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CORRECT FAMILY NAMES FOR THE FRESHWATER "MUTELOID" BIVALVES (UNIONOIDA: ETHERIOIDEA)

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ABSTRACT. This paper discusses the family level nomenclature of the tropical freshwater unionoidan bivalves usually referred to as the "Muteloidea" (or Mutelacea). There are numerous errors and discrepancies in the literature concerning the attribution of the relevant family names, which has led to taxonomic instability. It is here shown that **Etherioidea** Deshayes 1830 is the correct superfamily name for this group; the constituent families include **Etheriidae** Deshayes 1830, **Iridinidae** Swainson 1840 (+ "Mutelidae"), and **Mycetopodidae** Gray 1840 (the last as a subfamily in some classifications). Taxonomic stability will be maximized by usage of the correct names for these bivalves.

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INTRODUCTION

The freshwater bivalves of the Order Unionoida are usually classified in two superfamilies (*e.g.*, Boss, 1982: 1123-1127). The Unionoidea [= Unionacea], with over 1,000 Recent species, is best known for its glochidium larva, which has two valves during the dispersal and attachment stage. The Unionoidea includes several Recent families; most authors have recognized the Unionidae, Margaritiferiidae and Hyriidae.

The other superfamily, usually called the "Muteloidea" [or Mutelacea], is significantly less speciose (with about 125 tropical species) and is the subject of this paper. These bivalves have a lasidium (or haustorium) larva which is not truly bivalved, in contrast to the glochidium larva of the Unionoidea (Parodiz and Bonetto, 1963; Heard and Vail, 1976).

This smaller superfamily of the Unionoidea has had a significant variety of family-level names applied to its constituent taxa. A careful survey of the relevant literature has shown that no one author has made the correct determinations of the family names or the author-date thereof. The purpose of this paper is to delineate all relevant family names applied to "muteloid" bivalves and to determine their correct attributions.

Indeed, almost every author who has provided a classification for this group has used a different combination of names, authors, and dates. Taxonomic stability, including the ease of information retrieval, is significantly hampered by the inconsistent usage of these names in the literature. The correct usage, as here determined, will actually maximize taxonomic stability by providing a single, common reference frame.

Before reviewing the names and classifications which

have been applied to "muteloid" bivalves, several fundamental principles (here paraphrased) of the International Code of Zoological Nomenclature [ICZN, 1985] should be taken into consideration.

1. A family name established at any one rank is simultaneously established with the same author and date at all other family level ranks [Article 36(a)].

   In other words, if Swainson in 1840 had established the "Iridininae," then the "Iridinidae" (if used), also dates to Swainson 1840.

2. A family name, when described, must end in a latinized suffix (*e.g.* -idae, -inae), and not merely the plural noun or adjective referring to a genus [Article 11(f)(i)(2)]. However, a family group name published prior to 1900, but not fully latinized, can be made available with the original author-date, if it was latinized by a subsequent author, and if this was "generally accepted" by other authors [Article 11(f)(iii)].

These considerations are of direct relevance to the problem of the "muteloid" bivalves.

The first author to discuss the family-level classification of "muteloid" bivalves was Deshayes in 1830 (also in 1831). Deshayes, in his tabular charts showing the higher classification of bivalves, explicitly referred to various taxa now placed in the "Muteloidea". However, Deshayes did **not** have formally latinized generic or family level names. Deshayes used two family names for this group: **Ethéries** [for "*Ethérie*", *i.e. Etheria* Lamarck 1807] and **Mullerie** [for "*Mullerie*", *i.e. Mulleria* Férussac 1824]. Both generic and family names were given in the "vernacular" by Deshayes. According to ICZN Article 11(f), these two names could be accepted as validly described in Deshayes (1830) **if** they were subsequently latinized and **if** this has been accepted by other authors (the latter potentially a subjective criterion).

Swainson (May 1840), in his "quinarian" classification of

mollusks, appears to have been the first subsequent author to have formally latinized one of Deshayes' names: on pages 257 and 390, Swainson used **Etheridae**, which has a latinized suffix. This was further emended to **Etheriadae** by Gray (Nov. 1840: 141) and is now spelled as **Etheriidae**. This family name has received frequent usage in the malacological and faunistic literature, although few authors have correctly dated it to "Deshayes 1830".

Deshayes' other family name, "**Mullerie**," has been largely ignored by subsequent authors. As far as I can determine, the first source to use the form "**Mulleriidae**" was Starobogatov (1970: 73, 74). Herrmannsen (1846: 24; 1847: 61) had used "**Mülleriae**" which is not a plural but should be regarded as a family name since he stated it to be "secunda familia Monomyariourum primi ordinis" [note the erroneously added umlaut in the name]. The Mulleriidae has been used (in this century) only by Russian authors (see also Nevesskaya, *et al.*, 1971a: 13, 1971b: 149; Scarlato & Starobogatov, 1979: 20; 1985 translation: 19; Starobogatov, 1992: 20), thus the Mulleriidae has not been as widely accepted by other authors.

In any case, most non-Russian authors have classified *Etheria* and *Mulleria* in the same family, **Etheriidae**. Hence the Mulleriidae and Etheriidae are synonyms, and it is here concluded that taxonomic stability will be maximized by the usage of **Etheriidae** Deshayes 1830 for these and related genera.

There are two other groups of "muteloids" traditionally classified in the African Mutelidae and the neotropical Mycetopodidae. A careful consideration of the nomenclature of these two groups shows discrepancies and errors in the usage of the family level names for these two groups.

Most authors have used "Mutelidae" for *Mutela*, *Iridina*, *Aspatharia* and certain other African genera. This family

level name has usually been dated to "Gray 1847" (*i.e.*, as "**Muteladae**", on page 197). However, Swainson in 1840 had already established the **Iridininae** as a subfamily of the Unionidae (pages 286, 380). This was subsequently elevated to a full family, **Iridinidae**, by Gray (1840: 142, 155). As subsequent authors have invariably classified *Iridina* and *Mutela* in the same family, then this means that the **Iridinidae** Swainson 1840 has seven years' priority over the Mutelidae Gray 1847.

The remaining neotropical group, comprising *Andontites*, *Mycetopoda*, and other genera (see Vaught, 1989: 124) has traditionally been classified in the Mycetopodidae, which dates from Gray 1840 (pages 142, 155). Heard and Vail (1976), based upon anatomical research on *Etheria*, concluded that in fact *Etheria* was confamilial with the Mycetopodidae. They then stated that:

> "This action treats Etheriidae Swainson 1840 and Mycetopodidae Gray 1840 as synonyms. Acting as 'first reviser' we select Mycetopodidae Gray as the senior synonym." (Heard and Vail, 1976: 22).

Their statement is doubly erroneous: (1) Swainson's publication actually appeared earlier in 1840 (*i.e.*, May) than did Gray's (*i.e.*, November) and this clear priority should have led to the "selection" of Etheriidae as the senior synonym; (2) in any case, the Etheriidae actually dates to Deshayes 1830, as shown herein.

Therefore, for those authors who desire to treat *Etheria*, *Mycetopoda*, and related genera as confamilial, then the Etheriidae Deshayes 1830 has priority as the family name. In such classifications, Mycetopodinae Gray 1840 could still be used as a subfamily name for certain South American genera within this family. Alternatively, if these genera are classified in separate families, then of course both names are to be used at the family level.

Finally, to resolve the question of the proper superfamily name for "muteloid" bivalves. The oldest family level names available are the Etheriidae and Mulleriidae both of Deshayes 1830; the next name is the Iridinidae Swainson 1840. Obviously, the name "Muteloidea" (or Mutelacea), dating from Gray 1847, must fall into synonymy. Based upon priority (and synonymy of Mulleriidae with Etheriidae), the correct superfamily name for the unionoidan bivalves with a lasidium larva is **Etherioidea** (or Etheriacea). As it happens, only the aforementioned Russian authors have arrived at this determination, albeit they also recognized the "**Mulleroidea**" as a separate superfamily (Starobogatov, 1992: 21). As Boss (1982: 1127) noted, "Soviet authorities are inclined to separate each genus into its own family..." and indeed other

Table 1. Selected twentieth-century classifications of "mutelid" bivalves. An asterisk * indicates an incorrect author or date for a family-level taxon.

MODELL, 1942:
Mutelidae (Gray) Ihering 1893 *
Prisodontinae Modell 1942
Monocondylaeinae Modell 1942
Glabarinae Modell 1942
Anodotitinae Modell 1942
Bartlettiinae Modell 1942
Mycetopodinae Modell 1942 *
Pseudaviculinae Modell 1942
Spathopsinae Modell 1942
Iridininae Modell 1942 *
Aspathariinae Modell 1942
Etheriinae Modell 1942 *
Mutelinae Ortmann 1911 *
Diplasminae Modell 1942
Velesunioninae Iredale 1934
Lortiellinae Iredale 1934
[The last two taxa are now in Unionoidea: Hyriidae]

PARODIZ & BONETTO, 1963 (pages 205-206):
Mutelacea
Mutelidae Gray 1847
Mycetopodidae Gray 1840
Mycetopodinae Adams & Adams 1858 *
Monocondylaeinae Modell 1942
Anodontitinae Modell 1942
? Leilinae Morretes 1949
[The status of the Etheriidae was not discussed by Parodiz & Bonetto]

NEVESSKAYA, *et al.*, 1971a (page 13); 1971b (page 149):
Mullerioidea Deshayes 1830
Mulleriidae Deshayes 1830
Mycetopodidae Modell 1942 *
Etherioidea Deshayes 1830
Mutelidae Gray 1847
Etheriidae Deshayes 1830
Pseudomulleriidae Starobogatov 1970
? Desertellidae Dechaseaux 1946

malacologists have consistently rejected the extensive splitting of these Russian publications.

A review of the twentieth-century literature on "muteloid" bivalves has revealed a remarkable range of usage of family names, and often erroneous attributions of their author and dates (Table 1). In particular, the works of Modell (1942; 1949; 1964) have internal inconsistencies and lack compliance with the ICZN principles concerning the attributions of family names. The two publications of Haas (1969a: 548-606; 1969b: N463-N467) are also inconsistent; in the second work, the Mutelidae was dated to "Swainson, 1840" instead of Gray 1847 (see also Vokes, 1980: 92).

In conclusion, it is documented that the correct superfamily name for unionoidan bivalves having a lasidium larval stage is **Etherioidea** Deshayes 1830, with constituent families **Etheriidae** Deshayes 1830, **Iridinidae** Swainson 1840 (+ Mutelidae) and **Mycetopodidae** Gray 1840 (the last as a subfamily of Etheriidae in some classifications).

CATALOGUE OF FAMILY-LEVEL NAMES

Acostaeidae Morrison 1973: 45. As a family in the Mutelacea. For *Acostaea* d'Orbigny 1851 [South America].

Aetheridae Herrmannsen 1846: 24. Emendation for Etheriidae (and of "Aethéries" Deshayes). For "*Aetheria* Lamck. 1808" [= *Etheria* Lamarck] [Africa].

Anodontitinae Modell 1942: 175. As a subfamily of Mutelidae. For *Anodontites* Bruguière 1792 [South America].

Aspathariinae Modell 1942: 177. As a subfamily of Mutelidae. For *Asphatharia* [sic] Bourguignat 1885; *Leptospatha* Rochebrune & Germain 1904; *Arthropteron* Rochebrune 1904 [Africa].

Bartlettiinae Modell 1942: 176. As a subfamily of Mutelidae. For

Bartlettia H. Adams 1870 and *Acostaea* d'Orbigny 1835 [South America].

Dentaspathariinae Modell 1964: 83. As a subfamily of Mutelidae. For *Dentaspatharia* Modell 1964 [fossil, Europe]; *Prisodontopsis* Tomlin 1928 [= *Pseudavicula* Simpson 1900 *non* Etheridge 1892] [Africa]. As the type genus of the Pseudaviculinae was a junior homonym, Modell thought that this necessitated a change in the family-level name.

Desertellidae Dechaseaux 1947: 307-309. For *Desertella* Haug 1905 [*ex* Munier-Chalmas MS.] [fossil, North Africa].

Diplasminae Modell 1942: 177-178. As a subfamily of Mutelidae. For *Diplasma* Rafinesque 1831 [South Asia]. See Hemisolasminae Starobogatov 1970; new name for Diplasminae Modell 1942.

Etheriae Owen 1837: 64. Printed in italics, but not properly latinized.

Etheridae Swainson 1840 (May): 257, 390. For *Etheria* Lamarck 1807 and *Mulleria* Férussac 1824 [Africa and South America]. This represents the first latinization of "Ethéries" Deshayes (*q.v.*). Emended to "Etheriadae" by Gray (Nov. 1840: 141); emended to "Aetheridae" by Herrmannsen (1846: 24).

Ethéries Deshayes 1830 (also in 1831): table, Famille 20. For "*Ethérie*" [*i.e.*, *Etheria* Lamarck 1807]. The family and genus are given in the vernacular French spelling; this was latinized by Swainson 1840. See also "Mullerie" herein.

Etheriinae: Modell (1942: 176) stated that this was a "n. subfam." -- in fact, the name dates to Deshayes 1830.

Fossulini Bonetto 1966: 3*ff*. As a tribe in the Monocondylaeinae. For *Fossula* Lea 1870 [South America].

Glabarinae Modell 1942: 175. As a subfamily of Mutelidae. For *Glabaris* Gray 1847 and *Leila* Gray 1840 [Central and South America].

Hemisolasminae Starobogatov 1970, pg. 73, 192. New name for Diplasminae Modell 1942. For *Hemisolasma* Rafinesque 1831.

However, Starobogatov transferred this taxon to the Hyriidae (Unionoidea).

Iridininae Swainson 1840: 286, 380. As a subfamily of Unionidae. For *Iridina* Lamarck 1819; *Calliscapha* Swainson 1840; *Mycetopus* d'Orbigny 1847 [Africa and South America]. As a full family, Iridinindae, in Gray (1840: 142, 155).

Iridininae: Modell (1942: 176) stated that this was a "n. subfam." -- in fact, the name dates to Swainson 1840.

Leilinae Morretes 1949: 28. As a subfamily of Monocondylaeidae [*i.e.*, Mycetopodidae]. For *Leila* Gray 1840 [South America].

Monocondylaeinae Modell 1942: 175. As a subfamily of Mutelidae. For *Monocondylaea* d'Orbigny 1835; *Iheringella* Pilsbry 1893; *Marshalliella* Haas 1931; *Diplodontites* Marshall 1922; *Tamsiella* Haas 1931 [South America].

Mullerie Deshayes 1830 (also 1831): table, Famille 23. For "*Mullerie*" [*i.e.*, *Mulleria* Férussac 1824]. The family and genus are given in the vernacular French spelling; this was latinized by Herrmannsen (1847: 61), as "Mülleriae". Subsequently emended to "Mulleriidae" by Starobogatov (1970: 73, 74). However, note that Herrmannsen had previously (1846: 24) listed "Mülleriae Desh. olim" as a synonym of "Aetheriae Desh." (*q.v.*). See also "Ethéries" herein.

Muteladae Gray 1847: 197. For *Mutela* Scopoli 1777; *Leila* Gray 1840; *Pleiodon* Conrad 1834; *Paxyodon* Schumacher 1817; *Prisodon* Schumacher 1817 [Africa].

Mycetopodidae Gray 1840: 142, 155. For *Mycetopus* d'Orbigny 1840 [= *Mycetopoda* d'Orbigny 1835] [South America].

Mycetopodinae: Modell (1942: 176) stated that this was a "n. subfam." -- in fact, the name dates to Gray 1840.

Pliodontidae Rochebrune 1904: 342. As a family. For "*Pliodon* Conrad 1854" [= *Pleiodon* Conrad 1834]; *Iridina* Lamarck 1819; *Cameronia* Bourguignat 1879.

Pleiodoninae Pain & Woodward 1964: 5. As a subfamily of Mutelidae. For *Pleiodon* Conrad 1834 [Africa]. Pain & Woodward had overlooked Rochebrune's "Pliodontidae" (*q.v.*) which is a senior homonym. The authors stated, in a footnote, that:

> "It has been brought to our notice that the subfamily name Pleiodoninae is an example of incorrect latinisation and should be emended to Pleiodontinae, however, we consider it advisable to retain the name Pleiodoninae since the emended name Pleiodontinae infers [*sic*! implies] that the type genus is *Pleiodonta* and not *Pleiodon* and thus may lead to unnecessary confusion."

Prisodontinae Modell: 1942: 174-175. As a subfamily of Mutelidae. For *Prisodon* Schumacher 1817 [South America].

Pseudaviculinae Modell 1942: 176. As a subfamily of Mutelidae. For *Pseudavicula* Simpson 1900 [Africa].

Pseudomulleriidae Starobogatov 1970: 75, 288. For *Pseudomulleria* Anthony 1907 [India].

Spathopsinae Modell 1942: 176. As a subfamily of Mutelidae. For *Spathopsis* Simpson 1900 [Africa].

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