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Zoanthid housekeeping: some nomenclatural notes on the Zoantharia (Cnidaria: Anthozoa: Hexacorallia)

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Abstract

The identities, authorship and/or spellings of three genus- and three family-group names in the order Zoantharia (= Zoanthidea), are clarified. *Palythoa axinellae* Schmidt, 1862, is designated as the type species of *Heterozoanthus* Verrill, 1870, making this genus-group name an objective synonym of *Parazoanthus* Haddon & Shackleton, 1891, with prevailing usage of the latter maintained by a reversal of precedence. The family-group name Heterozoanthidae was inadvertently established by Pax & Müller (1956), and is a junior objective synonym of Parazoanthidae Delage & Hérouard, 1901. The genus- and family-groups names *Mardoell* and Mardoellidae (both established by Danielssen 1890) are respective synonyms of *Epizoanthus* Gray, 1867, and Epizoanthidae Delage & Hérouard, 1901, with prevailing usage of the last-named family-group conserved by a reversal of precedence. The genus-group name *Mardoellia* Blanchard, 1893, is an unjustified emendation and objective synonym of *Mardoell* Danielssen, 1890. Rafinesque (1815) and not Gray (1832, 1840) is the author of the family-group name Zoanthidae.

Keywords: Zoantharia, Zoanthidea, type species designation, Article 23.9, ICZN, nomenclature.

Introduction

The taxonomy of the order Zoantharia (= Zoanthidea) remains far from resolved, with many new taxa being discovered and described (e.g. Fujii & Reimer 2011). In addition to this, the order is filled with many species- and genus-group names of doubtful validity (Burnett *et al.* 1997; Reimer *et al.* 2006b). Two recent publications (Low & Reimer 2011a, b) address this ‘synonymy load’ from a nomenclatural viewpoint, and this publication builds on this effort to further resolve and stabilise the nomenclature and taxonomy of the zoanthids. Herein, the current (fourth) edition of the *International Code of Zoological Nomenclature* is referred to as the Code (ICZN 1999).

***Heterozoanthus* Verrill, 1870 (*nomen oblitum*), and Heterozoanthidae Pax & Müller, 1956, objective synonyms of *Parazoanthus* Haddon & Shackleton, 1891 (*nomen protectum*), and Parazoanthidae Delage & Hérouard, 1901: reversal of precedence**

Verrill (1870: 371) established the genus-group name *Heterozoanthus* with the inclusion of three species—*Palythoa axinellae* Schmidt, 1862, *Parazoanthus swiftii* Duchassaing & Michelotti, 1860, and the new species *Heterozoanthus scandens*. No type species was designated. *Palythoa axinellae* Schmidt, 1862, and

Parazoanthu swiftii Duchassaing & Michelotti, 1860, are now assigned to the genus *Parazoanthus* Haddon & Shackleton, 1891, the former the type species by original designation (Low & Reimer 2011: 64; Pax & Müller 1956: 2). The name *Heterozoanthus scandens* Verrill, 1870, has not been treated taxonomically since it was first described.

Pax & Müller (1956: 2) considered *Heterozoanthus* Verrill, 1870, to be a synonym of *Parazoanthus* Haddon & Shackleton, 1891, and showed that the name *Heterozoanthus* Verrill, 1870, had not been used as a valid name in over 50 years and enacted the “*Loi de conservation adoptée par le XIV^{me} Congrès International de Zoologie à Copenhagen (1953)*”. This “*Loi de conservation*” was a draft proposal for the conservation of a junior synonym (or homonym) in current usage when it was found that the senior synonym (or homonym) had not been used for 50 years or more (Mayr *et al.* 1953). This so-called “50-year rule” only came into force in the first edition of the Code (ICZN 1961: 23). Therefore, the action of Pax & Müller (1956: 2) is not valid.

We designate *Palythoa axinellae* Schmidt, 1862, as the type species of *Heterozoanthus* Verrill, 1870, thereby making this genus-group name a junior objective synonym of *Parazoanthus* Haddon & Shackleton, 1891, as they have the same type species (Article 61.3.3 of the Code).

The Principle of Priority (Article 23 of the Code) requires that the oldest available name for the taxon under consideration is to be used. However, replacing *Parazoanthus* Haddon & Shackleton, 1891, with *Heterozoanthus* Verrill, 1870, is not in the interest of nomenclatural stability, as recognised by Pax & Müller (1956). We invoke Article 23.9 of the Code that requires a reversal of precedence of a junior synonym when the senior synonym has not been used as a valid name after 1899 (Article 23.9.1.1) and the junior synonym “has been used for a particular taxon, as its presumed valid name, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years” (Article 23.9.1.2).

Since 1899, the genus-group name *Heterozoanthus* Verrill, 1870, has only been used in two nomenclators (see Pax & Müller 1956: 2), which do not constitute valid usage on their own (Article 23.9.6 of the Code), thus fulfilling Article 23.9.1.1 of the Code. Low & Reimer (2011a: 67, 68) cited 30 publications by 69 different authors in the last 33 years using *Parazoanthus* Haddon & Shackleton, 1891, as a valid name to fulfil Article 23.9.1.2 of the Code to reverse precedence of *Bergia* Duchassaing & Michelotti, 1860, and *Parazoanthus* Haddon & Shackleton, 1891.

As both requirements of Article 23.9.1 are met, and in accordance with Article 23.9.2, the name *Parazoanthus* Haddon & Shackleton, 1891, is considered the valid name and takes precedence over *Heterozoanthus* Verrill, 1870. *Parazoanthus* Haddon & Shackleton, 1891, now becomes a *nomen protectum* and *Heterozoanthus* Verrill, 1870, a *nomen oblitum*.

The “Heterozoanthidae” (based on *Heterozoanthus*) appears to have been inadvertently established by Pax & Müller (1956: 2) in their discussion of the family Parazoanthidae Delage & Hérouard, 1901 (based on *Parazoanthus*). The authorship of the family-group name Heterozoanthidae should thus be attributed to Pax & Müller (1956: 2). As both family-group names are based on type genera that are objective synonyms, Heterozoanthidae Pax & Müller, 1956, and Parazoanthidae Delage & Hérouard, 1901, are objective synonyms (Article 61.3.2 of the Code). This family-group synonymy does not cause any problems as Parazoanthidae Delage & Hérouard, 1901—which is in current and widespread use (see Low & Reimer 2011a)—has priority over Heterozoanthidae Pax & Müller, 1956.

***Mardoell* Danielssen, 1890, *Mardoellia* Blanchard, 1893, and Mardoellidae Danielssen, 1890 (*nomen oblitum*), synonyms of *Epizoanthus* Gray, 1867, and Epizoanthidae Delage & Hérouard, 1901 (*nomen protectum*): reversal of precedence**

Based on Erdmann’s (1886: 481–486, figs. 3, 4, pl. 4, fig. 17) description of an unnamed zoanthid genus and species, as well as additional data, Danielssen (1890: 116–126) established the new genus and species, *Mardoell erdmanni* and the new family Mardoellidae. As only one species was included in the description, *Mardoell erdmanni* is the type species of *Mardoell* by monotypy (Article 68.3 of the Code). The gender of the genus-group name *Mardoell*, the name of a Norse goddess is feminine (Article 30.2.1 of the Code). Blanchard (1893: 130) emended this name to *Mardoellia* based on the rules of nomenclature then in force, an action which was justified at that time. Under the current Code (ICZN 1999), the name *Mardoell* Danielssen, 1890, is available, and the emendation *Mardoellia* is unnecessary. The unnecessary emendation *Mardoellia* is a junior objective synonym of *Mardoell* Danielssen, 1890, with authorship attributable to Blanchard (1893) (Article 19.1 of the Code).

Lwowsky (1913: 603, 604) discussed the identity of *Mardoell erdmanni* Danielssen, 1890, and considered it to be a valid species but transferred it to the genus *Sidisia* Gray, 1858, clearly considering *Mardoell* Danielssen, 1890, to be a junior synonym of *Sidisia* Gray, 1858. We refrain from making a decision on the validity of the species *Mardoell erdmanni* Danielssen, 1890, until the type material is located and examined, but agree with Lwowsky (1913) that *Mardoell* Danielssen, 1890, is synonym of *Sidisia* Gray, 1858, and thus *Epizoanthus* Gray, 1867 (see below).

In Opinion 1689 (ICZN 1992: 236), the International Commission on Zoological Nomenclature ruled that the name *Sidisia* Gray, 1858, should be suppressed in favour of *Epizoanthus* Gray, 1867. The name *Mardoell* Danielssen, 1890, is thus also a subjective synonym of *Epizoanthus* Gray, 1867, but the latter—which is in prevailing use—has priority over the former. The genus *Epizoanthus* Gray, 1867, is also the basis of the valid and widely-used family Epizoanthidae Delage & Hérouard, 1901 (see references cited in the Appendix). As the type genus *Mardoell* Danielssen, 1890, is a subjective synonym of *Epizoanthus* Gray, 1867, the family name Mardoellidae Danielssen, 1890, becomes a senior subjective synonym of Epizoanthidae Delage & Hérouard, 1901.

Replacing Epizoanthidae Delage & Hérouard, 1901, with Mardoellidae Danielssen, 1890, is not in the interest of nomenclatural stability, and we invoke Article 23.9 of the Code (as discussed above) to reverse the precedence of both names. The family-group name Mardoellidae Danielssen, 1890, has not been used as valid name since it was established (thus fulfilling Article 23.9.1.1 of the Code). In the Appendix, we list 30 publications, by 69 different authors in the past 44 years in which the name Epizoanthidae Delage & Hérouard, 1901, has been used as valid name for the taxon it denotes (thus fulfilling Article 23.9.1.2 of the Code).

As both requirements of Article 23.9.1 are met, and in accordance with Article 23.9.2, the name Epizoanthidae Delage & Hérouard, 1901, is considered a valid name and takes precedence over Mardoellidae Danielssen, 1890. Epizoanthidae Delage & Hérouard, 1901, now becomes a *nomen protectum* and Mardoellidae Danielssen, 1890, a *nomen oblitum*.

Authorship of the family Zoanthidae: Rafinesque (1815) not Gray (1840)

Authorship of the family-group name Zoanthidae (based on the genus *Zoanthus* Lamarck, 1801), is conventionally attributed (e.g. Griffith & Fromont 1998: 228; Muirhead & Ryland 1985: 325; Reimer *et al.* 2006a: 262) to Gray (1840: 72), who wrote: “Fam. 2. Zoanthidae” and listed the genera “*Isaura Hughea Zoanthus Mammillifera ... Corticifera*”. This indication is antedated by Gray (1832: 95) who wrote: “The Zoanthi (Zoanthidae) are very like the Sea Anemones ... *Zoanthus* and *Isaurus ... Mamellifera* [sic] ... *Corticifera ...*”. However, it was Rafinesque (1815: 155) who first established the family-group name “1. S. F. [= subfamily] *Zoanthia. Les Zoanthiens ... Zoantha Lam. ...*”.

The genus-group name “*Zoantha*” (Lamarck 1801: 363), is derived from the Greek words ζῷο (*zoo* = animal) and ανθος (*anthos* = flower). The Greek ending “-os” should be Latinised to the masculine “-us” (Article 30.1.3 of the Code). “*Zoantha*” Lamarck (1801: 363) is therefore an original incorrect spelling (Articles 32.4 and 32.5 of the Code), and was first emended to *Zoanthus* by Tilesius (1809: 394, footnote). The authorship and date of publication of the genus-group name *Zoanthus* remains Lamarck (1801) (Article 33.2.2 of the Code).

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APPENDIX

A list of 30 publications by 69 different authors published in the last 44 years using Epizoanthidae Delage & Hérourard, 1901, as a valid name to fulfil the requirements of Article 23.9.1.2 of the Code (ICZN 1999: 28).

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