

A classification within the pycnogonids

WILLIAM G. FRY

Department of Science, Luton College, Park Square, Luton, Bedfordshire

Data were collected for 45 characters from all of the published descriptions of 73 genera of living pycnogonids. Each genus was compared over all characters, equally weighted, with every other genus and similarity values were calculated by means of a restricted version of Gower's Generalized Coefficient (S_G). The resulting matrix of intergeneric similarity values was subjected to principal co-ordinate analysis followed by single nearest-neighbour analysis at 0.5% S_G intervals of the data as described by the first two vectors.

Four groupings, at 82.5, 81.5, 80.5 and 78.5 S_G , were well defined. From this pattern was developed the hypothesis of a classification of the genera into 5 orders containing 30 families.

Achelia, *Ascorhynchus*, *Boreonymphon*, *Pentacolossendeis* and *Phoxichilidium*, amongst some other genera, were found to lie in unexpected systematic positions. *Rhynchothorax* was found to be widely different from all other genera.

New names are proposed for certain taxa and descriptions are given of suprageneric groups.

Further analysis is required to discern character state correlations within the proposed polythetic groups, so that simple keys can be constructed.

KEY WORDS:—Pycnogonida—extant—73 genera—morphological similarity—multivariate analysis—five orders—30 families.

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INTRODUCTION

Not only is classification of the modern Pycnogonida Latreille, 1810 (*sensu* Hedgpeth, 1955) unstable above the familial level, but there also remains some

CONCLUSIONS

The modern, extant pycnogonids can be distributed amongst five orders, containing a total of 30 families. A scheme of classification and definitions of the taxa are given in Tables 6 and 7 (Appendix 2).

As the nomenclatorally requisite definitions indicate, a number of the taxa are strongly polythetic. An analysis of character state correlations or some other, analogous investigation (see e.g., Gower, 1974) is required before a simple key can be constructed.

Regrettably, a number of new names have had to be proposed for suprageneric groups, although existing names have been retained wherever possible even though this has required amendment of descriptions.

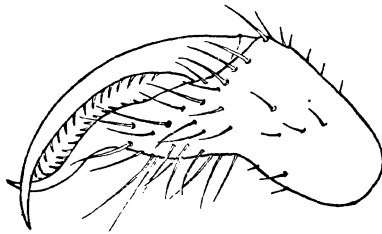
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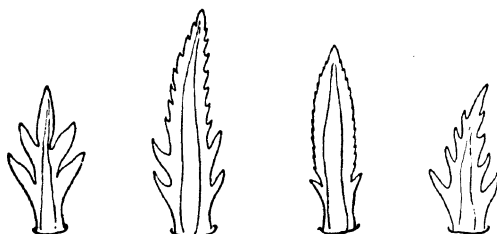
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A complete reference list for this study would be a pycnogonid bibliography. However, I cannot claim to have seen every published description of a pycnogonid. In particular, I have not had access to the very earliest pycnogonid papers of the 18th and 19th centuries, nor to the earlier publications of Schimkewitsch.

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APPENDIX 2

Table 6. Proposed classification of 73 genera of modern pycnogonids.
The letters A-F indicate groups of genera so marked in Fig. 5.
See also Table 2 (Appendix 1).

Class Pycnogonida Latreille, 1810

Order Pigmata¹ nom. nov.

Suborder Eupantopodida nom. nov.

Superfamily Iuventivellendoidea² nom. nov.

(A) Family Ammotheidae Dohrn, 1881 emend.

Acheliana, *Ammothea*, *Anammothea*, *Athernopycnon*, *Bohemia*, *Calypsopycnon*,
Ecleipsothremma, *Heterofragilia*, *Kyphomia*, *Magnammothea*, *Nymphopsis*, *Pentacolossendeis*,
Phoxichilidium, *Pigrogromitus*, *Pycnothea*, *Thavmastopycnon*, *Pycnosomia*, *Oorhynchus*.

(B) Family Colossendeidae Hoek, 1881 emend.

Colossendeis, *Decolopoda*, *Dodecolopoda*, *Pantopipetta*, *Boreonymphon*.

(C) Family Tanystylidae Schimkewitsch, 1913 emend.

Aduncorostris, *Austrotraptus*, *Discoarachne*, *Tanystylum*, *Decachela*.

Family Clavigeropallenidae nom. nov.: *Clavigeropallene*.

Family Phoxiphilyridae nom. nov.: *Phoxiphilyra*.

Family Trygaeidae nom. nov.: *Trygaeus*.

Family Eurycyidae Sars, 1891 emend.: *Eurycyde*.

Superfamily Extorridoidea³ nom. nov.

Family Endeidae Norman, 1908: *Endeis*.

Superfamily Stiripastoroidea⁴ nom. nov.

Family Austrodecidae Stock, 1954: *Austrodecus*.

Superfamily Ammothelloidea nom. nov.

(E) Family Ammothellidae nom. nov.

Ammothella, *Cilunculus*, *Scipiolus*.

Superfamily Paranymphonoidea nom. nov.

Family Paranymphonidae nom. nov.: *Paranymphon*.

Superfamily Vellendoidea⁵ nom. nov.

(D) Family Callipallenidae Hilton, 1942 emend.

Austropallene, *Callipallene*, *Neopallene*, *Oropallene*, *Anoropallene*, *Pallenoides*, *Parapallene*,
Propallene, *Pseudopallene*, *Siphopallene*, *Spasmopallene*.

Family Metapallenidae nom. nov.: *Metapallene*.

Family Cheilapallenidae nom. nov.: *Cheilapallene*.

Family Stylopallenidae nom. nov.: *Stylopallene*.

Superfamily Nymphonoidea nom. nov.

(F) Family Nymphonidae Wilson, 1878 emend.

Nymphon, *Nymphonella*, *Pentanymphon*, *Sexanymphon*, *Heteronymphon*, *Neonymphon*.

Suborder Verecundida⁶ nom. nov.

Family Achelidae Wilson, 1881 emend.: *Achelia*.

Suborder Anoplodactylida nom. nov.

Family Anoplodactylidae nom. nov.: *Anoplodactylus*.

Suborder Ephyrogymnida nom. nov.

Family Ephyrogymnidae nom. nov.: *Ephyrogymna*.

Suborder Pallenopsida nom. nov.

Family Pallenopsidae nom. nov.: *Pallenopsis*.

Suborder Sericosurida nom. nov.

Family Sericosuridae nom. nov.: *Sericosura*.

Incertae sedis:

Hemichela, *Prototrygaeus*, *Nanonymphon*.

Order Pycnogonomorpha Pocock, 1904 emend.

Family Pycnogonidae Wilson, 1878 emend.

Pycnogonum, *Pentapycnon*.

Order Ascorhynchomorpha Pocock, 1909 emend.

Family Ascorhynchidae Hoek, 1881: *Ascorhynchus*.

Order Rhopalorhynchomorpha nom. nov.

Family Rhopalorhynchidae nom. nov.: *Rhopalorhynchus*.

Table 6—continued

 Incertae sedis:

 Family Queubidae nom. nov.: *Quebus*

 Family Hannonidae nom. nov.: *Hannonia*

Order Rhynchothoracimorpha nom. nov.

 Family Rhynchothoracidae nom. nov.: *Rhynchothorax*.

1, Scaffolding; 2, "young tweakers"; 3, exiled; 4, icicle shepherds; 5, "tweakers"; 6, bashful.

 Table 7. Descriptions of the suprageneric taxa of the modern pycnogonids

Order Pelmata nom. nov.

Palps absent or 1-, 2-, or 4- to 10-segmented (rarely 19 or 20 segments), with or without distal anaxial articulations. **Chelicerae**: scape absent or 1- or 2-segmented in adults; adult chelae completely atrophied to functional with smooth, tuberculate or denticulate fingers. **Proboscis** usually without a pedicel, with or without a styliform tip, without dorsal ornamentation, sometimes with two basal ventral alar processes. **Trunk** 4-, 5-, or 6-segmented, with articulations between all to no segments; dorsal ornamentation absent or as ridges and/or humps; cephalic hood absent to very strongly developed; lateral processes variably widely separated; pre- and postocular necks absent to long. **Ovigers** 3- to 10-segmented in ♂, with or without distal apophysis on 5th segment and distal synaxial articulation, in ♀ absent or 3- to 10-segmented; terminal claw present or absent; spines of 4 distal segments simple or compound; chela sometimes formed by distal spine and claw. **Legs**: tarsi elongate or arcuate; 1^Y and accessory claws present or absent; propodi occasionally with strong distal dorsal projection; propodal sole spination sometimes dimorphic, homogeneous or heterogeneous, rarely forming a subchela with 1^Y claw; keel sometimes present; genital pores on 1, 2, 3, 4, 5 or (?)6 pairs of legs in ♀, on 2, 3, 4, 5, or 6 pairs of legs in ♂.

Suborder Eupantopodida nom. nov.

Palps absent or 1-, 2-, or 4- to 10-segmented in adults (rarely 19 or 20 segments). **Chelicerae**: scape absent or 1- or 2-segmented in adults; fingers, when present, smooth, tuberculate or denticulate, < or > than palm. **Proboscis** usually without a pedicel, without basal ventral or dorsal ornamentation, with or without a styliform tip. **Trunk** 4-, 5- or 6-segmented, with articulations between all to no segments; dorsal ornamentation absent or present as ridges and/or humps; cephalic hood absent to very strongly developed; lateral processes separated by > or < their diameters; pre- and postocular necks absent to long. **Ovigers** 3- to 10-segmented in ♂, with or without distal apophysis on 5th segment and distal anaxial articulation, in ♀ absent or 3- to 10-segmented; terminal claw present or absent; 4 distal segment spines simple or compound; chela sometimes formed by claw and distal spine. **Legs**: tarsi arcuate or elongate; 1^Y and accessory claws present or absent; propodi occasionally with distal dorsal projection; propodal sole spination usually monomorphic, homogeneous or heterogeneous; subchela sometimes formed with 1^Y claw; no keel; genital pores on 1, 2, 3, 4, 5 or 6 pairs of legs in ♂, on 2, 3, 4, 5 or (?)6 pairs in ♀.

Superfamily Iuventellendoidea nom. nov.

Palps absent or 4- to 9-segmented in adults, with or without distal anaxial articulation, where present ≥ proboscis length. **Chelicerae**: scape absent or 1- or 2-segmented in adults; adult chela fingers functional to completely atrophied; fingers, when present, smooth, tuberculate or denticulate, < or > palm length. **Proboscis** with or without pedicel or styliform tip, without dorsal or basal ventral ornamentation. **Trunk** of 4-, 5- or 6-segments with articulations between all or no segments; dorsal ornamentation absent or present as ridges and/or humps; cephalic hood absent or moderately developed; lateral processes separated by < or > their diameters; pre- and postocular necks absent to long. **Oviger** 3- or 5- to 10-segmented in ♂, absent or 4- to 10-segmented in ♀; terminal segments with simple or compound spines, ♂ with or without distal apophysis on 5th segment and distal anaxial articulation, no distal anaxial articulation in ♀; terminal claw absent or present in both sexes, sometimes forming a chela with distal spines. **Legs**: tarsi usually arcuate; 1^Y claw usually present, accessory claws present or absent; propodi usually without distal dorsal projection; propodal sole spination mono- or dimorphic, homogeneous or heterogeneous, occasionally forming a subchela with 1^Y claw; keel absent; ♂ genital pores on 1, 2 or all pairs of legs, nearly always on all legs in ♀.

Family Ammotheidae Dohrn, 1881 emend.

Palps absent or 7-, 8- or 9-segmented, similar in both sexes, when present ≥ proboscis length, without distal anaxial articulations. **Chelicerae**: scape 1- or 2-segmented; chelae, when present, with smooth, func-

tional fingers $<$ or \geq palm length. **Proboscis** without pedicel, rarely a styliform tip, without dorsal or basal ventral ornamentation. **Trunk** 4- or 5-segmented, with all to no segments articulating; dorsal ornamentation absent or present as ridges and/or humps; cephalic hood absent or present; lateral processes separated by $<$ to $>$ their own diameters; preocular neck short or absent; postocular neck absent to long. **Ovigers** 5-, 6- or 10-segmented in σ , with or without distal anaxial articulation; absent or 5-, 6-, 9- or 10-segmented in φ , without anaxial distal articulation; with simple or compound spines on 4 distal segments; terminal claw absent or present in both sexes, no chela formed with spines; no distal apophysis on 5th segment. **Legs:** tarsi elongate or arcuate; 1^Y and accessory claws absent or present; propodi without distal dorsal projection; propodal sole spination mono- or dimorphic, homogeneous or heterogeneous; without a keel; σ genital pores on 1, 2, 4 or 5 pairs of legs; φ genital pores on 2 or 4 pairs of legs.

Family Colossendeidae Hoek, 1881 emend.

Palps 5-, 8-, 9- or 10-segmented, similar in both sexes, with or without distal anaxial articulation, \geq proboscis length. **Chelicerae:** scape absent or 1-segmented in adults, 1- or 2-segmented in juveniles; where chelae present in adults, fingers functional, smooth, \geq palm length. **Proboscis** without pedicel, or dorsal or basal ventral ornamentation, with or without styliform tip. **Trunk** 4-, 5- or 6-segmented with articulations between all, all but 3, or all but 4 segments; dorsal ridges or no ornamentation; cephalic hood absent; lateral processes separated by $<$ to $>$ their diameters; pre- and postocular necks absent. **Ovigers** 9- or 10-segmented in both sexes, with simple and/or compound spines on 4 terminal segments, without distal anaxial articulations, without distal apophysis on 5th segment, terminal claw present and sometimes forming a chela with a spine. **Legs:** tarsi elongate; 1^Y claw present; accessory claw present or absent; propodi without a distal dorsal projection; sole spination monomorphic and homogeneous, not forming a chela with a spine; genital pores on 4 pairs of legs in both sexes.

Family Tanystylidae Schimkewitsch, 1913 emend.

Palps absent or 4- to 8-segmented, similar in two sexes, when present \geq proboscis length, with or without distal anaxial articulation. **Chelicerae:** scape 1-segmented, adult chelae fingers functional, atrophied or palm absent; fingers smooth when present, $<$ or \geq palm. **Proboscis** without pedicel, styliform tip present or absent, without dorsal or basal ventral ornamentation. **Trunk** 4-segmented with articulations between one or no segments, without dorsal ornamentation; cephalic hood absent or present; lateral processes separated by $<$ their own diameters; preocular neck absent to long; postocular neck short or absent. **Ovigers** 10-segmented in both sexes with simple or compound spines on 4 distal segments; no distal apophysis on 5th segment, with or without distal anaxial articulation; terminal claw absent or present, but not forming a chela. **Legs:** tarsi arcuate; 1^Y claws present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic, heterogeneous, occasionally forming a chela with 1^Y claw; genital pores on 2 pairs of legs in σ , on 4 pairs of legs in φ .

Family Clavigeropallenidae nom. nov.

Palps absent in both sexes. **Chelicerae:** scape 1-segmented in adults; fingers functional, smooth, $<$ palm length. **Proboscis** without pedicel, styliform tip, dorsal or basal ventral ornamentation. **Trunk** of 4 segments with articulations between all segments; with dorsal median humps; cephalic hood well-developed; lateral processes separated by $>$ their diameters; preocular and postocular necks absent. **Ovigers** 7-segmented in σ ; 4-segmented in φ ; simple spines on 4 distal segments; no distal anaxial articulations; terminal claw absent. **Legs:** tarsi arcuate; 1^Y claw present; accessory claws absent; propodi with strong distal dorsal projection; propodal sole spination monomorphic, heterogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 4 pairs of legs in both sexes.

Family Phoxiphilyridae nom. nov.

Palps absent in both sexes. **Chelicerae:** adults with 1 scape segment; chelae fingers functional, smooth or denticulate, $<$ or $>$ palm length. **Proboscis** without pedicel, styliform tip or dorsal or basal ventral ornamentation. **Trunk** of 4 segments, all articulating, with dorsal ornamentation; cephalic hood present; preocular neck short or absent; postocular neck long. **Ovigers** 3-segmented in σ , 4- or 5-segmented in φ ; compound spines absent from 4 distal segments; no terminal claw. **Legs:** tarsi arcuate; 1^Y claw present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic, heterogeneous, not forming a chela; keel absent; genital pores?

Family Trygaeidae nom. nov.

Palps 4-, 5- or 6-segmented in both sexes, \geq proboscis length, without distal anaxial articulations. **Chelicerae:** adults with 1-segmented scape, chelae absent. **Proboscis** without pedicel, styliform tip or dorsal or basal ventral ornamentation. **Trunk** of 4 segments, all articulating, with dorsal humps, cephalic hood absent; lateral processes separated by $<$ their own diameters; preocular neck absent; postocular neck short. **Ovigers** 7- to 10-segmented in both sexes, without compound spines on 4 terminal segments; σ with distal anaxial articulation; terminal claws absent. **Legs:** tarsi arcuate; 1^Y claws present; propodi without distal dorsal projection; propodal sole spination monomorphic, heterogeneous, but not forming chela with 1^Y claw; keel absent; genital pores?

Table 7—continued

Family Eurycydidae Sars, 1891 emend.

Palps 9-segmented in both sexes, \geq proboscis length. **Chelicerae**: adults with 2-segmented scape, fingers atrophied. **Proboscis** with pedicel but without styliform tip or dorsal or basal ventral ornamentation. **Trunk** of 4 segments, all articulating, without dorsal ornamentation or cephalic hood; lateral processes separated by $<$ their own diameters; preocular neck short; postocular neck long. **Ovigers** 9- or 10-segmented in both sexes, with compound spines on 4 distal segments; without distal anaxial articulations or apophysis on 5th segment; with terminal claw but not forming a chela. **Legs**: tarsi arcuate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores ?

Superfamily Extorridoidea nom. nov.

Description as for Family Endeidae.

Family Endeidae Norman, 1908 emend.

Palps absent in adults of both sexes. **Chelicerae** absent in adults. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 articulating segments, without dorsal ornamentation and without a strong cephalic hood; lateral processes separated by $>$ their own diameters; pre- and postocular necks absent. **Ovigers** (?6-), 7- or 8-segmented in σ , absent in ρ ; no compound distal spines, apophysis on 5th segment, anaxial articulations or terminal claw. **Legs**: tarsi arcuate; 1^Y claw and accessory claws present; propodi sometimes with strong distal dorsal projection; propodal sole spination monomorphic, heterogeneous, but not forming a chela with 1^Y claw; keel absent; genital pores on all legs in both sexes.

Superfamily Stiripastoroidea nom. nov.

Description as for Family Austrodecidae.

Family Austrodecidae Stock, 1954 emend.

Palps 5-, 6- or 7-segmented in adults, \geq proboscis length. **Chelicerae**: scape and chelae absent in adults. **Proboscis** without pedicel or basal ventral or dorsal ornamentation, but with styliform tip. **Trunk** of 4 articulating segments, with no dorsal ornamentation or humps only; cephalic hood present; lateral processes separated by $<$ their diameters; preocular neck absent; postocular neck short. **Ovigers** 4-, 5-, 6- or 7-segmented in both sexes; without compound spines, terminal claw, apophysis on 5th segment or distal anaxial articulations. **Legs**: tarsi arcuate; 1^Y claw present; accessory claws present or absent; propodi without a distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 3 or 4 pairs of legs in ρ , in σ ?

Superfamily Ammothelloidea nom. nov.

Description as for Family Ammothellidae.

Family Ammothellidae nom. nov.

Palps 9-segmented in both sexes, \geq proboscis length. **Chelicerae**: scape 1- or 2-segmented in adults; fingers atrophied. **Proboscis** with or without pedicel, without styliform tip, or basal ventral or dorsal ornamentation. **Trunk** of 4 segments with 2 or 3 articulations, without dorsal ornamentation or with humps or ridges plus humps; cephalic hood present; lateral processes separated by $<$ to $>$ their diameters; preocular neck short or absent; postocular neck absent to long. **Ovigers** 9- or 10-segmented in both sexes, with distal compound spines but no terminal claw; distal anaxial articulation variably present in σ , absent in ρ . **Legs**: tarsi arcuate; 1^Y claw and accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic and homogeneous or heterogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on all legs in ρ , in σ ?

Superfamily Paranymphonoidea nom. nov.

Description as for Family Paranymphonidae.

Family Paranymphonidae nom. nov.

Palps 6- or 7-segmented in both sexes, \geq proboscis length. **Chelicerae**: scape 1-segmented in adults, fingers functional, smooth, \geq palm length. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 fused segments, without dorsal ornamentation; cephalic hood present; lateral processes separated by $<$ their diameters; preocular neck absent; postocular neck short. **Ovigers** 10-segmented in both sexes, with compound distal spines, without distal anaxial articulation or distal apophysis on 5th segment; terminal claw present but not forming a chela. **Legs**: tarsi arcuate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 1 pair of legs in σ , on 3 pairs of legs in ρ .

Superfamily Vellendoidea nom. nov.

Palps absent or 1-, 2- or 4-segmented. **Chelicerae** functional in adults, scape 1-segmented; fingers smooth, tuberculate or denticulate, < to > palm length. **Proboscis** without pedicel, without basal ventral or dorsal ornamentation, with or without styliform tip. **Trunk** 4-segmented, with all, none, or all but 2 segments articulating; dorsal ornamentation absent or as humps only; cephalic hood weakly to very strongly developed; lateral processes separated by < to > their diameters; preocular neck absent to long; postocular neck short or absent. **Ovigers** 10-segmented in ♂, 6- or 10-segmented in ♀; both sexes with simple or compound spines on 4 distal segments; ♂ with or without distal anaxial articulation and distal apophysis on 5th segment; terminal claws present or absent in ♂ and ♀, never forming a chela with spines. **Legs:** tarsi arcuate; 1^Y claws present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination mono- or dimorphic, homo- or heterogeneous, never forming a chela with 1^Y claw; keel absent; genital pores on 2 or 4 pairs of legs in ♂, on all pairs of legs in ♀.

Family Callipallenidae Hilton, 1942 emend.

Palps absent in both sexes, or 1-, 2- or 4-segmented in ♂, or absent or 1-segmented in ♀. **Chelicerae:** scape 1-segmented; fingers functional in adults, smooth, tuberculate or denticulate, < or > palm length. **Proboscis** without pedicel, or basal ventral or dorsal ornamentation, with or without styliform tip. **Trunk** 4-segmented, with articulations between 3, all, or no segments; without dorsal ornamentation; cephalic hood weakly to very strongly developed; lateral processes separated by < to > their diameters; preocular neck absent to long; postocular neck short or absent. **Ovigers** 10-segmented in both sexes, with simple or compound distal spines; ♀ without and ♂ with or without distal anaxial articulation; terminal claw absent or present, never forming a chela; ♂ with or without distal apophysis on 5th segment. **Legs:** tarsi arcuate; 1^Y claws present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination mono- or dimorphic, homo- or heterogeneous, but not forming a chela with 1^Y claw; sole keel absent; genital pores on 2 or 4 pairs of legs in ♂, on all legs in ♀.

Family Metapallenidae nom. nov.

Palps 1-segmented in both sexes, < proboscis length. **Chelicerae:** scape 1-segmented; fingers denticulate, ≥ palm length. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 segments, without dorsal ornamentation; cephalic hood present; lateral processes separated by < their diameters; preocular neck absent; postocular neck short. **Ovigers** 10-segmented in both sexes, with compound spines on 4 distal segments, without terminal claw, with or without distal apophysis on 5th segment. **Legs:** tarsi arcuate; 1^Y claws present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, heterogeneous, but not forming chela with 1^Y claw; keel absent; genital pores ?

Family Cheilapallenidae nom. nov.

Palps absent in both sexes. **Chelicerae:** adult scape 1-segmented; moveable finger smooth, immoveable finger tuberculate, fingers < palm length. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 segments, with articulations between 3 or 4 segments; without dorsal ornamentation; cephalic hood well-developed; lateral processes separated by < their diameters; preocular neck long; postocular neck absent. **Ovigers** 6-segmented in ♀; 10-segmented in ♂; simple spines on distal segments in ♀, compound spines in ♂; neither sex with anaxial distal articulations or terminal claw. **Legs:** tarsi arcuate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on all legs in both sexes.

Family Stylopallenidae nom. nov.

Palps absent in both sexes. **Chelicerae:** scape 1-segmented; fingers smooth, < palm length. **Proboscis** without pedicel or basal ventral or dorsal ornamentation, with or without styliform tip. **Trunk** of 4 segments, of which 3 articulate; dorsal ornamentation absent or as humps; cephalic hood present; narrow separation of lateral processes; preocular neck long; postocular neck short. **Ovigers** 10-segmented in both sexes; terminal 4 segments with compound spines; ♂ sometimes with distal anaxial articulation; terminal claw present, not forming a chela or subchela. **Legs:** tarsi arcuate; 1^Y claws present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on all legs in both sexes.

Superfamily Nymphonoidea nom. nov.

Description as for Family Nymphonidae.

Family Nymphonidae Wilson, 1878 emend.

Palps similar in the two sexes, 4-, 5-, or 19- or 20-segmented, without distal anaxial articulations, ≥ proboscis length. **Chelicerae** chelate in adults; scape 1-segmented; fingers functional, smooth, tuberculate or denticulate, < to > palm length. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal orna-

Table 7—continued

mentation. **Trunk** 4-, 5- or 6-segmented, with articulations between all segments; with prominent dorsal ornamentation; no cephalic hood; separation of lateral processes \geq their diameters; pre- and postocular necks absent to long. **Ovigers** 10-segmented in both sexes, with compound spines on 4 distal segments; 1 or no distal anaxial articulation in σ , none in ♀ ; terminal claw absent or present, never forming a chela or subchela; distal apophysis absent or sometimes present in σ . **Legs:** tarsi arcuate or elongate; 1^Y and accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic, either homo- or heterogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 1, 2, 3, 5 or 6 pairs of legs in σ , on all pairs in ♀ .

Suborder Verecundida nom. nov.

Description as for Family Achelidae.

Family Achelidae Wilson, 1881 emend.

Palps 6- to 9-segmented in both sexes, \geq proboscis length, with or without distal anaxial articulation. **Chelicerae:** scape 1-segmented; fingers, and sometimes palm, atrophied in adults. **Proboscis** without pedicel or basal ventral or dorsal ornamentation, with or without styliiform tip. **Trunk** of 4 segments, none to all articulating; dorsal ornamentation absent or as humps; cephalic hood absent; lateral processes separated by $<$ their diameters; preocular neck absent; postocular neck short or absent. **Ovigers** 9- or 10-segmented in both sexes; 4 distal segments with simple or compound spines, without terminal claw; 1 or 2 distal anaxial articulations in σ and ♀ . **Legs:** tarsi arcuate; 1^Y and accessory claws present; propodi without distal dorsal projection; propodal sole spination monomorphic, homo- or heterogeneous, but not forming a chela with 1^Y claw; keel absent; genital pores on all legs in both sexes.

Suborder Anoplodactylida nom. nov.

Description as for Family Anoplodactylidae.

Family Anoplodactylidae nom. nov.

Palps absent or 1-segmented, same in two sexes. **Chelicerae:** scape 1- or 2-segmented, adult fingers functional, smooth or denticulate, $<$ or $>$ palm length. **Proboscis** with pedicel, styliiform tip or dorsal ornamentation; ventral basal alar processes usually present. **Trunk** of 4 segments, all to non articulated, without dorsal ornamentation; cephalic hood absent or present; separation of lateral processes $<$ to $>$ their diameters; preocular neck absent; postocular neck absent to long. **Ovigers** 5- or 6-segmented in σ , absent or 5- or 6-segmented in ♀ , without compound spines on distal 4 segments, distal anaxial articulations, distal apophysis on 5th segment, or terminal claw. **Legs:** tarsi elongate; 1^Y claws present; accessory claws present or absent; propodi sometimes bearing strong distal dorsal projection; propodal sole spination monomorphic, heterogeneous, but not forming a chela with 1^Y claw; keel (lamella) present; genital pores in 2 pairs of legs in σ , on all legs in ♀ .

Suborder Ephyrogymnida nom. nov.

Description as for Family Ephyrogymnidae.

Family Ephyrogymnidae nom. nov.

Palps 6- to 8-segmented in both sexes, \geq proboscis length. **Chelicerae:** scape 2-segmented in adults, fingers atrophied. **Proboscis** with pedicel, without styliiform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 articulating segments, without dorsal ornamentation; cephalic hood present; lateral processes separated by $<$ their diameters; preocular neck absent; postocular neck long. **Ovigers** 10-segmented in both sexes, without compound spines; σ only with distal anaxial articulation; no distal apophysis on 5th segment; terminal claw present but not forming a chela or subchela. **Legs:** tarsi elongate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores ?

Suborder Pallenopsida nom. nov.

Description as for Family Pallenopsidae.

Family Pallenopsidae nom. nov.

Palps absent or 1-segmented. **Chelicerae:** scape 1- or 2-segmented, adult fingers functional, smooth or tuberculate $<$ or $>$ palm length. **Proboscis** without pedicel, styliiform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 segments, all or none articulating; without dorsal ornamentation; cephalic hood absent or present; separation of lateral processes very variable; preocular neck short or absent; postocular neck long or absent. **Oviger** 7- or 10-segmented in σ , 7- to 10-segmented in ♀ ; without distal compound spines, terminal claw, distal apophysis on 5th segment, or distal anaxial articulation. **Legs:** tarsi arcuate; 1^Y claw present, accessory claws absent or present; propodi without distal dorsal projection; propodal

sole spination monomorphic, heterogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 2 pairs of legs in ♂; on all legs in ♀.

Suborder Sericosurida nom. nov.

Description as for Family Sericosuridae.

Family Sericosuridae nom. nov.

Only ♀ known. **Palps** 7-segmented, without distal anaxial articulation, \geq proboscis length. **Chelicerae**: scape 1-segmented, fingers atrophied. **Proboscis** without pedicel, styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 articulating segments; dorsal ornamentation of ridges; cephalic hood well-developed; preocular neck absent; postocular neck short. **Oviger** 10-segmented, with compound spines on 4 distal segments, without terminal claw or distal anaxial articulation. **Legs**: tarsi arcuate; 1^Y and accessory claws present; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming chela with 1^Y claw; keel absent; genital pores on 3 pairs of legs.

Order Pycnogonomorpha Pocock, 1904

Description as for Family Pycnogonidae.

Family Pycnogonidae Wilson, 1878 emend.

Palps absent in adults and juveniles. **Chelicerae** absent in adults and juveniles. **Proboscis** without pedicel or basal ventral ornamentation; sometimes with one or two dorsal projections; tip sometimes styliform. **Trunk** of 4 or 5 articulating segments, ornamented with ridges and/or humps; cephalic hood absent; lateral processes separated by $<$ their diameters; pre- and postocular necks absent. **Oviger** absent in ♀; absent or 4- to 9-segmented in ♂, without compound spines, distal apophysis on 5th segment or distal anaxial articulations; terminal claw present but not forming a chela. **Legs**: tarsi arcuate; 1^Y claw present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming chela with 1^Y claw; keel absent; genital pores on 1 pair of legs in ♂, on 1, 2 or 4 pairs of legs in ♀.

Order Ascorhynchomorpha Pocock, 1909

Description as for Family Ascorhynchidae.

Family Ascorhynchidae Hoek, 1881 emend.

Palps 9- or 10-segmented in both sexes, \geq proboscis length. **Chelicerae**: scape 1- or 2-segmented in adults; adult fingers atrophied or functional, when smooth and $>$ palm length. **Proboscis** usually with a pedicel, without styliform tip or basal ventral or dorsal ornamentation. **Trunk** of 4 articulating segments, with no dorsal ornamentation, or with humps or ridges and humps; cephalic hood present or absent; lateral processes separated by $>$ their diameters; pre- and postocular necks short to long. **Ovigers** of 8 to 10 segments in both sexes, with compound spines on 4 distal segments; only ♂ sometimes with distal anaxial articulation; terminal claw present or absent, not forming a chela or subchela. **Legs**: tarsi arcuate or elongate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination mono- or dimorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores on 2 pairs of legs in ♂, on 4 pairs in ♀.

Order Rhopalorhynchomorpha nom. nov.

Description as for Family Rhopalorhynchidae.

Family Rhopalorhynchidae nom. nov.

Palps 9- or 10-segmented in ♂, 10-segmented in ♀, \geq proboscis length. **Chelicerae** absent in adults. **Proboscis** with pedicel, without basal ventral ornamentation; with or without dorsal thorn-like projection. **Trunk** of 4 articulating segments ornamented with ridges; cephalic hood absent; lateral processes separated by $>$ their diameters; preocular neck short to long; postocular neck absent. **Ovigers** 9- or 10-segmented in both sexes, with simple or compound spines on 4 distal segments; terminal claws present, sometimes forming a subchela with a spine; no distal anaxial articulations. **Legs**: tarsi arcuate or elongate; 1^Y claw present; accessory claws absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, not forming a chela with 1^Y claw; keel absent; genital pores ?

Incertae sedis:

Family Queubidae nom. nov.

Description as for genus *Queubus*—see Barnard (1954).

Family Hannonidae nom. nov.

Description as for genus *Hannonia*—see Barnard (1954).

Table 7—*continued*

Order Rhynchothoracimorpha nom. nov.

Description as for Family Rhynchothoracidae.

Family Rhynchothoracidae nom. nov.

Palps 5- or 6-segmented in adults of both sexes, \geq proboscis length. **Chelicerae** absent or present in adults; where present, scape 1-segmented, fingers atrophied but palm retained. **Proboscis** without pedicel or basal ventral ornamentation, but sometimes with dorsal projection; tip not styliform. **Trunk** of 4 segments, all or all but one articulating; dorsal ornamentation absent or present as humps; cephalic hood absent; lateral processes separated by $<$ their diameters; preocular neck absent; postocular neck short. **Ovigers** absent or 9- or 10-segmented in ♀, 9- or 10-segmented in ♂; both sexes with compound spines on 4 distal segments; terminal claw present, sometimes forming a chela with a spine; no distal anaxial articulations. **Legs**: tarsi arcuate; 1^Y claw present; accessory claws present or absent; propodi without distal dorsal projection; propodal sole spination monomorphic, homogeneous, sometimes forming a chela with 1^Y claw; keel absent; genital pores ?
