

Some misapplied nomina nova in reef coral taxonomy (Scleractinia)

B. W. Hoeksema

Hoeksema, B.W. Some misapplied nomina nova in reef coral taxonomy (Scleractinia).
Zool. Med. Leiden 67 (3), 30.vii.1993: 41-47.— ISSN 0024-0672.

Key words: Nomen novum, reef corals, Scleractinia, misapplication.

Nomina nova should be used only to denote replacement names for preoccupied names, i.e. in the case of homonymy. Three examples of incorrect applications of nomina nova in scleractinian taxonomy are given. Coincidentally, in the cases discussed each wrongly proposed nomen novum concerns a new species so that there are no nomenclatorial consequences. For one of these species, *Galaxea paucisepta* Claereboudt, 1990, a lectotype is designated.

Bert W. Hoeksema, National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands

Introduction

Nomina nova are uncommon in scleractinian taxonomy and not in all cases in which coral taxonomists used the expression "nomen novum" this was correct. According to the International Code of Zoological Nomenclature (I.C.Z.N., 1985: 233), the expression "nomen novum" should only be used to denote a new replacement name for a preoccupied name, i.e. when a junior homonym must be rejected and there is no existing available name (I.C.Z.N., 1985: Art. 60). A nomen novum can therefore not be used, e.g., to correct a previous identification, to upgrade a species variety, to avoid synonymy problems, or to replace a nomen nudum.

Below, three examples of misapplied nomina nova in reef coral taxonomy are given. These cases concern species that were referred to as "nom. nov." for different reasons or for no clear reason at all. All three of them happen to be valid species, so that coincidentally there are no nomenclatorial consequences.

In the first case, the new name clearly concerns a "new species", which was in fact recognized as such by its author. That the two other new names concern "new species" is a coincidence since their respective authors were not aware of this. They thought that they were describing species that were already known but that these had invalid names. However, it appears that these names are not invalid and belong to different taxa. In the examples below, the synonymies of these taxa are also presented, prior to those of the new species with which they erroneously were synonymized.

Examples of misapplied nomina nova

Case 1

Fungia (*Cycloseris*) *vaughani* Boschma, 1923

Fungia patella; Vaughan, 1907: 128-130 (partim), pl. 27 figs. 2-3a, pl. 28 figs. 2-2a.

Fungia vaughani Boschma, 1923: 17-18, pl. 10 figs. 27-27b (Honolulu and Hilo, Hawaii).

Fungia (*Cycloseris*) *vaughani*; Hoeksema, 1989: 74-78, figs. 177-184 (see for extensive synonymy).

Some specimens misidentified by Vaughan (1907) as *Fungia patella* (Ellis & Solander, 1786) appear to belong to an at that time unnamed species. Boschma (1923) described this new species, but incorrectly referred to it as *Fungia vaughani* nov. nomen. He should have referred to it as *Fungia vaughani* spec. nov., as he did not replace an older available name but corrected a misidentification. This incorrect application of the term nomen novum has no further consequences for the nomenclature of this species.

Case 2

Echinophyllia orpheensis Veron & Pichon, 1980

The following synonymy of *Echinophyllia aspera* var. *tosaensis* (Yabe & Sugiyama, 1935), previous subjective senior synonym of *Echinophyllia orpheensis* Veron & Pichon, 1980, is relevant to the clarification of this case (partly after Veron & Pichon, 1980):

Oxyphyllia aspera var. *tosaensis* Yabe & Eguchi, 1935: 377, figs. 3-4 (Loc. "Misaki, Tosa, and Udo, Hyuga").

Oxypora aspera var. *sugiyamai* Yabe & Eguchi, 1935: 377 (Loc. "Yura-wan, Kii").

Oxyphyllia aspera tosaensis; Yabe, Sugiyama & Eguchi, 1936: 51: pl. 36 fig. 6; Ma, 1937: 123, pl. 38 figs. 5-6; Ma, 1959: 75, pl. 90 figs. 5-6.

Oxyphyllia aspera sugiyamai; Yabe, Sugiyama & Eguchi, 1936: 51, pl. 38 figs. 5-6; Ma, 1937: 122; Ma, 1959: 75, pl. 216 fig. 1, pl. 243 fig. 1.

Oxyphyllia aspera; Umbgrove, 1939: 40-41, pl. 10 figs. 1-2.

Echinophyllia aspera var. *tosaensis*; Chevalier, 1975: 362-363, pl. 32 fig. 2.

Echinophyllia aspera var. *sugiyamai*; Pillai & Scheer, 1976: 67-68, pl. 30 fig. 2; not Chevalier, 1975: 361-362, pl. 33 fig. 2, pl. 34 fig. 2.

Echinophyllia orpheensis Veron & Pichon, 1980: 302-307, figs. 522-534 ("South Pioneer Bay, Orpheus Island, Palm Islands", eastern Australia); Veron, 1986: 375; Veron & Marsh, 1988: 88; Best et al., 1989: 109; Veron & Hodgson, 1989: 264; Veron, 1992: 142.

Veron & Pichon (1980: 302) agreed with Umbgrove (1939) by regarding *E. aspera* var. *tosaensis* Yabe & Eguchi, 1935, and *E. aspera* var. *sugiyamai* Yabe & Eguchi, 1935) as identical, a conclusion which they based on descriptions and illustrations given by Yabe et al. (1936). For both varieties they introduced the new species name *Echinophyllia orpheensis* as a nomen novum. Despite the synonymization of their *E. orpheensis* with two existing taxa, which therefore became subjective senior synonyms, they designated a new holotype (deposited in the British Museum of Natural History) and two paratypes (deposited in the Queensland Museum and in the Australian Institute of Marine Science).

It is not clear why Veron & Pichon (1980) did not select one of the two available names and use that for the species they described as *Echinophyllia orpheensis*. A new name published for a variety before 1961 has subspecific status (I.C.Z.N., 1985: Art. 45g) and therefore does not prevent availability (I.C.Z.N., 1985: Art. 16). In the publication by Yabe & Eguchi (1935: 377) *Oxyphyllia aspera* var. *tosaensis* nov. precedes *Oxypora aspera* var. *sugiyamai* nov. As synonyms, the first is hereby selected as the valid name (act of first revisor following Recommendation 24A in I.C.Z.N., 1985), and consequently the species of Veron & Pichon should be referred to as *Echinophyllia tosaensis* (Yabe & Eguchi, 1935). Yabe & Eguchi (1935: 377) distinguished this "variety" from other ones "by its smaller and inclined calices, circumscribed by walls". Yabe et

al. (1936) subsequently designated the specimen from Misaki, Tosa, (Tôhoku Imperial University (at Sendai), Dept. of Geology, Reg. No. 40883) as "holotype". Since it was not designated as such in the original description by Yabe & Eguchi (1935), it should be considered the lectotype (cf. I.C.Z.N., 1985: Art. 69a).

According to Veron & Pichon (1980: 307) their *Echinophyllia orpheensis* differs from congeneric species "in the development of protruding, branching corallites, also in the development of the costae", and in particular from *E. aspera* "by the development of a paliform crown and also by the growth form which is much more massive". The two former varieties (united under the new name *E. orpheensis*) were clearly not anymore considered part of *E. aspera*. In a later publication, however, Veron (1992: 141) again treated these two taxa as varieties of *E. aspera*, separate from *E. orpheensis* (p. 142), without remarking on their previous status as synonyms. This has no consequences for the validity of *E. orpheensis* since it happens to have its own holotype and two paratypes. If Veron (1992) had not done so, and *E. orpheensis* would still not be considered a separate taxon, then it should be referred to as *E. tosaensis*.

By the establishment of *Echinophyllia orpheensis* as a subjective junior synonym, it appears that Veron & Pichon (1980) did not consider it a new species. Nevertheless, they treated it as such by designating a new holotype and paratypes and by not referring to one of the types of the senior synonyms. Since there was no replacement of a homonym *E. orpheensis* should not have been referred to as a nomen novum. That this misapplication of the term has no further consequences for the nomenclature of this species is only coincidental.

Case 3

Galaxea paucisepta Claereboudt, 1990

The following synonymy of *Galaxea pauciradiata* (Blainville, 1830), invalid subjective senior synonym of *Galaxea paucisepta* Claereboudt, 1990, is relevant to the clarification of this case (partly after Claereboudt, 1990):

Sarcinula organum; Lamarck, 1816a: 223 (Red Sea; partim); 1816b: pl. 482 fig. 3; Schweigger, 1819: pl. 7 fig. 66. Not *Madrepora organum* Linnaeus, 1758: 796.

Sarcinula pauciradiata Blainville, 1830: 314; 1834: 348; Milne Edwards & Haime, 1848: 312.

Galaxea pauciradiata; Milne Edwards & Haime, 1851: 70; 1857: 227; Chevalier, 1971: 82.

Galaxea astreata; Chevalier, 1971: pl. 7 fig. 6.

Galaxea paucisepta Claereboudt, 1990: 2-6, figs. 2-4.

Claereboudt (1990) reported on *Galaxea* specimens from northern Papua New Guinea, which he identified as *G. pauciradiata* (Blainville, 1830), but he considered the name *Sarcinula pauciradiata* Blainville, 1830, a nomen nudum that "should be made unavailable for further use" (Claereboudt, 1990: 6-7). Therefore he referred to it as *Galaxea paucisepta* nom. nov., and he designated five syntypes (deposited at the Institut Royal des Sciences Naturelles de Belgique at Brussels: IRSNB 27009 403-407). He should have described it as a new species because (1) he did not replace a junior homonym and (2) Blainville's name never was a nomen nudum and concerned another species.

Although Blainville (1830: 314) did not give an illustration of this species himself, he referred to Lamarck's description (1816a: 223) and illustration (1816b: pl. 482 fig.

3) of a scleractinian coral from the Red Sea that was misidentified by Lamarck as *Sarcinula organum* (Linnaeus, 1758). Linnaeus (1758: 796) originally used the name *Madrepora organum* for a fossil coral from the Baltic coast. Blainville (1830: 315) examined the specimen illustrated by Lamarck (1816b) and gave a short description "Les étoiles du polypier du Muséum n'ont que six rayons complets" (The calices of the coral of the museum have only six complete septa). Since Blainville (1830) referred to the specimen illustrated by Lamarck (1816b), it should formally be considered holotype of *Galaxea pauciradiata* (Blainville, 1830) with the Red Sea as its type locality.

Among the material that was misidentified by Lamarck as *Sarcinula organum*, Milne Edwards & Haime (1848, 1851, 1857) distinguished *Galaxea pauciradiata* (Milne Edwards & Haime, 1848) and *G. lamarcki* Milne Edwards & Haime, 1851. According to their descriptions of *G. pauciradiata*, the calices, which are about 3 mm in diameter, contain only two cycles of septa. Furthermore, in their synonymy of *G. pauciradiata*, they refer to Schweigger's (1819: pl. 7 fig. 66) figure of a coral belonging to *Sarcinula organum* sensu Lamarck (1816a, b). Chevalier (1971: 79, pl. 7 fig. 6) subsequently referred to one of Lamarck's misidentified specimens as "the type of *Sarcinula organum* Lamarck" (there is no such a type), and considered it to belong to *Galaxea astreata* (Lamarck, 1816a), which is in agreement with the synonymy of the latter species given by Scheer & Pillai (1983: 143).

Five specimens of Lamarck's *Sarcinula organum* are present in the Muséum National d'Histoire Naturelle at Paris (NMNH): three syntypes of *Galaxea lamarcki* and two specimens identified as *G. pauciradiata* by Milne Edwards & Haime. None of these is identical to the holotype of *G. pauciradiata* (Blainville), a massive coral fragment, which in Lamarck's (1816b) slightly schematic illustration shows calices with only one cycle of septa. The specimens identified by Milne Edwards & Haime as *G. pauciradiata* are abraded massive coral fragments with most calices at least 3 mm in diameter. These calices show two or three cycles of septa, of which the first is very distinct (Chevalier, 1971: pl. 7 fig. 6) and the third usually absent. These specimens probably belong to *G. astreata* (Lamarck, 1816), as already suggested by Chevalier (1971).

The name *Sarcinula pauciradiata* Blainville, 1830, was overlooked by various authors until Chevalier (1971: 82) mentioned it in his discussion of *Galaxea explanata* Quelch, 1886. He referred to the description of *G. pauciradiata* given by Milne Edwards & Haime (1848: 312) and remarked that this species resembles *G. astreata* (Lamarck, 1816) very closely, except that it lacks a third cycle of septa. Furthermore, he noted that the type is lost and that the species has never been figured, which is not correct, as explained above.

Claereboudt (1990: 6) added to this confusion by assuming that Milne Edwards & Haime (1848) only referred to "manuscript notes from de Blainville". Consequently, he described the species as "*Galaxea paucisepta* nom. nov." Since Blainville (1830) gave a description of the coral illustrated by Lamarck (misidentified as *Sarcinula organum*), *S. pauciradiata* never was a nomen nudum. Otherwise, the name would have been validated by subsequent authors who gave descriptions of the species, i.e., Milne Edwards & Haime (1848, 1851, 1857) and Chevalier (1971). Hence, Claereboudt's (1990) *Galaxea paucisepta* was introduced as a subjective junior synonym of *S. pauciradiata* and as such is invalid.

However, the syntypes of *Galaxea paucisepta* designated by Claereboudt and additional specimens observed by me in 1992 off the Christensen Research Institute near

Madang, appr. 200 km from the type locality at the northern coast of Papua New Guinea, appear to be different from the holotype of *Sarcinula pauciradiata* Blainville, 1830: the coralla are not massive but encrusting and foliaceous as also indicated by Claereboudt (1990: 4, figs. 2a, 3a). Furthermore, in comparison to the two specimens of *Galaxea pauciradiata* sensu Milne Edwards and Haime, the calices of *G. paucisepta* are smaller in diameter, mostly less than 2 mm (Claereboudt, 1990: figs. 2b, 3b, 4a, b) and the number of septal cycles is more consistent, never more than two. Therefore, I consider *G. paucisepta* a distinct species. The lectotype (IRSNB 27009-403), hereby designated, is the specimen illustrated in Claereboudt's (1990) fig. 2.

Even if *Sarcinula pauciradiata* Blainville, 1830, would have been a nomen nudum, as assumed by Claereboudt (1990), this would not have justified reference to *Galaxea paucisepta* as a "nomen novum" since there was no replacement of a homonym. This incorrect application of the term "nomen novum" has no further consequences for the nomenclature of *G. paucisepta* Claereboudt, 1990, which is only coincidental. If *G. pauciradiata* (Blainville, 1830) and *G. paucisepta* Claereboudt, 1990, would have been similar, as assumed by Claereboudt (1990), then the first name would have had priority. The present observations indicate that *G. paucisepta* happens to be a valid species that originally should have been referred to as *Galaxea paucisepta* "spec. nov."

Conclusion

The three examples presented above represent three different kinds of wrong applications of nomina nova: (1) a new species with reference to specimens previously misidentified; (2) an eventually new species that previously was incorrectly given a new name because of the wrongly assumed synonymy with two varieties of another species; (3) an eventually new species that previously was incorrectly given a new name because of the misidentification as a species with a wrongly assumed nomen nudum. In the first case, the species to which a new name was given actually concerned a new species for which later a lectotype was designated (Hoeksema, 1989). In the second and third case the species with erroneously applied nomina nova could have been interpreted as new species because of their holotype and presently designated lectotype, respectively.

There are also correct applications of nomina nova in reef coral taxonomy. An example is *Fungia elegans* Verrill, 1870, which has been replaced by *F. curvata* Hoeksema, 1989, because it is a primary junior homonym of *F. elegans* Bronn, 1837 (Hoeksema, 1989: 47). Another example of replacement of a preoccupied name concerns *Millepora tenera* Boschma, 1949, the name of a hydrocoral (a non-scleractinian reef coral), which replaced *M. tenella* Ortmann, 1892, because of its primary senior homonym *M. tenella* Esper, 1795 (Boschma, 1949: 669).

Madrepora limax Esper, 1797, a junior homonym of *M. limax* Houttuyn, 1772, should have been replaced by the available name *M. trilinguis* Boddaert, 1768, but this would have caused too much confusion, since *M. limax* Houttuyn, 1772, was also a senior synonym of *Fungia talpina* Lamarck, 1801 (Hoeksema, 1988, 1989). Therefore the International Commission on Zoological Nomenclature was asked to use its plenary powers to protect Esper's well known name for this mushroom coral (Hoeksema, 1988, 1989; I.C.Z.N., 1990).

Acknowledgements

I thank Prof. L.B. Holthuis for his advice. Dr Chang-feng Dai (Institute of Oceanography, National Taiwan University) provided me with relevant literature. Dr M. Guillaume sent *Galaxea* specimens from the MNHN and Dr C. Massin allowed me to study the syntypes of *G. paucisepta* at the IRSNB. The research was partially funded by a travel grant from the Jan Joost ter Pelkwijkfonds, University of Leiden.

References

- Best, M.B., B.W. Hoeksema, W. Moka, H. Moll, Suharsono & I N. Sutarna, 1989. Recent scleractinian coral species collected during the Snellius-II Expedition in eastern Indonesia.— *Neth. J. Sea Res.* 23: 107-115.
- Blainville, H.M.D. de, 1830. Zoophytes. In: *Dictionnaire des sciences naturelles* 60: 1-548.— Paris.
- Blainville, H.M.D. de, 1834. *Manuel d'actinologie ou de zoophytologie*: 1-694, pls. 1-100.— Paris.
- Boschma, H., 1923. The Madreporaria of the Siboga Expedition. IV. *Fungia patella*. Siboga Exped. XVII: 129-148, pls. 9-10.— Leiden.
- Boschma, H., 1949. Notes on specimens of the genus *Millepora* in the collection of the British Museum.— *Proc. Zool. Soc. Lond.* 119: 661-672.
- Chevalier, J.P., 1971. Les scléactiniaires de la Mélanésie Française (Nouvelle-Calédonie, Iles Chesterfield, Iles Loyauté, Nouvelles Hébrides). I. Expéd. Française Récifs Corall. *Nouv.-Calédonie* 5: 1-307, pls. 1-38.— Paris.
- Chevalier, J.P., 1975. Les scléactiniaires de la mélanésie française (Nouvelle-Calédonie, Iles Chesterfield, Iles Loyauté, Nouvelles Hébrides). II. Expéd. Française Récifs Corall. *Nouv.-Calédonie* 7: 1-407, pls. 1-42.— Paris.
- Claereboudt, M., 1990. *Galaxea paucisepta* nom. nov. (for *G. pauciradiata*), rediscovery and redescription of a poorly known scleractinian species (Oculinidae).— *Galaxea* 9: 1-8.
- Hoeksema, B.W., 1988. *Madrepora limax* Esper, 1797 (currently *Herpolitha limax*) and *Fungia talpina* Lamarck, 1801 (currently *Polyphyllia talpina*; both Cnidaria, Anthozoa): proposed conservation of the specific names.— *Bull. Zool. Nomencl.* 45: 13-17.
- Hoeksema, B.W., 1989. Taxonomy, phylogeny and biogeography of mushroom corals (Scleractinia: Fungiidae).— *Zool. Verh. Leiden* 254: 1-295.
- International Commission on Zoological Nomenclature, 1985. *International Code of Zoological Nomenclature*, 3rd ed., adopted by the XX assembly of the International Union of Biological Sciences: i-xx, 1-338— International Trust for Zoological Nomenclature, London.
- International Commission on Zoological Nomenclature, 1990. *Madrepora limax* Esper, 1797 (currently *Herpolitha limax*) and *Fungia talpina* Lamarck, 1801 (currently *Polyphyllia talpina*; both Cnidaria, Anthozoa): specific names conserved.— *Bull. Zool. Nomencl.* 47: 63.
- Lamarck, J.B.P.A., 1816a. *Histoire naturelle des animaux sans vertèbres* 2: 1-568.— Paris.
- Lamarck, J.B.P.A., 1816b. *Tableau encyclopédique et méthodique des trois Règnes de la Nature*. 23e Part. Mollusques et Polypes divers. Pls. 391-488.— Paris.
- Linnaeus, C., 1758. *Systema naturae* (ed. 10), 1: 1-824.— Holmiae.
- Ma, T.Y.H., 1937. On the growth rate of reef corals and its relation to sea water temperature.— *Paleontol. Sinica* B16 (1): 1-126, pls. 1-100.
- Ma, T.Y.H., 1959. Effect of water temperature on growth rate of reef corals.— *Oceanogr. Sinica Spec.* Vol. 1: 1-116, pls. 1-320.
- Milne Edwards, H. & J. Haime, 1848. *Recherches sur les polypiers*. Mém. 4. Monographie des Astreides.— *Ann. Sci. Nat. Zool.* 3e Sér. 10: 209-320, pls. 5-9.
- Milne Edwards, H. & J. Haime, 1851. *Monographie des polypiers fossiles des terrains Palaeozoïques, précédée d'un tableau général de la classification des polypes*.— *Arch. Mus. Hist. Nat. Paris* 5: 1-502, pls. 1-20.
- Milne Edwards, H. & J. Haime, 1857. *Histoire naturelle des coralliaires* 2: 1-632.— Paris.
- Pillai, C.S.G. & G. Scheer, 1976. Report on the stony corals from the Maldivian Archipelago. Results of the Xarifa Expedition 1957/58.— *Zoologica, Stuttgart* 43 (126): 1-83, pls. 1-32.
- Scheer, G. & C.S.G. Pillai, 1983. Report on the stony corals from the Red Sea.— *Zoologica, Stuttgart* 45 (133): 1-198, pls. 1-41.

- Schweigger, A.F., 1819. *Beobachtungen auf naturhistorischen Reisen*. i-vii, 1-128, tabs. 1-12, pls. 1-8.— Berlin.
- Umbgrove, J.H.F., 1939. *Madreporaria from the Bay of Batavia*.— *Zool. Med. Leiden* 22: 1-64, pls. 1-18.
- Veron, J.E.N., 1986. *Corals of Australia and the Indo-Pacific*: 1-644.— Sydney.
- Veron, J.E.N., 1992. *Hermatypic corals of Japan*.— *Aust. Inst. Mar. Sci. Monogr. Ser. 9*: 1-234.
- Veron, J.E.N. & G. Hodgson, 1989. *Annotated checklist of the hermatypic corals of the Philippines*.— *Pac. Sci.* 43: 234-287.
- Veron, J.E.N. & L.M. Marsh, 1988. *Hermatypic corals of Western Australia*.— *Rec. Western Aust. Mus.* 29 (Suppl.): 1-136.
- Veron, J.E.N. & M. Pichon, 1980. *Scleractinia of Eastern Australia*. III. Families Agariciidae, Siderastreidae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae.— *Aust. Inst. Mar. Sci. Monogr. Ser. 4*: 1-422.

Received: 4.ii.1993

Accepted: 7.ii.1993

Edited: J.C. den Hartog