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A Phylogeny and Classification of the Senticaudata subord. nov. (Crustacea: Amphipoda)

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Abstract

The Amphipoda includes a large clade defined by the presence of a previously unrecognised synapomorphy, apical robust setae on the rami of uropods 1–2. We term this clade the Senticaudata **subord. nov.** (Latin: *sentis* = thorn). It includes almost all freshwater species as well as a number of marine benthic taxa, formerly part of the 'Gammaridea'. The phylogeny of the senticaudates was determined by cladistic analysis of morphological characters and character states. Within the suborder Senticaudata there are six infraorders: Carangoliopsida, Talitrida, Hadziida, Corophiida, Bogidiellida and Gammarida. A classification is provided and all the senticaudate families are diagnosed. We introduce for the first time in amphipod classification, the level parvorder between infraorder and superfamily. Four new families are described: Kairosidae; Eriopisidae; Nuuanuidae and Kergueleniolidae.

Key words: Phylogeny, Classification, Crustacea, Amphipoda, New Suborder, Senticaudata, New Infraorders, Bogidiellida, Carangoliopsida, Corophiida, Gammarida, Hadziida, Talitrida, New Parvorders, Bogidiellidira, Caprelliidira, Carangoliopsidira, Corophiidira, Crangonyctidira, Gammaridira, Melitidira, Talitridira, New Superfamilies, Allocrangonyctoidea, Biancolinoidea, Bogidielloidea, Calliopioidea, Carangoliopsoidea, Caspicoloidea, New Families, Eriopisidae, Kairosidae, Kergueleniolidae, Nuuanuidae

Introduction

The current higher classification of the Amphipoda is not phylogenetic and consequently is in need of revision. In this paper we provide a morphologically based higher classification of one suborder of the Amphipoda. We commenced this process in an earlier paper (Myers & Lowry 2003) and this is the second in a series of planned papers which will address the issue of higher classification and produce a modern testable phylogenetic classification for the Amphipoda.

Historically there have been four suborders in the Amphipoda: Gammaridea Latreille, 1802; Caprellidea Leach 1814; Hyperiidea Milne Edwards, 1830 and Ingolfiellidea Hansen, 1903. The caprellideans, hyperiideans and ingolfiellideans have always been recognizable entities defined by one or more apomorphic characters. The Gammaridea has no synapomorphies and was originally defined on symplesiomorphies, i.e. a well developed abdomen to distinguish it from the carpellideans and a well developed maxilliped to distinguish it from the hyperiideans. As such the Gammaridea became the repository for any family-level taxon that did not fall into one of the other groups. This situation remained until Myers & Lowry (2003) established the suborder Corophiidea, removed it from the Gammaridea and showed that the Caprellidea was a highly derived part of the corophiidean clade.

In this paper we establish the new suborder Senticaudata **subord. nov.**, which incorporates 95 families formerly in the Gammaridea. We recognise six infraorders in the suborder Senticaudata: Carangoliopsida, Talitrida, Hadziida, Corophiida, Bogidiellida and Gammarida. We have previously considered the suborder Corophiidea (Myers & Lowry, 2003), which is herein demoted to the infraorder Corophiida with parvorders Corophiidira and Caprellidira in order to facilitate the higher levels of classification in the Senticaudata while retaining diagnosable family level taxa (see later).

There has been much discussion about what group of amphipods are ancestral. Taxa proposed include gammarids (J.L. Barnard 1969a) and corophiidans (Barnard & Barnard 1983). From a behavioural perspective proposals include swimmers (Bousfield & Shih 1994) or 'clingers' (Steele 1988). We agree with Steele (1988) that the ancestral amphipod was a 'clinger' in anastomoses that was able to perform fast escape reactions by means of rapid straightening of a reflexed urosome. This combination of behavioural characteristics would explain the unique characters of amphipods: a) the reflexed urosome (explosive locomotion) as opposed to six in-line pleosome segments and b) the opposable pereopods, pereopods 3 and 4 working against the rotated pereopods 6–7 (clinging) as compared with all legs working in the same plane. The nearest approximation of this form in extant amphipod taxa would probably be an amphilochid. Although clinging might be the primary behaviour of these ancestral forms, the need to swim from one anastomosis to another would have lead to free swimming amphipods such as eusirids and lysianassids. Swimmers would then have radiated into benthic forms and sediment burrowers that retained swimming males for reproductive purposes.

A large clade derived from the early 'clingers' possesses as a synapomorphy, apical robust setae on the rami of uropods 1–2 (Fig. 1). We term this clade the suborder Senticaudata **subord. nov.** (Latin: *sentis* = thorn). This

suborder includes almost all freshwater species as well as a number of marine benthic species. The development of robust setae on the apices of uropods 1 and 2 was one of the major innovations in the evolution of the Amphipoda and lead to increased amphipod diversity. It appears to be useful in keeping contact with the surface in epibenthic or infaunal amphipods. As long ago as 1853, Dana commented that "the posterior caudal stylets offer important characters for distinguishing natural groups …" In the same paper, taxa such as the lysianassids, stegocephalids and leucothoids (without apical robust setae on uropods 1 and 2) were placed in the gammarideans for the first time. A few species outside the senticaudate clade have secondarily developed robust setae on the terminations of the uropods 1 and 2 rami. These are mainly sediment burrowers. In some cases, these 'terminal' setae can be seen in fact to be subterminal with a small portion of the ramus extending beyond the setae.

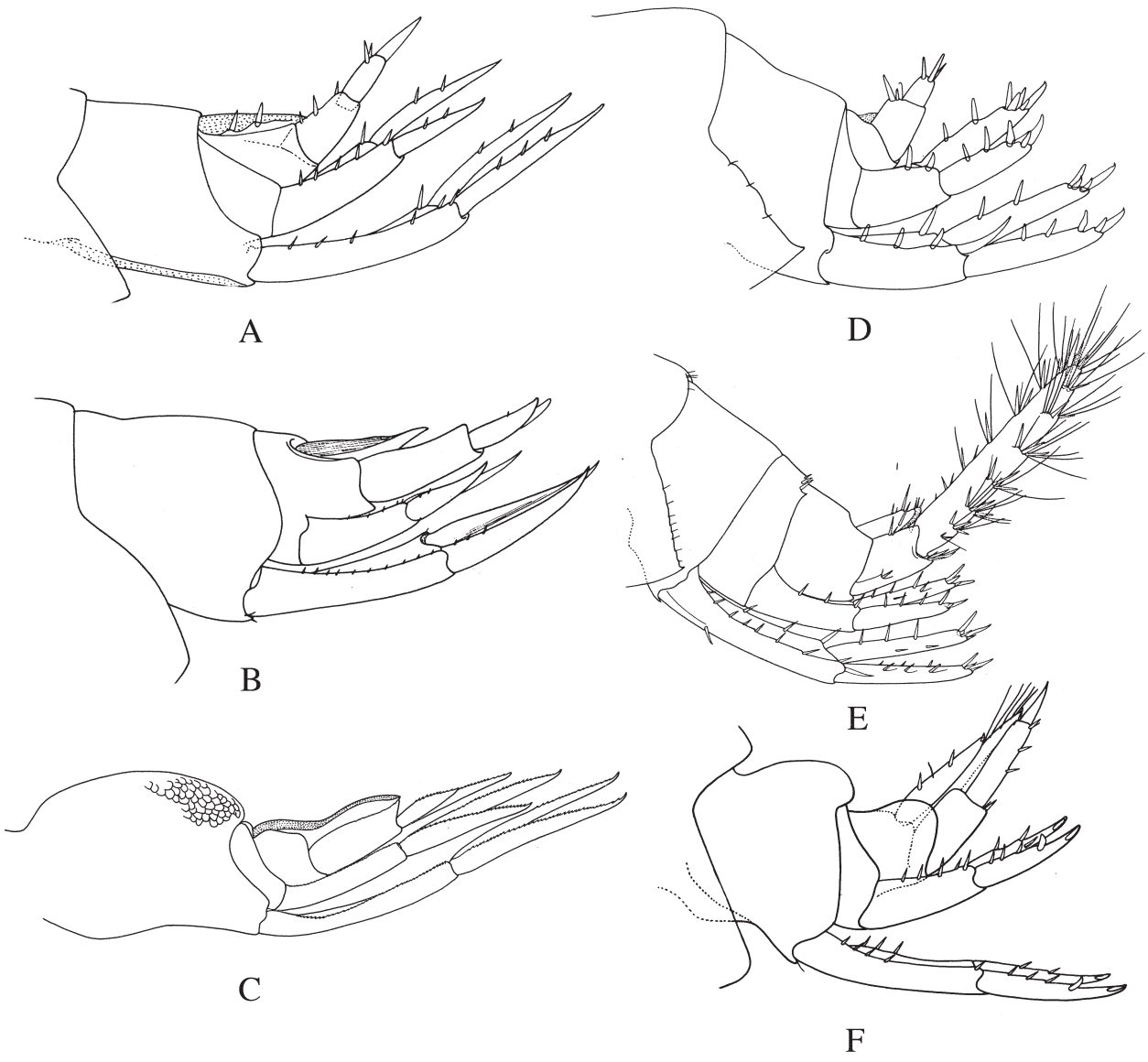

FIGURE 1. Uropods 1-2. A-C no apical robust setae; D-E apical robust setae (Senticaudata) F embedded apical seta. A. *Stenothoe*; B. *Paraleucothoe*; C. *Austropheonoides*; D. *Hyale*; E. *Melita*; F. *Tryphosella* (B, C, E, F, after J.L. Barnard 1972a; A, D after J.L. Barnard, 1974).

Molecular studies have suggested that evolution is driven not only by natural selection but also by gene architecture. Lineages do not necessarily evolve in a linear or hierarchical way so phylogeny may develop through the recombination of ancestral characters, rather than the evolution of any new, uniquely derived characters (Burridge 1997, Heads 2012). A character state developed by an ancestor may be 'switched off' by selection pressure but reappear much later in a relatively distant descendant. This means that apparent homoplasies may in fact be homologous character states that have lain 'dormant' and are reactivated in taxa which have quite distant

relationships. This has implications for cladistic analysis. When the same character state appears in widely separated parts of the tree, the state has previously been considered convergent (homoplasious) but in fact it may be homologous. In that case the character state is ancient and represents a synapomorphy that must be moved much further down towards the base of the tree. This does not imply, that the same character state cannot unite one group of taxa in one part of the tree as well as another group of taxa in another part of the same tree. An ancestral character state may reappear in two or more distantly related taxa and then be passed on to descendants thus forming independent clades exhibiting the same character state.

As a result of the extensive homoplasy/character re-emergence that occurs in the Amphipoda, it is doubtful if we will ever be able to produce a fully supported phylogenetic tree based on morphological data alone (Browne *et al.* 2007). The best we can expect to discern is a signal of relationships. Rarely do all members of a clade uniquely possess a particular character state. A clade may be characterised by a character state, but not every member of the clade may exhibit that state. This means that higher taxa cannot usually be diagnosed on the basis of a uniquely derived character state. For example, in the hadziidan clade, some members have a distoventral robust seta on urosomite 1 and no basofacial robust seta on the peduncle of uropod 1 whereas others have a basofacial robust seta on the peduncle of uropod 1 and no distoventral robust seta on urosomite 1. Rarely, however, both or neither may be present. This means that neither character by itself, nor both characters together will be sufficient to identify every member of the Hadziida on these two characters alone.

Characters used in the analysis

(Figs 2–6)

1. Coxal shield.
    1. coxae large body laterally compressed
    2. coxae small, body subcylindrical
    3. coxae small, fused to body
2. Type 4 calceolus
    1. absent
    2. present or lost
3. Type 9 calceolus
    1. absent
    2. present or lost
4. Type 1 calceolus
    1. absent
    2. present or lost
5. Antenna 1 length
    1. longer than antenna 2
    2. subequal in length with antenna 2
    3. shorter than antenna 2
    4. shorter than peduncle of antenna 2
6. Antenna 1 accessory flagellum
    1. well developed
    2. vestigial, scale like
    3. absent
7. Antenna 2 peduncular article 1
    1. not enlarged
    2. bulbous
8. Mandible palp
    1. present
    2. vestigial or absent
9. Maxilla 1 palp
    1. present
    2. vestigial or absent
10. Maxilla 1 basal endite
    1. strongly setose along medial margin
    2. setose apically
    3 without setae
11. Maxilla 1 palp
    1. similar left and right
    2. dissimilar left and right
12. Maxilla 2 basal endite
    1. without oblique setal row
    2. with oblique setal row
13. Labium
    1. with inner lobes
    2. without inner lobes
14. Coxal gills
    1. present on coxae 2–7
    2. present on coxae 2–6
    3. present on coxae 2–4
15. Coxal gills
    1. unstalked
    2. stalked
16. Sternal simple gills
    1. absent
    2. present
17. Sternal dendritic gills
    1. absent
    2. present
18. Sternal blisters
    1. absent
    2. present

19. Gnathopod 1 enlargement
    1. similar in enlargement to gnathopod 2
    2. weaker than gnathopod 2
    3. stouter than gnathopod 2
20. Gnathopod 1 propodus palm
    1. without row of robust setae along margin
    2. with single row of robust setae along margin
    3. with double row of robust setae along margin
21. Gnathopod 1 propodus palm
    1. without row of peg-like robust setae along margin
    2. with row of peg-like robust setae along margin
22. Gnathopod 2
    1. not sexually dimorphic
    2. sexually dimorphic
23. Gnathopod 2 carpus
    1.not produced along posterior margin of propodus
    2.slightly produced along posterior margin of propodus
    3.strongly produced along posterior margin of propodus
24. Pereopod 4 coxa
    1. with well developed posteroventral lobe
    2. without posteroventral lobe
25. Pereopod 5 length
    1. subequal to pereopod 6
    2. shorter than pereopod 6
26. Pereopod 5 coxa
    1. without lobes
    2. equilobate
    3. with posteroventral lobe
    4. with anteroventral lobe
27. Pereopod 7 length
    1. subequal to pereopod 5
    2, shorter than pereopod 5
    3. longer than pereopod 5
28. Oostegites
    1. setae straight tipped
    2. setae curl tipped
29. Pleonites 1–3
    1. without dorsal carinae
    2. with dorsal carinae
30. Pleopods
    1. biramous
    2. uniramous
31. Urosomites
    1. 1–3 free
    2. 1–3 coalesced
    3. 1–2 coalesced
    4. 2–3 coalesced
32. Urosomites 1–3
    1. without robust dorsal setae
    2. with scattered dorsal robust setae
    3. with bands of dorsal robust setae
33. Urosomite 1
    1. without distoventral robust seta
    2. with distoventral robust seta
34. Urosomite 2
    1. without paired dorsal robust setae
    2. with paired dorsal robust setae
35. Uropod 1 peduncle
    1. without basofacial robust seta
    2. with basofacial robust seta
36. Uropod 3 type
    1. biramous
    2. uniramous of crangonyctid type
    3. uniramous of talitrid type
    4. without rami
37. Uropod 3 dimorphism
    1. not sexually dimorphic
    2. sexually dimorphic
38. Uropod 3 rami setation
    1. Without fringing plumose setae
    2. With fringing plumose setae
39. Uropod 3 endopod
    1. subequal to exopod
    2. longer than exopod
    3. shorter than exopod
    4. vestigial
    5. absent
40. telson form
    1. entire to notched
    2. cleft
41. telson armature
    1. without robust setae
    2. with robust setae

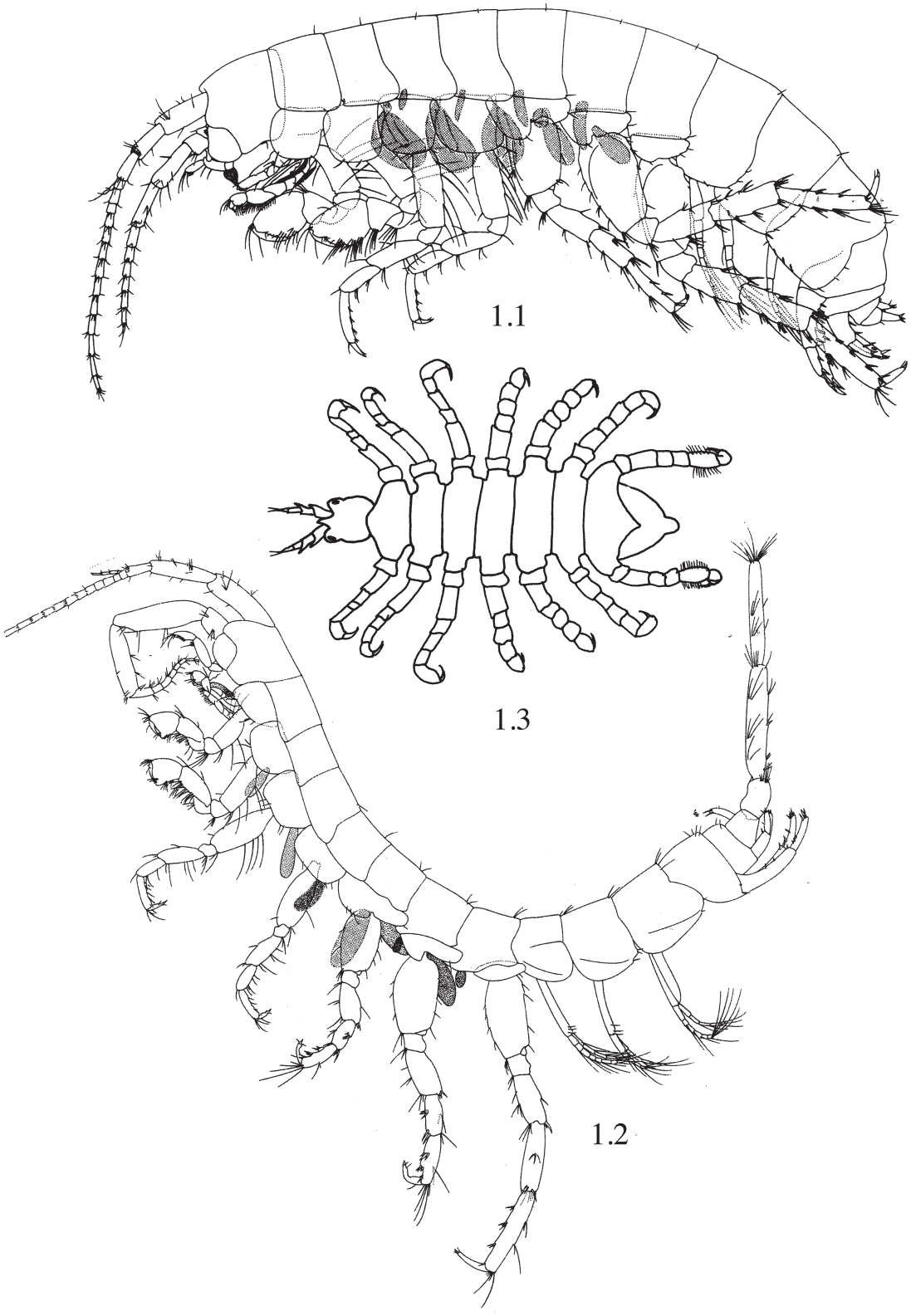

FIGURE 2. Characters 1.1 *Protocrangonyx*; 1.2 *Giniphargus*; 1.3 *Temnophlias* (1.1 /1.2 after Williams & Barnard, 1988; 1.3 after Griffiths 1975).

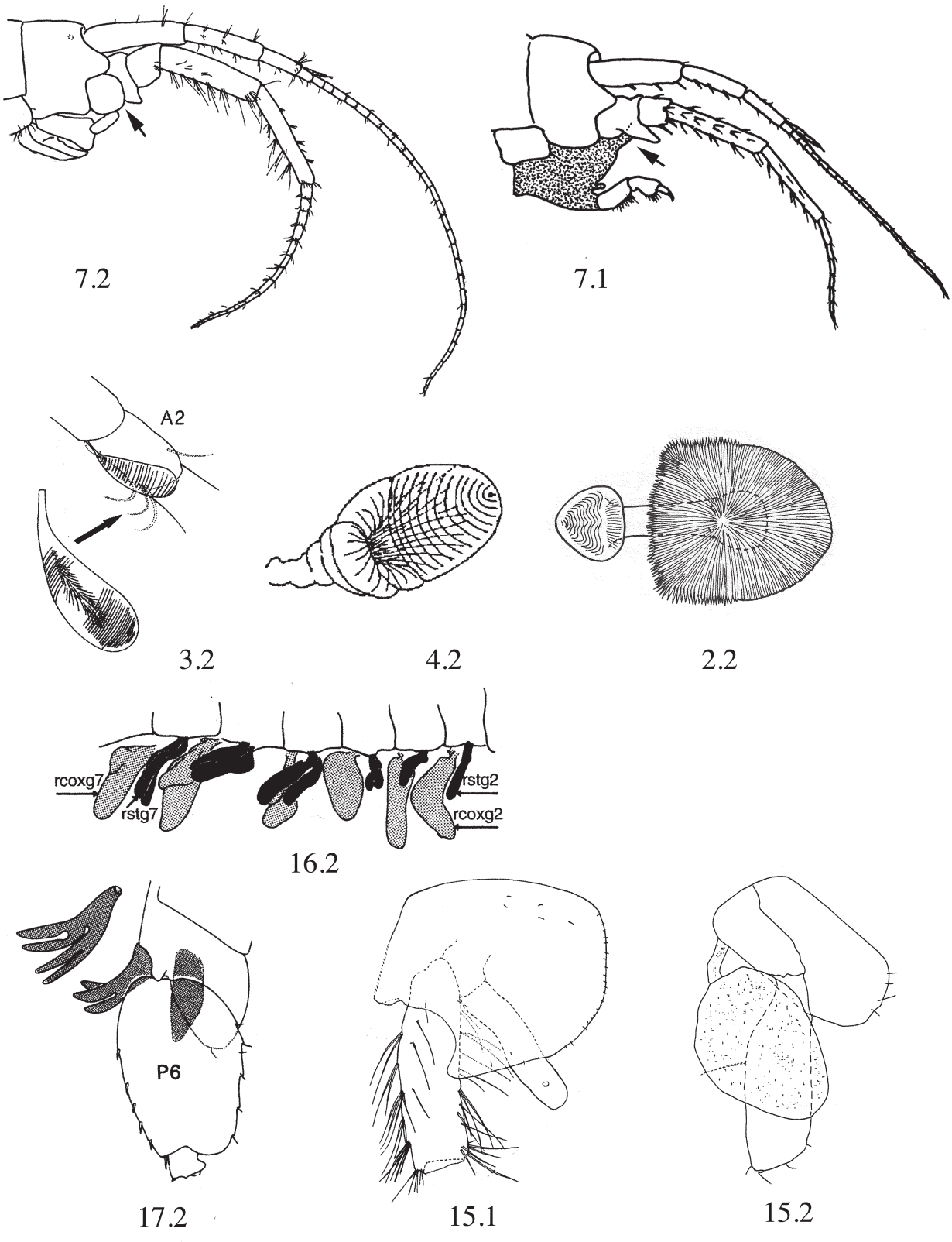

FIGURE 3. Characters 7.2 *Crymostygius*; 7.1 *Spelaeogammarus*; 3.2 *Neoniphargus*; 4.2 *Gammarus* 2.2 *Schraderia*; 16.2 *Totgammarus*; 17.2 *Neoniphargus*; 15.1 *Praefalklandella*; 15.2 *Tegano* (2.2 after Thurston, 1974 ; 3.2 after Williams & Barnard, 1988; 4.2 after Bousfield, 1994; 7.1 after Koenemann & Holsinger, 2001; 7.2 after Kristjánsson & Svavarsson, 2004; 15.1 after Stock & Platvoet, 1991; 15.2 after Sawicki *et al*. 2005; 16.2 after Bradbury & Williams, 1995; 17.2 after Williams & Barnard, 1988).

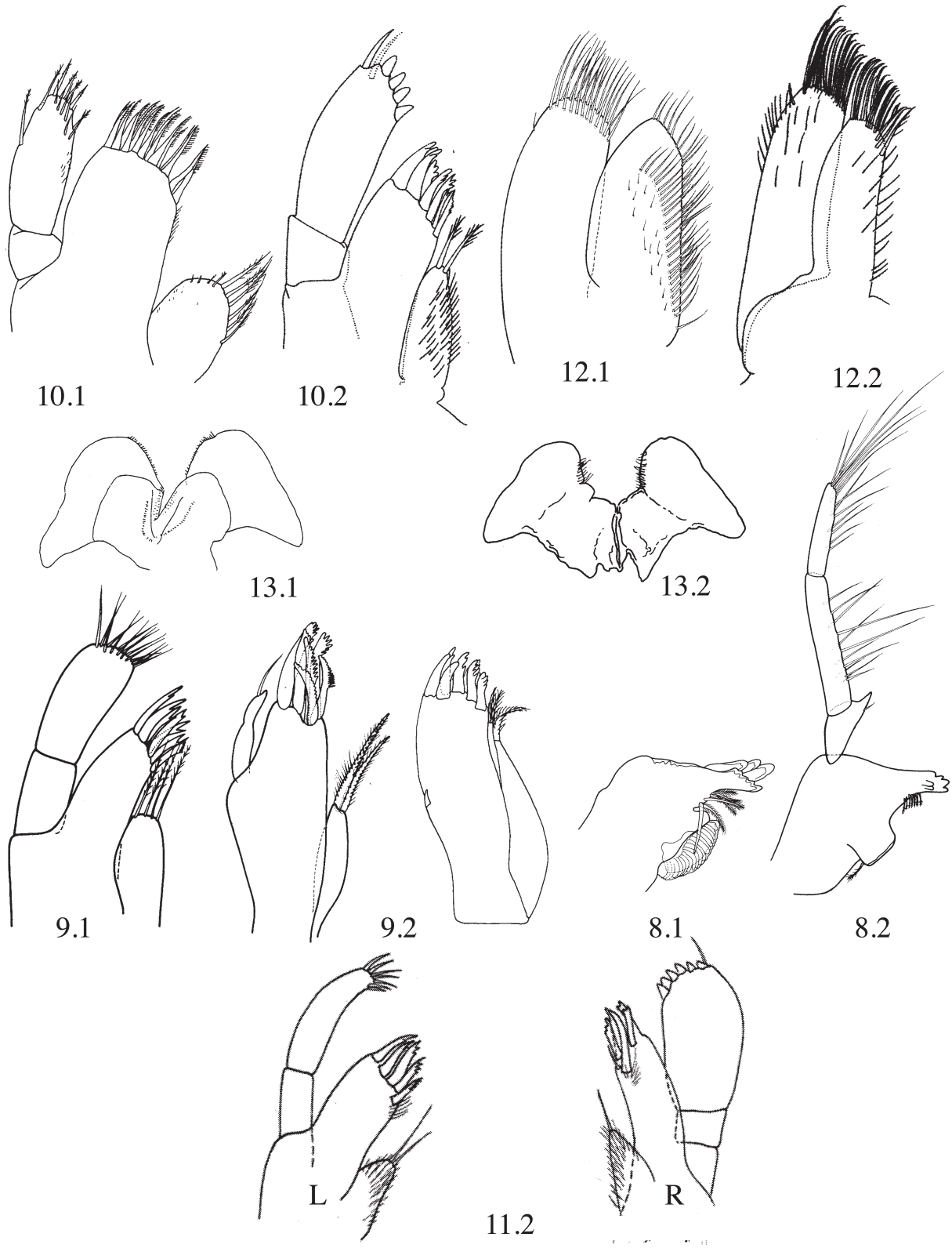

FIGURE 4. Characters 10.1 *Crymostygius*; 10.2 *Neoniphargus*; 12.1 *Indoweckelia* ; 12.2 *Neoniphargus*; 13.1 *Bactrurus*; 13.2 *Crangonyx*; 9.1 *Maera*; 9.2 *Parhyale*; 9.2 *Talitrus*; 8.2; *Parhyale*; 8.1 *Maera*; 11.2 *Davidia* (8.1 after Karaman, 1982; 8.2, 9.2, 9.3 after Bellan-Santini & Krapp-Schickel, 1993; 9.1 after Karaman, 1982; 10.1 after Kristjánsson & Svavarsson; 10.2. after Williams & Barnard, 1988; 11.1 after Iannilli, Krapp & Ruffo 2011; 12.1 After Holsinger & Ruffo 2002; 12.2 after Williams & Barnard, 1988; 13.1 after Koenemann & Holsinger, 2001; 13.2 after Morino, Kusano & Holsinger, 2004).

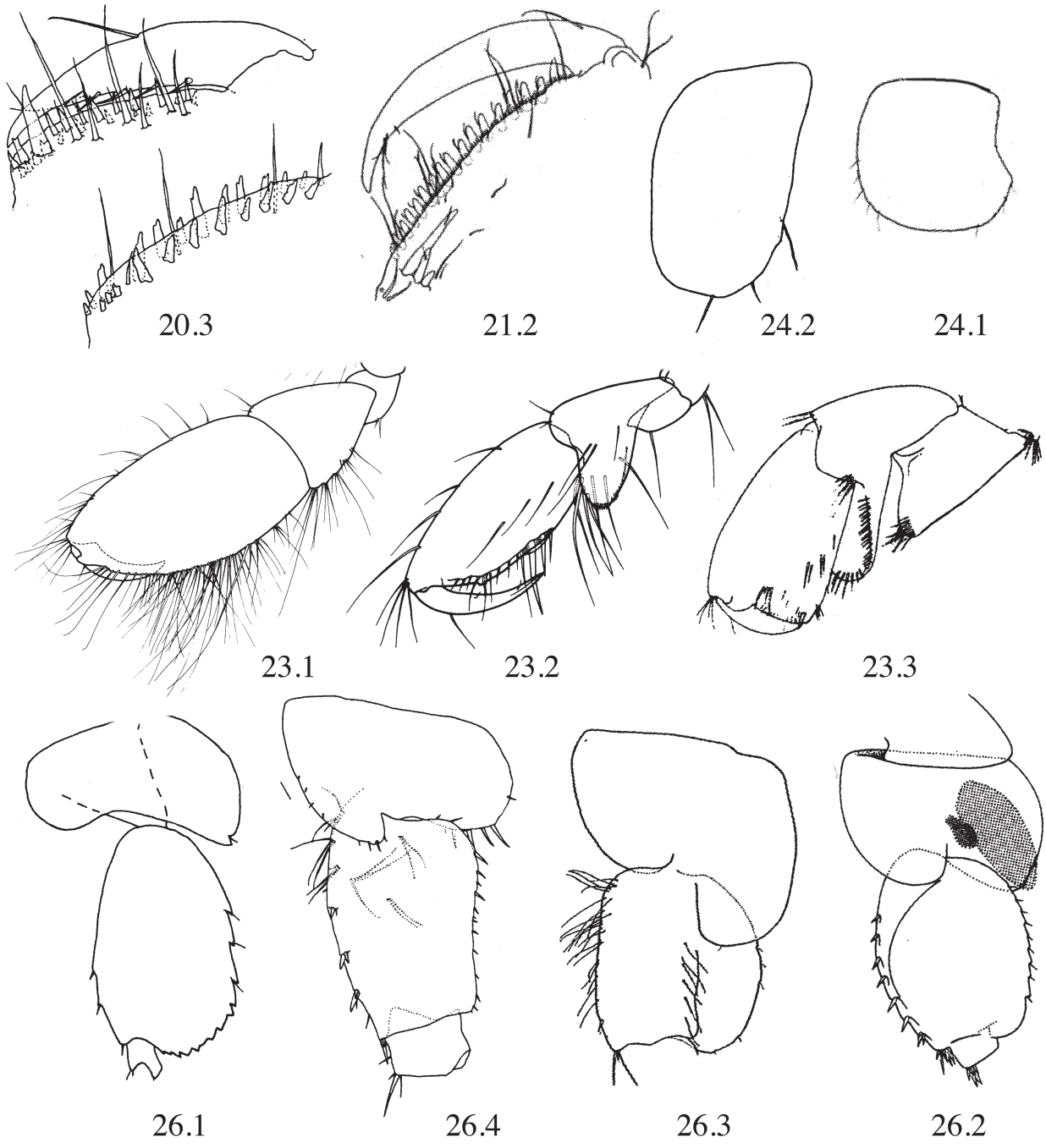

FIGURE 5. Characters 21.3 *Crangonyx*; 22.2 *Lucioblivio*; 23.1 *Cheirocratus*; 23.2 *Carangoliopsis*; 23.3 *Allorchestes*; 24.2 *Artesia*; 24.1 *Lucioblivio*; 26.1 *Artesia*; 26.2 *Perthia*; 26.3 *Haliogeneia*; 26.4 *Lucioblivio* (21.3 after Morino, Kusano & Holsinger, 2004; 22.2, 24.2, 26.4 after Tomikawa *et al*, 2007.; 23.1, 23.2 after Karaman, 1982; 23.3 after Hendrycks & Bousfield, 2001; 24.1, 26.1 after Holsinger, 1980; 26.2 after Williams & Barnard, 1988; 26.3 after Lowry & Stoddart, 1998).

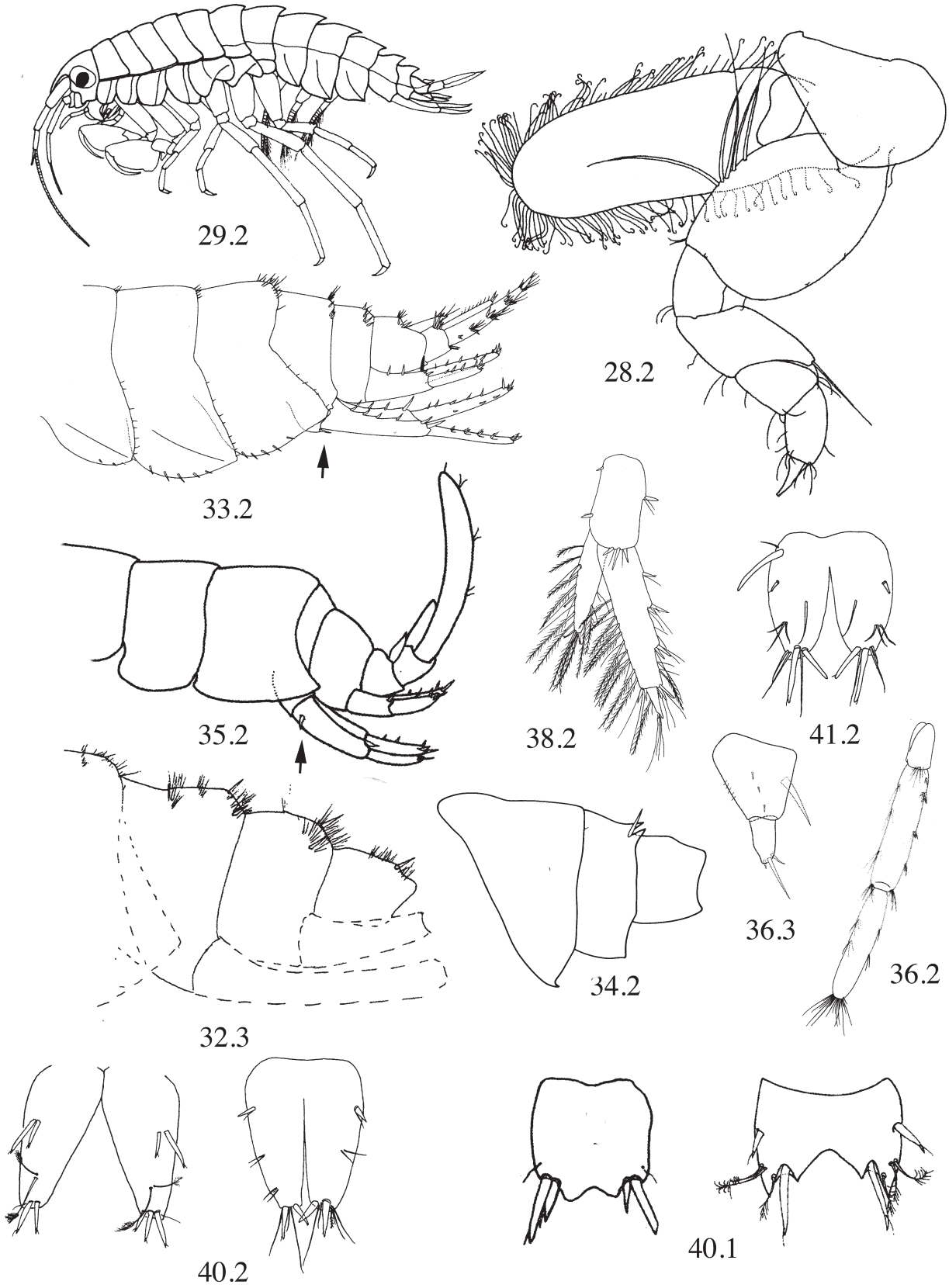

FIGURE 6. Characters 28.2 *Biancolina*; 29.2 *Gammaracanthus*; 32.3 *Echinogammarus*; 33.2 *Austrogammarus*; 34.2 *Melita*; 35.2 *Tagua*; 36.2 *Giniphargus*; 36.3 *Talitrus*; 38.2 *Gammarus*: 40.1 *Sternophysinx* (left) *Linguimaera* (right); 40.2 *Sensonator* (left) *Gammarus* (right); 41.2 *Gammarus* (28.2 after Ishimaru, 1996; 29.2 after Bousfield 1989; 32.3 after Pinkster, 1993; 33.2 after Williams & Barnard, 1988; 34.2, 40.2 (right) after Karaman 1982; 35.2 after Lowry & Fenwick, 1983; 36.2 after Williams & Barnard, 1988; 36.3 after Javier & Coleman, 2010; 38.2, 41.2 after Hou & Shouqiang, 2004; 40.1 (left) after Holsinger & Straškraba, 1973; 40.1 (right) after Lowry & Springthorpe, 2005; 40.2 (left) after Notenboom, 1993).

Materials and methods

As a starting point, approximately 300 characters were assembled in a DELTA (Description language for Taxonomy; Dallwitz *et al*., 2005) database for the 212 families of world amphipods. The database was designed to include all the known families or putative families of marine, freshwater and terrestrial amphipods.
Of the approximately 300 characters assembled, many were autapomorphies and others were symplesiomorphies, that were therefore not available for constructing a phylogenetic tree. After data reduction, the database was reduced to 41 characters that were considered valuable for distinguishing the senticaudate suborders, infraorders, parvorders and families.

An analysis was performed with PAUP version 4.0b8a (Swofford, 2003) using heuristic searches and the criterion of parsimony. For further details of methodology see Myers & Lowry (2003).
The size of the database for world taxa with more than 200 families was considered intractable for a single analysis. It was therefore decided to consider the senticaudate clade only in this analysis. The suborder Corophiidea (herein infraorder Corophiida) has already been discussed in a previous paper (Myers & Lowry, 2003). Additional clades will be considered in papers in preparation.

After the final phylogenetic analysis each family was taken through an identification process (Intkey) in the Delta database to world amphipod families to confirm that it could be identified by using the characters and states used in the phylogenetic analysis. This also provided confirmation that the taxon being examined aligned itself with sister taxa as determined in the phylogenetic analysis.

Because the number of characters used in the analysis was low compared with the number of taxa, the precision of the tree is relatively low for terminal relationships. We were not overly concerned with determining the precise sister relationship of each family with any other family in the same superfamily, rather we wished to produce a higher level classification of the senticaudates. Higher classifications have been sadly lacking in the Amphipoda and as a result most listings of amphipods are given in alphabetical order of families. This contribution attempts to redress this for one suborder of Amphipoda.

The terminology for spines and setae follows Watling (1989). The classification of calceolus types follows Lincoln & Hurley (1981). Also we are using terminology more in line with other peracaridan groups. For mouthparts, the inner and outer plates of the maxilla 1 and maxilla 2 are termed the basal endite and ischial endite respectively. Jaume *et al*. (2009) interpret the maxillae plates as coxal and basal endites. This confusion can only be rectified by embryological studies and for the moment we prefer to use a terminology that is consistent between maxillae and maxilliped. We also prefer to retain the terms antenna 1 and antenna 2 instead of antennules and antennae and likewise maxilla 1 and maxilla 2 instead of maxillule and maxilla, simply because we feel these terms are less subject to confusion.

Results

Phylogenetic analysis

All characters were unweighted with the exception of the calceoli types 1 (gammarid), 4 (pontogeneid) and 9 (crangonyctid), each of which was given a weight of 4. These are complex organelles which should have a good index of monophyly and we thus felt justified in giving a weighting factor to these unique characters. The type 5 (Paraleptamphopidae) and type 6 (Gammarellidae) calceoli were not included in the analysis, as each is an autapomorphy in the present analysis.

After carrying out a preliminary phylogenetic analysis of all world families of amphipods using PAUP we concluded that the Amphilochidae, which occupied a basal position in the tree, was the most appropriate taxon to select as an outgroup for the senticaudate analysis. Using an extant taxon has the disadvantage that it will almost always exhibit some apomorphies in the selected characters. Using a real outgroup was nevertheless considered a better alternative than Lundberg rooting which requires subjective decisions on state polarity for each character.
Because the analysis employed an iterative process between Delta, Paup and MacClade, the choice of starting tree was unimportant as long as it was a parsimoniously shortest tree.
The final tree had a length of 500, a CI of 0.60 and an RI of 0.66.

Tree description

The senticaudates are a monophyletic clade defined by the presence of robust setae on the apices of uropods 1–2. The Corophiida have been treated in a previous contribution (Myers & Lowry 2003) and in this analysis were included as an infraorder and not as separate families. However, the full classification of the Corophiida is provided here (Table 1) for completeness and to indicate the small changes in the higher taxa that were necessary in the Corophiida to accommodate the classification for the suborder Senticaudata.

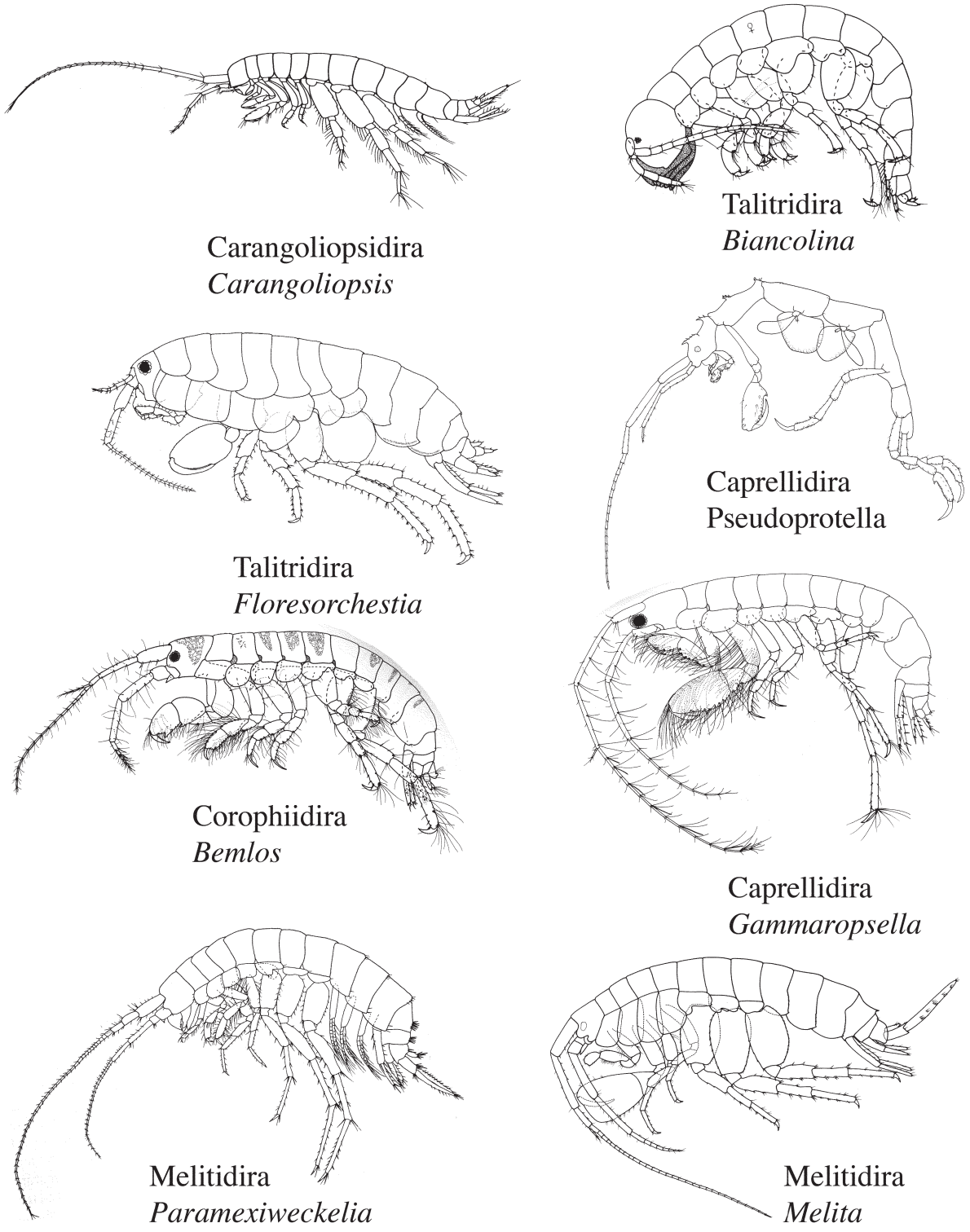

FIGURE 7. Body form in parvorders Carangoliopsidira, Talitridira, Caprellidira, Corophiidira and Melitidira (*Carangoliopsis*, *Melita* after Karaman, 1982; *Floresorchestia* after Lowry & Springthorpe, 2009; *Pseudoprotella* after Krapp-Schickel, 1993; *Bemlos*, *Biancolina*, *Gammaropsella* after Myers, 1995; *Paramexiweckelia* after Holsinger, 1996).

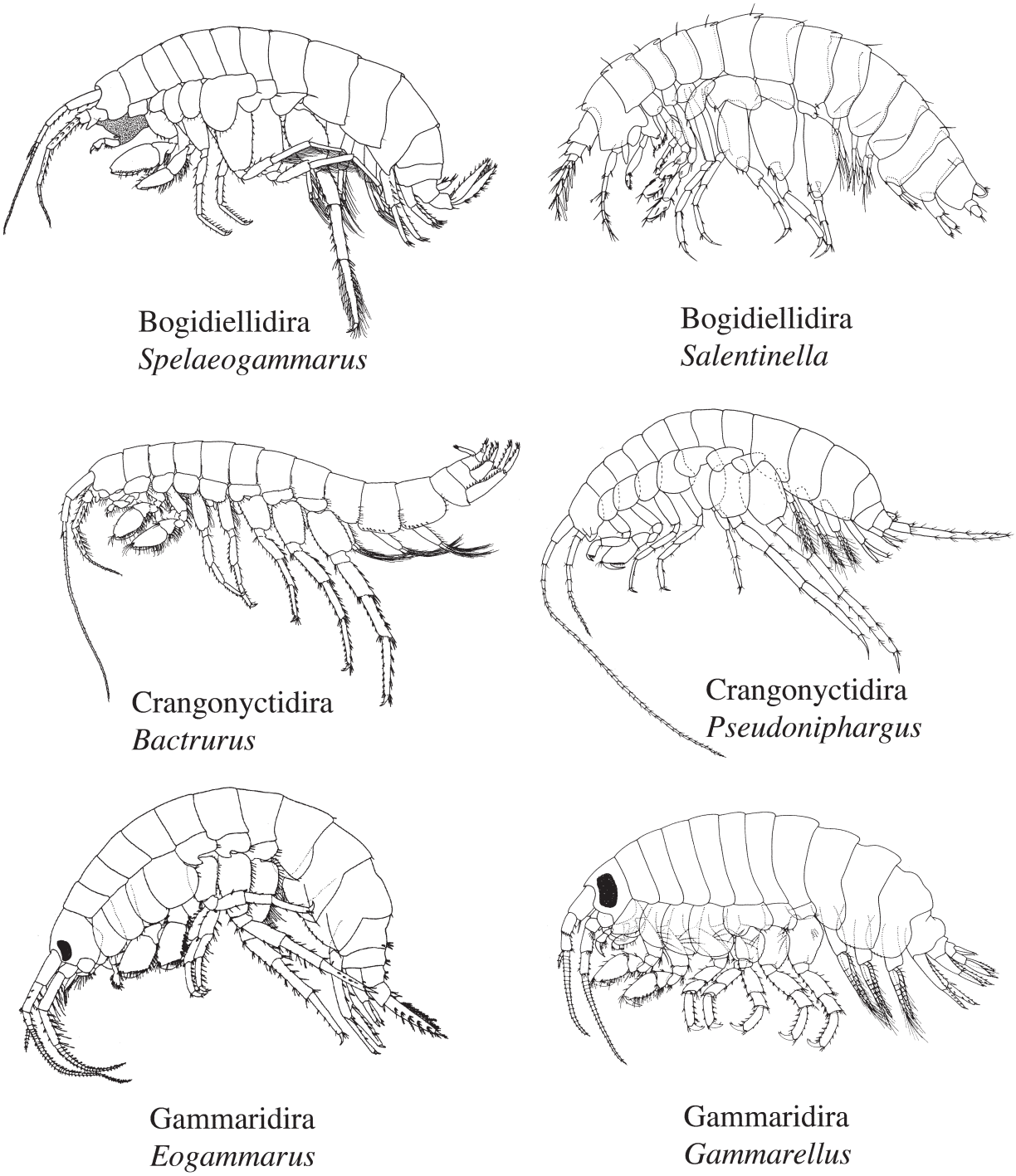

FIGURE 8. Body form in parvorders Bogidiellidira, Crangonyctidira and Gammaridira (*Spelaeogammarus* after Koenemann & Holsinger, 2000; *Salentinella*, *Gammarellus* after Barnard & Barnard, 1983; *Bactrurus* after Koenemann & Holsinger, 2001; *Pseudoniphargus* after Abiari *et al*.,1999; *Eogammarus* after Tomikawa *et al*., 2006).

The tree is well resolved into six infraorders: Carangoliopsida, Talitrida, Hadziida, Corophiida, Bogidiellida and Gammarida and eight parvorders: Carangoliopsidira, Talitridira, Corophiidira, Caprelliidira, Melitidira, Bogidiellidira, Crangonyctidira and Gammaridira (Figs 7, 8)

The taxa in the infraorder Carangoliopsida have gnathopod 2 carpus produced along posterior margin of propodus and merus of pereopod 6 significantly longer than that of pereopod 7 and hence, pereopod 6 longer than 7. Another possible synapomorphy is gills restricted to coxae 2–4 (but this state is unknown in Kairosidae). The taxa in the infraorder Talitrida have an apically setose or asetose basal endite of maxilla 1, no oblique setal row on the basal endite of maxilla 2, loss of (or vestigial) mandibular palp, loss of (or vestigial) maxilla 1 palp, loss of an

accessory flagellum, absence of (or vestigial) endopod on uropod 3 (except in Biancolinidae) and presence of curl-tipped setae on the oostegites (except in Caspicolidae). The taxa in the infraorder Bogidiellida have antenna 1 and 2 subequal, coxal gills stalked, gnathopod 1 stouter than gnathopod 2 and an entire telson with robust setae. The taxa in the infraorder Corophiida have a fleshy telson, glandular pereopods 3–4 and gnathopods 1 and 2 of dissimilar size. The taxa in the infraorder Hadziida have gnathopod 2 stouter than gnathopod 1, a pair of small robust setae on urosomite 2 and uropod 1 peduncle with a basofacial robust seta. The taxa in the infraorder Gammarida have a bulbous article 1 on antenna 2. The taxa in the parvorder Gammaridira have an oblique setal row on the maxilla 2 basal endite and, with the exception of Gammaracanthidae, Pachyschesidae and Sensonatoridae, a well developed posteroventral lobe on coxa 4. The taxa in the parvorder Crangonyctidira have an apically setose basal endite on maxilla 1 (except Crymostygiidae, Sandroidae and Giniphargidae) and stalked coxal gills (except Neoniphargidae, Paramelitidae, Perthiidae, Chillagoeidae and Giniphargidae). They also have a unique synapomorphy, a crangonyctid-type 9 calceolus, but this is only present in six of the 19 families. Sternal gills are present in most families but are lacking in, Dussartiellidae, Allocrangonyctidae, Pseudoniphargidae, Austroniphargidae, Sandroidae and Niphargidae.

Tree Discussion

The tree presented here is four steps longer than the shortest tree (shortest tree = 496). Biancolinids were brought to the base of the Talitrida because they have biramous third uropods whereas all other talitridans have either uniramous third uropods or have no rami on the third uropods. Leaving biancolinids more terminally in the clade involved an unacceptably high number of reversals. We feel justified in not choosing the shortest tree for a number of reasons. All trees are based on certain assumptions: a) that the characters selected from the vast number of possible characters are necessarily the most appropriate for revealing ancestor-descendent pathways, b) that the character states have been correctly interpreted and c) that the character states have been correctly polarised. If, as is probable, some of these assumptions are not fully justified, then the shortest tree will not be the most accurate hypothesis of relationships. No amount of statistical testing (jacknife resampling, bootstrap etc. that are essentially phenetic) will justify a flawed determination of synapomorphies (Mooi & Gill 2010), so all cladistic trees, for the reasons given above, are likely to be imperfect. Our tree is a hypothesis, based on a careful analysis of characters and character states, and on the selection of characters that are parsimony informative and do not require an unacceptably high number of steps in the tree (see also Myers & Lowry 2003). Mooi & Gill (2010) have stressed the importance of examining data quality, character distribution and evidence, plotting characters to identify and examine character conflict and weighing evidence for homology. We must also accept that there is no valid reason to assume that evolution is always parsimonious.

There are few absolute synapomorphies in the tree, with exceptions occurring in every clade. This is in accord with the opinion of Browne *et al*. (2007) that the Amphipoda are highly homoplasious. Nevertheless we are confident that a signal can be discerned that allows us to construct a phylogeny for the senticaudate clade.

In the tree (Fig. 9), the Corophiida is a sister to the Hadziida and the Gammarida is a sister to the Bogidiellida. The Corophiida/Hadziida is then a sister to the Gammarida/Bogidiellida. These in turn are a sister to the Talitrida and finally to the Carangoliopsida.

Our preliminary analysis of world amphipod taxa suggests that the Senticaudata are a sister to the 'eucallynophorates' (taxa with uropod 1–2 rami ending acutely and with antennae bearing complex two-field callynophores (Lowry 1986) and that both clades are derived from a basal clade including such taxa as amphilochids, colomastigids and stenothoids that have the rami of uropods 1–2 ending acutely and no, or at most very simple, monofield callynophores, not considered in Lowry (1986).

In the current tree (Fig. 10), some clades are paraphyletic or based on autapomorphies. Strongly supported clades are the infraorders Gammarida, Bogidiellida, Corophiida and Talitrida, and the parvorders Crangonyctidira, Gammaridira, Corophiidira and Caprelliidira.

In the Talitrida, the loss or near loss of a maxilla 1 palp is a synapomorphy. Curl-tipped setae on the oostegites is a unique synapomorphy for the talitridans but is lacking in the basal taxon, the Caspicolidae. The latter taxon shares with talitridans the loss of an accessory flagellum, apically setose maxilla 1 basal endite, labium lacking inner plates and loss of the endopod on uropod 3. *Biancolina* Della Valle, 1893 has been placed in the Corophiida (Bousfield, 1983). However in our analysis, and that of Serejo (2004), it sits firmly in the Talitrida based on the loss

of palps of mandible and maxilla 1 and the presence of curl-tipped setae on the oostegites. It lacks the fleshy telson of the corophiidans.

The bogidiellidans retain a number of plesiomorphic character states such as unswollen article 1 of antenna 2, maxilla 1 basal endite lacking an oblique setal row, no sternal gills and a long uropod 3 endopod. They differ from gammaridans in having antenna 1 and antenna 2 subequal in length and from most gammaridans in having gnathopod 1 stouter than gnathopod 2. In our tree they are basal to the gammaridans.

An important synapomorphy for the Gammarida is the enlarged (swollen) article 1 of antenna 2. Since this is the position of the antennary gland that has a role in osmotic balance one might consider that this adaptation to fresh-water could have developed independently in all freshwater amphipods, however, it does not occur in freshwater bogidiellidans or in freshwater melitidirans.

Within the Gammaridira, the Acanthogammaroidea is composed mainly of taxa from the Caspian basin and Lake Baikal. Exceptions are the Bathyporeidae, and Gammarellidae. These are the only taxa in the Gammarida to have an unenlarged article 1 on antenna 2, presumably because they are marine.

The Crangonyctidira have as synapomorphies the presence of a minute or absent endopod on uropod 3 (except in Kergueleneolidae), stalked coxal gills (except in Neoniphargidae, Paramelitidae, Perthiidae, Chilagoeidae and Giniphargidae) and a distoventral robust seta on urosomite 1 (absent in Crangonyctidae, Allocrangonyctidae, Pseudoniphargidae, Dussartiellidae, Crymostygiidae and Kergueleniolidae).

In the hadziidiran families, Calliopiidae, Cheirocratidae and most Hornelliidae antenna 1 is shorter than antenna 2 but all other hadziidirans antenna 1 is longer than antenna 2. The calliopiids have traditionally been placed in the Eusiridae, but we do not believe that they have any affinity with that family. In our tree they sit in the Hadziidira next to the pontogeneids.

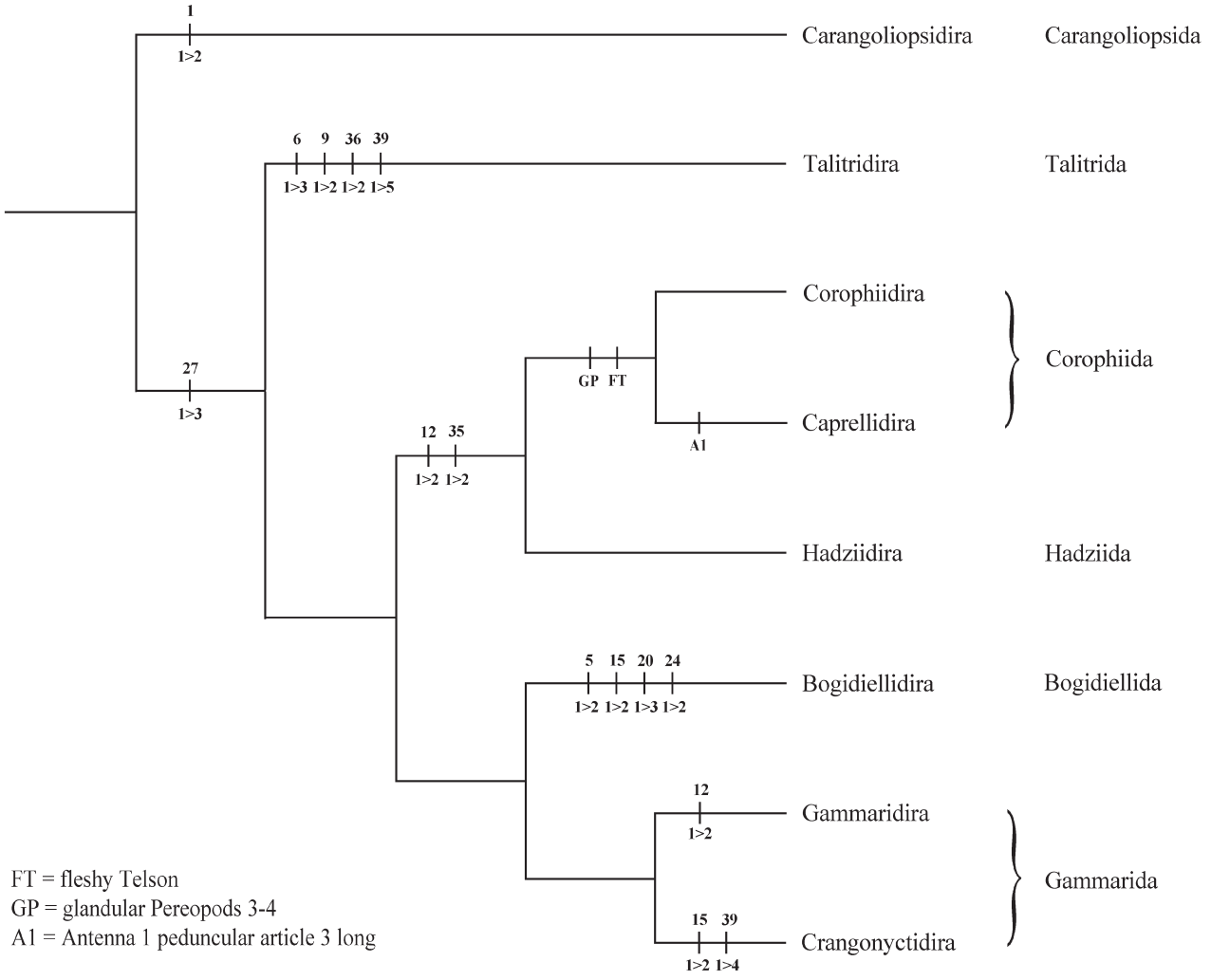

FIGURE 9. Cladogram of relationships of parvorders within the Senticaudata. Cross-lines represent significant synapomorphies with character state transformation.

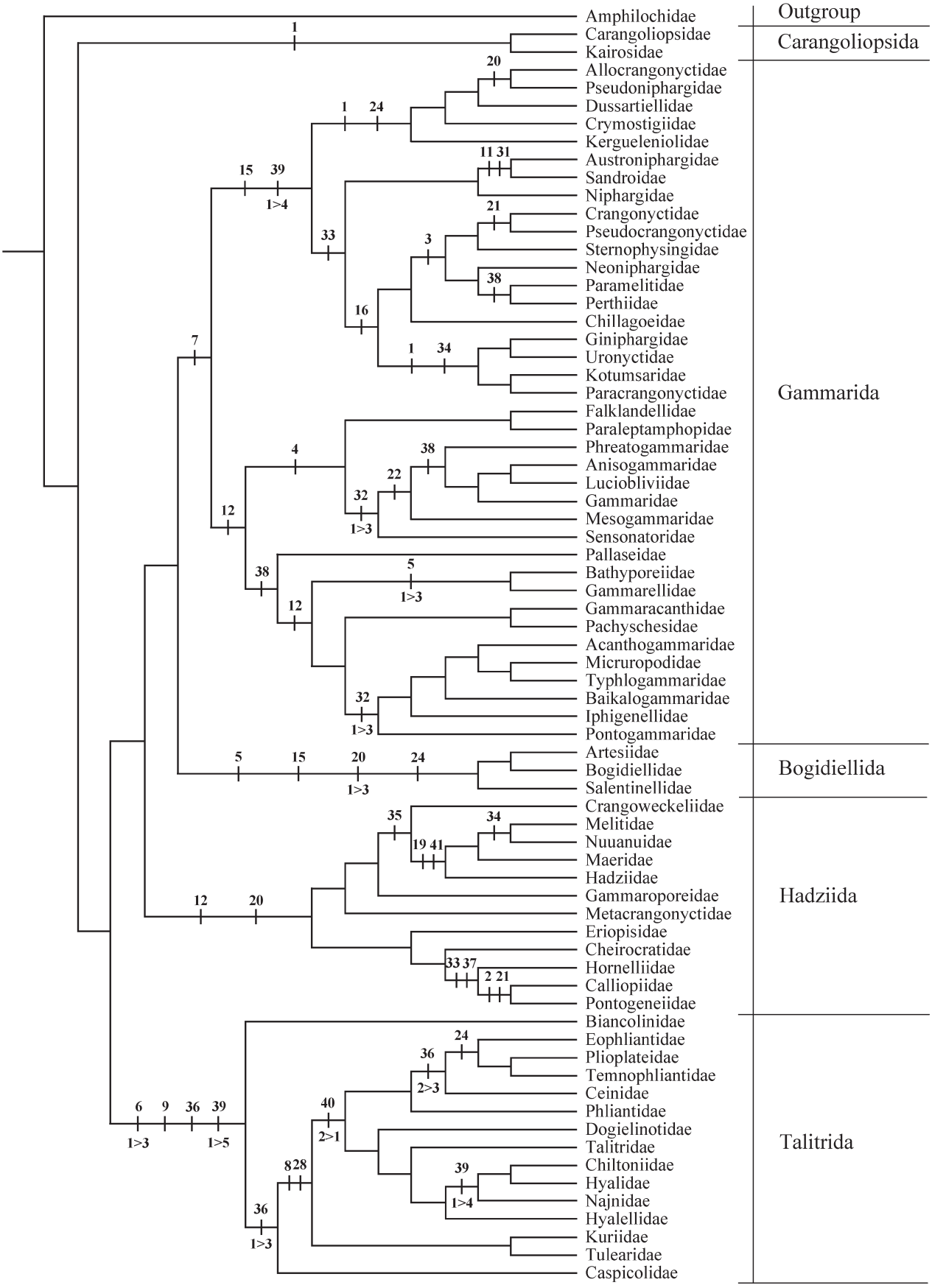

FIGURE 10. Cladogram of relationships of families within the Senticaudata (Corophiida omitted). Cross-lines represent significant synapomorphies with character state transformation. All transformations are 1>2 unless otherwise stated.

The macrohectopids from Lake Baikal have no robust setae on the apices of uropods 1 and 2 and were excluded from our analysis. However, MacDonald *et al*. (2005) has provided molecular evidence that indicates macrohectopids are part of the micrurupid clade of Lake Baikal. They have become highly modified morphologically in line with their pelagic mode of life.

Sanchoidae are highly derived. We excluded them from our analysis and place them in *incertae sedis*. Iciliidae defy our attempts at analysis and have been omitted from the analysis even though the apical robust setae on uropods 1–2 indicate that they are senticaudates. Behningiellidae are omitted from the analysis due to insufficient knowledge, but we include them in our classification with a question mark.

Classification

We provide here (Table 1) an updated complete classification of the Senticaudata. The new classification necessitates a slight adjustment to the higher level categories of the suborder Corophiidea (now infraorder Corophiida) as published by Myers & Lowry (2003).

TABLE 1. Classification of the Senticaudata subord. nov.

Infraorder Carangoliopsida (2 families)
Parvorder Carangoliopsidira
Superfamily Carangoliopsoidea
Family Carangoliopsidae
Family Kairosidae
Infraorder Talitrida (15 families)
Parvorder Talitridira
Superfamily Biancolinoidea
Family Biancolinidae
Superfamily Caspicoloidea
Family Caspicolidae
Superfamily Kurioidea
Family Kuriidae
Family Tulearidae
Superfamily Talitroidea
Family Ceinidae
Family Chiltoniidae
Family Dogielinotidae
Family Eophliantidae
Family Hyalellidae
Family Hyalidae
Subfamily Hyacheliinae
Subfamily Hyalinae
Family Najnidae
Family Phliantidae
Family Plioplateidae
Family Talitridae
Family Temnophliantidae
Infraorder Corophiida (21 families)
Parvorder Corophiidira
Superfamily Aoroidea
Family Aoridae
Family Unciolidae
Subfamily Acuminodeutopinae
Subfamily Unciolinae
Superfamily Cheluroidea
Family Cheluridae
Superfamily Chevalioidea
Family Chevaliidae
Superfamily Corophioidea
Family Ampithoidae
Subfamily Ampithoinae
Subfamily Exampithoinae
Family Corophiidae
Subfamily Corophiinae
Tribe Corophiini
Tribe Haplocheirini
Tribe Paracorophiini
Subfamily Protomedeiinae
Parvorder Caprellidira
Superfamily Aetiopedesoidea
Family Aetiopedesidae
Family Paragammaropsidae
Superfamily Caprelloidea
Family Caprellidae
Subfamily Caprellinae
Subfamily Paracercopinae
Subfamily Phtisicinae
Family Caprogammaridae
Family Cyamidae
Family Dulichiidae
Family Podoceridae
Superfamily Isaeoidea
Family Isaeidae
Superfamily Microprotopoidea
Family Microprotopidae
Superfamily Neomegamphoidea
Family Neomegamphopidae
Family Priscomilitariidae

.....continued on the next page

TABLE 1. (Continued)

Superfamily Photoidea
- Family Ischyroceridae
  - Subfamily Bonnierellinae
  - Subfamily Ischyrocerinae
    - Tribe Ischyrocerini
    - Tribe Siphonoecetini
- Family Kamakidae
  - Subfamily Aorchinae
  - Subfamily Kamakinae
- Family Photidae

Superfamily Rakirooidea
- Family Rakiroidae

Infraorder Hadziida (12 families)

Parvorder Hadziidira

Superfamily Hadzioidea
- Family Crangoweckeliidae
- Family Eriopisidae
- Family Gammaroporeiidae
- Family Hadziidae
- Family Maeridae
- Family Melitidae
- Family Metacrangonyctidae
- Family Nuuanuidae

Superfamily Calliopioidea
- Family Calliopiidae
- Family Cheirocratidae
- Family Hornelliidae
- Family Pontogeneiidae

Infraorder Bogidiellida (3 families)

Parvorder Bogidiellidira

Superfamily Bogidielloidea
- Family Artesiidae
- Family Bogidiellidae
- Family Salentinellidae

Infraorder Gammarida (40 families)

Parvorder Crangonyctidira

Superfamily Allocrangonyctoidea
- Family Allocrangonyctidae
- Family Crymostygiidae
- Family Dussartiellidae
- Family Pseudoniphargidae
- Family Kergueleniolidae

Superfamily Crangonyctoidea
- Family Austroniphargidae
- Family Chillagoeidae
- Family Crangonyctidae
- Family Giniphargidae
- Family Kotumsaridae
- Family Neoniphargidae
- Family Niphargidae
- Family Paracrangonyctidae
- Family Paramelitidae
- Family Perthiidae
- Family Pseudocrangonyctidae
- Family Sandroidae
- Family Sternophysingidae
- Family Uronyctidae

Parvorder Gammaridira

Superfamily Gammaroidea
- Family Acanthogammaridae
- Family Anisogammaridae
- Family Baikalogammaridae
- Family Bathyporeiidae
- Family Behningiellidae
- Family Falklandellidae
- Family Gammaracanthidae
- Family Gammarellidae
- Family Gammaridae
- Family Iphigenellidae
- Family Luciobliviidae
- Family Macrohectopidae
- Family Mesogammaridae
- Family Micruropodidae
- Family Pachyschesidae
- Family Pallaseidae
- Family Paraleptamphopidae
- Family Phreatogammaridae
- Family Pontogammaridae
- Family Sensonatoridae
- Family Typhlogammaridae

Incertae Sedis
- Family Iciliidae
- Family Sanchoidae

The Freshwater Senticaudata

Bogidiellidans would have entered freshwaters no later than the Triassic (250 Ma). They were derived from marine ancestors the descendants of which include the marine carangoliopsids and kairosids which lie at the base of the tree of modern senticaudate families. At some period during the existence of Pangaea, gammaridans penetrated into freshwaters including groundwaters. After the rifting of Pangaea at the beginning of the Jurassic (200 Ma), gammaridirans radiated in the surface waters of Laurasia and some, such as the ancestors of the Hadziidae and the Luciobliviidae invaded the hypogean in competition with resident crangonyctidirans. In Gondwana, gammaridirans may have been successful for a while but then went into decline, leaving as their descendants the

relict Falklandellidae, Paraleptamphopidae and Phreatogammaridae. Crangonyctidirans continued to flourish and they now dominate the amphipod fauna worldwide in most groundwater habitats. Relict monotypic crangonyctidiran families include crymostygiids in Iceland and kergueleniolids in Kerguelen.

There have been multiple origins of freshwater amphipods. In addition to the gammaridans, independent colonisation of freshwaters took place by talitridans e.g. *Hyalella* Smith, 1874 and *Floresorchestia* Bousfield, 1984, Hadziidans e.g. *Hadzia* S. Karaman, 1932, *Weckelia* Shoemaker, 1942, *Brachina* Barnard & Williams, 1995 and *Lutriwita* Lowry & Myers, 2012 and corophiidans e.g. *Grandidierella* Coutière, 1904 and *Corophium* Latreille, 1806. It is probable that entry into freshwater has ocurred repeatedly in *Floresorchestia* on different land masses, because it is very doubtful that all freshwater *Floresorchestia* are derived from a most recent common ancestor. Outside the senticaudate clade, freshwater 'crawl-outs' are known only from the Seborgiidae (*Seborgia* Bousfield, 1970) and Ingolfiellidea (*Metaingolfiella* Ruffo, 1969).

In Australia there appear to have been at least three origins for the crangonyctidiran fauna. One led to paramelitids, neoniphargids and perthiids, one to chillagoeids and another to giniphargids and uronyctids. In Madagascar there have been at least two origins for the crangonyctidiran fauna, dussartiellids on one hand and austroniphargids and sandroids on the other. New Zealand and Patagonian South America have no crangonyctidiran representatives but share ancient gammaridans such as paraleptamphopids and phreatogammarids. In Europe, the niphargids are a sister taxon to the Madagascan families Austroniphargidae and Sandroidae. According to our analysis, the niphargids are relict crangonyctidirans from Pangaea that have survived in Laurasian groundwaters to the present day.

The Carangoliopsida and the origin of the Senticaudata

The Carangoliopsidae and Kairosidae appear to be relict marine families from the early evolution of the senticaudates. *Carangoliopsis* Ledoyer (1970) is known from the Mediterranean. *Kairos* Krapp-Schickel & Müller, 2011 is known from Bora Bora in Polynesia. This represents a Tethyan distribution. Modern gammaridirans are distributed in both hemispheres, so their ancestors must have been distributed across Pangaea. We would place the origins of the senticaudates at the latest at 250 Ma (Triassic). An explosive radiation of gammaridirans probably took place in Laurasia during the Cretaceous–Tertiary (after the breakup of Pangaea). During this time, crangonyctidirans continued to radiate in Gondwana fragments. The great baikalian radiations of gammaridirans probably started about 72 Ma (late Cretaceous), when a series of shallow lakes ocurred in the Baikal basin (MacDonald *et al*. 2005), facilitating allopatry. These later joined to become a permanent lake about 27 Ma. It became substantially deepened and cold about 3 Ma (MacDonald *et al*. 2005). The rate of evolutionary change has probably been much slower in groundwaters than in surface lakes due to the relatively stable ecology of subterranean waters over geological time scales.

The phylogenetic position of the Falklandellidae

The phylogenetic position of the Falklandellidae has been considered as equivocal. *Falklandella* has been placed in the Crangonyctoidea (Bousfield 1977, 1982a; Barnard & Barnard 1983 and Williams & Barnard 1988) and in the Eusiroidea (Bousfield & Shih 1994), but the problem with these allocations is the presence of gammarid-type (type 1) calceoli. Stock & Platvoet (1991) concluded either that the structure of the calceoli is not, as believed by Stapleton *et al*. (1988) diagnostic, or that the structure of the sternal and coxal gills, the shortened uropod 3 and the posterolobate coxa of pereopods 5–6 of falklandellids are convergences and falklandellids are ‘aberrant’ gammarids. In our analysis falklandellids are aligned at the base of the gammaridirans. In general, crangonyctidirans have maxilla 1 basal endite setose apically whereas most gammaridirans and falklandellids have the endite setose along the posterior margin; maxilla 2 basal endite lacks an oblique setal row in most crangonyctidirans, but it is present in most gammaridirans and falklandellids; most crangonyctidirans have the endopodite of uropod 3 minute or absent, whereas most gammaridirans and falklandellids have a well developed endopod; almost all crangonyctidirans have robust setae on the telson whereas many gammaridirans and falklandellids do not. We conclude that the Falklandellidae are relict (from Pangaea) gammaridirans and that gammaridirans radiated in Laurasia but became almost extinct in Gondwana perhaps due to competition with

crangonyctidirans. The Falklandellidae is the only known family of amphipods to possess the combination of gammarid type 1calceoli with sternal gills. In our tree, falklandellids and paraleptamphopids are sister taxa and the biogeographic link between New Zealand and Patagonian South America is supported by the presence in both areas of paraleptamphopids as well as of phreatogammarids.

The Hadziidae

The hadziids are a clade of freshwater amphipods with a limited global distribution. Morphologically they are scarcely separable from the Maeridae that are a worldwide marine group. The main distingushing characters of the Hadziidae are the double row of robust setae along the palm of gnathopod 1 and 2 that are not present in maerids and the absence of a posteroventral lobe on coxa 4, present in maerids.

The phylogenetic position of Pseudingolfiellidae

The genus *Pseudingolfiella* Noodt, 1965 does not possess apical robust setae on uropods 1–2. This would preclude it from the senticaudate clade, unless the lack represents loss. We have not been able to find any strong synapomorphies linking *Pseudingolfiella* with the senticaudate clade members. On the contrary, the reduced pleopods, lack of epimera and pleosome-like urosome all suggest that the monotypic Pseudingolfiellidae Lowry & Myers, 2012 is closely related to ingolfiellids. The pseudingolfiellids differ from other ingolfielideans in the subchelate gnathopods and from some ingolfiellideans in the fully sessile eyes.

The Callynophore

The callynophore (Lowry 1986) is a character developed in the earliest amphipods. At its simplest it consists of an unordered bunch of aesthetascs on antenna 1, probably derived from the fusion of many flagellar articles. At its most complex it consists of complex rows of aesthetascs ordered into fields. This latter complex 'eucallynophore' is a synapomorphy for a large group of amphipods that will be considered in a future publication. The simple callynophore (found in the outgroup Amphilochidae) is a plesiomorphy that is expressed within the Senticaudata by the Phliantoidea but is lost in more derived senticaudates.

Diagnostic descriptions

The bold-italic parts are diagnostic descriptions, generated with the aid of Intkey (Dallwitz 2005). They distinguish each taxon in at least two respects from every other taxon. Diagnostic characters include some autapomorphies that being parsimony uninformative were not used in the analysis.

Order Amphipoda Latreille, 1816

Suborder Senticaudata nov.

Diagnosis. Antenna 1 without complex callynophore. Antenna 2 without brush setae or elongate flagellum in male. Uropods 1 and 2 with apical robust setae.

Included infraorders. Carangoliopsida Bousfield, 1977 **stat. nov.**; Talitrida Rafinesque, 1815 (Serejo, 2004); Hadziida S. Karaman, 1943 **stat. nov.**; Corophiida Leach, 1814 (Myers & Lowry, 2003); Bogidiellida Hertzog, 1936 **stat. nov.**; Gammarida Latreille, 1802 **stat. nov.**

Infraorder Carangoliopsida Bousfield, 1977 stat. nov.

Diagnosis. Gnathopod 2 carpus produced along posterior margin. Pereopod 6 propodus and merus significantly longer than that of pereopod 7. Pereopod 6 longer than 7.

Parvorder Carangoliopsidira nov.

Diagnosis. As for infraorder.

Included superfamilies. Carangoliopsoidea Bousfield, 1977 **stat. nov.**

Superfamily Carangoliopsoidea Bousfield, 1977 **stat. nov.**

Diagnosis. As for parvorder.

Included families. Carangoliopsidae Bousfield, 1977; Kairosidae **fam. nov.**

Carangoliopsidae Bousfield, 1977

Type genus. *Carangoliopsis* Ledoyer, 1970.

Diagnostic description. Body subcylindrical. Eyes absent. Antennae 1–2 calceoli absent**.** ***Antenna 1*** longer than antenna 2; ***peduncular article 1 shorter than article 2***; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 2–4, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus (lobate). Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. ***Uropod 1 with 1 or 2 with basofacial robust setae***. Uropod 3 not sexually dimorphic; biramous, without plumose setae; ***endopod minute***. ***Telson moderately cleft***.

Habitat. Marine, interstitial.

Included genera. *Carangoliopsis* Ledoyer, 1970.

Distribution. Mediterranean.

Kairosidae fam. nov.

Type genus. *Kairos* Krapp-Schickel & Müller, 2011.

Diagnostic description. Body laterally compressed. Eyes well developed, round. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 subequal to article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. Coxal gills number and sequence [not known], not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus slightly produced along posterior margin of propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 coxa with small anteroventral lobe. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–2 coalesced, 3 free***; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 biramous, without plumose setae; endopod minute. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Remarks. Kairosids are similar to the endemic Mediterranean carangoliopsids. However, carangoliopsids are subcylindrical amphipods with very small, discontiguous coxae, with gnathopod 2 dissimilar in form between males and females, with the carpus of gnathopod 1 shorter than the propodus, with well developed dactyli on the pereopods, with a relatively short merus on pereopod 3 and 4, with non-coalesced urosomites, with styliform rami on uropods 1 and with a basofacial robust seta on the peduncle of uropod 1.

Habitat. Marine, epigean.

Included genera. *Kairos* Krapp-Schickel & Müller, 2011.

Distribution. Society Islands.

Infraorder Talitrida Rafinesque, 1815 (Serejo 2004)

Diagnosis. Antenna 1 accessory flagellum absent. Mandibular palp vestigial or absent. Maxilla 1 basal endite apically setose or asetose; palp vestigial or absent. Maxilla 2 basal endite without apical setal row. Oostegites with curl-tipped setae straight. Uropod 3 rami biramous, vestigial or absent.

Parvorder Talitridira Rafinesque, 1815 stat. nov.

Diagnosis. As for Infraorder.

Included superfamilies. Biancolinoidea J.L. Barnard, 1972b; Caspicoloidea Birstein, 1945; Talitroidea Rafinesque, 1815.

Superfamily Biancolinoidea J.L. Barnard, 1972b stat. nov.

Diagnosis. Oostegites setae curl-tipped. Uropod 3 biramous.

Included family. Biancolinidae J.L. Barnard, 1972b.

Biancolinidae J.L. Barnard, 1972b

Type genus. *Biancolina* Della Valle, 1893.

Diagnostic description. ***Body subcylindrical.*** Eyes well developed, round. Antennae 1–2 calceoli absent. ***Antenna 1 shorter than or subequal in length to antenna 2***; peduncular article 1 subequal or longer than article 2; article 2 longer than article 3; article 3 subequal to article 1; peduncular articles 1–2 not geniculate; ***accessory flagellum absent***. ***Antennae 1–2 calceoli absent***. Antenna 2 peduncular article 1 not enlarged. Mandible reduced or absent; palp absent. Maxilla 1 basal endite apically setose; palp absent. Maxilla 2 basal endite without oblique setal row. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae curl-tipped. Gnathopod 1 parachelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 parachelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posterodorsal lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous***; endopod shorter than exopod or subequal to exopod. Telson weakly cleft or entire; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Biancolina* Della Valle, 1893.

Distribution. Widespread in warm-temperate and tropical seas (not Indian Ocean).

Superfamily Caspicoloidea Birstein, 1945 stat. nov.

Diagnosis. Mandibular palp present. Pereopod 5 coxa equilobate. Oostegites with straight-tipped setae.

Included families. Caspicolidae Birstein, 1945.

Caspicolidae Birstein, 1945

Type genus. *Caspicola* Derzhavin, 1945.

Diagnostic description. Body laterally compressed. Eyes well developed, round. Antennae 1–2 calceoli absent. ***Antenna 1*** subequal in length to antenna 2, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to, or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; ***accessory flagellum absent***. Antenna 2 peduncular article 1 not enlarged. ***Mandible*** reduced or absent; ***palp symmetrical***. Maxilla 1 inner plate apically setose; palp symmetrical. Coxal gills number and sequence not known, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 chelate; smaller (or weaker) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 chelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and carpus. Pereopods 3–4 not sexually dimorphic. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. ***Urosomite 1 without large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust seta (robust or simple). ***Uropod 3*** not sexually dimorphic; ***uniramous***, without plumose setae. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Caspicola* Birstein, 1945.

Distribution. Caspian Sea.

Superfamily Kurioidea J.L. Barnard, 1964 (Serejo 2004)

Diagnosis. Gnathopod 2 not sexually dimorphic. Pereopods 5 and 7 subequal in length. Uropod 3 uniramous. Telson deeply cleft.

Included families. Kuriidae J.L. Barnard, 1964; Tulearidae Ledoyer, 1979.

Kuriidae J.L. Barnard, 1964

Type genus. *Kuria* Walker & Scott, 1903.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or slightly longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; ***accessory flagellum absent***. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp absent. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; **oostegites *fringing setae curl-tipped***. ***Gnathopod 1 similar in size to gnathopod 2***; propodus palm without robust setae along palmar margin. Gnathopod 2 dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa equilobate or with large anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free or 1–3 coalesced; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1

without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***uniramous***, without plumose setae. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Kuria* Walker & Scott, 1903; *Micropythia* Krapp-Schickel, 1976.

Distribution. Mediterranean Sea, Arabian Sea.

Tulearidae Ledoyer, 1979

Type genus. *Tulearus* Ledoyer, 1979.

Diagnostic description. Body laterally compressed. Eyes well developed, round. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. Mandible molar reduced or absent; palp absent. Maxilla 1 palps symmetrical. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. ***Pereopod 5*** subequal in length to pereopod 6; ***coxa without lobes***. Pereopod 7 subequal in length to pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***uniramous***. ***Telson weakly cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Marine, epigean.

Included genera. *Tulearus* Ledoyer, 1979.

Distribution. Madagascar.

Superfamily Talitroidea Rafinesque, 1815 (Bulycheva 1957)

Diagnosis. Mandibular palp vestigial or absent. Oostegites with curl-tipped setae. Telson entire or notched.

Included families. Ceinidae J.L. Barnard, 1972a; Chiltoniidae J.L. Barnard, 1972b; Dogielinotidae Gurjanova, 1953; Eophliantidae Sheard, 1936; Hyalidae Bulycheva, 1957; Najnidae J.L. Barnard, 1972b; Phliantidae Stebbing, 1899b; Pleioplateidae J.L. Barnard, 1978; Talitridae Rafinesque, 1815; Temnophliidae Griffiths, 1975.

Ceinidae J.L. Barnard, 1972a

Type genus. *Ceina* Della Valle, 1893.

Diagnostic description. ***Body laterally compressed.*** Eyes well developed, round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative, non-triturative or a tiny triturating patch; palp absent. Maxilla 1 basal endite apically setose; palp present or absent, if present symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxa gills not stalked, not stalked; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; ***similar in males and females (not sexually dimorphic)***; smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic or not); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with

posteroventral lobe or with posterodorsal lobe or with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***rami absent***. Telson moderately cleft, weakly cleft or entire; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Ceina* Della Valle, 1893; *Taihape* J.L. Barnard, 1972b; *Waitomo* J.L. Barnard, 1972b.

Distribution. Philippines, Australia, New Zealand, South America.

Chiltoniidae J.L. Barnard, 1972b

Type genus. *Chiltonia* Stebbing, 1899b.

Diagnostic description. Body laterally compressed. Eyes well developed or absent, if present then round or subrectangular. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or slightly longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp absent. ***Maxilla 1*** basal endite apically setose; ***palp absent***. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–7, not stalked; sternal gills present or sternal gills absent, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. ***Gnathopod 2*** subchelate; ***dissimilar in males and females (sexually dimorphic)***; ***carpus not produced along posterior margin of propodus, projecting between merus and propodus***. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with or with small posteroventral lobe. ***Pereopod 5*** shorter than or subequal in length to pereopod 6; ***coxa equilobate or with posteroventral lobe***. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; uniramous or rami absent, without plumose setae. Telson emarginate or entire; dorsal or lateral robust setae absent; apical robust setae absent.

Included genera. *Afrochiltonia* K.H. Barnard, 1955; *Arabunnachiltonia* King, 2009; *Austrochiltonia* Hurley, 1958; *Chiltonia* Stebbing, 1899b; *Phreatochiltonia* Zeidler, 1991; *Scutachiltonia* King, 2012; *Stygochiltonia* King, 2012; *Wangiannachiltonia* King, 2009; *Yilgarniella* King, 2012.

Habitat. Freshwater, epigean and hypogean.

Remarks. The most significant differences between chiltoniids and ceinids appears to be the swollen first article on the peduncle of antenna 2 and the second gnathopods which are dissimilar between males and females in chiltoniids, but similar in ceinids.

Distribution. Australia, New Zealand, South Africa.

Dogielinotidae Gurjanova, 1953

Type genus. *Dogielinotus* Gurjanova, 1953

Diagnostic description. Body laterally compressed. Eyes well developed, round, ovoid or subrectangular. Antennae 1–2 calceoli absent. ***Antenna 1 shorter than, subequal in length to, or longer than antenna 2***; peduncular article 1 subequal to, or longer than article 2; article 2 subequal to, or longer than article 3; article 3 shorter than or subequal to article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged or enlarged, bulbous. ***Mandible*** molar triturative; ***palp absent***. Maxilla 1 basal endite apically setose; palp present or absent, if present symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6 or pereonites 2–7, not stalked; sternal gills present or sternal gills absent, simple; sternal blisters absent; oostegites fringing setae simple or fringing setae curl-tipped. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. ***Gnathopod 2***

subchelate; dissimilar in males and females (sexually dimorphic); ***carpus strongly produced or slightly produced along posterior margin of propodus***. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with posteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with or without dorsal carinae. ***Urosomites 1–3 free***; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***uniramous***, without plumose setae. ***Telson weakly cleft, emarginate or entire***; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Marine, epifaunal.

Included genera. *Allorchestes* Dana, 1849; *Dogielinoides* Bousfield, 1982c; *Dogielinotus* Gurjanova, 1953; *Eohaustorioides* Bousfield, 1982c; *Exhyalella* Stebbing, 1917; *Haustorioides* Oldevig, 1958; ? *Insula* Kunkel, 1910; *Marinohyalella* Lazo-Wasem & Gable, 2001; *Parhyalella* Kunkel, 1910; *Proboscinotus* Bousfield, 1982c.

Distribution. Widespread in both hemispheres.

Remarks. Serejo (2004) divided the dogielinotids into three subfamilies: Dogielinotinae; Hyalellinae and Najninae. Based on our analysis each of the subfamilies is restored to family level.

Eophliantidae Sheard, 1936

Type genus. *Eophliantis* Sheard, 1936

Diagnostic description. ***Body subcylindrical***. Eyes well developed, round or ovoid. Antennae 1–2 calceoli absent. ***Antenna 1*** shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 shorter than or subequal to article 2; article 2 subequal to or longer than article 3; ***article 3 subequal to, or longer than article 1***; peduncular articles 1–2 not geniculate; accessory flagellum absent. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar present**,** reduced or absent, if present then non-triturative or with tiny triturating patch; palp symmetrical or absent. Maxilla 1 basal endite apically setose; palp present or absent, symmetrical. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate or parachelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate or parachelate; dissimilar in males and females (sexually dimorphic) carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free or 1 free, 2–3 coalesced; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***rami absent***. Telson deeply cleft or entire; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Bircenna* Chilton, 1884; *Ceinina* Stephensen, 1933b; *Cylindryllioides* Nicholls, 1938; *Eophliantis* Sheard, 1936; *Lignophliantis* J.L. Barnard, 1969b; *Wandelia* Chevreux, 1906a.

Distribution. Widespread in both hemispheres.

Hyalellidae Bulycheva, 1957

Type genus. *Hyalella* S.I. Smith, 1874.

Diagnostic description. Body laterally compressed. Eyes well developed or absent, if present then round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar triturative; palp absent. Maxilla 1 basal endite apically setose; palp present or absent, symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. *Coxal gills* on pereopods 2–7, not stalked; sternal gills present, simple; sternal blisters absent; ***oostegites fringing setae curl-tipped***. Gnathopod 1 similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 carpus slightly

produced along posterior margin of propodus. ***Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe***. Pereopod 5 shorter than pereopod 6; coxa equilobate or with posteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae (small) or without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***uniramous***, without plumose setae. Telson entire; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Freshwater, epigean.

Included genera. *Hyalella* (*Austrohyalella*) Bousfield, 1996; *Hyalella* (*Hyalella*) S.I. Smith, 1874; *Hyalella* (*Mesohyalella*) Bousfield, 1996.

Remarks. Hyalellids differ from all other talitridirans in the swollen first peduncular article of antenna 2 and the presence of a coxal gill on pereopod 7.

Distribution. North and South America.

Hyalidae Bulycheva, 1957

Type genus. *Hyale* Rathke, 1837.

Diagnostic description. Body laterally compressed. Eyes well developed or poorly developed, round, ovoid, reniform, ventrally tapered or subrectangular. Antennae 1–2 calceoli absent. ***Antenna 1 shorter than antenna 2***; peduncular article 1 subequal to, or longer than article 2; article 2 shorter than, subequal to, or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. ***Mandible*** molar triturative; ***palp absent***. Maxilla 1 basal endite apically setose; palp present or absent, symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple or fringing curl-tipped. Gnathopod 1 subchelate or parachelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus or not produced along posterior margin of propodus, not projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous or uniramous***, without plumose setae; endopod minute. ***Telson deeply or moderately cleft***; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Marine, epigean.

Included subfamilies. Hyacheliinae Bousfield & Hendrycks, 2002; Hyalinae Bulycheva, 1957.

Included genera. *Apohyale* Bousfield & Hendrycks, 2002; *Hyachelia* J.L. Barnard, 1967; *Hyale* Rathke, 1837; *Insula* Kunkel, 1910; *Lelehua* J.L. Barnard, 1970; *Neobule* Haswell, 1879a; *Parallorchestes* Shoemaker, 1941; *Parhyale* Stebbing, 1897; *Protohyale* (*Boreohyale*) Bousfield & Hendrycks, 2002; *Protohyale* (*Diplohyale*) Bousfield & Hendrycks, 2002; *Protohyale* (*Leptohyale*) Bousfield & Hendrycks, 2002; *Protohyale* (*Protohyale*) Bousfield & Hendrycks, 2002; *Ptilohyale* Bousfield & Hendrycks, 2002; *Ruffohyale* Bousfield & Hendrycks, 2002; *Serejohyale* Bousfield & Hendrycks, 2002.

Distribution. Cosmopolitan.

Najnidae J.L. Barnard, 1972b

Type genus. *Najna* Derzhavin, 1937.

Diagnostic description. Body laterally compressed. Eyes well developed, round or ovoid. Antennae 1–2 calceoli absent. ***Antenna 1 subequal in length to antenna 2***; peduncular article 1 slightly longer than article 2; article 2 subequal to, or slightly longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not

geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. ***Mandible molar reduced or absent; palp absent***. Maxilla 1 basal endite apically setose; palp present, symmetrical. Maxilla 2 basal endite without oblique setal row. ***Coxal gills on pereopods*** 2–6, not stalked; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae curl-tipped. Gnathopod 1 subchelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. ***Gnathopod 2*** subchelate; similar in males and females (not sexually dimorphic); ***carpus slightly produced along posterior margin of propodus***. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3 uniramous***, without plumose setae. ***Telson entire***; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Marine, algal dwellers, epigean.

Included genera. ? *Insula* Kunkel, 1910; *Najna* Derzhavin, 1937.

Remarks. Serejo (2004) considered this taxon as a subfamily. We re-establish it to family-level status. Najnids separate from other talitroid taxa in not having a mandibular molar and in having non-sexually dimorphic second gnathopods.

Distribution. North Pacific.

Phliantidae Stebbing, 1899b

Type genus. *Phlias* Guerin, 1836.

Diagnostic description. Body laterally compressed or dorsoventrally flattened. Eyes well developed, round. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to, or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. ***Mandible*** molar non-triturative or with tiny triturating patch; ***palp absent***. ***Maxilla 1*** basal endite apically setose; ***palp absent***, symmetrical. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae curl-tipped. Gnathopod 1 simple or subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 simple or subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 with well developed posteroventral lobe***. ***Pereopod 5 subequal in length to pereopod 6***; ***coxa with large anteroventral lobe***. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free or 1–2 coalesced, 3 free or 1–3 superficially coalesced; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; uniramous or rami absent. Telson entire; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Gabophlias* J.L. Barnard, 1972b; *Iphinotus* Stebbing, 1899b; *Iphiplateia* Stebbing, 1899b; *Pariphinotus* Kunkel, 1910; *Pereionotus* Bate & Westwood, 1863; *Phlias* Guerin, 1836; *Quasimodia* Sheard, 1936.

Distribution. Widespread in both hemispheres.

Pleioplateidae J.L. Barnard, 1978

Type genus. *Plioplateia* K.H. Barnard, 1916.

Diagnostic description. ***Body dorsoventrally flattened.*** Eyes well developed, round. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. ***Mandible*** molar non-triturative or with tiny triturating patch; ***palp absent***. Maxilla 1 basal endite without setae; palps symmetrical. Coxal gills [not known]; sternal gills absent; sternal

blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***rami absent***. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Plioplateia* K.H. Barnard, 1916.

Distribution. South Africa.

Talitridae Rafinesque, 1815

Type genus. *Talitrus* Bosc, 1802.

Diagnostic description. ***Body laterally compressed*.** Eyes well developed or absent, if present then round or ovoid. Antennae 1–2 calceoli absent. ***Antenna 1 shorter than peduncle of antenna 2*;** peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 shorter than, subequal to, or longer than article 3; article 3 subequal to, or longer than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp absent. Maxilla 1 basal endite apically setose; palp present or absent, symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills [not known]; not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple or curl-tipped. Gnathopod 1 simple, subchelate or chelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate, minutely subchelate, chelate or simple; similar or dissimilar in males and females (sexually dimorphic or not) carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with or small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with posteroventral lobe or with posterodorsal lobe or with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***uniramous***, without plumose setae. Telson moderately cleft to entire; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Habitat. Supralittoral beaches, mangrove forests and terrestrial forests.

Included genera. *Africorchestia* Lowry & Coleman, 2011; *Agilestia* Friend, 1982; *Americorchestia* Bousfield, 1991; *Arcitalitrus* Hurley, 1975; *Atlantorchestoidea* Serejo, 2004; *Australorchestia* Serejo & Lowry, 2008; *Austrotroides* Friend, 1982; *Bellorchestia* Serejo & Lowry, 2008*; Bousfieldia* Chou & Lee, 1996; *Brevitalitrus* Bousfield, 1971; *Britorchestia* Lowry & Bopiah, 2012; *Caribitroides* (*Caribitroides*) Bousfield, 1984; *Caribitroides* (*Mexitroides*) Lindeman, 1990; *Cariborchestia* Smith, 1998; *Cerrorchestia* Lindeman, 1990; *Chelorchestia* Bousfield, 1984; *Chiltonorchestia* Bousfield, 1984; *Chroestia* Marsden & Fenwick, 1984; *Cochinorchestia* Lowry & Peart, 2010; *Curiotalitrus* Lowry & Coleman, 2012; *Dana* Lowry, 2011; *Deshayesorchestia* Ruffo, 2004; *Eorchestia* Bousfield, 1984; *Floresorchestia* Bousfield, 1984; *Hawaiorchestia* Bousfield, 1984; *Kanikania* Duncan, 1994; *Keratroides* Hurley, 1975; *Lanorchestia* Miyamoto & Morino, 2010; *Macarorchestia* Stock, 1989; *Makawe* Duncan, 1994; *Megalorchestia* Brandt, 1851; *Microrchestia* Bousfield, 1984; *Mysticotalitrus* Hurley, 1975; *Neorchestia* Friend, 1987; *Notorchestia* Serejo & Lowry, 2008*; Orchestia* Leach, 1814; *Orchestiella* Friend, 1987; *Orchestoidea* Nicolet, 1849; *Paciforchestia* Bousfield, 1982b; *Palmorchestia* Stock & Martin, 1988; *Parorchestia* Stebbing 1899c; *Platorchestia* Bousfield, 1982b; *Protaustrotroides* Bousfield, 1984; *Protorchestia* Bousfield, 1982b; *Pseudorchestoidea* Bousfield, 1982b; *Puhuruhuru* Duncan, 1994; *Sardorchestia* Ruffo, 2004; *Sinorchestia* Miyamoto & Morino, 1999; *Spelaeorchestia* Bousfield & Howarth, 1976; *Talitriator* Methuen, 1913; *Talitroides* Bonnier, 1898; *Talitrus* Bosc, 1802;

Talorchestia Dana, 1853; *Tasmanorchestia* Friend, 1987; +*Tethorchestia* Bousfield, 1984; *Transorchestia* Bousfield, 1982b; *Traskorchestia* Bousfield, 1982b; *Trinorchestia* Bousfield, 1982b; *Uhlorchestia* Bousfield, 1984; *Vallorchestia* Lowry, 2012; *Vietorchestia* Thanh & Anh, 2011; *Waematau* Duncan, 1994.

Distribution. Cosmopolitan.

Temnophliidae Griffiths, 1975

Type genus. *Temnophlias* K.H. Barnard, 1916.

Diagnostic description. ***Body dorsoventrally flattened.*** Eyes well developed, round. Antennae 1–2 calceoli absent. Antenna 1 peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; articles 1–2 not geniculate; articles 2–3 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 not enlarged. Mandible molar non-triturative or with tiny triturating patch; palp absent. ***Maxilla 1*** basal endite absent; ***palp absent***. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple or chelate; dissimilar in males and females (sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 simple or chelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 without posteroventral lobe***. Pereopod 5 subequal in length to pereopod 6; coxa with large anteroventral lobe. Pereopod 7 subequal in length to pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; rami absent. Telson entire.

Habitat. Marine, epigean.

Included genera. *Hystriphlias* Barnard & Karaman, 1987; *Temnophlias* K.H. Barnard, 1916.

Distribution. South African.

Infraorder Hadziida S. Karaman, 1932c stat. nov.

Diagnosis. Gnathopod 2 stouter than gnathopod 1. Urosomite 2 with a pair of small dorsal robust setae. Uropod 1 peduncle with a basofacial robust seta.

Parvorder Hadziidira S. Karaman, 1943 stat. nov.

Diagnosis. As for infraorder.

Included superfamilies. Hadzioidea S. Karaman, 1932; Calliopioidea Sars, 1895b.

Superfamily Hadzioidea S. Karaman, 1943 (Bousfield 1983)

Diagnosis. Antenna 1 longer than antenna 2. Uropod 1 peduncle with basofacial robust seta.

Included families. Crangoweckeliidae Lowry & Myers, 2012; Eriopisidae **fam. nov.**; Gammaroporeiidae Bousfield, 1978; Hadziidae S. Karaman, 1943; Maeridae Krapp-Schickel, 2008a; Melitidae Bousfield, 1973; Metacrangonyctidae Boutin & Messouli, 1988b; Nuuanuidae **fam. nov.**

Crangoweckeliidae Lowry & Myers, 2012

Type genus. *Crangoweckelia* Stock, 1985.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 shorter than or subequal to article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate;

accessory flagellum short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 2–6, stalked (with proximal restriction or complete suture); sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; ***propodus palm with row or rows of simple or bifid robust setae along palmar margin***. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae***. Uropod 1 with 1 or 2 basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod shorter than exopod. Telson deeply or moderately cleft; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Crangoweckelia* Stock, 1985; *Pintaweckelia* Stock, 1985.

Distribution. Caribbean.

Eriopisidae fam. nov.

Type genus. *Eriopisa* Stebbing, 1890.

Diagnostic description. Body laterally compressed, subcylindrical or vermiform. Eyes well developed, poorly developed or absent, if present then round or ovoid. ***Antennae 1–2 calceoli absent***. ***Antenna 1 longer than antenna 2***; peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes present. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. **Gnathopod 2** subchelate; **similar in males and females (not sexually dimorphic)**; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posterodorsal lobe or with large anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites*** 1–3 free; ***without slender or robust dorsal setae***. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with or without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous***, without plumose setae; ***endopod minute or shorter than exopod***. ***Telson deeply cleft***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Marine, epigean and hypogean.

Included genera. The *Eriopisa* group includes 9 genera: *Confodiopisa* Karaman, 1984c; *Eriopisa* Stebbing, 1890; *Flagitopisa* Karaman, 1984c; *Impertiopisa* Karaman, 1984c; *Nedsia* Barnard & Williams, 1995; *Psammogammarus* S. Karaman 1955; *Tunisopisa* Stock, 1980; *Victoriopisa* Karaman & Barnard, 1979; *Vocitopisa* Karaman, 1984c.

The *Eriopisella* group includes 12 genera: *Cephalopisella* G. Karaman, 1984c; *Cuneimelita* Senna & Serejo, 2012; *Eriopisella* Chevreux, 1920; *Gammaropisa* Ruffo & Vigna-Taglianti, 1988; *Madapisella* Stock, 1980; *Maleriopa* Barnard & Karaman, 1982; *Netamelita* J.L. Barnard, 1962; *Nippopisella* Stock, 1980; *Norcapensis* Bradbury & Williams, 1997; *Psammomelita* Vonk, 1988; *Spiniferopisella* G. Karaman, 1984c; *Tagua* Lowry & Fenwick, 1983.

Remarks. *Roropisa* Karaman, 1984c, which would fall into the *Eriopisa* group is considered to be a subjective synonym of *Victoriopisa* by Morino (1991) and Stock & Iliffe (1995).

The only difference between the *Eriopisa* and *Eriopisella* groups appears to be the extraordinarily well developed second article of the outer ramus of uropod 3 in the *Eriopisella* group. Eriopisids differ from maerids

and melitids in the second gnathopods which are similar between males and females. Melitids are mate-guarders in which the male gnathopod 2 is enlarged. Pereopod 4 coxa is larger than that of pereopod 3 in melitids.

Distribution. Cosmopolitan.

Gammaroporeiidae Bousfield, 1978

Type genus. *Gammaroporeia* Bousfield, 1978.

Diagnostic description. Body laterally compressed. Eyes small, round. Antennae 1–2 calceoli absent. ***Antenna 1 longer than antenna 2***; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. ***Coxal gills*** on pereopods 2–6, ***not stalked***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; dissimilar in males and females (sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; ***propodus palm with peg-like robust setae along palmar margin***. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa with small anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute or shorter than exopod. ***Telson moderately cleft***; dorsal or lateral robust setae absent; ***apical robust setae absent***.

Habitat. Marine, estuarine, epigean.

Included genera. *Gammaroporeia* Bousfield, 1978.

Distribution. Alaska.

Hadziidae S. Karaman, 1943

Type genus. *Hadzia* S. Karaman, 1932.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturating; palp symmetrical or absent. Maxilla 1 basal endite setose along medial margin; palps symmetrical. ***Labium inner lobes vestigial or absent***. ***Pereonites stalked (with proximal restriction or complete suture)***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. *Gnathopod 1* subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than gnathopod 2; propodus palm with peg-like robust setae along palmar margin or without robust setae along palmar margin. ***Gnathopod 2*** subchelate; ***similar in males and females (not sexually dimorphic)***; carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae or without dorsal setae. ***Uropod 1 with 1 or 2 basofacial robust setae***. Uropod 3 not sexually dimorphic; biramous; endopod minute or shorter than exopod or subequal to exopod. ***Telson deeply cleft***; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Freshwater, marine, epigean and hypogean.

Remarks. Hadziids and melitids have traditionally been considered as separate family level groups. We find it difficult to separate them because of so much character state overlap even though we can see the 'jizz'. But they

may separate on the palm of gnathopod 2 which appears to have a double row of robust setae in hadziids and not in melitids. We leave them as separate. *Psammoniphargus* Ruffo, 1956 is an odd genus with a vestigial mandibular palp. It has been considered as a hadziid. However it is very similar to eriopisids except that it has no inner lobes on the labium, even though the second article on the outer ramus of uropod 3 can be interpreted as long, common in the eriopisids. The other problem is that *Psammoniphargus* has sexually dimorphic second gnathopods – not a eriopisid character. It's a mystery and remains as a provisional hadziid. *Zhadia*, Lowry & Fenwick, 1983 moved to Maeridae.

Included genera. *Allotexiweckelia* Holsinger, 1980; *Alloweckelia* Holsinger & Peck, 1968; *Bahadzia* Holsinger, 1985; *Caribdzia* Stock, 1985; *Croidzia* Stock, 1985; *Dulzura* J.L. Barnard, 1969b; *Guadzia* Stock, 1985; *Hadzia* S. Karaman, 1932; *Hispadzia* Stock, 1985; *Holsingerius* Barnard & Karaman, 1982; *Indoweckelia* Holsinger & Ruffo, 2002; *Jamadzia* Stock, 1985; *Liagoceradocus* J.L. Barnard, 1965; *Mayaweckelia* Holsinger, 1977; *Metahadzia* Stock, 1977; *Metaniphargus* Stephensen, 1933a; *Mexiweckelia* Holsinger & Minckley, 1971; *Paramexiweckelia* Holsinger, 1982; *Paraweckelia* Shoemaker, 1959; *Protohadzia* Zimmerman & Barnard, 1977; *Psammoniphargus* Ruffo, 1956; *Radoweckelia* Stock, 1985; *Saliweckelia* Stock, 1977; *Texiweckelia* Holsinger, 1980; *Texiweckeliopsis* Barnard & Karaman, 1982; *Tuluweckelia* Holsinger, 1990; *Weckelia* Shoemaker, 1942; *Zombiweckelia* Stock, 1985.

Distribution. Cosmopolitan.

Maeridae Krapp-Schickel, 2008a (Lowry & Hughes, 2009)

Type genus. *Maera* Leach, 1814.

Diagnostic description. ***Body laterally compressed or subcylindrical***. Eyes well developed or absent, if present then round, ovoid, reniform, lageniform or subrectangular. ***Antennae 1–2 calceoli absent.*** Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 longer than article 3; ***article 3 shorter than article 1***; peduncular articles 1–2 not geniculate; accessory flagellum long, short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical or absent. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Labium inner lobes present, vestigial or absent. ***Coxal gills*** *on pereopods* 2–6, ***not stalked***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; ***similar in males and females (not sexually dimorphic)***; smaller (or weaker) than or similar in size to gnathopod 2; ***propodus palm without robust setae along palmar margin***. Gnathopod 2 ***Gnathopod 1*** subchelate; **dis*similar in males and females (sexually dimorphic)***; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa with posteroventral lobe or with large anteroventral lobe or with small anteroventral lobe or without lobes. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–3 free***; with or without slender or robust dorsal setae. ***Urosomite 1 without large distoventral robust seta***. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae or without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. ***Uropod 3*** sexually dimorphic or not; ***biramous***, without plumose setae; ***endopod shorter than or subequal to exopod***. ***Telson deeply cleft to entire***; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Included genera. *Anamaera* Thomas & Barnard, 1985a; *Anelasmopus* Oliveira, 1953; *Animoceradocus* G. Karaman, 1984d; *Austromaera* Lowry & Springthorpe, 2005; *Bathyceradocus* Pirlot, 1934; *Beaudettia* J.L. Barnard, 1965; *Ceradocoides* Nicholls, 1938; *Ceradocopsis* Schellenberg, 1926; *Ceradocus* Costa, 1853; *Ceradomaera* Ledoyer, 1973; *Clessidra* Krapp-Schickel & Vader, 2009; *Coxomaerella* G. Karaman, 1981c; *Dumosus* Thomas & Barnard, 1985b; *Elasmopoides* Stebbing, 1908; *Elasmopus* Costa, 1853; *Glossomaera* Krapp-Schickel, 2009; *Hamimaera* Krapp-Schickel, 2008a; *Hoho* Lowry & Fenwick, 1983; *Ifalukia* J.L. Barnard, 1972a; *Jerbarnia* Croker, 1971; *Linguimaera* Pirlot, 1936; *Lupimaera* Barnard & Karaman, 1982; *Maera* Leach, 1814; *Maeracoota* Myers, 1997; *Maerella* Chevreux, 1911b; *Maeropsis* Chevreux, 1919; *Mallacoota* J.L. Barnard, 1972a; *Megaceradocus* Mukai, 1979; *Metaceradocoides* Birstein & Vinogradov, 1960; *Meximaera* J.L. Barnard,

1969c; *Othomaera* Krapp-Schickel, 2000; *Paraceradocus* Stebbing, 1899b; *Parapherusa* Haswell, 1879b; *Parelasmopus* Stebbing, 1888; *Pseudelasmopus* Ledoyer, 1978; *Quadrimaera* Krapp-Schickel & Ruffo, 2000; *Quadrivisio* Stebbing, 1907; *Ruffomaera* Krapp-Schickel, 2008b; *Saurodocus* Yerman & Krapp-Schickel, 2008; *Spathiopus* Thomas & Barnard, 1985a; *Thalassostygius* Vonk, 1990; *Wimvadocus* Krapp-Schickel & Jarrett, 2000; *Zhadia*, Lowry & Fenwick, 1983; *Zygomaera* Krapp-Schickel, 2000.

Habitat. Marine, epigean.

Remarks. Maeridae is very similar to Hadziidae. They are separated by the coxal gills which are stalked in hadziids. Maeridae is also very similar to Melitidae. They are separated by the head shape of lateral cephalic lobe; gnathopod 1 with robust setae along palm; the form of the first and second uropods and the inner ramus of uropod 3.

Distribution. Cosmopolitan.

Melitidae Bousfield, 1973

Type genus. *Melita* Leach, 1814.

Diagnostic description. Body laterally compressed. Eyes well developed, poorly developed or absent, if present then round, ovoid or reniform. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 or 2–3 not geniculate; accessory flagellum long, short or minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative, non-triturative or with tiny triturating patch; palp symmetrical. Maxilla 1 inner plate setose along medial margin; palp symmetrical. Maxilla 2 with or without oblique setal row. ***Labium inner lobes present***. Coxal gills number and sequence [not known], stalked (with or without proximal restriction or complete suture) or not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than gnathopod 2, or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and carpus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large or small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae***. Uropod 1 with or without basofacial robust seta (robust or simple). Uropod 3 not sexually dimorphic; biramous; inner ramus minute. ***Telson deeply cleft***; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Freshwater, marine, hypogean, epigean.

Included genera. *Abludomelita* Karaman, 1981b; *Allomelita* Stock, 1984a; *Alsacomelita* Karaman, 1984e; *Anamaera* Thomas & Barnard, 1985; *Anchialella* J.L. Barnard, 1979; *Brachina* Barnard & Williams, 1995; *Caledopisa* Stock & Iliffe, 1995; *Carnarimelita* Bousfield, 1990; *Cottarellia* Ruffo, 1994; *Desdimelita* Jarrett & Bousfield, 1996; *Dulichiella* Stout, 1912; *Galapsiellus* J.L. Barnard, 1976; *Josephosella* Ruffo, 1985; *Megamoera* Bate, 1862; *Melita* Leach, 1814; *Melitoides* Gurjanova, 1934; *Nainaloa* Karaman & Barnard, 1979; *Nurina* Bradbury & Eberhard, 2000; *Quasimelita* Jarrett & Bousfield, 1996; *Rotomelita* J.L. Barnard, 1977; *Sriha* Stock, 1988 (new name for *Quadrus* Karaman, 1984e); *Tegano* Barnard & Karaman, 1982; *Verdeia* Lowry & Springthorpe, 2007.

Distribution. Cosmopolitan.

Metacrangonyctidae Boutin & Messouli, 1988b

Type genus. *Metacrangonyx* Chevreux, 1909.

Diagnostic description. Body laterally compressed. Eyes absent. Antennae 1–2 calceoli absent. ***Antenna 1 longer than antenna 2***; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3;

article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. ***Maxilla 1 basal endite setose along medial margin***; palps symmetrical. Maxilla 2 basal endite with oblique setal row. ***Pereonites stalked (with proximal restriction or complete suture)***; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; ***smaller (or weaker) than gnathopod 2***; propodus palm with row or rows of simple or bifid robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic or not); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posteroventral lobe or with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous or uniramous, without plumose setae; endopod minute. ***Telson emarginate or entire***; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Freshwater, hypogean.

Included genera. *Afrocrangonyx* Karaman, 1981a; *Metacrangonyx* Chevreux, 1909; *Longipodacrangonyx* Boutin & Messouli, 1988a; *Pygocrangonyx* Karaman & Barnard, 1979.

Distribution. Morocco.

Nuuanuidae fam. nov.

Type genus. *Nuuanu* J.L. Barnard, 1970.

Diagnostic description. Body laterally compressed. Eyes well developed, poorly developed or absent, if present then round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 geniculate or not; accessory flagellum short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; ***propodus palm with single row of simple robust setae along palmar margin***. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae***. Uropod 1 with 1 or 2 basofacial robust setae. Uropod 3 not sexually dimorphic; biramous; endopod minute or shorter than exopod. Telson deeply cleft; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Marine, epigean.

Included genera. *Gammarella* Bate, 1857; *Nuuanu* J.L. Barnard, 1970.

Remarks. In addition to the diagnostic characters mentioned above nuuanuids differ from melitids based on the shape of the coxae and the enlarged basis of pereopods 5 to 7.

Distribution. Cosmopolitan.

Superfamily Calliopioidea Sars, 1895b stat. nov.

Diagnosis. Antenna 1 shorter than antenna 2. Uropod 1 peduncle without basofacial robust seta.

Included families (4 families)**.** Calliopiidae Sars, 1895b; Cheirocratidae d'Udekem d'Acoz, 2010**;** Hornelliidae d'Udekem d'Acoz, 2010; Pontogeneiidae Stebbing, 1906.

Calliopiidae Sars, 1895b

Type genus. *Calliopius* Lilljeborg, 1865.

Diagnostic description. Body laterally compressed. Eyes well developed, round, ovoid, reniform, subrectangular or occupying most of lateral surface of head. ***Antennae 1–2 calceoli pontogeneiid (type 4)***. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present minute or scale-like. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Labium inner lobes present, vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple or subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm with row or rows of simple or bifid robust setae or with one to several simple or bifid robust setae, or without robust setae along palmar margin. Gnathopod 2 simple or subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or without posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa equilobate or with posteroventral lobe or with posterodorsal lobe or with large anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3, pleonites 1–2 each with carina or each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with or without plumose setae; endopod subequal in length to, or longer than exopod. ***Telson notched, emarginate or entire***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, freshwater, epigean.

Included genera. *Amphithopsis* Boeck, 1861; *Apherusa* Walker, 1891; *Bouvierella* Chevreux, 1900q; *Calliopiella* Schellenberg, 1925; *Calliopiurus* Bushueva, 1986; *Calliopius* Lilljeborg, 1865; *Cleippides* Boeck, 1871; *Domicola* Pretus & Abello 1993; *Frigora* Ren, 1991; *Halirages* Boeck, 1871; *Haliragoides* Sars, 1895b; *Harpinioides* Stebbing, 1888; *Laothoes* Boeck, 1871; *Leptamphopus* Sars, 1895b; *Lopyastis* Thurston, 1974; *Lutriwita* Lowry & Myers, 2012; *Manerogeneia* Barnard & Karaman, 1987; *Membrilopus* Barnard & Karaman, 1987; *Metaleptamphopus* Chevreux, 1911a; *Oligochinus* J.L. Barnard, 1969b; *Oradarea* Walker, 1903; *Paracalliopiella* Tzvetkova & Kudrjaschov, 1975; *Pontogeneoides* Nicholls,1938; *Rozinante* Stebbing, 1894; *Stenopleura* Stebbing, 1888; *Stenopleuroides* Birstein & Vinogradov, 1964; *Tylosapis* Thurston, 1974; *Weyprechtia* Stuxberg, 1880.

Distribution. Cosmopolitan.

Cheirocratidae d'Udekem d'Acoz, 2010

Type genus. *Cheirocratus* Norman, 1867

Diagnostic description. Body laterally compressed or subcylindrical. Eyes round. Antennae 1–2 calceoli absent. **Antenna 1 shorter than peduncle of antenna 2**; peduncular article 1 shorter than article 2, or subequal to article 2, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; peduncular articles 2–3 not geniculate; accessory flagellum present; short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 inner plate setose along medial margin; palp symmetrical. Maxilla 2 with oblique setal row. Labium inner lobes present. Pereonites coxal gills on pereonites 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple, carpochelate, weakly subchelate, subchelate or parachelate; similar in males and females (not sexually dimorphic), or dissimilar in males and females (sexually dimorphic); smaller or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 simple or subchelate; similar or dissimilar in males and females (sexually dimorphic or not), carpus not produced along posterior margin of propodus, projecting between merus and carpus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small

posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posteroventral lobe or with posterodorsal lobe or with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with or without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae***. Uropod 1 without basofacial robust seta (robust or simple). ***Uropod 3*** not sexually dimorphic; ***biramous***, without plumose setae; ***inner ramus subequal to outer ramus***. ***Telson deeply cleft***; dorsal or lateral robust setae present, or absent; apical robust setae present or absent.

Habitat. Marine, epigean.

Included genera. *Casco* Shoemaker, 1930; *Cheirocarpochela* Ren & Andres, 2006; *Cheirocratella* Stephensen, 1940; *Cheirocratus* Norman, 1867; *Degocheirocratus* G. Karaman, 1985a; *Incratella* Barnard & Drummond, 1982; *Prosocratus* Barnard & Drummond, 1982.

Distribution. Cosmopolitan.

Hornelliidae d'Udekem d'Acoz, 2010

Type genus. *Hornellia* Walker, 1904.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes well developed, round, reniform or subrectangular. ***Antennae 1–2 calceoli absent***. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 shorter than or subequal to article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. ***Maxilla 1 basal endite setose along medial margin***; palps symmetrical. Maxilla 2 basal endite with oblique setal row. ***Coxal gills*** on pereopods 2–6, ***not stalked***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; subchelate; similar in males and females (not sexually dimorphic); ***smaller (or weaker) than gnathopod 2***; propodus palm without robust setae along palmar margin. Gnathopod 2 similar or in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. ***Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe***. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae (check). Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with or without basofacial robust setae. ***Uropod 3*** sexually dimorphic or not; ***biramous***, with or without plumose setae; ***endopod subequal in length to exopod***. ***Telson deeply to weakly cleft***; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Habitat. Marine, epigean.

Included genera. *Hornellia* Walker, 1904; *Metaceradocus* Chevreux, 1925.

Remarks. d'Udekem d'Acoz (2010) believes that hornelliids are related to liljeborgiids and megaluropods, but these groups do not belong in the senticaudates. For us hornelliids are more similar to cheirocratids.

Distribution. Cosmopolitan**.**

Pontogeneiidae Stebbing, 1906

Type genus. *Pontogeneia* Boeck, 1871.

Diagnostic description. Body laterally compressed. Eyes well developed, round, ovoid, reniform or occupying most of lateral surface of head. ***Antennae 1–2 calceoli pontogeneiid (type 4)***. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present minute or scale-like. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 2–6, not stalked; sternal gills present or sternal gills absent, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or

weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus slightly produced or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with posteroventral lobe or with large anteroventral lobe or with small anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 biramous, with or without plumose setae; endopod shorter than or subequal to exopod. ***Telson deeply to weakly cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Abdia* Barnard & Karaman, 1987; *Accedomoera* J.L. Barnard, 1964; *Antarctogeneia* Thurston, 1974; *Atyloella* Schellenberg, 1929c; *Awacaris* Uéno, 1971; *Bathyschraderia* Dahl, 1959; *Bovallia* Pfeffer, 1888; *Dautzenbergia* Chevreux, 1900; *Djerboa* Chevreux, 1906b; *Dolobrotus* Bowman, 1974; *Eurymera* Pfeffer, 1888; *Eusiroides* Stebbing, 1888; *Gondogeneia* J.L. Barnard, 1972a; *Haliogeneia* Lowry & Stoddart, 1998; *Inhaca* Ortiz, Berze-Freire & Wasikete, 1990; *Liouvillea* Chevreux, 1911a; *Luckia* Bellan-Santini & Thurston, 1996; *Nasageneia* Barnard & Karaman, 1987; *Paramoera* (*Ganigamoera*) Sidorov, 2010; *Paramoera* (*Moonamoera*) Staude, 1995; *Paramoera* (*Paramoera*) Miers, 1875; *Paramoera* (*Rhithromoera*) Staude, 1995; *Paramoerella* Ruffo, 1974a; *Pleusiroides* Ortiz, Lalana & Varela, 2007; *Pontogeneia* Boeck, 1871; *Prostebbingia* Schellenberg, 1926; *Pseudomoera* Schellenberg, 1929; *Pseudopontogeneia* Oldevig, 1959; *Relictomoera* Barnard & Karaman, 1991; *Ronco* J.L. Barnard, 1965; *Schraderia* Pfeffer, 1888 *Sternomoera* Barnard & Karaman, 1991; *Tethygeneia* J.L. Barnard, 1972a.

Remarks. We re-establish *Dolobrotus* based on the reversed antenna length and the lack of a serrated anteroventral corner on the head. In *Dolobrotus* antenna 2 is longer than antenna 1.

Distribution. Cosmopolitan.

Infraorder Bogidiellida Hertzog, 1936 stat. nov.

Diagnosis. Antenna 1 and 2 subequal in length. Maxilla 2 basal endite without oblique setal row. Coxal gills stalked. Gnathopod 1 larger than 2.

Included parvorder. Bogidiellidira Hertzog, 1936 **stat. nov.**

Parvorder Bogidiellidira Hertzog, 1936 stat. nov.

Diagnosis. As for infraorder.

Included superfamilies. Bogidielloidea Hertzog, 1936 **stat. nov.**

Superfamily Bogidielloidea Hertzog, 1936 (Bousfield, 1977)

Diagnosis. As for infraorder.

Included families (3 families)**.** Artesiidae Holsinger, 1980; Bogidiellidae Hertzog, 1936; Salentinellidae Bousfield, 1977.

Artesiidae Holsinger, 1980

Type genus. *Artesia* Holsinger, 1980.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to antenna 2; peduncular article 1 longer than article 2; article 2 longer than

article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar non-triturative or with tiny triturating patch; palp, symmetrical. ***Maxilla 1 basal endite without setae***; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills number and sequence [not known], stalked (with proximal restriction or complete suture); sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; dissimilar in males and females (sexually dimorphic); larger (or stouter) than gnathopod 2; ***larger (or stouter) than gnathopod 2***; propodus palm with peg-like robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic);carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae. Uropod 3 sexually dimorphic; biramous, with plumose setae or without plumose setae; endopod subequal in length to exopod. ***Telson deeply or moderately cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Artesia* Holsinger, 1980; *Spelaeogammarus* Da Silva Brum, 1975.

Remarks. Holsinger (1980) considered the artesiids and bogidiellids as sister-taxa. According to Holsinger (1980) artesiids 'differs from most other bogidiellids in having broader coxal plates (especially those of pereopods 5 and 6), broadened basis of pereopod 7, unreduced pleopods (although the number of segments in the rami is low when compared with many other gammaridan genera), urosomites with dorsal spines, setae on the margins of the rami of uropod 3, and deeply cleft telson'.

Distribution. Texas, southern United States. Brazil.

Bogidiellidae Hertzog, 1936

Type genus. *Bogidiella* Hertzog, 1933.

Diagnostic description. ***Body subcylindrical or vermiform***. Eyes, well developed or absent, if present then subrectangular. Antennae 1–2 calceoli absent. ***Antenna 1*** subequal in length or longer than antenna 2; peduncular article 1 shorter than, subequal in length to or longer than article 2; article 2 longer than article 3; ***article 3 shorter than article 1***; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present if present short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp, symmetrical. Maxilla 1 basal endite apically setose or without setae; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills on pereopods 2–6, stalked (with proximal restriction or complete suture) or not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple or subchelate; similar in males and females (not sexually dimorphic); similar in size to or larger (or stouter) than gnathopod 2; ***propodus palm with one to several simple or bifid robust setae along palmar margin***. Gnathopod 2 simple or subchelate; dissimilar in males and females (sexually dimorphic); similar in males and females (not sexually dimorphic); carpus strongly produced along posterior margin of propodus or slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posterodorsal lobe or with large anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. ***Urosomite 1 without large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 with or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod shorter than exopod or subequal to exopod. ***Telson moderately cleft, weakly cleft, notched, emarginate or entire***; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Habitat. Freshwater, hypogean.

Included genera. *Actogidiella* Stock, 1981; *Aequigidiella* Botosaneanu & Stock, 1989; *Afridiella* Karaman & Barnard, 1979; *Antillogidiella* Stock, 1981; *Arganogidiella* Koenemann & Holsinger, 1999; *Argentinogidiella* Koenemann & Holsinger, 1999; *Aurobogidiella* G. Karaman, 1988b; *Bermudagidiella* Koenemann & Holsinger, 1999; *Bogidiella* Hertzog, 1933; *Bogidomma* Bradbury & Williams, 1996; *Bollegidia* Ruffo, 1974a; *Cabodigiella*

Stock & Vonk, 1992; *Dycticogidiella* Grosso & Claps, 1985; *Eobogidiella* Karaman, 1981d; *Fidelidiella* Jaume, Gràcia & Boxshall, 2007; *Glyptogidiella* Vonk & Jaume, 2010; *Grossogidiella* Koenemann & Holsinger, 1999; *Guagidiella* Stock, 1981; *Hebraegidiella* G. Karaman, 1988a; *Indogidiella* Koenemann & Holsinger, 1999; *Maghrebidiella* Diviacco & Ruffo, 1985; *Marigidiella* Stock, 1981; *Marinobogidiella* G. Karaman, 1981d; *Medigidiella* Stock, 1981; *Megagidiella* Koenemann & Holsinger, 1999; *Mesochthongidiella* Grosso & Fernandez, 1985; *Mexigidiella* Stock, 1981; *Nubigidiella* G. Karaman, 1988a; *Omangidiella* Iannilli, Holsinger, Ruffo & Vonk, 2006; *Orchestigidiella* Stock, 1981; *Parabogidiella* Holsinger, 1980; *Patagongidiella* Grosso & Fernández, 1993; *Racovella* Jaume, Gràcia & Boxshall, 2007; *Stockigidiella* Iannilli, Holsinger, Ruffo & Vonk, 2006; *Stygogidiella* Stock, 1981; *Xystriogidiella* Stock, 1984b.

Distribution. Cosmopolitan.

Salentinellidae Bousfield, 1977

Type genus. *Salentinella* Ruffo, 1947.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. ***Antennae 1–2 calceoli absent***. Antenna 1 shorter than or subequal in length to antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp, symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills number and sequence [not known], not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple, weakly subchelate or subchelate; smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 simple or subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 subequal in length to pereopod 6; coxa equilobate or with posteroventral lobe. ***Pereopod 7 subequal in length to pereopod 5***. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous or uniramous, without plumose setae; endopod shorter than exopod. Telson deeply cleft to entire; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Freshwater or slightly brackish, hypogean.

Included genera. *Parasalentinella* Bou, 1971; *Salentinella* Ruffo, 1947.

Distribution. Balkans to Southern France, Spain and Morocco.

Infraorder Gammarida Latreille, 1802 stat. nov.

Diagnosis. Antenna 2 peduncular article 1 bulbous. Labium without inner plates.

Included parvorders. Crangonyctidira Bousfield, 1973 **stat. nov.**; Gammaridira Latreille, 1802 **stat. nov.**

Parvorder Crangonyctidira Bousfield, 1973 stat. nov.

Diagnosis. Maxilla 1 ischial endite setose apically. Coxal gills stalked. Uropod 3 endopod minute or absent.

Included superfamilies. Allocrangonyctoidea Holsinger, 1989 **stat. nov.**; Crangonyctoidea Bousfield, 1973.

Superfamily Allocrangonyctoidea Holsinger, 1989 stat. nov.

Diagnosis. Urosomite 1 without distoventral robust seta.

Included families. Allocrangonyctidae Holsinger, 1989; Crymostygiidae Kristjansson & Svavarsson, 2004; Dussartiellidae Lowry & Myers, 2012; Kergueleniolidae **fam. nov.**; Pseudoniphargidae Karaman, 1993.

Allocrangonyctidae Holsinger, 1989

Type genus. *Allocrangonyx* Schellenberg, 1936.

Diagnostic description. Body subcylindrical. Eyes absent. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 subequal to article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters present or absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than gnathopod 2; propodus palm with row or rows of simple or bifid robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. ***Pereopod 5*** shorter than pereopod 6; ***coxa with large anteroventral lobe***. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae. Uropod 3 sexually dimorphic; biramous, without plumose setae; endopod minute. ***Telson notched***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Allocrangonyx* Schellenberg, 1936.

Distribution. USA.

Crymostygiidae Kristjánsson & Svavarsson, 2004

Crymostygidae (*sic*) Kristjánsson & Svavarsson, 2004: 188.

Type genus. *Crymostygius* Kristjánsson & Svavarsson, 2004.

Diagnostic description. Body subcylindrical. Eyes poorly developed. Antennae 1–2 calceoli absent. Antenna 1 slightly longer than antenna 2; peduncular article 1 slightly longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills number and sequence [not known], stalked (with proximal restriction or complete suture) or stalked (without proximal restriction); ***sternal gills present***, simple; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in size to gnathopod 2; ***propodus palm with row or rows of simple or bifid robust setae along palmar margin***. Gnathopod 2 subchelate; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites*** 1–3 free; ***with slender or robust dorsal setae***. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3 biramous***, without plumose setae; endopod minute. Telson entire; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Crymostygius* Kristjánsson & Svavarsson, 2004.

Distribution. Iceland.

Dussartiellidae Lowry & Myers, 2012

Type genus. *Dussartiella* Ruffo, 1979.

Diagnostic description. ***Body subcylindrical.*** Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged,

bulbous. Mandible molar triturative; palp symmetrical. ***Maxilla 1 basal endite apically setose*; *palps asymmetrical***. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–7, stalked (with proximal restriction or complete suture); sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–3 free***; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute. ***Telson entire***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Dussartiella* Ruffo, 1979; *Reinhardia* Iannilli, Krapp & Ruffo, 2011.

Distribution. Madagascar.

Kergueleniolidae fam. nov.

Type genus. *Kergueleniola* Ruffo, 1974b.

Diagnostic description. ***Body vermiform***. Eyes absent. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; peduncular articles 1–2 not geniculate; accessory flagellum present. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar present; palp symmetrical. ***Maxilla 1 basal endite apically setose***; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills on pereopods 2–6, stalked (with proximal restriction or complete suture) or not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. ***Pereopod 5 coxa with small anteroventral lobe***. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1, large distoventral robust seta [unknown]. Uropod 1 without basofacial robust setae. ***Uropod 3*** biramous, without plumose setae; ***endopod subequal in length to exopod***. ***Telson moderately cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Freshwater, epigean.

Included genera. Kergueleniolidae includes 1 genus: *Kergueleniola* Ruffo, 1974b.

Remarks. Koenemann & Holsinger (1999) expelled *Kergueleniola* from the Bogidiellidae because it had: cleft telson without robust setae; pleopods 1–3 with subequal, 1–articulate rami; gnathopod 1 carpus without distal lobe; and mandibular palp with row of subapical setae (C-setae). They listed other character differences such as; 'the unusually shaped palp of the maxilliped, the long, rounded epimeral plates, and the armature and shape of the mandibles and uropods'. For us the kergueleniolids form a distinct family-level taxon based on the vermiform body with discontiguous coxae, subequal rami on uropod 3 and moderately cleft telson.

Distribution. Kerguelen Island.

Pseudoniphargidae G. Karaman, 1993

Type genus. *Pseudoniphargus* Chevreux, 1901.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present.

Coxal gills number and sequence [not known], ***stalked (without proximal restriction)***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; dissimilar in males and females (sexually dimorphic); ***smaller (or weaker) than gnathopod 2***; propodus palm with row or rows of simple or bifid robust setae along palmar margin (reduced in size). Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. ***Urosomite 1 without large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 with or without basofacial robust setae. ***Uropod 3*** sexually dimorphic (*adriaticus* group) or not; biramous, without plumose setae; ***endopod minute***. Telson notched, emarginate or entire; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Parapseudoniphargus* Notenboom 1988; *Pseudoniphargus* Chevreux, 1901.

Remarks. G. Karaman (1993) does not strictly follow the ICZN rules for establishing this family, in that he does not specifically state that it is a new family, but he does give a type genus and indicates that it is monotypic. We therefore attribute authorship of the family to G. Karaman (1993).

Distribution. Mediterranean region and Canary Islands.

Superfamily Crangonyctoidea Bousfield, 1973

Diagnosis. Urosomite 1 with distoventral robust seta.

Included families (14 families)**.** Austroniphargidae Iannilli, Krapp & Ruffo, 2011; Chillagoeidae Lowry & Myers, 2012; Crangonyctidae Bousfield, 1973; Giniphargidae Lowry & Myers 2012; Kotumsaridae Messouli, Holsinger & Reddy, 2007; Neoniphargidae Bousfield, 1977; Niphargidae Bousfield, 1977; Paracrangonyctidae Bousfield, 1983; Paramelitidae Bousfield, 1977; Perthiidae Williams & Barnard, 1988; Pseudocrangonyctidae Holsinger, 1989; Sandroidae Lowry & Myers, 2012; Sternophysingidae Holsinger, 1992; Uronyctidae Lowry & Myers, 2012.

Austroniphargidae Iannilli, Krapp & Ruffo, 2011

Type genus. *Austroniphargus* Monod, 1925.

Diagnostic description. Body laterally compressed. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical or asymmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–7 or on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe. Pereopod 5 subequal in length to pereopod 6; coxa with posterodorsal lobe. Pereopod 7 subequal in length to pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–3 coalesced***; without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous or uniramous, without plumose setae; endopod minute. ***Telson weakly cleft, notched, emarginate or entire***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Austroniphargus* Monod, 1925; *Libertinia* Iannilli, Krapp & Ruffo, 2011; *Davidia* Iannilli, Krapp & Ruffo, 2011.

Distribution. Madagascar.

Chillagoeidae Lowry & Myers, 2012

Type genus. *Chillagoe* Barnard & Williams, 1995.

Diagnostic description. Body laterally compressed. Eyes absent. ***Antennae 1–2 calceoli crangonyctoid (type 9)***. Antenna 1 subequal in length or longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, stalked (without proximal restriction) or not stalked; sternal gills present, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod subchelate; 1 similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; 1 similar in males and females (not sexually dimorphic); carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae***. Uropod 1 with 1 or 2 basofacial robust setae. Uropod 3 not sexually dimorphic; uniramous, without plumose setae. Telson deeply cleft; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Chillagoe* Barnard & Williams, 1995.

Distribution. Tropical Australia.

Crangonyctidae Bousfield, 1973

Type genus. *Crangonyx* Bate, 1859.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes well developed or absent, if present then round, ovoid or subrectangular. ***Antennae 1–2 calceoli crangonyctoid* (*type 9*)**. Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. ***Maxilla 2 basal endite with oblique setal row***. Labium inner lobes present. Coxal gills number and sequence [not known], stalked (with proximal restriction or complete suture); sternal gills present, simple; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; ***propodus palm with row or rows of simple or bifid robust setae along palmar margin***. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe***. Pereopod 5 shorter than, subequal in length to, or longer than pereopod 6; coxa with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 shorter than, subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. ***Urosomite 2 without dorsal setae***. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, uniramous or rami absent, without plumose setae; endopod minute or shorter than exopod. Telson moderately cleft, notched, emarginate or entire; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean and epigean.

Included genera. *Bactrurus* Hay, 1902; *Crangonyx* Bate, 1859; *Lyurella* Derzhavin, 1939; *Pachypodacrangonyx* Boutin & Coineau, 1987; *Stygobromus* Cope, 1872; *Stygonyx* Bousfield & Holsinger, 1989; *Synurella* Wrzesniowski, 1877.

Distribution. Holarctic.

Giniphargidae Lowry & Myers 2012

Type genus. *Giniphargus* Williams & Barnard, 1988.

Diagnostic description. Body subcylindrical or vermiform. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 shorter than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar absent; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes present. ***Coxal gills on pereopods*** 2–6; ***sternal gills present***, simple; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; ***propodus palm without robust setae along palmar margin***. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. ***Pereopod 5*** shorter than pereopod 6; ***coxa with posterodorsal lobe***. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; uniramous, without plumose setae. Telson moderately cleft; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, ? hypogean.

Included genera. *Giniphargus* Williams & Barnard, 1988.

Distribution. Temperate Australia.

Kotumsaridae Messouli, Holsinger & Reddy, 2007

Type genus. *Kotumsaria* Messouli, Holsinger & Reddy, 2007.

Diagnostic description. Body subcylindrical. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 slightly longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum absent. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. ***Coxal gills on pereopods*** 2–6, stalked (with proximal restriction or complete suture); ***sternal gills present***, simple; sternal blisters absent. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); ***larger (or stouter) than gnathopod 2***; propodus palm with single row of simple robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. ***Pereopod 5*** shorter than pereopod 6; ***coxa without lobes***. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute. Telson entire; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Kotumsaria* Messouli, Holsinger & Reddy, 2007.

Remarks. Messouli *et al*. (2007) alluded to the possibility that kotumsarids might be crangonyctidirans and our phylogenetic results indicate they are.

Distribution. India.

Neoniphargidae Bousfield, 1977

Type genus. *Neoniphargus* Stebbing, 1899b.

Diagnostic description. Body laterally compressed. Eyes well developed or absent, if present then reniform. ***Antennae 1–2 calceoli crangonyctoid (type 9)***. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 shorter or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. ***Antenna 2 peduncular article 1 enlarged, bulbous***. ***Mandible molar triturative***; palps symmetrical. Maxilla 1 basal endite apically setose; palp present, asymmetrical (slight, in the apical setae). Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills number and sequence [not known], stalked (with proximal restriction or complete suture); ***sternal gills present***, simple or dendritic; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic or not); carpus slightly produced or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or small posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa equilobate or with posteroventral lobe or with small anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. **Urosomite 2 without dorsal setae**. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with plumose setae or without plumose setae; endopod minute or shorter than exopod. **Telson deeply cleft**, moderately cleft, weakly cleft or notched; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Jasptorus* Bradbury & Williams, 1997; *Neocrypta* Bradbury & Williams, 1997; *Neoniphargus* Stebbing, 1899b; *Tasniphargus* Williams & Barnard, 1988; *Wesniphargus* Williams & Barnard, 1988; *Wombeyanus* Bradbury & Williams, 1997; *Yulia* Williams & Barnard, 1988.

Remarks. There is not much to separate Neoniphargidae from Perthiidae. Based on our analysis: maxilla 1 palp is slightly asymmetrical (symmetrical in Perthiidae) and coxal gills are stalked (not stalked in Perthiidae). Another good character may be the mandibular molar which is triturating in neoniphargids (not in perthiids).

Distribution. Temperate Australia.

Niphargidae Bousfield, 1977

Type genus. *Niphargus* Schiödte, 1849

Diagnostic description. Body laterally compressed, subcylindrical or vermiform. Eyes absent. Antennae 1–2 calceoli absent. ***Antenna 1 longer than antenna 2***; peduncular article 1 longer than article 2; article 2 shorter than, subequal to, or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. ***Labium inner lobes present***. ***Coxal gills*** number and sequence [not known], ***stalked (with proximal restriction or complete suture)***; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar or dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posterodorsal lobe or with large anteroventral lobe or with small anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae or without dorsal setae. ***Uropod 1 without basofacial robust setae***. Uropod 3 biramous or uniramous, with plumose setae or without plumose setae; endopod minute or shorter than exopod. ***Telson deeply cleft or moderately cleft***; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Habitat. Freshwater, hypogean.

Included genera. *Carinurella* Sket, 1971; *Foroniphargus* G. Karaman, 1985b; *Haploginglymus* Mateus & Mateus, 1958; *Micronipharg*us Schellenberg, 1934; *Niphargellus* Schellenberg, 1938; *Niphargobates* Sket, 1981; *Niphargopsis* Chevreux, 1922; *Niphargus* Schiödte, 1849; *Pontoniphargus* Dancau, 1970.

Distribution. Palaearctic**.**

Paracrangonyctidae Bousfield, 1983

Type genus. *Paracrangonyx* Stebbing, 1899b.

Diagnostic description. Body subcylindrical or vermiform. Eyes absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. ***Antennae 1–2 calceoli absent***. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose or without setae; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills on pereopods 2–6, stalked (without proximal restriction) or not stalked; ***sternal gills present***, simple; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); ***similar in size to gnathopod 2***; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous or uniramous, without plumose setae; endopod minute. ***Telson notched or entire***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Paracrangonyx* Stebbing, 1899b.

Distribution. New Zealand.

Paramelitidae Bousfield, 1977

Type genus. *Paramelita* Schellenberg, 1926

Diagnostic description. Body laterally compressed. Eyes well developed or absent, if present then round, ovoid or reniform. ***Antennae 1–2 calceoli crangonyctoid (type 9)***. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Coxal gills on pereopods 2–6, stalked (without proximal restriction) or not stalked; sternal gills present or sternal gills absent, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar or dissimilar in males and females (sexually dimorphic or not); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic or not); carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posteroventral lobe or with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. ***Urosomite 2 with or with multiple slender setae across the somite***. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute or shorter than exopod. Telson deeply cleft, moderately cleft or entire; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean and hypogean.

Included genera. *Antipodeus* Williams & Barnard, 1988; *Aquadulcaris* Stewart & Griffiths, 1995; *Austrocrangonyx* Barnard & Karaman, 1984; *Austrogammarus* Barnard & Karaman, 1984; *Chydaekata* Bradbury, 2000; *Hurleya* Straškraba, 1966; *Kruptus* Finston, Johnson & Knott, 2008; *Mathamelita* Stewart & Griffiths, 1995; *Molina* Bradbury, 2000; *Paramelita* Schellenberg, 1926; *Pilbarus* Bradbury & Williams, 1997; *Protocrangonyx* Nicholls, 1926; *Totgammarus* Bradbury & Williams, 1995; *Toulrabia* Barnard & Williams, 1995.

Distribution. Australia, South Africa.

Perthiidae Williams & Barnard, 1988

Type genus. *Perthia* Straškraba, 1964.

Diagnostic description. Body laterally compressed. Eyes well developed, reniform. ***Antennae 1–2 calceoli crangonyctoid (type 9)***. Antenna 1 shorter than or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar non-triturative or with tiny triturating patch; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Coxal gills on pereopods 2–6, not stalked; sternal gills dendritic; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. ***Gnathopod 2*** subchelate; similar in males and females (not sexually dimorphic); ***carpus strongly produced along posterior margin of propodus***. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute or shorter than exopod. ***Telson deeply cleft***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Perthia* Straškraba, 1964.

Distribution. Temperate Australia.

Pseudocrangonyctidae Holsinger, 1989

Type genus. *Pseudocrangonyx* Akatsuka & Komai, 1922.

Diagnostic description. Body subcylindrical. Eyes well developed or absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antennae 1–2 calceoli absent. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp present, symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–7, stalked with proximal suture; ***sternal gills present***, simple; sternal blisters present or absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; propodus palm with peg-like robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–3*** free; ***with slender or robust dorsal setae***. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. ***Uropod 1 with 1 or 2 basofacial robust setae***. Uropod 3 sexually dimorphic; uniramous, without plumose setae. ***Telson notched, emarginate or entire***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Procrangonyx* Schellenberg, 1934; *Pseudocrangonyx* Akatsuka & Komai, 1922.

Distribution. North-eastern China, eastern Siberia (including the Kamchatka Peninsula), Korea and the Japanese Islands.

Sandroidae Lowry & Myers, 2012

Type genus. *Sandro* Karaman & Barnard, 1979.

Diagnostic description. Body laterally compressed. Eyes apparently absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 longer than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite without setae; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 3–7, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; carpus slightly produced along posterior margin of propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small posterodorsal lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites 1–3 coalesced***; ***with sparse slender or robust dorsal setae***. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 sexually dimorphic; biramous, without plumose setae; endopod minute. Telson deeply cleft; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Sandro* Karaman & Barnard, 1979.

Distribution. Madagascar.

Sternophysingidae Holsinger, 1992

Type genus. *Sternophysinx* Holsinger & Straškraba, 1973.

Diagnostic description. ***Body laterally compressed.*** Eyes absent. ***Antennae 1–2 calceoli crangonyctoid (type 9)***. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. ***Coxal gills*** on pereopods 2–6, ***stalked (with proximal restriction or complete suture); sternal gills present, simple;*** **sternal blisters** ***present***; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 with small posteroventral lobe***. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute. Telson notched or emarginate; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Sternophysinx* Holsinger & Straškraba, 1973.

Distribution. South Africa.

Uronyctidae Lowry & Myers, 2012

Type genus. *Uronyctus* Stock & Iliffe, 1990.

Diagnostic description. Body subcylindrical or vermiform. Eyes absent. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 shorter than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. **Antenna 2 peduncular article 1 enlarged, bulbous**. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. ***Coxal gills on pereopods*** 2–7, stalked (with proximal restriction or complete suture); ***sternal gills present***, simple; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; sexually dimorphic [not known]; ***smaller (or weaker) than gnathopod 2***; propodus palm with row or rows of simple or bifid robust setae along palmar margin. Gnathopod 2 subchelate; sexual dimorphism [not known]; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. ***Pereopod 5*** shorter than pereopod 6; ***coxa with posterodorsal lobe***. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. **Uropod 3** not sexually dimorphic; **uniramous**, without plumose setae. ***Telson moderately cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater hypogean.

Included genera. *Uronyctus* Stock & Iliffe, 1990.

Distribution. Temperate Australia.

Parvorder Gammaridira Latreille, 1802 stat. nov.

Diagnosis. Coxal gills unstalked. Sternal gills absent. Uropod 3 endopod well developed, shorter than exopod.

Included superfamilies. Gammaroidea Latreille, 1802.

Superfamily Gammaroidea Latreille, 1802 (Bousfield, 1977)

Diagnosis. As for parvorder.

Included families (20 families)**.** Acanthogammaridae Garjajev, 1901; Anisogammaridae Bousfield, 1977; Baikalogammaridae Kamaltynov, 2001; Bathyporeiidae d'Udekem d'Acoz, 2011; Behningiellidae Kamaltynov, 2001; Falklandellidae Lowry & Myers 2012; Gammaracanthidae Bousfield, 1989; Gammarellidae Bousfield, 1977; Gammaridae Latreille, 1802; Iphigenellidae Kamaltynov, 2001; Lucioblividae Tomikawa 2007; Macrohectopidae Sowinsky, 1915; Mesogammaridae Bousfield, 1977; Micruropodidae Kamaltynov, 1999; Pachyschesidae Kamaltynov, 1999; Pallaseidae Takhteev, 2000; Paraleptamphopidae Bousfield, 1983; Phreatogammaridae Bousfield, 1982a; Pontogammaridae Bousfield, 1977; Sensonatoridae Lowry & Myers, 2012; Typhlogammaridae Bousfield, 1978.

Acanthogammaridae Garjajev, 1901

Type genus. *Acanthogammarus* Stebbing, 1899b.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes well developed or absent, if present then round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar [not known]; palps symmetrical; 3–articulate. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. ***Maxilla 2 basal endite without oblique setal row***. Coxal gills on pereopods 2–7, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1***

subchelate; ***dissimilar in males and females (sexually dimorphic)***; subchelate; similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than pereopod 6 or subequal in length to pereopod 6; coxa equilobate or with posteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 each with or without dorsal carina or carinae. Pleopods well developed, biramous. ***Urosomites 1–3*** free; **without slender or robust dorsal setae**. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; biramous, ***with plumose setae***; ***endopod subequal in length to exopod***; exopod longer than peduncle, 1-articulate. Telson deeply cleft, moderately cleft or weakly cleft.

Included subfamilies. Abyssogammarinae Kamaltynov, 1999; Acanthogammarinae Garjajev, 1901; Carinogammarinae Takhteev, 2000; Eulimnogammarinae Kamaltynov, 1999; Hyalellopsinae Kamaltynov, 1999; Odontogammarinae Kamaltynov, 1999; Parapallaseinae Kamaltynov, 1999; Plesiogammarinae Kamaltynov, 1999; Poekilogammarinae Kamaltynov, 1999.

Habitat. Freshwater, epigean and hypogean.

Included genera. Acanthogammarinae includes 16 genera: *Acanthogammarus (Acanthogammarus)* Stebbing, 1899b; *Acanthogammarus (Ancyracanthus)* Kamaltynov, 2001; *Boeckaxelia* Schellenberg, 1940; *Brachyuropus* Stebbing, 1899b; *Brandtia* Bate 1862; *Carinurus* Sowinsky, 1915; *Cheirogammarus* Sowinsky, 1915; *Coniurus* Sowinsky, 1915; *Cornugammarus* Kamaltynov, 2001; *Dedyuola* Kamaltynov, 2001; *Diplacanthus* Kamaltynov, 2001; *Dorogammarus* Bazikalova, 1945; *Dorogostaiskia* Kamaltynov, 2001; *Eucarinogammarus* Sowinsky, 1915; *Issykogammarus* Chevreux, 1908 ; *Metapallasea* Bazikalova, 1959; *Oxyacanthus* Kamaltynov, 2001.

Carinogammarinae includes 9 genera: *Aspretus* Kamaltynov, 2001; *Asprogammarus* Bazikalova, 1975; *Carinogammarus* Stebbing, 1899b; *Echiuropus* (*Asprogammarus*) Bazikalova, 1975; *Echiuropus* (*Echiuropus*) Sowinsky, 1915; *Echiuropus* (*Smaragdogammarus*) Bazikalova, 1945 ; *Eremogammarus* Kamaltynov, 2001; *Pseudomicruropus* Bazikalova, 1961; *Smaragdogammarus* Bazikalova, 1975.

Eulimnogammarinae includes 1 genus: *Eulimnogammarus* Bazikalova, 1945.

Hyalellopsinae Kamaltynov, 1999 includes 2 genera: *Gammarosphaera* Bazikalova, 1936; *Hyalellopsis* Stebbing, 1899b.

Odontogammarinae Kamaltynov, 1999 includes 11 genera: *Bazikalovia* Takhteev, 2000; *Berchinia* Kamaltynov, 2001; *Heterogammarus* Stebbing, 1899b; *Lobogammarus* Bazikalova, 1945; *Macropereiopus* Sowinsky, 1915; *Odontogammarus* Stebbing, 1899b; *Ommatogammarus (Abludogammarus)* G. Karaman, 1980; *Ommatogammarus (Ommatogammarus)* Stebbing, 1899b; *Ommatogammarus (Pretiositus)* Kamaltynov, 2001; *Profundalia* Kamaltynov, 2001; *Tengisia* Kamaltynov, 2001.

Parapallaseinae Kamaltynov, 1999 includes 3 genera: *Ceratogammarus* Sowinsky, 1915; *Palicarinus* Barnard & Barnard, 1983; *Parapallasea* Stebbing, 1899b.

Plesiogammarinae Kamaltynov, 1999 includes 7 genera/subgenera: *Garjajewia* Sowinsky, 1915; *Koshovia* Bazikalova, 1975; *Paragarjajewia* Bazikalova, 1945; *Plesiogammarus (Plesiogammarus)* Stebbing, 1899b; *Plesiogammarus (Caecogammarus)* Kamaltynov, 2001; *Sentogammarus* Kamaltynov, 2001; *Supernogammarus* Kamaltynov, 2001.

Poekilogammarinae Kamaltynov, 1999 includes 8 genera/subgenera: *Bathygammarus* Bazikalova, 1945; *Gymnogammarus* Sowinsky, 1915; *Inobsequentus* Takhteev, 2000; *Nyctoporea* Kamaltynov, 2001; *Onychogammarus (Onychogammarus)* Sowinsky, 1915; *Onychogammarus (Variogammarus)* Takhteev, 1995; *Poekilogammarus* Stebbing, 1899b; *Rostrogammarus* Bazikalova, 1945.

Distribution. Lake Baikal.

Anisogammaridae Bousfield, 1977

Type genus. *Anisogammarus* Derzhavin, 1927.

Diagnostic description. Body laterally compressed. Eyes well developed, round, ovoid or reniform. ***Antennae 1–2 calceoli gammarid (type 1)***. Antenna 1 shorter than subequal in length to or longer than antenna 2; peduncular

article 1 subequal to or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. ***Coxal gills on pereopods 2–7***, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; propodus palm with peg-like robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or with small posteroventral lobe. ***Pereopod 5 shorter than pereopod 6***; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 pleonite 3 with or without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae (check). Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with pair of dorsal concavities each with 1–3 small setae or without dorsal setae***. Uropod 1 with or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute or shorter than exopod. ***Telson deeply or moderately cleft***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Annanogammarus* Bousfield, 1979; *Anisogammarus* Derzhavin, 1927; *Barrowgammarus* Bousfield, 1979; *Carineogammarus* Bousfield, 1979; *Eogammarus* Birstein, 1933; *Eurypodogammarus* Hou, Morino & Li, 2005; ? *Fuxiana* Sket, 2000; *Fuxigammarus* Sket & Fiser, 2009; *Jesogammarus* Bousfield, 1979; *Locustogammarus* Bousfield 1979; *Ramellogammarus* Bousfield, 1979; *Spasskogammarus* Bousfield, 1979; *Spinulogammarus* Tzvetkova, 1972.

Distribution. Eurasia.

Baikalogammaridae Kamaltynov, 2001

Type genus. *Baikalogammarus* Stebbing, 1899b.

Diagnostic description. Body laterally compressed. Eyes well developed, reniform. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 subequal to article 2; article 2 subequal to or slightly longer than article 3; article 3 slightly shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar [unknown]; palp symmetrical. Maxilla 1 and 2 [not known]. Coxal gills on pereopods 2–7, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod subchelate; 1 dissimilar in males and females (sexually dimorphic); smaller (or weaker) than gnathopod 2 or similar in size to gnathopod 2. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 with well developed posteroventral lobe***. Pleonites 1–3 without dorsal carinae. ***Urosomites*** 1–3 free; ***with slender or robust dorsal setae***. Uropod 3 not sexually dimorphic; biramous, with plumose setae; endopod shorter than exopod. ***Telson deeply cleft or moderately cleft***; dorsal or lateral robust setae absent; ***apical robust setae absent***.

Habitat. Freshwater, epigean.

Included genera. *Baikalogammarus* Stebbing, 1899b.

Distribution. Lake Baikal.

Bathyporeiidae d'Udekem d'Acoz, 2011

Type genus. *Bathyporeia* Lindstrom, 1855.

Diagnostic description. Body laterally compressed. Eyes present, well developed, reniform. Antennae 1–2 calceoli gammarid (type 1). ***Antenna 1 shorter than antenna 2***; peduncular article 1 longer than article 2; longer than article 3; shorter than article 1; ***peduncular articles 1–2 geniculate***; peduncular articles 2–3 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar non-triturative or with tiny triturating patch; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical.

Maxilla 2 basal endite without oblique setal row. Labium inner lobes present. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than gnathopod 2 or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with few plumose setae; endopod minute. Telson deeply cleft; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Marine, epigean.

Included genera. *Amphiporeia* Shoemaker, 1929; *Bathyporeia* Lindstrom, 1855.

Distribution. North Atlantic Ocean, Mediterranean and Black Seas.

Behningiellidae Kamaltynov, 2001

Type genus. *Behningiella* Derzhavin, 1948.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid or reniform. ***Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2***; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than gnathopod 2. Gnathopod 2 subchelate; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. ***Pereopod 5*** shorter than or subequal in length to pereopod 6; ***coxa equilobate or with posteroventral lobe***. Pereopod 7 subequal in length longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous***, without plumose setae; endopod shorter than, subequal to, or longer than exopod. ***Telson deeply cleft***.

Habitat. Marine, freshwater and semi-parasitic (Osadchikh 1977; Mordukhai-Boltovskoi *et al*. 1969), epigean.

Included genera. *Cardiophilus* Sars, 1896; *Behningiella* Derzhavin, 1948; *Zernovia* Derzhavin, 1948.

Distribution. Black and Caspian Seas, Volga River.

Falklandellidae Lowry & Myers 2012

Type genus. *Falklandella* Schellenberg, 1931.

Diagnostic description. Body laterally compressed. Eyes absent. ***Antennae 1–2 calceoli absent or gammarid (type 1)***. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2-6, not stalked; ***sternal gills present***, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with posteroventral lobe. Pereopod 7 longer than

pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod shorter than exopod. ***Telson emarginate or entire***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean and ?hypogean.

Included genera. *Falklandella* Schellenberg, 1931; *Osornodella* Pérez-Schultheiss, 2013; *Praefalklandella* Stock & Platvoet, 1991.

Distribution. Southern South America.

Gammaracanthidae Bousfield, 1989

Type genus. *Gammaracanthus* Bate, 1862.

Diagnostic description. Body laterally compressed. Eyes well developed, round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Coxal gills on pereopods 2–7, not stalked; sternal gills present or absent, if present simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than, similar in size to, or larger (or stouter) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa with large anteroventral lobe. ***Pereopod 7 shorter than pereopod 5***. ***Pleonites 1–3 each with dorsal carina or carinae***. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with plumose setae; endopod subequal in length to exopod. Telson moderately cleft or notched; dorsal or lateral robust setae absent; apical robust setae present or absent.

Habitat. Freshwater epigean.

Included genera. *Gammaracanthus* Bate, 1862; *Relictacanthus* Bousfield, 1989.

Distribution. Northern Europe including Caspian Sea.

Gammarellidae Bousfield, 1977

Type genus. *Gammarellus* Herbst, 1793.

Diagnostic description. Body laterally compressed. Eyes present, well developed, reniform or subrectangular. ***Antennae 1–2 calceoli gammarellid (type 6)***. ***Antenna 1 shorter than or subequal in length to antenna 2***; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present short or minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with or without oblique setal row. Labium inner lobes vestigial or absent. ***Coxal gills on pereopods 2–7***, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or with small posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa equilobate or with large anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 pleonite 3 with dorsal carina or each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with or without large

distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; biramous, with plumose setae or without plumose setae; ***endopod subequal in length to exopod***. Telson moderately cleft, notched, emarginate or entire; dorsal or lateral robust setae present, or absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Austroregia* J.L. Barnard, 1989; *Chosroes* Stebbing, 1888; *Gammarellus* Herbst, 1793; *Gondogeneia* J.L. Barnard, 1972a.

Remarks. Generic structure according to J.L. Barnard (1989).

Distribution. Cosmopolitan.

Gammaridae Latreille, 1802

Type genus. *Gammarus* J.C. Fabricius, 1775.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes present, well developed or absent, round or ovoid or reniform. ***Antennae 1–2 calceoli gammarid (type 1)***. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 shorter than, subequal to, or longer than article 2; article 2 shorter than, subequal to, or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum present or absent; if present short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes vestigial or absent. ***Coxal gills on pereopods 2–6***, stalked or not; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar or dissimilar in males and females (sexually dimorphic); smaller (or weaker) than, similar in size to gnathopod 2 or larger (or stouter) than gnathopod 2; propodus palm with peg-like robust setae along palmar margin, or without robust setae along palmar margin. Gnathopod 2 subchelate; similar or dissimilar in males and females (sexually dimorphic or not)carpus slightly produced or not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed or small posteroventral lobe. Pereopod 5 shorter than or subequal in length to pereopod 6; coxa with small anteroventral lobe. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3, pleonite 3 with or without dorsal carina or each with or without dorsal carina or carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. ***Urosomite 2 with multiple small robust setae across the somite***. Uropod 1 with or without 1 or 2 basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with or without plumose setae; endopod minute or shorter than exopod or subequal to exopod or longer than exopod. Telson deeply cleft, moderately cleft or weakly cleft; dorsal or lateral robust setae present or absent; apical robust setae present or absent.

Habitat. Freshwater, occasionally marine, epigean.

Included genera. +fossil. For species groups see Karaman & Pinkster (1977a, b; 1987). *Akerogammarus* Derzhavin & Pjatakova, 1967; *Albanogammarus* Ruffo, 1995; *Amathillina* G.O. Sars, 1894b; *Axelboeckia* Stebbing, 1899b; *Baku* Karaman & Barnard, 1979; *Cephalogammarus* Karaman & Barnard, 1979; *Chaetogammarus* Martynov, 1924b; *Comatogammarus* Stock, 1971; +*Condiciogammarus* G. Karaman, 1984b; *Dershavinella* Birstein, 1938; *Dikerogammarus* Stebbing, 1899b; *Echinogammarus* Stebbing, 1899b; *Fontogammarus* S. Karaman, 1931; *Gammarus* J.C. Fabricius, 1775; *Gmelina* G.O. Sars, 1894b; *Gmelinopsis* G.O. Sars, 1896; *Ilvanella* Vigna-Taglianti, 1971; +*Jubeogammarus* G. Karaman, 1984b; *Jugogammarus* S. Karaman, 1953; *Kuzmelina* Karaman & Barnard, 1979; *Lanceogammarus* Karaman & Barnard, 1979; *Laurogammarus* G. Karaman, 1984a; *Longigammarus* G. Karaman, 1970; *Lusigammarus* Barnard & Barnard, 1983; *Marinogamamrus* Sexton & Spooner, 1940; *Neogammarus* Ruffo, 1937; *Scytaelina* Stock, Mirzajani, Vonk, Naderi & Kiabi, 1998; *Pallasiola* Barnard & Barnard, 1983; *Pectenogammarus* Reid, 1940; *Rhipidogammarus* Stock, 1971; *Sarothrogammarus* Martynov, 1935; *Shablogammarus* Cărăuşu, Dobreanu & Manolache, 1955; *Sinogammarus* Karaman & Ruffo, 1995; *Sowinskya* Derzhavin, 1948; *Tadzhikistania* Barnard & Barnard, 1983; *Tadzocrangonyx* Karaman & Barnard, 1979; *Tyrrhenogammarus* Karaman & Ruffo, 1989; *Yogmelina* Karaman & Barnard, 1979.

Remarks. Gammarids separate from anisogammarids based on gill numbers.

Distribution. Palaearctic.

Iphigenellidae Kamaltynov, 2001

Type genus. *Iphigenella* Sars, 1896.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid or reniform. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antennae 1–2 calceoli absent. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); ***larger (or stouter) than gnathopod 2***; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe. ***Pereopod 5*** shorter than pereopod 6 or subequal in length to pereopod 6; ***coxa equilobate***. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, commensal on decapods, epigean.

Included genera. *Iphigenella* Sars, 1896.

Distribution. Caspian, Black and Azov Seas and associated rivers.

Lucioblivіidae Tomikawa 2007

Type genus. *Lucioblivio* Tomikawa 2007.

Diagnostic description. Body laterally compressed. Eyes absent. ***Antennae 1–2 calceoli gammarid (type 1)***. ***Antenna 1 longer than antenna 2***; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar non-triturative or with tiny triturating patch; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite with oblique setal row (2 large setae). Labium inner lobes present. ***Coxal gills on pereopods*** 2–6, ***stalked (with proximal restriction or complete suture)***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm with peg-like robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe. Pereopod 5 coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae (kind of). Uropod 1 with 3–4basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod subequal in length to exopod. Telson moderately cleft; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Freshwater, hypogean in river beds.

Included genera. *Lucioblivio* Tomikawa, 2007.

Distribution. Japan.

Macrohectopidae Sowinsky, 1915

Type genus. *Macrohectopus* Stebbing, 1906.

Diagnostic description. Eyes well developed, ovoid or reniform. ***Antenna 1 subequal in length to antenna 2*;** peduncular article 1 shorter than article 2; article 2 shorter than article 3; ***article 3 longer than article 1***; peduncular

articles 1–2 not geniculate. Antennae 1–2 calceoli absent. Antenna 2 peduncular article 1 not enlarged. Mandible molar present; palp symmetrical. Maxilla 1 basal endite [not known]; palps symmetrical. Maxilla 2 [not known]. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to gnathopod 2. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus slightly produced along posterior margin of propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe. Pereopod 7 longer than or much longer that pereopod 5. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 biramous, with plumose setae; endopod subequal in length to exopod. ***Telson moderately cleft***.

Habitat. Freshwater, pelagic planktivores.

Included genera. *Macrohectopus* Stebbing, 1906.

Remarks. Based on molecular evidence Macdonald *et al*. (2005) consider the macrohectopids to be a divergent part of the Micruropodidae.

Distribution. Lake Baikal.

Mesogammaridae Bousfield, 1977

Type genus. *Mesogammarus* Tzvetkova, 1965.

Diagnostic description. Body laterally compressed. Eyes well developed or absent, if present then ovoid or reniform. ***Antennae 1–2 calceoli gammarid (type 1)***. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. ***Gnathopod 1*** subchelate; similar in males and females (not sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; ***propodus palm with row or rows of simple or bifid robust setae along palmar margin***. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. Urosomite 2 with pair of dorsal concavities each with 1–3 small setae. Uropod 1 with or without 1 or 2 basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod minute, shorter than or subequal to exopod. ***Telson moderately cleft or notched***; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Marine, intertidal epigean.

Included genera. *Mesogammarus* Tzvetkova, 1965; *Paramesogammarus* Bousfield, 1979.

Distribution. North Pacific.

Micruropodidae Kamaltynov, 1999

Type genus. *Micruropus* Stebbing, 1899b.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid or reniform. ***Antennae 1–2 calceoli gammarid (type 1)***. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 subequal to or longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar [not known]; palp symmetrical. Maxilla 1 endopod [not known]; palps symmetrical. Maxilla 2 [not known]. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1

subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 subequal in length to pereopod 6; coxa equilobate or with small anteroventral lobe. ***Pereopod 7 subequal in length to pereopod 5***. Pleonites 1–3 each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free. Urosomite 1 without large distoventral robust seta. Uropod 1 without basofacial robust setae. Uropod 3 sexually dimorphic or not; biramous, without plumose setae; endopod minute or shorter than exopod. Telson deeply cleft; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included subfamilies. Crypturopodinae Kamaltynov, 2001; Gmelinoidinae Kamaltynov, 2001; Micruropodinae Kamaltynov, 2001.

Crypturopodinae includes 2 genera: *Crypturopus* Sowinsky, 1915; *Homocerisca* Bazikalova, 1945.

Gmelinoidinae includes 1 genus: *Gmelinoides* Bazikalova, 1945.

Micruropodinae includes 2 genera: *Linevichella* Kamaltynov, 2001; *Micruropus* Stebbing, 1899b.

Distribution. Lake Baikal.

Pachyschesidae Kamaltynov, 1999

Type genus. *Pachyschesis* Bazikalova, 1945.

Diagnostic description. Body laterally compressed. Eyes well developed, poorly developed or absent, if present then round, ovoid, reniform, ventrally tapered or subrectangular. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 without posteroventral lobe***. ***Pereopod 5 subequal in length to pereopod 6***; coxa with large or with small anteroventral lobe. Pereopod 7 subequal in length to pereopod 5. Pleonites 1–3 without dorsal carinae. ***Urosomites*** 1–3 free; ***with slender or robust dorsal setae***. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. *Uropod 3* not sexually dimorphic; biramous, with plumose setae; ***endopod shorter than exopod***. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Freshwater, epigean.

Included genera. *Pachyschesis* Bazikalova, 1945.

Distribution. Lake Baikal.

Pallaseidae Takhteev, 2000

Type genus. *Pallasea* Bate, 1862.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid or reniform. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 slightly longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 enlarged, bulbous***. Mandible molar present; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. ***Coxal gills on pereopods*** 2–7, not stalked; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic);

carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with small posteroventral lobe. ***Pereopod 5*** shorter than or subequal in length to pereopod 6; ***coxa with small anteroventral lobe***. Pereopod 7 subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with plumose setae; endopod shorter than exopod. ***Telson emarginate***; dorsal or lateral robust setae absent; ***apical robust setae absent***.

Habitat. Freshwater, epigean.

Included genera. *Babr* Kamaltynov & Väinölä, 2001; *Burchania* Takhteev, 2000; *Hakonboeckia* Stebbing, 1899b; *Homalogammarus* Bazikalova, 1945; *Pallasea* Bate, 1862; *Pallasaeopsis* Kamaltynov & Väinölä, 2001; *Pentagonurus* Sowinsky, 1915; *Propachygammarus* Bazikalova, 1945.

Distribution. Lake Baikal.

Paraleptamphopidae Bousfield, 1983

Type genus. *Paraleptamphopus* Stebbing, 1899a.

Diagnostic description. Body laterally compressed. Eyes absent. ***Antennae 1–2 calceoli pontogeneiid (type 4)***. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–7, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); similar in size to, or larger (or stouter) than gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod subequal in length to exopod. Telson emarginate or entire; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Freshwater, hypogean.

Included genera. *Paraleptamphopus* Stebbing, 1899a; *Ringanui* Fenwick, 2006; *Rudolphia* Grosso & Peralta, 2009.

Remarks. Bousfield (1983: 267, 272) established the "*Paraleptamphopus* family group". In the Appendix on page 273 he formally set out a diagnosis and type genus for this group, but without using a formal family name. Since then it has been listed by Barnard & Karaman (1991: 4) attributing authorship to Bousfield (1983); Bousfield & Shih (1994: 128) without authorship attribution and Martin & Davis (2001: 67) with authorship attributed to Bousfield, 1983). More recently Fenwick (2006) and Grosso & Peralata (2009) both attributed authorship of the Paraleptamphopidae to Bousfield (1983) when describing new genera in the family. We also attribute authorship of the family to Bousfield (1983) and recommend acceptance of the current status.

Distribution. New Zealand, southern South America.

Phreatogammaridae Bousfield, 1983

Type genus. *Phreatogammarus* Stebbing, 1899b.

Diagnostic description. Body subcylindrical or vermiform. Eyes well developed or absent, if present then round. ***Antennae 1–2 calceoli absent***. Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturating;

palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes vestigial or absent. ***Coxal gills on pereopods*** 2–6, ***stalked (with proximal restriction or complete suture)***; sternal gills present or sternal gills absent, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar or dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm with peg-like robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe or without lobes. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. ***Urosomite 2 with multiple small robust setae across the somite***. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod subequal in length to exopod. ***Telson deeply cleft***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater or brackish, epigean.

Included genera. *Caledonietta* Iannilli & Ruffo, 2007; *Phreatogammarus* Stebbing, 1899b; *Ruffia* Bréhier, Vonk & Jaume, 2010.

Remarks. Bousfield (1982a) used the family name Phreatogammaridae without a diagnosis or type species designation. Bousfield (1983: 268, 274) referred to the family name with formal diagnosis and included genera. Since then it has been listed by Barnard & Karaman (1991: 4) incorrectly attributing authorship to Bousfield (1982d); to Bousfield & Shih (1994: 128, table 3) without authorship attribution and to Martin & Davis (2001: 67) with authorship attributed to Bousfield, 1982, but three Bousfield (1982) papers are cited in the references). More recently Chapman (2003) attributed authorship to Bousfield (1982), but no citation in references and Chapman (2004) also attributed authorship to Bousfield (1982), but cited reference as Bousfield (1983)) and Bréhier, Vonk & Jaume, 2010: 504 attributed authorship of the Phreatogammaridae to Bousfield (1982a). In our opinion the name Phreatogammaridae of Bousfield (1982a) is a *nomen nudum*. Although Bousfield (1983) did not specifically designate Phreatogammaridae as a new family he provided a diagnosis, a type genus and included genus. We therefore attribute authorship of the family to Bousfield (1983).

Distribution. New Caledonia, New Zealand, southern South America.

Pontogammaridae Bousfield, 1977

Type genus. *Pontogammarus* Sowinsky, 1904.

Diagnostic description. Body laterally compressed. Eyes well developed, ovoid or reniform. ***Antennae 1–2 calceoli absent***. Antenna 1 shorter than, subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum *long or short*. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Labium inner lobes vestigial or absent. Coxal gills [not known]; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than or similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. ***Pereopod 4 with well developed posteroventral lobe***. Pereopod 5 shorter than pereopod 6; coxa with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 each with dorsal carina or carinae or without dorsal carinae. Urosomites 1–3 free; with or without slender or robust dorsal setae. ***Urosomite 1 with large distoventral robust seta***. Urosomite 2 without dorsal setae. ***Uropod 1 without basofacial robust setae***. Uropod 3 not sexually dimorphic; biramous, with plumose setae or without plumose setae; endopod minute or shorter than exopod or subequal to exopod or longer than exopod. ***Telson deeply cleft***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Compactogammarus* Stock, 1974; *Euxinia* Tucolesco, 1933; *Niphargogammarus* Birstein, 1945; *Niphargoides* Sars, 1894a; *Obesogammarus* Stock, 1974; *Pandorites* Sars, 1895a; *Paraniphargoides* Stock,

1974; *Pontogammarus* Sowinsky, 1904; *Stenogammarus* (*Stenogammarus*) Martynov, 1924a; *Stenogammarus* (*Wolgagammarus*) Stock, 1974; *Turcogammarus* Karaman & Barnard, 1979; *Uroniphargoides* Stock, 1974.

Distribution. Eurasia.

Sensonatoridae Lowry & Myers, 2012

Type genus. *Sensonator* Notenboom, 1986.

Diagnostic description. Body laterally compressed. Eyes absent. ***Antennae 1–2 calceoli gammarid (type 1)***. ***Antenna 1 shorter than antenna 2***; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. ***Coxal gills on pereopods*** 2–5, ***stalked (with proximal restriction or complete suture)***; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); similar in size to gnathopod 2; propodus palm without robust setae along palmar margin. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 without posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa with small anteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, with plumose setae; endopod subequal in length to exopod. Telson deeply cleft; dorsal or lateral robust setae present; apical robust setae present.

Habitat. Freshwater, hypogean.

Included genera. *Sensonator* Notenboom, 1986.

Remarks. Based on the presence of gammarid type 1 calceoli, stalked coxal gills and antenna 1 shorter than antenna 2, sensonatorids appear to be most similar to gammarid amphipods.

Distribution. Europe.

Typhlogammaridae Bousfield, 1978

Type genus. *Typhlogammarus* Schaferna, 1907.

Diagnostic description. Body laterally compressed or subcylindrical. Eyes absent. Antennae 1–2 calceoli absent. Antenna 1 longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum short or minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes vestigial or absent. ***Coxal gills on pereopods*** 2–7, ***stalked (with proximal restriction or complete suture)***; ***sternal gills absent***; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; dissimilar in males and females (sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2. Gnathopod 2 subchelate; dissimilar in males and females (sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 subequal in length to pereopod 6; coxa with small anteroventral lobe. ***Pereopod 7 subequal in length to pereopod 5***. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; with slender or robust dorsal setae. Urosomite 1 with large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, without plumose setae; endopod shorter than exopod or subequal to exopod. ***Telson deeply cleft***; dorsal or lateral robust setae present or absent; apical robust setae present.

Habitat. Freshwater, epigean.

Included genera. *Accubogammarus* G. Karaman, 1974; *Anopogammarus* Derzhavin, 1945; *Metohia* Absolon, 1927; *Typhlogammarus* Schaferna, 1907; *Zenkevitchia* Birstein, 1940.

Distribution. Eurasia.

Incertae Sedis

Iciliidae Dana, 1849

Type genus. *Icilius* Dana, 1849.

Diagnostic description. ***Body dorsoventrally flattened.*** Eyes present, well developed, bulging, round. Antennae 1–2 calceoli absent. Antenna 1 shorter than or subequal in length to antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 not enlarged. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. ***Labium inner lobes present***. Coxal gills on pereopods 2–7, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 simple; similar in males and females (not sexually dimorphic); similar in size to gnathopod 2. Gnathopod 2 simple; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. ***Pereopods 3–4 sexually dimorphic***. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with acute posterodistal lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous***; endopod longer than exopod. ***Telson entire***; dorsal or lateral robust setae absent; apical robust setae present.

Habitat. Marine, epigean.

Included genera. *Icilius* Dana, 1849.

Remarks. Iciliids are suspension feeders associated with sponges (Watson *et al*. 2004).

Distribution. Eastern Australia, New Caledonia, Kalimantan and the South China Sea.

Sanchoidae Lowry, 2006

Type species. *Sancho* Stebbing, 1887.

Diagnostic description. Body dorsoventrally flattened. Eyes well developed, round or ovoid. Antennae 1–2 calceoli absent. Antenna 1 subequal in length to, or longer than antenna 2; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. ***Antenna 2 peduncular article 1 not enlarged***. Mandible molar triturating; palp symmetrical. Maxilla 1 basal endite apically setose; palps symmetrical. Maxilla 2 basal endite without oblique setal row. Labium inner lobes vestigial or absent. Coxal gills on pereopods 2–6, not stalked; sternal gills absent; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; smaller (or weaker) than or similar in size to gnathopod 2; similar in males and females (not sexually dimorphic); propodus palm without robust setae along palmar margin. ***Gnathopod 2*** subchelate; ***dissimilar in males and females (sexually dimorphic)***; carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe. Pereopod 5 shorter than pereopod 6; coxa equilobate or with posteroventral lobe. Pereopod 7 longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 without basofacial robust setae. ***Uropod 3*** not sexually dimorphic; ***biramous***, without plumose setae; ***endopod longer than exopod***. ***Telson notched, emarginate or entire***; dorsal or lateral robust setae absent; apical robust setae absent.

Habitat. Marine, epigean.

Included genera. *Choroes* Stebbing, 1888; *Sancho* Stebbing, 1897.

Remarks. Sanchoids are associated with sponges (Lowry & Barnard 2001).

Distribution. South-eastern Australia (endemic).

Discussion

The Senticaudata is composed largely of freshwater taxa. Amphipods probably first entered freshwaters in the Triassic when Bogidiellida and Gammarida (Gammaridira and Crangonyctidira) invaded the freshwater environment. They have survived as the dominant amphipods in freshwaters, including groundwaters, to this day. Three other senticaudate infraorders, the Hadziida, Talitrida and Corophiida, have also occupied freshwaters, sometimes as a consequence of stranding from marine transgressions (Bradbury & Ebehard 2000). These latter infraorders remain relatively undiverse in freshwaters and their limited radiations are probably a consequence of competition with resident gammaridans.

The Senticaudata defined here shows similarity with the 'Reptantia' proposed by Bousfield (1994). It differs from it, however, in excluding the Liljeborgoidea and Leucothoidea that were included in the Reptantia by Bousfield as well in the inclusion of the Pontogeneiidae, Calliopiidae, Paraleptamphopidae, Falklandellidae, Gammarellidae, Gammaracanthidae, Sensonatoridae, Cheirocratidae, Hornelliidae, Niphargidae and Phreatogammaridae that were placed by Bousfield (1994) in the 'Natantia'. Bousfield did not formalise the names Reptantia and Natantia, but in his classification (Bousfield, 1994) placed them above the level of suborder and presumably below the level of order.

We reiterate our belief that a phylogenetic reconstruction is only as good as the character state interpretation upon which it is based (see Myers & Lowry 2003, Mooi & Gill 2010). Statistical tests do not provide support for the 'correctness' of a tree if the underlying data set is imperfect. Careful analysis of synapomorphies is the only way to improve confidence in a phylogenetic analysis.

The family taxon is the most important higher taxon in amphipod taxonomy. As a consequence, in order to preserve a useful hierarchy without affecting the family level, we have found it necessary to introduce for the first time in amphipod taxonomy, the level parvorder between infraorder and superfamily.

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