

## NOMENCLATURAL NOTES

### **Mexican Cretaceous coral species (Cnidaria, Anthozoa, Scleractinia) described as new by Filkorn & Pantoja-Alor (2009), but deemed ‘unpublished’ under the International Code of Zoological Nomenclature: republication of data necessary for nomenclatural availability**

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#### **Introduction**

The names of the Mexican Cretaceous coral species described as new by Filkorn & Pantoja-Alor (2009) are not available for taxonomic purposes because that work is deemed ‘unpublished’ under the criteria of the International Code of Zoological Nomenclature (the Code; ICZN, 1999, 2012). The original manuscript was in the final stages of preparation for publication as a printed issue of the Boletín of the Instituto de Geología, a well-established series of the Universidad Nacional Autónoma de México (UNAM), when the printed paper version was discontinued and final publication was transferred to CD-ROM (ISSN 0185–5530). The CD-ROM file, in PDF format, also was posted online on the UNAM website, where it is still freely available. Unfortunately, neither the CD-ROM version nor the online version of that 2009 monograph met the Code’s (then) current criteria for publication. The names of the species described as new therein are therefore also deemed to be unpublished and, in consequence, unavailable, and any other information in the monograph potentially affecting nomenclature is similarly affected. Löser (2011, p. 259) first brought this matter to our attention. Specifically, the CD-ROM version did not comply with Article 8.6 of the Code because it did not include a statement that copies of the CD-ROM had been deposited in at least five major publicly accessible libraries named therein and the online electronic version simply did not constitute a published work under Article 9.8. The recent amendment of the Code allowing for electronic publication under some circumstances (ICZN, 2012) did not change the publication status of the 2009 monograph: the CD-ROM still does not comply with (renumbered) Article 8.4.2.2 concerning library deposition and the online electronic version, having been issued before 2012 and not having been registered in Zoobank, does not fulfill (new) Articles 8.5.1 and 8.5.3. The main purpose of the present note is to republish the new specific names and related necessary information in order to fulfil the Code’s requirements for publication and availability, thereby making these names available for use. Besides the 14 new species treated in the present note, Filkorn &

Pantoja-Alor (2009) also presented detailed taxonomic descriptions of 25 other species of Mexican Cretaceous corals, but proposed no nomenclatural acts involving them that require validation here.

### Material, repository, abbreviation, geological age and localities

All of the coral specimens utilized for the species descriptions and illustrations of Filkorn & Pantoja-Alor (2009) are housed in the collections of the Museo de Paleontología of the Instituto de Geología, Universidad Nacional Autónoma de México, México D.F. The acronym for that repository is IGM. The abbreviations used for the petrographic thin sections of the type specimens in the list below are: M = Mal Paso; TZ = Turitzio. Other abbreviations: CD = calicular diameter; GCD = greater calicular diameter; LCD = lesser calicular diameter; MP = designation for numbered beds of upper member of Mal Paso Formation.

For each of the new species, its name (explicitly indicated as new), diagnosis and type designation are given in order to meet the conditions for availability specified by Articles 13.1.1, 16.1 and 16.4.1 of the Code; the specification of the type depository above similarly meets the conditions of Article 16.4.2; the synonymy, etymology, stratigraphic horizon, geologic age and geographic locality are also given to provide context. Additional information for each species, including the detailed description, illustrations, occurrence data, and remarks (= discussion), none of which directly or potentially affects nomenclature, is given in the original work (Filkorn & Pantoja-Alor, 2009) and not repeated here.

Locality data for type specimens from the Cumburindio Formation (lower Aptian) are given in each respective 'Types' section. All of the type specimens from the upper member of the Mal Paso Formation (upper Albian) are from the same type locality in the state of Guerrero, Mexico, just north of the border with the adjacent state of Michoacán, about 0.75 km north of the rural village of Chumbítaro, Michoacán, at 18°29.3' N, 100°42.5' W on the Mexican 1:50,000 scale Coyuca de Catalan (E14A74) topographic map. The geologic age of the upper member of the Mal Paso Formation recently has been constrained to the late Albian based on biostratigraphy of microfossils (Filkorn & Scott, 2011).

## SYSTEMATIC PALAEONTOLOGY

Class Anthozoa Ehrenberg, 1834

Subclass Zoantharia de Blainville, 1830

Order Scleractinia Bourne, 1900

Suborder Archaeocoeniina Alloiteau, 1952

Family ACTINASTRAEIDAE Alloiteau, 1952

Genus *Actinastrea* d'Orbigny, 1849

*Actinastrea chumbitaroensis* n. sp.

2009 *Actinastrea chumbitaroensis* Filkorn & Pantoja-Alor, p. 79, fig. 29 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum ramose. Calicular margin typically hexagonal. CD 1.2–1.8 mm. Distance between calicular centers about 1.5 mm. Septa 16 in number, octamerally arrayed in two cycles, and laterally free orally. Columella prominent, styliform, cylindrical.

*Etymology.* Named for the village of Chumbítaro, Michoacán, which is just south of the type locality in the state of Guerrero, with the Latin suffix *-ensis* = of or from a place.

*Types.* Three fragments: holotype IGM-7036 (20 x 33 mm in width and 15 mm in height); paratype IGM-7037 (28 x 18 mm in width and 40 mm in height), with two thin sections (M-01 and M-02); and paratype IGM-7038 (20 x 35 mm in width and 35 mm in height).

*Type stratum.* Upper member of Mal Paso Formation, bed MP17, upper Albian.

*Type locality.* In state of Guerrero, Mexico (details above).

Suborder Rhipidogyrina Roniewicz, 1976

Family RHIPIDOGYRIDAE Koby, 1905

Genus *Saltocyathus* Morycowa & Masse, 1998

*Saltocyathus cumburindioensis* n. sp.

2009 *Saltocyathus cumburindioensis* Filkorn & Pantoja-Alor, p. 35, fig. 14 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum relatively large, flabellate; calicular margin elliptical. Septa numerous and relatively thick. Tabular endothecal dissepiments vertically spaced about 6 per 5 mm.

*Etymology.* Named for the formation in which the samples were found, the Cumburindio Formation, with the Latin suffix *-ensis* = of or from a place.

*Types.* Holotype, IGM-7006, fairly well preserved but with calice not exposed, elliptical CD 40 x 75 mm, height 75 mm; paratype, IGM-7007, a small, weathered fragment, with two thin sections (TZ-49 and TZ-50).

*Type stratum.* Cumburindio Formation, lower Aptian.

*Type locality.* Upper slopes of Loma de San Juan, a small hill just south of Turitzio, Michoacán, Mexico, at 18°31.28'N, 100°56.65'W on Mexican 1:50,000 scale Huetamo (E14A64) topographic map.

Genus *Preverastraea* Beauvais, 1976

*Preverastraea coatlicuae* n. sp.

2009 *Preverastraea coatlicuae* Filkorn & Pantoja-Alor, p. 82, fig. 30 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum plocoid. Wall of corallite developed as single parathecal zone; outer corallite wall absent. CD 4–5 mm. Septa 12 in number and hexamerally arrayed in two cycles.

*Etymology.* Named for Coatlicue, an Aztec goddess of the Earth. Spelling of species name given as new herein is the correct original name of this taxon.

*Types.* Holotype, IGM-7039, about 85 x 150 mm in width and 75 mm in height, with two thin sections (M-22 and M-23); paratype, IGM-7040, 90 x 140 mm in width and 90 mm in height (part of a much larger corallum that was about 38 cm in diameter).

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; species common in coral reef horizon, bed MP13 (types), and also observed in beds MP 9 and MP 5, stratigraphically below reef horizon.

*Type locality.* In state of Guerrero, Mexico (details above).

*Preverastraea tociae* n. sp.

2009 *Preverastraea tocae* Filkorn & Pantoja-Alor, p. 85, fig. 31 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum plocoid or subcerioid. Wall of corallite developed as single parathecal zone; outer corallite wall absent. CD 2.2–6 mm. Septa 12–24 in number and hexamerally arrayed in two to three cycles.

*Etymology.* Named for Toci, an Aztec goddess of the Earth. Spelling of species name given as new herein is the correct original name of this taxon.

*Types.* Holotype, IGM-7041, 70 x 120 mm in width and 90 mm in height, with two thin sections (M-18 and M-19); paratype, IGM-7042, 90 x 130 mm in width and 60 mm in height.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; holotype from coral reef horizon, bed MP13; paratype from lower portion of bed MP 9, stratigraphically just below reef horizon.

*Type locality.* In state of Guerrero, Mexico (details above).

## Suborder Faviina Vaughan &amp; Wells, 1943

Family MONTLIVALTIIDAE Dietrich, 1926

Genus *Latiphyllia* de Fromentel, 1861

*Latiphyllia mexicana* n. sp.

2009 *Latiphyllia mexicana* Filkorn & Pantoja-Alor, p. 87, fig. 32 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum typically phaceloid, flabellate and relatively large. Calicular diameters larger than those of other members of genus: LCD typically 30–40 mm, GCD 45–125 mm. Costae laterally spaced 3–4 per 5 mm.

*Etymology.* Named for the country of Mexico.

*Types.* Holotype, IGM-7043; paratype figured by Filkorn & Pantoja-Alor (2009), IGM-7044, with one thin section (M-60); and 15 other paratypes, IGM-7045 to IGM-7056, IGM-7723 to IGM-7725.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; most of specimens, including holotype, from coral reef horizon, bed MP13.

*Type locality.* In state of Guerrero, Mexico (details above).

Genus *Thecosmilia* Milne Edwards & Haime, 1848*Thecosmilia guerreroensis* n. sp.

2009 *Thecosmilia guerreroensis* Filkorn & Pantoja-Alor, p. 89, fig. 33 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum relatively small for genus. Corallites monocentric, elongate, tapered aborally, and laterally free orally. CD 12–15 mm. Septa relatively few in number, typically 24 and arranged hexamerally in three cycles.

*Etymology.* Name derived from the Mexican state of Guerrero, where the type specimen was found, with the Latin suffix *-ensis* = of or from a place.

*Types.* Holotype, IGM-7726, with two thin sections (M-24 and M-25).

*Type stratum.* Upper member of Mal Paso Formation, upper Albian. Holotype found in float debris on bed MP10, possibly originally derived from bed MP11; both units a few meters stratigraphically below coral reef horizon, bed MP13.

*Type locality.* In state of Guerrero, Mexico (details above).

Genus *Mycetophyllopsis* Oppenheim, 1930

*Mycetophyllopsis azteca* n. sp.

2009 *Mycetophyllopsis azteca* Filkorn & Pantoja-Alor, p. 95, fig. 35 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum meandroid, series relatively few in number. Septa relatively thin with wide interseptal spaces.

*Etymology.* Named for an ancient people of Mexico, the Aztec. The specific name is treated as a noun in apposition.

*Types.* Holotype, IGM-7730; paratype, IGM-7731, with two thin sections (M-11 and M-12); and paratype, IGM-7732.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian, coral reef horizon, bed MP13.

*Type locality.* In state of Guerrero, Mexico (details above).

Suborder Meandriina Alloiteau, 1952

Family DENDROGYRIDAE Alloiteau, 1952

Genus *Orbignygyra* Alloiteau, 1952

*Orbignygyra? incognita* n. sp.

2009 *Orbignygyra? incognita* Filkorn & Pantoja-Alor, p. 103, fig. 38 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum meandroid and massive. Series relatively narrow, about 1–2 mm in width. Septa laterally spaced 3 per 2 mm along wall of series. Columella absent.

*Etymology.* From Latin *incognitus* = unknown or strange, alluding to the uncertainty of some of its morphological characteristics.

*Types.* Holotype, IGM-7739, about 75 x 90 mm in width and 70 mm in height, with two thin sections (M-61 and M-62).

*Type stratum.* Upper member of Mal Paso Formation, upper Albian, coral reef horizon, bed MP13.

*Type locality.* In state of Guerrero, Mexico (details above).

Suborder Fungiina Verrill, 1865

Family ACTINACIDIDAE Vaughan & Wells, 1943

Genus *Actinaraea* d'Orbigny, 1849

*Actinaraea michoacanensis* n. sp.

1944 *Actinaraea* sp. cf. *A. arborescens* (Felix, 1891); Hedberg & Pyre, p. 7.

1944 *Actinaraea arborescens* (Felix, 1891); Wells, p. 440, pl. 72, figs. 1–5, pl. 74, fig. 1.

1957 *Actinaraea arborescens* (Felix, 1891); von der Osten, p. 572.

1997 *Actinaraea arborescens* (Felix, 1891); Baron-Szabo, p. 88.

2009 *Actinaraea michoacanensis* Filkorn & Pantoja-Alor, p. 48, fig. 19 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum massive to ramose. Calices 2–5 mm in diameter; calicular centers spaced 3.5–7 mm apart. Septa numerous, up to four complete cycles developed in larger corallites.

*Etymology.* Named for the Mexican state in which the samples were found, with the Latin suffix *-ensis* = of or from a place.

*Types.* Holotype, IGM-7016, fragment of corallum, about 45 x 50 mm in width and 75 mm in height, with one thin section (TZ-48).

*Type stratum.* Cumburindio Formation, lower Aptian.

*Type locality.* Coral reef horizon at top of Loma de San Juan, a small hill just south of Turitzio, Michoacán, Mexico, at 18°31.28'N, 100°56.65'W on Mexican 1:50,000 scale Huetamo (E14A64) topographic map.

Genus *Thamnarea* Étallon in Thurmann & Étallon, 1864

*Thamnarea hornosensis* n. sp.

2009 *Thamnarea hornosensis* Filkorn & Pantoja-Alor, p. 51, fig. 20 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum typically large, greater than 1 m in both diameter and height, and exclusively ramose; branches elongate, 8–20 mm in diameter, but most commonly about 15 mm. Distance between calicular centers 4–5 mm. Number of septa variable, usually 10–12 axially, but as many as 40–56 peripherally. Septocostae laterally spaced 4 per mm.

*Etymology.* Named for the type locality, the Arroyo Los Hornos, with the Latin suffix *-ensis* = of or from a place.

*Types.* Holotype corallum, IGM-7017, with nine thin sections (TZ-62 to TZ-70).

*Type stratum.* Cumburindio Formation, lower Aptian.

*Type locality.* Knickpoint in thalweg of Arroyo Los Hornos, about 1 km north of Turitzio, Michoacán, Mexico, at approximately 18°32.10'N, 100°56.74'W on Mexican 1:50,000 scale Huetamo (E14A64) topographic map.

Family THAMNASTERIIDAE Vaughan & Wells, 1943

Genus *Thalamocaeniopsis* Alloiteau, 1953

*Thalamocaeniopsis mexicanensis* n. sp.

2009 *Thalamocaeniopsis mexicanensis* Filkorn & Pantoja-Alor, p. 112, fig. 42 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum relatively large for genus and massive to ramose. CD 2.5–8 mm, commonly 5 mm. Calicular centers typically spaced 4–6 mm apart.

*Etymology.* Named for the country of origin, with an appropriate connective and the Latin suffix *-ensis* = of or from a place.

*Types.* Holotype, IGM-7742, with two thin sections (M-20 and M-21); five paratypes, IGM-7743 to IGM-7747.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; all specimens from coral reef horizon, bed MP13, except for paratype IGM-7747, from unit MP17.

*Type locality.* In state of Guerrero, Mexico (details above).

Genus *Thamnasteria* Lesauvage, 1823

*Thamnasteria tonantzinae* n. sp.

2009 *Thamnasteria tonantzinae* Filkorn & Pantoja-Alor, p. 114, fig. 43 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum massive to ramose. Calices small, CD 1.6–2.4 mm. Calicular centers closely spaced, 1.6–3 mm apart. Septa variable in number: 8–10 axially, but as many as about 30 peripherally. Synapticulothecal wall sometimes weakly developed aborally.



*Etymology.* Named for Tonantzin, an Aztec goddess of the Earth.

*Types.* Holotype, IGM-7748, with four thin sections (M-03, M-05, M-06 and M-39).

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; holotype from bed MP17.

*Type locality.* In state of Guerrero, Mexico (details above).

Suborder Microsolenina Morycowa & Roniewicz, 1995

Family CUNNOLITIDAE Alloiteau, 1952

Genus *Paracycloseris* Wells, 1934

*Paracycloseris effrenatus* n. sp.

2009 *Paracycloseris effrenatus* Filkorn & Pantoja-Alor, p. 117, fig. 44 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Diameter of corallum small for genus. Septa numerous and inserted in normal hexamerall pattern. Columella trabecular, well-developed and narrow.

*Etymology.* From Latin *effrenatus* = unrestrained, for the unattached mode of life of the corallum.

*Types.* Holotype, IGM-7749, with CD of 11.6 mm and about 72 septa (Filkorn & Pantoja-Alor, 2009, fig. 44.1); paratype IGM-7750, with CD of 11 mm and about 72 septa, with one thin section (M-07) (Filkorn & Pantoja-Alor, 2009, figs. 44.2 and 44.4); paratype IGM-7751, with CD of 12.8 mm and about 100 septa, with one thin section (M-08) (Filkorn & Pantoja-Alor, 2009, fig. 44.3); paratype lot, IGM-7752.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; all specimens from bed MP18.

*Type locality.* In state of Guerrero, Mexico (details above).

Family LATOMEANDRIDAE Alloiteau, 1952

Genus *Ovalastrea* d'Orbigny, 1849

*Ovalastrea malpaso* n. sp.

2009 *Ovalastrea malpaso* Filkorn & Pantoja-Alor, p. 119, fig. 45 (deemed unpublished for purposes of zoological nomenclature).

*Diagnosis.* Corallum massive, typically hemispherical or subspherical and frequently relatively large in size. Calices relatively large, CD 6–12 mm, and laterally spaced 2–7 mm apart. Septa fenestrate axially and numerous, usually four complete cycles and about half of fifth cycle.

*Etymology.* Named for the type stratum, the Mal Paso Formation. The specific name is a noun in apposition.

*Types.* Holotype, IGM-7753, a massive corallum about 19 x 23 cm in diameter and 20 cm in height, with three thin sections (M-13, M-14 and M-15); paratype, IGM-7754, part of a massive corallum, about 12 x 13 cm in diameter and 8 cm in height.

*Type stratum.* Upper member of Mal Paso Formation, upper Albian; holotype from coral reef horizon, bed MP13; paratype from bed MP 5, lower in stratigraphic section.

*Type locality.* In state of Guerrero, Mexico (details above).

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The Case is hereby closed.