

REVISION OF THE ISOPOD FAMILY SPHAEROMATIDAE
(CRUSTACEA: ISOPODA: FLABELLIFERA) I.
SUBFAMILY NAMES WITH
DIAGNOSES AND KEY

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ABSTRACT

Nomenclature used to designate groups of sphaeromatid genera is discussed. New, properly formed, names are proposed to replace the previously incorrectly formed subgroups of Hansen and others that have been proposed over the years since Hansen. A diagnosis and list of the genera with authors is given for each subfamily. A key to the subfamilies is provided.

Hansen (1905) revised the family Sphaeromatidae (i.e., his subfamily Sphaerominae), dividing it into three taxa: Eubranchiatae, Hemibranchiatae, and Platybranchiatae. This division was based primarily on the structure of the pleopods, in particular the presence or absence of folds on the fourth and fifth pleopods. Hansen identified these divisions as "groups," a category which is not recognized by the International Commission on Zoological Nomenclature. From Hansen's usage, however, it is obvious that he intended these "groups" to be a category between the familial and generic levels of organization. Since Hansen's work, two additional "groups" have been proposed, but not widely accepted: the Colobranchiata (Richardson, 1909), and the Pentadibranchiata (Miller, 1975). Although Bodle (1969) first proposed the Pentadibranchiata in an unpublished master's thesis, Miller (1975) satisfied the requirements of availability (Article 10, International Code of Zoological Nomenclature, 1964), and thus becomes the author of the name.

The Eubranchiatae, Hemibranchiatae, and Platybranchiatae were raised to subfamily status by Hurley and Jansen (1977). However, Article 11e (International Code of Zoological Nomenclature, 1964) states that family-group names must be derived from a valid generic name at the time of publication. The above authors failed to satisfy the provisions of this article because the names given to their subfamilies represent combined names which do not take their respective roots from a generic name. Replacement by properly formed names is warranted.

It is my intention here to replace the name Platybranchiatae, and to establish the groups proposed by Richardson (1909) and Miller (1975) as valid subfamilies. Bowman (1981) proposed the subfamily Dynameninae, based on *Dynamene*, for the name Eubranchiatinae. Since the Hemibranchiatae group contains the nominate genus of the family, *Sphaeroma*, this group becomes the subfamily Sphaeromatinae. The name Cassidininae (based on *Cassidina*) is hereby proposed to replace the name Platybranchiatinae. Tattersall (1905) established the family Anciniidae for the existing genus *Ancinus* and his new genus *Bathycopea*. Unfortunately, Richardson (1909: 174) confused the issue by stating in footnote C "I prefer to retain *Ancinus* as the type and only genus of the family Anciniidae, but those who desire to follow the classification of Hansen may accept the name *Sphaerominae colobranchiata* for a fourth group to include this form." Anciniidae must become the subfamily Ancininae which includes both *Ancinus* and *Bathycopea*. The remaining group, Pentadibranchiata, contains only *Tecticeps*, and therefore the subfamily must be called Tecticipitinae. Table 1 gives a preliminary arrangement of the extant genera in each subfamily.

Table 1. A preliminary arrangement of extant sphaeromatid genera by subfamilies.

Subfamily Ancininae (Tattersall, 1905)

- Ancinus* H. Milne Edwards, 1840
Bathycopea Tattersall, 1905 (jr. syn. *Ancinella* Hansen, 1905)

Subfamily Cassidininae, new name

- Anoplocopea* Racovitza, 1908
Artopoles Barnard, 1920
Caecosphaeroma Dollfus, 1896 (inc. *Vireia* Vire, 1903)
Campecopea Leach, 1814
Cassidina H. Milne Edwards, 1840
Cassidinidea Hansen, 1905 (jr. syn. *Cassidisca* Richardson, 1905; ? *Dies* Barnard, 1951)
Chitonopsis Whitelegge, 1902
Dynameniscus Richardson, 1905
Gnorimosphaeroma Menzies, 1954
Leptosphaeroma Hilgendorf, 1885
Monolista Gerstaecker, 1856 (jr. syn. *Spelaosphaeroma* Feruglio, 1904; incl. *Microlista* Racovitza, 1929)
Paracassidina Baker, 1911
Paraleptosphaeroma Buss and Iverson, 1981
Parasphaeroma Stebbing, 1910
Platysphaera Holdich and Harrison, 1981
Stathmos Barnard, 1940
Striella Glynn, 1966
Syncassidina Baker, 1928
Tholozodium Eleftheriou, Holdich, and Harrison, 1980
Waiteolana Baker, 1926

Subfamily Dynameninae Bowman, 1981

- Amphoroidea* H. Milne Edwards, 1840
Amphoroidella Baker, 1908 (1)
Caecocassidias Kussakin, 1967
Botryias Richardson, 1910
Cassidias Richardson, 1906
Cassidinopsis Hansen, 1905
Cerceis H. Milne Edwards, 1840
Cymodocella Pfeffer, 1887
Discerceis Richardson, 1905
Dynamene Leach, 1814 (syn. *Nesaea* Leach, 1814, *nom. praeocc.*; jr. syn. *Prochonaesea* Hesse, 1873, and *Naesa* Leach, 1815)
Dynamenella Hansen, 1905
Dynamenoides Hurley and Jansen, 1977
Dynamenopsis Baker, 1908
Euvallentinia Stebbing, 1914 (syn. *Vallentinia* Stebbing, 1914, *nom. praeocc.*)
Exocerceis Baker, 1926
Geocerceis Menzies and Glynn, 1968
Haswellia Miers, 1884 (syn. *Calyptura* Haswell, 1881, *nom. praeocc.*)
Holotelson Richardson, 1909
Ischyromene Racovitza, 1908
Moruloidea Baker, 1908
Naesicopea Stebbing, 1893
Neocassidina Roman, 1973
Paracassidinopsis Nobili, 1906
Paracerceis Hansen, 1905 (jr. syn. *Sergiella* Pires, 1980)
Paradella Harrison and Holdich, 1982
Paradynamene Richardson, 1905
Paradynamenopsis Menzies, 1962
Platycerceis Baker, 1926 (2)
Scutuloidea Chilton, 1883
Sphaeromopsis Holdich and Jones, 1973
Thermosphaeroma Cole and Bane, 1978
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Table 1. Continued.

Subfamily Sphaeromatinae H. Milne Edwards, 1840

- Cassidinella* Whitelegge, 1901
Ceratocephalus Woodward, 1877 (jr. syn. *Bregmocerella* Haswell, 1885, *nom. praeocc.*)
Cilicaea Leach, 1818
Cilicaeopsis Hansen, 1905
Clianella Boone, 1923 (3)
Cymodetta Bowman and Kuhne, 1974
Cymodoce Leach, 1814
Cymodopsis Baker, 1926
Dynoides Barnard, 1914 (jr. syn. *Dynoidella* Pillai, 1965; *Dynoidella* Nishimura, 1976; ?*Parady-
noides* Loyola e Silva, 1960)
Exosphaeroma Stebbing, 1900
Hemisphaeroma Hansen, 1905
Isocladus Miers, 1876
Neosphaeroma Baker, 1926
Paracilicaea Stebbing, 1910
Parisocladus Barnard, 1914
Pseudosphaeroma Chilton, 1909
Sorrentosphaera Verhoeff, 1944
Sphaeramene Barnard, 1914
Sphaeroma Latreille, 1802
Zuzara Leach, 1818 (jr. syn. *Cyclura* Stebbing, 1874; *Cycloidura* Stebbing, 1878)

Subfamily Tecticipitinae, new name

- Tecticeps* Richardson, 1897

(1) Originally *Amphoroidella* was proposed as a subgenus of *Amphoroidea*, but the only species, *A. elliptica*, differs from the latter genus in many ways. Hale (1929) raised the name to full generic status without comment.

(2) Baker (1926) proposed *Platycerceis hyalina* as a new subgenus and species, but did not assign it to a genus. From Baker's usage, it seems that he never intended *Platycerceis* to be a subgenus, and the confusion resulted in a *lapsus calami*. Hale (1929) raised the name to full generic status without comment.

(3) Menzies and Glynn (1968) considered *Clianella* to be a junior synonym of *Dynamenella*. Examination of the type specimens revealed that *Clianella* is distinct from *Dynamenella*, and should be retained as a valid genus.

Family Sphaeromatidae H. Milne Edwards, 1840

nom. correct. Dahl, 1916

Diagnosis.—Antenna one peduncle of 3 articles; antenna two peduncle of 5 articles. Mandible stout; lacinia mobilis and molar process usually well developed; palp of 3 articles. Maxillipedal palp of 5 articles. Pleon of an anterior and posterior part; anterior part of 5 partially or completely fused pleonites (1 to 4 visible in dorsal view, indicated by lateral suture lines); posterior part forming vaulted pleotelson. Uropods lateral; exopod free when present; endopod fused with peduncle. Sexual dimorphism often pronounced. Young brooded in invaginated pouches of ventral body wall. Capable of rolling into a sphere or folding over (i.e., cephalon to pleotelson).

Subfamily Ancininae (Tattersall, 1905)

Type-genus.—*Ancinus* H. Milne Edwards, 1840.

Diagnosis.—Cephalon medially fused with first pereonite. Molar process of mandible, when present, highly modified, not forming broad grinding surface. Pereopod 1 prehensile; pereopod 2 prehensile in male only. Pleopod 1 endopod closely set with setae; endopod absent in *Ancinus*. Pleopod 2 highly modified and operculate in *Ancinus*. Pleopod 3 endopod either biarticulate or unjointed; setae if present, on apex only. Pleopods 4 and 5 subsimilar; lacking transverse pleats or folds; somewhat fleshy; no setae, except for 1 seta on apex of pleopod 4 endopod. Pleopod 5 exopod with subapical squamiferous protuberances of low relief. Pleotelson with acutely pointed apical margin. Uropods uniramous.

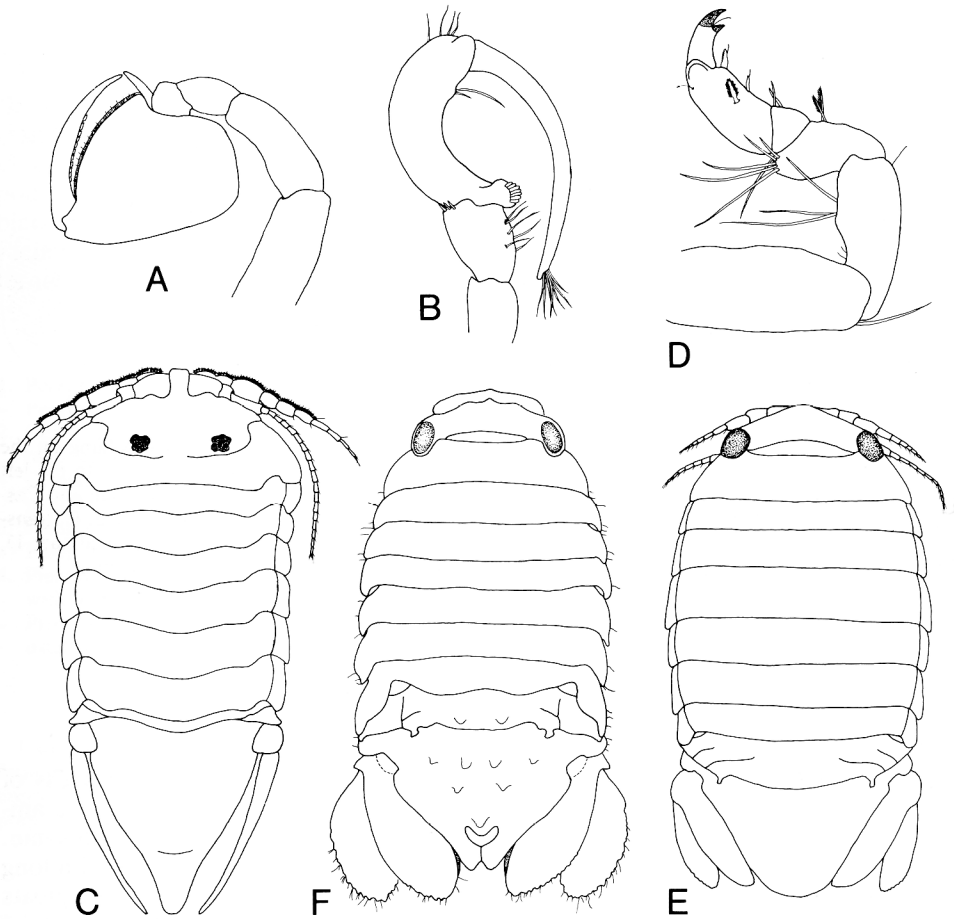


Fig. 1. *Ancinus seticomys*, A-C. A, pereopod I; B, pereopod II; C, dorsal view. *Exosphaeroma inornata*, D-E (redrawn from Iverson, 1978). D, pereopod I; E, dorsal view. *Paradella diana* male (redrawn from Glynn, 1970). F, dorsal view.

Subfamily **Cassidininae**, new name

Type-genus.—*Cassidina* H. Milne Edwards, 1840.

Diagnosis.—Cephalon not medially fused with first pereonite. Molar process of mandible present, grinding surface usually not appreciably raised. Pereopod 1 ambulatory. Pereopod 2 sometimes prehensile in male. Pleopod 1 endopod usually narrow, rarely broad; setae usually only on apex. Pleopod 2 normal, not operculate. Pleopod 3 sometimes with setae on both rami; sometimes inner ramus nearly naked; sometimes both rami naked. Pleopods 4 and 5 with both rami lacking transverse pleats or folds; outer rami unsegmented. Pleopod 4 with both rami lacking setae in most genera; inner ramus at most with few short, terminal setae. Pleopod 5 with both rami lacking setae; outer ramus with low subapical squamiferous protuberances. Pleotelson apex entire, lacking terminal notch or foramen. Uropods, when biramous, with exopod generally reduced in size.

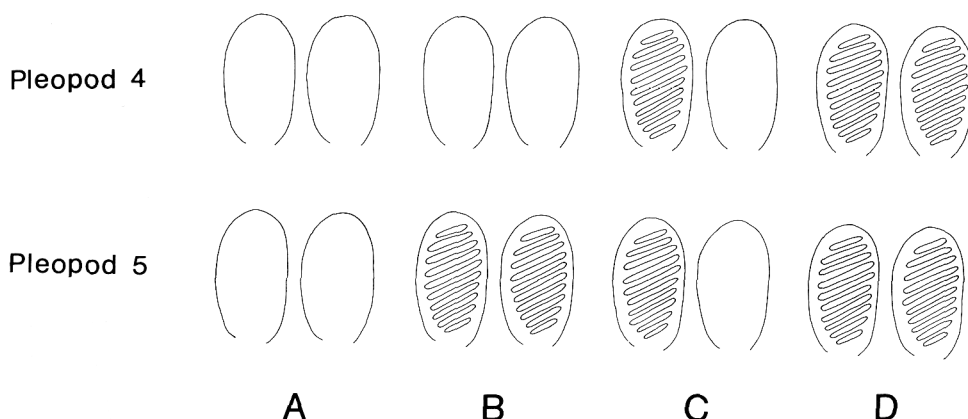


Fig. 2. Simplified schematic representation of the presence or absence of pleopod folding on the fourth and fifth pleopods in the Sphaeromatidae. In each set of diagrams the endopod is to the left and the exopod is to the right. A, transverse pleats or folds absent, subfamilies Ancininae and Casidininae; B, transverse pleats or folds present on pleopod 5 only, subfamily Tecticipitinae; C, transverse pleats or folds present on pleopods 4 and 5 endopods only, subfamily Sphaeromatinae; D, transverse pleats or folds present on both rami of pleopods 4 and 5, subfamily Dynameninae.

Subfamily Dynameninae Bowman, 1981

Type-genus.—*Dynamene* Leach, 1814.

Diagnosis.—Cephalon not medially fused with first pereonite. Molar process of mandible present, grinding surface strongly developed. Pereopods 1 and 2 ambulatory, never prehensile. Pleopod 1 with endopod broad, closely set with setae. Pleopod 2 normal, not operculate. Pleopod 3 with both rami closely set with long setae, at least on distal margin. Pleopod 4 with both rami lacking transverse pleats or folds; exopod unjointed and without setae in most genera; endopod with at most a few, short, terminal setae. Pleopod 5 with both rami lacking transverse pleats or folds and without setae; exopod with low subapical squamiferous protuberances. Pleotelson apex often with terminal notch or foramen (especially in males). Uropods biramous (except in *Scutuloidea*).

Subfamily Sphaeromatinae H. Milne Edwards, 1840

Type-genus.—*Sphaeroma* Latreille, 1802.

Diagnosis.—Cephalon not medially fused with first pereonite. Molar process of mandible present, grinding surface well developed. Pereopods 1 and 2 ambulatory, never prehensile. Pleopod 1 endopod broad, closely set with setae. Pleopod 2 normal, not operculate. Pleopod 3 with both rami closely set with long setae, at least on distal margin. Pleopods 4 and 5 with endopods thick and fleshy, with deep essentially transverse folds; exopod membranaceous (except *Pseudosphaeroma*) and rather pellucid, of 2 segments; both rami with setae. Pleopod 5 with subapical squamiferous protuberances moderately raised. Pleotelson apex weakly emarginate in some genera, occasionally with large notch or slit terminating in foramen. Uropods biramous.

Subfamily **Tecticipitinae**, new name

Type-genus.—*Tecticeps* Richardson, 1897.

Diagnosis.—Cephalon not medially fused with first pereonite. Molar process of mandible lacking. Pereopod 1 subchelate. Pereopod 2 subchelate in males only. Pleopod 1 endopod broad, lacking setae. Pleopod 2 normal, not operculate. Pleopod 3 exopod uniramous; setae, if present, on apex only. Pleopod 4 endopod biarticulate, usually lacking distal setae; both rami lacking transverse folding. Pleopod 5 with both rami with fleshy transverse folds; endopods lacking spiniferous patches. Pleotelson apical margin entire, not emarginate. Uropods biramous.

KEY TO THE SUBFAMILIES OF SPHAEROMATIDAE

1. Pereopod 1 prehensile in both sexes (Fig. 1a); pereopod 2 prehensile in male only (Fig. 1b) ... 2
- Pereopods 1 and 2 ambulatory (Fig. 1d) 3
2. Cephalon medially fused to first pereonite (Fig. 1c); uropods uniramous; pleopod 5 with both rami lacking transverse pleats or folds (Fig. 2a) Ancininae
- Cephalon and first pereonite not medially fused (Fig. 1e, f); uropods biramous; both rami of pleopod 5 with transverse pleats or folds (Fig. 2b) Tecticipitinae
3. Pleopods 4 and 5 lacking transverse pleats or folds (Fig. 2a) Cassidininae
- Pleopods 4 and 5 with transverse pleats or folds on endopods (Fig. 2c, d) 4
4. Pleopods 4 and 5 with transverse pleats or folds on both rami (Fig. 2d); pleotelson apex usually with terminal notch or foramen (Fig. 1f) Dynameninae
- Pleopods 4 and 5 with transverse pleats or folds on endopods only (Fig. 2c); pleotelson apex usually entire, lacking a notch or foramen (Fig. 1e) Sphaeromatinae

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LITERATURE CITED

- Baker, W. H. 1926. Species of the isopod family Sphaeromidae from the eastern, southern and western coasts of Australia.—Transactions and Proceedings of the Royal Society of South Australia 50: 247–279.
- Bodley, J. E. 1969. Pleopod and penial structure in the isopod family Sphaeromatidae with special reference to its taxonomy.—Unpublished M.A. Thesis, University of California, Davis, 71 pp.
- Bowman, T. E. 1981. *Thermosphaeroma milleri* and *T. smithi*, new sphaeromatid isopod crustaceans from hot springs in Chihuahua, Mexico, with a review of the genus.—Journal of Crustacean Biology 1: 105–122.
- Dahl, F. 1916. Die Asseln order Isopoden Deutschlands.—Jena, 90 pp.
- Hale, H. M. 1929. The crustaceans of South Australia.—Handbooks of the Flora and Fauna of South Australia 2: 201–380. British Science Guild (South Australian Branch), Adelaide.
- Hansen, H. J. 1905. On the propagation, structure and classification of the family Sphaeromidae.—Quarterly Journal of Microscopical Science 49: 69–135.
- Hurley, D. E., and K. P. Jansen. 1977. The marine fauna of New Zealand: family Sphaeromatidae (Crustacea Isopoda: Flabellifera).—New Zealand Oceanographic Institute, Memoir 63, pp. 1–95.
- Latreille, P. A. 1802. Histoire naturelle, générale et particulière des crustacés et des insectes. Vol. 3, Paris, An X [1802]–XII [1805].—In: G. L. L. de Buffon, Histoire naturelle . . . nouvelle édition, accompagnée de notes . . . ouvrage . . . rédigé par C. S. Sonnini. [Suites.], Paris.
- Leach, W. E. 1814. Crustaceology.—In: Brewster's Edinburgh Encyclopaedia 7: 383–437.
- Menzies, R. J., and P. W. Glynn. 1968. The common marine isopod Crustacea of Puerto Rico.—Studies on the Fauna of Curaçao and other Caribbean Islands 27: 1–133.
- Miller, M. A. 1975. Phylum Arthropoda: Crustacea, Tanaidacea and Isopoda.—In: R. I. Smith and J. T. Carlton, Light's Manual: Intertidal Invertebrates of the Central California Coast, University of California Press, 3rd ed., 716 pp.

- Milne Edwards, H. 1840. Histoire naturelle des Crustacés comprenant l'anatomie, la physiologie et la classification de ces animaux.—Librairie Encyclopédique de Roret 3: 1–605.
- Richardson, H. R. 1897. Description of a new genus and species of Sphaeromidae from Alaskan waters.—Proceedings of the Biological Society of Washington 11: 181–183.
- . 1909. The isopod crustacean, *Ancinus depressus* (Say).—Proceedings of the United States National Museum 36: 173–177.
- Tattersall, W. M. 1905. The marine fauna of the coast of Ireland. Part V. Isopoda.—Scientific Investigations Fisheries Branch Ireland 2: 1–90.

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