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XXVII.—A revision of the British Jurassic Bryozoa.—Part V. The families Idmoniidae and Entalophoridae

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Fig. 3. *Scorpio fulvipes*, nat. size.

Fig. 4. *Opisthophthalmus capensis*, $\times \frac{1}{4}$. *Ln.*, longitudinal nerve.

Fig. 5. *Uroplectes triangulifer*, $\times \frac{1}{4}$.

Fig. 6. Portion of ovary of *Scorpio fulvipes*.

Fig. 7. Portion of ovary of *Euscorpius italicus*, with unfertilized eggs.

Fig. 8. Portion of the same, with embryos in the ovarian tube.

Fig. 9. Portion of edge of lung-book lamella of *Vejois*, sp. (spinous type).

Fig. 10. The same of *Euscorpius italicus* (arcade type).

Fig. 11. The same of *Buthus nigrolineatus* (reticulate type).

XXVII.—*A Revision of the British Jurassic Bryozoa.*—

Part V. *The Families Idmoniidae and Entalophoridae.*

By J. W. GREGORY, D.Sc., F.G.S.

[Continued from p. 155.]

Family Idmoniidae.

Diagnosis.—Cyclostomata Tubulata in which the zoöcia are simple open tubes and grow into adnate or erect branching zoaria. The zoarium is branched and the zoöcia open only on one side of it. The apertures are arranged in regular transverse series, usually alternately arranged.

Genus IDMONEA, Lamouroux, 1821.

Diagnosis.—Zoarium adnate or erect. Branches ridged or triangular in section. Zoöcia in regular, transverse, and usually alternate series. The zoarium is branched and the branches usually radiate from a centre. The branches sometimes anastomose.

Type species: *Idmonea triquetra*, Lamx. 1821.

1. *Idmonea triquetra*, Lamouroux, 1821.

Idmonea triquetra, Lamouroux, 1821, Expos. méth. p. 80, pl. lxxix. figs. 13–15.

Non *Idmonea triquetra*, Walford, 1889, Bry. Shipton, Part I., Quart. Journ. Geol. Soc. vol. xlv. pp. 568, 569, pl. xviii. fig. 13, pl. xix. figs. 3, 4.

Reptotubigera triquetra, d'Orbigny, 1852, Pal. franç., Terr. crét. t. v. p. 751.

Idmonea gracilis, d'Orbigny, 1849, Prod. Pal. t. i. p. 317.

Diagnosis.—Zoarium composed of triangular branches, beside each of which is a thin flat selvage. The branches dichotomize repeatedly.

Zoœcia from 4 to 7 in each series.

Peristomes open along the summit of a low ridge.

Zoœcia slender and cylindrical in adult, short, thick, and angular in young stages. Walls punctate.

Distribution.—England: Great Oolite and Bradford Clay. Foreign: Bathonian, France.

Family *Entalophoridae*.

Diagnosis.—Cyclostomata Tubulata in which the zoarium is erect and dendroid; the branches consist of solid bundles of zoœcia. The zoœcia are monomorphic and open on all sides of the stems.

Genus 1. *ENTALOPHORA*, Lamouroux, 1821.

Diagnosis.—Entalophoridae in which the zoarium consists of thin stems, each of which is composed of a small number of zoœcia. The peristomes are scattered irregularly. The œcia are cylindrical.

Type species: *E. cellarioides*, Lamouroux, 1821.

1. *Entalophora cellarioides*, Lamouroux, 1821.

Entalophora cellarioides, Lamouroux, 1821, Expos. méth. p. 81, pl. lxxx. figs. 9–11.

Entalophora laxipora, d'Orbigny, 1849, Prod. Pal. t. i. p. 318.

Entalophora subgracilis, d'Orb., var. *corrugata*, Walford, 1889, Bry. Shipton, Part I., Quart. Journ. Geol. Soc. vol. xlv. p. 573, pl. xviii. fig. 14.

Diagnosis.—Zoarium caespitose, composed of thin fragile branches about 1 millim. in diameter.

Zoœcia long; the free distal portion is often very long.

Peristomes irregularly quincuncial in arrangement.

Distribution.—England: Inferior Oolite, Great Oolite. Foreign: Bathonian, France.

2. *Entalophora magnipora*, Walford, 1889.

Entalophora magnipora, Walford, 1889, Bry. Shipton, Part I., Quart. Journ. Geol. Soc. vol. xlv. p. 572, pl. xix. figs. 11, 12.

? *Entalophora subirregularis*, d'Orbigny, 1849, Prod. Pal. t. i. p. 289.

Entalophora raripora, non d'Orb., Walford, 1889, *op. cit.* p. 572, pl. xix. fig. 10.

Entalophora raripora, Walf., var. *anomala*, Reuss, Walford, 1889, *ibid.* p. 573.

Cisternifera clausa, Walford, 1894, *ibid.* Part II., vol. i. p. 82, pl. vii. figs. 11, 17.

Cisternifera inconstans, pars, Walford, 1889, *ibid.* Part II., vol. i. p. 80, pl. vii. fig. 16.

Diagnosis.—*Zoarium* of thin regularly cylindrical branches, composed of about twelve zoëcia. Branches 1 to 2 millim. in diameter.

Zoëcia long, cylindrical, with only a small portion free. Apertures irregular in distribution, distant. Surface wrinkled.

Distribution.—England: Mid Lias—Great Oolite. Foreign: Bajocian, France?

3. *Entalophora nidulata* (Walford), 1894.

Pergensia nidulata, Walford, 1889, Bry. Shipton, Part II., Quart. Journ. Geol. Soc. vol. 1. p. 73, pl. ii. figs. 1, 2.

Pergensia major, Walford, 1894, *ibid.* p. 74, pl. ii. figs. 3, 4.

Pergensia porifera, *id. ibid.* p. 75, pl. ii. fig. 6.

Pergensia galeata, *id. ibid.* p. 76, pl. iii. fig. 27.

Pergensia minima, *id. ibid.* p. 74, pl. ii. fig. 12.

Entalophora richmondiensis, var. *pustulopora*, Vine, 1884, Polyz. Richmond Boring, Quart. Journ. Geol. Soc. vol. xl. p. 792.

Diagnosis.—*Zoarium* short, clavate, cylindrical in section.

Zoëcia cylindrical, partly immersed, but a free distal portion, the extent of which varies greatly. The apertures are irregularly arranged, but a tendency to a spiniform arrangement occurs in the proximal portion of the zoarium.

Ooëcia large, spherical.

Distribution.—England: Inferior Oolite and Great Oolite.

Genus 2. SPIROPORA, Lamouroux, 1821.

Diagnosis.—Entalophoridæ in which the apertures in most parts of the zoarium occur in regular annular or spiral lines. The zoëcia are regularly cylindrical.

Type species: *Spiropora elegans*, Lamouroux, 1821.

1. *Spiropora elegans*, Lamouroux, 1821.

Spiropora elegans, Lamx. 1821, Expos. méth. p. 47, pl. lxxiii. figs. 19-22.

Cricopora elegans, Blainville, 1830, Dict. Sci. nat. t. lx. p. 385.

Diagnosis.—*Zoarium* formed of loose tufts; branches dichotomize repeatedly, rather stout.

Zoëcia long, regularly tubular.

Peristomes slightly elevated, arranged in regular horizontal rows; from 5 to 7 peristomes are seen on each side of a branch; the rows of peristomes are distant, the zoëcia being long.

Distribution.—British: Great Oolite. Foreign: Bathonian, France.

2. *Spiropora annulosa* (Michelin), 1847.

Cricopora annulosa, Michelin, 1847, Icon. Zooph. p. 339, pl. lvi. fig. 3.
Cricopora verticillata, non Goldf., Michelin, 1846, *op. cit.* p. 236, pl. lvi. fig. 3.

Laterotubigera verticillata, d'Orbigny, 1852, Pal. franç., Terr. crét. t. v. p. 715.

Cricopora tessonis, Michelin, 1846, Icon. Zooph. p. 236, pl. lvi. fig. 6.

Entalophora tessonis, d'Orbigny, 1849, Prod. Pal. t. i. p. 318.

Spiropora tessonis, Haime, 1854, Bry. jur., Mém. Soc. géol. France, sér. 2, t. v. p. 195.

Cricopora subverticillata, d'Orbigny, 1849, Prod. Pal. t. i. p. 318.

Spiropora straminea (non Phill.), Haime, 1854, *op. cit.* sér. 2, t. v. p. 196, pl. ix. fig. 6.

Entalophora straminea (non Phill.), Brauns, 1879, Bry. mittl. Jura, Metz, Zeit. deut. geol. Ges. Bd. xxxi. p. 331.

Spiropora caespitosa (non Lamx.), Haime, 1854, *op. cit.* p. 195 (excl. syn.), pl. ix. fig. 7.

Spiropora compressa, Haime, 1854, *op. cit.* p. 197, pl. ix. fig. 5.

Entalophora compressa, Vine, 1888, Polyz. Caen, Journ. Northampton Nat. Hist. Soc. vol. v. p. 10.

Cricopora acutimargo, Waagen, 1868, *Zone Amm. Sowerbyi*, Geogn. Pal. Beitr. Bd. i. Heft 3, p. 641, pl. xxxiii. fig. 7.

Diagnosis.—*Zoarium* forming very loose tufts; branches dichotomize irregularly, of medium thickness; section of branches circular, oval, or compressed.

Zoecia regularly cylindrical, rather short.

Peristomes raised and arranged in regular rows; these are horizontal or slightly oblique; from 5 to 7 peristomes can be seen on one side of a branch; the distance between the rows of peristomes is short.

Distribution.—England: Inferior Oolite and Great Oolite. Foreign: Bajocian, France and Germany. Bathonian: France.

3. *Spiropora caespitosa*, Lamouroux, 1821.

Spiropora caespitosa, Lamouroux, 1821, Expos. méth. p. 86, pl. lxxxii. figs. 11, 12.

Non *Spiropora caespitosa*, Haime, Bry. jur., Mém. Soc. géol. France, sér. 2, t. v. p. 195, pl. ix. fig. 7.

Cricopora caespitosa, Blainville, 1830, Dict. Sci. nat. t. lx. p. 386.

Entalophora caespitosa, d'Orbigny, 1849, Prod. Pal. t. i. p. 318.

? *Spiropora capillaris*, Lamouroux, 1821, *op. cit.* p. 47.

Cricopora capillaris, Blainville, 1830, *op. cit.* p. 386.

Intricaria bajocensis, Defrance, 1822, Dict. Sci. nat. t. xxiii. p. 546, pl. xlv. fig. 1.

Spiropora bajocensis, Haime, 1854, *op. cit.* p. 196.

Laterotubigera bajocensis, d'Orbigny, 1852, Pal. franç., Terr. crét. t. v. p. 715.

Entalophora bajocensis, d'Orbigny, 1852, *op. cit.* t. v. p. 779.

Pustulopora tenuis, Waagen, *Zone Amm. Sowerbyi*, Geogn. Pal. Beitr. Bd. i. Heft 3, p. 641.

Diagnosis.—*Zoarium* growing in dense tufts of long slender cylindrical branches; these dichotomize repeatedly and occasionally anastomose.

Zoæcia regularly cylindrical.

Peristomes slightly raised; three or four apertures seen on each side of a branch; peristomial rows very oblique and crowded, and therefore giving the orifices an apparently quincuncial arrangement. At the ends of branches the peristomes are irregular and low (form *cæspitosa*, Lamx. & Mich., non Haime).

Distribution.—England: Great Oolite and Forest Marble. Foreign: Bajocian, France and Germany; Bathonian, France.

4. *Spiropora richmondiensis* (Vine), 1884.

Entalophora richmondiensis, Vine, 1884, Polyz. Richmond Boring, Quart. Journ. Geol. Soc. vol. xl. p. 791, fig. 3.

Terebellaria? *increscens*, Vine, 1884, *ibid.* p. 79.

Diagnosis.—*Zoarium* of thin bifurcating stems, from 1 to 2 millim. in diameter.

Zoæcia numerous, in regular spirals; below the points of bifurcation the rows of peristomes become less oblique and increase to ten in number; elsewhere 7 or 8 *zoæcia* can be seen in a single row across one face of the stem; *zoæcia* are short and cylindrical.

Peristomes well raised.

Distribution.—England: Great Oolite.

5. *Spiropora tetragona*, Lamouroux, 1821.

Spiropora tetragona, Lamouroux, 1821, Expos. méth. p. 85, pl. lxxxii. figs. 9, 10.

Cricopora tetragona, Blainville, 1830, Dict. Sci. nat. t. lx. p. 386.

Entalophora tetragona, d'Orbigny, 1849, Prod. Pal. t. i. p. 318.

Bisidmonea tetragona (non Lamx.), Walford, 1889, Bry. Shipton, Part I, Quart. Journ. Geol. Soc. vol. xlv. p. 571, pl. xix. figs. 7-9.

Spiropora tetraquetra, Lamouroux, 1821, *op. cit.* p. 47.

Cricopora tetraquetra, Bronn, 1835, Leth. Geogn. p. 247.

Bisidmonea antiqua, d'Orbigny, 1852, Pal. franç., Terr. crét. p. 720, pl. 762. figs. 10-12.

Diagnosis.—*Zoarium* composed of thick tetragonal stems, which dichotomize repeatedly but irregularly; they form a loose tuft.

Zoæcia short.

Peristomes slightly raised, arranged in alternate horizontal series (as in *Idmonea*). On each face of a stem there occur two rows of apertures placed alternately on the left and right

sides of the face ; the distance between two rows on the same side is of medium length.

Distribution.—British : Inferior Oolite. Foreign : Ba-
thonian, France.

Genus 3. HAPLOECIA, gen. nov.

Diagnosis.—Entalophoridae in which the zoecia are short and angular in form. The peristomes are never greatly raised ; the apertures are small and they are arranged either lineally or quincuncially.

Type species : *Haploecia straminea* (Phillips), 1829.

Affinities.—This genus is proposed for some species which differ from *Entalophora* and *Spiropora* by having short hexagonal zoecia instead of long regularly tubular ones. As the aperture is not truly terminal and is somewhat contracted, the zoecia show a certain resemblance to those of the Cheilostomata ; if the ordinarily accepted definitions of Cheilostomata and Cyclostomata be rigidly applied the members of this genus ought to enter the former order. Some of the species have been included in *Melicerites*, a genus of which the type species is very uncertain. These forms cannot, however, enter *Melicerites*, as accepted by Pergens, whose use of this name may be conveniently accepted.

1. *Haploecia straminea* (Phillips), 1829.

Millepora straminea, Phillips, 1829, Geol. Yorks., Part I., Yorks.
Coast, p. 143, pl. vii. fig. 8.

Cricopora straminea, Morris, 1843, Cat. Brit. Foss. p. 34.

Intricaria straminea, d'Orbigny, 1849, Prod. Pal. t. i. p. 289.

Non *Laterotubigera straminea*, d'Orbigny, 1852, Pal. franç., Terr. crét.
t. v. p. 715.

Entalophora straminea, id. ibid. p. 779.

Non *Spiropora straminea*, Haime, 1854, Bry. jur., Mém. Soc. géol.
France, sér. 2, t. v. p. 196, pl. ix. fig. 6.

Non *Spiropora straminea*, Vine, 1883, Rep. Brit. Assoc. 1882, p. 262.

Pustulopora straminea, Gregory, 1893, Cat. Jur. Bry. York Museum,
Rep. Yorks. Phil. Soc. 1893, p. 60, fig. 2.

Pustulopora Quenstedti, Waagen, 1868, Zone *Amm. Sowerbyi*, Geogn.
Pal. Beitr. Bd. i. Heft 3, p. 641, pl. xxxii. fig. 10.

Diagnosis.—*Zoarium* tufted, loose, and irregular ; branches
of medium thickness.

Zoecia in regular, horizontal, closely adjoining series,
usually hexagonal and bisymmetrical, but variations in growth-
pressure render some irregularly polygonal. Aperture trans-
versely elliptical. Peristomes slightly raised. Front wall
punctate.

Distribution. — England: Inferior Oolite — Cornbrash. Foreign: Bajocian, Germany; Bathonian, France.

2. *Haploœcia irregularis*, sp. n.

Diagnosis.—*Zoarium* composed of small cylindrical stems, which dichotomize irregularly and usually at short intervals.

Zoœcia usually hexagonal, but occasionally heptagonal or pentagonal, often irregular, irregularly quincuncial in arrangement. Apertures large, circular, or, when worn, transversely elongate. Front wall coarsely punctate.

Distribution.—British: Great Oolite, Ancliff, near Bath; Lincolnshire Limestone, Stamford. Foreign: Bathonian, Normandy.

Affinities.—This species is separated from the former one by the irregularly quincuncial arrangement of the zoœcia.

Genus 4. CERIOCAVA.

Diagnosis.—Entalophoridæ in which the zoarium consists of thick massive stems, each of which is composed of a large number of zoœcia. The zoœcia are funnel-shaped. The apertures crowded. The peristomes flush. The axis of the zoarium consists of fine zoœcia, densely packed. The outer zone consists of zoœcia which are usually reflexed and of much greater diameter.

Type species: *Ceriocava corymbosa* (Lamouroux), 1821.

1. *Ceriocava corymbosa* (Lamouroux), 1821.

Millepora corymbosa, Lamouroux, 1821, Expos. méth. p. 87, pl. lxxxiii. figs. 8, 9.

Non *Ceriopora corymbosa*, Michelin, 1846, Icon. Zooph. p. 246, pl. lvii. fig. 9.

Ceriocava corymbosa, d'Orbigny, 1852, Pal. franç., Terr. crét. t. v. p. 1016.

Heteropora corymbosa, Haime, 1854, Bry. Jur., Mém. Soc. géol. France, sér. 2, t. v. p. 212.

Ceriopora Neptuni, d'Orbigny, 1849, *op. cit.* p. 324.

Ceriocava Neptuni, d'Orbigny, 1852, *op. cit.* p. 1016.

Ceriopora conferta (non Lamx.), Michelin, 1846, *op. cit.* p. 245, pl. lvii. fig. 8.

Ceriopora dumetosa, Michelin, 1846, *op. cit.* p. 245, pl. lvii. fig. 7.

Cava dumetosa, d'Orbigny, 1852, *op. cit.* t. v. p. 1019.

Cava pustulosa, Michelin, 1846, *op. cit.* p. 245, pl. lvii. fig. 6.

Monticulipora pustulosa, d'Orbigny, 1849, Prod. Pal. t. i. p. 323.

Nodicava pustulosa, d'Orbigny, 1852, *op. cit.* t. v. p. 1014.

Heteropora pustulosa, pars, Brauns, 1879, Bry. mittl. Jura, Metz, Zeit. deut. geol. Ges. Bd. xxxi. p. 336.

Diagnosis.—*Zoarium* dendroid, erect, growing in thick, solid branches, which anastomose occasionally. The branches are regularly cylindrical, or compressed (form *dumetosa*). The surface is level, or raised into pustules (var. *pustulata*).

Zoecia thin-walled; diaphragms numerous. Aborted zoecia scattered irregularly through the zoarium.

Distribution.—England: Great Oolite and Cornbrash. Foreign: Bathonian, France.

2. *Ceriocava laxata*, sp. n.

Diagnosis.—*Zoarium* with branches fairly regularly cylindrical.

Peristomes irregular in shape, size, and arrangement. Number of zoecia in a branch comparatively limited. The central axis consists of few zoecia, irregularly and loosely arranged.

Distribution.—Inferior Oolite, Leckhampton.

Affinities.—This species is most nearly allied to *Ceriocava corymbosa* (Lamx.). The differences can be clearly seen in a longitudinal section. The central axis has far fewer zoecia, and these are not so tightly packed. It is not easy to separate the specimens of the two species by the external characters; but the apertures in *C. corymbosa* are more regular than in *C. laxata*.

Synopsis of Species of Entalophoridae.

- A. Zoecia long and tubular; apertures equal in diameter to zoecia.
 - I. Branches slender; structure simple.
 - a. Apertures never in linear series. = *Entalophora*.
 - a. Zoarium of long thin cylindrical branches:
 - (1) free distal end long *E. cellarioides*.
 - (2) free distal end short *E. magnipora*.
 - b. Zoarium short, clavate *E. nidulata*.
 - b. Apertures mostly in linear series. = *Spiropora*.
 - a. Apertures in regular horizontal rows:
 - (1) series of apertures distant *S. elegans*.
 - (2) series of apertures close *S. annulosa*.
 - b. Apertures in oblique spiral series:
 - (1) peristomes slightly raised *S. caespitosa*.
 - (2) peristomes well raised *S. richmondensis*.
 - c. Apertures in short alternate series *S. tetragona*.
 - II. Branches stout, with a central dense axis.
= *Ceriocava*.
 - (1) Axis thick *C. corymbosa*.
 - (2) Axis loose and irregular *C. laxata*.
- B. Zoecia short and hexagonal; apertures contracted.
= *Haploecia*.
 - (1) Apertures regularly arranged *H. straminea*.
 - (2) Apertures irregularly arranged *H. irregularis*.