



***Velesunio* Iredale, 1934**

Diagnostic features

Shell medium to large, oblong to oval or subcircular, valves thin, inflated, rarely winged, sculpture of collabral growth lines only, umbos without sculpture and usually eroded, olive brown to black periostracum, interior of valves nacreous bluish to bronze to white, hinge teeth with pseudocardinal teeth thin, rarely grooved, usually smooth; hinge sometimes reduced.

Anatomy: the gills (ctenidia) are eulamellibranch and the foot is compressed, tongue-shaped and lacks a byssal groove. Larvae are brooded in a marsupium that occupies about two-thirds of the inner pair of demibranchs of females. Inhalant and exhalant siphons not prominent and formed by the mantle edge, which is open ventrally, inhalant 'siphon' larger than exhalant 'siphon' bearing up to five rows of papillae internally; often heavily pigmented. Labial palps of medium size, triangular to subtriangular in shape.

Velesunio is most closely related to *Alathyria*, species of the latter genus having a thicker shell and more prominent hinge.

The species of *Velesunio* can be distinguished as follows:

V. ambiguus. Compressed to globose, ventral margin at least slightly rounded; width/length ratio 58-69%; shell length up to 120 mm; pseudocardinal teeth usually smooth, sometimes grooved. Anterior adductor scar weak, except in old individuals.

V. angasi. Shell compressed, posterior expanded, usually winged; ventral margin usually straight, rarely convex or slightly sinuate; width/length ratio 50-60%; shell length up to 90 mm.

V. moretonicus. Shell slightly swollen, anteriorly and posteriorly rounded, pseudocardinal teeth grooved; shell length up to 120 mm; ventral margin straight over mid-section; anterior adductor scar usually deeply impressed.

V. wilsonii. Shell compressed, rather elongate for genus (height/length ratio less than 53%); shell length up to 125 mm; tapered and not winged or very slightly winged posteriorly, ventral margin slightly rounded in juveniles, straight in adults.

Classification

Velesunio Iredale, 1934

Class Bivalvia

Infraclass Heteroconchia

Cohort Palaeoheterodonta

Order Unionida

Superfamily Unionoidea

Family Hyriidae

Subfamily Velesunioninae

Genus *Velesunio* Iredale, 1934

Type species: *Unio balonnensis* Conrad, 1850

Original reference: Iredale, T. (1934). The Freshwater mussels of Australia. *Australian Zoologist* 8: 57-78.

Type locality: Balonne River, New South Wales.

Synonyms: *Centralhyria* Iredale, 1934; *Aparcthyria* Iredale, 1934.

State of taxonomy

The last major taxonomic revision of Australian freshwater mussels was by McMichael & Hiscock (1958). Based on the available molecular results, Walker et al. (2014) pointed out that a re-assessment of Australian hyriids is needed.

Biology and ecology

Rivers, streams, lakes, billabongs, and water catchment dams. Infaunal, living two thirds to almost fully buried in sand and sediment. Suspension feeders. Sexes separate. Females brood young in marsupia in the inner pair of demibranchs. Larvae parasitic, using fish as hosts and dispersal agents. Tends to favour still to sluggish streams, rivers, and lakes.

Distribution

Most of mainland Australia and Tasmania, except for the southwest corner of Western Australia. The genus also occurs in West Papua and Papua New Guinea.

Notes

The Australian genera of freshwater mussels are distinguished by the following shell characters (note that all are subject to erosion with age, depending on the local environment):-

Hyridella. Beaks and umbos of at least young specimens sculptured with V-shaped ridges; shell quadrate to elongate (ratio of maximum height of shell to its length >50%), not markedly winged. Hinge strong with grooved pseudocardinal teeth and simple 'lateral' teeth. Shell surface (other than beaks) are, in most species of *Hyridella*, more-or-less smooth except for collabral growth lines, but sculpturing extends over shell surface in *H. gnelgensis*. Eastern and south-eastern Australia, and Tasmania.

Velesunio. Beaks smooth, shell can be rather thick, rounded in outline (ratio of maximum height of shell to its length >50%), often inflated, hinge lamellar, usually simple (rarely serrated). Shell surface with collabral growth lines only. Northern and eastern Australia, Tasmania.

Alathyria. Shell typically large, elongate-ovate (ratio of maximum height of shell to its length >50%), often distinctly winged, thick, hinge usually with heavy, pseudocardinal teeth grooved, 'lateral' teeth smooth. Shell surface more-or-less smooth, with collabral growth lines only, although nodular sculpture has been observed on the beaks of *A. pertexta*. Eastern half of Australia.

Cucumerunio. Shell very elongate (ratio of maximum height of shell to its length <40%), beaks sculptured with V-shaped ridges; rest of shell surface with conspicuous nodules or ridges. Hinge strong, pseudocardinal teeth grooved. Eastern rivers of NSW and Queensland.

Lortiella. Shell elongate (ratio of maximum height of shell to its length <45%), usually winged posteriorly, hinge simple, not well developed. Beaks smooth and shell surface with collabral growth lines only. Found in NW Australia.

Westralunio. Shell more or less oblong (ratio of maximum height of shell to its length >50%). Pseudocardinal teeth erect, strongly serrated, shell medium-sized (usually less than 70-80 mm in length, up to 90-100 mm). Beaks sculptured in un-eroded juveniles with v- or w-shaped ridges, shell rather thick, with collabral growth lines. Three taxa in SW Australia and two species in Papua New Guinea.

Further reading

Baker, A. M., Bartlett, C., Bunn, S. E., Goudkamp, K., Sheldon, F. & Hughes, J. M. (2003). Cryptic species and morphological plasticity in longlived bivalves (Unionoida: Hyriidae) from inland Australia. *Molecular Ecology* 12:2707–2717.

Baker A. M, Sheldon F, Somerville, J., Walker, K.F. & Hughes J.M. 2004. Mitochondrial DNA phylogenetic structuring suggests similarity between two morphologically plastic genera of Australian freshwater mussels (Unionoida: Hyriidae) *Molecular Phylogenetics and Evolution* 32: 902–912

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

Graf, D. L., Jones, H. A., Geneva, A. J., Pfeiffer, J. M. III & Klunzinger, M. W. (2015). Molecular phylogenetic analysis supports a Gondwanan origin of the Hyriidae (Mollusca: Bivalvia: Unionida) and the paraphyly of Australasian taxa. *Molecular Phylogenetics and Evolution*. 85: 1-9.

Graf, D. L. & Cummings, K. S. (2019). Hyriidae Swainson, 1840. Pp. 214-217 in C. Lydeard & Cummings, K. S. *Freshwater Mollusks of the World: a Distribution Atlas*. Baltimore, John Hopkins University Press.

Haas, F. (1969). Superfamilia Unionacea. Das Tierreich, 88 (1-10), 1-663.

Hughes, J. M., Baker A. M, Bartlett, C, Bunn, S. E, Goudkamp, K. & Somerville, J., 2004. Past and present patterns of connectivity among populations of four cryptic species of freshwater mussels *Velesunio* spp. (Hyriidae) in central Australia. *Molecular Ecology* 13, 3197–3212.

Humphrey, C. L. (1984). *Biology and Ecology of the freshwater mussel Velesunio angasi (Bivalvia: Hyriidae) in the Magela Creek, Alligator Rivers Region, Northern Territory*. Ph.D. Thesis, University of New England, Armidale.

Iredale, T. (1934). The freshwater mussels of Australia. *Australian Zoologist* 8: 57-78.

Iredale, T. (1943). A basic list of the fresh water Mollusca of Australia. *Australian Zoologist* 10: 188-230.

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

McMichael, D. F. & Hiscock, I. D. (1958). A monograph of the freshwater mussels (Mollusca: Pelecypoda) of the Australian region. *Australian Journal of Marine and Freshwater Research* 9: 372-508.

Ponder, W. F., Clark, S. A. & Dallwitz, M. J. (2000). *Freshwater and estuarine molluscs: an interactive, illustrated key for New South Wales*. Melbourne, CSIRO Publishing.

Smith, B. J. (1992). Non-marine Mollusca. Pp. i-xii, 1-408 in W. W. K. Houston. *Zoological Catalogue of Australia*, 8. Canberra, Australian Government Publishing Service.

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

Walker, K. F. (1981). The distribution of freshwater mussels (Mollusca: Pelecypoda) in the Australian zoogeographic region. Pp. 1233-1249 in A. Keast. *Ecological Biogeography of Australia*. The Hague, Dr W. Junk.

Walker, K. F. (2004). *A guide to the provisional identification of the freshwater mussels (Unionoida) of Australasia*. Albury, Murray Darling Freshwater Research Centre.

Walker, K. F., Byrne, M., Hickey, C. W. & Roper, D. S. (2001). Freshwater Mussels (Hyriidae) of Australasia. Pp. 5-31 in G. Bauer & Wächtler, K. *Ecology and Evolution of the Freshwater Mussels Unionoida. Ecological Studies*. Berlin, Springer-Verlag.

Walker, K. F., Jones, H. A. & Klunzinger, M. W. (2014). Bivalves in a bottleneck: taxonomy, phylogeography and conservation of freshwater mussels (Bivalvia: Unionoida) in Australasia. *Hydrobiologia* 735:61–79.

Zeritz, A., Sartori, A. F. & Klunzinger, M. W. (2013). Morphological evidence shows that not all Velesunioninae have smooth umbos. *Journal of Molluscan Studies* 79: 277–282.

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 © 2023. All rights reserved. The Australian Museum.

