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Marine benthic diatoms in the coral reefs of Reunion and Rodrigues Islands, West Indian Ocean [1]

ADIL Y. AL-HANDAL[2],
Department of Biological and Environmental Sciences, University of Gothenburg, Box 463 40530 Göteborg, Sweden
adil.alhandal@gmail.com

PIERRE COMPÈRE
Botanic Garden Meise, Domein van Bouchout, BE–1860 Meise, Belgium

CATHERINE RIAUX-GOBIN
CRIOBE-USR 3278 CNRS-EPHE-UPVD, Laboratoire d'Excellence 'CORAIL', F-66000 Perpignan, France

Abstract— The present study provides the first detailed list of diatoms from the coral reefs of Reunion and Rodrigues Islands in the Western Indian Ocean. The list includes 141 taxa belonging to 59 genera excluding many taxa previously described or partially reported in separate works from the region. Many of the taxa recorded are not known from habitats outside the coral reef environments. Sampling was carried out for several years starting 2005 and collected from various types of habitats. The islands are rich in diatoms and several species were recently described as new to science. Several taxa with no clear identity have not been treated in this report and require detailed taxonomic investigation. Apart from *Cocconeis* with 18 species, no other genus seemed to be widely diversified.

Introduction

Coral reefs are one of the richest habitats in biodiversity and can support a wide variety of organisms owing to their high turnover rate thorough complex food webs (Goreau et al. 1979, Pandolfi et al. 2003). Among these organisms, diatoms were found to be rather diverse and productive. Until two decades ago, information on the diatoms inhabiting coral sands and deposit were rare and their ecology was not well known (Lobban & Jordan 2010, Riaux-Gobin et al. 2011c). Many investigations on diatoms assemblages were made in tropical waters and coral reef during the second half of the 20th century (see review by Riaux-Gobin et al. 2011c) and more recent studies have revealed a considerable number of new taxa. The reason behind unraveling so many taxa of coral reefs in the detailed works on diatoms (*e.g.* Ricard's 1974, 1975, 1977, Navarro 1981a, b, 1982a, b, c, 1983a, b, Navarro et al. 1989) may come from type of sampling. Diatom samples in such studies were mostly net samples (plankton diatoms) where only small part of the richest benthic assemblages can be found (Lobban et al. 2012). During the last decade, C. Riaux-Gobin has made several field campaigns for benthic diatom sampling from coral reefs in the

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[2] Corresponding Author

Western Indian Ocean where a rather rich diatom flora were discovered with many new species (*e.g.* Riaux-Gobin & Compère 2009, Riaux-Gobin et al. 2010, 2011a, c, Riaux-Gobin & Al-Handal 2012). These investigations, however, focused almost on taxa belonging to Achnanthales. It would not be surprising to discover more new marine benthic taxa from coral habitats if all other diatom assemblages are investigated (Lobban 2015).

The volcanic Mascarene Islands (55° 13' to 61° 10'E; 21° 7' to 19° 40' S), namely Reunion, Mauritius and Rodrigues are located along the Seychelles-Mauritius Plateau submarine ridge, 640 to 800 km northeast from southern Madagascar in the western Indian Ocean (Fig. 1). These islands are bordered by a reef system which has been estimated to be about 9000 years old (Camoin et al. 2004). During this time, shallow water lagoons were formed where coral debris and detrital sand accumulated and supported a wide diversity of flora and fauna (Connell 1978). The material for this study was obtained from two of these islands, Reunion and Rodrigues. Reunion Island is surrounded by fringing reefs of no more than 12 km^2 surface area while the reefs bordering Rodrigues Island are more complex and stretch for a distance of 90 km, completely surrounding the island (see detailed description *in* Riaux-Gobin et al. 2011c).

The present study is a continuation to the investigation on small sized Achnanthales of Reunion and Rodrigues Islands made by Riaux-Gobin et al. (2011c). The latter work tackled several taxa belonging to the order Achnanthales which are rarely found in coral reefs including description of nine new species. The present work is intended to cover all other marine taxa found in that region but also reporting some other taxa that have previously been described from the region to have a good insight on the benthic diatom assemblages. It is to fill a gap in our knowledge on the benthic diatoms of Mascarenes since most of the previous studies focused either on freshwater forms (*e.g.* Coste & Ricard 1982, 1984, Le Cohu et al. 2006, Eulin-Garrigue et al. 2005) or on marine plankton forms of offshore water (Sournia 1968, Devassy & Goes 1991).

Materials and Methods

Samples were obtained by collecting surficial coral sediments, macroalgae, diverse debris, and scraping dead corals from intertidal zone during different periods. Fringing reefs off Reunion Island were sampled in June 2005, June 2007 and May 2009 while samples from Rodrigues were taken on June 2007. The sites and samples are described in detail in Riaux-Gobin et al (2011c). All samples were preserved in formaline (10% final concentration). For light microscope examination, diatom samples were first rinsed with deionized water to remove salts and then cleaned by boiling with 30% hydrogen peroxide for 30 minutes. Few drops of 50% hydrochloric acid were added to the diatom suspension to ensure the removal of mineral carbon compounds followed by several rinses with distilled water. 0.5 ml of the cleaned diatoms suspension were allowed to settle on cover slips and left to dry on metal trays at room temperature. Permanent slides were made by mounting diatoms in Naphrax®. Diatoms were identified and photographed using a Zeiss Axioshot 200 imaging light microscope with differential interference contrast (DIC) and a Canon powershot digital camera (Carl Zeiss Axio Imager 2, Marine Science Center, Iraq). For SEM examination, the cleaned diatom suspension was filtered through 1µm Whatman® Nuclepore filters (Analytic Lab, St Mathieu de Treviers, France). The filters were left to dry on aluminum stubs and then coated with gold palladium alloy. Examination was made with a Hitachi SEM S-4500 operated at 10 to 15 kV (C2M, Perpignan University, France).

Relative abundance of species was not counted but occurrence of all taxa in the samples examined are treated as the following: very rare, species observed only once in a whole slide, rare if a species appears sporadically in a slide, frequent if at least one valve is observed in a light microscope field, and common if several valves of a species appear in all microscope fields. Literature upon which species were identified are given under each species. Morphometric information were obtained from the observed taxa and the variation in dimensions depend on

number of individuals examined. The systematic account of the encountered taxa is arranged basically according to Round et al. (1990). An alphabetic list of all taxa is given in Table 1. Terminology used is based on Ross et al. (1979) and Round et al. (1990). For valve description, and as previously proposed, in particular by Riaux-Gobin et al. (2013), we designate the valve with a raphe as the raphe valve (RV) and the valve without a raphe as the sternum valve (SV).

When appropriate, diatom reports from Seychelles and Mauritius islands, as well as previous reports from Reunion and Rodrigues, namely from Desikachary (1987-1989) (D) and Giffen (1980) (G) are given.

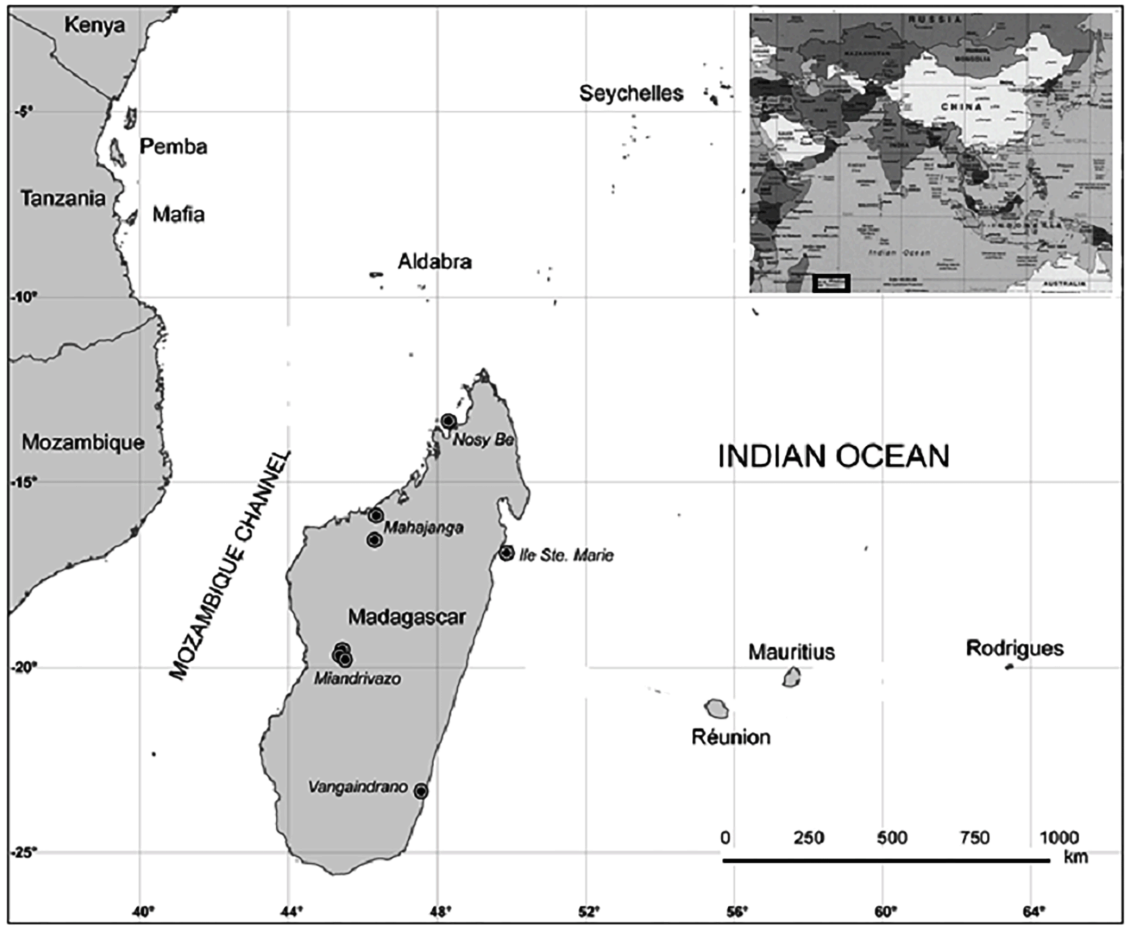

Figure 1. Map showing location of Reunion and Rodrigues Islands, Indian Ocean and sampling sites.

Taxonomic Account

Class Coscinodiscophyceae Round & Crawford
Order Thalassisirales Glezer & Makarova
Family Thalassiosiraceae Lebour

Thalassiosira sp. (Pl. 1, Fig. 5)

Features: Valves circular, flat, 16-18 µm in diameter. Valve surface strongly areolated with small hexagonal areolae arranged in curved tangential rows, not radiating from the center, very slightly decrease in size towards the margin, 26 in 10 µm. Valve margin with numerous small processes.

Remarks: Very few specimens were observed in valve view. Rimoportulae could not be seen. The pattern of areolation looks similar to *T. eccentrica* but with higher density of areolae and more marginal processes. Pervalvar axis not examined.

Occurrence: Rare in Reunion Island.

Order Melosirales Crawford
Family Hyalodiscaceae Crawford

Hyalodiscus ambiguus (Grunow) Tempère *et* Peragallo (Pl. 1, Fig. 7)

References: Peragallo & Peragallo 1897-1908, pl. CXIX, fig. 18; Desikachary 1988, pl. 600, figs 1-7.

Features: Diameter 54-56 µm, areolae 21-23 in 10 µm. Characteristic feature of this species is the spiral arrangement of the rows of areolae. Valve face is slightly convex.

Remarks: Widely distributed marine neritic species.

Occurrence: Rare in Reunion Island. Previously reported from Mauritius (D)

Order Coscinodiscales Round & Crawford
Family Hemidiscaceaea Hendey

Actinocyclus* cf. *bipartitus A. Mann (Pl. 1, Fig. 3)

References: Desikachary 1988, pl. 406, figs 2, 4-6.

Features: Diameter 32-38 µm, areolae 10 in 10 µm.

Remarks: This species looks similar to *A. octonarius* var. *sparsus* (Greg.) Hendey (Stidolf et al. 2012, pl. 4, fig. 92) but radiation of areolae on the valve face of this taxon looks more scattered and not arranged in clear radiating sectors.

Occurrence: Rare in Rodrigues Island. Previously reported from Mauritius (D).

Actinocyclus octonarius Ehrenberg (Pl. 1, Fig. 1)

References: Desikachary 1988, pl. 404, figs 1, 5; Witkowski et al. 2000, pl. 4, figs 2, 3.

Features: Diameter 40-62 µm, areolae 13-14 in 10 µm. Valves discoid with small central area filled with scattered areolae. Striae consist of variable number of radial lines of areolae running from valve margin towards the centre, dividing valve face into several radial areas. Hyaline spaces appear between radiate striae giving the appearance of radial rays. Marginal ocellus small and round.

Remarks: Number of areolae in the observed specimens is rather higher than that reported by Witkowski et al. 2000 (6-8 versus 13-14 in 10 µm). Sharing similarities with *A. subtilis* (Greg.)

Ralfs, but the hyaline spaces between the radiating rows of areolae is a feature of *A. octonarius* rather than *A. subtilis.* Widely distributed species on all marine coasts.

Occurrence: Frequent in Rodrigues and rare in Reunion Islands. Previously reported from Seychelles (G) and Mauritius (D).

Actinocyclus octonarius* var. *tenellus (Brébisson) Hendey (Pl. 14, Fig. 9)

References: Peragallo & Peragallo 1897-1908, pl. CXIII, figs 7, 8 (as *Actinocyclus tenellus*); Hustedt, 1927-1930, fig. 302 (as *Actinocyclus ehenbergii* var. *tenella*); Hendey 1964, p. 84.

Features: Valves 35-38 µm in diameter. Valve surface divided into several distinct sectors of loosely fasciculated striae. Each sectorial stria has small apiculus where it terminates on the valve margin. Areolae decrease in size and become denser near valve margin. Observed specimens possess 9-10 labiate processes arranged in a ring inside valve margin.

Occurrence: Rare in Reunion Island. *A. octonarius* var. *ralfsii* is reported from Mauritius and *A. octonarius* var. *sparsus* from Rodrigues (D)

Actinocyclus* cf. *subtilis (Gregory) Ralfs (Pl. 1, Fig. 4)

References: Stidolf et al. 2012, pl. 44, fig. 1, Witkowski et al. 2000, pl. 4, fig. 1.

Features: Diameter 25-26 µm, areolae 26-28 in 10 µm. Valves discoid, slightly undulated with few areolae in its rounded central area. Areolae small, becoming slightly larger towards the center of the valve. Striae radiate and packed in separated fasicules, fasicules are very narrowly spaced. Marginal ocellus small, round, situated slightly below valve margin.

Remarks: Small specimens only observed. Number of areolae is rather higher than usually found in *A. subtilis.* It may appear similar to *A. polysculptus* A.Mann by the shape of radiating areolae but the absence of hyaline areas between rows of areolae place it more closely to *A. subtilis.*

Occurrence: Rare in Reunion and Rodrigues samples. Previously reported from Seychelles (G); and also previously from Rodrigues (D).

Actinocyclus* cf. *tenuissimus Cleve (Pl. 1, Fig. 2)

References: Navarro 1981, p. 429, figs 28, 29; Lobban 2012, p. 249, pl. 5, figs 1, 2.

Features: Diameter 38 µm, areolae 38 in 10 µm.

Remarks: Areolae density is rather higher than that reported for *A. tenuissimus*. Acccording to Hustedt 1927-1930, *A. tenuissimus* can be differentiated from *A. subtilis* by the number of areolae with the former showing 18-20 in 10 µm and the later 12–15 areolae in 10 µm. Populations of both species from Mascarenes possess higher areola density than those reported elsewhere and may belong to different taxa.

Occurrence: Frequent in both sites.

Order Triceratiales Round & Crawford
Family Triceratiaceae (Schütt) Lemmermann

Odontella aurita (Lyngbye) C. Agardh (Pl. 2, Fig. 3)

References: Witkowski et al. 2000, p. 36, pl. 8, figs 12-13, pl. 9, figs 1-3; Hein et al. 2008: p. 20, pl. 4, fig. 7; Lobban et al. 2012, p. 250, pl. 6, figs 1, 2.

Features: Apical axis: 25-30 µm, transapical axis: 21-26 µm, areolae 8-10 in 10 µm. Frustules mostly seen in girdle view, either single or in chains. Valves broadly elliptic with radiating coarse areolae. Central part of the valve convex with slightly convergent spines. A marine littoral and neritic species.

Occurrence: Frequent in Reunion Island and rare in Rodrigues.

Triceratium balearicum Cleve (Pl. 3, Fig. 3)

References: A. Schmidt Atlas, pl. 98, fig.21; Peragallo & Peragallo 1897-1908, pl. CIII, fig. 4

Features: Diameter 50-55 µm.

Remarks: Only two specimens of pentagonal forms were observed. Valve outline looks similar to some pentagonal forms of *T. pentacrinus* (Ehrenberg) Wallich but can be distinguished by the marked undulations around the central area which appear under LM as a wide hyaline area.

Occurrence: Frequent in Reunion Island. Previously reported from Seychelles (G).

Triceratium dubium Brightwell (Pl. 3, Fig. 2)

References: Hendey, 1970: p.119, pl. 6, fig. 67; Podzorski & Håkansson, 1987, p. 29, pl. 5, figs 5, 7 ; Witkowski et al., 2000: p. 42, pl. 8, figs 4, 5.

Features: Length of valve side 18-25 µm, areolae irregularly arranged, 5-6 in 10 µm. Cells rectangular in girdle view. Valves with six angles and finely reticulate.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Family Plagiogrammaceae De Toni

Dimeregramma* cf. *minor (Gregory) Ralfs ex Pritchard (Pl. 4, Figs 8-10)

References: Hustedt 1931-59, p. 118, fig. 640; Witkowski et al. 2000, p. 29, pl. 11, figs 3-9.

Features: Apical axis 16-30 µm, transapical axis: 5-11, striae 16-18 in 10 µm. Cells rectangular in girdle view with convex margins, normally united by valve face to form ribbon-like chains. Valves lanceolate with rounded apices which possess haline areaes. Sternum lanceolate. Striae radiate, particularly towards valve poles.

Remarks: The specimens observed in the Mascarenes match illustrations given by both references mentioned above but the striae density is much higher than those reported. Husted gave striae 9-10 in 10. Further investigation may be required to reveal correct identity of this taxon.

Occurrence: Frequent in Reunion and Rodrigues samples. *D. minor* var. *nana* was reported from Seychelles (G).

Plagiogramma staurophorum (Gregory) Heiberg (Pl. 4, Figs 6)

References: Hustedt 1931-59, p. 106, fig. 635; Witkowski et al. 2000, p. 39, pl. 11, figs 16-21, Lobban et al. 2012, p. 254, pl.10, figs 3-5.

Features: Apical axis: 15-35 µm, transapical axis: 5-12, striae 9-11 in 10 µm, areolae 8-9 in 10 µm. Valves linear-elliptic with obtusely rounded apices. Striae radiate and crossed by longitudinal ribs.

Remarks: Witkowski et al. (2000) mentioned that valves of this species have parallel margins but the figures they provided (figs 17-21) are all showing elliptic valves where margins are not parallel.

Occurrence: Common in Reunion and rare in Rodrigues samples. Previously reported from Seychelles (G).

***Plagiogramma* sp**. (Pl. 4, figs 7, 16)

Features: Apical axis: 14-20 µm, transapical axis: 5-8 µm, striae 20-24 in 10 µm. Cells small. Valve linear elliptic to broadly elliptic with rounded apices. Striae slightly to strongly radiate particulary towards the apices, interrupted by longitudinal ribs. Axial area narrow.

Remarks: The two specimens illustrated in Figs 7 and 16 may belong to two different taxa, examination with SEM is required to elucidate valves fine structure.

Order Biddulphiales Krieger
Family Biddulphiaceae Kützing

Biddulphia pulchella Gray (Pl. 2, Fig. 4, Pl. 3, Fig. 4)

References: Cupp 1943, p. 152, fig. 109; Subrahmanyan 1946, p. 154, figs 283-284; Witkowski et al. 2000, p. 25, figs 8,9.

Features: Apical axis: 35-45 µm, transapical axis: 30-35 µm, areolae 4-6 in 10 µm. Girdle cylindrical. Valves ellipitic with undulating sides, valve face with coarse round areolae and divided by three or more ribs. Valve poles with subconical processes.

Remarks: A common epiphytic and benthic species widely distributed on marine coasts.

Occurrence: Rare in Reunion, frequent in Rodrigues Island. Previously reported from Seychelles (G), and already reported from Rodrigues (D).

Cerataulus turgidus (Ehrenberg) Ehrenberg (Pl. 2, Fig. 5)

References: Desikachary 1988, pl. 497, figs 1, 2; Snoeijs & Potapova 1995, p. 33, fig. 221; Watanabe et al. 2006, p. 62, figs 1–15.

Features: Transapical axis of the oval valves 44-48 µm.

Remarks: All specimens observed were lying on girdle view which is rectangular and markedly twisted with fine areolae arranged in quincunx. Widely distributed benthic marine species.

Occurrence: Rare in Reunion Island.

Isthmia enervis Ehrenberg (Pl. 2, Figs 1, 2)

References: Round 1984, p. 458, Figs a, e-h; Hendey 1964, p. 110, pl. 25, fig. 2; Al-Handal & Wulff 2008, fig. 67).

Features: Apical axis: 138-160 µm, transapical axis: 30-70 µm, areolae on valve face 3-4 in 10 µm. All examind specimens were in girdle view. Frustules large, solitary or in short zig-zag chains. One valve is produced to blunt protuberance. Areolae on the valve is larger than those on the girdle.

Remarks: Widely distributed epiphytic species, also found in the plankton.

Occurrence: Rare in Reunion and Rodrigues Islands.

Trigonium formosum* var. *pentagonale (Schmidt) Desikachary et Prema (Pl. 3, Fig. 1)

References: Desikachary 1989, pl. 801, fig. 3; A. Schmidt Atlas 1874-1959, pl. 79, fig. 4.

Features: Diameter 82-92 µm, areolae 9-10 in 10 µm. Valves pentagular, flat or concave, slightly elevated at valve margins and corners, finely reticulated with hexagonal areolae. Areolae radiating from the center and slightly increase in size in the area surrounding the center.

Remarks: Valve outline and areola structure appear similar to *T. graeffeanum* (Witt) Hendey reported from Galapagos Islands (Hendey 1971, p. 382, fig. 29) and also to four lobbed illustration in A. Schmidt Atlas pl. 79, fig. 1, as *Amphitetras graeffeanum* Witt. It is also similar to *Triceratium formosum* f. *quadrangulare* (Greville) Hustedt (Hustedt 1927-1930, fig. 483) but only differ by the number of angles. *T. formosum* var. *pentagonale* is selected here as it fits well with the illustration of Desikachary & Perma (1984).

Occurrence: Rare in Reunion Island. Previously reported from Mauritius (D).

Class Fragilariophyceae Round
Order Fragilariales Silva
Family Fragilariaceae Greville

Hyalosynedra laevigata (Grunow) D.M.Williams et Round (Pl. 6, Fig. 8)

References: Hustedt 1931-59, p. 213, figs 706a-c (as *Synedra laevigata* Grunow); Witkowski et al. 2000, p. 62, pl. 17, fig. 22, pl. 29, figs 6-10, pl. 30, fig. 23.

Features: Apical axis: 120-180 µm, transapical axis: 4-6 µm, striae very fine, 38-40 in 10 µm. Valves long, narrow, linear lanceolate, tapering into broadly rounded apices. Sternum very narrow. Transapical striae barely visible and difficult to resolve under LM.

Remarks: Widespread in marine and brackish waters.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Neosynedra provincialis (Grunow) William et Round (Pl. 6, Fig. 7)

References: William & Round1986, p. 332, figs 62-67; Witkowski et al. 2000, p. 68, pl.17, figs 6, 7, pl. 29, figs 4, 5, pl. 30, fig. 20.

Features: Apical axis: 32-38 µm, transapical axis: 3-4 µm, striae 32-34 in 10 µm. Valves linear lanceolate with slightly capitate apices. Sternum very narrow. Transapical striae very fine, hardly resolvable under LM.

Remarks: Short valves of this species were observed with slightly finer striae.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Neosynedra tortuosa (Grunow) D.M.Williams et Round (Pl. 6, Fig. 4)

References: William & Round 1986, p. 334, figs 68–71; Witkowski et al. 2000, p. 69, pl. 29, fig. 11; Lobban et al. 2012, pl. 12, fig. 1. (all as *N. tortosa*).

Features: Apical axis: 40-46 µm, transapical axis: 3-5 µm, striae of the observed specimens are very fine and hardly resolved under LM, but have been reported to be 34-35 in 10 µm (Witkowski et al.2000). Valves linear lanceolate with slightly capitate apices and characterized by having undulating margins.

Remarks: The species has been reported in the literature as *N. tortosa* following William & Round (1986). Basionym of the species is *Synedra provincialis* var. *tortuosa* Grunow and therefore its species name should be corrected.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Opephora mutabilis **(**Grunow) Sabbe et Vyverman (Pl. 4, fig. 11)

References: Vyverman & Sabbe 1995, 9.241, figs 13-28; Witkowski et al. 2000, p. 72, pl. 25, figs 10-17.

Features: Apical axis: 10-15 µm, transapical axis: 3-6 µm, striae 12-14 in 10 µm. Valves heteropolar, elliptic clavate with broad rounded upper end and smaller rounded lower end. Valve surface with coarse areolae. At higher magnification, a hyaline longitudinal rib is observed along the valve margin and short spinulae at the end of each stria.

Occurrence: Rare in Reunion Island.

Opephora pacifica (Grunow) Petit (Pl. 4, Figs 12-13)

References: Sabbe & Vyverman 1995, p. 244, figs 45-53; Witkowski et al., 2000: p. 72, pl. 25, figs 18-26; Hein et al., 2008: p. 28, pl.11, fig 10.

Features: Apical axis: 12-26 µm, transapical axis: 5-6 µm, striae 8-11 in 10 µm. Valves heteropolar, narrowly clavate with the upper end broadly rounded and subacute lower end. Striae coarse interrupted by a narrow linear sternum.
Remarks: Stria density slightly higher than reported which is normally 6-9 in 10 µm, which also appears close to *O. mutabilis* (Grunow) Sabbe *et* Wyverman. Valves observed were of strongly heteropolar outline to almost isopolar. A widely distributed marine species in all coasts.
Occurrence: Frequent in Reunion samples. Previously reported from Seychelles (G).

Podocystis spathulata (Shadbolt) Van Heurck (Pl. 6, Fig. 12)
References: Hustedt 1931-59, fig. 653; Lobban et al. 2012, p. 256, pl. 12, figs 4-6.
Features: Apical axis: 45-50 µm, transapical axis: 36-42 µm, striae 10 in 10 µm. Valves broadly ovate with slightly produced and flattened lower end. Striae radiate and interrupted by very narrow sternum. Striae near the broader end are curved upwards. Striae composed of single rows of areolae.
Remarks: Very similar in shape to *Podocystis americana* Baily but differes in the number of areolae rows in each striae, where the later species has two to three rows.
Occurrence: Rare in Rodrigues Island. Previously reported from Seychelles (G) and Mauritius (D).

Tabularia* cf. *affinis (Kützing) Snoeijs (Pl. 6, Fig. 6)
References: Snoeijs 1993, figs 49-71.
Features: Apical axis: 40-56 µm, transapical axis: 4-5 µm, striae 18-20 in 10 µm. Valves linear lanceolate with obtusely rounded apices. Sternum narrow, linear lanceolate. Striae occupy half the distance from valve margin to the center of the valve.
Remarks: William & Round (1986) considered this species a synonym to *T. fasiculata* (see discussion below). Widely distributed brackish water species.
Occurrence: Frequent in Rodrigues and rare in Reunion Islands.

Tabularia fasiculata (Agardh) Williams et Round (Pl. 6, Fig. 5)
References: Williams & Round 1986, p. 326, figs 46-52; Snoeijs 1993, p. 103, fig. 89.
Features: Apical axis: 30-42 µm, transapical axis: 4-5 µm, striae 13-15 in 10 µm. Valves linear lanceolate tapering into obtusely rounded apices. Striae marginal. Sternum widely lanceolate and occupying nearly two-thirds of the valve width.
Remarks: Tabularia is one of the diatoms genera that has several species conspecific with each other and many synonyms can be found in the literature. William & Round (1986) have extensively investigated some species of *Tabularia* based on type and other material and concluded that "some of the taxa associated with *T. fasciculata* may probably have to be redistributed into other marine genera or be treated as distinct species of *Tabularia*". Confusion in particular occurs between *T. fasiculata* and *T. affinis* and their varieties. Snoeijs (1993) reinvestigated some of the *Tabularia* species including *T. affinis*, *T. fasiculata* and *T. tabulata* using LM and EM and showed a rather distinct stria patterns and structures between these species and she concluded that these are separate taxa. Under LM, however, such distinction may not be accurate if only based on valve outline, stria density or shape of axial area as these features may interfere.
Occurrence: Frequent in Rodrigues, rare in Reunion Island. Previously reported from Seychelles (G).

Order Licmophorales Round
Family Licmophoraceae Kützing

Licmophora abbreviata C. Agardh (Pl. 4, Figs 2, 3)

References: Hustedt 1931-59, p. 66, fig. 590; Desikachary 1988, pl. 611, figs 4, 5; Witkowski et al. 2000, p. 63, pl. 20, figs 3-5.

Features: Apical axis: 65-75µm, transapical axis (at widest part): 6-17µm, striae 15-18 in 10 µm. Frustules broadly cuneate in girdle view. Valves clavate with slightly rounded apices. Sternum linear, very narrow. When seen in girdle view, several longitudinal septa appear as lines.

Remarks: Widely distributed epiphytic species in the marine littoral.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Licmophora* cf. *ehrenbergii (Kützing) Grunow (Pl. 4, Fig 4)

References: Hustedt 1931-59, p. 70, fig. 593; Desikachary 1988, pl. 610, figs 1-10; Witkowski et al. 2000, p. 64, pl. 18, fig. 11, pl. 20, fig. 16.

Features: Apical axis: 58-60 µm, transapical axis: 8-10 µm, striae 30 in 10 µm. Frustules cuneate in girdle view with deep septa at the upper apex. Valves clavate with broadly round upper apex and slightly rounded capitate lower apex. Sternum linear, very narrow.

Remarks: Valve outline and stria structure is very similar to *L. ehrenbergii* but stria density is much higher than those reported (30 versus 8-15 in Wikowski et al. 2000). Although this species looks similar to *L. ehrenbergii,* the widely round apex is also makes it close to *L. paradoxa.*

Occurrence: Frequent in Reunion and rare in Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Licmophora paradoxa (Lyngbye) C. Agardh (Pl. 4, Fig. 5)

References: Hustedt 1931-59, p. 76, fig. 605; Desikachary 1988, pl. 609, fig. 5; Witkowski et al. 2000, p. 67, pl. 18, figs 4-10.

Features: Apical axis: 60-65 µm, transapical axis: 13-14 µm, striae 24-25 in 10 µm. Frustules cuneate in girdle view with deep septa extending to quarter of valve length. Valves club-shaped with broadly rounded upper apex and slightly produced, rounded lower apex. Sternum very clear, linear.

Remarks: Widespread species in the marine littoral.

Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Licmophora sp. (Pl. 4, Fig. 1)

Features: Apical axis: 70-80 µm, transapical axis: 14-16 µm, striae 18 in 10 µm.

Remarks: This species appears similar to *L. ehrenbergii* var. *ovata* (Wm. Smith) Peragallo (Desikachary 1988, pl. 609, figs 4, 8, 9) but having more rostrate headpole and the striae structure looks thicker and less radiate near the upper pole. Our specimen is also close to *L. ehrenbergii* illustrated by Hustedt (1931, fig. 593) with slight difference in the shape of the apex.

Occurrence: Rare in Reunion and Rodrigues Islands.

Order Raphoneidales Round
Family Psammodiscaceae Round & Mann

Psammodiscus nitidus (W.Gregory) Round et D.G. Mann (Pl. 1, Fig. 6)

References: Witkowski et al. 2000, p. 75, pl. 23, figs 12-14; Hein et al. 2008, p. 29, pl. 5, figs 5, 6; Lobban et al. 2012, p. 258, pl. 14, figs 6, 7.

Features: Diameter 27-30 µm, areolae 6-7 in 10 µm. Valves almost flat covered with coarse, sparsed irregularly arranged rounded areoale. Areolae size slightly smaller around the center of the valve while those near the valve margin are arranged in short lines.

Remarks: After a detailed investigation of *Psammodiscus* valve structure under SEM, Watanabe et al. (2013) concluded that this genus shares common features with some members of the family Rhaphoneidaceae such as *Raphoneis* and *Delphineis*, a finding that removed *Psammodiscus* from the centric diatoms and considered it as araphid. Furthermore, valve ultrastructure of *Psammodiscus* bear differences from *Delphineis* enough to erect a new family, Psammodiscaceae.

Occurrence: Rare in Reunion Island. Previously reported from Mauritius (D).

Family Raphoneidaceaea Forti

Raphoneis sp. (Pl. 6, Fig. 13)

Features: Apical axis: 15-20 µm, transapical axis: 10-12 µm, striae 16-18 in 10 µm. Valves lanceolate elliptic with slightly produced rounded apices. Sternum very narrow, linear. Striae arranged in radiate line, becoming nearly curved near the apices.

Remarks: Valve outline bears similarity to *R. amphiceros* but with less acute apices, more dense striae and a much narrower sternum. *R. amphiceros*, however is variable in shape (Wikowski et al. 2000) and may undergo large morphogenesis (Sato et al. 2011).

Occurrence: Rare in Rodrigues Island.

Order Ardissoneales Round
Family Ardissoneacea Round

Ardissonea robusta (Ralfs *ex* Pritchard) De Notaris (Pl. 6, Fig. 3)

References: Hustedt 1931-59, p. 234, fig. 721, Witkowski et al. 2000, pl. 31, Figs 3, 4.

Features: Apical axis 200-400 µm, transapical axis 22-36 µm, striae 8-10 in 10 µm. Valves linear lanceolate with slightly obtusely rounded apices. Transapical striae parallel throughout, interrupted by two longitudinal ribs, each on one side of a very narrow central rib running from pole to pole.

Remarks: Ardissonea spp. are known to be widely distributed in warm waters. In our material only *A. robusta* were found.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Order Toxariales Round
Family Toxariaceae Round

Toxarium hennedyanum (Gregory) Pelletan (Pl. 6, Fig. 10)

References: Hustedt 1931-59, p. 83, fig. 713 (as *Synedra hennedyana* Gregory); Witkowski et al., 2000: p. 83, pl. 30, fig. 11, pl. 31, fig. 7; Hein et al., 2008, p. 33, fig. 15, 2; Lobban et al. 2012, p. 260, pl. 17, figs 1-5.

Features: Apical axis: 210-400 µm, transapical axis: 5-7 µm, striae 10-12 in 10 µm. Valves long, linear, slightly convex in the middle with subcapitate rounded apices. Sternum indistinct. Valve surface with coarse areolae arranged irregularly in the middle of the valve.
Occurrence: Common in Reunion, rare in Rodrigues Island. Previously reported from Seychelles (G).

Toxarium undulatum Bailey ex Bailey (Pl. 6, Fig. 9)
References: Hustedt 1931-59, p. 714, fig. 714 (as *Synedra undulata* Bailey); Witkowski et al. 2000, p. 83, pl. 30, fig. 11, pl. 31 figs 5-7; Lobban et al. 2012, p. 260, pl. 17, figs 6-8.
Features: Apical axis: 200-350 µm, transapical axis: 6-8 µm, striae 12-18 in 10 µm. Valves linear with undulated margins and with subcapitate rounded apices. Undulations start from the region where the middle part of the valve starts to become narrow. Sternum indistinct. Transapical striae irregularly arranged at the center of the valve.
Remarks: The genus *Toxarium* has long been considered as member of the pennate diatoms owing to its elongate valve shape. In their detailed investigation on the two only known species of *Toxarium*, Kooistra et al. (2003) found that pennate diatoms characteristics are missing from this genus such as the sternum, pseudoraphe, apical pore fields and some other raphid or araphid features. They placed the genus in the group of centric bi- or multipolar genera. Moreover, they are inclined to consider both *T. hennedyanum* and *T. undulatum* no more than different forms of one species. The latter asssumption, however, does not agree with the molecular analysis made by Lobban et al. 2012 who prefer to keep both species as separate entities.
Occurrence: Common in Reunion, rare in Rodrigues Island. Previously reported from Seychelles (G) and Mauritius (D).

Order Rhabdonematales Round & Crawford
Family Rhabdonemataceaea Round & Crawford

Rhabdonema adriaticum Kützing (Pl. 6, Fig. 11)
References: Hustedt 1931-59, p. 53, fig. 552; Witkowski et al. 2000, p. 76, pl.13, figs 10-12; Lobban et al. 2012, p. 261, p. 18, figs 1-3.
Features: Apical axis: 28-50 µm, transapical axis: 10-11 µm, striae 6-10 in 10 µm. Frustules in girdle view rectangular with rounded hyaline corners. Girdle with septa slightly increasing in length towards the center of the valve.
Remarks: Cells were only seen in girdle view, but when observed in valve view, each septum appear with three foramina, one central and two apical (Witkowski et al. 2000).
Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D), already reported from Rodrigues.

Order Striatellales Round
Family Striatellaceae Kützing

Grammatophora* cf. *macilenta W.Smith (Pl. 4, fig. 15)
References: Hustedt 1931-59, p. 39, fog. 564; Witkowski et al. 2000, p. 58, pl.15, figs 16-18.
Features: Apical axis 60-70 µm, girdle width 14-16 µm. Frustules narrow, oblong with two straight and parallel septa penetrating to almost near the center of the frustule.
Remarks: All specimens observed were in girdle view. Very similar to *G. macilenta* but did not have a slightly bent frustule nor the wavy septa in the upper part of the frustule.

Grammatophora oceanica (Ehrenberg) Grunow (Pl. 4, Figs 14)

References: Hustedt 1931-59, fig. 573; Witkowski et al. 2000, p.58, pl. 15, figs 13, 14, pl. 16, fig. 12, pl. 17, figs 3, 4; Lobban et al. 2012, p. 262, pl. 19, Figs 6-8.

Features: Apical axis: 25-50 µm, transapical axis: 6-8, striae 24-25 in 10 µm. Frustules rectangular in girdle view with rounded corners and slightly wavy septa.

Remarks: Cells were only observed in girdle view. Widespread species in all marine and brackish waters.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Order Climacospheniales Round
Family Climacospheniaceae Round

Climacosphenia elongata Bailey (Pl. 6, Figs 1, 2)

References: Round 1982, figs 4-6, 14; Stidolf et al. 2000, pl. 7, fig. 152, pl. 16, fig. 93.

Features: Apical axis 180-300 µm, transapical axis: 12-18 µm, striae 36 in 10 µm. Valves heteropolar, club-shaped with broadly rounded upper poles. The lower part of the valve, nearly from valve center, start to become much narrower with parallel margins. Sternum indistinct. Two longitudinal ribs interrupting the transapical striae.

Remarks: The most common species under *Climacosphenia* are *C. moniligera* Ehrenberg and *C. elongata*. Both species look similar in size or outline of the valve, stria density is not a reliable criterion for distinguishing species as these may overlap. The major differentiating feature under LM is the two longitudinal internal thickenings which are close to one another in *C. moniligera* and widely separated in *C. elongata.*

Occurrence: Frequent in Reunion and rare in Rodrigues Island. *C. moniligera* is reported from Seychelles (G) and from Rodrigues (D)

Class Bacillariophyceaea Mann
Order Lyrellales Mann
Family Lyrellaceae Mann

Lyrella clavata (Gregory) D.G.Mann (Pl. 9, Fig. 5)

References: Hustedt 1961-66, p. 444, figs 1509a-c; Desikachary & Prema (1987, pl. 300, fig. 1) (both as *Navicula clavata* Gregory); Witkowski et al. 2000, p. 231, pl. 97, fig. 6.

Features: Apical axis: 45-60 µm, transapical axis: 20-30 µm, striae 16-18 in 10 µm. Valves elliptic with produced rostrate apices. Raphe straight, axial area narrow; central area transversely extended. Lateral hyaline areas broad in the middle of the valve, narrowing towards apices and terminating at either side of the base of the apex, slightly deflected to the sides.

Remarks: Striae density is slightly higher than those given elsewhere (10-14 in 10 µm). Widespread marine species.

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G).

Order Mastogloiales Mann

Family Mastogloiaceae Mereschkowsky

Mastogloia affirmata (Leudiger-Fortmorel) Cleve (Pl. 14, Fig. 10)

References: Hustedt 1931-59, p. 528, fig. 962; Witkowski et al. (2000), p. 237, pl. 82, figs 2-4.

Featurs: Apical axis: 34 µm, transapical axis: 14 µm, striae 12 in 10 µm.

Remarks: Only very few specimens were observed under SEM showing external valve face. This species however can be recognized by the strongly wavy raphe and the shape and arrangement of the areolae as well as the assymetric central area.

Occurrence: Rare in Rodrigues Island.

Mastogloia angulata Lewis (Pl. 5, Fig. 3)

References: Hustedt 1931-59, p. 465, fig. 885; Foged 1987, p. 56, pl. 11, figs 4-6; Witkowski et al. 2000, p. 238, pl. 80, figs 1, 2; Lobban et al. 2012, p. 266, pl. 23, figs 1, 2.

Features: Apical axis: 38-42 µm, transapical axis: 18-21 µm, striae 12-14 in 10 µm, areolae 16 in 10 µm. Partecta 6, with two large central ones, 2 in 10 µm, 3-4 µm wide.

Remarks: Stria density slightly higher than those reported in the bibliography (ca. 9-12 in 10 µm). Widespread species in the marine littoral of warm waters.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Mastogloia binotata (Grunow) Cleve (Pl. 5, Fig. 13)

References: Hustedt 1931-59, p. 471, fig. 889; Witkowski et al. 2000, p. 240, pl. 75, figs 15-18; Lobban et al. 2012, p. 266, pl. 23, figs 3, 4.

Features: Apical axis: 18-22 µm, transapical axis: 14-18 µm, striae striae 13-15 in 10 µm, areolae 12 in 10 µm. Valves broadly elliptical. Raphe straight, central area distinct, variable in width and forming fascia extending to valve margin. Areolae hexagonal and appear in lines crossing each other. Valves with a single central partectum.

Remarks: M. binotata can be easily distinguished by the single elongated partectum which occupy almost a third of valve face. Widely distributed in warm waters.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Mastogloia* cf. *citrus (Cleve) De Toni (Pl. 14, Fig. 11)

References: Hustedt 1931-59, p. 519, fig. 952; Wikowski et al. 2000, p. 241, pl. 78, figs 3, 4, 13, 14).

Features: Apical axis: 23-28 µm, transapical axis: 14-18 µm, striae 20 in 10 µm. Valves broadly elliptic with sub-rostrate rounded apices. Partecta rectangular and of the same size, 2.5 µm wide.

Remarks: Specimens observed only showed internal side of the valve which is very similar to that of *M. citrus.*

Occurrence: Rare in Rodrigues Island.

Mastogloia corsicana Grunow (Pl. 5, Fig. 14)

References: Hustedt 1931-59, p. 454, fig. 966; Witkowski et al. 2000, pl. 77, figs 15-18; Lobban et al. 2012, p. 269, pl. 26, figs 1-3.

Features: Apical axis: 25-30 µm, transapical axis: 12-16 µm, striae 18-20 in 10 µm, partecta equal in size, 8-10 in 10 µm. Valves elliptical with rostrate apices. Raphe undulated, central area narrow and asymmetrical, axial area narrow. There are two to three longitudinal ribs interrupting the transapical striae. Partecta end shortly before valve poles.

Remarks: Widely distributed species in warm and temperate regions.

Occurrence: Rare in Reunion samples. Previously reported from Seychelles (G).

Mastogloia crucicula var. ***alternans*** Zanon (Pl. 14, Fig. 12)

References: Witkowski et al. 2000, p. 243, pl. 75, figs 4-6.

Features: Apical axis: 13-15 µm, transapical axis: 6-7 µm, striae 20-21 in 10 µm. Valves elliptic with broadly round apices. Raphe straight, axial area very narrow. Areolae rounded, 22 in 10 µm. Only one lobed partectum located alternately on both sides of the valve.

Occurrence: Rare in Rodrigues Island.

Mastogloia erythraea Grunow (Pl. 5, Figs 11, 12)

References: Hustedt 1931-59, p. 525, fig. 959; Witkowski et al. 2000, pl. 76, figs 2–7; Lobban et al. 2012, p. 272, pl. 27, figs 10, 11, pl. 28, figs 1-2.

Features: Apical axis: 36-60 µm, transapical axis: 16-18 µm, striae 25-26 in 10 µm, partecta variable in size, shape and number. One distinctive feature is the presence of two groups of 3-4 large partecta (observed specimens) positioned between the valve center and the apices, between them are smaller partecta, covering all distance along valve margin, 10-12 in 10 µm.

Remarks: Widely distributed in tropical and subtropical regions.

Occurrence: Common in Reunion and frequent in Rodrigues Islands. Previously reported from Seychelles (G).

Mastogloia fimbriata (Brightwell) Grunow (Pl. 5, Fig. 2)

References: Hustedt 1931-59, p. 464, fig. 884; Witkowski et al. 2000, pl. 77, figs 1-4, pl. 83, figs 1-4; Lobban et al. 2012, p. 272, pl. 28, figs 8-11.

Features: Apical axis: 36-38 µm, transapical axis: 26-28 µm, striae 9-11 in 10 µm, partecta 1-2 in 10 µm, 2.5 to 4 µm wide. Valves elliptical. Raphe straight, proximal raphe endings are well apart from each other in a distance and terminal endings stop shortly below the valve apices. Striae uniseriate in the mid-valve and biseriate near the valve margins. Areolae round. Partecta elongated and separated from each other at the base.

Remarks: Slightly higher stria density was observed on our specimens. Widespread in tropical and temperate regions.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Mastogloia horvathiana Grunow (Pl. 5, Fig. 1)

References: Hustedt 1931-59, p. 471, fig. 890; Witkowski et al. 2000, p. 249, pl. 82, figs 15–16 and pl. 85, figs 1, 2; Lobban et al. 2012, p. 274, pl. 29, figs 1, 2.

Features: Apical axis: 52-60 µm, transapical axis: 30-35 µm, striae 17-19 in 10 µm, partecta 12-14 in 10 µm, partecta width 4 µm. Valves elliptical. Raphe weakly undulating, axial area narrow, central area small, rectangular. Transapical striae parallel in the middle, slightly radiating towards the poles, interrupted by slightly wavy longitudinal ribs. Partecta equal in size, extending to valve poles.

Remarks: Stria density is rather higher than those previously reported, it normally ranges between 12-15 in10 µm. Navarro (1983, p. 121, fig. 38) has even reported lower stria density of 10 in 10 µm, with partecta not denser than 9 in 10 µm. Such variation in *Mastogloia* species is not unusual and has been reported for other taxa in the genus (Lobban et al. 2012). Widespread in warm waters.

Occurrence: Common in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Mastogloia manokwariensis Cholnoky (Pl. 5, Fig. 5)

References: Witkowski et al. 2000, p. 253, pl. 80, fig. 1; Lobban et al. 2012, p. 277, pl. 32, figs 1-3.

Features: Apical axis: 12 µm, transapical axis: 5 µm, striae very fine and difficult to resolve, partecta 3-4 on each side, 3-4 in 10 µm, partectum width 0.7 (central).

Remarks: Only one valve has been observed. Stria density seems rather higher than reported for this species (ca 22-28 in 10 µm, see above mentioned references).

Occurrence: Very rare in Reunion Island.

Mastogloia obliqua Hagelstein (Pl. 14, Fig. 13)

References: Witkowski et al. 2000, p. 254, pl.74, figs 11, 12; Lobban et al. 2015, p. 7, figs 62, 63.

Features: Apical axis: 18-20 µm, transapical axis: 3-5 µm, striae 24 in 10 µm. Valves linear lanceolate with broadly rostrate apices. One broad partectum located slightly oblique on each side of the valve.

Occurrence: Rare in Rodrigues Island.

***Mastogloia* sp.** (Pl. 5, Fig. 4)

Features: Apical axis: 17-19 µm, transapical axis: 7-8 µm, striae very fine and difficult to resolve under LM, partecta 7-8 in 10 µm, partecta width 0.7 µm. Valves elliptic-lanceolate with protracted apices. Raphe straight, axial area very narrow, central area very small, round. Partecta small, similar in size and terminating slightly before valve poles.

Remarks: Few small sized valves were encountered. Valve outline and partecta shape and number match *M. delicatissima* Hustedt but differ by the absence of the depressed regions on both sides of the axial area (Witkowski et al. 2000).

Occurrence: Rare in Rodrigues Island.

Order Cymbellales Mann
Family Rhoicospheniaceae Chen & Zhu

Gomphonemopsis* cf. *lindae Witkowski, Metzeltin et Lange-Bertalot (Pl. 14, Fig. 3)

References: Witkowski et al. 2000, p. 221, pl. 61, figs 11-14.

Features: Apical axis 8-10 µm, transapical axis: 2.5-3 µm, striae 26-28 in 10 µm. Valves linear cuneate with bluntly rounded head pole and and slightly arcuate foot-pole. Raphe straight, terminal raphe endings end in a distance from poles, axial area rectangular. Striae uniseriate, slightly radiate.

Remarks: The observed specimens were rather small and possess higher stria density than previously reported for this taxon (*i.e.*, 18-24 in 10 µm). Under LM, this species looks very similar to *Gomphonemopsis littoralis* (Hendey) Medlin but with denser striation.

Occurrence: Rare in Reunion and Rodrigues Islands.

Order Achnanthales Silva
Family Achnanthaceaea Kützing

Achnanthes brevipes C.A. Agardh (Pl. 7, Fig. 20)

References: Witkowski et al. 2000, pl. 45, figs 11-12; Cox 2006, figs 1, 3, 4, 6-9; Lobban et al. 2012, pl. 38, figs 1-4.

Features: Apical axis: 42-76 µm, transapical axis: 8-18 µm, striae: 10-11 in 10 µm. This species can be distinguished by the eccentric pseudoraphe on the sternum valve and the raphe on the other valve is enclosed in a stout rib.

Remarks: The specimens examined are rather elongate and relatively similar to *A. angustata* Greville but valves are shorter and striae are denser (7-8 in 10 µm for *A. angustata*). The variability of the valve outline of this species makes it rather uneasy to identify, it also share similarities with other taxa such as *A. brevipes* var *intermedia* (Kützing) Cleve and *Achnanthes bongarinii* (M. Peragallo) A. Mann. *A. brevipes* is cosmopolitan species on marine and brackish coasts.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Achnanthes* cf. *brevipes* var *intermedia (Kützing) Cleve (Pl. 7, Fig. 24)

References: Krammer & Lange-Bertalot 1991, fig. 1:4-8; Snoeijs 1993, p. 16, fig. 2)

Features: Apical axis: 20-26 µm, transapical axis: 8-12 µm, striae 14 in 10 µm. Valve lanceolate and slightly constricted in the middle, with broadly rounded apices. Raphe sinuous, axial area narrowly linear, central area transversely extending into widening stauros. Sternum narrow, linear and exentric.

Remarks: Very few specimens were observed. Valves are rather shorter and wider than those reported in the literature and striae are denser. Our specimens, however, look very similar to the figures of *A. brevipes* var *intermedia* shown by Snoeijs 1993 although puncta appears rather coarser. *A. brevipes* var *intermedia* can also be easily confused with *Achnanthes taylorensis* Kellogg, Stuiver, Kellogg et Denton, where both appear to be conspecific under LM. The major difference is in stria density where the later possess denser striae.

Occurrence: Frequent in Reunion and rare in Rodrigues Islands. Previously reported from Seychelles (G).

Achnanthes kuwaitensis Hendey (Pl. 7, Fig. 21)

References: Hendey 1970, fig. 6: 63, 64, McIntire & Reimer 1974, , pl. II, fig. 6a-c, pl. III, fig. 4a-b; Witkowski et al. 2000, pl. 43: 13-15; Al-Handal 2009, fig. 58.

Features: Apical axis: 40-48 µm, transapical axis: 8-9 µm, striae: 10-11 in 10 µm. The species is distinguished from A. brevipes by possessing subtrangular pseudo-ocelli on both apices of the sternum valve.

Remarks: Only raphe valves were observed, valve structure matches descriptions by Hendey (1970) but specimens were slightly shorter than those described from other regions with striae slightly denser. When SV is observed, *A. kuwaitensis* can be easily recognized and differentiated from other *Achnanthes* species with linear valves by the terminal orbiculi on the ends of the SV. We differentiated our specimens from *A. brevipes* in that the observed raphe valves have very narrow dilated central area and more slender valves with round apices, features not shared by *A. brevipes*. It is widely distributed in warm and temperate waters around the world.

Occurrence: Rare in Reunion and Rodrigues Islands.

Achnanthes pulchella Heiden (Pl. 7, Fig. 29)

References: Simonsen 1992, pl. 21, figs 1-5.

Features: Apical axis: 28-32 µm, transapical axis: 10-12 µm (middle part), striae (SV) 11-13 in 10 µm, (RV) 16-17 in 10 µm , areolae 18-19 in 10 µm. Valves slightly constricted in mid-valve with concave margins and obtusely rounded apices. Sternum valve with very narrow axial area and coarsely areolated striae, areolae rectangular. Raphe valve with very narrow axial area and straight raphe. Central stria are more spaced. Areolae on RV are more dense and smaller in size.

Remarks: This species has not been widely reported and was not described in detail in the literature (see illustrations *in* Riaux-Gobin et al. 2011c).

Occurrence: Frequent in Reunion and rare in Rodrigues Island. Previously reported from Seychelles (G).

Achnanthes trachyderma (F.Meister) Riaux-Gobin *et al.* (Pl. 7, Fig. 9)

Basionoym: Cocconeis trachyderma F.Meister.

References: Meister 1935, p. 99, figs 63–64; Riaux-Gobin et al. 2015, p. 108, figs 27-32 (LM), figs 45-57 (SEM).

Features: Apical axis: 29-32 µm, transapical axis: 14-15 µm, 9-11 SV striae in 10 µm, 26 RV striae in 10 µm. Valves elliptical with produced capitate apices. Raphe valve slightly concave, raphe filiform and straight, axial area narrow, proximal raphe endings straight and close to each other, terminal raphe fissures slightly curved and continuing on the mantle. Extended and narrow stauros delineated on the margins by short striae. SV strongly convex, one row of large areolae lies on each side of the narrow sternum.

Remarks: Achnanthes trachyderma is relatively small (<45 µm long, see the tentative identification key *in* Riaux-Gobin et al. 2015) with an oblong-elliptic shape, and a SV striation denser than in *Achnanthes citronella* (A.Mann) Hustedt *in* Schmidt et al. (1874–1959: pl. 415, figs 3–8). On the largest *A. trachyderma* individuals, only the RV examination permits a precise determination (in *A. citronella* the RV central area is small and the stauros very reduced, while extended in *A. trachyderma*). For these reasons, this taxon has probably been often misidentified as *Achnanthes citronella* in several publications (see references and comments *in* Riaux-Gobin et al. 2015, p. 115 and table 3, p. 116)

Occurrence: Rare in Reunion Island

Achnanthes sp. (Pl. 7, Figs 22, 23)

Features: Valves linear, with almost parallel margins, slightly constricted in the middle with round apices, 15-30 µm long, 4-6 µm wide. Transapical striae 12-14 in 10 µm. Raphe straight, axial area narrow, central area expanded transversely forming a narrow fascia reaching the valve margins.

Remarks: The taxon appears similar to *A. kuwaitensis* but is much smaller, with a denser striation and fewer areolae per stria.

Occurrence: Rare in Rodrigues Island.

Family Achnanthidiaceaea Mann

Astartiella* cf. *punctifera (Hustedt) Witkowski et Lange-Bertalot (Pl. 12, Fig. 5)

References: Hustedt 1955, p. 18, fig. 5: 26-28 (as *Achnanthes punctifera* Hustedt); Witkowski et al. 2000, p. 101, pl. 52, figs 11-19; Riaux-Gobin et al. 2013, figs 7-8, 30-37.

Features: Apical axis: 25 µm, transapical axis: 8 µm, striae 36 in 10 µm.

Remarks: Specimens examined under SEM exhibit SV stria density higher than that reported by Wikowski et al. (2000), 25-28 versus 36 in 10 µm. According to Riaux-Gobin et al. (2013), the stria density on both valves exceed 35 in 10 µm. The observed specimens, although matching illustrations by the above mentioned references, may pertain to a different species. Valve outline is relatively variable in this species and it may appear elliptic or elliptic-lanceolate with parallel sides in mid-valve.

Occurrence: Rare in Reunion and Rodrigues Islands.

Achnanthidium glyphos Riaux-Gobin, Compère et Witkowski (Pl. 12, Figs 1-3)

References: Riaux-Gobin et al. 2010, Figs (SEM) 25-37; Riaux-Gobin et al. 2011c, p. 15, pl. 12, figs (SEM) 1-4, pl. 13, figs 1-6.

Features: Apical axis: 6-10 µm, transapical axis: 3-4 µm, striae (SV) 24-31 in 10 µm, striae (RV) 30-34 µm. Valves elliptic lanceolate to capitate with round apices. Raphe straight, distal endings deflected into the same direction, central area assymetrical. RV striae monoseriate in mid-valve, becoming biseriate towards apices. Sternum wide with large central area. Striae on the SV are marginal and composed of one areolae.

Remarks: Very small valves, striae are not resolved under LM. The species is abundant in coral sands of Reunion Island and present in Rodrigues Island but specimens from Rodrigues are slightly larger and possess higher stria density.

Occurrence: Common in Reunion and rare in Rodrigues Island.

Planothidium delicatulum (Kützing) Round et Bukhtiyarova (Pl. 7, Figs 17-19)

References: Round & Bukhtiyarova, 1996: p. 353; Witkowski et al., 2000: p. 118, pl. 46, figs 28, 29, pl. 48, figs 1, 2.

Features: Apical axis: 12-20 µm, transapical axis: 4-8 µm, striae 12-14 in 10 µm. Valve elliptic-lanceolate with acutely protracted apices, Raphe straight, filamentous, axial area narrow, central area small and round. SV with narrow sternum, central area absent. Striae on both valves parallel in mid-valve and radiate toward apices.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Planothidium sp. (Pl. 7, Fig. 16)

Features: Valves elliptic lanceolate with slightly produced apices, 10-14 µm long, 4-5 µm wide. Axial area narrow, striae slightly radiate at the centre and bocoming more radiate near the poles, 14-16 in 10 µm.

Remarks: In all specimens observed, there is one short stria on one side of the valve at the center. Only SV were encountered.

Occurrence: Rare in Reunion Island.

Family Cocconeidacaea Kützing

Amphicocconeis mascarenica Riaux-Gobin et Compère (Pl. 7, Fig. 2, Pl. 12, Fig. 4)

References: Riaux-Gobin et al. 2011a, p.176, figs 1-6 (LM), figs 7-27 (SEM). Riaux-Gobin et al. 2011c, p.18, pl. 1, figs (LM) 8-12, pls. 21, 22, 23, 24, figs (SEM) 1-5.

Features: Apical axis: 9-21 µm, transapical axis: 4.5-8 µm, striae (SV) 12-14 in 10 µm. Valves elliptic with rounded apices. Raphe valve slightly concave, raphe straight and filamentous with slightly inflated central endings, terminal raphe endings deflected to the same direction. SV convex

with large sternum and uniseriate striae. Areolae oblong and arranged in a number of regular bands, median areolae larger, marginal areolae slightly denser.

Remarks: A. mascarenica can be compared to *A. disculoides* (Hustedt) De Stefano et Marino but can be recognized by its oblong shape, more acute apices, and by several other features concerning its RV and RV valvocopula (RVVC) (see detailed remarks *in* Riaux-Gobin et al. 2011ab, p 178). SV only were observed under LM. Specimens slightly larger than those described by Riaux-Gobin et al. (2011a) with less stria density. Until present, the distribution of this species may confined to tropical regions but according to Riaux-Gobin et al (2011a), the illustration of *Cocconeis* sp. by Loseva (1992, p. 63, figs 24-27) might pertain to *A. mascarenica* which expands its distribution to Northern Europe.

Occurrence: Common in Reunion but rare in Rodrigues Island.

Cocconeis alucitae Riaux-Gobin et Compère (Pl. 7, Fig. 1)

References: Riaux-Gobin et Compère 2008, figs 2-17; Riaux-Gobin et al. 2011c, p. 19, pl. 1, figs 4, 5. pl. 2, figs 1-6 (LM); pl. 27, 1-7 (SEM), pl. 28, figs 1-4 (SEM).

Features: Apical axis: 22-26 µm, transapical axis: 16-20 µm, striae 11-12 in 10 µm on the sternum valve and 29-22 in 10 µm on the raphe valve. Valves elliptical with round apices. Raphe straight, terminal raphe endings far from poles and very slightly deflected into opposite directions. Striae on RV uniseriate, becoming biseriate near the valve margins. SV convex with uniseriate striae in mid-valve, becoming biseriate and then tri or quadriseriate near the margins.

Remarks: Valve outline relatively similar to *C. scutellum* Ehrenberg. De Stefano et al. (2008) described *C. scutellum* var. *gorensis*, a taxon with features close to those of *C. alucitae*, except for its SV sternum and raphe that are straight, while slightly oblique in *C. alucitae* (see remarks *in* Riaux-Gobin et al. 2011c, p. 20).

Occurrence: Common in Reunion and rare in Rodrigues Island.

Cocconeis borbonica Riaux-Gobin et Compère (Pl. 12, Fig. 6)

References: Riaux-Gobin & Compère 2008, Figs 24-32 (SEM), 45-47 (LM).

Features: Apical axis: 10-15 µm, transapical axis: 4-5 µm, striae (SV) 40-50 in 10 µm. Valves oblong with round apices. Raphe straight, proximal raphe endings close to each other, terminal raphe endings enlarged and slightly deflected to opposite directions. Striae irregularly spaced on the RV. On SV, striae arranged regularly and appear in 4-5 apical rows.

Remarks: Very small species which can hardly be distinguished under LM. Differs from *Cocconeis finmarchica* Grunow by a denser striation on both valves and reduced dimensions. Also differs from *C. oblongata* Edsbagge and some other taxa (see Riaux-Gobin et al. 2008). We can note that Car et al. (2012) described a taxon very similar to *C. borbonica*, with very slight differences possibly due to plasticity of the taxon, under *Cocconeis caulerpacola* Witkowski, Car et Dobosz. Marine to brackish water species.

Occurrence: So far only recorded from Reunion Island. Frequent.

Cocconeis convexa Giffen (Pl. 7, Fig. 5)

References: Witkowski et al. 2000, p. 104, pl. 37, figs 5, 6, pl. 41, figs 1-4; Riaux-Gobin et al. 2011c, p. 22, pl. 3, figs (LM) 1-5, pl. 32, figs (SEM) 1-7.

Features: Apical axis: 18-20 µm, transapical axis: 13-18 µm, striae on raphe valve 24-26 in µm. Valves broadly elliptic with round apices. Raphe valve concave, raphe straight, distal raphe endings elongate. SV convex, sternum narrow.

Remarks: This is a widely distributed species in tropical to temperate littoral regions. Also found in inland waters characterized by high conductivity (Al-Handal 2009).

Occurrence: Common in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Cocconeis coralliensis Riaux-Gobin et Compère (Pl. 12, Fig. 7)

References: Riaux-Gobin & Compère 2008, figs 16-23 (SEM), figs 52-55 (LM).

Features: Apical axis: 12-14 µm, transapical axis: 5-6 µm, striae on both valves 36-40 in 10 µm. Valves oblong with round apices. Raphe straight, filiform. Proximal raphe endings close to each other, slightly deflected to opposite directions, terminal raphe endings far from the margin. Striae on the SV are parallel in mid-valve and parallel to the axial area at valve poles. Areolae oblong.

Remarks: In LM, this taxon is easily identifiable by strong virgae (Riaux-Gobin et al. 2011c, pl. 3, figs 12, 13) and elongate shape.

Occurrence: So far only recorded from Reunion Island. Common.

Cocconeis coronatoides Riaux-Gobin et Romero (Pl. 7, Fig. 10; Pl. 12, Fig. 8)

References: Riaux-Gobin et al. 2011c, p. 23, pl. 34, figs 1-6, pl. 35, figs 1-6, pl. 36, figs 1-3 (all SEM images).

Features: Apical axis: 13-29 µm, transapical axis: 5-23 µm, striae (SV) 13-19 in 10 µm, striae (RV) 21-27 in 10 µm. Valves lanceolate-elliptic with round apices. Raphe valve concave, raphe straight and filiform, proximal raphe endings tear-like and close to each other, slightly deflected to opposite directions. Axial area narrow, distal raphe endings terminate far from the valve margin. Striae uniseriate in mid-valve becoming bi- to triseriate towards the margins. SV convex, sternum narrow, striae radiate and equidistant.

Remarks: The abundant material of this species in Rodrigues allowed Riaux-Gobin et al. (2010) to examine it in detail under SEM and to assign it into a new species to include a number of *Cocconeis* taxa that do not have a definite affinity such as *Cocconeis* sp.4 illustrated in Montgomery (1978, pl. 60, figs E-G), *Cocconeis* sp. in Podzorski & Håkansson (1987, pl. 14, figs 8, 9) and to some extent *Cocconeis* sp. in Wikowski et al. (2000, pl. 40, figs 2-4).

Occurrence: Common in Rodrigues and rare in Reunion Islands.

Cocconeis dapalistriata Riaux-Gobin, Romero, Compère et Al-Handal (Pl. 7, Fig. 26)

References: Riaux-Gobin et al. 2011c, p. 24, pl. 6, figs (LM) 6-8, pl. 39, figs (SEM) 1-7.

Features: Apical axis: 12-16 µm, transapical axis: 7-11 µm, striae on the sternum valve 14-16 in 10 µm. Valves elliptic with round apices. RV concave, striae with slightly elongate areolae alternating from one row to the next. Axial area narrow, proximal raphe endings close to each other, distal raphe endings simple and close to the apex. SV valve convex, axial area narrow. Striae with one row of oblong and large areolae on each side of the sternum, separated by short areolae from one marginal row of slightly elongate areolae.

Remarks: This species is characterized by the unique SV stria structure, justifying its epithet (from Latin *dapalis*, sumptuous, see Riaux-Gobin et al. 2011c)

Ocurrence: Epipsamic species so far only recorded from Mascarenes. Frequent in Reunion and Rodrigues Islands.

Cocconeis sp. aff. ***dirupta*** Gregory (Pl. 7, Fig. 7)

References: Riaux-Gobin et al. 2011c, p. 26, figs (LM) 9, 10, pl. 41, figs (SEM) 1-6.

Features: Apical axis: 9-26 µm, transapical axis: 6-12 µm, striae (SV) very fine, hardly resolved under LM (26-42 in 10 µm, SEM). SV seen under LM with slightly sigmoid axial area and hemifascia (one stria lacking on one side).

Remarks: The very slightly sigmoid axial area and the asymmetrical narrow central area make identification of this species uncertain but most likely close to *C. dirupta* described by Gregory (1857, pl. 1, fig.25), see also Riaux-Gobin et al (2016).

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Cocconeis distans Gregory (Pl. 7, Fig. 3)

References: Wikowski et al. 2000, p. 106, pl. 38, figs 12, 13; Riaux-Gobin et al. 2011c, p. 26, pl. 4, figs 4-7 (LM).

Features: Apical axis: 13-26 µm, transapical axis: 11-17 µm, striae (SV) 8-9 in 10 µm. Valves elliptical with round apices. RV flat or slightly convex, raphe filiform, straight, terminal raphe endings indistinct, axial area very narrow, central area weakly developed, roundish. SV striae composed of coarse areolae, spaced from each other, radiate towards apices. Axial area of the SV slightly depressed, presence of a marginal row of dense and elongate areolae separated from the valve face areolae by a *crista marginalis* (see SEM illustration in Riaux-Gobin et al. 2011c, pl. 43).

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Cocconeis guttata Hustedt et Aleem (Pl. 12, Fig. 9)

References: Simonsen 1987, fig. 522:1-5; Witkowski et al. 2000, p. 108, pl. 40, figs 13-18; Riaux-Gobin et al. 2011c, p. 27, pl. 46, figs 1-7, pl. 47, figs 1-6 (SEM).

Features: Apical axis: 10-17 µm, transapical axis: 6-11 µm, striae (SV) 11-17 in 10 µm, striae (RV) 26-36 in 10 µm. Valves small, elliptical with round slightly produced apices. Raphe straight, axial area narrow, central area very small and round. SV with indistinct axial area and scattered areolae arranged in radiate striae.

Remarks: Despite the small size of the valve, the SV bears coarse striae and areolae clearly visible under LM, but appears close to *C. distans* Gregory in valve outline and striation. Differentiation under LM between these two species is largely based on striae number which is denser in *C. guttata.* In fact this might not be enough to readily distinguish both taxa since the stria density was found to be slightly variable in both taxa. SEM examination is necessary in this regard (see SEM illustrations of SV and RV of each taxon and remarks by Riaux-Gobin et al. 2011c).

Occurrence: Common in Reunion and rare in Rodrigues Islands.

Cocconeis* cf. *krammeri Lange-Bertalot et Metzeltin (Pl. 7, Figs 4, 11)

References: Wikowski et al. 2000, p. 109, pl. 33, figs 1-5, pl. 34, figs 4, 5, pl. 42, fig. 34, Riaux-Gobin et al. 2011c, p. 29, pl. 4, figs (LM) 8-13, pl. 49, figs (SEM) 1-6.

Features: Apical axis: 17-25 µm, transapical axis: 12-15, striae on RV 22-26 in 10 µm and very fine on the SV. Valves broadly elliptical with round apices. Raphe sigmoid, axial area very narrow, central area very small or indistinct. RV axial area narrow and sigmoid. Striae on the SV composed of several elongate areolae arranged in three longitudinal sectors interrupted by hyaline areas.

Occurrence: Common in Reunion and rare in Rodrigues Island.

Cocconeis* cf. *molesta Kützing (Pl. 7, Fig. 8)

References: Hustedt 1931-1959, p. 351, figs 305a, b; Witkowski et al. 2000, pl. 41, figs 33, 34. Riaux-Gobin et al. 2016, figs 15-20.

Features: Apical axis: 14-24 µm, transapical axis: 6-8 µm, striae (SV) very fine, 32-40 in 10 µm. Valves elliptic with round apices. RV concave with very fine striae hardly seen under LM. SV convex with striae arranged within a zig zag pattern along the axial area.

Remarks: This species can be distinguished by the SV longitudinal lines in zig-zag and dense striation. A common species in the marine littoral of warm and temperate regions.

Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Cocconeis peltoides Hustedt (Pl. 7, Fig. 12)

References: Witkowski et al. 2000, p. 112, pl. 38, figs 1-9; Riaux-Gobin et al. 2011d, p. 326, figs 1-22.

Features: Apical axis: 6-10 µm, transapical axis: 6-8 µm, 16-18 SV striae in 10 µm. Valves small, elliptical with broadly round apices. RV with a very narrow axial area, a filiform raphe, and dense striae composed of tiny areolae (see SEM in Riaux-Gobin et al. 2011c, pl. 59, fig. 4). SV slightly concave, presence of a lanceolate median area delineated by two longitudinal costae not reaching the valve apices. Marginal and median areas composed of uniseriate striae with round to elongate areolae. Great variability of the SV ornamentation (see Riaux-Gobin et al. 2011c).

Remarks: Widely distributed species in all marine habitats.

Occurrence: Rare in Rodrigues Island. Previously reported from Seychelles (G).

Cocconeis peltoides* var. *archaeana Riaux-Gobin et Compère (Pl. 7, Figs 14, 25)

References: Riaux-Gobin et al. 2011c, p. 21, pl. 2, figs (LM) 7-9, pl. 30, figs (SEM) 1-6.

Features: Apical axis: 7-9 µm, transapical axis: 4-5 µm, striae on the SV 17-18 in 10 µm. This taxon is rather small and details of features can only be resolved under SEM (see full description by Riaux-Gobin et al. 2011d). Only sternum valves were observed in LM.

Remarks: Differs from the nominate variety by its small size, higher stria density on the SV, absence of the longitudinal median costae and the areolae free elliptical axial area. This taxon is so far only recorded from Mascarenes, Western Indian Ocean.

Occurrence: Rare in Reunion and Rodrigues Islands.

Cocconeis pseudograta Hustedt (Pl. 7, Figs 27, 28)

Reference: Riaux-Gobin et al. 2011c, p. 33, pl. 5, fig. (LM) 5, pl. 64, figs (SEM) 1-7, pl. 65, figs (SEM) 1-6. Romero & Riaux-Gobin 2014, p. 432, fig. 4 (LM) , fig. 5-7 (SEM).

Features: Apical axis: 17-20 µm, transapical axis: 13-14 µm, SV striae 22-24 in 10 µm. Valves elliptic with broadly round apices. The SV is externally concave, with a marginal *crista marginalis*. Sternum linear-lanceolate, widening at the valve center. Striae uniseriate, radiate throughout, more curved near the valve poles (see extensive description of both valves in Riaux-Gobin et al. 2011c, pls 64-65 and in Romero et al. 2014).

Remarks: Considered as 'European' by Hustedt (1939), this taxon was recently found in the South Pacific by C. Riaux-Gobin (see Romero et al. 2014)

Occurrence: Rare in Reunion and common in Rodrigues Island, probably a tropical ubiquist taxon.

Cocconeis scutellum Ehrenberg (Pl. 7, Fig. 6)

References: Witkowski et al. 2000, p. 114, pl. 36, figs 1-7, pl. 38m fig. 11, Riaux-Gobin et al. 2011c, pl. 5, figs (LM) 12, 13, 15, 17.

Features: Apical axis: 17- 42 µm, transapical axis: 8-20, striae 11-13 in 10 µm (SV), 11-14 in 10 µm (RV), areolae 8 in 10 µm. Valve broadly elliptical to orbicular with round apices. RV margin with broad hyaline border. Raphe straight, filiform with proximal endings thickened and close to each other, and terminal fissures somewhat distinct from the apical margins, roundishly widened. SV with narrow axial area, transapical striae radiate and coarsely punctate, 5-8 rows in 10 µm, crossed by fairly straight longitudinal ribs. Subquadrangular areolae in mid-valve, transapically elongate near the margins where dividing into multiple rows of smaller areolae.

Remarks: The observed specimens possess stria and areola density that roughly match this species. Some valves, however, appeared with denser striae (15 in 10 µm on SV) which may represent a different variety.

Remarks: Ubiquist species, in all habitats from marine and brackish to inland waters with high conductivity.

Occurrence: Common in both islands. Previously reported from Seychelles (G).

Cocconeis sigillata Riaux-Gobin et Al-Handal (Pl. 7, Fig. 13)

References: Riaux-Gobin et al. 2011c, p. 35, pl. 6, figs (LM) 1, 2, pl. 69, figs (SEM) 1-7.

Features: Apical axis: 7-10 µm, transapical axis: 4.5- 5.6 µm, 15-19 SV striae in 10 µm. Valves lanceolate-elliptic to suborbicular. Raphe straight, proximal raphe endings simple and opposed, terminal raphe endings tear-like, close to the valve margin and slightly deflected. Central area small and elliptical. Axial area narrow. RV striae uniseriate, with one row of marginal elongate areolae (see complete SEM description in Riaux-Gobin et al. 2011c). SV convex with marginal hyaline area, striae biseriate, interrupted in each hemivalve by a hyaline longitudinal area.

Remarks: This species pertains to the same group as *C. peltoides* Hustedt except for having biseriate SV striae. So far not recorded outside Mascarenes.

Occurrence: Common in Reunion samples but very rare in Rodrigues.

Vikingea gibbocalyx (Brun) Witkowski, Lange-Bertalot et Metzeltin (Pl. 7, Fig. 30).

References: Witkowski et al. 2000, p. 125, pl. 55, figs 8-16, pl. 56, figs 1-5, pl. 57, figs 1-4; Riaux-Gobin et al. 2011c, p. 40, pl. 7, figs 1-6.

Features: Apical axis: 27-41 µm, transapical axis: 12-32 µm, SV striae 5-6 in 10 µm, RV striae 6-8 in 10 µm. Valves rhombic-lanceolate with round cuneate distinctly raised apices. RV strongly concave with apices raising above valvar lane. Raphe straight with expanded and spathulate proximal endings, axial area narrow, slightly widening near the center, central area elliptical and not reaching the margins. SV convex with a narrow, linear axial area, central area missing and valve slightly depressed at the center. Elliptical to sub-rectangular large areolae, increasing in size towards the margins, areolae of the outer row are very large and bordered by a short and thickened crest.

Remarks: The genus *Vikingea* has been created by Witkowski et al. (2000) based on *Cocconeis gibbocalyx* Brun which is mainly different from *Cocconeis* by showing terminal raphe endings strongly deflected and by lacking fimbriate valvocopula. The Mascarenes specimens possess lower stria density than reported by Witkowski et al. (2000) (7-8 versus 9-12 in 10 µm).

Occurrence: Frequent in one sample from Reunion and rare in Rodrigues Islands. Previously reported from Seychelles (G).

Order Naviculales Bessey
Family Berkeleyaceae Mann

Berkeleya rutilans (Trentepohl *ex* Roth) Grunow (Pl. 14, Fig. 5)

Features: Apical axis: 13-15 µm, transapical axis: 2-3 µm, striae 48 in 10 µm. Valves linear to linear-lanceolate with round apices. Axial area narrow, central area linear and narrow. Raphe branches short, terminal raphe endings terminate at a distance from the apices and appear as deflected inwards. Proximal raphe endings round and slightly deflected on one direction, well distant from each other. The first rows of striae bordering the central area composed of single,

elongated areolae which have a round ending near the axial area and terminate in narrow linear slit-like endings toward the valve margin. Rest of the areolae are roundish.

Occurrence: Rare in Reunion Island.

Berkeleya sp. (Pl. 14, Fig. 4)

Features: Valves linear lanceolate with broadly round apices, 15-20 µm long, 4-5 µm wide. Axial area narrow, central area small and nearly round. Raphe branches straight with terminal endings shortly hooked before reaching the apices. Striae uniseriate, formed of roundish to slightly elongate areolae, 30-32 in 10 µm. Striae slightly radiate at the centre of the valve, becoming parallel towards apices.

Occurrence: Rare in Reunion Island.

Family Diadesmidaceae

Luticola sp. (Pl. 13, Fig. 8)

Features: Valves broadly elliptic with convex margins and round, non-protracted apices, 8-10 µm long, 4-6 µm wide. Axial area wide, forming a clear hyaline area, central area rectangular. There is one row of areolae running around valve margin. One circular stigma located closer to valve center than to the margin. Raphe branches straight with central raphe endings slightly deflected away from the stigma. Terminal raphe endings are curved to the same direction and terminate at valve apices. Transapical striae composed of 2-3 rows of round to elongate areolae, 24-26 in 10 µm.

Remarks: Very small species with scattered striae and areolae with irregular shape.

Occurrence: Rare in Reunion and Rodrigues Islands.

Family Sellaphoraceaea Mereschkowsky

Fallacia forcipata (Greville) Stickle et Mann (Pl. 9, Fig. 9)

References: Krammer & Lange-Bertalot 1986, p. 172, pl. 65, figs 12, 13 (as *Navicula forcipata* Greville); Witkowski et al. 2000, p. 205, pl. 72, figs 2-9.

Features: Apical axis: 15-32 µm, transapical axis: 7-13 µm, striae 24-26 in 10 µm. Valves elliptical with broadly round apices. Lateral hyaline area narrow, constricted in mid-valve and slightly convergent towards the apices. Raphe straight, proximal raphe endings distant from each other, axial area narrow, central area transverse and connected to the lateral hyaline areas.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Fallacia ny (Cleve) D.G.Mann (Pl. 9, Fig. 10)

References: Hustedt 1961-1966, p. 369, fig. 1459; Witkowski et al. 2000, p. 209, pl. 70, figs 8-11.

Features: Apical axis: 38-42 µm, transapical axis: 22-25 µm, striae 14-16 in 10 µm. Valves broadly elliptic with round apices. Raphe straight, terminal raphe endings curved hook-like into the same direction. Lateral hyaline area terminates at the base of the hooked terminal raphe endings. Lateral area separated from the axial area by a longitudinal row of poroids.

Remarks: The larger specimens observed can be distinguished by the strong curvature of the terminal raphe endings, which are deflected to the same direction. Marine tropical to subtropical species.

Occurrence: Rare in Rodrigues Island. Previously reported from Seychelles (G).

Fallacia pygmaea (Kützing) Stickle et D.G.Mann (Pl. 9, Fig. 8)

References: Krammer & Lange-Bertalot 1986, p. 171, pl. 65, figs 1-6 (as *Navicula pygmaea* Kützing); Witkowski et al. 2000, p. 211, pl. 72, figs 28-30.

Features: Apical axis: 15-32 µm, transapical axis: 7-13 µm, striae 24-26 in 10 µm. Valves elliptical with round apices. Raphe straight but slightly deflected near the central area, axial area very narrow or indistinct in some specimens. Lateral hyaline areas curved, constricted in the middle and connected to fairly large central area.

Remarks: Widespread in all marine and brackish waters, also in inland waters with high conductivity.

Occurrence: Frequent in Reunion and rare in Rodrigues Island.

Fallacia sp. (Pl. 9, Fig. 7)

Features: Valves elliptic lanceolate with round apices, 8-12 µm long, 6-8 µm wide. Axial area very narrow. Lateral areas very slightly narrowed in mid-valve and terminate before reaching the apices. Striae very fine and hardly resolved under LM, ca. 38-40 in 10 µm.

Occurrence: Rare in Reunion Island.

Family Diploneidaceaea Mann

Diploneis crabro Ehrenberg (Pl. 8, Fig. 11)

References: Hustedt 1931-59, p. 616, fig. 1028; Witkowski et al. 2000, p. 184, pl. 93, figs 18-21; Lobban et al. 2012, pl. 44, fig. 5; pl. 45, figs 1, 2.

Features: Apical axis: 52-86 µm, transapical axis: 18-24 µm, striae 6-8 in 10 µm. Valves panduriform with abruptly round to acute apices. Central raphe endings sub-orbicular and extended to form parallel horns. Furrows relatively narrow and bordered by large areolae. Costae coarse and alternating with double rows of areolae.

Remarks: specimens from the Mascarenes are smaller in size with higher stria density than those reported from other geographical regions (see ref. cit.). Widely distributed marine species.

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G).

Diploneis smithii (Brébisson) Cleve (Pl. 8, Fig. 12)

References: Hustedt 1931-59, fig. 1051; Witkowski et al. 2000, pl. 88, figs 2-5, pl. 89, fig. 1; Lobban et al. 2012, p. 290, pl. 45, figs 3–6; pl. 46, fig. 1.

Features: Apical axis: 30-58 µm, transapical axis: 14-30 µm, striae 12-16 in 10 µm. Valves elliptical with round apices. Central raphe endings small, round or elliptical with truncate ends, expanded forming two horns on both sides of the raphe. Furrows narrow and close to the horns. Costae separated by two rows of areolae decreasing in size towards valve margins.

Remarks: Taxon variable in valve shape, outline and length of longitudinal canals which run across valve width. Several varieties were described but these may be variations due to different environmental conditions (Droop 1994, Lobban et al. 2012,). Widely distributed species in marine, brackish and inland waters with high conductivity.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Diploneis weissflogii (A.Schmidt) Cleve (Pl. 8, Fig. 13)

References: Hustedt 1931-59, fig. 1085; Witkowski et al. 2000, pl. 92, figs 4-5, pl. 94, figs 12-13.

Features: Apical axis: 18-28 µm, transapical axis: 12-18 µm, striae 8-9 in 10 µm. Valves elliptical with round to slightly produced apices, sharply constricted in the middle forming tongue-shaped

halves. Central raphe endings small and elongate. Horns parallel and approaching at ends. Costae marked and elongated in mid-valve, slightly radiate and interrupted by several longitudinal ribs.
Remarks: Only small specimens have been found in the Mascarenes and all with one half of the valve slightly larger than the other. Widespread species in warm waters.
Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Family Naviculaceaea Kützing

Amicula* cf. *specululum (Witkowski) Witkowski (Pl. 13, Fig. 7)
References: Witkowski et al. 2000, p. 127, pl. 65, figs 1-14.
Features: Apical axis: 8-9 µm, transapical axis: 3-4 µm, striae 38 in 10 µm. Valves broadly elliptic with round apices. Valve surface almost flat, raphe straight with straight terminal raphe endings positioned far from the margin. Striae parallel in mid-valve, strongly radiate near the apices and limited to marginal part of the valve.
Remarks: Similar to *A. specululum* illustrated in Witkowski et al. (2000) but differs in the length of striae (longer in our specimens) and stria density (38 in 10 µm versus 30 in *A. specululum*).
Occurrence: Rare in Reunion Island.

Haslea nautica (Cholnoky) Giffen (Pl. 9, Fig. 4)
References: Giffen 1980, p. 146, fig. 64; Witkowski et al. 2000, p. 224, pl. 148, figs 9-11.
Features: Apical axis: 64-80 µm, transapical axis: 10-15 µm, striae 16-18 in 10 µm. Valves lanceolate with sub-acute apices. Raphe straight and lacking central area, axial area narrow. Striae composed of rectangular poroids separated from each other by hyaline areas along axial rows.
Remarks: Only large specimens were observed in the Indian Ocean material. Stria density is slightly higher than that reported by the above mentioned references but corresponds with that given by Lobban et al. (2012) from Guam (Pacific Ocean). Widely distributed species in marine and brackish waters.
Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Hippodonta sp. (Pl. 14, Fig. 6)
Features: Valves elliptic to linear elliptic with round apices, 7-9 µm long, 2-2.5 µm wide. Axial area very narrow, central area rectangular and developed in a fascia delineated by one short stria on both sides of the valve. Raphe straight, terminal raphe endings terminate at some distance from the apices, slightly deflected to one direction. Striae parallel, formed of slightly apically elongate areolae, 18-20 in 10 µm.
Remarks: Several *Hippodonta* species of very small size were observed under SEM, but identification was not possible due to insufficient material.
Occurrence: Rare in Reunion and in Rodrigues Islands.

Navicula* cf. *arenaria* var. *rostellata Lange-Bertalot (Pl. 5, Fig. 8)
References: Krammer & Lange-Bertalot 1986, p. 118, pl. 39, fig. 2; Witkowski et al. 2000, p. 267, pl. 116, figs 19-21, pl. 129, fig. 29.
Features: Apical axis: 32-46 µm, transapical axis: 7-9 µm, striae 11-13 in 10 µm. Valves linear lanceolate with produced apices. Raphe straight, axial area very narrow, central area nearly rectangular and occupying half width of the valve. Striae slightly curved in mid-valve, becoming parallel towards the apices.

Remarks: Stria density is slightly higher than that reported by Krammer & Lange-Bertalot (1986, 9-10 in 10 µm). It differs from *N. arenaria* var. *arenaria* only by having linear lanceolate valves. Marine species but also present in freshwater with high conductivity (Patrick & Reimer 1966).

Occurrence: Rare in Reunion and Rodrigues Islands.

Navicula* cf. *directa (W.Smith) Ralfs (Pl. 5, Fig. 15)

References: Poulin et al. 1990, p. 138, pl. 18, fig. 24, Witkowski et al. 2000, p. 275, pl. 129, fig. 1, pl. 133, figs 10-12; Al-Handal & Wulff 2008, p. 429, figs 87, 88.

Features: Apical axis: 52-70 µm, transapical axis: 8-10 µm, striae 10-12 in 10 µm. Valves linear-lanceolate with subacute apices. Raphe straight, axial area very narrow, central area rectangular to suborbicular, proximal and distant raphe ending small. Striae radiate but becoming parallel towards apices.

Remarks: Small forms of this species were encountered with stria density slightly higher than that reported in the literature (see ref. cit.). Stria density of *N. directa*, however, is highly variable, Witkowski et al. (2000) reported stria density as low as 4 in 10 µm.

Occurrence: Rare in Reunion and Rodrigues Islands.

Navicula longa* var. *irregularis Hustedt (Pl. 5, Fig. 16)

References: Simonsen 1987, p.413, pl. 618, figs 4-6; Witkowski et al. 2000, p. 288, pl. 135, figs 7-12; Hein et al., 2008: p. 76, pl. 50, figs 1-3.

Features: Apical axis: 58-79 µm, transapical axis: 8-12 µm, striae 9-11 in 10 µm. Valves long, rhombic-lanceolate with subacute apices. Raphe straight, axial area narrow, proximal raphe endings small. Central area rectangular or elliptical. Striae weakly radiate at the centre, becoming parallel towards apices.

Remarks: Stria density is slightly higher than that reported (Witkowski et al. 2000), but similar stria density were observed in specimens from Kuwait coasts (Al-Yamani & Saburova 2011, p.108, pl. 82, figs f-j).

Occurrence: Frequent in Reunion and Rodrigues Islands.

Navicula perminuta Grunow (Pl. 5, Fig. 6)

References: Krammer & Lange-Bertalot 1986, p. 112, pl. 35, figs 14-20; Witkowski et al. 2000, p. 297, pl. 125, figs 12-19; Busse & Snoeijs 2002, figs 12-15.

Features: Apical axis 14-20 µm, transapical axis: 3-5 µm, striae 13-16 in 10 µm.

Occurrence: Frequent in Rodrigues, rare in Reunion Island.

Navicula perrhombus Hustedt *ex* Simonsen (Pl. 5, Fig. 10)

References: Simonsen 1987, p.163, pl. 262, figs 7-12; Witkowski et al. 2000, p. 298, pl. 142, figs 24-26; Al-Handal, 2009: p. 20, fig. 101.

Features: Apical axis: 16-20 µm, transapical axis: 8-10 µm, striae 10-12 in 10 µm.

Remarks: Specimens observed have valves more elliptic than rhombic. Rarely recorded from tropical waters.

Occurrence: Rare in Reunion Island.

Navicula* cf. *salinarum* var. *rostrata (Hustedt) Lange-Bertalot (Pl. 5, Fig. 7)

References: Witkowski et al. 2000, p. 304, pl. 123, figs 9-13.

Features: Apical axis: 26-34 µm, transapical axis: 8-9 µm, striae 18-22 in 10 µm. Valves linear lanceolate with produced capitate apices. Raphe straight, axial area indistinct, proximal raphe

endings slightly deflected, central area small and round. Striae strongly radiate in mid-valve with alternating shorter and longer ones.

Remarks: Valve outline and striation match the illustrations given by Wikowski et al. (2000), but differs in stria density and also valve sides are more or less parallel.

Occurrence: Rare in Rodrigues Island. *N. salinarum* was reported from Seychelles (G).

***Navicula* sp. 1** (Pl. 9, Fig. 6)

Features: valves lanceolate with acutly round apices, 16-20 µm long, 4-7 µm wide. Raphe straight, axial area very narrow, central area small and slightly elevated. Striae parallel in the centre, slightly radiat towards the apices, 20-22 in 10 µm.

Occurrence: Rare in Reunion Island.

***Navicula* sp. 2** (Pl. 13, Fig. 9)

Features: Valves elliptic to broadly lanceolate with protracted subrostrate ends, 10-13 µm, 6-7 µm wide. Axial area narrow, linear. Central area rectangular, with one shortened stria bordering the central area. Raphe branches straight with distinct central raphe endings, slightly deflected to the same direction. Distal raphe endings terminate at apices and deflected to the same direction. Apices with two distinct areolae. Transapical striae moderately radiate in mid-valve becoming convergent at the ends, 20-22 in 10 pm. Striae composed of 4-5 distinctly elongated areolae.

Remarks: A population of a rather small-sized *Navicula* also appeared in the SEM material from the Mascraenes but identification was difficult due to rarity of the specimens.

Occurrence: Rare in Reunion Island.

Olifantiella mascarenica Riaux-Gobin et Compère (Pl. 14, Fig. 1)

References: Riaux-Gobin & Compère 2009, p. 180, figs (LM) 1-5, figs (SEM) 6-22.

Features: Apical axis: 6.7- 8.2 µm long, 1.8-3.4 µm wide, striae 37-41 in 10 µm. Valves small, linear lanceolate with capitate apices, very slightly constricted in mid-valve. Raphe straight, filiformm, axial area very narrow, proximal raphe endings close to each other, small, simply inflated, terminal raphe endings small, slightly deflected. Striae parallel throughout and not reaching the valve margin.

Remarks: This species is so far only recorded from marine lagoons in Reunion Island.

Occurrence: Frequent in Reunion Island.

Seminavis robusta D.B. Danielidis & D.G. Mann (Pl. 8, Fig. 8)

Basionym: Amphora ventricosa Gregory

References: Peragallo & Peragallo 1897-1908, pl. 50, fig. 39 (as *Amphora angusta* var. *ventricosa* (Gregory) Cleve); Hendey 1964, p. 38, fig. 12 (as *Amphora ventricosa* Gregory)

Features: Apical axis: 54-68 µm, transapical axis:10-15 µm, striae 14-15 in 10 µm on the dorsal side and 15-18 in 10 µm on the ventral side. Valves semi-lanceolate with narrowly round apices, convex dorsal margin and slightly convex ventral margin. Ventral stria slightly radiate in mid-valve and becoming parallel towards apices.

Remarks: The illustration given by Hendey (1964) for *A. ventricosa* matches that of Peragallo & Peragallo (1897-1908) as *Amphora angusta* var. *ventricosa* which makes both forms the same species. Also Wikowski et al. (2000) showed several images (pl. 164, figs 21-25) as *Seminavis* sp. which also fit with *Amphora angusta* var *ventricosa*. *Amphora ventricosa*, however, was transferred to *Seminavis ventricosa* by Garcia-Baptista (1993), although according to Danielidis & Mann (2002) this combination was based on a lectotype not corresponding to Greville's slide of *A.*

ventricosa examined by Garcia-Baptista (1993). *A. angusta* and *A. ventricosa* seem to be conspecific and a great confusion in their identity can be found in the literature including assigning several varieties to *Amphora angusta* [see detailed discussion and literature by Danielidis & Mann (2002)].

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G).

Seminavis sp. (Pl. 8, Fig. 7)

Features: Valves semi-lanceolate with round apices, 30-38 µm long, 6-8 µm wide. Dorsal margin convex, ventral margin straight in the middle and very narrowly concave towards the apices. Raphe straight, central nodules slightly deflected, distal endings markedly deflected into the same direction. Transapical striae very fine and hardly resolved under LM but with higher magnification it appear parallel in mid-valve, slightly radiating towards the apices, 42-44 in 10 µm.

Occurrence: Rare in Reunion and Rodrigues Islands.

Trachyneis aspera (Ehrenberg) Cleve (Pl. 8, Fig. 15)

References: Witkowski et al. 2000, p. 355, p. 159, figs 1-6, 9; Hein et al. 2008, p. 82, pl. 55, fig. 3; Lobban et al. 2012, p. 293, pl. 48, figs 4-9.

Features: Apical axis: 58-90 µm, transapical axis: 12-28 µm, striae 10-12 in 10 µm.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Family Pinnulariaceae Mann

Caloneis linearis (Grunow) Boyer (Pl. 5, Fig. 9)

References: Stidolf et al. 2000, pl. 16, fig. 84; Wikowski et al. 2000, p.166, pl. 160, fig. 12.

Features: Apical axis: 40-42 µm, transapical axis: 5 µm, striae very fine. Valves linear with round apices and parallel sides. Raphe straight, slightly bent near the center, axial area narrow, central area small and round. Striae weakly radiate throughout.

Remarks: Only few small specimens were observed. Marine species widely distributed in coastal regions.

Occurrence: Very rare in Rodrigues Island.

Family Pleurosigmacaea Mereschkowsky

Pleurosigma elongatum W.Smith (Pl. 9, Fig. 3)

References: Hendey 1951, p. 62, pl. X1, fig. 10; Sar et al. 2014, p. 160, figs 48-50.

Features: Apical axis: 110-130 µm, transapical axis: 18-38 µm, oblique striae 16-18 in 10 µm. Valves long, slender, linear lanceolate slightly tapering from the middle to acute apices. Raphe central with small proximal and terminal endings. Striae transverse and oblique crossing each other at 60°.

Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Pleurosigma formosum W.Smith (Pl. 9, Fig. 2)

References: Hendey 1951, p. 62, pl. X1, fig. 6; Podzorski & Håkansson 1987, p. 86, pl. 35, figs 1, 1a; Hein et al. 2008, p. 80, fig. 56:1

Features: Apical axis: 110-130 µm, transapical axis: 18-38 µm, oblique striae 16-18 in 10 µm. Valves lanceolate to linear-lanceolate with subacute apices. Raphe strongly sigmoid, running from

the central nodule towards the convex part of valve margin giving a twist appearance. Transverse striae slightly more dense than the oblique ones.

Remarks: Short and small sized valves were only observed, the species can reach 550 µm long. Widely distributed marine epipelic, epiphytic and neritic species.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Pleurosigma rigidum W.Smith (Pl. 9, Fig. 1)

References: Sterrenburg 2001, p. 124, figs 7-10, 17-22.

Features: Apical axis: 110-190 µm, transapical axis: 14-34 µm, oblique striae 18-20 in 10 µm. Valves weakly sigmoid, linear-lanceolate with obtuse apices. Raphe central with small proximal and terminal endings. Striae oblique, crossing each other with an angle of 60°.

Remarks: According to Sterrenburg (2001), *P. rigidum* is hardly differentiated from *P. validum* under LM due to the valve outline similarity and stria density; the later should be considered as synonym. At present both taxa are still being considered as two separate species. Owing to the absence of type material of *P. validum*, further observation under SEM is not possible. The material examined contained only small forms of this species as with other *Pleurosigma* spp. encountered.

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G) and Mauritius (D).

Order Thalassiophysales Mann
Family Catenulaceaea Mereschkowsky

Amphora acutiuscula Kützing (Pl. 8, Fig. 9)

References: Krammer & Lange-Bertalot 1986, p.348, fig. 151:6; Snoeijs & Potapova 1995, p. 21, fig. 209; Witkowski et al. 2000, p. 128, pl. 161, figs 10-13.

Features: Apical axis 34-50 µm, transapical axis: 7-11, striae 16-20 in 10 µm.Valves broadly semi linear-lanceolate with produced sub-capitate apices. Raphe close to the ventral margin. Striae on the dorsal side radiate.

Remarks: The observed specimens characterized by broad valves. Images shown *in* Witkowski et al. (2000) have much narrower valves than the dimensions given in their text (ref. cit., p. 128). Snoeijs & Potapova (1995) reported valves with width not exceeding 7 µm.Widely distributed species in marine and brackish water.

Occurrence: Rare in Reunion and Rodrigues Islands.

Amphora bigibba Grunow (Pl. 13, Figs 1, 2)

References: A. Schmidt Atlas, pl. 25, figs 66, 67, 69-77; Hustedt 1955, p. 40, pl. 14, figs 19-25 (as *Amphora binodis* var. *bigibba* (Grunow) Peragallo); Navarro 1982, p. 322, fig. 17; Navarro & Lobban 2009, Figs 135, 136.

Features: Apical axis: 18-22 µm, transapical axis: 4-6 µm, striae 25-27 in 10 µm on the dorsal side, 35-38 in 10 µm on the ventral side. Valves lanceolate, constricted at the middle forming two convex sides, with truncate sub-acute apices. Raphe straight and close to the ventral margin.

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G).

Amphora coffeaeformis (C.Agardh) Kützing (Pl. 8, Figs 4, 5)

References: Krammer & Lange-Bertalot 1986, fig. 151:1-6; Witkowski et al. 2000, pl. 161, figs 21-25.

Features: Apical axis: 32-40 µm, transapical axis: 8-12 µm, striae 12-20 in 10 µm. Valves linear to elliptic-lanceolate, arcuate on the dorsal side, with produced capitate apices. Raphe very close to the ventral margin which is slightly concave in some specimens.

Remarks: Stria density in the observed specimens are less than that reported for the species (see ref. cit.). Under LM, this species may look similar to *Amphora acutiuscula* Kützing but the latter possess a higher stria density. Widespread species in coastal regions and in inland waters with high conductivity.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles Islands (G).

Amphora helenensis Giffen (Pl. 13, Figs 5, 6)

References: Giffen 1973, p. 33, figs 7-9; Witkowski et al. 2000, p. 139, pl. 163, figs 31-33.

Features: Apical axis: 6-8 µm, transapical axis: 3-4 µm, striae 24-25 in 10 µm. Valves lunate-shaped with broadly round apices. Raphe close to the ventral margin, slightly bi-arcuate. Axial area narrow, central area extend to one direction. Striae composed of transverse areolae.

Remarks: Stria density rather higher than that reported by Wikowski et al. (2000). Observed specimens were with small valves which could not be clearly resolved under LM.

Occurrence: Rare in Reunion Island.

Amphora holsatica Hustedt (Pl. 8, Figs 2, 3)

References: Krammer & Lange-Bertalot 1986, p. 349, fig. 152:1-6; Simonsen 1987, pl. 132, figs 11-16.

Features: Apical axis: 30-45 µm, transapical axis: 8-12 µm, striae 10-14 in 10 µm. Valves semi-lanceolate with protracted sub-subrostrate apices. Dorsal margin convex, ventral margin flat to slightly concave. Raphe straight, fifliform, very close to ventral margin. Striae on dorsal margin coarsely punctate and very fine on ventral margin.

Remarks: Under LM, this species looks very similar to *A. pseudoholsatica* Nagumo & Kobayasi, *A. holsaticoides* Nagumo & Kobayasi and *A. subholsatica* Krammer. Stria density on the dorsal side of the valve appears similar in all of these taxa. The main differences are in the ultrastructure of some features other than stria density which can only be observed under SEM.

Occurrence: Frequent in Reunion and rare in Rodrigues Island.

Amphora laevissima W. Gregory (Pl. 8, Fig. 1)

References: Snoeijs & Balashova 1998, p.22, fig. 410; Witkowski et al. 2000, p. 142, pl. 168, figs 5-7.

Features: Apical axis: 42-60 µm, transapical axis: 8-12 µm, striae 26-28 in 10 µm on the dorsal side. Valves linear lanceolate, slightly constricted in the middle of ventral side, with slightly deflected sub-truncate apices. Raphe bi-arcuate, axial area very narrow, central area dilated to a sort of fascia reaching the dorsal valve margin.

Remarks: This is a common species found in all marine environments.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles Islands (G).

Amphora* cf. *marina W. Smith (Pl. 8, Figs 6, 10)

References: Witkowski et al. 2000, pl. 162, figs 8-14, pl. 166, figs 9-11; Al-Handal & Wulff 2008, p. 54, figs 112-115; Levkov 2009, p. 470, Fig. 7.

Features: Apical axis: 16-28 µm, transapical axis: 6-8 µm, striae 14-16 in 10 µm.

Remarks: Only small specimens were observed which match the illustrations of *A. marina*. The ventral striae which is composed of single, clearly elongated areolae increased in length towards the mid-valve and converge toward the ends may distinguish this species. Widely distributed species on marine coasts.

Occurrence: Frequent in Reunion, rare in Rodrigues Island.

Amphora pediculus (Kützing) Grunow (Pl. 13, Fig. 3)

References: Krammer & Lange-Bertalot 1986, fig.150: 8-13; Snoeijs 1993, p. 24, fig. 10.

Features: Apical axis: 3-6 µm, transapical axis: 4-5 µm, striae 20-22 in 10 µm. Valves broadly semi-elliptic with arched dorsal margin and round apices. Raphe straight, distal raphe endings dorsally deflected. Dorsal striae with 2-3 rows of areolae and ventral striae composed of one row of areolae.

Remarks: Very small species, striae not resolved under LM. Freshwater species, most likely drifted to the study sites.

Occurrence: Rare in Rodrigues Island.

Amphora* cf. *rhombica* var. *intermedia Cleve (Pl. 13, Fig. 4)

References: Peragallo 1897-1908, pl. 50, fig. 3; Snoeijs & Kasperoviciene 1996, p. 28, fig. 316.

Features: Apical axis: 45 µm, transapical axis: 7-9 µm, striae on the dorsal side 13-15 in 10 µm, 15-18 in 10 µm on the ventral side. Valves semi-rhomboidal with slightly inflated ventral margin and convex dorsal margin. Raphe slightly bi-arcuate, central area small, axial area narrow. Dorsal striae composed of rows of elongated areolae.

Remarks: The observed specimens were relatively small. This taxon differs from the nominate variety only by its valve size and coarser striae. A fresh to brackish water species, probably drifted to the study site.

Occurrence: Rare in Rodrigues Island. Previously reported from Seychelles (G).

Halamphora angularis (Greory) Levkov (Pl. 14, Fig. 2)

References: Levkov 2009: p. 169, pl. 110, fig. 16, pl. 250, figs 5, 6

Features: Apical axis: 26-28 µm, transapical axis: 6-8 µm, striae 17-19 in 10 µm.

Occurrence: Rare In Reunion Island.

Order Bacillariales Hendey
Family Bacillariacaeae Ehrenberg

Bacillaria paxillifera* var. *tumidula (Grunow) Witkowski, Lange-Bertalot & Metzeltin (Pl. 10, Fig. 3)

References: Hustedt 1931-59, p. 849, fig. 756; Wikowski et al. 2000, p. 357, pl. 196, fig. 8.

Features: Apical axis: 80-110 µm, transapical axis: 6-9 µm, striae 24-26 in 10 µm, fibulae 10-12 in 10 µm. Valves linear lanceolate with produced apices and inflated sides in the central part. Keel occupy central position on valve face with unevenly spaced fibulae.

Remarks: Easily distinguished from the type variety by the inflated central part of the valve which do not appear identical on both sides of the median line.

Occurrence: Frequent in Reunion and rare in Rodrigues Island.

Bacillaria socialis (Gregory) Ralfs (Pl. 10, Fig. 8)

References: Poulin et al. 1990, p. 75, figs 2-4, 8; Witkowski et al. 2000, p. 357, pl. 196, figs 5-7, pl. 207, fig. 9.

Features: Apical axis: 36-50 µm, transapical axis: 5-7 µm, fibulae 9-10 in 10 µm. Valves linear lanceolate tapering into produced subacute apices. Keel central, fibulae evenly spaces.

Remarks: According to Jahn & Schmidt (2007), both *Bacillaria paxillifera* var. *tumidula* and *B. socialis* do not belong to the genus *Bacillaria* Grunow. These authors compared the Grunow's and Gregory's *(Nitzschia socialis*) lectotypes with Witkowski et al. (2000) images and found noticeable differences in valve structure. In this context, these taxa needs to be examined thoroughly under LM and SEM and to compare them with lectotypes to verify their correct identity.

Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Ceratoneis closterium Ehrenberg (Pl. 10, Fig. 9)

References: Krammer & Lange-Bertalot 1988, p. 124, fig. 87:1, 2; Witkowski et al. 2000, p. 374, pl. 212, figs 4-6 (both as *Nitzschia closterium* (Ehrenberg) W. Smith); Jahn & Kusber 2005, p. 301, figs 3-7.

Features: Apical axis 40-210 µm, transapical axis 3-6 µm, striae very fine, fibulae 30-36. Valves narrowly elliptical tapering into long hair-like apices, usually deflected either to the same or to opposite directions. Raphe eccentric. Fibulae evenly spaced but the central two are more distant.

Remarks: This species is often identified as *Cylindrotheca closterium* (Ehrenberg) Reimann & Lewin. The genus *Ceratoneis* Ehrenberg has been typified by Jahn & Kusber (2005) and included species of the genus previously classified under *Nitzschia* and *Cylindrotheca*. Widespread species in all marine and brackish waters.

Occurrence: Common in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Nitzschia distans Gregory (Pl. 10, Fig. 12)

References: Hendey, 1964, p. 281; Witkowski et al., 2000: p. 378; pl. 203, figs 7-9.

Features: Apical axis: 40-52 µm, transapical axis: 4-7 µm, striae very fine, fibulae unevenly spaced, 3-5 in 10 µm. Valves narrow lanceolate with produced apices having short braod extensions seen only in girdle view. Keel central, fibulae irregular in size. Striae interrupted by a longitudinal line on both sides of the keel.

Remarks: Striae in the observed specimens could not be resolved under LM but the species can be distinguished by the inflated corners with the short expansions in the girdle view.

Occurrence: Rare in Reunion island. Previously reported from Seychelles (G).

Nitzschia hybrida Grunow (Pl. 10, Fig. 10)

References: Krammer & Lange-Bertalot 1988, p. 61, pl. 46, figs 3-6; Witkowski et al. 2000, p. 385, pl. 191, figs 12-14.

Features: Apical axis: 55 µm, transapical axis: 8 µm, striae 28 in 10 µm, fibulae 8 in 10 µm. Vaves linear, slightly constricted in mid-part of dorsal margin, with acutely round apices. Raphe eccentric, fibulae unevenly spaced, the two central ones are distant.

Remarks: A single specimen was observed which is relatively small for this species. A widely distributed species particularly in brackish waters, rarely from tropical waters.

Occurrence: Very rare in Reunion Island.

Nitzschia insignis Gregory (Pl. 10, Fig. 11)

Reference: Witkowski et al. 2000, p. 387, pl. 202, fig. 5, pl. 204, figs 1-7.

Features: Apical axis: 72 µm, transapical axis: 7 µm, striae 12-14 in 10 µm, fibulae 6 in 10 µm. Valves linear with round apices. Raphe central, fibulae elongated and occupying almost half of the valve width.

Remarks: Only two specimens were observed, valve size rather small.

Occurrence: Very rare in Rodrigues Island.

Nitzschia* cf. *perindistincta Cholnoky (Pl. 10, Fig. 7)

References: Lange-Bertalot & Krammer, 1987, p. 41, pl. 38, figs 1-22; Witkowski et al. 2000, p. 399, pl. 208, figs 12-16.

Features: Apical axis: 22-26 µm, transapical axis: 6-9 µm, striae very fine, fibulae 12-14 in 10 µm. Valves linear lanceolate with produced apices. Raphe eccentric, fibulae evenly spaced.

Remarks: This may represent large forms of *N. perindistincta* although valves appear more elliptic. Marine to brackish water species, not very well documented in the literature.

Occurrence: Rare in Rodrigues Island.

Nitzschia* cf. *scalpelliformis (Grunow) Grunow (Pl. 10, Fig. 2)

References: Krammer & Lange-Bertalot 1988, p. 26, pl. 18, figs 2-5, 7, 11, 12; Witkowski et al., 2000: p. 404, pl. 201, figs 10-12; pl. 202, figs 1-3; Hein et al., 2008: p. 86, fig. 60: 2.

Features: Apical axis: 82-140 µm, transapical axis: 6-8 µm, striae 18-20 in 10 µm, fibulae 8-10 in 10 µm. Valves linear, weakly sigmoid with slightly oblique and round apices. Keel almost central but slightly deflected in at the center of the valve. Fibulae evenly spaced with two central distant ones.

Remarks: Specimens observed match the figures and description of this species (see ref. cit.) but having much less stria density which is 25-38 in 10 µm. Widely distributed species in marine and brackish waters.

Occurrence: Common in Reunion and frequent in Rodrigues Islands.

Nitzschia sigma (Kützing) W.Smith (Pl. 10, Fig. 4)

References: Krammer & Lange-Bertalot 1988, p. 32, pl. 23, figs 1-9; Witkowski et al., 2000: p. 404, pl. 206, figs 1-10; Hein et al., 2008: p. 86, fig. pl. 60, fig. 3.

Features: Apical axis: 62-80 µm, transapical axis: 5-9 µm, striae 24-30 in 10 µm, fibulae 12-14 in 10 µm. Valves linear, slightly sigmoid with sub-acute apices. Raphe eccentric, fibulae evenly spaced.

Remarks: This species can reach several hundreds micrometers long but only short specimens were observed. Widely distributed species in marine and brackish waters, also in inland waters with high conductivity.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Nitzschia ventricosa Kitton (Pl. 10, Fig. 1)

References: Witkowski et al. 2000, p. 408, pl. 204, fig. 8; Lobban et al. 2012, p. , 304, pl. 62, figs 1, 2

Features: Apical axis: 180-400 µm, transapical axis: 9-18 µm, striae 30-32 in 10 µm, fibulae 4-8 in 10 µm. Valves linear elliptic tapering into long filiform apices. Raphe eccentric, fibulae elongate to almost three quarters of valve width, unevenly spaced.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Psammodictyon panduriforme (W.Gregory) D.G. Mann (Pl. 10, Fig. 5)

References: Hendey, 1970: p. 157, pl. 5, fig. 56; Witkowski et al. 2000, p. 397, pl. 184, figs 13, 14 and pl. 186, figs 1, 2 (both as *Nitzschia panduriformis* Gregory); Lobban et al. 2012, p. 304, pl. 62, figs 3, 4

Features: Apical axis: 60-96 µm, transapical axis: 16-25 µm, striae 16-18 in 10 µm, fibulae 9-10 in 10 µm. Valves linear elliptic with slightly constricted sides and broadly cuneate apices. Raphe eccentric. Transapical striae interrupted by a longitudinal hyaline area in a form of a fold along the apical axis but can also be shifted towards the marginal keel.

Occurrence: Frequent in Reunion and Rodrigues Islands. Previously reported from Seychelles (G) and Mauritius (D).

Psammodictyon* cf. *panduriforme* var. *continua (Grunow) Snoeijs (Pl. 10, Fig. 14)

Basionym: *Nitzschia* cf. *panduriformis* var. *continua* Grunow

References: Snoeijs & Balashova 1998, p. 88, fig. 476 (as *Psammodictyon panduriformis* var. *continua* (Grunow) Snoeijs); Witkowski et al., 2000, p. 398, pl. 183, fig. 6

Features: Apical axis: 10-15 µm, transapical axis: 4-7 µm, striae 16-17 in 10 µm, fibulae 12-14 in 10 µm.

Remarks: The specimens observed were relatively small but with similar stria density than those illustrated by Snoeijs & Balashova (1993) and rather different from those of Witkowski et al. (2000) who reported 20-21 in 10 µm.

Occurrence: Rare in Reunion Island.

Tryblionella acuta (Cleve) D.G.Mann (Pl. 10, Fig. 6)

References: Desikachary 1989, pl. 651, figs 1-11, pl. 652, figs 1-4 as *Nitzschia tryblionella*.

Features: apical axis: 105-120 µm, transapical axis: 15-20 µm (middle part). Striae 13-15 in 10 µm. Valves oblong lanceolate, slightly constricted in mid-valve, with obtusely round apices. Raphe eccentric, fibulae evenly spaced with the central two distal. Transapical striae interrupted by a longitudinal apical fold. Striae punctate, puncta give the appearance of transverse ribs.

Occurrence: Rare in Reunion Island.

Tryblionella coarctata (Grunow) D.G.Mann (Pl. 10, Fig. 13)

References: Navarro 1983b, p. 394, figs 12-15; Krammer & Lange-Bertalot 1988, p. 50, fig. 38:13-15A; Witkowski et al., 2000: p. 374, pl. 183, fig. 13, pl. 186, Figs 4-13 (all as *Nitzschia coarctata*).

Features: Apical axis: 24-34 µm, transapical axis: 10-18 µm, areolae 12-16 in 10 µm, fibulae 14 in 10 µm. Valves linear, slightly concave at the center, with broadly cuneate apices. Raphe eccentric. Transapical striae in transverse rows interrupted by an apical longitudinal fold.

Remarks: The observed specimens possess slightly higher stria and fibula densities.

Occurrence: Frequent in Reunion and rare in Rodrigues Island.

Order Surirellales Mann

Family Entomoneidacaea Reimer

Entomoneis* cf. *gigantea Grunow (Pl. 8, Fig. 14)

References: Grunow 1860, p. 258, pl. 6, fig. 12; Peragallo 1897-1908, p1. 48, figs 1-3 (as *Amphiprora gigantea* var *sulcata* O'Meara); Al-Handal & Wulff 2008, p. 54, figs 117,119.

Features: Apical axis: 52-80 µm, transapical axis: 28-38 µm, striae 16-18 in 10 µm. Cells strongly constricted. Keel with a hyaline margin. Junction line curved like a bow. Keel with puncta forming obliquely decussating rows, Striae curved, divergent from the central nodule, not decussating. Median line strongly sigmoid. Connecting zone with numerous longitudinal divisions.

Remarks: This species is often confused with *Amphiprora sulcata* O'Meara with similarities in valve outline but the stria number in the latter is higher, reaching 21 in 10 µm. Areolae in the dorsal side of *E. gigantea* are also more distant from each other. Widely distributed species in all marine regions.

Occurrence: Rare in Rodrigues Island. Previously reported from Seychelles (G).

***Entomoneis* sp.** (Pl. 14, Fig. 8)

Features: Frustules strongly constricted in mid-valve, with biarcuated sides, 40-45 µm long, 14-18 µm broad. Valves very finely striated and hardly resolved under LM, around 40-50 in 10 µm.

Remarks: Very few specimens observed lying in girdle view, valve face could not be examined.

Occurrence: Rare in Reunion Island.

Family Surirellacaea Kützing

Campylodiscus incertus A. Schmidt (Pl. 11, Fig. 8)

References: Desikachary, 1988, pl. 485, fig. 1; Navarro 1983b, p. 396, fig. 59.

Features: Diameter 35-58 µm, central area on external valve surface is broad, divided by two radiating rows of costae, 14-15 in 10 µm.

Remarks: Under LM, this species appears similar to *C. innominatus* Ross et Abdin (Ross & Abdin 1949, p. 227, fig. 4). The latter species has narrower central area and the costae are parallel.

Occurrence: Rare in Reunion Island. Previously reported from Seychelles (G).

Campylodiscus latus Shadbolt (Pl. 11, Figs 5, 6)

References: Desikachary 1988, pl. 482, figs 4, 5, 9-11, 13.

Features: Diameter 50-60 µm, infundibula 2 in 10 µm, extending from the raphe keel toward a broad elliptic lanceolate central area. *C. latus* is very similar to *C. ambiguus* Greville and according to Ruck & Kociolek (2004), the latter is a synonym to *C. latus*. However, type material has not been examined in detail and both taxa remain separate (Lobban et al. 2012).

Occurrence: Rare in Reunion and Rodrigues Islands.

***Campylodiscus* sp**. (Pl. 11, fig. 7)

Features: Diameter 46-60 µm. Valve outline appears similar to *C. brightwellii* Grunow but the central area is narrow and is not divided by two parallel sets of costae. Elevation of the inner parts of the infundibula on both sides of the central area (external valve face) looks as two separate rows of costae.

Occurrence: Rare in Reunion Island.

Plagiodiscus nervatus Grunow (Pl. 11, Fig. 10, Pl. 14, Fig. 7)

References: Hendey, 1970, p. 160, pl. 4, fig. 39; Podzorski & Håkansson, 1987, p. 100, pl. 48, figs 2, 6 (as *Surirella nervata*); Lobban et al. 2012, pl. 66, figs 4, 5.

Features: Apical axis: 35-50 µm, transapical axis: 16-28 µm, striae fine, 24-26 in 10 µm, costae 4-5 in 10 µm.

Occurrence: Rare in Reunion and Rodrigues Islands. Previously reported from Seychelles (G).

Surirella fastuosa Ehrenberg (Pl. 11, Figs 1, 2)

References: Witkowski et al. 2000, p. 414, pl. 215, figs 1-3; Hein et al. 2008, p. 90, pl. 62, figs 2, 3, pl. 64, fig. 1; Lobban et al. 2012, p. 307, pl. 67, figs 2, 3, pl. 64, fig. 1.

Features: Apical axis: 48-80 µm, transapical axis: 28-50 µm, marginal alae 2 in 10 µm. Valves broadly ovate with round apices. Raphe canal small, central area broadly lanceolate. Marginal alae small. Costae dilated near the margin, becoming narrow towards the central area. Striae arranged along two narrow apical rows located half way beween the margin and the central area.

Remarks: S. fastuosa is one of the rather variable forms in valve shape and structure. The lanceolate central area may take different dimensions and shape and appear in various striation with changing focal view. For this reasons, several varieties were described.

Occurrence: Common in Reunion, frequent in Rodrigues Island. Previously reported from Seychelles (G) and Mauritius (D). *S. fastuosa* var. *cuneata* was also reported from Rodrigues (D).

Surirella* cf. *fluminensis Grunow (Pl. 11, Figs 3, 4)

References: A. Schmidt Atlas, pl. 5, fig. 6; Peragallo & Peragallo, 1897-1908, pl. 60, fig. 1.

Features: Apical axis: 42-76 µm, transapical axis: 25-46 µm, alae 2 in 10 µm.

Occurrence: Frequent in Reunion and rare in Rodrigues samples.

Petrodictyon gemma (Ehrenberg) D.G.Mann (Pl. 11, Fig. 9)

References: Hendey, 1964, p. 288, pl. XL, fig. 5, Pl. XLII, fig. 4; Krammer & Lange-Bertalot 1988, p. 191, pl. 140, figs 1-3 (both as *Surirella gemma*); Witkowski et al. 2000, p. 413, pl. 216, figs 8, 9.

Features: Apical axis: 52-70 µm, transapical axis: 24-26 µm, striae 18-20 in 10 µm, areolae 22-26 in 10 µm. Valves elliptic ovate with round apices. Alae reduced. Axial area very narrow. Costae unevenly spaced, transverse in mid-valve, alternate toward the apices, 5-6 in 10 µm.

Remarks: Only relatively small valves were observed, the species can be two folds longer than the observed ones. Costa density can be as low as 1-2 in 10 µm. Widely distributed marine and brackish water species, neritic or epiphytic, particularly in temperate regions.

Occurrence: Frequent in Reunion and Rodrigues Islands.

Concluding Remarks

In the diatom investigation which started in 2005 and proceeded during the following years, a large number of taxa were identified from Reunion and Rodrigues Islands, several of these were separately described and discussed in Riaux-Gobin et al. (2011c) and are not repeated here except for some taxa pertaining to the genera *Cocconeis*, *Amphicocconeis* or *Vikingea*, leaving 141 taxa treated in the present study. This general survey is the first on marine benthic diatoms from these islands and will add information to our knowledge on diatom assemblages of the reef biodiversity from that tropical region. This list however, is far from complete since sampling was carried out from selected sites in coral reefs surrounding Reunion and Rodrigues Islands. Further exploration may add other known or new taxa: i.e., lagoons bordering the reefs are particularly rich in epipssamic and epiphytic diatoms (*i.e*., Podzorski & Hakansson 1987; Navarro et al. 2000).

Several taxa recorded here are actually only known from Reunion and Rodrigues Islands and have not been so far recorded from other reef habitat or tropical regions. These include taxa occurring commonly on the reef sands or epiphytic on other macrophytes such as *Achnanthidium glyphos, Cocconeis alucitae, Cocconeis peltoides* var. *archaeana, Cocconeis borbonica, Cocconeis coralliensis, Cocconeis sigillata* and several other species which were described as new to science from Mascarene reefs (Riaux-Gobin & Compère 2008; Riaux-Gobin et al. 2011c). These taxa, on the other hand, although not known from any other region yet, cannot be considered endemic in the region. Many of these species are indeed very small in size and can easily be missed in samples examined under LM. Examination under both LM and SEM (as in the present work) can only reveal occurrence of such taxa. Under SEM, several very small taxa were observed as very rare in the material examined, *i.e.*, some taxa belonging to *Navicula* (16 species), *Hippodonta* (7 species), *Fallacia* (4 species) and *Luticola*. The latter taxa were not included in the present report since their correct identity could not be elucidated owing to insufficient examination or lack of appropriate literature.

Numerous taxa observed in the present study have been reported from other tropical regions or have cosmopolitan or tropical ubiquist distribution. However, some genera which are well known from reefs and warm waters were poorly represented in the material from Mascarene Islands. The most important of these is *Mastogloia* which is very widely represented in tropical regions. Lobban et al. (2012) have recorded 55 *Mastogloia* taxa from Guam (Western Pacific) and some more taxa were encountered in other tropical regions (*e.g.*, Hein et al. 2008 with 75 taxa from the Bahamas, Loir & Navarro 2013 with 80 taxa from the French Antilles). In the material examined, only 12 *Mastogloia* taxa were encountered. This may in part be due to the unsuitable conditions in Reunion reefs or lack of appropriate habitat samples such as macrophytes on which *Mastogloia* thrive. Rodrigues reef lagoons, on the other hand, are affected by anthropogenic activities and subject to freshwater effect which turn many of its lagoons into brackish water habitats. This might explain the accidental occurrence of some freshwater taxa such as *Amphora* cf. *rhombica* var. *intermedia* and *Amphora pediculus*.

The variable conditions between Reunion and Rodrigues reefs as a result of some natural environmental stresses resulted in the appearance of some species in two morphotypes, slightly different from each other in some structures but enough to be distinguished as separate taxa. The best example of such taxa are the small-sized morphotypes of *Achnanthidium glyphos*, *Cocconeis mascarenica*, *Cocconeis peltoides* and *Cocconeis sigillata* (see Riaux-Gobin et al. 2011c for details). It is not unusual, however, that diatoms respond to some environmental stresses by changing level of silicification during seasonal cycles which produce variations in some structures (see Round et al. 1990). The physico-chemical conditions that promote growth of morphotypes in Reunion and Rodrigues Islands and the maintenance of each morphotype still need to be investigated. Such phenomena may result in describing new varieties but modern molecular analysis may solve the problem of confusion in identification.

Table 1. Alphabetic list of benthic diatoms encountered in Reunion and Rodrigues Islands (see text for abbreviations).

Species	Figure	Reunion	Rodrigues
Achnanthes brevipes C.A. Agardh	Pl. 7, Fig. 20	f	f
Achnanthes cf. *brevipes* var *intermedia* (Kützing) Cleve	Pl. 7, Fig. 24	f	r
Achnanthes kuwaitensis Hendey	Pl. 7, Fig. 21	r	r
Achnanthes pulchella Heiden	Pl. 7, Fig 29	f	r
Achnanthes trachyderma (F.Meister 1935) Riaux-Gobin *et al.*	Pl. 7, Fig. 9	r	
Achnanthidium glyphos Riaux-Gobin, Compère et Witkowski	Pl. 12, Figs 1-3	c	r
Actinocyclus cf. *bipartitus* A.Mann	Pl. 1, Fig. 3		r
Actinocyclus octonarius Ehrenberg	Pl. 1, Fig. 1	r	f
Actinocyclus octonarius var. *tenellus* (Brébisson) Hendey	Pl. 14, Fig. 9	r	
Actinocyclus cf. *subtilis* (Gregory) Ralfs	Pl. 1, Fig. 4	r	r
Actinocyclus cf. *tenuissimus* Cleve	Pl. 1, Fig. 2	f	f
Amicula cf. *speculatum* Witkowski	Pl. 13, Fig. 7	r	
Amphicocconeis mascarenica Riaux-Gobin et Compère	Pl. 7, Fig. 2, Pl. 12, Fig. 4	c	r
Amphora acutiuscula Kützing	Pl. 8, Fig. 9	r	r
Amphora bigibba Grunow	Pl. 13, Figs 1, 2	r	
Amphora coffeiformis (C.Agardh) Kützing	Pl. 8, Figs 4, 5	f	f
Amphora helenensis Giffen	Pl. 13, Fig. 5, 6	r	
Amphora holsatica Hustedt	Pl. 8, Figs 2, 3	f	r
Amphora laevissima W.Gregory	Pl. 8, Fig. 1	f	f
Amphora cf. *marina* W.Smith	Pl. 8, Figs 6, 10	f	r
Amphora pediculus (Kützing) Grunow	Pl. 13, Fig. 3		r
Amphora cf. *rhombica* var. *intermedia* Cleve	Pl. 13, Fig. 4		r
Ardissonea robusta (Ralfs ex Pritchard) De Notaris	Pl. 6, Fig. 3	f	f
Astartiella cf. *punctifera* (Hustedt) Witkowski & Lange-Bertalot	Pl. 12, Fig. 5	r	r
Bacillaria paxillifera var. *tumidula* (Grunow) Witkowski, Lange-Bertalot & Metzeltin	Pl. 10, Fig. 3	f	r
Bacillaria socialis (Gregory) Ralfs	Pl. 10, Fig. 8	r	r
Berkeleya rutilans	Pl. 14, Fig. 5	r	
Berkeleya sp.	Pl. 14, Fig. 4	r	
Biddulphia pulchella Gray	Pl. 2, Fig. 4, Pl. 3, Fig. 4	r	f
Caloneis linearis (Grunow) Boyer	Pl. 5, Fig. 9		vr
Campylodiscus incertus A. Schmidt	Pl. 11, Fig. 8	r	
Campylodiscus latus Shadbolt	Pl. 11, Figs 5, 6	r	r
Campylodiscus sp.	Pl. 11, Fig. 7	r	
Cerataulus turgidus (Ehrenberg) Ehrenberg	Pl. 2, Fig. 5	r	

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Species	Figure	Reunion	Rodrigues
Ceratoneis closterium Ehrenberg	Pl. 10, Fig. 9	c	c
Climacosphenia elongata Bailey	Pl. 6, Figs 1, 2	f	r
Cocconeis alucitae Riaux-Gobin et Compère	Pl. 7, Fig. 1	c	r
Cocconeis borbonica Riaux-Gobin et Compère	Pl. 12, Fig. 6	f	
Cocconeis convexa Giffen	Pl. 7, Fig. 5	c	c
Cocconeis coralliensis Riaux-Gobin et Compère	Pl. 12, Fig. 7	c	
Cocconeis coronatoides Riaux-Gobin et Romero	Pl. 12, Fig. 8	r	c
Cocconeis dapalistriata Riaux-Gobin, Romero, Compère et Al-Handal	Pl. 7, Fig. 26	f	f
Cocconeis sp. aff. *dirupta* Gregory	Pl. 7, Fig. 7	f	f
Cocconeis distans Gregory	Pl. 7, Fig. 3	f	f
Cocconeis guttata Hustedt et Aleem	Pl. 12, Fig. 9	c	r
Cocconeis cf. *krammeri* Lange-Bertalot et Metzeltin	Pl. 7, Figs 4, 11	c	r
Cocconeis cf. *molesta* Kützing	Pl. 7, Fig. 8	r	r
Cocconeis peltoides Hustedt	Pl. 7, Fig. 12		r
Cocconeis peltoides var. *archaeana* Riaux-Gobin et Compère	Pl. 7, Figs 14, 25	r	r
Cocconeis pseudograta Hustedt	Pl. 7, Figs 27, 28	r	c
Cocconeis scutellum Ehrenberg	Pl. 7, Figs 6	c	c
Cocconeis sigillata Riaux-Gobin et Al-Handal	Pl. 7, Fig. 13	c	vr
Dimeregramma cf. *minor* (Gregory) Ralfs ex Pritchard	Pl. 4, Figs 8-10	f	f
Diploneis crabro Ehrenberg	Pl. 8, Fig. 11	r	
Diploneis smithii (Brébisson) Cleve	Pl. 8, Fig. 12	f	f
Diploneis weissflogii (A.Schmidt) Cleve	Pl. 8, Fig. 13	r	r
Entomoneis cf. *gigantea* Grunow	Pl. 8, Fig. 14		r
Entomoneis sp.	Pl. 14, Fig. 8	r	
Fallacia forcipata (Greville) Stickle & Mann	Pl. 9, Fig. 9	f	f
Fallacia ny (Cleve) D.G.Man	Pl. 9, Fig. 10		r
Fallacia pygmaea (Kützing) Stickle & D.G.Mann	Pl. 9, Fig. 8	f	r
Fallacia sp.	Pl. 9, Fig. 7	r	
Gomphonemopsis cf. *lindae* Witkowski, Metzeltin et Lange-Bertalot	Pl. 14, Fig. 3	r	r
Grammatophora cf. *macilenta*	Pl. 4, Fig. 15	r	r
Grammatophora oceanica (Ehrenberg) Grunow	Pl. 4, Figs 14	f	f
Halamphora angularis (Greory) Levkov	Pl. 14, Fig. 2	r	
Haslea nautica (Cholnoky) Giffen	Pl. 9, Fig. 4	r	r
Hippodonta sp.	Pl. 14, Fig. 6	r	r
Hyalodiscus ambiguus (Grunow) Tempère & Peragallo	Pl.1, Fig. 7	r	
Hyalosynedra laevigata (Grunow) D.M.Williams et Round	Pl. 6, Fig. 8	f	f
Isthmia enervis Ehrenberg	Pl. 2, Figs 1, 2	r	r
Licmophora abbreviata C. Agardh	Pl. 4, Figs 2, 3	f	f

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Species	Figure	Reunion	Rodrigues
Licmophora cf. *ehrenbergii* (Kützing) Grunow	Pl. 4, Fig 4	f	r
Licmophora paradoxa (Lyngbye) C.Agardh	Pl. 4, Fig. 5	r	r
Licmophora sp.	Pl. 4, Fig. 1	r	r
Luticola sp.	Pl. 13, Fig. 8	r	r
Lyrella clavata (Gregory) D.G.Mann	Pl. 9, Fig. 5	r	
Mastogloia affirmata (Leudiger-Fortmorel) Cleve	Pl. 14, Fig. 10		r
Mastogloia angulata Lewis	Pl. 5, Fig. 3	f	f
Mastogloia binotata (Grunow) Cleve	Pl. 5, Fig. 13	f	f
Mastogloia cf. citrus (Cleve) De Toni	Pl. 14, Fig. 11		r
Mastogloia corsicana Grunow	Pl. 5, Fig. 14	r	
Mastogloia crucicula var. alternans Zanon	Pl. 14, Fig. 12		r
Mastogloia erythraea Grunow	Pl. 5, Figs 11, 12	c	f
Mastogloia fimbriata (Brightwell) Grunow	Pl. 5, Fig. 2	f	f
Mastogloia horvathiana Grunow	Pl. 5, Fig. 1	c	c
Mastogloia manokwariensis Cholnoky	Pl. 5, Fig. 5	vr	
Mastogloia obliqua Hagelstein	Pl. 14, Fig. 13		r
Mastogloia sp.	Pl. 5, Fig. 4		r
Navicula cf. *arenaria* var. *rostellata* Lange-Bertalot	Pl. 5, Fig. 8	r	r
Navicula cf. *directa* (W.Smith) Ralfs	Pl. 5, Fig. 15	r	r
Navicula longa var. *irregularis* Hustedt	Pl. 5, Fig. 16	f	f
Navicula perminuta Grunow	Pl. 5, Fig. 6	r	r
Navicula perrhombus Hustedt *ex* Simonsen	Pl. 5, Fig. 10	r	
Navicula cf. *salinarum* var. *rostrata* (Hustedt) Lange-bertalot	Pl. 5, Fig. 7		r
Navicula sp. 1	Pl. 9, Fig. 6	r	
Navicula sp. 2	Pl. 13, Fig. 9	r	
Neosynedra provincialis (Grunow) William & Round	Pl. 6, Fig. 7	f	f
Neosynedra tortuosa (Grunow) D.M.Williams & Round	Pl. 6, Fig. 4	f	f
Nitzschia distans Gregory	Pl. 10, Fig. 12	r	
Nitzschia hybrida Grunow	Pl. 10, Fig. 10	r	
Nitzschia insignis Gregory	Pl. 10, Fig. 11		vr
Nitzschia cf. *perindistincta* Cholnoky	Pl. 10, Fig. 7		r
Nitzschia cf. *scalpelliformis* (Grunow) Grunow	Pl. 10, Fig. 2	c	f
Nitzschia sigma (Kützing) W.Smith	Pl. 10, Fig. 4	f	f
Nitzschia ventricosa Kitton	Pl. 10, Fig. 1	f	f
Odontella aurita (Lyngbye) C.Agardh	Pl. 2, Fig. 3	f	r
Opephora mutabilis (Grunow) Sabbe & Vyverman	Pl. 4, Fig. 11	r	
Opephora pacifica (Grunow) Petit	Pl. 4, Figs 12, 13	f	
Olifantiella mascarenica Riaux-Gobin et Compère	Pl. 14, Fig. 1	f	

Table 1. Alphabetic list of benthic diatoms encountered in Reunion and Rodrigues Islands (see text for abbreviations).

Species	Figure	Reunion	Rodrigues
Petrodictyon gemma (Ehrenberg) D.G.Mann	Pl. 11, Fig. 9	f	f
Plagiodiscus nervatus Grunow	Pl. 11, Fig. 10	r	r
	Pl. 14, Fig. 7		
Plagiogramma staurophorum (Gregory) Heiberg	Pl. 4, Fig. 6	c	r
Plagiogramma sp.	Pl. 4, Fig. 7	c	r
Planothidium delicatulum (Kützing) Round & Bukhtiyarova	Pl. 7, Figs 17-19	f	f
Planothidium sp.	Pl. 7, Fig. 16	r	
Pleurosigma elongatum W.Smith	Pl. 9, Fig. 3	r	r
Pleurosigma formosum W.Smith	Pl. 9, Fig. 2	f	f
Pleurosigma rigidum W.Smith	Pl. 9, Fig. 1	r	
Podocystis spathulata (Shadbolt) Van Heurck	Pl. 6, Fig. 12	r	
Psammodictyon panduriforme (W.Gregory) D.G. Mann	Pl. 10, Fig. 5	f	f
Psammodictyon cf. *panduriforme* var. *continua* (Grunow) Snoeijs	Pl. 10, Fig. 14	r	
Psammodiscus nitidus (W.Gregory) Round & D.G. Mann	Pl. 1, Fig. 6	r	
Rhabdonema adriaticum , Kützing	Pl. 6, Fig. 11	f	f
Raphoneis sp.	Pl. 6, Fig. 13		r
Seminavis robusta Danielidis & Mann	Pl. 8, Fig. 8	r	
Seminavis sp.	Pl. 8, Fig. 7	r	r
Surirella fastuosa Ehrenberg	Pl. 11, Figs 1, 2	c	f
Surirella cf. *fluminensis* Grunow	Pl. 11, Figs 3, 4	f	r
Tabularia cf. *affinis* (Kützing) Snoeijs	Pl. 6, Fig. 6	r	f
Tabularia fasiculata (Agardh) Williams and Round	Pl. 6, Fig. 5	r	f
Thalassiosira sp.	Pl. 1, Fig. 5	r	
Toxarium hennedyanum (Gregory) Pelletan	Pl. 6, Fig. 10	c	r
Toxarium undulatum Bailey ex Bailey	Pl. 6, Fig. 9	c	r
Trachyneis aspera (Ehrenberg) Cleve	Pl. 8, Fig. 15	f	f
Triceratium balearicum Cleve	Pl. 3, Fig. 3	f	
Triceratium dubium Brightwell	Pl. 3, Fig. 2	f	f
Trigonium formosum var. *pentagonale* (Schmidt) Desikachary & Prema	Pl. 3, Fig. 1	r	
Tryblionella acuta (Cleve) D.G.Mann	Pl. 10, Fig. 6	r	
Tryblionella coarctata (Grunow) D.G.Mann	Pl. 10, Fig. 13	f	r
Vikingia gibbocalyx (Brun) Witkowski, Lange-Bertalot et Metzeltin	Pl. 7, Fig. 30	f	r

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Plate 1.
Fig.1. *Actinocyclus octonarius*, Fig. 2. *Actinocyclus* cf. *tenuissimus,* Fig. 3. *Actinocyclus* cf. *bipartitus*, Fig. 4. *Actinocyclus* cf. *subtilis*, Fig. 5. *Thalassiosira* sp., Fig. 6. *Psammodiscus nitidus*, Fig. 7. *Hyalodiscus ambiguous.*

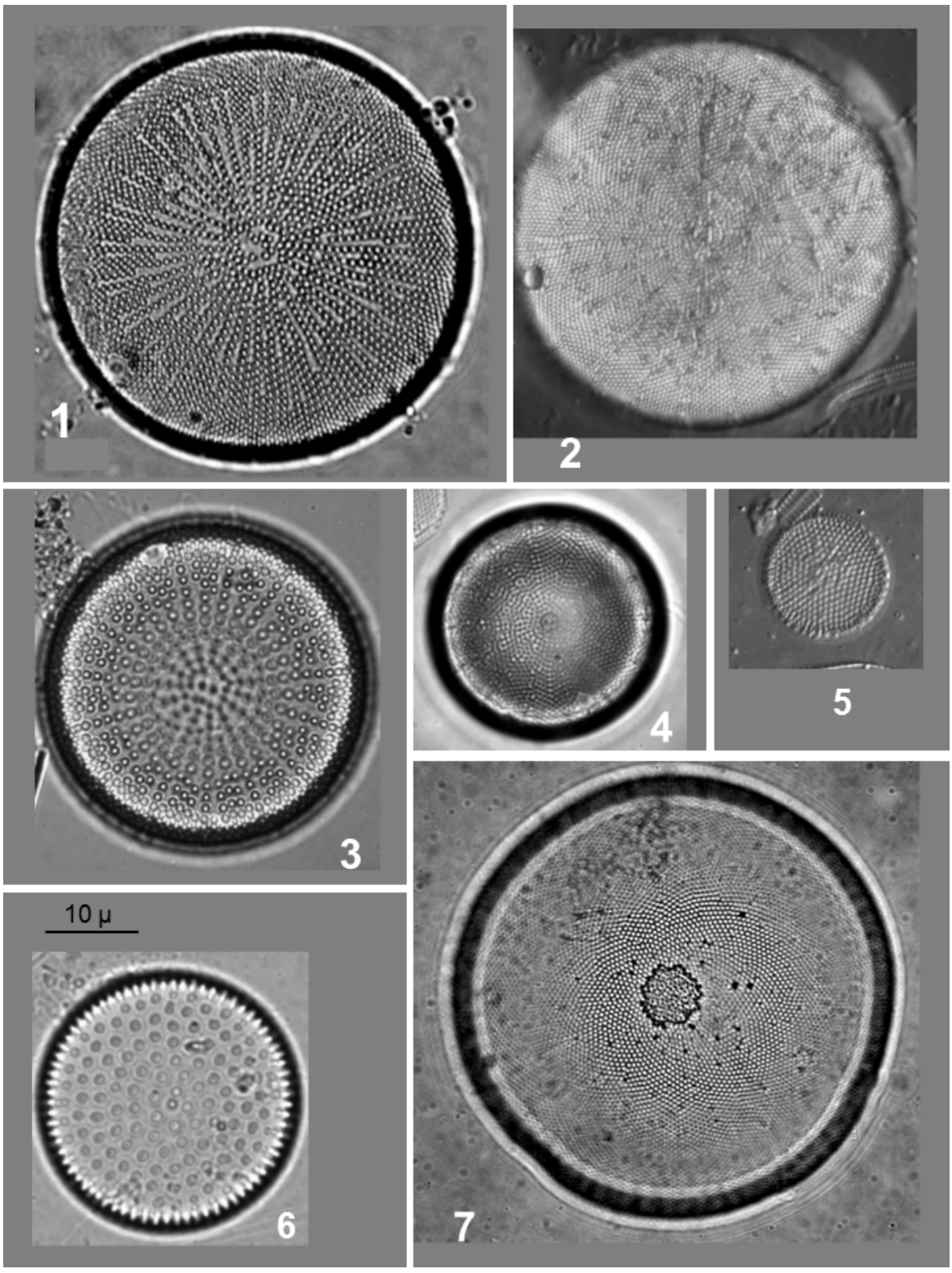
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Plate 2
Figs 1, 2. *Isthmia enervis*, Fig. 3. *Odontella aurita*, Fig. 4. *Biddulphia pulchella*, Fig. 5. *Cerataulus turgidus*

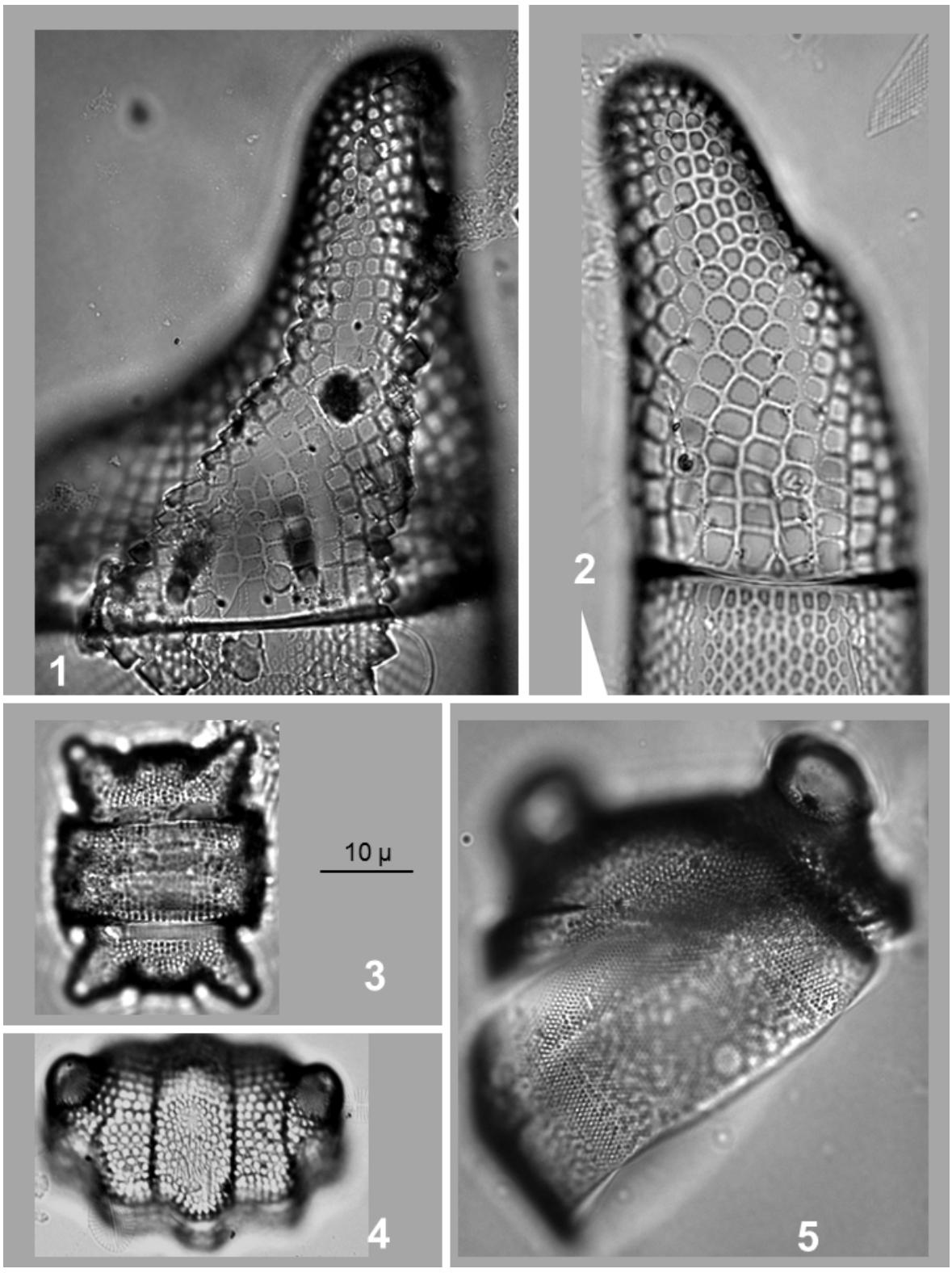
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Plate 3
Fig. 1. *Trigonium formosum* var. *pentagonale,* Fig. 2. *Triceratium dubium*, Fig. 3. *Triceratium balearicum*, Fig. 4. *Biddulphia pulchella*.

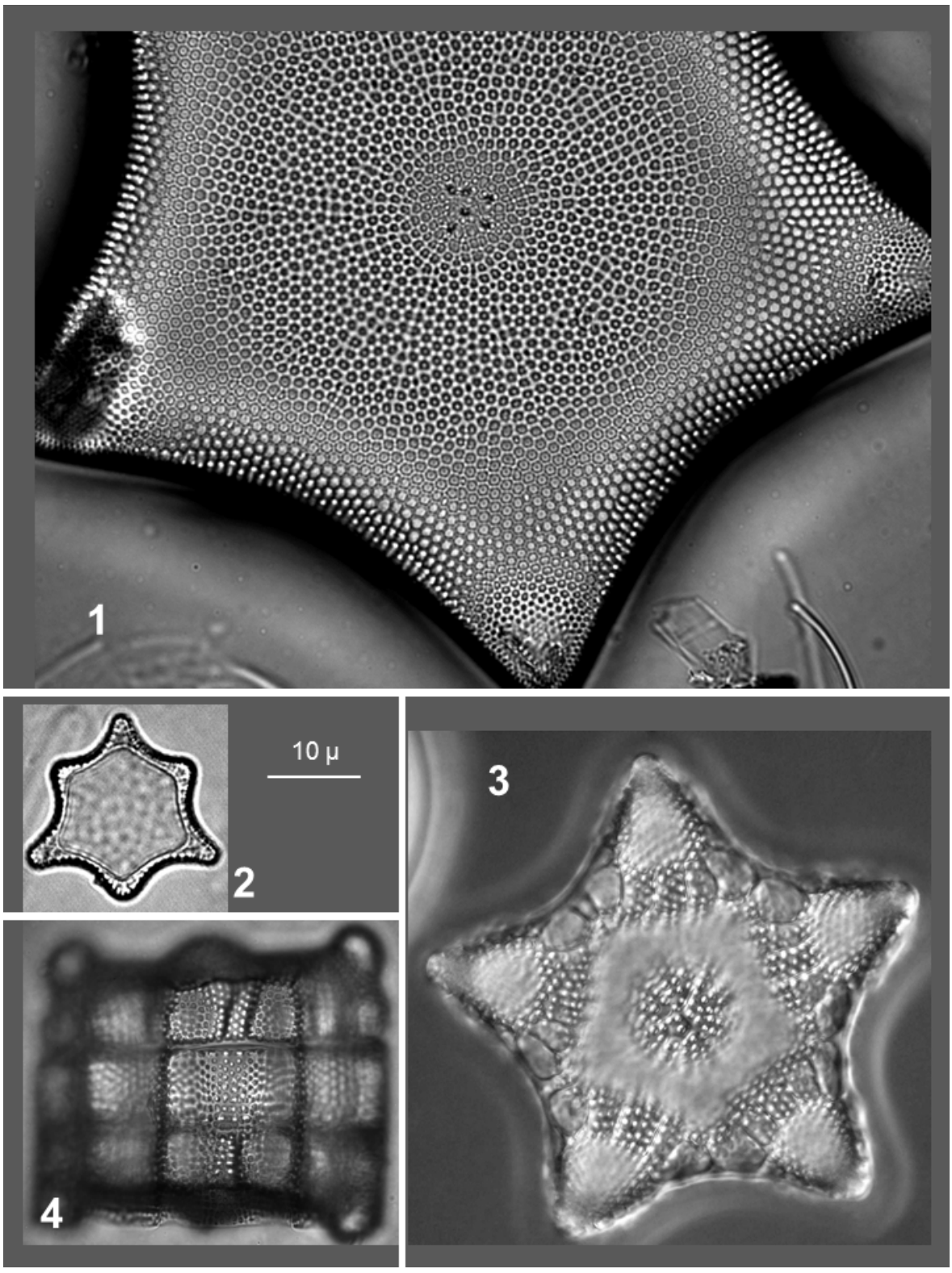
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Plate 4
Fig. 1. *Licmophora* sp., Figs 2, 3. *Licmophora abbreviata,* Fig. 4. *Licmophora* cf. *ehrenbergii*, Fig. 5. *Licmophora paradoxa*, Figs 6. *Plagiogramma staurophorum,* Fig. 7. *Plagiogramma* sp., Figs 8-10. *Dimeregramma* cf. *minor*, Fig. 11. *Opephora mutabilis*, Figs 12, 13. *Opephora pacifica*, Fig. 14. *Grammatophora oceanica*, Fig. 15. *Grammatophora* cf. *macilenta.*

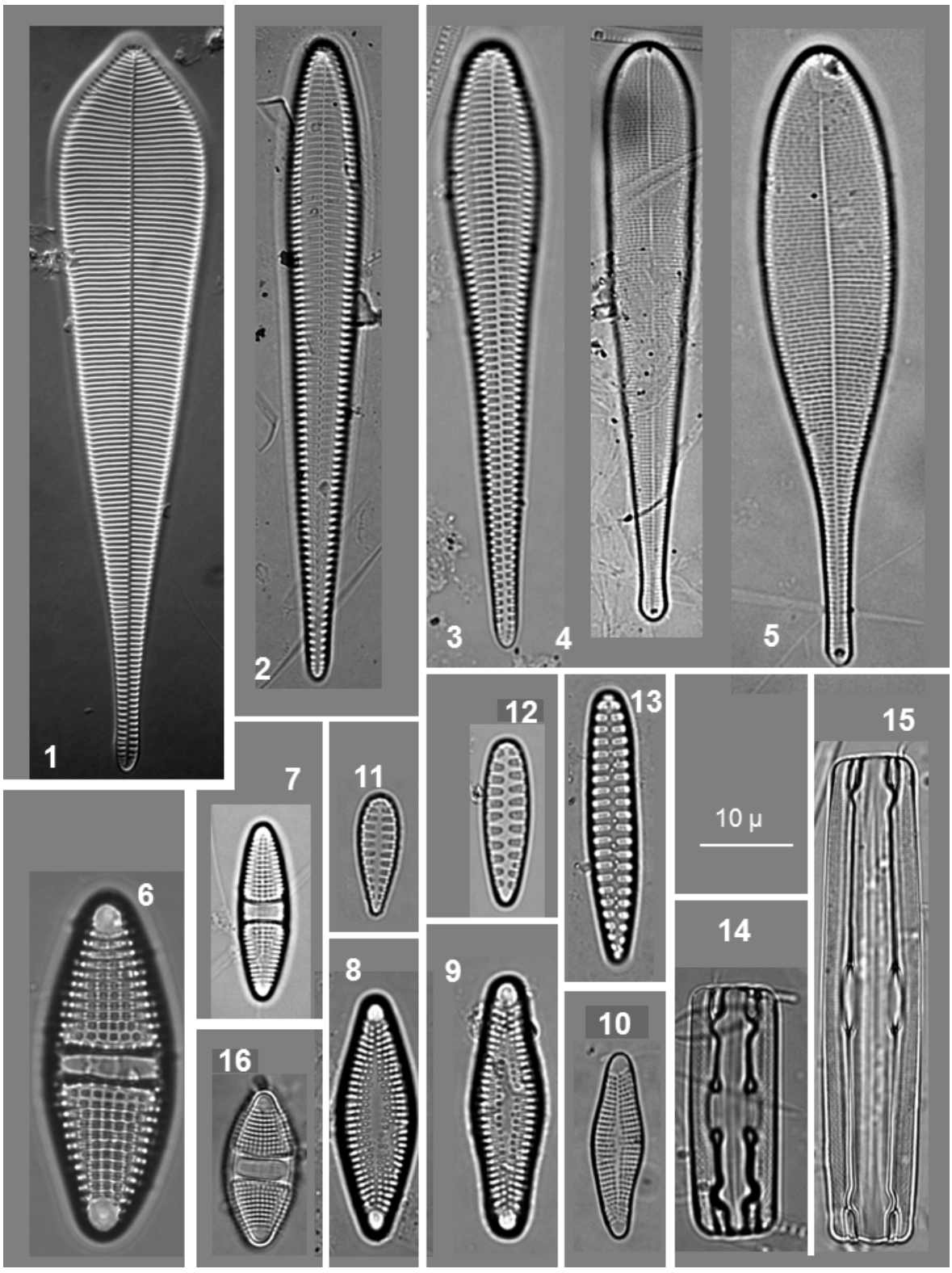
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Plate 5
Fig. 1. *Mastogloia horvathiana*, Fig. 2. *Mastogloia fimbriata*, Fig. 3. *Mastogloia angulata*, Fig. 4. *Mastogloia* sp., Fig. 5. *Mastogloia manokwariensis,* Fig. 6. *Navicula perminuta*, Fig. 7. *Navicula* cf. *salinarum* var. *rostrata*, Fig. 8. *Navicula* cf. *arenaria* var. *rostellata*, Fig. 9. *Caloneis linearis,* Fig. 10. *Navicula perrhombus*, Figs 11, 12. *Mastogloia erythraea*, Fig. 13. *Mastogloia binotata*, Fig. 14. *Mastogloia corsicana,* Fig. 15. *Navicula* cf. *directa*. Fig. 16. *Navicula longa* var. *irregularis*.

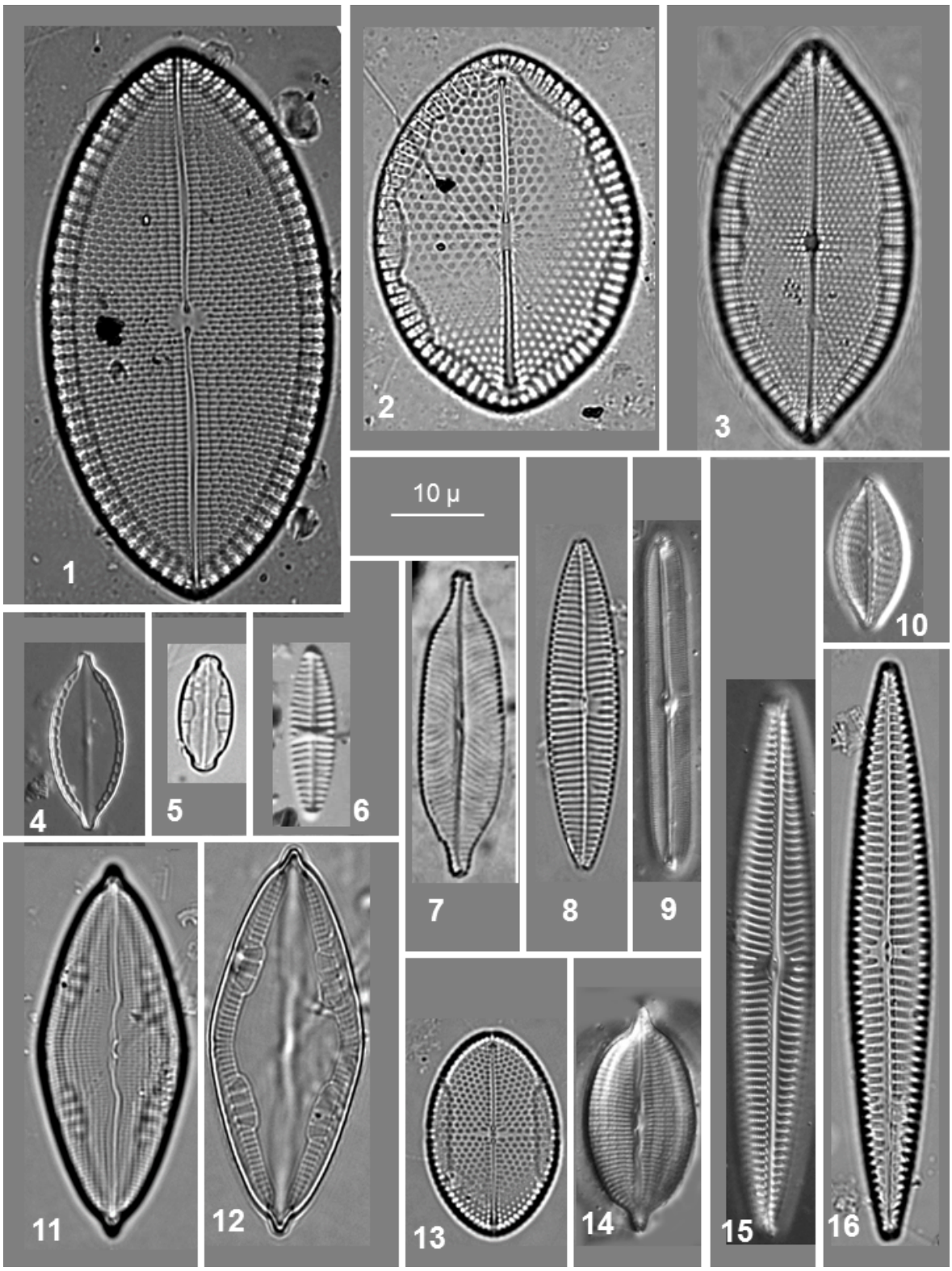
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Plate 6
Figs 1, 2. *Climacosphenia elongata*, Fig. 3. *Ardissonea robusta,* Fig. 4. *Neosynedra tortuosa*, Fig. 5. *Tabularia fasiculata*, Fig. 6. *Tabularia* cf. *affinis*, Fig. 7. *Neosynedra provincialis,* Fig. 8. *Hyalosynedra laevigata,* Fig. 9. *Toxarium undulatum ,* Fig. 10. *Toxarium hennedyanum*, Fig. 11. *Rhabdonema adriaticum*, Fig. 12. *Podocystis spathulata,* Fig.13. *Raphoneis* sp.

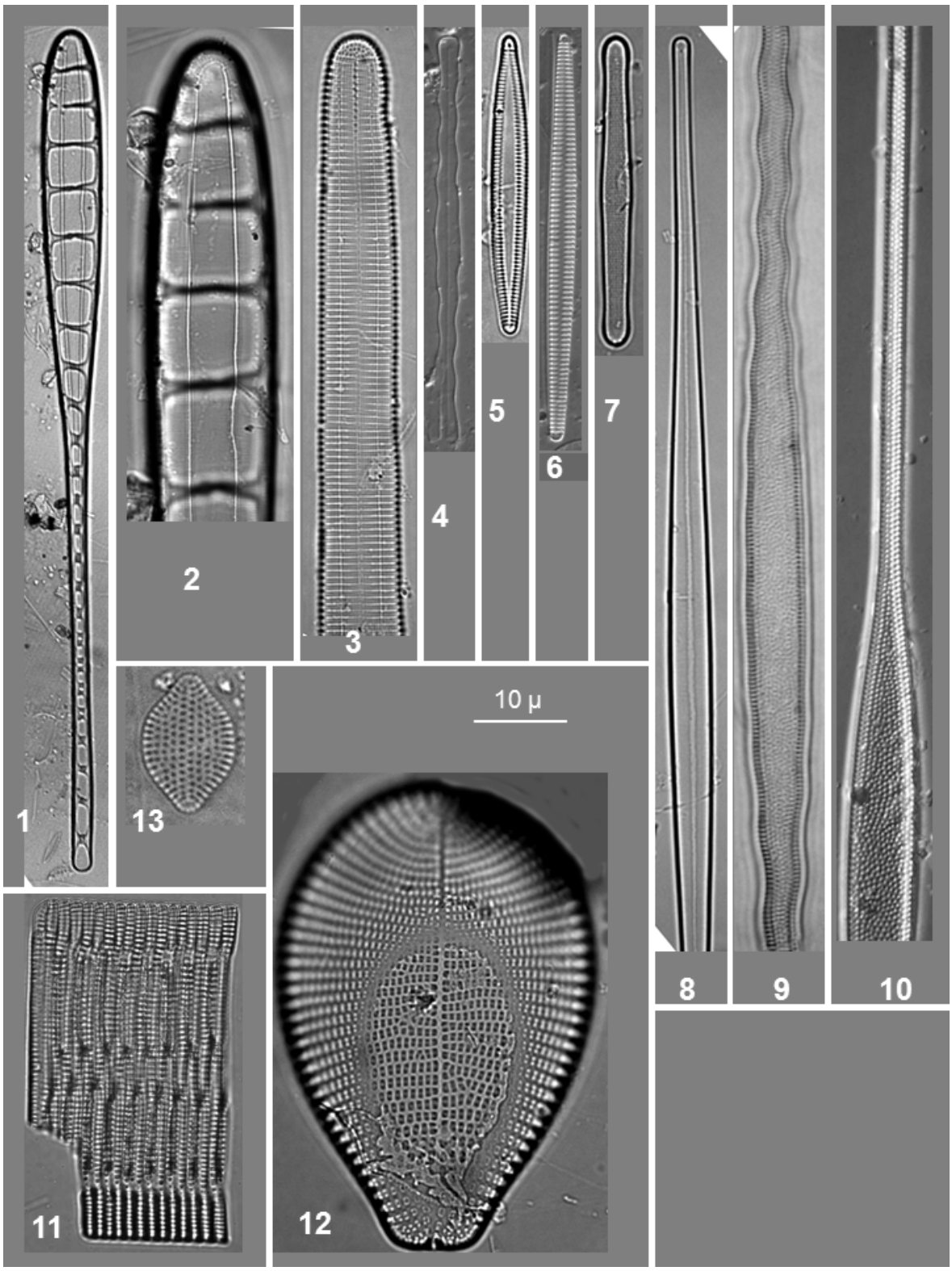
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Plate 7
Fig. 1. *Cocconeis alucitae*, Fig. 2. *Amphicocconeis mascarenica*, Fig. 3. *Cocconeis distans*, Figs 4, 11. *Cocconeis* cf. *krammeri*, Fig. 5. *Cocconeis convexa*, Figs 6. *Cocconeis scutellum*, Fig.7. *Cocconeis* sp. aff. *meisteri*, Fig. 8. *Cocconeis* cf. *molesta,* Fig. 9. *Achnanthes trachyderma*, Fig. 10. *Cocconeis coronatoides*. Fig. 12. *Cocconeis peltoides*, Fig. 13. *Cocconeis sigillata,* Figs 14, 25, *Cocconeis peltoides* var. *archaeana*, Fig. 15. *Cocconeis* sp., Fig. 16. *Planothidium* sp., Figs 17-19. *Planothidium delicatulum*, Fig. 20. *Achnanthes brevipes*, Fig. 21. *Achnanthes kuwaitensis*, Figs 22, 23. *Achnanthes* sp. Fig. 24. *Achnanthes* cf. *brevipes* var. *intermedia*, Fig. 26. *Cocconeis dapalistriata*, Figs 27, 28. *Cocconeis pseudograta*, Fig. 29. *Achnanthes pulchella*, Fig. 30. *Vikingea gibbocalyx*.

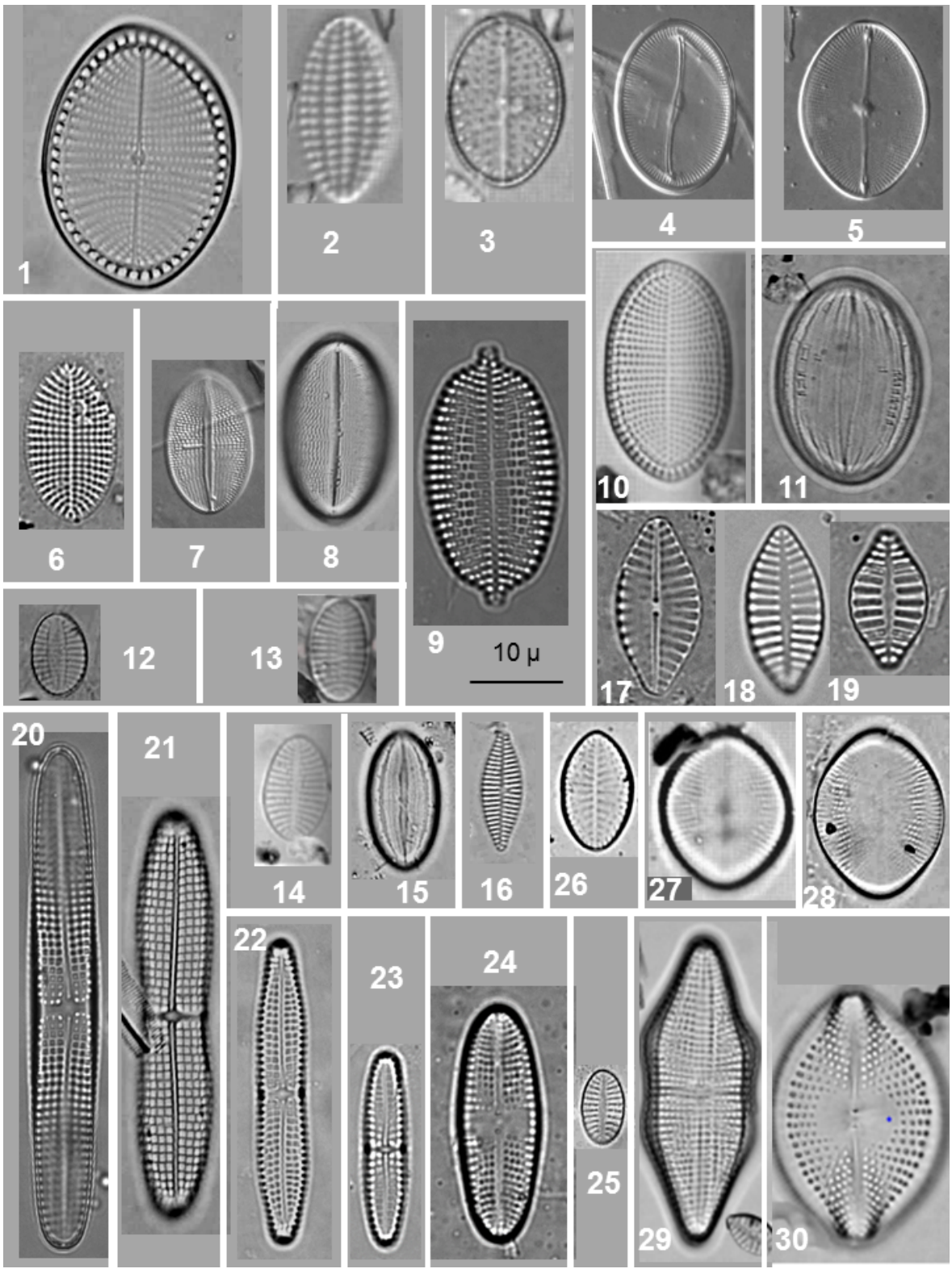
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Plate 8
Fig. 1. *Amphora laevissima*, Figs 2, 3. *Amphora holsatica*, Figs 4, 5. *Amphora coffeiformis,* Figs 6, 10. *Amphora* cf. *marina*, Fig. 7. *Seminavis* sp., Fig. 8. *Seminavis angusta* var. *ventricosa*, Fig. 9. *Amphora acutiuscula*, Fig. 11. *Diploneis crabro*, Fig. 12. *Diploneis smithii*, Fig. 13. *Diploneis weissflogii*, Fig. 14. *Entomoneis* cf. *gigantean*, Fig. 15. *Trachyneis aspera*.

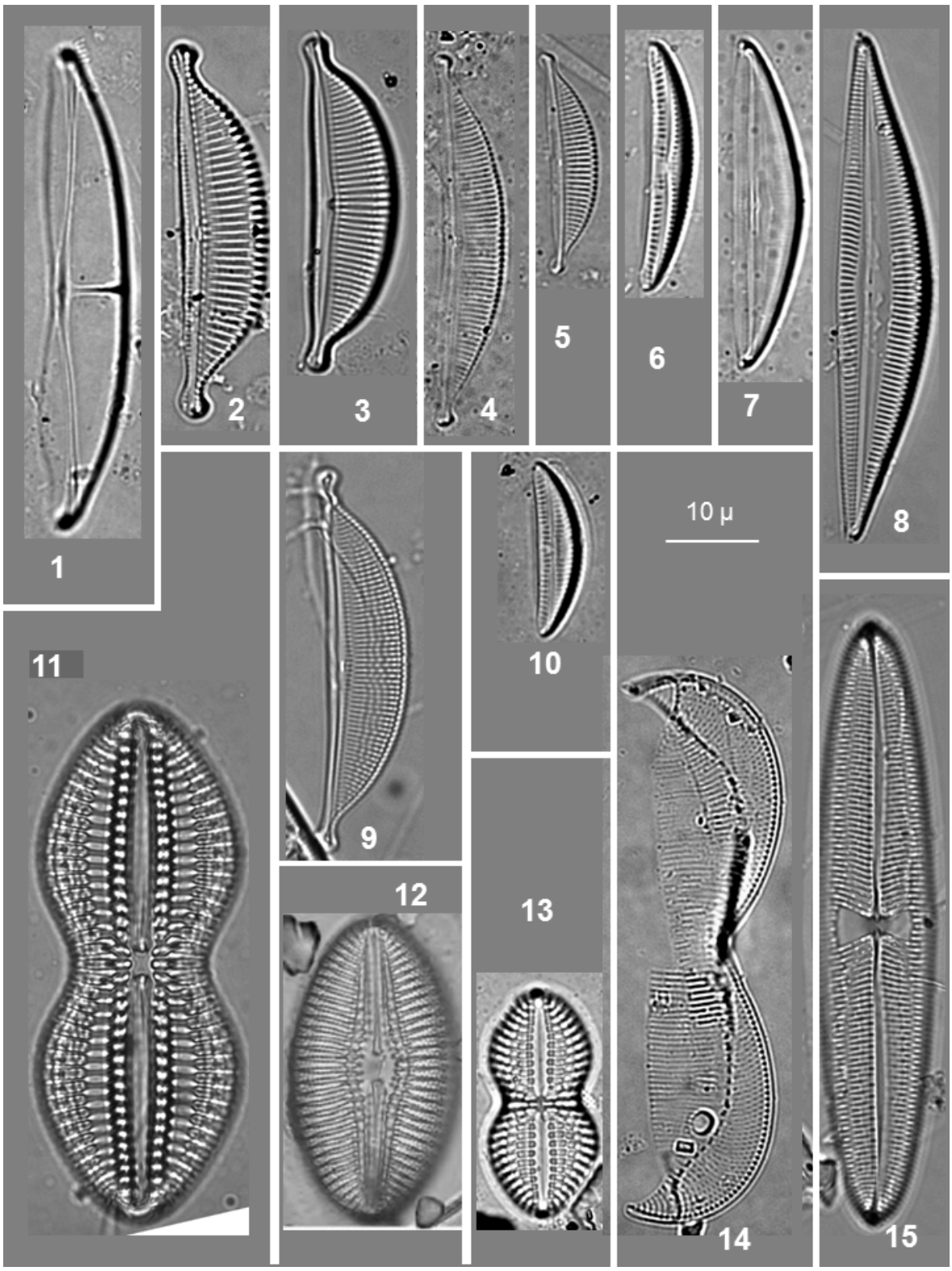
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Plate 9
Fig. 1. *Pleurosigma rigidum*, Fig. 2. *Pleurosigma formosum,* Fig. 3. *Pleurosigma elongatum,* Fig. 4. *Haslea nautica*, Fig. 5. *Lyrella clavata*, Fig. 6. *Navicula* sp. 1, Fig. 7. *Fallacia* sp., Fig. 8. *Fallacia pygmaea*¸ Fig. 9. *Fallacia forcipata*, Fig. 10, *Fallacia ny*.

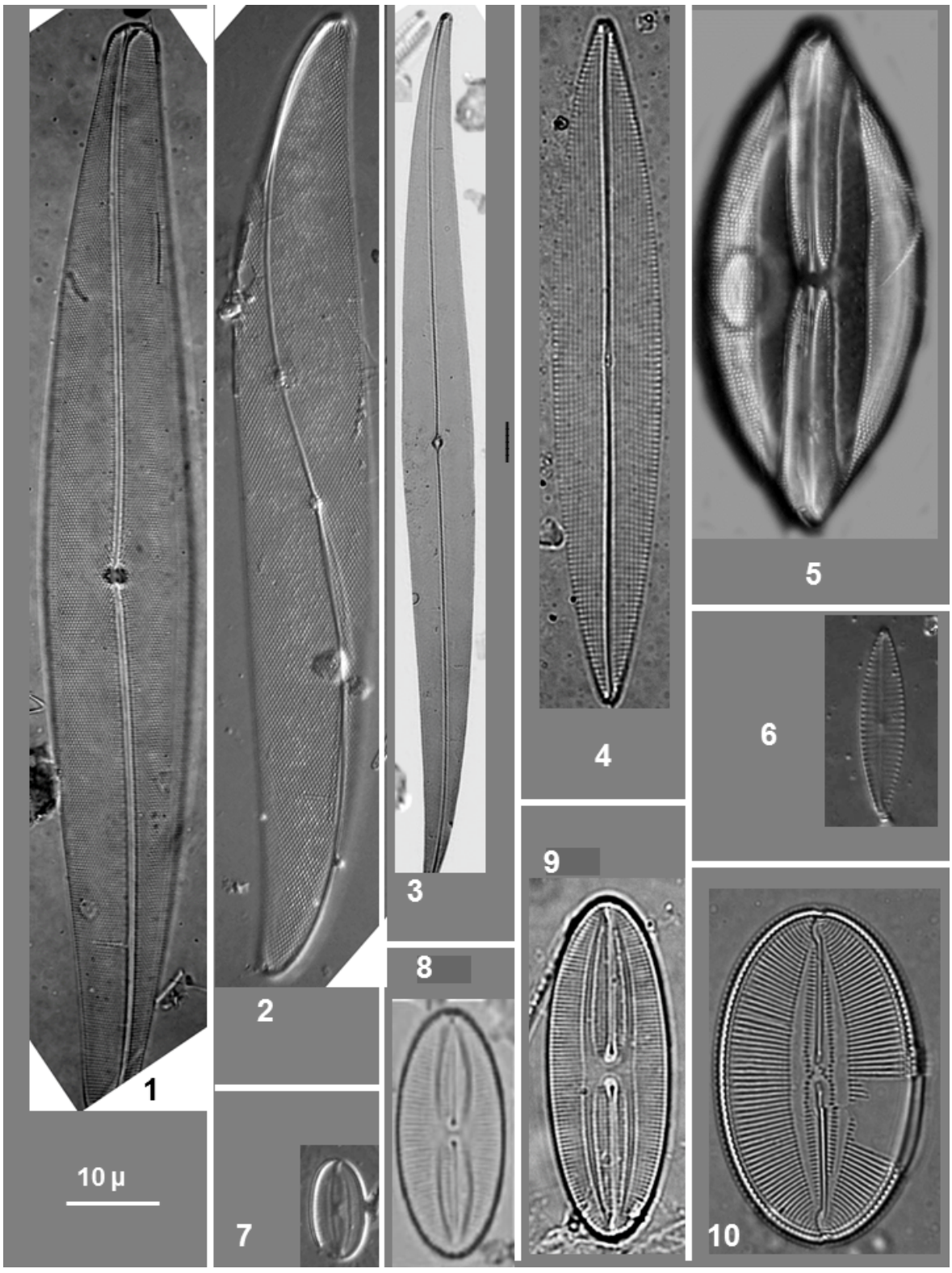
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Plate 10
Fig. 1. *Nitzschia ventricosa*, Fig. 2. *Nitzschia* cf. *scalpelliformis,* Fig. 3. *Bacillaria paxillifera* var. *tumidula*, Fig. 4. *Nitzschia sigma,* Fig. 5. *Psammodictyon panduriforme,* Fig. 6. *Tryblionella acuta*, Fig. 7. *Nitzschia* cf. *perindistincta,* Fig. 8. *Bacillaria socialis*, Fig. 9. *Ceratoneis closterium*, Fig. 10. *Nitzschia hybrida*, Fig. 11. *Nitzschia insignis*, Fig. 12. *Nitzschia distans*, Fig. 13. *Tryblionella coarctata*, Fig. 14. *Psammodictyon* cf. *panduriforme* var. *continua*.

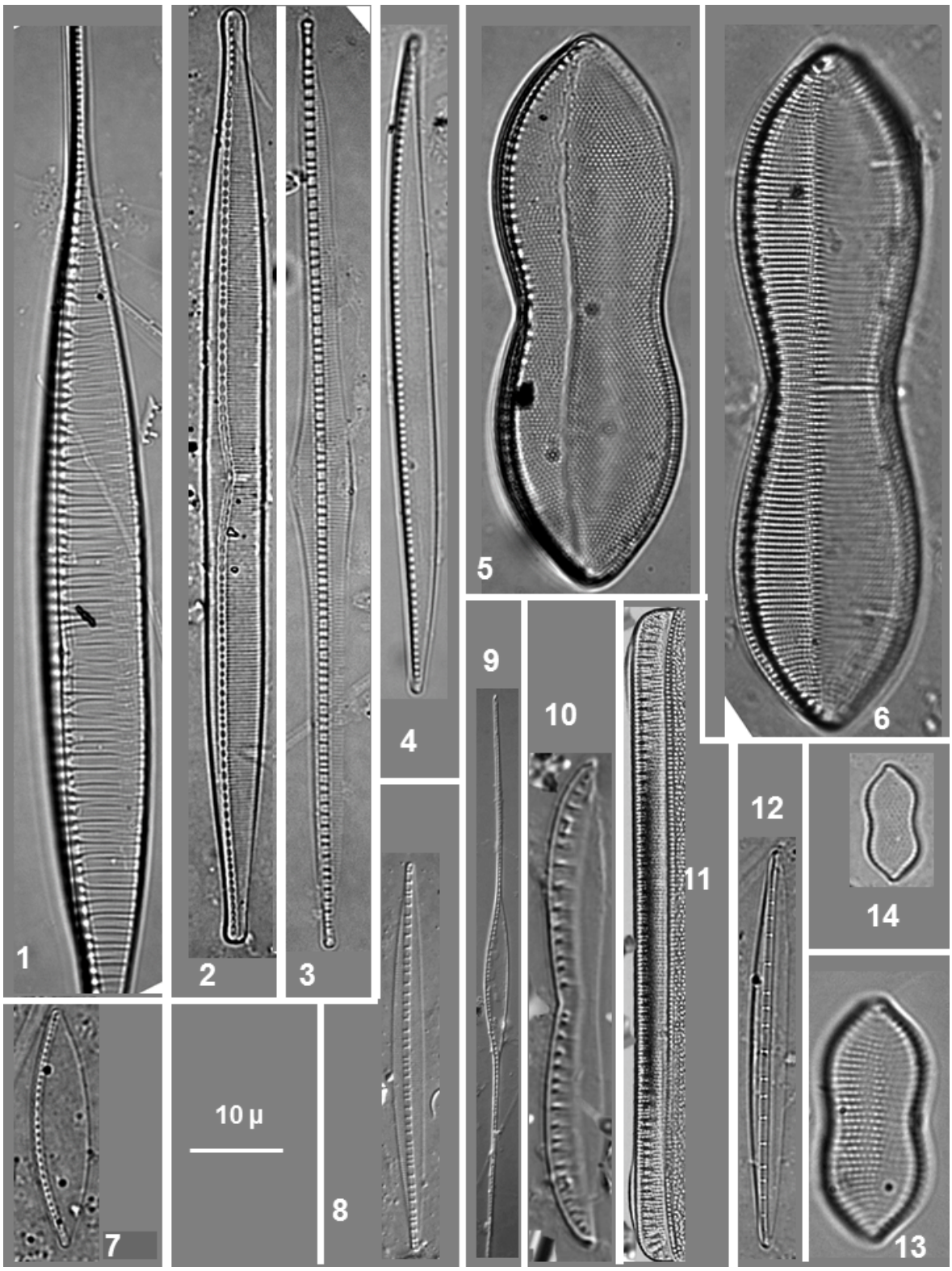
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Plate 11
Figs 1, 2. *Surirella fastuosa*, Figs 3, 4. *Surirella* cf. *fluminensis*, Figs 5, 6. *Campylodiscus latus*, Fig. 7. *Campylodiscus* sp., Fig. 8. *Campylodiscus incertus*, Fig. 9. *Petrodictyon gemma*, Fig. 10. *Plagiodiscus nervatus*.

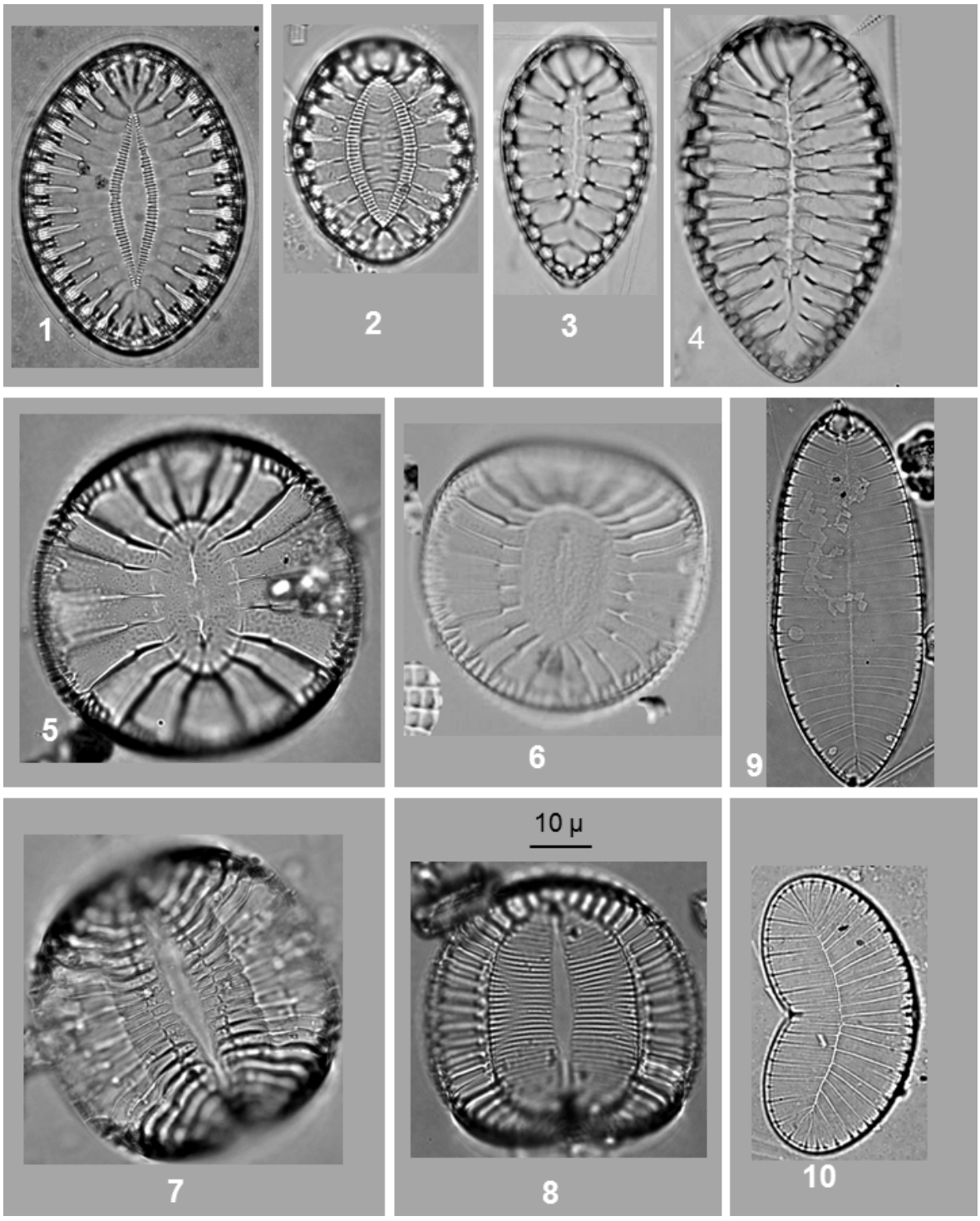
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Plate 12
Figs 1-3. *Achnanthidium glyphos*, Fig. 4. *Amphicocconeis mascarenica*, Fig. 5. *Astartiella* cf. *punctifera*, Fig. 6. *Cocconeis borbonica*, Fig. 7. *Cocconeis coralliensis*, Fig. 8. *Cocconeis coronatoides,* Fig. 9. *Cocconeis guttata*.

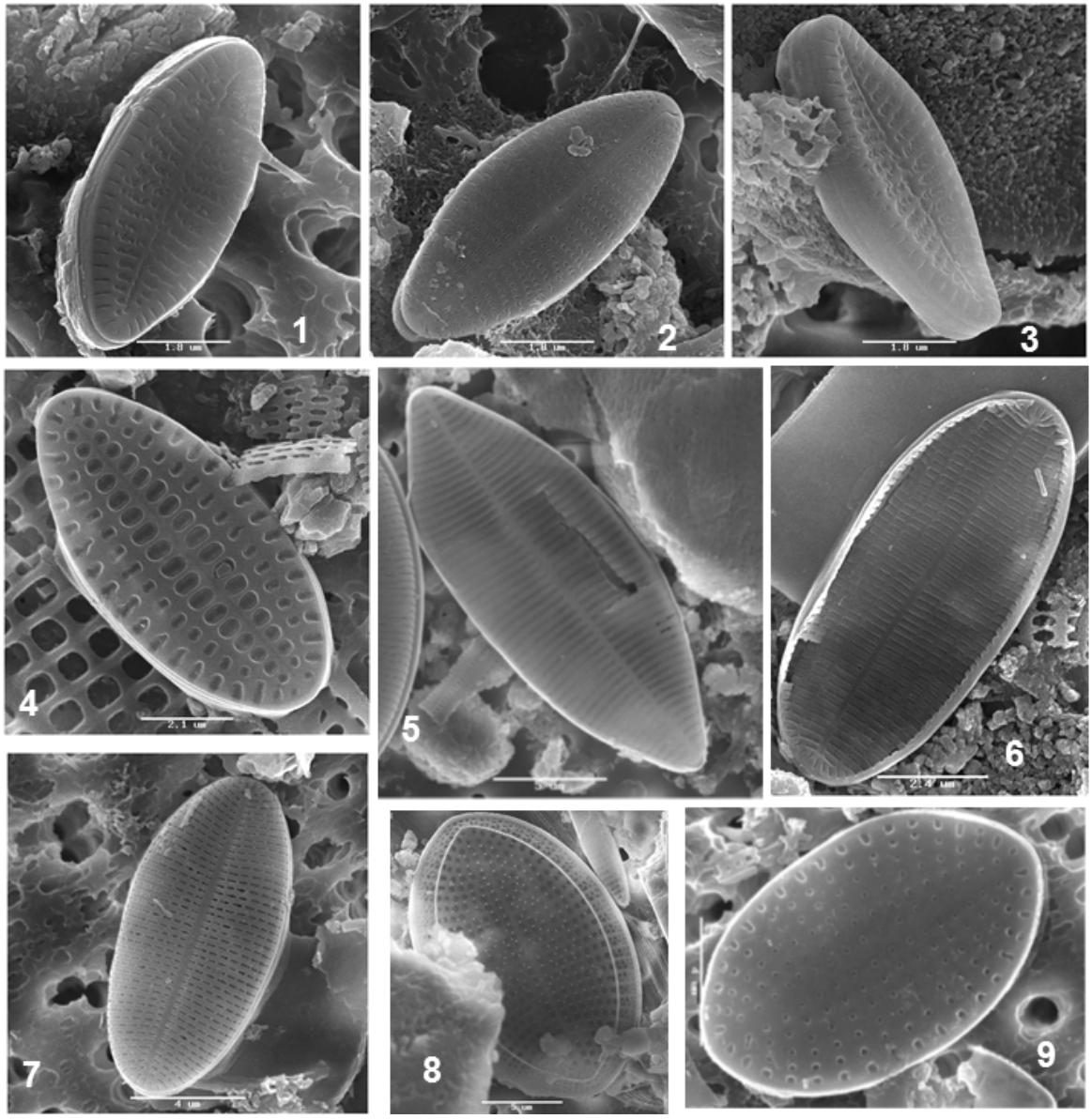
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Plate 13
Figs 1, 2. *Amphora bigibba*, Fig. 3. *Amphora pediculus*, Fig. 4. *Amphora* cf. *rhombica* var. *intermedia*, Figs 5, 6. *Amphora helenensis,* Fig. 7. *Amicula* sp., Fig. 8. *Luticola* sp., Fig. 9. *Navicula* sp. 2.

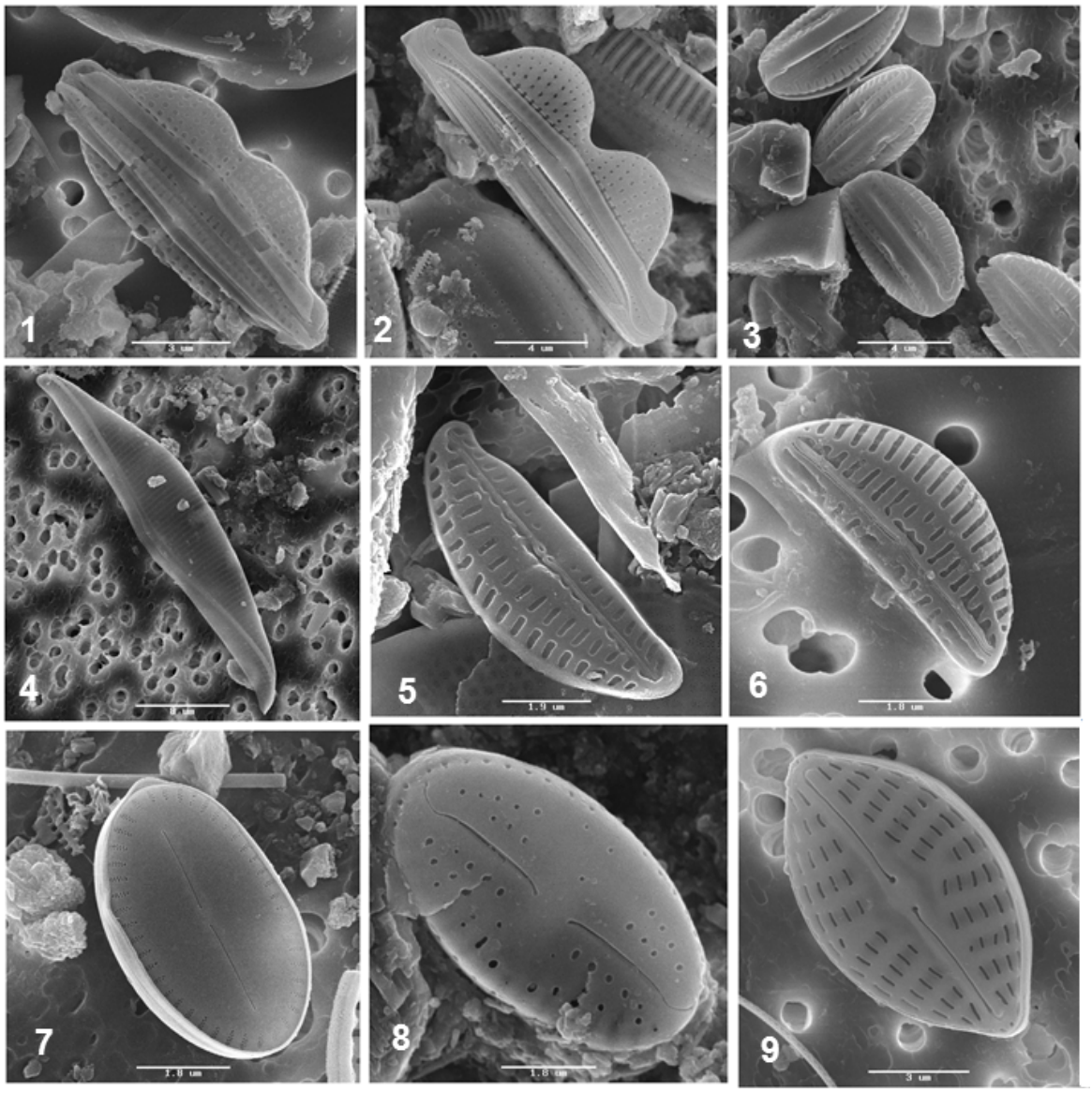
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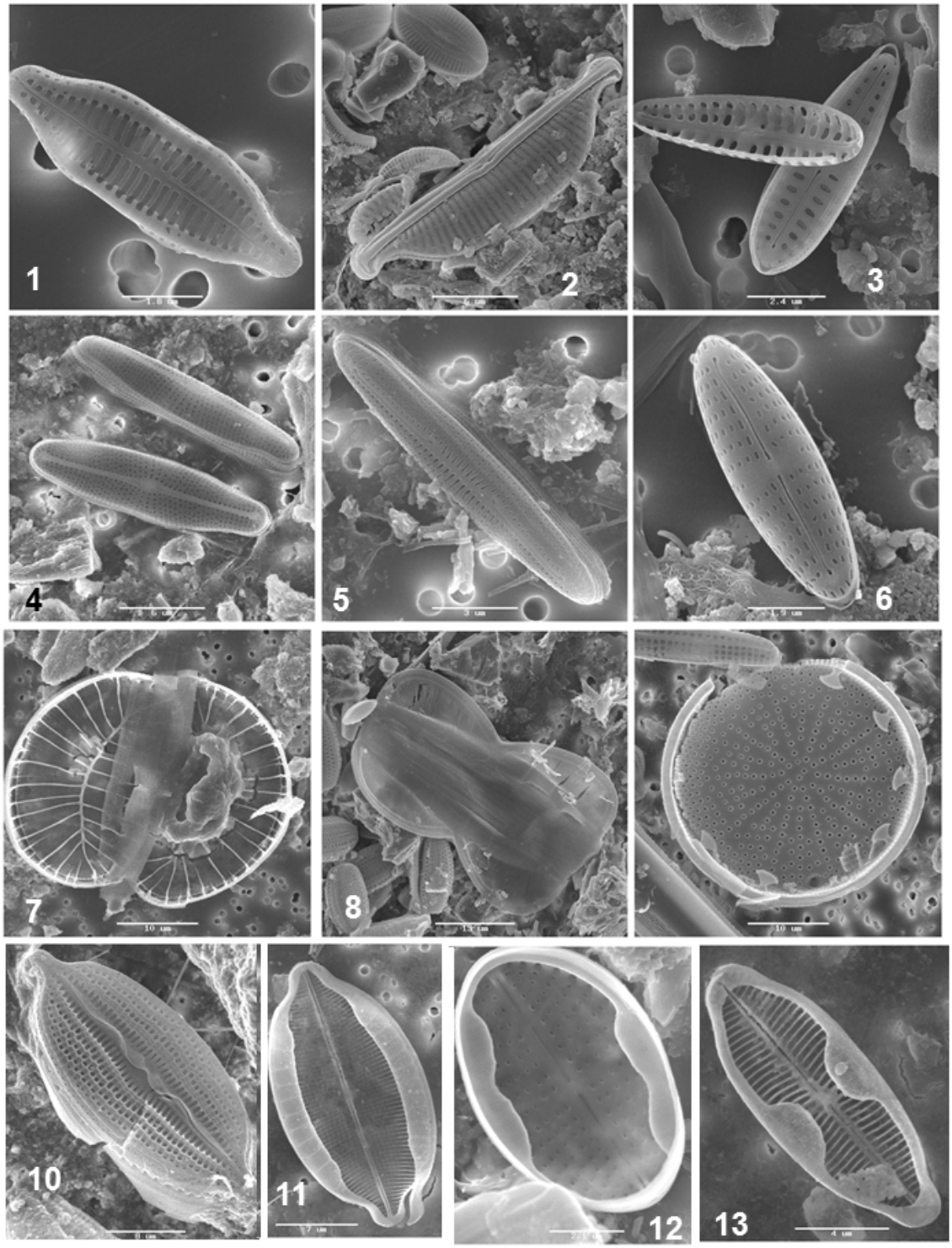
Plate 14
Fig. 1. *Olifantiella mascarenica,* Fig. 2. *Halamphora angularis*, Fig. 3. *Gomphonemopsis* cf. *lindae*, Fig. 4. *Berkeleya* sp. 1, Fig. 5. *Berkeleya rutilans*, Fig. 6. *Hippodonta* sp., Fig. 7. *Plagiodiscus nervatus*, Fig. 8. *Entomoneis* sp., Fig. 9. *Actinocyclus octonarius* var. *tenellus*, Fig.10. *Mastogloia affirmata*, Fig. 11. *M. Mastogloia* cf. *citrus*, Fig. 12. *Mastogloia crusicula* var. *alternans*, Fig. 13. *Mastogloia obliqua*.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