



Sphaerium (Musculium) Link, 1807

Diagnostic features

Both *Sphaerium* and *Musculium* have small shells (length up to 9 mm, usually 7-8 mm) with their beaks usually slightly shifted posteriorly, not protruding, prodissoconch sometimes separated by growth break line but never forming a bean-shaped cap. The ligament is externally visible, and elevated in the largest specimens. Siphons are short, especially their fused part, and the dorsal retractor muscles of the inhalant siphon are markedly reduced, and their scars merged with those of the posterior adductors. The kidney has a broad to narrow and elongate dorsal lobe. The outer demibranch is 30-40% the height of the inner demibranch (depending on stage of development) (based on Korniuschin, 2000).

According to Korniuschin (2002) the autapomorphies of *Sphaerium* are (1) interlamellar septae in inner demibranch are developed on all gill filaments and (2) and there is simultaneous development of several broods (asynchronous brooding) and the released juveniles have an outer demibranch present. In *Musculium* a cap is present on the umbo and the inner cardinal tooth on the left valve is straight. *Sphaerinova* differs from *Sphaerium* in having weak upper retractors of the branchial siphon.

Diagnosis of *Sphaerium* given by Bespalyala et al. (2024): Shell large-sized (shell length in adults varies between 6 and 25 mm), rounded to ovate in shape, typically thick walled. The beaks rounded and slightly prominent or narrow, pore density varies among species. Cardinal and lateral teeth well developed. Nephridia moderately elongated. Two siphons (exhalant and inhalant) are present. The outer and inner demibranch relatively well developed.

Classification

Sphaerium Scopoli, 1777

Class Bivalvia

Infraclass Heteroconchia

Cohort Heterodonta

Megaorder Neoheterodontei

Order Sphaeriida

Superfamily Sphaerioidea

Family Sphaeriidae

Subfamily Sphaeriinae

Genus *Sphaerium* Scopoli, 1777

Type species: *Tellina cornea* Linnaeus, 1758. Europe.

Musculium Link, 1807

Type species: Tellina lacustris O. F. Müller, 1774. Europe.

Original reference: Link, D.H.F. (1807-1808). Beschreibung der Naturalien-Sammlung der Universität zu Rostock. Adlers Erben. 1 Abt. [Part 1], pp. 1-50; 2 Abt. [Part 2], pp. 51-100; 3 Abt. [Part 3], pp. 101-165; Abt. 4 [Part 4], pp. 1-30; Abt. 5 [Part 5], pp. 1-38 [1808]; Abt. 6 [Part 6], pp. 1-38., available online at <https://www.biodiversitylibrary.org/page/43301237>

State of taxonomy

The Australian species were included in *Sphaerinova* Iredale as a subgenus of *Sphaerium* (Kuiper 1983) or *Musculium* (Korniushin 2000) but Lee and Ó Foighil (2003) included only *Sphaerium tasmanicum* in the subgenus *Sphaerinova* and that taxon and *Musculium* were considered to be subgenera of *Sphaerium*. Graf & Cummings (2023) treat both *Sphaerinova* and *Musculium* as synonyms of *Sphaerium* (along with another 50 genus-group names!) but without justification.

The two subgenera of *Sphaerium* that are recognised here follows Bespalaya et al. (2024), although this author had doubts about the status of *Musculium*.

Biology and ecology

Inhabit almost all types of freshwater habitats including springs, rivers, lakes, ponds, billabongs, waterholes, small creeks, drains and peat bogs. Brood young in multiple brood pouches. Suspension and deposit feeder. Live in sediment and in weeds.

Distribution

Australia, and taxa from New Zealand, USA, Spain, Portugal, eastern Europe and northern Asia.

Notes

Sphaerium is distinguished from the related genus *Euglesa* by its larger size, median or nearly median position of the umbo, presence of two tubular siphons, two pairs of retractor muscles by the lower (branchial) siphon, and the outer demibranchs have both descending and ascending lamellae and multiple brood pouches.

Further reading

Beesley, P. L., Ross, G. J. B. & Wells, A., Eds. (1998). *Mollusca: The Southern Synthesis. Parts A & B*. Melbourne, CSIRO Publishing.

Bespalaya, Y. V., Vinarski, M. V., Aksenova, O. V., Babushkin, E. S., Gofarov, M. Y., Kondakov, A. V., Konopleva, E. S., Kropotin, A. V., Mabrouki, Y., Ovchankova, N. B., Palatov, D. M., Sokolova, S. E., Shevchenko, O. V. T., Abdelkhaleq, F. T., Soboleva, A. A., Zubrii, N. A. & Bolotov, I. N. (2024). Phylogeny, taxonomy, and biogeography of the Sphaeriinae (Bivalvia: Sphaeriidae). *Zoological Journal of the Linnean Society* 201: 305-338.

Fuentealba-Jara, C., D'Elia, G., González, F. & Franco-Jaccard, C. (2017). Phylogenetic reconstruction of Sphaeriidae (Veneroidea: Bivalvia) and phylogenetic position of *Pisidium chilense*. *Hidrobiológica*, 27: 115-117.

Lee, T. (2019). Sphaeriidae Deshayes, 1855 (1820). Pp. 197-201 in C. Lydeard & Cummings, K. S. *Freshwater Mollusks of the World: a Distribution Atlas*. Baltimore, John Hopkins University Press.

Korniushin, A. V. (2000). Review of the family Sphaeriidae (Mollusca: Bivalvia) of Australia, with the description of four new species. *Records of the Australian Museum* 52: 41-102.

Korniushin, A. V. & Glaubrecht, M. (2002). Morphological characters analysis, the intergroup phylogenetic relationships and possible outgroups of the family Sphaeriidae (Mollusca, Bivalvia). *Vestuj zoologii* 36(4): 3-22.

Kuiper, J. G. J. (1983). The Sphaeriidae of Australia. *Basteria* 47: 3-52.

Lamprell, K. & Healy, J. (1998). *Bivalves of Australia, volume 2*. Leiden, Backhuys Publishers.

Lee, T. & Ó Foighil, D. (2003). Phylogenetic structure of the Sphaeriinae, a global clade of freshwater bivalve molluscs, inferred from nuclear (ITS-1) and mitochondrial (16S) ribosomal gene sequences. *Zoological Journal of the Linnean Society* 137: 245-260.

Smith, B. J. & Kershaw, R. C. (1979). *Field guide to the non-marine Molluscs of South-eastern Australia*. Canberra, A.N.U. Press.

Smith, B. J. & Kershaw, R. C. (1981). *Tasmanian Land and Freshwater Molluscs*. Hobart, University of Tasmania.

To cite this resource: **Ponder, W. F., Hallan, A., Shea, M. E., Clark, S. A., Richards, K., Klunzinger, M. W., and Kessner, V. 2023. Australian Freshwater Molluscs. Revision 2.**

https://keys.lucidcentral.org/keys/v3/freshwater_molluscs/

To contact the authors for comment or suggestions, please email: fwmollusc@gmail.com

Copyright © 2024. All rights reserved. The Australian Museum.

