipedids do not have a dimorphic terminal male (vs. Bousfield's assertion), the inner plates of the maxillae are heavily setose (vs. sparsely setose), the outer plate of maxilla 1 often has many more than 15 apical spine teeth (vs. 7 to 8), coxa 4 is strongly excavate behind (vs. not excavate), and the outer ramus of uropod 3 is uniarticulate (vs. 2-articulate). The Stilipedidae, as revised, appear to be related to the Pardaliscidae, but if they are to be placed in a superfamily Pardaliscoidea, many of the features

characteristic of such a group will have to be revised from those listed by Bousfield (1978).

Alexandrella Chevreux, 1911

Alexandrella Chevreux, 1911: 1167; Chevreux, 1912a: 213; Chevreux, 1921b: 134.

Parandaniexis Nicholls, 1938: 42. Type-species, by original designation and monotypy: *Parandaniexis mixtus*. An invalid junior homonym of *Parandaniexis* Schellenberg, 1929.

Pseudandaniexis Nicholls, 1938, corrigendum. Replacement name for *Parandaniexis* Nicholls, 1938, non Schellenberg, 1929.

Type-species: *Alexandrella dentata* Chevreux, 1912a, by subsequent monotypy (by Chevreux, 1912a: 213).

Diagnosis. — Body variably carinate; upper lip asymmetrically lobed; mandible incisor broad, smooth or dentate; lower lip with or without inner lobes, distal margin broad, setose, outer distal corner marked by small acute projection; maxilla 1 palp biarticulate, variously expanded, distally with closely spaced spines and a short row of slender setae; maxilla 2 inner plate with medial setae distinct from distal setae, inner plate nearly as wide as high; maxilliped medial margin setose, inner plate extending past distal margin of palp article 1, palp article 4 no more than 0.6 length of article 3; telson entire, distal margin smoothly sculpted.

Description. — Strength and extent of body carination variable, but always with posteriorly directed keel on urosomite 1. Coxa 1 distally expanded, subequal to or shorter than coxa 2 or 3. Antenna 1 shorter than antenna 2 and with uniarticulate accessory flagellum. Upper lip strongly to weakly asymmetrical. Mandible lacking molar; accessory plate on both left and right sides, right being the smaller; short setal row also present. Maxilla 1 palp biarticulate, article 1 short, article 2 expanded distally, shape individually variable; outer plate with tapering spines distally, inner plate notched to accommodate outer plate, setose on inner face and medial margin. Maxilla 2, inner plate wider than outer, both strongly setose, medial setae on inner plate distinct in form or length from distal setae. Gnathopods simple to weakly subchelate, gnathopod 1 only slightly stouter than gnathopod 2. Pereopod 7, basis expanded, excavate behind, dactyl not longer than propodus. All uropods biramous; uropod 1 rami subequal, about equal to peduncle; uropod 2, outer ramus shorter than inner; uropod 3 outer ramus slightly shorter than inner but much longer than peduncle.

Remarks. — Maxilla 1 palp shape appears to be variable, at least for *A. mixta*, and is likely to be for the other three species as well. Smaller individuals also may not carry a full complement of dorsal carinae, consequently both palp shape and dorsal carinae are considered to have limited diagnostic value.

As defined above, this genus contains 4 species: *Alexandrella dentata* Chevreux; *A. australis* (Chilton); *A. mixta* (Nicholls) and *A. subchelata* n. sp. *Astyroides carinatus* Birstein & Vinogradova is not included, contrary to the sug-

gestion of Barnard (1969), for reasons discussed later. The component species of this genus were drawn from three separate families: *Alexandrella dentata* from the Stilipedidae (originally placed in the Tironidae), *A. mixta* from the Stegocephalidae, and *A. australis* from the Acanthonotozomatidae. Their scattered and seemingly unrelated arrangement was probably the result of the incomplete examination of mouthparts or damaged specimens. Such a divergent placement might have caused considerable misidentification, especially in view of the strong similarity among all members of this subfamily. There are few additional reports of any of these species but, where possible, identifications have been verified.

***Alexandrella australis* (Chilton, 1912) (figs. 1-3)**

Acanthonotozoma australis Chilton, 1912: 487, pl. 2 fig. 19.

Material. — "Eltanin", Cruise 6, Sta. 432, 7 January 1963, 62°52-55'S 59°27'-15'W, 884-935 m, head only. "Islas Orcadas", Cruise 575, Sta. 54, 27 March 1975, 57°39'S 26°00.4'W, 2380-2609 m, 1 ♀, 55 mm.

Diagnosis. — Large adults with single middorsal carinae on pereonite 7, pleonites 1-3, and urosomite 1; coxa 5 posterodistal corner acute; antenna 1, article 1 with prominent mediodorsal tooth; upper lip lobes weakly asymmetric, nonsetose; mandible incisor broad, smooth; lower lip without inner lobes; maxilla 1 with 10-11 setae distally; maxilla 2 inner plate, setae along medial edge much longer than distal setae but not strongly plumose; gnathopods simple; pereopod 7 basis posterodistal corner acute.

Description (supplementing Chilton, 1912). — Adult body with posteriorly projecting carinae on pereonite 7, pleonites 1-3, and urosomite 1; carina present on urosomite 1 preceded by a distinct notch. Coxa 1 expanded anterodistally; coxae 2 and 3 posterodistal corners subacute; coxa 4 acute distally, longer than coxae 1-3; coxa 5 rounded anteriorly, posterodistal corner produced acutely. Antenna 1, article 1 mediodorsal tooth extending past distal margin of article 2 in large adult, less prominent but still extending to distal end of article 2 in smaller individuals. Antenna 2, article 5 longer than article 4. Upper lip asymmetrically incised, right lobe only slightly longer than left, neither setose. Mandible incisor broad, very smooth although occasionally with 1-2 teeth at one end; accessory plate on left wide, smooth, that on right reduced to small lappet; molar absent; palp 3-articulate, article 2 the longest, articles 2 and 3 setose along ventral margin. Lower lip without inner lobes, outer lobes broad with small acute projection at outer corners. Maxilla 1 inner plate setose along medial margin and inner face, notched to accommodate outer plate; palp biarticulate, expanded distally with 1 short row of slender, well-spaced setae and 1 row of closely-spaced short spine-setae. Maxilla 2 inner plate larger than outer, medial setae conspicuously longer than those more distally but not strongly plumose; setae on outer plate not pectinate. Max-

illiped outer plate exceeding palp, setose medially; inner plate extending past distal margin of palp article 1, setae on distal margin of moderate length; palp 4-articulate, article 2 longest, article 4 less than 0.5 length of article 3, serrate along inside margin. Gnathopods 1 and 2 simple, gnathopod 1 slightly more robust. Pereopods 5 and 6 bases slightly expanded, more so proximally; posterodistal corners rounded; each with carpus approximately equal to

Fig. 1. *Alexandrella australis* (Chilton, 1912), ♀, 55 mm. a, side view of body; b, head; c, antenna 1, dorsal tooth broken; d, upper lip; e, right mandible; f, mandible palp; g, maxilla 2.

merus, propodus longer than carpus. Pereopod 7 basis widely expanded proximally, posterodistal corner acute; carpus much longer than merus; propodus shorter than on pereopods 5 or 6. Uropods biramous, rami with short spines along lateral margins. Uropod 1 outer ramus slightly shorter than inner, both rami shorter than peduncle. Uropod 2 outer ramus slightly more than 0.5 length inner ramus, inner ramus subequal to peduncle. Uropod 3 outer ramus

Fig. 2. *Alexandrella australis* (Chilton, 1912), ♀, 55 mm. a, lower lip; b, maxilla 1; c, maxilla 1 palp; d, maxilliped; e, gnathopod 1; f, gnathopod 2; g, uropod 3.

slightly shorter than inner, both rami at least 4 times length of peduncle. Telson entire, distal margin smoothly sculpted, without spines or setae.

Distribution. — Bransfield Strait, South Sandwich Islands, Cape Norwegia; 884-2609 m.

Remarks. — A single large female and the head of one smaller specimen were available for examination. The body morphology of the female is identical to that illustrated by Chilton (1912), especially with regard to the tooth on the first article of antenna 1, the unequal size of the first 4 coxal plates, the acute posterior projection of coxa 5 and the shape of the basis of pereopod 7. These features clearly distinguish it from the material Schellenberg (1931) identified as synonymous with Chilton's specimen and which he named *Iphimediopsis australis* (later moved to *Bathypanoploea*). Both sets of specimens are, however, sufficiently similar in body carination and overall appearance as to be easily confused. Nevertheless, the differences in mouthpart morphology warrant placement of these species in separate, albeit closely related genera.

Fig. 3. *Alexandrella australis* (Chilton, 1912), ♀, 55 mm. a-c, bases, pereopods 5-7, respectively; d, uropod 1; e, uropod 2; f, telson.

A. australis shares many features with *A. dentata*, notably: the shape of the mandible, distal margin of the lower lip, and the telson; the setation of maxilla 2, maxilla 1 palp, and the outer plate of the maxilliped; and the length of the maxilliped inner plate relative to the palp. All of these form the basis for their placement in the same genus.

Chilton, without examining the mouthparts, assigned *A. australis* to the Acanthonotozomatidae. Its removal (and also the removal of what is now called *Bathypanoploea schellenbergi*) negligibly affects the concept of the family Acanthonotozomatidae since the construction of the mouthparts for the majority of inclusive genera is drastically different, usually formed into a conical bundle with the mandible incisor drawn out to a point, the outer lobes of the lower lip smoothly rounded, narrow inner and outer plates of maxilla 2, and maxilliped palp that is longer than the outer plate. Body shape is similar although the first several coxae in most members of the Acanthonotozomatidae are distally acute and the dorsal carinae are usually paired, rather than single. The most similar acanthonotozomatid species is *Maxilliphimedia longipes* (unknown in 1912) which is exceptional in having a broad mandible incisor, slightly asymmetrical upper lip, and an expanded maxilla 1 palp. The similarity does not include other mouthparts, however. In *M. longipes*, the inner plate of maxilla 1 is not well developed nor are the plates of maxilla 2 medially widened. The basic construction of the maxilliped differs both in the size of the outer plate and the structure of the palp.

***Alexandrella dentata* Chevreux, 1912 (fig. 4)**

Alexandrella dentata Chevreux, 1912a: 213; Chevreux, 1912b: 134, figs. 31-33. Not J. L. Barnard, 1961: 77, fig. 46.

Material. — “*Pourquoi Pas?*”, 22 January 1909, near Alexander Island, 297 m, 1 ♀, 18 mm (Holotype, Muséum Nationale d'Histoire Naturelle, Paris, appendages only, body not available).

Diagnosis. — Pleonites 1 and 2 with weak middorsal carinae, pleonite 3 with 2 low rounded carinae, urosomite 1 with distinct posteriorly-directed keel; small posteriorly-directed triangular projections present laterally on pereonites 1-7; coxa 5 rounded posteriorly; antenna 1, article 1 without prominent mediodorsal tooth; upper lip strongly lobed asymmetrically, right lobe setose distally; mandible incisor broad, dentate along a portion of blade; lower lip with inner lobes; maxilla 1 outer plate with 16-17 setae distally; maxilla 2 inner plate medial setae plumose, only slightly longer but clearly different from those on distal edge; gnathopods simple; pereopod 7, basis, posterodistal corner rounded.

Description (supplementing Chevreux, 1912b). — Antenna 2, articles 4 and 5 subequal. Both mandibles with accessory plates, that of right small and irregularly toothed, setal row also present. Maxilla 1 palp biarticulate, strongly

Fig. 4. *Alexandrella dentata* Chevreux, 1912, ♀, 18 mm (holotype). a, upper lip; b, right mandible, without palp; c, lower lip; d, maxilla 1; e, maxilla 2; f, maxilliped.

expanded mediodistally, with 1 short row of well-spaced, slender setae and 1 longer row of closely-spaced short spine-setae. Maxilla 2 inner plate larger than outer, inner plate medial setae strongly plumose, distal setae shorter, weakly pectinate at tips; setae on outer plate slightly pectinate as well. Maxilliped outer plate exceeds palp, outer plate setose medially and distally, setae becoming heavier proximally along medial margin; inner plate extending past distal margin of palp article 1, setae short distally, longer on medial margin; palp article 4 less than 0.5 length article 3, toothed along one margin. Telson smoothly sculpted along distal margin, without spines or setae.

Distribution. — Alexander Island, 297 m.

Remarks. — The type material was in poor condition and the body was not available. The majority of the mouthparts were still in fair condition and have been refigured. Contrary to Chevreux's description, the right mandible was found to have a small accessory plate and setal row.

This species is easily distinguished from *A. australis* by the absence of a strong dorsal tooth on antenna 1 article 1, strongly asymmetric upper lip, partially toothed mandible incisor, presence of inner lobes on the lower lip, setation of the maxillae, and the shape of coxa 5. The distinctions between this species and *A. mixta* are not so well-defined (see also remarks under *A. mixta* (Nicholls)). Both are remarkably similar in mouthpart morphology and appendage shape. Possible distinctions include the absence of lateral triangular projections on the pereonites in *A. mixta*, wider distal margin of the lower lip, the larger number of distal spines on the outer plate of maxilla 1, and the shorter maxilliped palp length in *A. dentata*. It is suspected that both dorsal and lateral body carinations may be variable with size and that larger specimens may have acute dorsal carinae on at least the three pleonites. There is insufficient material to determine the diagnostic value of the remaining features, especially the variability in the number of spines on the outer plate of maxilla 1, although in *Bathypanoploea*, this feature appeared reasonably constant.

***Alexandrella mixta* (Nicholls, 1938) (fig. 5)**

Parandaniexis mixtus Nicholls, 1938: 42, fig. 22.

Pseudandaniexis mixtus Nicholls, 1938, corrigendum, by implication. Bellan-Santini, 1972: 230, fig. 36.

Material. — French Antarctic Expedition to Adélie Land, Sta. TAD 130, 29 January 1965, Geologie Archipelago 90-96 m, 1 ♀, 20 mm (specimen not dissected). "Galathea" Sta. 663, 24 February 1952, 36°31'S 178°38'W, 4520 m, 1 ♂, 27 mm.

Diagnosis. — Body carinae variable, urosomite 1 with posteriorly-directed carina; coxa 5 rounded posteriorly; antenna 1, article 1 without strong mediodorsal tooth; upper lip strongly asymmetrical, right lobe setose, mandible incisor broad, dentate along portion of blade; lower lip with inner lobes; maxilla 1 outer plate with 11 setae distally; maxilla 2 inner plate medial setae

considerably longer than distal setae; gnathopods simple; basis of pereopod 7 not acute at posterodistal corner.

Description (supplementing Nicholls 1938, and Bellan-Santini, 1972). — In large specimen, pleonites 1, 2, and 3 with acute posteriorly-directed carinae, smaller specimen with rounded carinae on pleonite 3 only. Coxa 1 expanded distally; coxa 2 slightly expanded proximally; coxa 4 only slightly longer than coxa 3. Mandible palp 3-articulate, setose along lateral margin of articles 2 and 3. Lower lip outer lobes moderately wide, inner lobes present. Maxilla 1 palp biarticulate, variously expanded. Maxilliped palp reaching just to apex of outer plate, article 4 about 0.6 as long as article 3. Telson distal margin smoothly sculpted.

Fig. 5. *Alexandrella mixta* (Nicholls, 1938), ♀, 20 mm. a, side view of body; b, maxilla 1 palp (right or left, undetermined); c, detail of telson distal margin.

Distribution. — Commonwealth Bay, Geologie Archipelago, Kermadec Trench, 60-4520 m.

Remarks. — The specimen provided to us by Dr. Bellan-Santini (20 mm ♀) was not dissected and many features of the mouthparts could not be compared with earlier illustrations. Both specimens examined by us differed from those previously illustrated in at least three features: the shape of the palp of maxilla 1, the detail of the distal margin of the telson, and the shape of the posterior margin of the basis of pereopod 7. The maxilla 1 palp on the specimen pro-

vided by Dr. Bellan-Santini is mediodistally expanded as in *A. dentata*. The shape of the palp figured by Bellan-Santini (1972) is also different from that figured by Nicholls (1938). It is assumed, therefore, that the exact shape is individually variable, although always expanded. The telsons on our specimens have a smoothly sculpted distal margin, similar to *A. dentata*, whereas the telson figured by Bellan-Santini appears somewhat irregular, possibly due to damage or wear. The basis of pereopod 7 on the specimen from Dr. Bellan-Santini is also similar to that of *A. dentata*, proximally enlarged into a posterior lobe, excavate below with a rounded posterodistal corner. The same article on the specimen figured by Bellan-Santini, while also expanded proximally into a posterior lobe, has an additional subacute tooth below the proximal lobe. The specimen from the Kermedec Trench (27 mm ♂), while badly damaged, is similar to the specimen figured by Dr. Bellan-Santini in almost all features, except those mentioned above and the following: the mandible appears slightly more dentate; the setae on the inner plate of the maxilliped is shorter; and pleonites 1-3 each carry a posteriorly-directed acute dorsal carina. The variability of these three features is considered to be within the concept of the species.

The setation of the maxillae of the Kermedec Trench specimen is similar to that of *A. dentata*, with the exception of the number of spines distally on the outer plate of maxilla 1. The setae on the inner plate of maxilla 1 are plumose, those on the outer plate of maxilla 2 are pectinate. The inner plate of maxilla 2 carries plumose setae medially, pectinate and smooth setae distally. These features could not be examined on the available French Antarctic material and are not detailed in previous illustrations. Consequently, based on the Kermedec Trench specimen, we assume the setation on these appendages to be the same in both *A. dentata* and *A. mixta* but unlike that of *A. australis*. *Alexandrella mixta* is easily distinguished from *A. australis* by its smoothly rounded coxa 5, dentate mandible, and strongly asymmetric upper lip as well as by the details of setation on the maxilliped and maxillae.

This variability removes many of the potentially distinctive features between *A. mixta* and *A. dentata*. The reliability of remaining diagnostic characters, the number of spines distally on the outer plate of maxilla 1, and the length of the maxilliped palp relative to the outer plate, may also be questionable although there is no evidence at this time to indicate any overlapping variability. The examination of additional material may prove these two species synonymous.

The original placement of this species in the Stegocephalidae was probably due to the damaged condition of Nicholls' specimen as he was obviously unaware of its similarity to *A. dentata*. The overall body shape resembles the typical stegocephalid form, however, the presence of a mandible palp, expanded condition of both inner and outer plates of maxilla 2, and construction of the telson are not typical of that group.

Fig. 6. *Alexandrella subchelata* n. sp., ♀, 13 mm. a, epimera 1-3, urosome and uropods (telson removed); b, antenna 1 peduncle, ventral view; c, antenna 1 peduncle, dorsal view; d, upper lip; e, right mandible, palp omitted; f, mandible palp; g, lower lip.

Fig. 7. *Alexandrella subchelata* n. sp. a-c, ♀, 13 mm, a, maxilla 1; b, maxilla 2; c, maxilliped; d, ♀, 8 mm, gnathopod 1.

***Alexandrella subchelata* n. sp. (figs. 6-8)**

Alexandrella dentata J. L. Barnard, 1961: 77, fig. 46 (not *Alexandrella dentata* Chevreux, 1912).

Material. — "Galathea", sta. 554, 5 December 1951, 37°28'S 138°55'E, 1 ♀, 13 mm, with 2 juveniles in brood pouch, holotype; the juveniles, 3 mm, and 1 non-ovigerous ♀, 8 mm, paratypes; all deposited in Zoologiske Museum, København, Denmark.

Diagnosis. — Pleonites 1, 2 with weak middorsal ridge (13 mm ♀), pleonite 3 with low rounded carina, urosomite 1 with distinct posteriorly-directed keel;

Fig. 8. *Alexandrella subchelata* n. sp. a-g, ♀, 13 mm, a, gnathopod 2; b, detail of palm and dactyl of gnathopod 2; c-d, pereopods 5, 6, distal articles missing; e, pereopod 7; g, telson; f, ♀, 8 mm, telson.

coxa 5 rounded posteriorly; antenna 1, article 1 without prominent mediodorsal tooth; upper lip strongly lobed asymmetrically; mandible incisor broad, strongly dentate; lower lip with inner lobes; maxilla 1 outer plate with 26 setae distally; maxilla 2 inner plate medial setae plumose, slightly longer than distal setae; gnathopods weakly subchelate; pereopod 7 basis, posterodistal corner rounded.

Description. — Larger female with rounded carina on pleonite 3, pleonites 1 and 2 with slight mediodorsal ridge, possibly indicating later development of more prominent carinae. Smaller female with ridge only on pleonite 2, and rounded carina on pleonite 3. Antenna 1 article 1 with slight mediodorsal tooth, not prominent as in *A. australis*. Upper lip strongly lobed asymmetrically, right lobe with small fringe along distal margin. Mandible incisor broad, strongly toothed; accessory plates on both right and left sides, that on left considerably wider; molar absent; palp 3-articulate, article 2 longest. Lower lip outer lobes broad, typical of *Alexandrella*, setae along distal margin heavier than in other species; small inner lobes present. Maxilla 1 inner plate well-developed, setose on inner face and along medial and distal margins, setae on medial and distal margins plumose; outer plate bearing 24-26 spine-setae; palp biarticulate, distally expanded with row of short spine-setae and short row of finer setae. Maxilla 2 outer plate with strongly pectinate setae; inner plate distal margin with smooth and occasionally pectinate setae, medial margin with plumose setae. Maxilliped inner plate distal margin with short setae at outer corner, becoming longer medially; outer plate exceeding palp, setose distally and medially; palp 4-articulate, article 2 longest, article 4 less than 0.5 length of article 3 and with several teeth along inner margin. Gnathopods 1 and 2 weakly but distinctly subchelate, propodus slightly shorter than carpus in both gnathopods, carpus of gnathopod 1 slightly more robust than in gnathopod 2, dactyls of both with small teeth on posterior margin. Pereopods 5 and 6 bases slender; pereopod 7 basis expanded proximally into posterior lobe, posterodistal corner rounded, dactyl slightly shorter than propodus. Uropods biramous; uropod 1 rami subequal, approximately as long as peduncle; uropod 2 outer ramus shorter than inner, peduncle slightly longer than outer ramus; uropod 3 missing one ramus, peduncle very short. Telson margin damaged, probably smoothly sculpted as in *A. dentata*.

Distribution. — Known from type locality only; Great Australian Bight; 1340-1320 m.

Remarks. — This species differs from all other species of *Alexandrella* by having weakly subchelate gnathopods. It closely resembles *A. dentata* in many other features, but differs in the number of spines on the outer plate of maxilla 1 and the type of setae on the distal margin of the lower lip. The setae on the inner plate of maxilla 2 are pectinate in both these species, but distinctly more so in *A. subchelata*. The bases of pereopods 5 and 6 also appear to be more slender for this new species than for *A. dentata*. The above differences apply to *A. mixta* and *A. australis* as well.

As noted by J. L. Barnard (1961), the second coxa of the smaller specimen was reduced compared to coxa 1 or 3 although that of the larger female was of a normal size.

Astyroides Birstein & Vinogradova, 1960

Astyroides Birstein & Vinogradova, 1960: 152.

Type-species, by original designation and monotypy: *Astyroides carinatus* Birstein & Vinogradova, 1960.

Diagnosis. — Adult with posteriorly-projecting middorsal tooth on pereonite 7, pleonites 1-3, and urosomite 1; upper lip asymmetrically lobed, non-setose; mandible incisor broad, strongly toothed along entire edge; lower lip without inner lobes, distal margin not broad; maxilla 1 palp uniarticulate, expanded distally, carrying short spines only; maxilla 2 inner plate, medial setae not distinct from distal setae; maxilliped inner plate extends past distal margin of palp article 1; outer plate sparsely spinose medially; palp article 4 less than half article 3; telson entire, distal margin smoothly sculpted.

Component species: *Astyroides carinatus*.

Remarks. — No specimens of this genus were available for examination, consequently no supplementary description was possible. It is with some hesitation that this genus remains separated from *Alexandrella* and *Bathypanoploea*. *Astyroides* is distinguished by the absence of a biarticulate palp on maxilla 1 and by not having a broad distal margin of the lower lip. It is possible that both characters were incorrectly described. If such were the case, this genus would bridge many of the distinctions between *Alexandrella* and *Bathypanoploea*, all three of which could be then combined into *Alexandrella*. The shape and setation of the inner plate of maxilla 2 and spination of the outer plate of the maxilliped of *Astyroides* appear very similar to *B. schellenbergi*. The shape of the telson, the lengths of the maxilliped inner plate and fourth article of the palp are similar to the condition in *Alexandrella*.

J. L. Barnard (1969) previously synonymized *Astyroides* with *Alexandrella*. However, without type material to indicate otherwise, we must assume the illustrations and descriptions given by Birstein & Vinogradova to be accurate and feel these three genera sufficiently distinct to warrant separation.

Bathypanoploea Schellenberg, 1939

Iphimediopsis Schellenberg, 1931: 126, invalid junior homonym of *Iphimediopsis* Della Valle, 1893. *Bathypanoploea* Schellenberg, 1939: 137 (footnote), replacement name for *Iphimediopsis* Schellenberg, 1931, non Della Valle, 1893.

Pseudiphimediopsis Ruffo, 1949: 18, replacement name for *Iphimediopsis* Schellenberg, 1931, non Della Valle, 1893.

Type-species: *Bathypanoploea schellenbergi* n. sp. (tentative, case to be submitted to the International Commission on Zoological Nomenclature).

Diagnosis. — Adult with middorsal carinae on pereonite 7, pleonites 1-3, and urosomite 1, occasionally on pereonite 6, as well; upper lip asymmetrically lobed, nonsetose; mandible incisor broad, strongly toothed along entire margin; lower lip, distal margin broad, setose, distal corner marked by small acute projection; maxilla 1 palp biarticulate, variously expanded, distally with short spines; maxilla 2, inner plate medial setae not different from distal setae; inner plate only half as wide as high; maxilliped outer plate medial margin sparsely spinose, inner plate extending only to base of palp article 1, article 4 of palp almost equal in length to article 3; telson cleft, spinose along distal and lateral margins.

Description. — See description and remarks under *B. schellenbergi*.

***Bathypanoploea schellenbergi* n. sp. (figs. 9-11)**

Iphimediopsis australis Schellenberg, 1931: 127, pl. 1, fig. c (not *Acanthonotozoma australis* Chilton, 1912).

Bathypanoploea australis Schellenberg, 1939: 137 (footnote, by implication).

Material. — Swedish Southpolar Expedition 1901-1903, between South Georgia and the Falkland Islands, 28 June 1902, 50°19'S 50°50'W, 2675 m, 1 ♀ with juveniles in brood pouch, 45 mm (holotype; in Swedish Museum of Natural History, Stockholm, Sweden). Paratypes: "Eltanin", Cruise 9, Sta. 684, 25 August 1963, 54°55'S 38°05-07'W, 595-677 m, 1 ♀ with juveniles in brood pouch, 28 mm; Cruise 12, Sta. 997, 14 March 1964, 61°44-46'S 55°56-54'W, 769 m, 1 ♂, 50 mm, 1 ♂, 38 mm; Cruise 32, Sta. 2016, 14 January 1968, 73°59'S 176°11'E, 581-586 m, 1 ♀ with juveniles in brood pouch, 50 mm; Cruise 32, Sta. 2085, 1 February 1968, 77°31'S 172°32'W, 468-482 m, 1 ♀ with juveniles in brood pouch, 45 mm; all paratypes deposited in U.S. National Museum of Natural History, Washington, D.C., U.S.A.

Diagnosis. — As for genus.

Description (supplementing Schellenberg, 1931). — Strong middorsal carinae present on pereonites 7, pleonites 1-3, and urosomite 1 in most large adults, juveniles from brood pouch with carina only on urosomite 1. Antenna 1 considerably shorter than antenna 2, reaching slightly past end of peduncle article 5 of antenna 2. Antenna 1 article 1 with short mediodorsal tooth, accessory flagellum uniarticulate. Antenna 2, article 5 slightly longer than article 4. Upper lip asymmetrically lobed, nonsetose. Mandible without molar but incisor strongly toothed, setal row and accessory plate present on both right and left sides. Palp 3-articulate, article 2 longest, both articles 2 and 3 setose along one margin. Lower lip with inner lobes, distal margin broad, setose, with small, acute projection at outer distal corner. Maxilla 1, palp biarticulate with well-spaced spines distally, one specimen also with short row of finer setae, as in *Alexandrella*; shape of palp variable but always expanded; outer plate carrying 9-11 strong spines distally; inner plate with nonplumose setae medially and on inner face. Maxilla 2 inner plate wider than outer; outer plate without pectinate setae, no distinction between distal and medial setae on inner plate, none plumose; inner plate not as medially expanded as in *Alexandrella*, plate only half as wide as high. Maxilliped outer plate clearly longer than palp, medial

Fig. 9. *Bathypanoploea schellenbergi* n. sp. a, "Eltanin" sta. 997, ♂, 38 mm, side view of body; b, "Eltanin" sta. 2016, ♀, 50 mm, antenna 1 peduncle; c-f, "Eltanin" sta. 997, ♂, 50 mm; c, upper lip; d, lower lip; e, maxilla 2; f, maxilliped.

Fig. 10. *Bathypanoploea schellenbergi* n. sp. a, "Eltanin" sta. 2016, ♀, 50 mm; side view of anterior portion of body; b-g, type, ♀, 45 mm; b, right mandible; c, mandible palp; d, maxilla 1; e, left maxilla 1 palp; f, right maxilla 1 palp; g, uropod 3, inner ramus missing.

Fig. 11. *Bathypanoploea schellenbergi* n. sp. a-e, type, ♀, 45 mm; a, gnathopod 1; b, gnathopod 2; c, pereopod 7, basis; d, uropod 2; e, telson; f, "Eltanin" sta. 2085, ♀, 45 mm, uropod 1; g-h, "Eltanin" sta. 997, ♂, 50 mm; g, telson; h, detail of distal margin of telson.

margin sparsely spinose; inner plate extends slightly past proximal margin of palp article 1 but not to distal margin; palp 4-articulate, article 4 approximately 80% of article 3. Gnathopods 1 and 2 simple and alike; gnathopod 1 carpus slightly longer than gnathopod 2 carpus, dactyl approximately half as long as propodus. Pereopods 5 and 6, bases slightly expanded, anterior and posterior margins almost parallel, merus and carpus of each subequal, propodus longest. Pereopod 7 basis posterior margin strongly expanded into proximal lobe, excavate below, posterodistal corner subacute, carpus longer than merus but subequal to propodus, dactyl almost as long as propodus. All uropods biramous with minute spines present along lateral margins of rami and peduncle. Uropod 1 inner ramus slightly shorter than outer, outer subequal to peduncle. Uropod 2 outer ramus approximately 0.7 inner, both rami longer than peduncle. Uropod 3, peduncle short, rami lanceolate. Telson variably cleft, with spines along lateral and distal margins.

Distribution. — South Georgia to South Shetland Islands and Ross Sea; 468-2675 m.

Remarks. — Differences with size and sex were noted for both middorsal carinae and overall body shape. Large females with juveniles in their brood pouches exhibited a noticeable enlargement and “humping” of the first four pereonites relative to the head (not in specimen from “Eltanin” Sta. 684). All adult specimens examined had well-developed carinae on pereonite 7 and pleonites 1-3 as well as on urosomite 1, though carinae were less pronounced on smaller specimens. One specimen also had an acute posteriorly-directed tooth on pereonite 6. Juveniles (5-10 mm) removed from the brood pouch lack all but the acute keel on urosomite 1. The shape and proportionate height of the maxilliped outer plate, and the shapes of the maxilla 1 palp and telson were also found to be variable. The size and shape of the maxilliped outer plate may be subject to geographical variation. The outer plates were proportionately longer relative to the palp in specimens from the Falklands, South Georgia, or South Shetland Island (“Eltanin” Sta. 684, 997, and type-material) than the outer plates of specimens from the Ross Sea (“Eltanin” Sta. 2016 and 2085). Differences in the shapes of the maxilla 1 palp and telson appear to be individually variable.

Schellenberg (1931) originally considered this species to be identical with *Alexandrella australis* (Chilton). There are, however, several differences that distinguish it from the genus *Alexandrella*; the shape and setation of maxilla 2, the setation of the maxilliped, the length of the inner plate and palp article 4 of the maxilliped, and the shape and ornamentation of the telson. In addition, it differs specifically from *A. australis* in the shape of coxa 5, lack of a prominent mediodorsal tooth on article 1 of antenna 1, form of the upper lip and dentation of the mandible incisor. *Bathypanoploea* has been retained as the generic designation for the species described by Schellenberg. The specific name *australis* must refer to Chilton's species, consequently *schellenbergi* has been

chosen to replace it. Schellenberg offered no explanation of the placement of this species in the Acanthonotozomatidae, although he may simply have been following the lead of Chilton, who unfortunately did not examine his specimen's mouthparts. The smoothly rounded distal margins of the first several coxae, the quadrate mouthparts, expanded and setose maxillae and enlarged outer plate of the maxilliped do not suggest this affinity (see also remarks under *A. australis*).

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RÉSUMÉ

La famille des Stilipedidae (Amphipodes) est élargie afin d'y inclure les Astyridae et trois sous-familles sont définies; les Stilipedinae, les Alexandrellinae et les Astyrinae. Une révision à l'intérieur des Alexandrellinae inclut la description de deux nouvelles espèces, l'incorporation et la redéfinition du genre *Bathypanoploea*, des Acanthonotozomatidae, et enfin la résurrection du genre *Astyroides*.

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