

Revision of the Oligocene bryozoan taxa described by Stoliczka (1862), with the description of a new genus of Bryocryptellidae

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ABSTRACT

A collection of bryozoans from the Oligocene of Latdorf, Germany, first described by Ferdinand Stoliczka in 1862 and not examined since, has been re-examined. Stoliczka had recognized 47 species, 24 of them new. Of these latter, 14 names remain valid; the remainder are synonyms of previously described taxa or, owing to the originally inadequate state of the fossil material examined, taxonomically indeterminable. The genera *Orbitulipora* Stoliczka, 1862 and *Stichoporina* Stoliczka, 1862, both introduced by Stoliczka in 1862 along with their type species, are still valid. Two of his species, one of which had not been examined since its first description, comprise a new bryocryptellid genus, *Stoliczkella* n. gen., which superficially resembles the celleporid genus *Galeopsis* Jullien & Calvet, 1903. Diagnoses or descriptions are provided herein for all of the taxa in the collection and lectotypes selected. The results of this revision will be applied to a forthcoming analysis of a recent extended excavation of the Latdorf section by the University of Leipzig, in which bryozoans are among the most abundant fossil groups.

KEY WORDS

Bryozoa,
Oligocene,
Germany,
lectotypification,
new genus,
new combinations.

RÉSUMÉ

Révision des bryozoaires oligocènes décrits par Stoliczka (1862), avec la description d'un nouveau genre de Bryocryptellidae.

Une collection de bryozoaires de l'Oligocène de Latdorf, Allemagne, initialement décrite par Ferdinand Stoliczka en 1862 et jamais revue depuis, a été réexaminée. Stoliczka avait reconnu 47 espèces, dont 24 nouvelles. Parmi ces dernières, 14 noms restent acceptables, les autres sont des synonymes de taxons déjà décrits ou, de taxonomie indéterminable en raison du mauvais état d'origine du matériel fossile. Les genres *Orbitulipora* Stoliczka, 1862 et *Stichoporina* Stoliczka, 1862, tous deux introduits par Stoliczka en 1862 avec leur espèce type, sont toujours acceptables. Deux de ses espèces, dont l'une n'avait pas été examinée depuis sa première description, comprennent un nouveau genre de Bryocryptellidae, *Stoliczkella* n. gen., qui ressemble superficiellement à *Galeopsis* Jullien & Calvet, 1903 (Celleporidae). Ici, les diagnostics et descriptions sont fournis pour tous les taxons de la collection et les lectotypes sélectionnés. Les résultats de cette révision seront utilisés pour l'analyse d'une extension récente de l'excavation de la coupe de Latdorf, entreprise par l'Université de Leipzig, dans lequel les bryozoaires sont parmi les groupes de fossiles les plus abondants.

MOTS CLÉS

Bryozoa,
Oligocène,
Allemagne,
lectotypification,
genre nouveau,
combinaisons nouvelles.

INTRODUCTION

Stoliczka (1862) described bryozoans from a fossil locality at Latdorf, Saxony-Anhalt, Germany, recognizing 47 species, 24 of them new, and ascribing an Oligocene age to the section. As is usual for many publications from the 19th century, the quality of illustrations and species descriptions is frequently inadequate for modern determination. Recently, an extended excavation of the Latdorf section was undertaken by the University of Leipzig (Institut für Geophysik und Geologie, Geologisch-Palaeontologische Sammlung). Bryozoans turned out to be among the most abundant fossil groups, but, in order to evaluate their taxonomic composition, and to contribute to a better understanding of the overall paleontological significance of the site, it has proven necessary to examine the type material of the species described by Stoliczka (1862). The main purpose of this paper is to revise Stoliczka's collection and, at the same time, provide a basis for the inclusion of this group of colonial suspension-feeding organisms in a later paleoecological analysis of the faunal components of the section.

MATERIAL AND METHODS

Thanks to the EU project Synthesys (AT-TAF-2647) one of us (KZ) was able to access the type collection of Stoliczka (1862) stored in the Natural History Museum in Vienna (NHMV). The collection is in good condition and all type material examined is properly labelled. Specimens were cleaned briefly (several seconds) in an ultrasonic cleaner before initial study by optical microscopy and preliminary taxonomic assessment. During this preliminary study an attempt was made to match type specimens with Stoliczka's (1862) illustrations. If the type collection included more than one specimen per species, a lectotype was selected that either most closely resembled the illustration made by Stoliczka (1862) or (if no such specimen could be found) was the best-preserved colony.

Selected specimens from among those showing sufficient preservation and important features were studied using SEM (Jeol, type JSM 6610 LV). The specimens were temporarily mounted on adhesive carbon disks and observed without coating in a low-vacuum regime. SEM micrographs were processed using CorelDraw X3[®] software to produce the final illustrations.

Our taxonomic and nomenclatural revision of the type collection is summarized in Table 1. Detailed description of all species described as new by Stoliczka (1862) follows, using taxonomically revised binomials where necessary. We illustrate those specimens that we regard as definitely intended by Stoliczka to represent his new taxa.

SYSTEMATICS

Phylum BRYOZOA Ehrenberg, 1831
Class STENOLAEMATA Borg, 1926
Order CYCLOSTOMATA Busk, 1852
Family TUBULIPORIDAE Johnston, 1838
Genus *Exidmonea*
David, Mongereau & Pouyet, 1972

Exidmonea hoernesii (Stoliczka, 1862)
(Fig. 1A)

Idmonea (*Tubigera*) *hörnési* Stoliczka, 1862: 82, pl. 1, fig. 7.

Exidmonea hoernesii – Zágoršek 2003: 111, pl. 2, fig. 3 (cum syn.).

MATERIAL EXAMINED. — Holotype, registered as 1862/0022/0050.

DIAGNOSIS. — Four zooecia in each fascicular row, fascicles not alternating. One aperture, close to the dorsal side, always arranged outside the fascicle. Apertures rectangular, with short narrow peristome. Zooecial tubes perforated by pseudopores. Dorsal side of colony slightly ribbed and convex. No gonozooecium developed.

REMARKS

Although no gonozooecia have been found, the presence of one aperture, close to the dorsal side of the colony, which is always arranged outside the fascicle is diagnostic, allowing positive identification.

Exidmonea giebeli (Stoliczka, 1862)
(Fig. 1B)

Idmonea giebeli Stoliczka, 1862: 81, pl. 1, fig. 6 (v).

Exidmonea giebeli – Zágoršek 2003: 110, pl. 2, figs 4, 5 (cum syn.).

MATERIAL EXAMINED. — Holotype, registered as 1859/0026/0144.

DIAGNOSIS. — Colony with triangular transverse section, the angle between the frontal sides *c.* 120°. Fascicles comprising pairs of apertures with 1 additional aperture situated close to median area of frontal side of colony. Dorsal side of colony flat or rarely slightly convex, perforated by pseudopores, with slight outline of zooecial tubes. Gonozooecium not observed.

REMARKS

The species is similar to *Ybseloecia typica* (Manzoni, 1878) but differs in the presence of an additional aperture situated between the pairs of fasciculate apertures, in the middle of the frontal side of the colony. This seems to be diagnostic for the species. Although the absence of a gonozooecium can make species identification problematic, the presence of median rows of autozooecia not belonging to a fascicle is also a specific feature. The species name was used also by Zágoršek (2010) to accommodate Miocene *Exidmonea* with median rows of autozooecia in very wide, low-profile branches.

Due to the gently convex frontal surface and absence of keel separating two fascicles, the species may belong also to genus *Nevianipora* Borg, 1944. Without a well-preserved gonozooecium, these two genera cannot be clearly distinguished, so the generic attribution of the species remains uncertain.

Family ONCOUSOECHIDAE Canu, 1918
Genus *Filisarsa* d'Orbigny, 1853

Filisarsa? sp.
(Fig. 1C, D)

Filisarsa tenella Stoliczka, 1862: 80, pl. 1, fig. 5. — Zágoršek 2001: 519; 2003: 115, pl. 2, fig. 6 (cum syn.).

MATERIAL EXAMINED. — Holotype of *Filisarsa tenella*, registered as 1862/0022/0049.

DIAGNOSIS. — Colony short, erect, with autozooecial apertures arranged in rows. Peristomes slightly curving laterally from colony axis. Frontal wall with pseudopores; boundaries between autozooecial tubes indistinct. Dorsal side of colony smooth, slightly ribbed. Gonozooecium not known.

TABLE 1. — Taxonomic and nomenclatural revision of the type collection of Oligocene bryozoan taxa described by Stoliczka (1862).

Original name	Ref – NHM Vienna	Proposed new name	Fig.
<i>Idmonea (Tubigera) hoernesii</i>	1862/0022/0050	<i>Exidmonea hoernesii</i>	
<i>Idmonea (Tubigera) giebeli</i>	1859/0026/0144	<i>Exidmonea giebeli</i>	1A
<i>Filisparsa tenella</i>	1862/0022/0049	<i>Filisparsa?</i> sp.	
<i>Pustulopora (Clausia) retifera</i>	1862/0022/0047	<i>Mecynoecia</i> cf. <i>pulchella</i>	
<i>Pustulopora attenuata</i>	2010/259/16A	<i>Mecynoecia</i> cf. <i>proboscidea</i>	
<i>Alveolaria buski</i>	1862/0022/0055	? <i>Bobbiesipora fasciculata</i>	
<i>Heteropora similis</i>	1859/0026/0138	" <i>Heteropora similis</i> Stoliczka, 1862"	1J
		<i>nomen dubium</i>	
<i>Hornera porosa</i>	1862/0022/0048	<i>Hornera</i> cf. <i>verrucosa</i>	
<i>Pavotubigera anhaltina</i>	1862/0022/0052	" <i>Disporella anhaltina</i> (Stoliczka, 1862)"	1K, L
		<i>nomen dubium</i>	
<i>Lunulites latdorfensis</i>	1867/0012/0018	<i>Lunulites latdorfensis</i>	1B-F
<i>Membranipora (Semiflustrata) anhaltina</i>	1862/0022/0054	<i>Onychocella subpyriformis</i>	
<i>Eschara reussi</i>	1859/0026/0136	<i>Steginoporella</i> cf. <i>reingruberhohensis</i>	2A
<i>Eschara (Escharifora) ornatissima</i>	2010/0259/0010	<i>Adeonella ornatissima</i>	2B-D
<i>Eschara (Escharifora) mortisaga</i>	1859/0026/0137	<i>Adeonella mortisaga</i> n. comb.	2E-F
<i>Eschara (Porellia) pulchra</i>	1862/0022/0056	<i>Adeonellopsis pulchra</i> n. comb.	3A
<i>Lepralia pedicularis</i>	1862/0022/0053	" <i>Lepralia pedicularis</i> Stoliczka, 1862"	4B
		<i>nomen dubium</i>	
<i>Eschara (Flustrina) subovata</i>	2010/0259/0006	<i>Stoliczkella subovata</i> n. comb.	3B-G
<i>Eschara crenatula</i>	2010/0259/0007	<i>Stoliczkella crenatula</i> n. comb.	4A-F
<i>Lepralia macropora</i>	1859/0026/0140	<i>Anarthropora macropora</i> n. comb.	5A-D
<i>Lepralia grotriani</i>	1862/0022/0051	<i>Escharella grotriani</i>	5E-F
<i>Cellaria beyrichi</i>	1859/0026/0133	<i>Myriapora?</i> <i>beyrichi</i> n. comb.	5G-H
<i>Eschara (Porina) porulosa</i>	2010/0259/0009	<i>Tubucella mammillaris</i>	5I-J
<i>Retepora fasciata</i>	1862/0022/0044	" <i>Retepora fasciata</i> Stoliczka, 1862"	
		<i>nomen dubium</i>	
<i>Orbitulipora haidingeri</i>	1862/0022/0045	<i>Orbitulipora haidingeri</i>	6A-H
<i>Stichoporina reussi</i>	1862/0022/0046	<i>Stichoporina reussi</i>	7A-G

REMARKS

Owing to the poor preservation and lack of the gonozooecium, the exact determination remains uncertain, but the arrangement of the autozooecia mostly resembles those in *Filisparsa*, even though the type species is Cretaceous. There is also some similarity to *Tervia serrata* (Reuss, 1869) in which, however, the V outline of the autozooecial tubes is observable on the dorsal side of the branch.

Family MECYNOECIIDAE Canu, 1918
Genus *Mecynoecia* Canu, 1918

Mecynoecia cf. *pulchella* (Reuss, 1847)
(Fig. 1E)

Cricopora pulchella Reuss, 1847: 40, pl. 6, fig. 10.

Pustulopora (Clausia) retifera Stoliczka, 1862: 78, pl. 1, fig. 2.

Mecynoecia pulchella – Zágoršek 2010: 32, pl. 17, figs 1-8 (cum syn.).

MATERIAL EXAMINED. — Two colonies of *Pustulopora (Clausia) retifera*, both lacking a gonozooecium, are registered as 1862/0022/0047. Owing to taxonomic uncertainty, no lectotype of Stoliczka's species has been selected.

DIAGNOSIS. — Colonies branches broken into a short length, with 12-14 autozooecial tubes arranged around branch axis. Tubes narrow, short, with circular to oval aperture. Apertures are very densely arranged, situated on short peristomes. Frontal walls short, slightly convex, smooth, sparsely perforated by small pseudopores. Gonozooecium lacking.

REMARKS

The arrangement of zooecia very closely resembles that in *Mecynoecia pulchella*, which is very common in tertiary sediments of Paratethys (see Zágoršek 2010). Insofar as gonozooecia are lacking in any of the Stoliczka specimens, the identification is not certain.

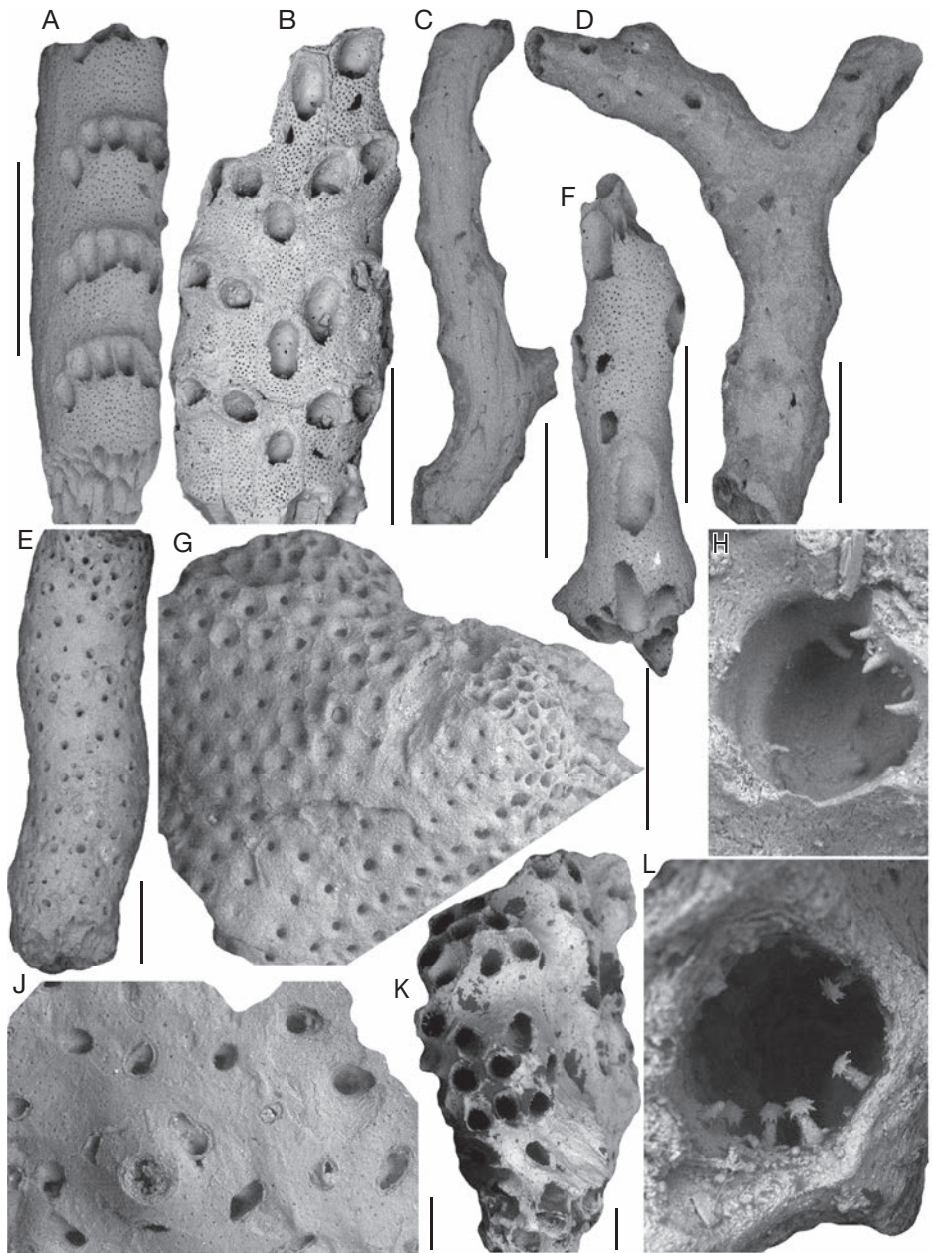


FIG. 1. — **A**, *Exidmonea hoernesii* (Stoliczka, 1862), general view of holotype showing diagnostic features: one aperture, close to the dorsal side of the colony, which is always arranged outside the fascicle; **B**, *Exidmonea giebeli* (Stoliczka, 1862), general view of holotype; **C**, **D**, holotype of *Filisparsa tenella* identified as *Filisparsa*? sp. due to the poor preservation and lack of the gonozoecium; **E**, one of the syntypes of *Pustulopora* (*Clausa*) *retifera* identified as *Mecynoecia* cf. *pulchella* (Reuss, 1847) owing to the lack of a gonozoecium; **F**, holotype of *Pustulopora attenuate* identified as *Mecynoecia* cf. *proboscidea* (Milne-Edwards, 1838) owing to the lack of a gonozoecium; **G**, **H**, syntype of *Alveolaria Buski* identified as ?*Bobiesipora fasciculata* (Reuss, 1848); **J**, holotype of *Heteropora similis* Stoliczka, 1862, identified as *nomen dubium* due to the very poor preservation and the absence of a gonozoecium or any other characteristic features; **K**, **L**, holotype of *Pavotubigera anhaltina* identified as “*Disporella anhaltina* (Stoliczka, 1862)” *nomen dubium* owing to poor preservation and the absence of a gonozoecium. Scale bars: A–G, 1 mm; H–L, 100 µm.

Mecynoecia cf. *proboscidea* (Milne-Edwards, 1838)
(Fig. 1F)

Pustulopora proboscidea Milne-Edwards, 1838: 219, pl. 12, fig. 2.

Pustulopora attenuata Stoliczka, 1862: 77, pl. 1, fig. 1.

Mecynoecia proboscidea – Zágoršek 2010: 32, pl. 18, figs 1-5 (cum syn.).

MATERIAL EXAMINED. Holotype of *Pustulopora attenuata*, registered as 2010/259/16A.

DIAGNOSIS. — Colony with four autozooeal tubes arranged around branch axis. Tubes very long, with circular to oval aperture situated on long peristomes. Frontal walls long, convex. Gonozooecium not developed.

REMARKS

The arrangement of zooecia very closely resembles that in *Mecynoecia proboscidea*, which is one of the commonest cyclostomes species in the Eocene (see Zágoršek 2003). Insofar as no gonozooecium is known in any of the Stoliczka specimens, the identification is not certain. Registered as 2010/259/16B are unrecognizable cheilostomes with a similar arrangement of zooecia.

Suborder CERIOPORINA Hagenow, 1851

Family CERIOPORIDAE Busk, 1859

Genus *Bobiesipora* Vávra, 1977

?*Bobiesipora fasciculata* (Reuss, 1848)
(Fig. 1G, H)

Apsendesia fasciculata Reuss, 1848: 40, pl. 6, fig. 8.

Alveolaria buski Stoliczka, 1862: 85, pl. 2, fig. 5.

Bobiesipora fasciculata – Zágoršek 2003: 119, pl. 5, fig. 3 (cum syn.).

MATERIAL EXAMINED. — Four syntypes of *Alveolaria buski* registered as 1862/0022/0055. No lectotype selected.

DIAGNOSIS. — Colony with a large circular encrusting basal part. Branches with zooecial tubes irregularly arranged around base. Branches often bifurcate, perforated by many kenozoecia and apertures in fascicles. Fascicles corresponding with a keel on dorsal surface of colony. Gonozooecium not observed.

REMARKS

In the absence of a gonozooecium in the Stoliczka specimens, the attribution to *Bobiesipora* remains uncertain. However, all other features (arrangement of apertures, branches and kenozoecia) show high similarities with *Bobiesipora fasciculata*.

“*Heteropora similis* Stoliczka, 1862” *nomen dubium*
(Fig. 1J)

Heteropora similis Stoliczka, 1862: 82, pl. 1, fig. 9.

MATERIAL EXAMINED. — Holotype of *Heteropora similis*, registered as 1859/0026/0138.

DIAGNOSIS. — Small fragments of columnar colony with oval transverse section. Zooecia of two types, the larger perhaps autozoecia, the smaller probably kenozoecia. No gonozooecium.

REMARKS

Owing to very poor preservation and the absence of a gonozooecium or any other characteristic features, the specimen is unrecognizable. The arrangement of apertures on the colony surface is cerioporine, somewhat comparable with *Tetrocycloecia* and/or *Heteropora* (see Zágoršek 2003, 2010).

Suborder CANCELLATA Gregory, 1899

Family HORNERIDAE Gregory, 1899

Genus *Hornera* Lamouroux, 1821

Hornera cf. *verrucosa* Reuss, 1847
(Fig. 2A)

?*Hornera verrucosa* Reuss, 1847: 43, pl. 6, fig. 22; ?1851: 173, pl. 9, fig. 21; ?1866: 197, pl. 9, fig. 9.

Hornera porosa Stoliczka, 1862: 79, pl. 1, fig. 3.

MATERIAL EXAMINED. — Two syntypes of *Hornera porosa* registered as 1862/0022/0048. Owing to the lack of gonozooecia and unclear attribution of the species, no lectotype has been selected.

DIAGNOSIS. — Apertures circular, alternating, forming more or less transverse rows. Cancelli of almost the same size, one proximal and one distal to the aperture. Dorsal side of colony with rare, scattered cancelli and anastomosing, wide, smooth nervi. Gonozooecia lacking in the Stoliczka specimens.

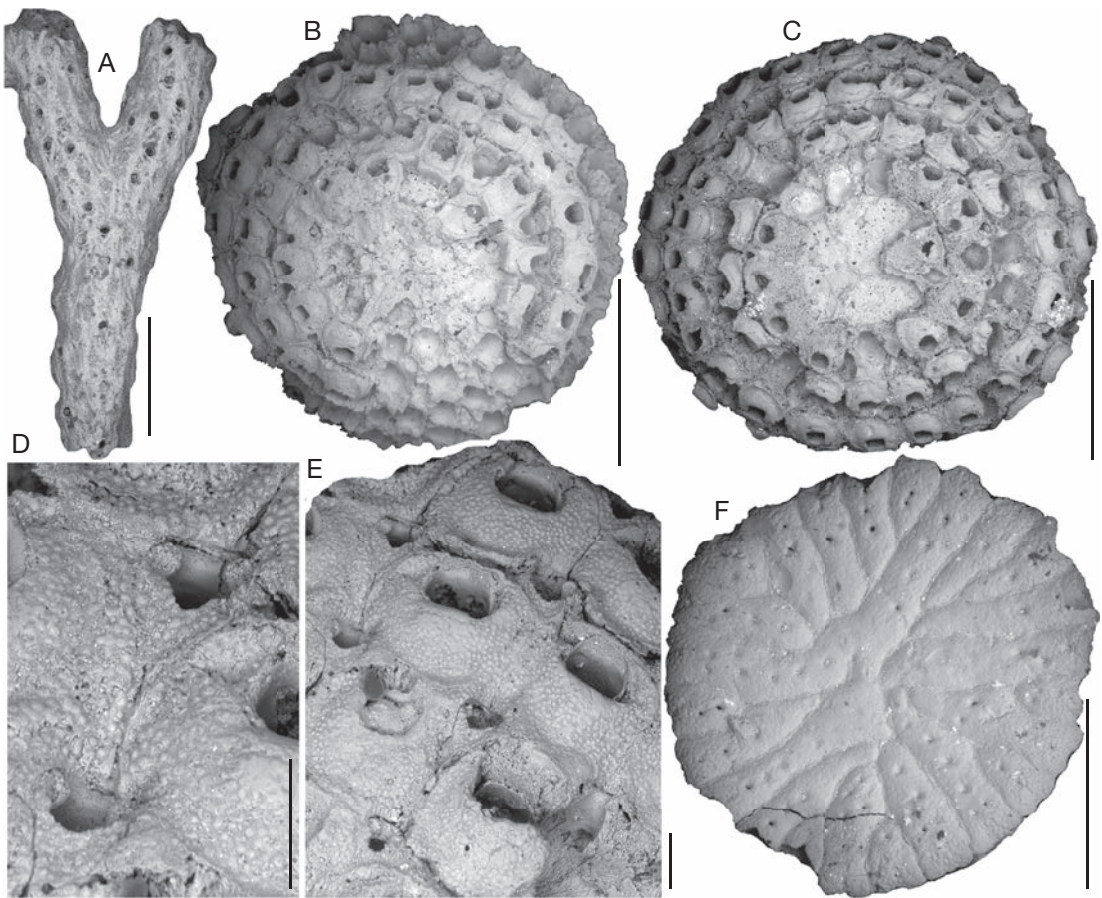


FIG. 2. — **A**, One of the syntypes of *Hornera porosa* identified as *Hornera* cf. *verrucosa* Reuss, 1847 due to the poor preservation and the lack of a gonozoecium; **B–F**, *Lunulites latdorfensis* Stoliczka, 1862; **B**, general view showing typical preservation, the central part sometimes revealing a preserved lithoclast; **C**, lectotype showing arrangement of autozooea; **D**, vibracular zooecia, with triangular shape and distinct condyles; **E**, autozooea showing granular cryptocyst and position of the vibracular zooecia; **F**, abfrontal (reverse) side of colony showing a single row of pores in each basal sector. Scale bars: A–C, F, 1 mm; D, E, 100 µm.

REMARKS

Owing to poor preservation and the lack of a gonozoecium, plus the unrecognisable type material of Reuss (1847), the species cannot be clearly identified. Moreover, *Hornera verrucosa* seems to represent an unresolved nomenclatural problem. Reuss (1847) described *Hornera verrucosa* as occurring in the Vienna Basin (Miocene). Reuss (1851) later described other specimens from the Miocene of Poland as *Hornera verrucosa* [but not sensu Reuss (1847)] and, moreover, further described *Hornera verrucosa* sensu Reuss (1851) from Söllingen (Oligocene). Reuss (1866) stated

that the species occurred from Early through Late Oligocene and the Miocene, even though all these specimens may represent different species. Smith *et al.* (2008) synonymized these three descriptions as one species (sensu Reuss 1847). Resolving this problem requires a thorough revision of the whole concept of Neogene *Hornera*, which is beyond the scope of this paper.

Because of this imprecise determination of the species, *Hornera verrucosa* has subsequently often been reported from Neogene (e.g., Bobies 1958; Vávra 1977; Zágoršek 2010) as well as Eocene sediments (Zágoršek 2001, 2003).

Suborder RECTANGULATA Waters, 1887
Family LICHENOPORIDAE Smitt, 1867
Genus *Disporella* Gray, 1848

“*Disporella anhaltina* (Stoliczka, 1862)”
nomen dubium
(Fig. 1K, L)

Pavotubigera anhaltina Stoliczka, 1862: 82, pl. 1, fig. 8.

MATERIAL EXAMINED. — Holotype of *Pavotubigera anhaltina*, registered as 1862/0022/0052.

DIAGNOSIS. — Small fragments of discoidal colony with autozooecia in radial fascicles. Fascicles comprising 1-2 parallel rows of apertures, slightly curving from centre of colony. Gonozooecium lacking.

REMARKS

The specimen is more or less unrecognizable owing to poor preservation and the absence of a gonozooecium. The arrangement of fascicles, however, resembles some species of *Disporella* (see *Disporella radiata* in Zágoršek [2003] and *Disporella hispida* in Zágoršek [2010]).

Class GYMNOLAEMATA Allman, 1856
Order CHEILOSTOMATA Busk, 1852
Suborder NEOCHEILOSTOMINA d'Hondt, 1985

Superfamily MICROPOROIDEA Gray, 1848
Family LUNULITIDAE Gregory, 1893
Genus *Lunulites* Lamarck, 1816

Lunulites latdorfensis Stoliczka, 1862
(Fig. 2B-F)

Lunulites Latdorfensis Stoliczka, 1862: 93, pl. 3, fig. 7. — Reuss 1867: 232 (not found in the collection).

MATERIAL EXAMINED. — Nine syntypes registered as 1867/0012/0018; five of them belong to *Lunulites latdorfensis*. A lectotype (Fig. 2C; designated here) has been selected from them that corresponds closely with Stoliczka (1862: pl. 3, fig. 7). The other four specimens belong to different species of *Lunulites*.

DIAGNOSIS. — Colony small, discoidal, always preserved intact. Autozooecia in very regular concentric rows, about 4-5 per colony. No budding from the fragments observed. Autozooecia roundly rectangular with granular frontal wall. Orifice semicircular. Vibracula small, acutely

triangular. Dorsal side comprising sectors as wide as an autozooecium and arranged more or less radially, slightly chaotically curved. Only one row of pores per sector.

REMARKS

The most characteristic features are: small colonies with very regularly arranged concentric rows of autozooecia, small triangular vibracula and one row of pores per sector.

Family ONYCHOCELLIDAE Jullien, 1881
Genus *Onychocella* Jullien, 1882

Onychocella subpyriformis (d'Archiac, 1846)

Eschara subpyriformis d'Archiac, 1846: 195.

Membranipora (Semiflustrella) anhaltina Stoliczka, 1862: 85, pl. 2, fig. 4.

Onychocella subpyriformis – Zágoršek 2003: 139, pl. 14, fig. 2 (cum syn.).

MATERIAL EXAMINED. — Holotype of *Membranipora (Semiflustrella) anhaltina*, registered as 1862/0022/0054.

DIAGNOSIS. — Colony erect, multiserial, with flat cross section. Autozooecia hexagonal to oval, slightly longer than wide with large, semilunar opesia. Cryptocyst extensive, shallow, flat and smooth. Vicarious avicularium as long as but half as wide as autozooecium; orifice of vicarious avicularium small, circular, or seldom narrow and oval; rostrum very long, acute distally and usually curved laterally.

REMARKS

The Stoliczka specimen is identical with the material described by Braga (1980) and Zágoršek (2001, 2003) as *Onychocella subpyriformis* (d'Archiac, 1846). As Braga (1980) pointed out, *O. subpyriformis* is quite variable and one of the commonest Eocene species in the Alpine Carpathians region.

Family STEGINOPORELLIDAE Hincks, 1884
Genus *Steginoporella* Smitt, 1873

Steginoporella cf. *reingruberhohensis*
Zágoršek, 2003
(Fig. 3A)

?*Steginoporella reingruberhohensis* Zágoršek, 2003: 142, pl. 15, figs 3, 4.

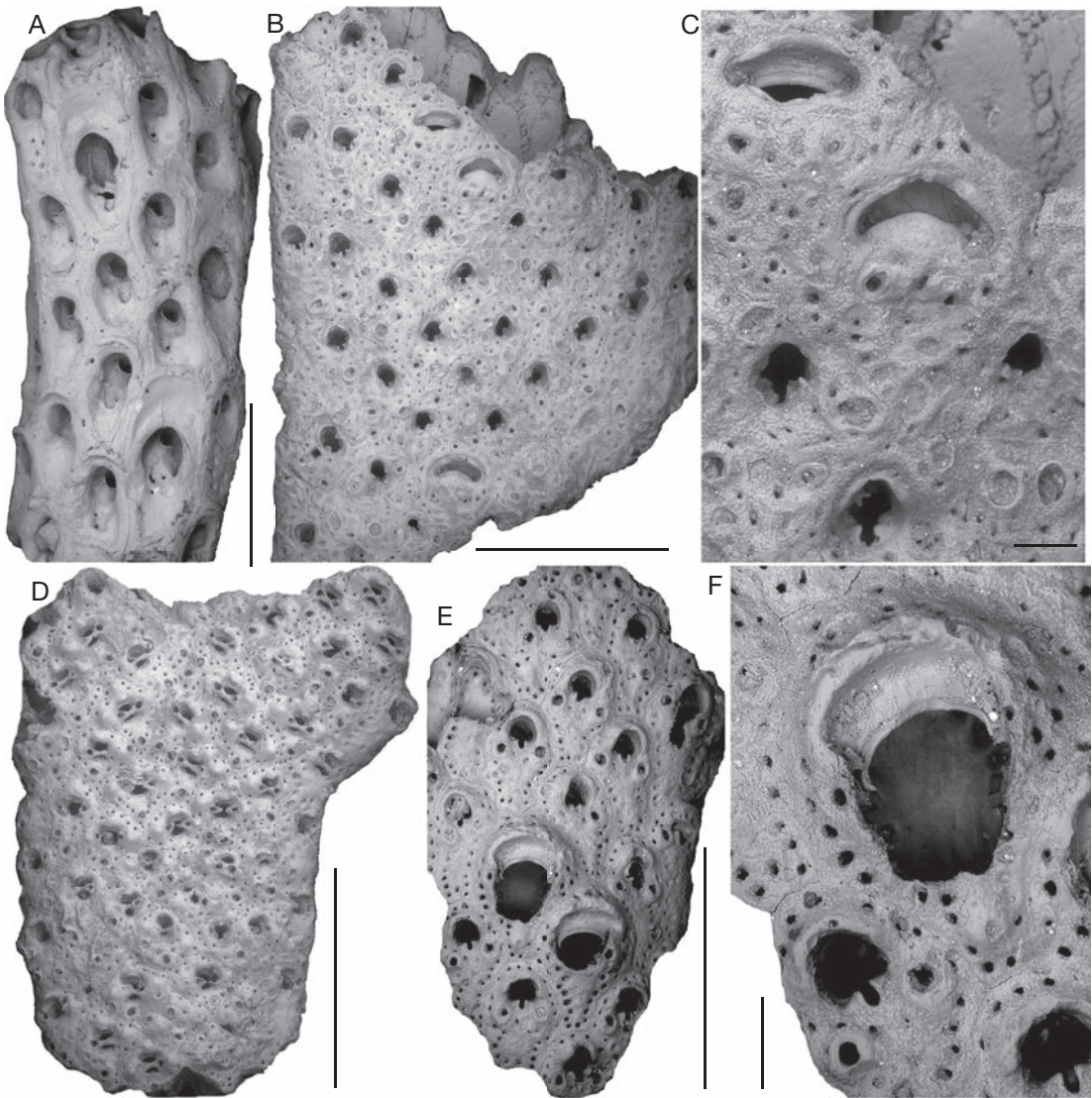


FIG. 3. — **A**, Lectotype of *Eschara reussi* identified as *Steginoporella* cf. *reingruberhohensis* Zágoršek, 2003 showing large avicularia (top and lower right) and elevated distal zooecial rims; **B–D**, *Adeonella ornatisissima* (Stoliczka, 1862); **B**, general view of lectotype with autozoecia and maternal zooecia; **C**, maternal zooecia showing the characteristic semilunar aperture and autozoecia with a deep narrow sinus; **D**, lectotype designated here as older stage of colony development showing secondary calcification producing a transverse apertural bar; **E, F**, *Adeonella mortisaga* (Stoliczka, 1862), n. comb.; **E**, general view of lectotype showing autozoecia with two suboral avicularia and large maternal zooecia; **F**, maternal zooecium with very large aperture (partly broken) and autozoecia with a narrow sinus. Scale bars: A, B, D, E, 1 mm; C, F, 100 µm.

Non *Cellaria haidingeri* Reuss, 1848: 60, pl. 7, fig. 30.

Eschara reussi Stoliczka, 1862: 88.

Non *Steginoporella cucullata* Pouyet & David, 1979: 774, fig. 3, pl. 3, fig. 10 (cum syn.).

MATERIAL EXAMINED. — Two syntypes of *Eschara reussi* registered as 1859/0026/0136. The chosen lectotype (designated here) is illustrated in Fig. 3A.

DIAGNOSIS. — Colony erect, columnar, multiserial, large with oval to circular transverse section. Autozoecia oval

to hexagonal, arranged in nine regular longitudinal rows. Mural rim wide and smooth. Cryptocyst shallow, perforated by 7-12 large pores but lacking opesiules. Orifice sunken, subcircular in shape, situated on the end of short peristome, bordered by a thin low rim. The vicarious avicularia (B-zooecia) up to twice as long and wide as autozooecia, with broad, truncate distal margin; cryptocyst perforated by about ten pores; palate wider than long, smooth, shallowly concave. Owing to poor preservation, opesial characters of vicarious avicularia are somewhat equivocal but polypide tube is well developed, its orifice similar to that of autozooecia.

REMARKS

Zágoršek (2003) synonymised this species with *Steginoporella haidingeri* (*sensu* Reuss 1848). SEM study of Stoliczka's material, however, shows features more reminiscent of *Steginoporella reingruberhohensis* Zágoršek, 2003. The main difference is the number of cryptocystal perforations. Whereas *S. haidingeri* usually has about 20-30 pores, *S. reingruberhohensis* has about 10-15, which is closer to the number (7-12) in *Eschara reussi*. Owing to the unclear cryptocystal features of the vicarious avicularia, these two species cannot presently be synonymised and the status of *Eschara reussi* remains unclear.

David & Pouyet (1974) and Pouyet & David (1979) synonymised *Eschara reussi* Stoliczka, 1862 with *Steginoporella cucullata* (Reuss, 1848). As already discussed by Zágoršek (2003), *S. cucullata* has a very wide mural rim, a consistently preserved pair of circular opesiules, and a wide vicarious avicularian palate. It is, moreover, a Miocene species.

Superfamily ADEONOIDEA Busk, 1884

Family ADEONIDAE Busk, 1884

Genus *Adeonella* Busk, 1884

Adeonella ornatissima (Stoliczka, 1862)

(Fig. 3B-D)

Eschara (Escharifora) ornatissima Stoliczka, 1862: 86, pl. 2, fig. 7.

Adeonella ornatissima – Zágoršek 2003: 152, pl. 19, fig. 2 (cum syn.).

MATERIAL EXAMINED. — Two syntypes registered as 2010/0259/0010. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 7) and is depicted in Figure 3D herein.

DIAGNOSIS. — Colony erect, flat, multiserial, bifurcating, with 8-10 longitudinal rows of autozooecia. Autozooecia at colony margin can be more than twice as long as those in colony centre. Frontal shield without granulations, knobbly, perforated by marginal areolar pores; lateral tubercles sometimes developing when secondary calcification occurs; frontal area relatively narrow in zooecia located in middle part of colony. Orifice oval to suborbicular with broad poster. Lateral-oral pair of avicularia small, circular, often fusing as bridge across aperture in older parts of colony. Secondary calcification often expressed as well-developed tubercles situated usually in corners of zooecia.

REMARKS

Adeonella ornatissima differs from *Adeonella mortisaga* (Stoliczka, 1862), n. comb. in having shorter autozooecia with a knobbly frontal shield and oral avicularia that may fuse across the aperture.

Adeonella mortisaga (Stoliczka, 1862), n. comb.
(Fig. 3E-F)

Eschara (Escharifora) mortisaga Stoliczka, 1862: 86, pl. 2, fig. 6.

MATERIAL EXAMINED. — Two syntypes registered as 1859/0026/0137. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 6) and is depicted as Figure 3E herein.

DIAGNOSIS. — Colony erect, multiserial. Autozooecia may be rhomboidal in central part of colony, more elongate on colony margin. Frontal shield granular, perforated by marginal areolar-septular pores. Orifice with transversely D-shaped anter and narrow sinus. Adventitious avicularia small, paired, one on either side suborally. Maternal zooecia up to more than twice as wide distally as autozooecia, with smooth oecial margin much wider than long, showing beneath distal secondary calcification. Secondary zooecial calcification often accompanied by tubercles situated usually in margins and/or on frontal shield including loci of suboral avicularia.

REMARKS

This species differs from *A. ornatissima* in having very large maternal zooecia, longer autozooecia with granular frontal shields, and suboral (not lateral-oral) avicularia. It is similar also to *Adeonella minor* (Reuss, 1869) which, however, never has such large brooding zooids and the apertural sinus is less prominent.

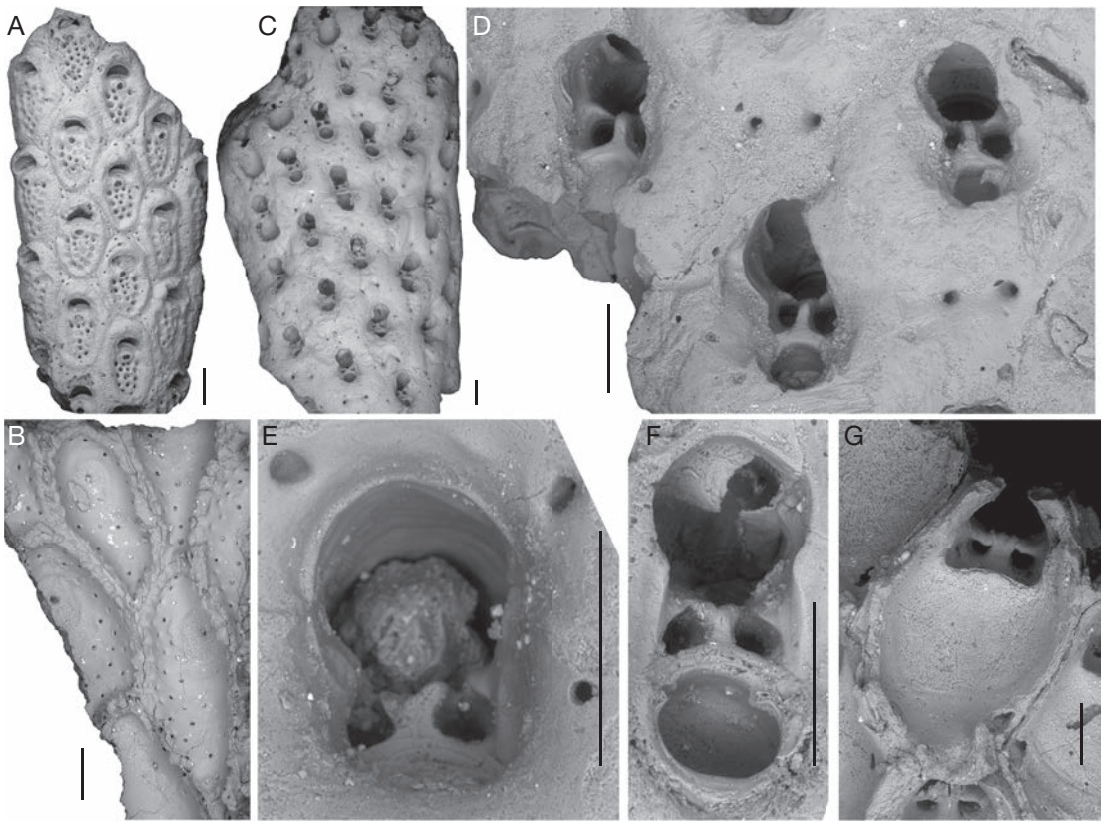


FIG. 4. — **A**, *Adeonellopsis pulchra* (Stoliczka, 1862) n. comb., lectotype showing arrangement of autozoecia; **B**, interior view of holotype of *Lepralia pedicularis* showing elongate zooecial chambers with mixed frontal shields and scattered lepralioid pseudopores; due to the very poor preservation and the absence any other characteristic features described here as “*Lepralia pedicularis* Stoliczka, 1862” *nomen dubium*; **C–G**, *Stoliczella subovata* (Stoliczka, 1862) n. comb.; **C**, general view of lectotype; **D**, detail of three autozoecia showing deeply immersed apertures and a proximal pair of frontal areolar pores; **E**, autozoecial aperture showing a Y-shaped denticle; **F**, autozoecial aperture showing spiraminal openings produced by fusion of lateral processes, proximal to which is a suboral avicularium; **G**, interior of the autozoecium showing umbonuloid surface and primary aperture with slightly convex proximal margin. Scale bars: 100 μ m.

Genus *Adeonellopsis* MacGillivray, 1886

Adeonellopsis pulchra (Stoliczka, 1862) n. comb. (Fig. 4A)

Eschara (*Porellia*) *pulchra* Stoliczka, 1862: 87, pl. 2, fig. 10.

MATERIAL EXAMINED. — Three syntypes registered as 1862/0022/0056. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 10) and is depicted as Figure 4A herein.

DIAGNOSIS. — Colony columnar, multiserial with 6–8 autozoecial rows. Autozoecia elongate-oval with thick raised margins and very small areolar-septular pores in

interzooidal furrows. Frontal shield mostly occupied by a very large spiraminal area with 12–16 perforations. Aperture semilunar to semicircular, narrow. Avicularia mostly median suboral, more or less transversely orientated with a very short acute rostrum; mostly eroded and represented by a subcircular foramen, this only slightly larger than spiraminal pores in some zooecia. Gonozoecium unknown.

REMARKS

Adeonellopsis pulchra n. comb. differs from other similar species in having a small avicularium and a large spiraminal area, perforated by more than 12 pores (Fig. 4A), that leaves a very narrow remaining area of frontal shield that comprises a raised rim.

"Lepralia pedicularis Stoliczka, 1862"
nomen dubium
 (Fig. 4B)

Lepralia pedicularis Stoliczka, 1862: 84, pl. 2, fig. 2.

MATERIAL EXAMINED. — Holotype of *Lepralia pedicularis*, registered as 1862/0022/0053.

DESCRIPTION

Colony robust, erect, bifurcating, exteriorly heavily secondarily calcified and rather densely perforated by tiny pores, some of which are in linear series. Obvious autozooeal boundaries are lacking although very thin, faint lines may be indicative; no other exterior features are visible. Interior view of a fracture shows parts of several elongate zooecial chambers with undersides of mixed frontal shields excluding orifices; each shows the internal openings of sparsely scattered lepralioid pseudopores and a small oval umbonuloid area of planar-spherulitic microstructure, bounded by a ring scar and in the centre of which is a foramen. Interzooecial communications via simple, uniporous pore.

REMARKS

The internal opening surrounded by a small umbonuloid area of exterior skeletal wall is highly distinctive. The only other known example at the present time is a species of *Siphonicytara* (Gordon & Taylor in press), from the Early Eocene of Chatham Island, New Zealand, which has an identical arrangement. Insofar as all other examined species of *Siphonicytara* Busk, 1884 have an ascopore, Gordon & Taylor interpreted the foramen as technically a spiraminal opening and that the genus evolved from a fully umbonuloid ancestor, perhaps resembling *Beisselina* Canu, 1913.

Lepralia pedicularis need not have belonged to a family Siphonicytaridae, however. Members of this monogeneric family were rooted in soft sediments and no known species has the same degree of robust secondary calcification. Adeonidae is a much more likely family, members of which include wholly umbonuloid and wholly lepralioid frontal shields; no species has yet been found with a skeletally mixed shield but it is highly likely that such species exist. Based on external appearance, similar colonies are produced

by several genera in Miocene of the Paratethys. The most similar is the non-spiraminate adeonid *Schizostomella grinzingensis* David & Pouyet, 1974, the branches of which are often heavily calcified proximally, gradually obliterating apertures and just leaving scattered pores and thin zooecial boundary lines as in *L. pedicularis*. Similarly, spiraminate fossil *Reptadeonella* cf. *violacea* (Johnston, 1847), as described by Zágoršek (2010), also produced heavily calcified parts of multilamellar colonies in which some orifices and spiramina become almost completely obliterated. Species of *Reptadeonella*, however, are all encrusting. Our conclusion is that *Lepralia pedicularis* is a presently indeterminable genus of adeonid and the species is *nomen dubium*.

Superfamily LEPRALIELLOIDEA Vigneaux, 1949
 Family BRYOCRYPTELLIDAE Vigneaux, 1949

Genus *Stoliczkella* n. gen.

TYPE SPECIES. — *Eschara (Flustrina) subovata* Stoliczka, 1862.

ETYMOLOGY. — Honorific for Ferdinand Stoliczka (Czech, Stolička), 7 June 1838–19 June 1874, a Moravian paleontologist who worked in India on paleontology, geology and various aspects of zoology, including ornithology and herpetology. He died of high-altitude sickness, at the early age of 36, during an expedition across the Himalayas.

DIAGNOSIS. — Erect, bilamellar colonies with median lamina and narrow, flat or with lensoidal cross section. Autozooeia umbonuloid, frontally imperforate apart from marginal areolar-septular pores. Aperture with median and lateral processes forming paired peristomial spiramina. Large suboral avicularia and imperforate immersed oecium. Additional adventitious and vicarious avicularia may be present, the latter larger than autozooeia and situated along the colony margin.

REMARKS

The apertural features of *Stoliczkella* n. gen. superficially resemble some species of the genus *Galeopsis* Jullien & Calvet, 1903 (Celleporidae), in which paired lateral-oral avicularia can fuse across the aperture forming a bridge and peristomial spiramen. In *Stoliczkella* n. gen., a median process fuses with a pair of lateral processes to form a double

spiramen and the apertural avicularium is single and median-suboral. Further, the frontal shield is umbonuloid with a distinct ring scar surrounding an area of planar-spherulitic ultrastructure on the undersurface, whereas the frontal shield in *Galeopsis* is lepralioid-cryptocystidean.

The double apertural spiramen resembles similar arrangements in some species of *Exochella* Jullien, 1888 (Romancheinidae), but the median suboral avicularium and erect habit suggest Bryocryptellidae. It may be that these two families (Romancheinidae Jullien, 1888 and Bryocryptellidae Vigneaux, 1949) should be merged but the type species of the type genera do not suggest a close relationship. *Stoliczkella* n. gen. is introduced here for two species described by Stoliczka (1862).

Stoliczkella subovata (Stoliczka, 1862) n. comb.
(Fig. 4C-G)

Eschara (Flustrina) subovata Stoliczka, 1862: 87, pl. 2, fig. 9.

Non *Reteporella subovata* – Zágóršek 2001: 558, pl. 20, fig. 2; 2003: 181, pl. 31, fig. 5.

Galeopsis cf. *subquadrangularis* – Zágóršek 2001: 556, pl. 19, fig. 1; 2003: 179, pl. 29, figs 3, 4.

MATERIAL EXAMINED. — Seven specimens labelled as *Eschara (Flustrina) subovata* registered as 2010/0259/0006, but only five may be regarded as syntypes. Two specimens belong to the genus *Reteporella*. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 9) and is depicted as Figure 4B herein.

DESCRIPTION

Colony erect, bilamellar, flat or with lensoidal cross section, with zooecial orientation indicative of potential bifurcation distally, autozoecia opening on both faces. Autozoecia somewhat elongate-oval (especially in interior view) to rhomboidal, although exterior boundary lines can disappear with secondary calcification. Frontal shield umbonuloid, frontally smooth, convex, imperforate except for tiny marginal areolar pores, these often tending to be lacking laterally, paired proximally. Interior view shows a large area of planar-spherulitic microstructure bordered by a ring scar. Peristomial aperture shows

a proximal median process that may or may not have 2–3 slight projections distally; median process fusing with a projection from either side to form a pair of spiramina; this arrangement more clearly seen from interior view, with the median process sometimes grooved. 'Primary orifice' (observable from interior view) semicircular with slightly convex proximal margin. Oral spines absent. Median suboral avicularium relatively large, subcircular, rostrum proximofrontally directed, crossbar mostly broken. Ooecium deeply immersed, recumbent on distal zooecium, ectooecium imperforate, typically somewhat concealed by secondary calcification. Additional smaller adventitious avicularia, circular, sparsely found laterofrontally or proximally on frontal shield, with rostrum directed obliquely laterally or proximally. Vicarious avicularia situated on margin of the colony, these larger than autozoecia with a rounded rostrum and oval aperture.

REMARKS

Two species occurred in a single box with the same name (*Eschara (Flustrina) subovata*) and registration number. Five specimens are *Stoliczkella subovata* n. comb. and correspond with Stoliczka's original description and illustrations. The remaining two specimens belong to *Reteporella* and comprise colony fragments with apertures opening only on one side. These two specimens were erroneously cited as *Eschara (Flustrina) subovata* by Zágóršek (2001, 2003) and listed under *Reteporella*. According to Stoliczka's original description and illustration, *Eschara (Flustrina) subovata* has bilamellar colonies (with a medial lamella) that definitely do not belong to Phidoloporidae; the species described as *Reteporella subovata* from Eocene sediments of Reingruberhohe (Zágóršek 2003) and Buda Marls (Zágóršek 2001) may represent a new species of *Reteporella*.

The specimen described by Zágóršek (2003) as *Galeopsis* cf. *subquadrangularis* (Reuss) corresponds to *Stoliczkella subovata* n. comb. in having elongate-oval autozoecia, large suboral avicularia and one pair of areolar septular pores in the proximal part of the autozoecium. Although adventitious and vicarious avicularia have not been observed in the Reingruberhohe specimens, we believe they belong to *Stoliczkella subovata* n. comb.

Stoliczkaella crenatula (Stoliczka, 1862) n. comb.
(Fig. 5A-F)

Escharella crenatula Stoliczka, 1862: 87, pl. 2, fig. 8.

MATERIAL EXAMINED. — Five syntypes, registered as 2010/0259/0007. Stoliczka's (1862) illustration does not correspond exactly to any of the specimens labelled as *Escharella crenatula*, hence the illustrated specimen may be lost, or Stoliczka inadvertently illustrated a different species. The selected lectotype (designated here) is the best-preserved of the syntypes and is depicted as Figure 5A herein.

DESCRIPTION

Colony erect, bilamellar, flat, autozoecia opening on both faces. Autozoecia of similar shape to *S. subovata* n. comb., with combined peristomial aperture/suboral avicularium complex proportionately larger, occupying a considerable part of frontal surface. Frontal shield smooth, imperforate except for small, sparse, areolar-septular pores in the margins typically paired proximally. Secondary calcification increases convexity of frontal shield. Two areolar-septular pores situated on the proximal margin of the autozoecia, sometimes indistinct. 'Primary aperture' deeply immersed beneath peristomial aperture, the rim of which embraces the suboral avicularium so that the paired spiramina and broken avicularian chamber often appear as three holes of equivalent size. Median process separating spiramina shorter than in *S. subovata* n. comb. Oral spines absent. Suboral avicularium circular, with no trace of crossbar remaining in any zoecium. Ooecium deeply immersed, recumbent on distal zoecium, ectooecium imperforate, typically mostly concealed by secondary calcification. Adventitious avicularia rare on frontal shield, large, with long rostrum tapering laterally. Vicarious avicularia situated on the margin of colony, as large as autozoecium, with rounder rostrum and drop-like aperture.

REMARKS

The type material examined cannot be fractured and the interior of the frontal shield and aperture have not been observed. From frontal view we infer that the construction of the spiraminal complex is similar to that in *S. subovata* n. comb. *Stoliczkaella*

crenatula n. comb. differs from *S. subovata* n. comb. in having shorter autozoecia, smaller suboral avicularia and larger adventitious avicularia with a pointed rostrum.

Family EXECHONELLIDAE Harmer, 1957
Genus *Anarthropora* Smitt, 1868

Anarthropora macropora
(Stoliczka, 1862) n. comb.
(Fig. 6A-D)

Lepralia macropora Stoliczka, 1862: 84, pl. 2, fig. 3.

Adeona sp. n. — Nehyba *et al.* 2008: 55, table 3.

MATERIAL EXAMINED. — Three syntypes, registered as 1859/0026/0140. The selected lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 3) and is depicted as Figure 6A herein.

DIAGNOSIS. — Colony encrusting, autozoecia sub-oval, arranged in irregular longitudinal rows. Frontal shield coarsely perforated by 8-12 large excavations, each bowl-shaped with a broad smooth rim and the sides sloping to a smaller hole edged with several blunt denticles, these conferring a stellate appearance to each foramen. Peristomial aperture subcircular to transversely oval, with low rim; deeper interior proximal margin of aperture straight with tiny separated denticles along its edge. No oral spines. Small avicularian chamber on mid-distal rim of peristome; a larger avicularium situated suborally at one corner of the aperture, the rostrum long, acute, directed laterally, no crossbar or pivots. No ooecia observed.

REMARKS

Recent *Anarthropora monodon* Busk, 1860 (type species) differs in having a much more densely foraminate frontal shield and smaller peristomial avicularia.

Family ROMANCHEINIDAE Jullien, 1888
Genus *Escharella* Gray, 1848

Escharella grotriani (Stoliczka, 1862)
(Fig. 6E-F)

Lepralia grotriani Stoliczka, 1862: 84, pl. 2, fig. 1.

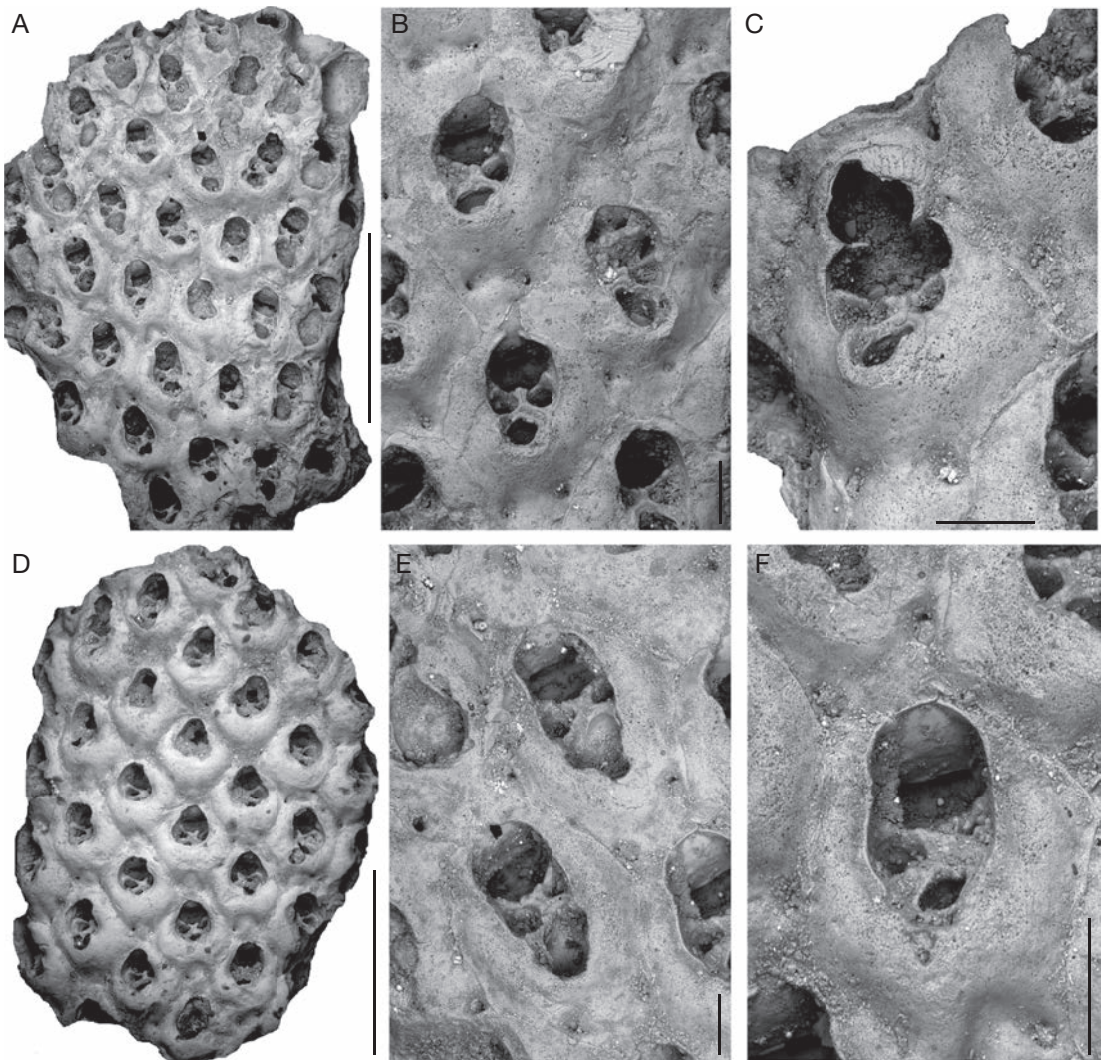


FIG. 5. — *Stoliczkaella crenatula* (Stoliczka, 1862), n. comb.; **A**, general view of lectotype; **B**, autozooeal apertures with suboral avicularia smaller than those in *Stoliczkaella subovata* n. comb. (cf. Fig. 3F); **C**, partly preserved ooeonium; **D**, older stage of colony development showing secondary calcification; **E**, autozooea with deeply immersed ooeia and small avicularia; **F**, autozooeal aperture with proximal depression accommodating areolar pores. Scale bars: A, D, 1 mm; B, C, E, F, 100 µm.

Escharella grotriani – Zágorský 2001: 51, pl. 17, fig. 8; 2003: 157 (cum syn.).

MATERIAL EXAMINED. — Holotype, registered as 1862/0022/0051.

DIAGNOSIS. — Colony encrusting, the fragment comprising three short rows of autozooea, these rhomboidal to oval with about 30 very small marginal areolar-septular pores. Frontal shield prominent, convex, smooth or

slightly granular, with a small umbo. Aperture oval with a shallow lyrula and usually 5-7 oral-spine bases around periphery. Ooeonium small, globular, recumbent on distal zooecium; ooeial aperture not preserved.

REMARKS

Escharella grotriani differs from *Escharella tenera* (Reuss, 1874) in having a small umbo on the frontal shield, 5-7 oral spines and broad, rhomboidal

autozooecia. Zágoršek (2003) presented a detailed discussion of the generic attribution of this species.

Superfamily SCHIZOPORELLOIDEA Jullien, 1883
Family MYRIAPORIDAE Gray, 1841
Genus *Myriapora* De Blainville, 1830

Myriapora? *beyrichi* (Stoliczka, 1862) n. comb.
(Fig. 6G-H)

Cellaria beyrichi Stoliczka, 1862: 83, pl. 1, fig. 10.

MATERIAL EXAMINED. — Holotype, registered as 1859/0026/0133.

DIAGNOSIS. — Colony multiserial, erect with circular cross section. Branch fragment comprising fewer than 20 autozooecia, these trapezoidal, with densely pseudoporous frontal shields bordered by smooth interzooecial boundaries that represent frontally eroded adjacent zooecial margins. Apertures large, more or less cleithridiate with wedge-shaped sinus delimited by prominent condyles. No avicularia or ooecia.

REMARKS

The smooth interzooecial boundaries and cleithridiate orifice are distinctive features of this species. The generic attribution is uncertain in the absence of ovicells and avicularia. The apertural shape most resembles that seen in *Myriapora*, a genus confined to Mediterranean and Arctic-Boreal waters, whose species, however, do not normally have such distinct interzooecial boundaries. A species with similar-looking zooecia is *Myriapora kuhni* Vávra, 2011, from the Oligocene of Germany; it is encrusting, however, and the visible autozooecial boundaries do not form such a wide outline.

On the other hand, the colonial and zooecial morphology of Stoliczka's species match that found in *Opphiphorina* Gordon & d'Hondt, 1997 (Phoriopniidae), a monotypic genus known only from New Caledonia and the Kermadec Islands in the Southwest Pacific. *Opphiphorina epaxia* (Gordon, 1984) has somewhat cleithridiate apertures (with a broader sinus, however) and densely perforated zooecia with raised margins that, if eroded, would present exactly the smooth interzooecial boundaries seen in *C. beyrichi*. Similar margins are seen in confamilial *Phoriopnia* Gordon & d'Hondt,

1997 from New Caledonia, which, however, has non-cleithridiate apertures and dimorphic female orifices. Only the finding of ovicells in Stoliczka's species will settle the matter.

Family MARGARETTIDAE Harmer, 1957
Genus *Tubucella* Canu & Bassler, 1917

Tubucella mammillaris
(Milne Edwards, 1836)
(Fig. 6I, J)

Eschara mammillaris Milne Edwards, 1836: 336, pl. 11, fig. 10.

Eschara (Porina) porulosa Stoliczka, 1862: 89, pl. 3, fig. 3.

Tubucella mammillaris – Zágoršek 2001: 67, pl. 28, figs 2, 3, 5; 2003: 176 (cum syn.).

MATERIAL EXAMINED. — Three syntypes of *Eschara porulosa*, registered as 2010/0259/0009. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 3, fig. 3) and is depicted as Figure 6I herein.

DIAGNOSIS. — Colony large, bilamellar, with lensoidal cross section and well-developed median lamella. Autozooecia hexagonal to circular, arranged in c. 12–15 longitudinal series around branch. Each autozooecium comprising two regions of about equal length, a distal peristomial part and a proximofrontal part, the former strongly convex, sometimes hexagonal, the latter weakly convex, not clearly delimited from that neighbours, the frontal shield coarsely pseudoporous. Aperture circular to oval, surrounded by thick, low peristome. Ascopore of similar size to pseudopores, situated in distal half of autozooecia. Ooecia and avicularia lacking.

REMARKS

The separation of autozooecia into two parts as described by Zágoršek (2003) and also illustrated by Bock (2013a) is not evident in the syntype specimens (the thin threads of calcification normally separating these parts are not observable). Other features, however (flat colonies, presence of median lamella and ascopore situated in the distal half of the autozooecium), clearly identify this species.

Tubucella mammillaris differs from *Tubucella papillosa* (Reuss, 1848) in having flatter branch profiles (*T. papillosa* has more-rounded branches), shorter autozooecia (more elongate in *T. papil-*

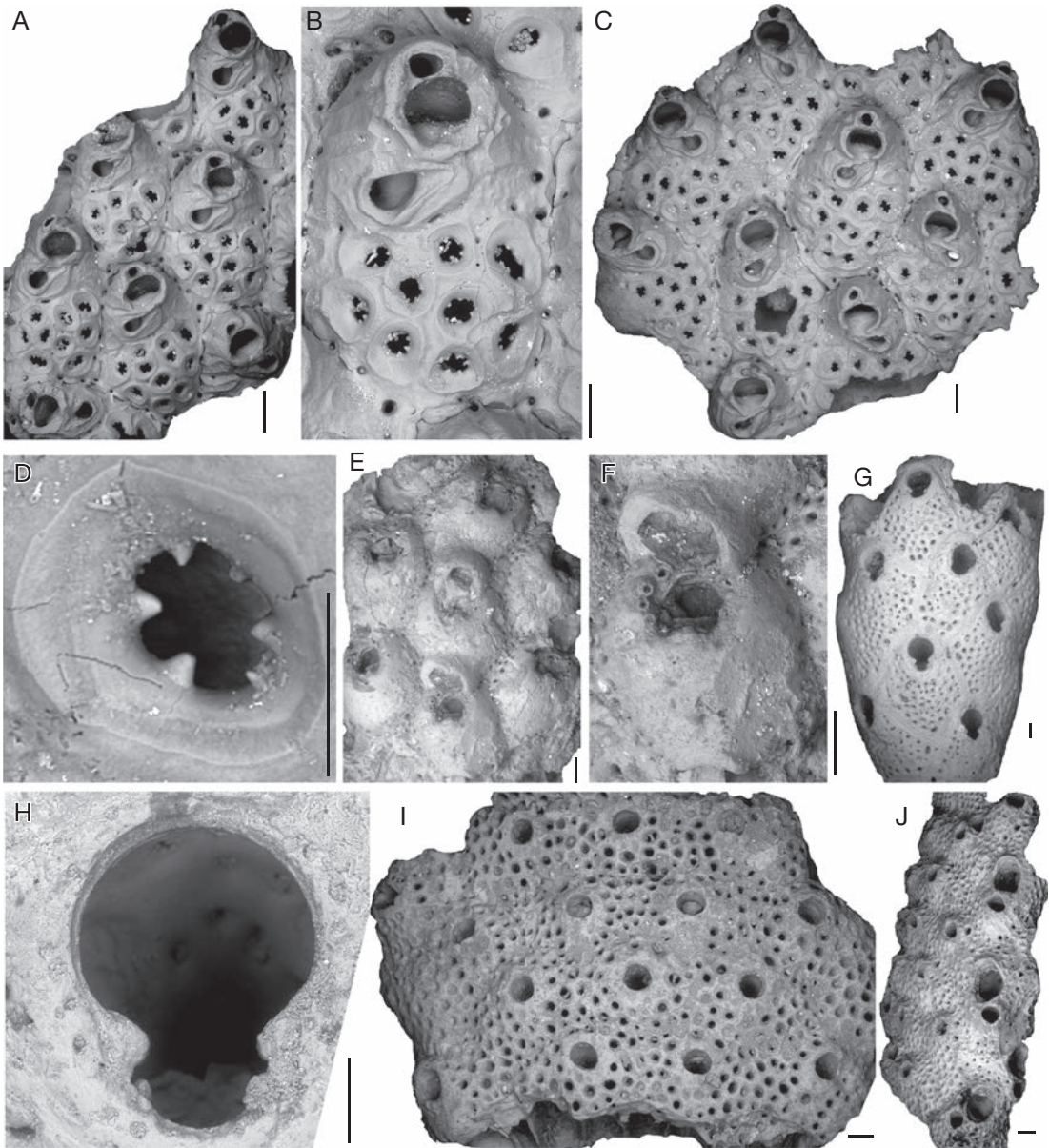


FIG. 6. – **A–D**, *Anarthropora macropora* (Stoliczka, 1862), n. comb.; **A**, general view of lectotype; **B**, autozoecium showing frontal foramina and suboral avicularium; **C**, syntype showing quincuncial arrangement of autozoecia; **D**, frontal-shield foramen showing well-preserved radial denticulation; **E, F**, *Escharella grotriani* (Stoliczka, 1862); **E**, lectotype showing arrangement of autozoecia; **F**, zoecium with oecium and oral spines; **G, H**, *Myriapora? beyrichi* (Stoliczka, 1862), n. comb.; **G**, lectotype showing smooth outlines of autozoecia; **H**, detail of aperture with condyles typical of myriaporids; **I, J**, syntype of *Escharella porulosa* identified as *Tubucella mammillaris* (Milne Edwards, 1836); **I**, general view of chosen lectotype of synonymous *Escharella porulosa* Stoliczka, 1862; **J**, lateral view of colony showing autozoecia with large apertures. Scale bars: 100 μ m.

losa) and the ascopore situated closer to the aperture (near the centre of the frontal shield in *T. papillosa*).

Superfamily CELLEPOROIDEA Johnston, 1838
Family PHIDOLOPORIDAE Gabb & Horn, 1862

“Retepora fasciata Stoliczka, 1862”
nomen dubium

Retepora fasciata Stoliczka, 1862: 91, pl. 3, fig. 4.

MATERIAL EXAMINED. — Holotype of *Retepora fasciata*, registered as 1862/0022/0044.

DIAGNOSIS. — Poorly preserved small fragment of branch with zooecia arranged in two longitudinal rows on one side only. Autozooecia elongate, lacking clear boundaries. Apertural characters weakly defined, possibly including a suboral spiramen or broken avicularian chamber. No frontal avicularia or oecia observed.

REMARKS

Owing to the very poor preservation of the specimen, with weakly defined autozooecia and no obvious avicularia and ovicells, this species must be regarded as a *nomen dubium*.

Superfamily CONESCHARELLINOIDEA
Levensen, 1909

Family ORBITULIPORIDAE Canu & Bassler, 1923
Genus *Orbitulipora* Stoliczka, 1862

Orbitulipora haidingeri Stoliczka, 1862
(Fig. 7A-H)

Orbitulipora haidingeri Stoliczka, 1862: 91, pl. 3, fig. 5.

Non *Orbitulipora petiolus* Lonsdale, 1850: 151. — Cheetham 1966: 105, fig. 80.

?*Orbitulipora petiolus* – Bassler 1953: p. G230, fig. 172.1.

Orbitulipora petiolus – Braga & Barbin 1988: 530. — Zágoršek 2003: 184, pl. 31, fig. 6 (cum syn.).

MATERIAL EXAMINED. — Five syntypes, registered as 1862/0022/0045. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 3, fig. 5) and is depicted as Figure 7A herein. The Auversian

specimen illustrated in Bock (2013b) is from a section at Bramshaw, Hampshire, England (Voigt Collection).

DIAGNOSIS. — Colony orbicular, bilamellar, discoidal with a perforated peduncle. Median lamella not formed; in cross section opposing autozooecial basal walls alternating in zigzag pattern. Ancestrula circular, no associated kenozooecia observed. Autozooecia grow in slightly regular radial rows, circular with orbicular aperture, the largest arranged at the colony margin, the smallest in the colony centre. Kenozooecia rarely present, usually visible on marginal autozooecia; aperture semilunar with straight or slightly elevated proximal edge. Large subvicarious avicularia present, about half the size of autozooecia, with subcircular aperture and massive pivot bar. Maternal zooecia at or near periphery of colony; owing to the reversed zooecial budding pattern, their oecia are directed towards colony centre; oecia subimmersed with bulging skeletal wall that is imperforate but decorated by reticulate, hexagonal sculpturing. A broad median lyrulate structure produced from lower edge of oecial opening, visible only if aperture is broken. Older zooecia can become closed by secondary calcification and appear as kenozooecia.

REMARKS

Orbitulipora haidingeri is the type species of the genus. Cheetham (1966) considered it to be a junior synonym of *Orbitulipora petiolus* Lonsdale, 1850. The lectotype and other syntypes have, however, subvicarious avicularia with a near-circular aperture, kenozooecia distributed among marginal autozooecia, hexagonal decoration of the oecial surface and a lyrulate structure arising from the lower edge of the oecium. These features are not present in *O. petiolus* and may be characteristic of *O. haidingeri*. Cheetham (1966) also described the hyperstomial ovicells of *O. petiolus* as deeply immersed, whereas those of *O. haidingeri* are less immersed. The specimens described by Braga & Barbin (1988) and Zágoršek (2003) are likely to have been *O. haidingeri*.

Genus *Stichoporina* Stoliczka, 1862

Stichoporina reussi Stoliczka, 1862
(Fig. 8A-G)

Stichoporina reussi Stoliczka, 1862: 93, pl. 3, fig. 6. — Braga 1980: 62. — Zágoršek 2001: 68, pl. 29, figs 1-3.

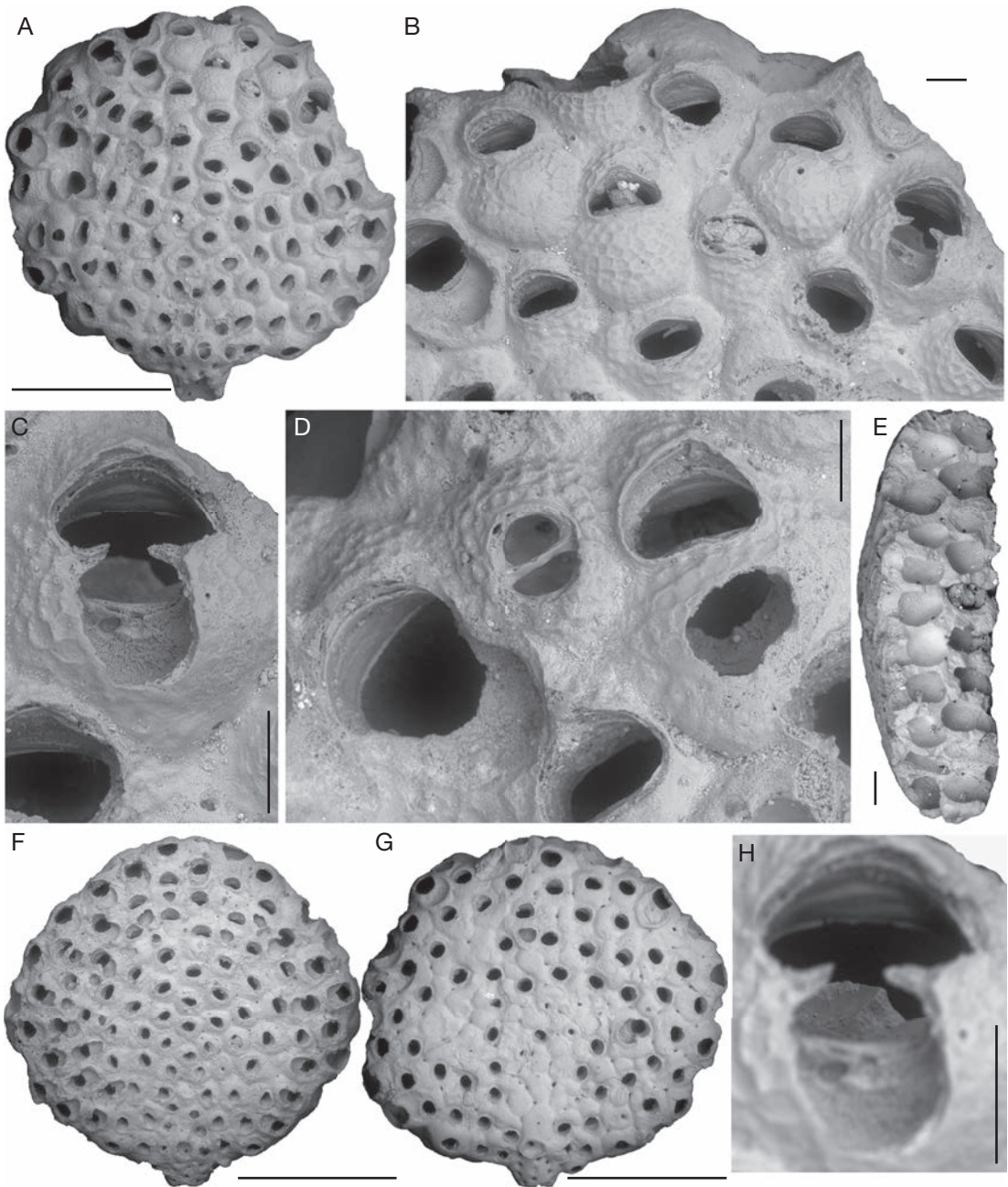


FIG. 7. — *Orbitulipora haidingeri* Stoliczka, 1862; **A**, lectotype colony; **B**, detail of distal colony margin showing ooeclia with reticulate surface sculpturing; **C**, broken ooeclial roof in relation to autozooeclial aperture; **D**, large interzooidal avicularium with complete pivot bar; **E**, transverse section of the colony showing arrangement of autozoecia in two parallel rows; **F**, a syntype colony with a more regular autozooeclial budding pattern; **G**, syntype with perforated peduncle; **H**, detail of **C** focusing on ledge-like structure at deeper level of aperture. Scale bars: **A**, **F**, **G**, 1 mm; **B-E**, **H**, 100 µm.

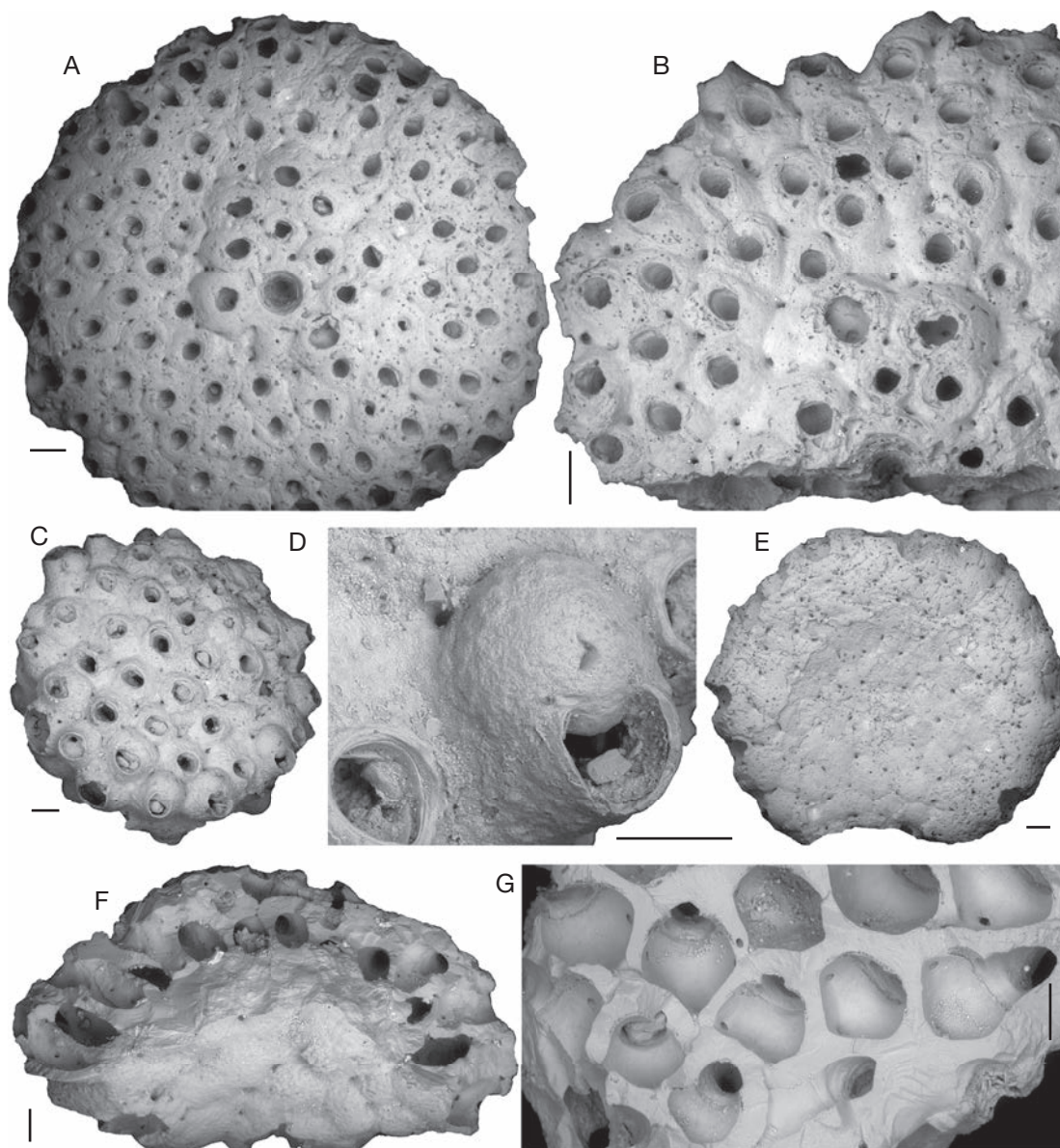


FIG. 8. — *Stichoporina reussi* Stoliczka, 1862; **A**, lectotype colony; **B**, colony margin showing budding pattern; **C**, a smaller syntype colony; **D**, detail of ooecium; **E**, abfrontal view of colony showing a single pore in zooecial basal wall; **F**, transverse section of colony showing arrangement of autozoecia in one row with a highly calcified central part; **G**, section showing internal view of autozoecia. Scale bars: 100 μ m.

MATERIAL EXAMINED. — Nine syntypes, registered as 1862/0022/0046. The chosen lectotype (designated here) corresponds with Stoliczka's illustration (1862: pl. 2, fig. 6)

and is depicted as Figure 8A herein. The species has been illustrated by Gordon on <http://bryozoa.net/cheilostomata/orbituliporidae/sticreu.html> (last access 1st December 2014).

DESCRIPTION

Colony discoidal, free-living, with a circular central kenozooidal pit on frontal face and having a concave obverse face. Autozooecia oval to regularly hexagonal with convex frontal shield on upper face of colony; hexagonal with a slightly porous basal wall on lower face; aperture more or less central in zooecium, elongate-oval/subpyriform with short condyles sometimes in evidence. In cross section, autozooecia bottle shaped, with slightly curved distal part. Small kenozoecia with tiny central foramen scattered among autozooecia on upper face. Avicularium usually not present. Ooecia situated on margin of colony, globular with imperforate frontal skeletal wall, slightly immersed in distal autozooecia.

REMARKS

Stichoporina reussi Stoliczka, 1862 has no avicularia, whereas *Stichoporina simplex* Koschinsky, 1885 and *Stichoporina protecta* Koschinsky, 1885 have them. *Stichoporina reussi* is the type species of the genus, which has been synonymised by Braga (1980) and many other authors with *Stenosipora* Canu & Bassler, 1927 (type species *Stichoporina protecta*). *Stenosipora*, however, has avicularia, lacks a central pit and basal kenozoecia, and does not form evenly circular colonies. We accept both genera as valid.

DISCUSSION

In his original paper, Stoliczka (1862) recognized 47 species, 24 of them new. Of these latter, 14 names remain valid; the remainder are synonyms of previously described taxa or, owing to the originally inadequate state of the fossil material examined, taxonomically indeterminable. The genera *Orbitulipora* and *Stichoporina*, both introduced by Stoliczka in 1862 along with their type species, are still valid. Two of his species, one of which had not been examined since its first description, comprise a new bryocryptellid genus, *Stoliczkella* n. gen., which superficially resembles the celeropid genus *Galeopsis*.

Oligocene bryozoans are part of the poorly known transitional fauna between very common Eocene and Miocene faunas. Stoliczka (1862) was the first

to describe bryozoans from this time span and therefore his paper has both historical and contemporary importance in understanding the European bryozoan fauna. Moreover, many Oligocene taxa show similarities linking Eocene and Miocene bryozoans. Many of Stoliczka's types can be regarded as new and/or as 'living fossils'. For example, a typical Eocene element is represented by the new genus *Stoliczkella* n. gen., which shows similarities with species described as *Galeopsis* cf. *subquadrangularis* from the Eocene of Hungary and Austria (Zágoršek 2001, 2003). *Lunulites latdorfensis* may be part of the ancestral lineage to Miocene *Lunulites androsaces* Michelotti, 1838, and *Myriapora? beyrichi* n. comb. is the earliest myriaporid with an erect growth form, which it has in common with Recent *M. truncata* Pallas, 1766. Both *L. androsaces* and *M. truncata* are common in Miocene sediments of the Alpine-Carpathian basins (Vávra 1977; Zágoršek, 2010) but are absent from Eocene sediments (Zágoršek 2001, 2003).

As well as adding to our understanding of Oligocene bryozoan faunas in general, this revision of the material examined by Stoliczka (1862) is also the basis for forthcoming research on Oligocene sedimentary sequences in Germany.

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