Ann. Naturhist. Mus. Wien	111 A	73–158	Wien, April 2009

Gastropods and their habitats from the northern Red Sea (Egypt: Safaga) Part 1: Patellogastropoda, Vetigastropoda and Cycloneritimorpha

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(With 19 plates, 5 figures and 4 tables)

Manuscript submitted on May 6th 2008,
the revised manuscript on November 24th 2008

Abstract

More than 2,100 shells from a highly structured, coral-dominated coastal area of approximately 75 km^2 were studied and yielded 68 species of Patellogastropoda, Vetigastropoda and Cycloneritimorpha. All species found are shortly described and figured. The high species richness was obtained from 41 quantitative and qualitative samples, which covered a broad range of soft and hard substrates in water depths from the intertidal to 40 m. More than half of the 11 superfamilies and 14 families present belong to Vetigastropoda, which is also the clade with the highest species diversity as well as the highest abundance of specimens. The majority of species was found in quantitative bulk samples from soft substrates. The highest species richness of individual samples occurred in sandy, coral- or seagrass-associated sediments. Most species are neither abundant nor frequent. Only five species (the trochids *Pseudominolia nedyma* (Melvill, 1897) and *Pagodatrochus variabilis* (H. Adams, 1873), the turbinid *Bothropoma* cf. *munda* (H. Adams, 1873), the neritid *Smaragdia purpureomaculata* Dekker, 2000 and the eoacmaeid *Eoacmaea* nov. spec.) account for more than two thirds of the shells found. The most frequent species, *Tectus dentatus* (Forsskål, 1775), was found in 14, but most species occurred in less than 5 samples. Among abundant families and subfamilies, Neritilidae were recorded in only one sample from the reef slope. Eoacmaeidae, Fissurellidae and Stomatellinae were abundant in bulk samples from coral sand and sands from reef slopes. Trochinae were also abundant in seagrass samples, the high abundance of Neritidae was virtually restricted to samples from seagrass, and Colloniinae and Phasianellidae were most abundant in the bulk sample from muddy seagrass. Finally, the extraordinarily high abundance of Umboniinae was largely restricted to bulk samples from mud.

Keywords: Mollusca, biodiversity, Red Sea, Indian Ocean, Egypt, assemblages

Zusammenfassung

Mehr als 2100 Schneckenschalen aus einem stark gegliederten, korallendominierten Küstenbereich von 75 km² wurden untersucht und 68 Arten von Patellogastropoda, Vetigastropoda und Cycloneritimorpha gefunden. Alle gefundenen Arten werden kurz beschrieben und abgebildet. Der große Artenreichtum resul-

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tiert aus 41 quantitativen und qualitativen Proben, die eine große Bandbreite von verschiedenen Weich- und Hartsubstraten vom Intertidal bis 40 m Wassertiefe abdecken. Mehr als die Hälfte der 11 Superfamilien und 14 Familien aus diesem Material gehören zu den Vetigastropoda, welche auch am häufigsten sind und die größte Artenzahl aufweisen.

Die Mehrheit der Arten stammt aus den quantitativen Proben der verschiedenen Weichböden. Die Proben mit den höchsten Diversitäten stammen von sandigen, Korallen- oder Seegras-assoziierten Sedimenten. Die meisten Arten sind selten; sie kommen mit wenigen Schalen in wenigen Proben vor. Mehr als zwei Drittel aller Schalen stammen von lediglich 5 Arten (die beiden Trochiden *Pseudominolia nedyma* (MELVILL, 1897) und *Pagodatrochus variabilis* (H. ADAMS, 1873), die Turbinide *Bothropoma* cf. *munda* (H. ADAMS, 1873), die Neritide *Smaragdia purpureomaculata* DEKKER, 2000 und die Eoacmaeidae *Eoacmaea* nov. spec.). Die am weitesten verbreitete Art, *Tectus dentatus* (FORSSKÅL, 1775), wurde in 14 Proben gefunden, aber die meisten Arten kommen in weniger als 5 Proben vor. Unter den häufigen Familien und Unterfamilien sind die Neritilidae auf eine einzige Probe aus einem Riffhang beschränkt. Eoacmaeidae, Fissurellidae and Stomatellinae waren häufig in Proben vom Korallensand und vom Riffhang. Trochinae waren zusätzlich noch häufig in den 2 Proben vom Seegras; die große Häufigkeit der Neritidae war nahezu beschränkt auf Seegras und Colloniinae and Phasianellidae sind vor allem in der Probe vom Seegras im schlammigen Sediment vorgekommen. Die außergewöhnlich große Häufigkeit der Umboniinae ist weitgehend beschränkt auf die Proben vom Schlamm.

Schlüsselwörter: Mollusca, Biodiversität, Rotes Meer, Indischer Ozean, Ägypten, Artengesellschaften oder Vergesellschaftungen

Study area

The Northern Bay of Safaga is a coral-dominated, shallow-water area measuring approximately 10 km from N-S and approximately 7 km from E-W. It exhibits a highly structured bottom topography extending down to more than 50 m water depth (fig. 1). The annual water temperature ranges between 21 and 29 °C, salinity between 40 and 46 ‰, both without any obvious depth gradient due to complete water mixing. The tidal range is < 1 m (PILLER & PERVESLER 1989). Terrigenous (thus nutrient) input occurs mainly along the coast and is due to fluvial transport during flash floods, local erosion of impure carbonate rocks and aeolian transport by the prevailing northerly winds (PILLER & MANSOUR 1994). Water energy is relatively weak, but a complex current pattern influences facies development (PILLER & PERVESLER 1989), and bottom facies and sedimentary facies generally show a good correspondence (PILLER & MANSOUR 1990; PILLER 1994).

In 1984, the Northern Bay of Safaga was chosen to study bottom types, sediments, burrows and selected groups of benthic organisms with considerable fossilization potential (including coralline red algae, foraminifera, corals, echinoids and molluscs) with respect to their palaeoecological significance (PILLER & PERVESLER 1989, see ZUSCHIN & OLIVER 2003 for summary of references). Four- to six-week field investigations were carried out in April/May 1986, November 1986, February 1987, and July/August 1987 and resulted in the basic mapping of bottom facies and description of sedimentary facies (PILLER & PERVESLER 1989; PILLER & MANSOUR 1990).

Sampling

Three- to four-week field campaigns by the first author in October/November 1994, July/August 1995, May/June 1996 and March/April 1997 yielded all quantitative samples from hard and soft substrata and many qualitative samples used for this study.

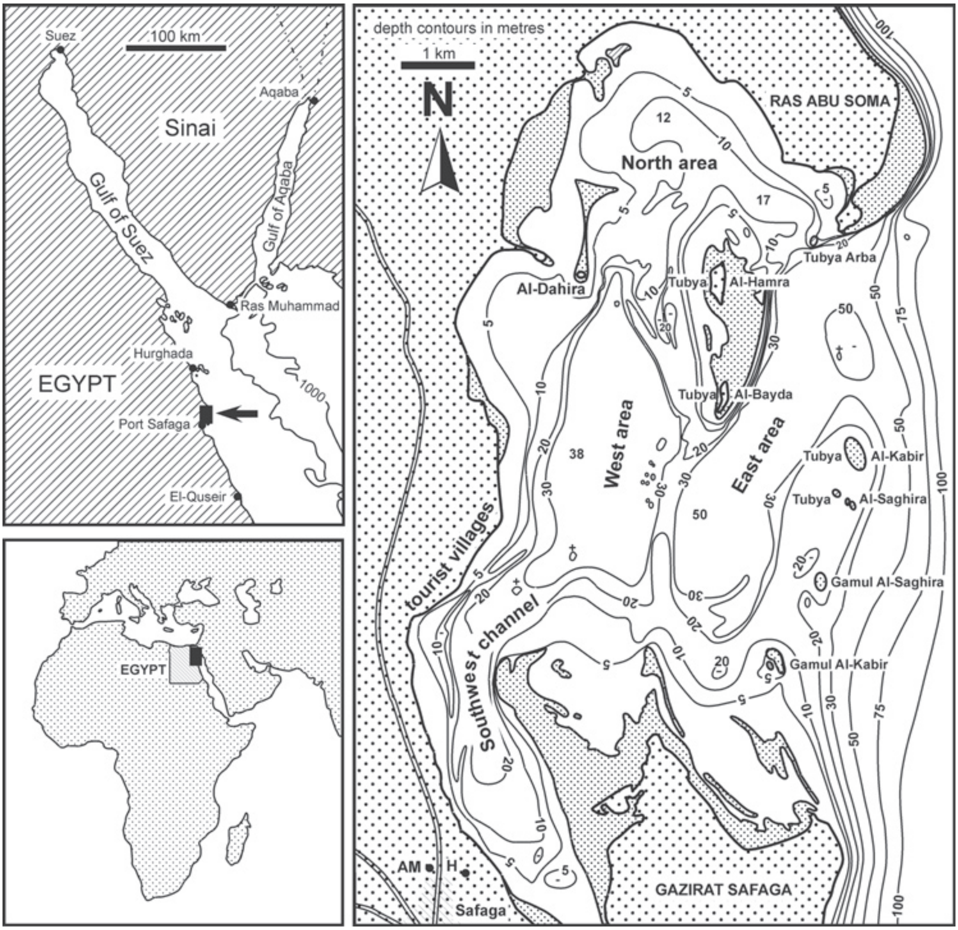

Fig. 1. Location map and general bathymetry of the study area (after PILLER & PERVESLER 1989). Dense stippled fields in the right map are intertidal areas. AM = Aerial mast, H = "Safaga Hotel".

From a methodological point of view, this study is based on three major sampling programs which covered soft substrata and hard substrata and included both quantitative and qualitative samples, in a depth range from intertidal to 40 m. For the quantitative analysis of soft substrata molluscs, we studied 13 standardised bulk samples taken by scuba diving. All quantitatively studied sedimentary facies, except the mangrove channel, are represented by more than one sample (tab. 1). The water depth ranges from shallow subtidal to 40 m (fig. 2). A steel cylinder (diameter 35 cm) was pushed into the sediment and the uppermost 30 cm, with a volume of 29 dm^3, was collected into a 1 mm-mesh net and sieved in seawater. The sediment was air-dried and molluscs > 2 cm were removed before splitting the samples using a modified sample splitter as described by KENNARD & SMITH (1961). For more details on soft substrata samples see ZUSCHIN & HOHENEGGER (1998) and ZUSCHIN & OLIVER (2003).

Tab. 1. Basic data (bottom facies, water depth), number of shells and number species for quantitative samples on soft- and hard substrata and for qualitative samples. Seven more qualitative samples (28 shells, 22 species) were taken near quantitative hard substrata transects and near bulk samples from sediments.

quantitative bulk samples

site	water depth (m)	bottom facies	no. of shells	no. of species
94/1/a	10	sand between coral patches	93	21
94/1/b	10	sand between coral patches	93	24
94/1/c	10	sand between coral patches	60	17
94/1/d	10	sand between coral patches	73	21
94/3/a	23	muddy sand	21	9
94/3/b	23	muddy sand	24	9
94/4/a	39	mud	349	2
94/4/b	39	mud	302	5
94/5	19	reef slope	96	22
95/31	12	reef slope	146	25
B5/8	6	sandy seagrass	353	22
C1/3	40	muddy sand with seagrass	418	12
94/6	<1	mangrove-channel	18	7

qualitative samples

site	water depth (m)	bottom facies	no. of shells	no. of species
©26	5	reef slope	5	4
©70	intertidal	rocky intertidal	15	10
©94/6	<1	mangrove-channel	2	2
©73	13	coral carpet	2	2
©20	2	reef slope	2	2
©27	5	reef slope	1	1
©7	15	coral carpet	1	1
B4/1	15	sand between coral patches	1	1
B5/6	1	sand	1	1
C4/2	3	sand with seagrass	1	1
C6/4	<1	sand on rocky intertidal	3	1
D4/2	<1	sand on rocky intertidal	2	1
"Safaga"	no depth and habitat information		14	6

quantitative transects on hard substrata

site	bottom facies	coral associations	water depth (m)	invest. area (m²)	no. of shells	no. of species
2	reef flat	*Stylophora* association	1	8	2	2
3	reef flat	*Stylophora* association	1	5,75	2	2
8	coral carpet	platy scleractinian association	23	3	1	1
15	reef slope	*Acropora* association	13	6	1	1
19	reef slope	*Porites* association	4	3	1	1
27	reef slope	*Acropora - Millepora* reef slope	5	8	1	1
30	coral carpet	faviid association	18	11	1	1
35	coral carpet	faviid association	15	4	1	1
38	reef slope	*Acropora - Millepora* reef slope	16	6	1	1
58	coral carpet	faviid association	18	6	2	1
63	coral carpet	*Porites* association	10	4	5	1
71	Conglomerate	rock bottom	intertidal	3	2	1
72	rock bottom	*Sarcophyton* association	14	1	1	1
74	rock bottom	*Sarcophyton* association	18	1	3	3
75	reef flat	*Stylophora* association	1	1,5	1	1

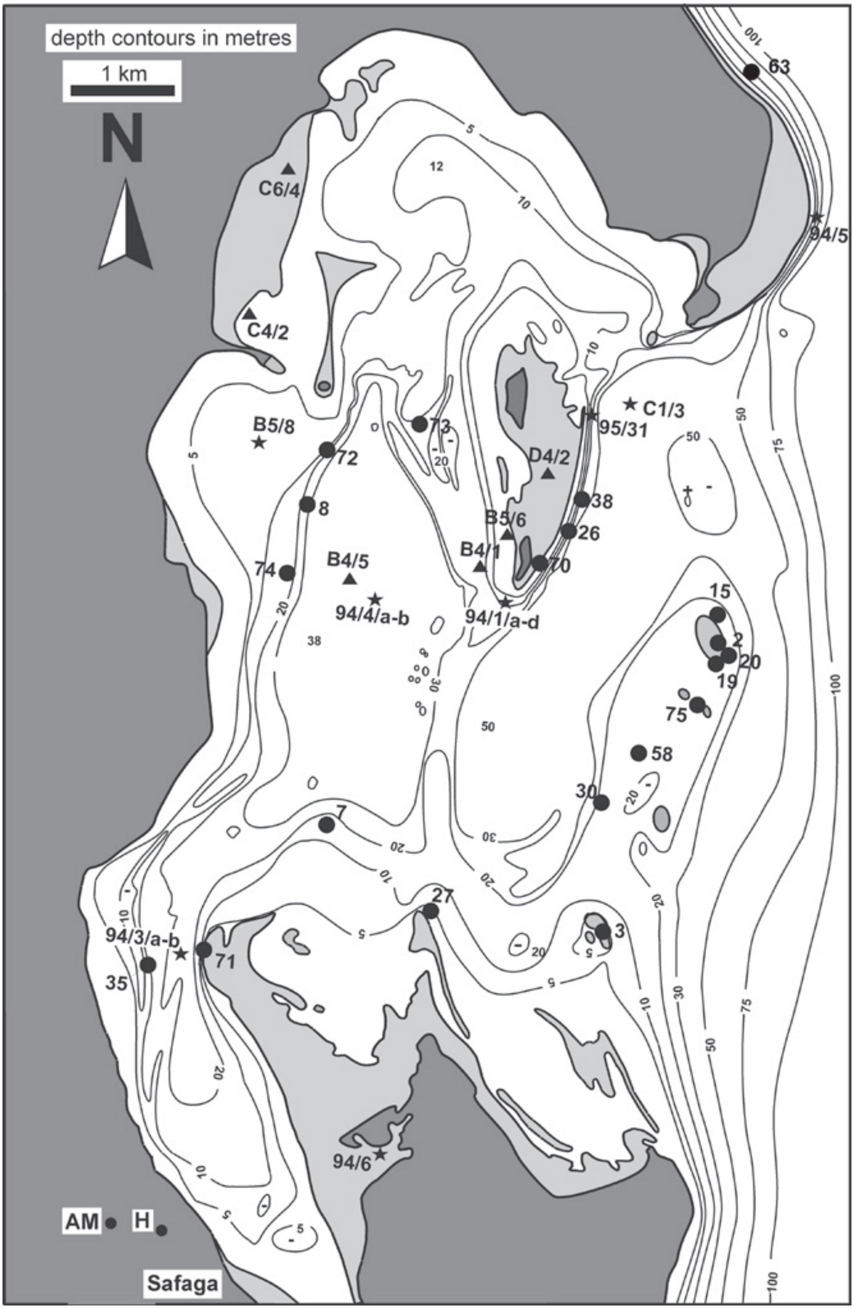

Fig. 2. Quantitative and qualitative samples from soft- and hard substrata. Consider that the total number of quantitative samples from hard substrata and of qualitative samples is much higher (see figure 3 and tables 1 and 2 in ZUSCHIN & OLIVER 2003), but most of these samples did not contain or were not investigated for shells of the three clades under study and are therefore not presented here. ● = hard substrata transects, ★ = bulk samples from soft substrata, ▲ = qualitative samples. For information on water depth and bottom facies of samples see tab. 1.

Different intertidal and subtidal hard substrata were sampled for molluscs at 74 localities in Safaga Bay with a 0.25 m² aluminium, square frame (see tab. 2 in ZUSCHIN & OLIVER 2003). Shells of the studied clades were only found at 15 hard substrata stations (fig. 2, tab. 1). At each locality, on such substrata, the location of the first frame was selected at random by a diver throwing the frame from a few meters above the substratum. The subsequent frames were positioned contiguously along a line extending from the first frame; areas covered by such transects ranged from 1 m² to 5.75 m² (tab. 1). For more details on hard substrata samples see ZUSCHIN et al. (2000, 2001).

During the initial mapping of bottom facies (PILLER & PERVESLER 1989), numerous samples (mostly from soft substrata) were taken all over the bay and some of these were evaluated qualitatively in the present study. Additionally, we unsystematically collected shells in the vicinity of most of our quantitative hard substrata stations and during dives around soft substrata stations.

Diversity of higher taxa

Sixty-eight species, identified from more than 2,100 shells, belong to 11 superfamilies and 14 families of the three clades studied. More than half of the superfamilies and families present belong to the Vetigastropoda, which is also the clade with the by far highest species diversity as well as highest abundance of specimens, followed by Cycloneritimorpha and Patellogastropoda (tab. 2). By far the most diverse superfamily is Trochoidea, followed by Fissurelloidea, Turbinoidea and Neritoidea. All other superfamilies have less than five species each (mostly only one or two) from a total of only 206 shells (tab. 3).

Tab. 2. The number of superfamilies, families, species and shells per clade.

	superfamilies	families	species	shells
Patellogastropoda	2	2	3	158
Vetigastropoda	6	8	55	1594
Cycloneritimorpha	3	4	10	369
Total	11	14	68	2121

Tab. 3. The number of families, species and shells per superfamily.

	families	species	shells
Nacelloidea	1	1	2
Lottioidea	1	2	156
Haliotoidea	1	2	7
Scissorelloidea	1	4	15
Fissurelloidea	1	14	57
Seguenzioidea	1	1	2
Trochoidea	1	24	1151
Turbinoidea	3	10	362
Helicinoidea	1	1	22
Neritopsoidea	1	1	2
Neritoidea	2	8	345
Total	14	68	2121

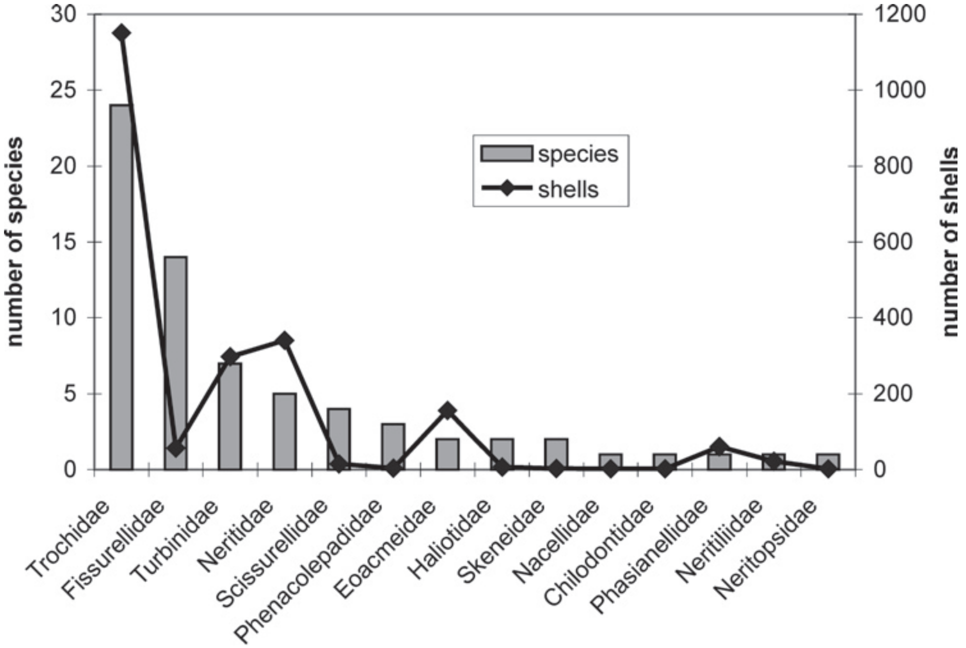

Fig. 3. Species richness and abundance of the 14 families of Patellogastropoda, Vetigastropoda and Cycloneritimorpha found in Safaga Bay.

Similarly, the most species-rich family is Trochidae (24), followed by Fissurellidae (14), Turbinidae (7) and Neritidae (5). These four families account for more than 87 % of shells, the remaining 10 families making up a total of only 274 shells (= 13 %: fig. 3).

Diversity and sampling programs

More than 96 % of the shells are from our quantitative soft substrata samples, and their detailed examination yielded 60 species. Only 25 shells (8 species) are from the quantitative hard substrata survey. Fifty shells from the qualitative samples represented 21 species (tab. 4, fig. 4).

Forty-three species were only found in samples from the quantitative soft substrata survey, but only one species was restricted to samples from the quantitative hard substrata survey. Five species were restricted to qualitative collections (fig. 4). Forty-nine species

Tab. 4. The number of shells per sampling strategy related to the three studied clades.

	quantitative soft substrata	quantitative hard substrata	qualitative
Patellogastropoda	157	0	1
Vetigastropoda	1532	25	37
Cycloneritimorpha	357	0	12
Total	2046	25	50

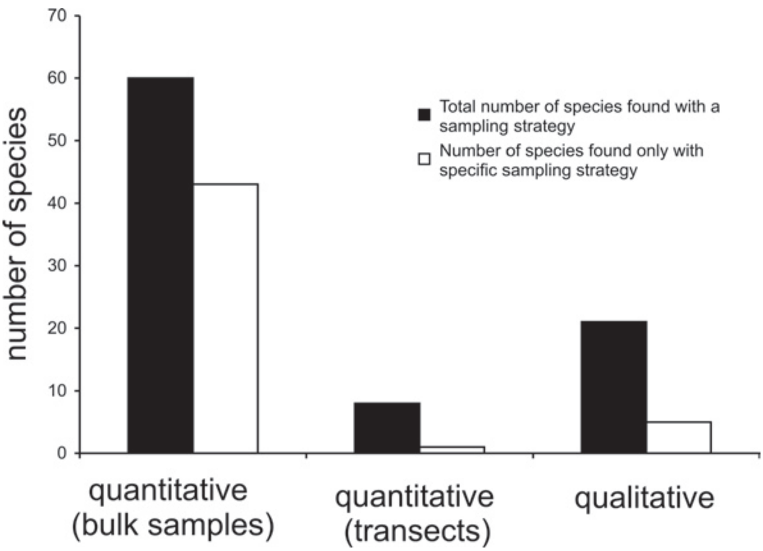

Fig. 4. Number of species in relation to sampling strategies.

could only be detected with one, 17 species were found with two, but only two species were found with all three sampling strategies.

Diversity of samples and habitats

The total species richness of the 13 quantitative bulk samples is 60 (fig. 4) and ranges from 2 to 25 in individual samples (tab. 1). Species richness has a relatively narrow range from 17 to 24 in the four samples from coral sand, and is similarly high in the two samples from the reef slope (22 and 25) and in the sample from the shallow sandy seagrass (22). Species richness is distinctly lower, however, in samples with finer grain sizes, i.e., muddy seagrass (12), muddy sand (both 9) and mud (2 and 5), and in the sample from the mangrove (7) (tab. 1).

Only the shells of Vetigastropoda were found in 15 transects of our quantitative hard substrata survey (tab. 4). These transects covered mostly reef flats, reef slopes and coral carpets, only three transects are from bottom types without or with only minor coverage by stony corals (conglomerate, rock bottoms with the soft coral *Sarcophyton*) (tab. 1). Total species richness of the quantitative hard substrata survey is only 8 (fig. 4), whereby values in the individual transects are also typically low (1-2 species); only one transect on a rock bottom with the soft coral *Sarcophyton* has three species (tab. 1).

The total species richness in the qualitative samples is 21 (fig. 4), but the 13 individual qualitative samples typically have low numbers of species (1 or 2); exceptions are only one sample from the reef slope (4 species), one sample from the rocky intertidal (10) and shells for which no depth and habitat information was recorded (6: tab 1).

Species abundance and frequency

By far the most abundant species is *Pseudominolia nedyma* (Melvill, 1897), which makes up almost 31 % of the shells. The next four most abundant species (*Smaragdia*

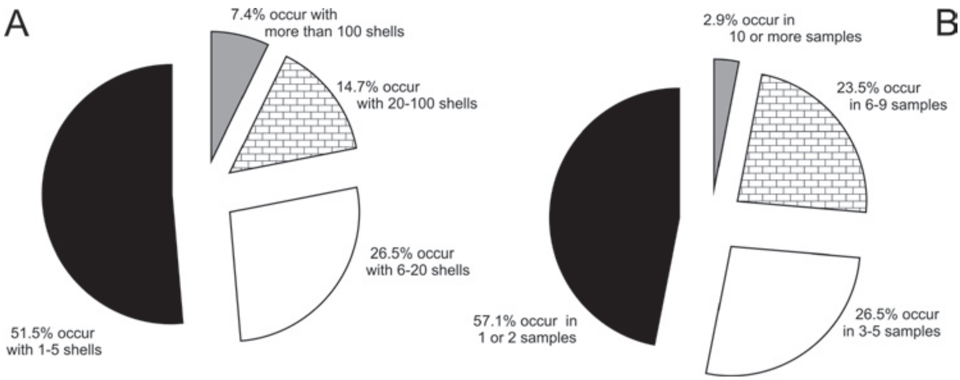

Fig. 5. Rarity of studied gastropod species at Safaga Bay. (a) The number of species in four abundance categories. (b) The number of species in four occurrence categories.

purpureomaculata DEKKER, 2000, *Pagodatrochus variabilis* (H. ADAMS, 1873), *Bothropoma* cf. *munda* (H. ADAMS, 1873), *Eoacmaea* nov. spec.) account for more than 36 %, and the remaining group of 66 species for 33 % of the shells. Most species (47) are present with less than 10 shells (fig. 5A).

The most frequent species, *Tectus dentatus* (FORSSKÅL, 1775), was found in 14 samples, mostly from the quantitative hard substrata survey. In contrast, most other common species (e.g., *Pagodatrochus variabilis* (H. ADAMS, 1873), *Smaragdia purpureomaculata* DEKKER, 2000, *Eoacmaea rolani* (CHRISTIAENS, 1987), *Ethalia* sp., *Ethminolia degregorii* (CARAMAGNA, 1888), *Bothropoma* cf. *pilula* (DUNKER, 1860), *Eoacmaea* nov. spec.) occurred almost exclusively in our samples from the quantitative soft substrata survey. Most species, however, are rare and occur in less than five samples (fig. 5B).

Abundance and occurrence of families and subfamilies

Nacellidae were frequently observed alive in the rocky intertidal and supratidal, but only the samples from seagrass habitats yielded a few dead shells. **Eoacmaeidae** were abundant in bulk samples from coral sand and sands from the reef slope. A few shells were also found in the samples from the mangrove channel and sand with seagrass. Only a few shells of **Haliotidae** were found in bulk samples or reef slope transects, one shell also in the rocky intertidal. The few shells of **Scissurellidae** were recovered from all habitats in which quantitative bulk samples were taken. Considering the relatively low number of shells found, **Fissurellidae** are remarkably rich in species, they were abundant in samples from reef slopes and coral sand and were also found in samples from seagrass and muddy sand as well as on coral carpets. **Chilodontidae** were represented by only one species and two shells, one in a sample from coral sand and one from the reef slope. The six species of **Stomatellinae** mostly occurred in samples from the reef slope and coral sand, but also in samples from seagrass and mud, and on coral carpets and rock bottoms with *Sarcophyton* associations. **Trochinae** were abundant in samples from seagrass, reef slope, coral sand and occurred on reef flats, coral carpets and rock bottoms. A few shells were also found in the mangrove channel and in muddy sand. The high abundance of **Umboniinae** is mostly due to one species, *Pseudominolia nedyma*, which is largely restricted to bulk samples from mud. Otherwise this subfamily occurs in samples from coral sand, muddy sand and seagrass and is particularly rare in reef slope samples. The relatively high abundance of **Colloniinae** is mostly due to *Bothropoma* cf. *munda*, which is most abundant in the bulk sample from muddy seagrass. Otherwise, **Colloniinae** occur in all habitats in which quantitative bulk samples were taken, except from mud, and were occasionally found on intertidal rock bottoms. A few **Turbininae** were found in coral sand, on reef slopes, reef flats, in sand with seagrass, on coral carpets and the rocky intertidal. The very few shells of **Skeneidae** occurred in coral sand and muddy sand. **Phasianellidae** were mostly found in muddy sand with seagrass and also occurred in sand with seagrass and coral sand, a single shell was also found in muddy sand. **Neritiliidae** is present with only one species, represented by *Pisulina adamsiana*, which exclusively occurred in one sample from the reef slope. The high abundance of **Neritidae** is mostly due to two species of *Smaragdia*, which preferentially occur in samples from seagrass. Otherwise, **Neritidae** occur on reef slopes, muddy sand and the mangroves and were also collected from the rocky intertidal. The few shells of **Phenacolepadidae** were recorded in coral sand, reef slope sand and sand with seagrass.

Remarks on systematics and taxonomy

The systematic arrangement adopted in this work generally follows the classification suggested by BOUCHET & ROCROI (2005). The taxonomy at the genus and species level is mainly based on recent literature dealing either with particular systematic groups or with the mollusc fauna of the Arabian region as a whole. Especially useful were the work of BOSCH et al. (1995) and the checklist of Red Sea molluscs by DEKKER & ORLIN (2000). Whereas the larger species usually present only little problems for identification, the sometimes specious groups of smaller-sized forms often pose many questions. Their taxonomy and nomenclature largely remains unresolved and there are no monographic revisions. Descriptions and especially figures of those species are scattered in the vast literature and very often do not permit to recognize them with certainty. Proper identification of these species in many cases would require a thorough revision of the whole group and comparison with respective type material. This clearly lies beyond the scope of the present study. Therefore, many species necessarily remained unidentified at the species level. Whenever appropriate, remarks on taxonomic problems relating to a particular species have been given. In cases where relationships of taxa originally described from Indopacific localities outside the Red Sea to those originally based on Red Sea material could not be resolved, we preferred to use the name established for the latter. Of course, this is merely pragmatic and does not mean that these names are truly valid or exclude possible synonymy with other taxa.

The given references are only a selection and it was not even intended to enumerate all synonyms founded on Red Sea material. Species identifications were initially made by the two first authors; additional taxonomic work as well as verification of earlier determinations were then undertaken by R.J.

The voucher material of this study is stored at the Natural History Museum Vienna and at the Senckenberg Museum Frankfurt.

Numbers & Occurrence

Numbers cited are divided into three categories, those from quantitative hard substrate analysis (QHS), those from quantitative sediment analysis (QBS) and those from qualitative observations (Ql). The occurrence data lists all sampling sites from which species were collected or observed, those with living specimens are given in Roman text, those with only dead specimens in italic text. © means "near to".

Systematic Part

Order Patellogastropoda LINDBERG, 1986

Superfamily Nacelloidea THIELE, 1891

Family Nacellidae THIELE, 1891

Cellana rota (GMELIN, 1791)

(pl. 1, fig. 1)

1791 *Patella rota* GMELIN: 3720.
1984 *Cellan eucosmia* (PILSBRY, 1891) – SHARABATI 1984: pl. 2, fig. 14.
1995 *Cellana rota* – BOSCH et al.1995: 32, fig. 25.
1986b *Cellana rota* – CHRISTIAENS 1986b: 105, pl. 2, figs b-c.
2008 *Cellana rota* – RUSMORE-VILLAUME 2008: 10, fig.

Remarks: An unmistakable shell characterised by its dense, rounded radial riblets and the pearly interior, which distinguishes this species from *Patelloida*, which have a porcellaneous interior shell layer.

Habitat: Frequently observed living in the rocky intertidal and supratidal, for example at Tubya Al-Hamra and Tubya Al-Bayda. A dead shell of a juvenile *Cellana* was also found in the QBS from muddy sand with seagrass at 40 m water depth.

Numbers: QHS (-), QBS (1), Ql (1).

Feeding type: Herbivorous grazers on hard substrata.

Occurrence: *C1/3*, *©B5/6.*

Range: Red Sea, Arabian Seas.

Superfamily Lottioidea J.E. GRAY, 1840

Family Eoacmaeidae NAKANO & OZAWA, 2007

***Eoacmaea* nov. spec.**

(pl. 1, figs 2-3)

1987 *Patelloida profunda* (DESHAYES, 1863) – CHRISTIAENS: 21, figs 1-3, 53.
2008 *Eoacmaea* sp. – RUSMORE-VILLAUME: 10, fig.

R e m a r k s : This species was until recently wrongly identified with *Patelloida profunda* (DESHAYES, 1863) but is an yet undescribed new species. Only small shells were found. These are distinguished from *Eoacmaea rolani* (CHRISTIAENS, 1987) by their strong sculpture of sharp radial ribs and the brownish to red colouration of the shell.

N u m b e r s : QHS (-), QBS (104), Ql (-).

F e e d i n g t y p e : Herbivorous on hard substrata.

H a b i t a t : Many dead shells were found in coral-associated shallow sands, few in shallow sand with seagrass.

O c c u r r e n c e : *94/1a-d*, *94/5*, *95/31*, *B5/8*.

R a n g e : Red Sea, Indian Ocean.

***Eoacmaea rolani* (CHRISTIAENS, 1987)**

(pl. 1, figs 4-5)

1987 *Patelloida rolani* CHRISTIAENS : 21, figs 4-7, 54-55.

R e m a r k s : Shells thin and fragile, with faint radial striation in contrast to the strongly ribbed *P. profunda*. Most shells show the typical white chevron-like colour pattern arranged in radial rows as described by CHRISTIAENS.

N u m b e r s : QHS (-), QBS (52), Ql (-).

F e e d i n g t y p e : Herbivorous on hard substrata.

H a b i t a t : Many dead shells were found in coral-associated shallow sands, few in muddy sand and in the mangrove channel.

O c c u r r e n c e : *94/1a-d*, *94/3b*, *94/6*.

R a n g e : Red Sea.

Order Vetigastropoda SALVINI-PLAWEN, 1980

Superfamily Haliotoidea RAFINESQUE, 1815

Family Haliotidae RAFINESQUE, 1815

Haliotis pustulata REEVE, 1846
(pl. 1, fig. 6)

1846 *Haliotis pustulata* REEVE: pl. 15, fig. 52.
1984 *Sanhaliotis varia* (LINNAEUS, 1758) – SHARABATI: pl. 2, fig. 2.
2000 *Haliotis pustulata* – GEIGER & POPPE: 73, pl. 17.
2004 *Haliotis pustulata* – PICKERY & VERBINNEN: 20, figs 1-21.
2008 *Haliotis pustulata* – RUSMORE-VILLAUME: 12, fig.

Remarks: No adult shells found; characterised by the rough sculpture of noded stronger and finer spiral cords.

Numbers: QHS (-), QBS (-), Ql (2).

Feeding type: Herbivorous on hard substrata.

Habitat: Few dead shells were collected from a *Millepora*-dominated fringing reef at the NW tip of Tubya Al-Bayda.

Occurrence: *©70*.

Range: Red Sea, Indian Ocean.

Haliotis unilateralis LAMARCK, 1822
(pl. 1, figs 7-8)

1822 *Haliotis unilateralis* LAMARCK 1822: 217.
1984 *Sanhaliotis* cf. *pustulata* REEVE, 1846 – SHARABATI: pl. 2, fig. 1.
2000 *Haliotis unilateralis* – GEIGER & POPPE: 91, pl. 19.
2004 *Haliotis unilateralis* – PICKERY & VERBINNEN: 21, figs 22-26.
2008 *Haliotis unilateralis* – RUSMORE-VILLAUME: 12, fig.

Remarks: Only small or not fully grown shells were found. These are smooth on the face between suture and row of holes.

Numbers: QHS (-), QBS (4), Ql (1).

Feeding type: Herbivorous on hard substrata.

Habitat: A few dead shells were found in samples from coral reef.

Occurrence: *94/5*, *95/31*, *©26*.

Range: Endemic to the Red Sea.

Superfamily Scissurelloidea GRAY, 1847

Family Scissurellidae GRAY, 1847

Scissurella sp.
(pl. 2, fig. 1)

1983 *Scissurella* ? sp. – YARON : 271, pl. 5.

R e m a r k s : It is not clear by what name this species should be called. Maybe it is still undescribed. However, it is possible, that this species was described as *Anatomus dohrnianus* DUNKER, 1861, a name which has not been used as a valid name for a long time because of uncertainty about its identity. The description by DUNKER as well as the type locality fit quite well to this common species from the Red Sea. YARON (1983) described it as *Scissurella* sp. A revision of Scisurellidae of the Arabian Seas is in progress by R. JANSSEN.

N u m b e r s : QHS (-), QBS (5), Ql (-).

F e e d i n g t y p e : fine detritus browser.

H a b i t a t : A few shells were found in samples from coral sand, mud, sand with seagrass and the mangrove channel.

O c c u r r e n c e : *94/1d*, *94/4b*, *94/6*, *B5/8*.

R a n g e : Indopacific.

Scissurella aff. *reticulata* PHILIPPI, 1853
(pl. 2, fig. 2)

aff. 1853 *Scissurella reticulata* PHILIPPI: 38, pl. 6, fig. 11.
aff. 1982 *Scissurella reticulata* – BOUCHET & DANRIGAL: 14, fig. 62.
aff. 1983 *Scissurella* (*Scissurella*) *reticulata* – YARON: 264, pl. 1.
aff. 1998 *Scissurella reticulata* – BANDEL: pl. 3, fig. 1.

R e m a r k s : This species is distinguished from *S.* sp. by its more rounded whorls and the wide umbilicus, which is not bounded by a sharp edge. The fine spiral ridge running from the lower corner of the inner lip into the umbilicus is missing, too.

Our specimens certainly are closely related to what usually has been identified as *S. reticulata*. However, there are several very similar species which differ by details of sculpture and an extended study of specimens by SEM would be necessary to assess specific variability and to settle the nomenclature of these taxa.

N u m b e r s : QHS (-), QBS (8), Ql (-).

F e e d i n g t y p e : fine detritus browser.

H a b i t a t : A few shells were found in samples from reef slope sand, muddy sand, mud, sand and muddy sand with seagrass and the mangrove channel.

O c c u r r e n c e : *94/5*, *95/31*,*94/3/a*, *94/4b*, *94/6*, *B5/8*, *C1/3*.

R a n g e : Red Sea.

Scissurella rota YARON, 1983
(pl. 2, fig. 3)

1983 *Scssurella* (*Scissurella*) *rota* YARON: 268, pl. 3.
1986 *Scissurella rota* – HERBERT: 622, figs 7, 25-27.
1995 *Scissurella rota* – BOSCH et al.: 28, fig. 4.

R e m a r k s : Easily recognizable by its strong and widely spaced sickle ribs on the shoulder.

N u m b e r s : QHS (-), QBS (1), Ql (-).

F e e d i n g t y p e : fine detritus browser.

H a b i t a t : A single shell was found in a sample from reef slope sand.

O c c u r r e n c e : *95/31*.

R a n g e : Red Sea, Western Indian Ocean.

Sukashitrochus dorbignii (AUDOUIN, 1826)
(pl. 2, fig. 4)

1826 *Scissurella dorbignii* AUDOUIN: 42.
1982 *Scissurella dorbignii* – BOUCHET & DANRIGAL: 12, fig. 63.
1983 *Scissurella* (*Scissurella*) *dorbignyi* – YARON: 266, pl. 2.
1983 *Sinezona armillata* YARON: 272, pl. 6.
1983 *Sinezona tricarinata* YARON: 273, pl. 7.
1995 *Sukasitrochus dorbignyii* – BOSCH et al.: 28, fig. 3.

R e m a r k s : A common and highly variable species. Probably the two species *Sinezona armillata* and *Sinezona tricarinata*, both described by YARON (1983) from the Red Sea, fall into the range of variability.

N u m b e r s : QHS (-), QBS (1), Ql (-).

F e e d i n g t y p e : fine detritus browser.

H a b i t a t : A single shell was found in a sample from muddy sand.

O c c u r r e n c e : *94/3/b*.

R a n g e : Red Sea, Arabian Seas.

Superfamily Fissurelloidea FLEMING, 1822

Family Fissurellidae FLEMING, 1822

Diodora imbricata (SOWERBY, 1862)

(pl. 3, fig. 1)

1862 *Fissurella imbricata* SOWERBY: 194, pl. 242, fig. 62.
1987 *Diodora imbricata* – CHRISTIAENS 1987: 28, figs 24-26, 47, 51.
1987 *Diodora imbricata* – SINGER 1998: 3, fig. 3.

R e m a r k s : This species is distinguished from its congener *D. ruppellii* (SOWERBY, 1834) by its more conical shape and the widely spaced, strong, ridge-like radial ribs which are decorated with fine scales caused by the crossing growth lines.

N u m b e r s : QHS (-), QBS (7), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in coral sand and sand from the reef slope.

O c c u r r e n c e : *94/1/a/ d*, *94/5*.

R a n g e : Red Sea, Arabian Seas.

Diodora ruppellii (SOWERBY, 1834)

(pl. 3, fig. 2)

1834 *Fissurella ruppellii* Sowerby: 128.
1984 *Diodora ruepelli* – SHARABATI: pl. 2, fig. 6.
1984 *Diodora* cf. *proxima* SOWERBY, 1862 – SHARABATI: pl. 2, fig. 7.
1987 *Diodora ruppellii* – CHRISTIAENS: 23, figs 8-19, 44, 56-58.
1995 *Diodora rueppellii* – BOSCH et al.: 31, fig. 16.
1998 *Diodora ruppellii* – SINGER: 3, fig. 4.
2008 *Diodora ruppellii* – RUSMORE-VILLAUME: 12, fig.

R e m a r k s : Characterised by rounded broad ribs, strong growth lamellae and the often conspicuous dark coloration of the rib interstices.

N u m b e r s : QHS (-), QBS (3), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in sand between coral patches.

O c c u r r e n c e : *94/1/a/b*.

R a n g e : Indopacific.

Emarginella cuvieri (AUDOUIN, 1826)
(pl. 3, fig. 3)

1826 *Emarginula cuvieri* AUDOUIN: 27
1915 *Emarginula* (*Emarginella*) *cuvieri* – THIELE: 95, pl. 11, figs 20-21.
1982 *Emarginula cuvieri* – BOUCHET & DANRIGAL: 12, fig. 9.
2008 *Emarginella cuvieri* – RUSMORE-VILLAUME: 14, fig.

R e m a r k s : The single specimen found is a juvenile shell with 30 narrow and rather sharp primary ribs; no secondary ribs are intercalated.

N u m b e r s : QHS (-), QBS (1), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : A single shells was found in sand between coral patches.

O c c u r r e n c e : *94/1a*.

R a n g e : Red Sea.

Emarginula sp. 1
(pl. 3, fig. 4)

R e m a r k s : Several species of *Emarginula* are listed for the Red Sea (see DEKKER & ORLIn 2000), some are figured by SINGER (1998). None of these is likely comparable to our specimens so that our species must remain unidentified. In general the taxonomy and nomenclature of Indopacific *Emarginula* is in need of revision. It is currently not possible to attach a name to the species found at Safaga with any degree of certainty.

Emarginula sp. 1 is characterized by a high conical shell and a sculpture of 26 narrow primary radial ribs, with regular intercalation of a secondary rib, and rather coarse and distant concentric ribs; colour white with grey-greenish blotches.

N u m b e r s : QHS (-), QBS (6), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in sand from reef slope.

O c c u r r e n c e : *94/5*, *95/31*.

R a n g e : unknown.

Emarginula sp. 2
(pl. 3, fig. 5)

R e m a r k s : See as for the former species. *Emarginula* sp. 2 is a juvenile shell with 22 strong nodulous primary radial ribs and few irregularly intercalated secondary ribs and weak, closely set concentric riblets; colour white.

N u m b e r s : QHS (-), QBS (1), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : A single shell was found in sand between coral patches.

O c c u r r e n c e : *94/1b*.

R a n g e : unknown.

Hemitoma arabica (A. ADAMS, 1852)
(pl. 4, fig. 1)

1852 *Subemarginula arabica* A. ADAMS: 90.
1987 *Hemitoma arabica* – CHRISTIAENS: 42, fig. 72.
1998 *Hemitoma* (*Montfortia*) *arabica* – SINGER: 9, fig. 2.
2008 *Hemitoma arabica* – RUSMORE-VILLAUME: 14, fig.

R e m a r k s : This species seems to be rather well characterised by its very strong sculpture. However, only small and apparently not fully-grown specimens have been examined.

N u m b e r s : QHS (-), QBS (6), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in sand from the reef slope.

O c c u r r e n c e : *94/1b*.

R a n g e : Red Sea.

Hemitoma modesta (H. ADAMS, 1872)
(pl. 4, figs 2-3)

1872 *Emarginula modesta* H. ADAMS: 10, pl. 3, fig. 8.
1987 *Hemitoma modesta* – CHRISTIAENS: 42, fig. 71.
1998 *Hemitoma* (*Montfortia*) *modesta* – SINGER: 10, fig.

R e m a r k s : *Hemitoma* species are quite variable in shell form and especially in sculpture and degree of sculpture strength. This species as well as *H. simpla* CHRISTIAENS, 1987 and *H. subrugosa* THIELE, 1917 agree in shell form and rib arrangement but differ in the strength of development of sculpture. Although it was possible to distinguish several named forms, they may well prove to fall into the range of variability of only one species after examination of a greater number of specimens.

N u m b e r s : QHS (-), QBS (2), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in sand from the reef slope.

O c c u r r e n c e : *95/31*.

R a n g e : Red Sea.

Hemitoma panhi (QUOY & GAIMARD, 1834)
(pl. 4, figs 4-5)

1834 *Emarginula panhi* QUOY & GAIMARD: 327, pl. 68, figs 7-8.
1984 *Emarginula rugosa* H. ADAMS, 1871 – SHARABATI: pl. 6, fig. 15.
1987 *Hemitoma panhi* – CHRISTIAENS: 40, figs 67, 70.
1995 *Subemarginula panhi* – BOSCH et al.: 30, fig. 11.
1998 *Hemitoma* (*Montfortia*) *panhi* – SINGER: 9, fig.
2008 *Hemitoma panhi* – RUSMORE-VILLAUME: 14, fig.

Remarks: This species is distinguished from the former species by its high conical shell form and intercalated secondary ribs.

Numbers: QHS (-), QBS (2), Ql (1).

Feeding type: Herbivores and browsing carnivores on hard substrata.

Habitat: A living individual was collected on sand between coral patches in 15 m water depth, two shells were found in sand with seagrass and in sand from the reef slope.

Occurrence: B4/1, *B5/8*, *94/5*.

Range: Indopacific.

Hemitoma simpla CHRISTIAENS, 1987
(pl. 4, fig. 6)

1987 *Hemitoma simpla* CHRISTIAENS: 43, figs 43, 73.
1998 *Hemitoma* (*Montfortia*) *simpla* – SINGER: 10, fig. 4.

Remarks: as for *H. modesta*.

Numbers: QHS (-), QBS (1), Ql (-).

Feeding type: Herbivores and browsing carnivores on hard substrata.

Habitat: A single shell was found in sand between coral patches.

Occurrence: *94/1b*.

Range: Red Sea.

Hemitoma subrugosa Thiele, 1916
(pl. 5, fig. 1)

1917 *Hemitoma subrugosa* Thiele: 125, pl. 13, fig. 22.
1984 *Emarginula rugosa* H. Adams, 1871 – Sharabati: pl. 2, fig. 3.
1987 *Hemitoma subrugosa* – Christiaens: 41, figs 68-69.
1995 *Subemarginula subrugosa* – Bosch et al.: 30, fig. 12.
1998 *Hemitoma* (*Montfortia*) *subrugosa* – Singer: 10, fig. 1.

Remarks: as for *H. modesta*.

Numbers: QHS (-), QBS (9), Ql (-).

Feeding type: Herbivores and browsing carnivores on hard substrata.

Habitat: Shells were found in sand between coral patches and in sand from the reef slope.

Occurrence: *94/1a-d*, *94/5*.

Range: Red Sea, South Arabia.

Macroschisma compressa A. Adams, 1851
(pl. 5, fig. 2)

1851 *Macrochisma compressa* A. Adams: 202.
1987 *Macroschisma compressa* – Christiaens: 38, fig. 52.
1998 *Macroschisma compressa* – Singer: 4, fig.
2008 *Macroschisma compressa* – Rusmore-Villaume: 4 fig.

Remarks: This is the only Red Sea species of the genus.

Numbers: QHS (-), QBS (3), Ql (-).

Feeding type: Herbivores and browsing carnivores on hard substrata.

Habitat: Shells were found in sand and muddy sand with seagrass.

Occurrence: *B5/8*, *C1/3*.

Range: Red Sea.

Medusafissurella ? sp.
(pl. 5, fig. 3)

Remarks: This is a juvenile specimen, which does not fit with any of the other fissurellids known from the Red Sea. It looks very much like young specimens of *Medusafissurella* species known from the Gulf of Aden (see Bosch et al. 1995) and therefore is attributed to that genus. The genus was not yet reported from the Red Sea.

Numbers: QHS (-), QBS (1), Ql (-).

Feeding type: Herbivores and browsing carnivores on hard substrata.

Habitat: A single shell was found in muddy sand.

O c c u r r e n c e : *94/3b*.

R a n g e : Red Sea.

***Scutus rueppelli* (PHILIPPI, 1851)**
(pl. 5, fig. 4)

1851 *Parmophorus rueppeli* PHILIPPI: 89.
1984 *Scutus unguis* (LINNAEUS, 1758) – SHARABATI: pl. 2, fig. 5.
1986a *Scutus rueppeli* – CHRISTIAENS: 21.
1998 *Scutus rueppellii* – SINGER: 11, fig.
2008 *Scutus rueppelli* – RUSMORE-VILLAUME: 14, fig.

R e m a r k s : According to CHRISTIAENS (1986a) the population of the Red Sea is distinct from the widespread Indopacific *S. unguis* (LINNAEUS, 1758). Because all Red Sea specimens examined are characterised by a well developed sculpture of oblique wrinkles, which contrasts to the much smoother shell of *unguis*, we follow CHRISTIAENS in keeping the Red Sea form separate.

N u m b e r s : QHS (1), QBS (2), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in sand from the reef slope, on reef slope hard substrata, and on a coral carpet with a faviid association.

O c c u r r e n c e : *94/6*, *35*, *38*.

R a n g e : Red Sea.

***Zeidora* (*Nesta*) *nesta* (PILSBRY, 1891)**
(pl. 5, fig. 5)

1891 *Emarginula nesta* PILSBRY: 269, pl. 28, fig. 10.
1912 *Zeidora* (*Nesta*) *candida* (H. ADAMS, 1870) – THIELE: 45, pl. 5, figs 16-18.
1985 *Nesta nesta* – DRIVAS & JAY: 3, fig. 4.
1998 *Zeidora* (*Nesta*) *nesta* – SINGER: 10, fig.
2008 *Zeidora nesta* – RUSMORE-VILLAUME: 14, fig.

N u m b e r s : QHS (-), QBS (8), Ql (-).

F e e d i n g t y p e : Herbivores and browsing carnivores on hard substrata.

H a b i t a t : Shells were found in coral sand, muddy sand and sand with seagrass.

O c c u r r e n c e : *94/1a/c*, *94/3a*, *B5/8*.

R a n g e : Red Sea, Western Indian Ocean.

Superfamily Seguenzioidea VERRILL, 1884

Family Chilodontidae WENZ, 1938

***Vaceuchelus* sp.**

(pl. 6, fig. 1)

Remarks: Only fragmentary and badly preserved material is available. This allows recognition of the genus *Vaceuchelus* but prevents a certain identification of the species. From the Red Sea only *V. delpretei* (CARAMAGNA, 1888) is known.

Numbers: QHS (-), QBS (2 fragments), Ql (-).

Feeding type: herbivorous on hard substrata.

Habitat: Two fragments were found in sand between coral patches and sand from the reef slope.

Occurrence: *94/1b*, *94/5*.

Range: Red Sea.

Superfamily Trochoidea RAFINESQUE-SCHMALTZ, 1815

Family Trochidae RAFINESQUE, 1815

Subfamily Stomatellinae GRAY, 1840

***Fossarina mariei* (FISCHER, 1890)**

(pl. 6, figs 2-4)

1890 *Clydonochilus mariei* FISCHER: 117, pl. 3, fig. 3.

Remarks: Some specimens show the typical sinus at the posterior margin of the aperture as illustrated on FISCHER'S original figure.

Numbers: QHS (-), QBS (24), Ql (-),

Feeding type: herbivorous on hard substrata.

Habitat: Shells occurred in sand between coral patches, mud, and sand on the reef slope.

Occurrence: *94/1a-d*, *94/4a*,*b*, *95/31.*

Range: Red Sea, Indian Ocean.

Stomatella auricula LAMARCK, 1816
(pl. 6, figs 5-6)

1816 *Stomatella auricula* LAMARCK: 10, pl. 450, fig. 1.
1984 *Stomatella auricula* – SHARABATI: pl. 3, fig. 13.
1984 *Stomatella nigra* QUOY & GAIMARD, 1834 – SHARABATI: pl. 3, fig. 14.
1995 *Stomatella auricula* – BOSCH et al.: 37, fig. 57.
2005 *Stomatella auricula* – VERBINNEN & DIRKX: 24, fig. 1.
2008 *Stomatella varia* (A. ADAMS, 1853) – RUSMORE-VILLAUME: 24, fig.

Remarks: Taxonomy and nomenclature of the species of *Stomatella* resp. *Gena* are in need of revision. There is no common agreement as to the names which have to be applied to various populations of the Indopacific. We follow BOSCH et al. (1995) in the use of *auricula* LAMARCK for our specimens. DEKKER & ORLIN (2000: 18) gave the above-mentioned references under the name *Stomatella varia* (A. ADAMS, 1850). VERBINNEN & DIRKX (2005) consider this species a synonym of *S. auricula*. A name based on Red Sea specimens is *St. callosa* (P. FISCHER, 1871) which could be the proper name to be used in case that names like *auricula* LAMARCK or *varia* A. ADAMS are not applicable to the Red Sea species.

Numbers: QHS (2), QBS (16), Ql (7).

Feeding type: unknown.

Habitat: Sand between coral patches, sand from the reef slope, coral carpet with a faviid association, *Millepora* fringing reef, rock bottom.

Occurrence: *©70*, *58*, *94/1c/d*, *94/5*, *95/31*, *74*.

Range: Indopacific.

Stomatella modesta H. ADAMS & A. ADAMS, 1864
(pl. 6, fig. 7)

1864 *Stomatella modesta* H. ADAMS & A. ADAMS: 433.
2008 *Stomatella modesta* – RUSMORE-VILLAUME: 24, fig.

Remarks: Only a fragment of the spire was found which clearly differs in shape and sculpture from the other stomatellids present in our material.

Numbers: QHS (-), QBS (2), Ql (-)

Feeding type: unknown.

Habitat: Sand between coral patches and sand from the reef slope.

Occurrence: *94/1b*, *95/31*.

Range: Red Sea.

Stomatia duplicata (SOWERBY, 1825)
(pl. 7, fig. 1)

1825 *Stomatia duplicata* SOWERBY: fig. 3
1995 *Stomatella duplicata* – BOSCH et al. : 37, fig. 58.
2005 *Stomatella modesta* H. & A. ADAMS, 1864 – VERBINNEN & DIRKX 2005: 24, fig. 2.
2008 *Stomatia duplicata* – RUSMORE-VILLAUME: 24, fig.

Remarks: Our specimens are identical with specimens from the Persian Gulf and match very well the shells figured by BOSCH et al. (1995) as *S. duplicata*. This species was described from the Philippines and judging from figures in the older literature it has a higher turbinated and more extracted shell than specimens from the Arabian and Red Sea. Therefore identification of the latter with that spcies is a bit doubtful.

Numbers: QHS (-), QBS (5), Ql (-).

Feeding type: unknown.

Habitat: Shells were found in seagrass-associated sediments.

Occurrence: *B5/8*, *C1/3*.

Range: Red Sea.

Stomatia phymotis HELBLING, 1779
(pl. 7, fig. 2)

1779 *Stomatia phymotis* HELBLING: 124.
1984 *Stomatia phymotis* – SHARABATI: pl. 3, fig. 15.
1995 *Stomatia phymotis* – BOSCH et al.: 37, fig. 59.
2005 *Stomatia phymotis* – VERBINNEN & DIRKX: 25, fig. 3.
2008 *Stomatia phymotis* – RUSMORE-VILLAUME: 24, fig.

Numbers: QHS (1), QBS (-), Ql (-).

Feeding type: unknown.

Habitat: A single shell was found on a rock bottom with a *Sarcophyton* association.

Occurrence: *72*.

Range: Indopacific.

***Synaptocochlea concinna* (GOULD, 1845)**
(pl. 7, fig. 3)

1845 *Stomatella concinna* GOULD: 26.
1890 *Stomatella concinna* – PILSBRY: 28, pl. 2, figs 6-7, pl. 55, figs 27-28.
1966 *Synaptocochlea concinna* – LADD: 41, pl. 5, figs 20-23.
1979 *Synaptocochlea concinna* – KAY: 53, fig. 14 H-I.

Remarks: A species of this genus was not recorded formerly from the Red Sea, although the species is regularly found in coral sand samples from various Red Sea localities. Our poor material from Safaga agrees perfectly with compared shells from other Indopacific localities. They are dark redbrown with an irregular broad white zone in the middle of the last whorl. The sculpture consists of many very fine and minutely granulated spiral threads. Compared material from Queensland, Hainan Island, the Maledives, Réunion, Sokotra Island and from the Sanganeb atoll (Sudan) proved to be very variable with regard to the colour pattern, which often changes abruptly, e.g. from dark brown to white with interrupted red spiral lines. There are several names available in the older literature (see PILSBRY 1890), which may prove to be synonymous (e.g. *asperulata* A. ADAMS, 1850, *pulchella* A. ADAMS, 1850, *montrouzieri* PILSBRY, 1890). We use the oldest available name *concinna* GOULD 1845 for our material.

Numbers: QHS (-), QBS (2), Ql (-).

Feeding type: unknown.

Habitat: Only two shells were found in sand from the reef slope.

Occurrence: *94/5*.

Range: Red Sea.

Subfamily Trochinae RAFINESQUE, 1815

***Agagus* nov. spec.**
(pl. 7, figs 4-5)

2008 *Agagus* sp. – RUSMORE-VILLAUME: 16, fig.

Remarks: HERBERT (1991) described *A. stellamaris* from the Indian Ocean, whereas *A. agagus* JOUSSEAUME, 1894 is confined to the Red Sea. However, our specimens are clearly distinct from *agagus* by the smooth base, which is a diagnostic character for *stellamaris*, but differ from the latter by its much higher conical shell form. We are dealing with a second Red Sea species which is currently described as new species by H. DEKKER (pers. comm.).

Numbers: QHS (-), QBS (1), Ql (2).

Feeding type: herbivorous on hard substrata.

Habitat: Only juvenile shells were found in sand from the reef slope.

O c c u r r e n c e : *95/31*, *©70*.

R a n g e : Southern Indian Ocean; first record for the Red Sea.

Calliotrochus marmoreus (Pease, 1861)
(pl. 7, fig. 6)

1861 *Margarita marmorea* Pease: 435.
1998 *Calliotrochus marmoreus* – Herbert: 547, figs 1-35.
2008 *Calliotrochus marmoreus* – Rusmore-Villaume: 16, fig.

N u m b e r s : QHS (-), QBS (8), Ql (1).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : Shells were found in sand between coral patches and sand on the reef slope.

O c c u r r e n c e : *94/1a*, *94/5*, *95/31*, *©70*.

R a n g e : Indopacific.

Clanculus pharaonius (Linnaeus, 1758)
(pl. 8, figs 1-2)

1758 *Trochus pharaonius* Linnaeus: 757.
1984 *Clanculus pharaonius* – Sharabati: pl. 3, fig. 6.
1993 *Clanculus pharaonius* – Herbert: pl. 1a, fig. 9.
1995 *Clanculus pharaonius* – Bosch et al. : 34, fig. 36.
2008 *Clanculus pharaonius* – Rusmore-Villaume: 16, fig.

N u m b e r s : QHS (-), QBS (-), Ql (3).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : “Safaga”.

O c c u r r e n c e : *Safaga*.

R a n g e : Red Sea, Arabian Seas.

Clanculus tonnerrei (G. Nevill & H. Nevill, 1874)
(pl. 8, figs 3-6)

1874 *Trochus* (*Clanculus*) *tonnerrei* G. Nevill & H. Nevill: 27, pl. 1, f. 3.
1995 *Clanculus gennesi* Fischer – Bosch et al.: 34, fig. 35.
1996 *Clanculus* (? *Clanculopsis*) *tonnerrei* – Herbert: 32, figs 1-23.
2008 *Clanculus tonnerrei* – Rusmore-Villaume: 18, fig.

N u m b e r s : QHS (-), QBS (7), Ql (1).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : Shells were found in sand between coral patches, sand with seagrass and sand from the reef slope.

O c c u r r e n c e : *94/1b/d*, *94/5*, *95/31*, *B5/8*, *©70*.

R a n g e : Red Sea, Indian Ocean.

Pagodatrochus variabilis (H. ADAMS, 1873)
(pl. 9, figs 1-4)

1873 *Minolia variabilis* H. ADAMS: 207, pl. 23, fig. 10.
1989 *Pagodatrochus variabilis* – HERBERT: 366, figs 1a-f, 2, 3, 4a-c, 5.
1995 *Pagodatrochus variabilis* – BOSCH et al.: 36, fig. 52.

N u m b e r s : QHS (-), QBS (219), Ql (-).

F e e d i n g t y p e : herbivorous on fine-grained substrata.

H a b i t a t : Shells were found in sand between coral patches, sand on the reef slope, muddy sand, the mangrove channel, muddy sand with seagrass and sand with seagrass. Adult shells were only found in samples from seagrass. Highest abundances occurred in sand with seagrass.

O c c u r r e n c e : *94/1a-d*, *943a,b*, *94/6*, *95/31*,*C1/3*, *B5/8*.

R a n g e : Red Sea, Indian Ocean.

Perrinia stellata (A. ADAMS, 1864)
(pl. 9, figs 5-7)

1864 *Turcica stellata* A. ADAMS: 508.
1995 *Perrinia stellata* – BOSCH et al.: 33, fig. 28.
2008 *Perrinia stellata* – RUSMORE-VILLAUME: 20, fig.

N u m b e r s : QHS (-), QBS (43), Ql (-).

F e e d i n g t y p e : herbivorous on fine-grained substrata.

H a b i t a t : Shells were found in sand between coral patches and mostly in muddy sand with seagrass and sand with seagrass. Adult shells were only found in samples from seagrass.

O c c u r r e n c e : *94/1d*, *C1/3*, *B5/8*.

R a n g e : Indopacific.

***Rubritrochus declivis* (FORSSKÅL, 1775)**
(pl. 10, figs 1-3)

1775 *Turbo declivis* FORSSKÅL: 126.
1984 *Gibbula declivis* – SHARABATI: pl. 3, fig. 7.
1995 *Rubritrochus declivis* – BECK: 71, pl. 3, figs 1-5.
2008 *Rubritrochus declivis* – RUSMORE-VILLAUME: 20, fig.

Remarks: Juvenile specimens (pl. 10, fig. 1) resemble very much young specimens of the turbinid genus *Lunella* but are distinguished by having only one peripheral carina (instead of two).

Numbers: QHS (1), QBS (7), Ql (-).

Feeding type: herbivorous on fine-grained substrata.

Habitat: Shells were found in muddy sand with seagrass and on rock bottom with a *Sarcophyton* association.

Occurrence: *C1/3*, *78*, *94/1b*,*c*, *B5/8*.

Range: Red Sea.

***Tectus dentatus* (FORSSKÅL, 1775)**
(pl. 10, figs 4-6)

1775 *Trochus dentatus* FORSSKÅL: 125.
1984 *Tectus dentatus* – SHARABATI: pl. 3, fig. 4.
2008 *Tectus dentatus* – RUSMORE-VILLAUME: 20, fig.

Numbers: QHS (8l, 2d), QBS (3), Ql (3).

Feeding type: herbivorous on hard substrata.

Habitat: Juvenile shells were found in sand on the reef slope and in sand with seagrass. Living adult individuals were mostly encountered on reef flats and reef slopes, but also on coral carpets, where also one dead shell was found. The figured shell under pl. 10, figs 5-6 was collected in the mangrove.

Occurrence: *94/5*, *B5/8*, *©70*, *©94/6*, 2, 3, 8, 15, 27, 71, 74, 75, *30*, "*Safaga*".

Range: Red Sea.

***Trochus erithreus* BROCCHI, 1821**
(pl. 11, figs 1-2)

1821 *Trochus erithreus* BROCCHI: 223.
1984 *Trochus erythreus* – SHARABATI: pl. 3, fig. 2.
1995 *Trochus* (*Infundibulops*) *erithreus* – BOSCH et al.: 34, fig. 38.
2008 *Trochus erithreus* – RUSMORE-VILLAUME: 22, fig.

Numbers: QHS (-), QBS (11), Ql (3).

Feeding type: herbivorous on hard substrata.

H a b i t a t : Shells were found in sand between coral patches, sand with seagrass and in the mangrove.

O c c u r r e n c e : *94/1a*, *B5/8*, *C4/2*, ©*94/6*.

R a n g e : Red Sea, Arabian Seas.

Trochus maculatus LINNAEUS, 1758
(pl. 11, figs 3-4)

1758 *Trochus maculatus* LINNAEUS: 756.
1984 *Trochus maculatus* – SHARABATI: pl. 3, fig. 3.
2008 *Trochus maculatus* – RUSMORE-VILLAUME: 22, fig.

N u m b e r s : QHS (4l), QBS (-), Ql (1).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : Five living specimens were found at a *Porites* carpet and one living specimen was recorded at a reef slope with a *Porites* association. A single dead shell was collected at a *Millepora*-dominated fringing reef.

O c c u r r e n c e : 63, 19, ©*26*.

R a n g e : Indopacific.

Trochus submorum (ABRARD, 1942)
(pl. 11, figs 5-7)

1942 *Clanculus submorum* ABRARD: 51, pl. 5, figs 32-33.
1984 *Trochus* sp. – SHARABATI: pl. 3, fig. 1.
1989 *Trochus wilsi* PICKERY: 1, figs 1-3.
2008 *Trochus submorum* – RUSMORE-VILLAUME: 22, fig.

R e m a r k s : Synonymy of *Trochus wilsi* PICKERY, 1989 with *submorum* was indicated by DEKKER & ORLIN (2000: 18).

N u m b e r s : QHS (-), QBS (5), Ql (3).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : Shells were found in sand between coral patches, in sand from the reef slope and in sand near coral carpet with a *Porites* association.

O c c u r r e n c e : 94/1b, *94/5*, *95/31*, ©*70*, ©*73*.

R a n g e : Red Sea.

Trochus (*Cardinalia*) *virgatus* Gmelin, 1791
(pl. 12, figs 1-3)

1791 *Trochus virgatus* Gmelin: 3580
1984 *Tectus virgatus* – Sharabati: pl. 3, fig. 5.
1993 *Tectus* (*Cardinalia*) *virgatus* – Herbert: 299, figs 109-115.
2008 *Trochus virgatus* – Rusmore-Villaume:22, fig.

Remarks: The juvenile specimens figured under pl. 12, figs 1-2 are attributed to this species on advice of H. Dekker. Usually juveniles can not be compared with the ealy stages of adult specimens because the early whorls mostly are corroded.

Numbers: QHS (1l), QBS (-), Ql (3).

Feeding type: herbivorous on hard substrata.

Habitat: A living specimen was found on a reef flat, empty shells in sand near coral carpet with a *Porites* association.

Occurrence: 2, ©*73*, "*Safaga*".

Range: Indopacific.

Subfamily Umboniinae H. Adams & A. Adams, 1854

Ethalia sp.
(pl. 12, figs 4-6)

2008 *Ethalia bellardii* (Issel, 1869) – Rusmore-Villaume: 18, fig.

Remarks: Our material agrees very well with the description and figures of *Ethalia meneghinii* (Caramagna, 1888), which was described from Assab (Eritrea). Also it matches very well the descriptions and figures of *Ethalia carneolata* Melvill, 1897 given by Herbert (1992: 396, figs 3, 4a-b, 9-22) and Bosch et al. (1995: 35, fig. 42). Because of often subtle differences in sculpture and outline of whorls in species of *Ethalia* and related genera, and because of lack of comparative material, we are not certain about the identity of our specimens and their relationships to these two taxa. Therefore, and because *E. carneolata* has not been mentioned before from the Red Sea, we prefer to call our specimens *Ethalia* sp. Dekker & Orlin (2000: 18) list *meneghinii* as younger synonym of *Trochus bellardii*, Issel, 1869, a species described after a juvenile shell of 2 mm size. In our opinion, however, the description as well as the figure (Issel 1869: pl. 2, fig. 12) do that species not allow to be recognized. Therefore this synonymy is not well founded.

Numbers: QHS (1), QBS (55), Ql (-).

Feeding type: fine detritus suspension feeder.

Habitat: Sand between coral patches, reef slope sand, sand and muddy sand with seagrass, rock bottom with a *Sarcophyton* association. Adult shells were only found in muddy sand with seagrass.

O c c u r r e n c e : *94/1a-d*, *95/31*, *B5/8*, *C1/3*, *74*.

R a n g e : Red Sea, Arabian Seas?

Ethminolia degregorii **(CARAMAGNA, 1888)**
(pl. 12, figs 7-8)

1888 *Gibbula De Gregorii* CARAMAGNA: 130, pl. 8, fig. 7.
1995 *Ethminolia degregorii* – BOSCH et al. : 35, fig. 44.

R e m a r k s : The descriptions and figures of this species match our specimens rather well. The colouration is very striking (especially that of the base) and does not seem to be very variable.

N u m b e r s : QHS (-), QBS (26), Ql (-).

F e e d i n g t y p e : fine detritus suspension feeder.

H a b i t a t : Shells were found in sand between coral patches, muddy sand, mud, sand and muddy sand with seagrass.

O c c u r r e n c e : *94/1*,*b*,*c*, *d*, *94/3a*,*b*, *94/4/b*, *B5/8*, *C1/3*.

R a n g e : Red Sea, Arabian Seas.

Ethminolia hemprichii **(ISSEL, 1869)**
(pl. 13, figs 1-3)

1869 *Trochus hemprichii* ISSEL: 223, 329 (ref. to SAVIGNY, 1817: pl. 3, fig. 6).
1982 *Minolia hemprichi* – BOUCHET & DANRIGAL: 13, fig. 22.
2008 *Ethminolia hemprichii* – RUSMORE-VILLAUME: 18, fig.

R e m a r k s : A small species which has not been treated in recent taxonomic literature.

N u m b e r s : QHS (-), QBS (5), Ql (-).

F e e d i n g t y p e : fine detritus suspension feeder.

H a b i t a t : Only few juveniles where found in sand between coral patches.

O c c u r r e n c e : *94/1a*,*b*,*d*.

R a n g e : Red Sea.

Priotrochus obscurus (Wood, 1828)
(pl. 13, fig. 4)

1828 *Trochus obscurus* Wood: 17, pl. 5, fig. 6.
1994 *Priotrochus obscurus* – Herbert: 139, figs 1-4.
1995 *Priotrochus obscurus* – Bosch et al.: 36, fig. 47.
2008 *Priotrochus obscurus* – Rusmore-Villaume: 20, fig.

Remarks: Only one young and rather badly preserved specimen was found which – after comparison with better preserved specimens – proved to belong to the fairly common species *P. obscurus*.

Numbers: QHS (-), QBS (1), Ql (-).

Feeding type: herbivorous on hardgrained substrata.

Habitat: A single shell was found in sand between coral patches.

Occurrence: *94/1d*.

Range: Red Sea, Western Indian Ocean.

Pseudominolia gradata (Sowerby, 1895)
(pl. 13, figs 5-6)

1895 *Minolia gradata* Sowerby: 279, pl. 18, figs 5-6.
1995 *Pseudominolia gradata* – Bosch et al.: 37, fig. 54.
2008 *Pseudominolia gradata* – Rusmore-Villaume: 20, fig.

Remarks: Only young specimens were found which are identical with compared material from the Persian Gulf. They are grey with dark brown spots. Some specimens have a dark-coloured apex or early whorls.

Numbers: QHS (-), QBS (14), Ql (-).

Feeding type: fine detritus suspension feeder.

Habitat: Shells were found in sand between coral patches, muddy sand and sand with seagrass.

Occurrence: *94/1a-d*, *94/3b*, *B5/8*.

Range: Red Sea, Arabian Seas.

Pseudominolia nedyma (Melvill, 1897)
(pl. 13, figs 7-9)

1897 *Minolia nedyma* Melvill: 17, pl. 7, fig. 23.
1995 *Pseudominolia nedyma* – Bosch et al.: 37, fig. 55.

Remarks: This species is distinguished fom *P. gradata* by its bigger size, a broadly conical shell, a highly variable and pronounced colour pattern and a dense spiral sculpture.

N u m b e r s : QHS (-), QBS (654), Ql (-).

F e e d i n g t y p e : herbivorous on fine-grained substrata/ fine detritus suspension feeder.

H a b i t a t : Shells were found in muddy sand and sand on the reef slope but occurred mostly in mud.

O c c u r r e n c e : *94/3a,b*, *94/4a,b*, *95/31*.

R a n g e : Red Sea, Arabian Seas.

Superfamily Turbinoidea RAFINESQUE, 1815

Family Turbinidae RAFINESQUE, 1815

Subfamily Colloniinae COSSMANN, 1917

"*Bothropoma*" *bellula* (H. ADAMS, 1873) ?

(pl. 14, figs 1-2)

1873 *Liotia bellula* H. ADAMS: 206, pl. 23, fig. 7.
1995 *Bothropoma* cf. *bellula* – BOSCH et al.: 40, fig. 86.

R e m a r k s : Our specimens are certainly conspecific with the so identified species from the Arabian Sea (see BOSCH et al. 1995). ADAMS described the species from the Persian Gulf. His figure shows a shell with distinctly elevated spire in contrast to our material, which has a rather discoidal or very low spired shell. Therefore, the identification remains somewhat doubtful. The discoidal shell form is unusual for the genus so that the generic allocation of the species is questionable. Although it is a minute shell, it is not the young of any other *Bothropoma* species.

N u m b e r s : QHS (-), QBS (16), Ql (-).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : shells were found in sand between coral patches and in sand from the reef slope.

O c c u r r e n c e : *94/1a-d*, *95/31*.

R a n g e : Red Sea, Arabian Seas.

Bothropoma cf. *munda* (H. ADAMS, 1873)

(pl. 14, figs 3-5)

cf. 1873 *Collonia munda* H. ADAMS: 206, pl. 23, fig. 6
1995 *Bothropoma* cf. *munda* – BOSCH et al.: 40, fig. 87.

R e m a r k s : Our material agrees rather well with specimens from the Persian Gulf and the figure given by BOSCH et al. (1995) but differs in details of spiral sculpture. The species has a somewhat angulated periphery of the whorls, the shoulder sometimes appears smooth, and the spiral sculpture usually consists of rather strong spiral cords. Whether *Bothropoma isseli* THIELE, 1924 is a synonym of this species or of cf. *pilula* (DUNKER, 1869) is unclear as far as the type has not been studied (see below).

N u m b e r s : QHS (-), QBS (196), Ql (-).

F e e d i n g t y p e : herbivorous on fine-grained substrata.

H a b i t a t : Shells occurred in sand between coral patches, sand on the reef slope, muddy sand, sand with seagrass and mostly in muddy sand with seagrass.

O c c u r r e n c e : *94/1b*, *94/3a*,*b*, *95/31*,*B5/8*, *C1/3*.

R a n g e : Red Sea, Arabian Seas.

***Bothropoma* cf. *pilula* (DUNKER, 1860)**
(pl. 14, fig. 6)

cf. 1860 *Liotia pilula* DUNKER: 226.
cf. 1993 *Bothropoma pilula* – JANSSEN: 414, Taf. 1, Fig. 7.
1995 *Bothropoma* cf. *pilula* – BOSCH et al.: 40, fig. 88.
2008 *Bothropoma isseli* THIELE, 1924 – RUSMORE-VILLAUME: 26, fig.

R e m a r k s : The species seems to be not uncommon in the Red Sea, although it has never been recorded from here before. Our material agrees rather well with material from Japan, but differs by its much finer spiral sculpture. It is distinguished from *B.* cf. *munda* (H. ADAMS, 1873) by its more rounded, not angulated, whorl profile and the fine spiral striation on the shoulder of the whorls. In our opinion the question whether the Red Sea population falls within the range of variability of the widespread *B*. *pilula* or constitutes a species of its own is not settled. If the name *B. isseli* THIELE, 1924 can be applied to it remains doubtful as long as the type of that species has not been compared. The figure of THIELE (1929: 67, fig. 46) shows a specimen with rather well developed stronger spiral cords of different strength and a strongly knoded umbilical cord. These features of sculpture could point to *B*. cf. *munda*, too (see above).

N u m b e r s : QHS (-), QBS (29), Ql (3).

F e e d i n g t y p e : herbivorous on hard substrata.

H a b i t a t : Shells occurred in sand between coral patches, sand on the reef slope and in the mangrove.

O c c u r r e n c e : *94/1a-d*, *94/5*, *94/6*, *95/31*, *©70*.

R a n g e : Indopacific.

Collonista arsinoensis (ISSEL, 1869)
(pl. 15, figs 1-2)

1869 *Turbo arsinoensis* ISSEL: 220, 346 (ref. to SAVIGNY, 1817: pl. 5, fig. 28).
1982 *Turbo arsinoensis* – BOUCHET & DANRIGAL: 11, fig. 25.
1982 *Turbo eroopolitanus* ISSEL, 1869 – BOUCHET & DANRIGAL: 13, fig. 24.
2008 *Collonista arsinoensis* – RUSMORE-VILLAUME: 26, fig.

Remarks: This species is characterized by its very well-developed granulated or knobbed spiral cords and its flattened planispiral apex. Another species of *Collonista* was described by Issel (1869) as *Turbo eroopolitanus* based on the reference to SAVIGNY (pl. 5, fig. 27) as well as on an own specimen. The figure of SAVIGNY, however, differs considerably from a shell from his collection which was figured by BOUCHET & DANRIGAl (1982) too. Compared to the syntype of *arsinoensis* it shows no difference apart from being a slightly smaller subadult specimen. Thus, the identity of *Turbo eroopolitanus* Issel remains doubtful. DEKKER & ORLIN (2000: 18) have listed only *arsinoensis* without mentioning *eroopolitana*.

Numbers: QHS (-), QBS (43), Ql (-).

Feeding type: herbivorous on hard substrata.

Habitat: Shells occurred in sand between coral patches, sand with seagrass and mostly in sand on the reef slope.

Occurrence: *94/1b*, *d*, *94/5*, *95/31*,*B5/8*.

Range: Red Sea.

Homalopoma (s. lat.) *pustulatum* (BROCCHI, 1821)
(pl. 15, fig. 3)

1821 *Turbo pustulatus* BROCCHI: 224.
1984 *Turbo pustulatus* – SHARABATI: pl. 3, fig. 11.
1984 *Turbo* sp. – SHARABATI: pl. 3, fig. 12.
2008 *Homalopoma pustulata* – RUSMORE-VILLAUME: 26, fig.

Remarks: An uncommon and seldomly figured species. Its generic allocation to *Homalopoma* is somewhat doubtful. It looks like a small species of the genus *Turbo* but lacks the typical "asteroid" spiny shape of juvenile *Turbo* and its close allies.

Numbers: QHS (-), QBS (-), Ql (1).

Feeding type: herbivorous on hard substrata.

Habitat: A single shell was found in sand from a *Millepora* reef slope.

Occurrence: *©70*.

Range: Red Sea.

Subfamily Turbininae RAFINESQUE, 1815

Turbo (_Marmarostoma_) _radiatus_ GMELIN, 1791
(pl. 16, figs 1-4)

1791 *Turbo radiatus* GMELIN: 3594.
1984 *Turbo radiatus* – SHARABATI: pl. 3, fig. 9.
1995 *Turbo radiatus* – BOSCH et al.: 41, fig. 93.
2003 *Turbo* (*Marmarostoma*) *radiatus* – ALF & KREIPL: 37, pls 44-46.
2008 *Turbo radiatus* – RUSMORE-VILLAUME: 26, fig.

Numbers: QHS (*1d*), QBS (1), Ql (1).

Feeding type: herbivorous on hard substrata.

Habitat: A living specimen was found on a *Millepora* reef slope, shells occurred on reef flats, reef slopes, sand near to an *Acropora* – *Millepora* reef slope, sand near coral carpet with a faviid association.

Occurrence: *95/31*, *©26*, *©70*, *©27*, *©7*, *©20*, *3*.

Range: Red Sea, Indian Ocean.

Turbo (_Turbo_) _petholatus_ LINNAEUS, 1758
(pl. 15, fig. 4)

1758 *Turbo petholatus* LINNAEUS: 762.
1984 *Turbo petholatus* – SHARABATI: pl. 3, fig. 10.
2003 *Turbo* (*Turbo*) *petholatus* – ALF & KREIPL: 21, pls 1-6.
2008 *Turbo petholatus* – RUSMORE-VILLAUME: 24, fig.

Numbers: QHS (-), QBS (1), Ql (1).

Feeding type: herbivorous on hard substrata.

Habitat: Shells occurred on reef slopes.

Occurrence: *94/5*, *©20*.

Range: Indopacific.

Family Skeneidae CLARK, 1851

Cirsonella sp. 1
(pl. 16, fig. 5)

Remarks: This species is characterised by its sculpture of about 12 strong spiral cords on the last whorl. It may belong to the very similar "*Cyclostrema*" *carinatum* H. ADAMS, 1873 (: 207, pl. 23, fig. 8) from the Persian Gulf. Lack of comparative material and inadequate description prevent us from an identification of our material with that species. Another similar species is "*Cyclostrema*" *eupoietum* MELVILL, 1904 (:159, pl.

10, fig. 2; see also BOSCH et al. 1995: 39, fig. 73), which has, however, a much finer spiral sculpture and a lirate columellar callus spreading to the umbilicus.

N u m b e r s : QHS (-), QBS (1), Ql (-).

F e e d i n g t y p e : unknown.

H a b i t a t : A single shell was found in sand between coral patches.

O c c u r r e n c e : *94/1a*.

R a n g e : Red Sea.

***Cirsonella* sp. 2**
(pl. 16, figs 6-7)

R e m a r k s : A species with a smooth, glossy and somewhat translucent shell and a well-developed columellar callus. It may be related to "*Ethalia*" *jucunda* MELVILL, 1904 (159, pl. 10, fig. 3) from the Gulf of Oman. However, as for many other microshells, identification at present is impossible because of inadequate descriptions in older literature.

N u m b e r s : QHS (-), QBS (2), Ql (-).

F e e d i n g t y p e : unknown.

H a b i t a t : Shells were found in sand between coral patches and muddy sand.

O c c u r r e n c e : *94/1c*, *94/3a*.

R a n g e : Red Sea.

Family Phasianellidae SWAINSON, 1840

***Phasianella solida* (BORN, 1778)**
(pl. 17, figs 1-5)

1778 *Helix solida* BORN: 408.
1984 *Phasianella variegata* LAMARCK, 1822 – SHARABATI: pl. 2, fig. 19.
1995 *Phasianella solida* – BOSCH et al.: 42, fig. 97.
2008 *Phasianella solida* – RUSMORE-VILLAUME: 28, fig.

R e m a r k s : Very variable in colouration, mainly with yellowish ground colour, distinct brown blotches and clearly visible narrow spiral colour lines.

N u m b e r s : QHS (-), QBS (61), Ql (-).

F e e d i n g t y p e : Herbivores on plant or algal substrates.

H a b i t a t : Shells were found in sand between coral patches, muddy sand, muddy sand with seagrass and sand with seagrass.

Occurrence: *94/1a-d*, *94/3a*, *B5/8*, *C1/3*.

Range: Red Sea, Indian Ocean.

Order Cycloneritimorpha FRÝDA, 1998

Superfamily Helicinoidea FÉRUSSAC, 1822

Family Neritiliidae SCHEPMAN, 1908

***Pisulina adamsiana* G. NEVILL & H. NEVILL, 1869**
(pl. 18, figs 1-3)

1869 *Pisulina adamsiana* G. NEVILL & H. NEVILL: 160, pl. 17, fig. 4.
1991 *Pisulina adamsiana* – HERBERT & KILBURN: 320, figs 1-5.
2000 *Pisulina adamsiana* – DEKKER: 56, pl. 5, fig. 32, text-fig. 42.

Numbers: QHS (-), QBS (22), Ql (-).

Feeding type: herbivorous on hard substrata.

Habitat: Shells were found in a sample from a *Millepora*-dominated reef slope.

Occurrence: *94/5*.

Range: Indopacific.

Superfamily Neritopsoidea GRAY, 1847

Family Neritopsidae GRAY, 1847

***Neritopsis aqabaensis* BANDEL, 2007**
(pl. 18, figs 4-5)

1984 *Neritopsis radula* (LINNAUS, 1758) – SHARABATI: pl. 2, fig. 17.
2007 *Neritopsis aqabaensis* BANDEL: 220, fig. 1A-C.
2008 *Neritopsis* cf. *radula* (LINNAEUS, 1758) – RUSMORE-VILLAUME: 28, fig.

Remarks: The *Neritopsis* species of the Red Sea had always been identified with the widespread Indo-Pacific species *Neritopsis radula* (LINNAEUS, 1758). However, it has been demonstrated by BANDEL, that the Red Sea population differs by a larval shell of two whorls in contrast to only one whorl in *N. radula*.

Numbers: QHS (-), QBS (-), Ql (2).

Feeding type: unknown.

Habitat: Shells were found in sand from the reef slope.

Occurrence: *©70*.

Range: Indopacific.

Superfamily Neritoidea RAFINESQUE, 1815

Family Neritidae RAFINESQUE, 1815

***Nerita* (*Linnerita*) *orbignyana* RÉCLUZ, 1841**
(pl. 18, fig. 6)

1841 *Nerita* (*Nerita*) *orbignyana* RÉCLUZ: 108.
1984 *Nerita polita* LINNAEUS – SHARABATI: pl. 2, fig. 15.
1995 *Nerita polita orbignyana* – BOSCH et al.: 44, fig. 105.
2000 *Nerita* (*Linnerita*) *orbignyana* – DEKKER: 33, pl. 1, figs 1-4, pl. 6, fig. 22a, text-fig. 36.
2008 *Nerita orbignyana* – RUSMORE-VILLAUME: 30, fig.

Numbers: QHS (-), QBS (-), Ql (5).

Feeding type: herbivorous on hard substrata.

Habitat: Five living shell were found, probably on the rocky intertidal.

Occurrence: *Safaga*.

Range: Red Sea, Arabian Seas.

***Nerita* (*Theliostyla*) *sanguinolenta* MENKE, 1829**
(pl. 18, fig. 7)

1829 *Nerita sanguinolenta* MENKE: 15.
1984 *Nerita albicilla* LINNAEUS, 1758 – SHARABATI: pl. 2, fig. 18.
2000 *Nerita* (*Theliostyla*) *sanguinolenta* – DEKKER: 43, pl. 4, figs 18-20, pl. 6, fig. 34b, text-fig. 40.
2008 *Nerita sanguinolenta* – RUSMORE-VILLAUME: 30, fig.

Numbers: QHS (-), QBS (4), Ql (5).

Feeding type: herbivorous on hard substrata.

Habitat: Shells were found on the rocky intertidal and in the mangrove.

Occurrence: *94/6*, *C6/4*, *D4/2*.

Range: Red Sea, Northern part of Gulf of Aden.

***Smaragdia purpureomaculata* DEKKER, 2000**
(pl. 19, figs 1-2)

2000 *Smaragdia purpureomaculata* DEKKER: 54, pl. 5, fig. 30, text-fig. 45.

Remarks: This species is the most abundant *Smaragdia* in Safaga. These shells match very well the description and figures of the species described by DEKKER (2000) from various localities, among them the region of Hurghada, in the northern part of the Red Sea.

N u m b e r s : QHS (-), QBS (248), Ql (-).

F e e d i n g t y p e : herbivorous on seagrass and algae.

H a b i t a t : Shells were found in sand between coral patches, muddy sand, sand from *Porites*-dominated reef slope, but mostly in sand with seagrass and muddy sand with seagrass.

O c c u r r e n c e : *94/1a-d*, *94/3a,b*, *95/31*, *B5/8*, *C1/3*.

R a n g e : Northern Red Sea.

Smaragdia rangiana (RÉCLUZ, 1841)
(pl. 19, figs 3-5)

1841 *Nerita* (*Neritina*) *rangiana* RÉCLUZ: 339.
1984 *Smaragdia rangiana* – SHARABATI: pl. 6, fig. 2b.
2000 *Smaragdia rangiana* – DEKKER: 53, pl. 5, figs 26-29, text-fig. 44.
2008 *Smaragdia rangiana* – RUSMORE-VILLAUME: 32, fig.

R e m a r k s : At most sampling stations this species occurs sympatric with *purpureomaculata*. The differences between these two species have been outlined by DEKKER (2000): *S. rangiana* has 3-4 denticles on the upper part of columellar edge in contrast to a smooth upper part in both S. *purpureomaculata* and *souverbiana*.

N u m b e r s : QHS (-), QBS (75), Ql (-).

F e e d i n g t y p e : herbivorous on seagrass and algae.

H a b i t a t : Shells were found in sand between coral patches, but mostly in sand with seagrass (they were absent in muddy sand with seagrass).

O c c u r r e n c e : *94/1a-c*, *B5/8*.

R a n g e : Indopacific.

Smaragdia souverbiana (MONTROUZIER, 1863)
(pl. 19, fig. 6)

1863 *Neritina souverbiana* MONTROUZIER in SOUVERBIE & MONTROUZIER: 75.
1984 *Smaragdia rangiana* (RÉCLUZ, 1841) – SHARABATI: pl. 6, figs 2, 2a.
1995 *Smaragdia souverbiana* – BOSCH et al.: 44, fig. 107.
2000 *Smaragdia souverbiana* – DEKKER: 50, pl. 5, figs 24-25, text-fig. 43.
2008 *Smaragdia souverbiana* – RUSMORE-VILLAUME: 32, fig.

R e m a r k s : See under *rangiana*.

N u m b e r s : QHS (-), QBS (4), Ql (-).

F e e d i n g t y p e : herbivorous on seagrass and algae.

H a b i t a t : A few shells were found in the mangrove channel.

Occurrence: *94/6*.

Range: Indopacific.

Family Phenacolepadidae PILSBRY, 1895

***Plesiothyreus elongatus* (THIELE, 1909)**
(pl. 19, fig. 7)

1909 *Phenacolepas elongata* THIELE: 37, pl. 6, figs 8-9.
1988 *Phenacolepas elongata* – CHRISTIAENS: 69, figs 2, 17.
1995 *Plesiothyreus elongatus* – BOSCH et al.: 44.

Remarks: CHRISTIAENS (1989) has shown that the more often used genus name *Phenacolepas* PILSBRY, 1891 is a younger synonym of *Plesiothyreus*. Our limited material does not allow an estimation of the variability of this and the following species. Shell broadly oval, with dense and finely granulated radial sculpture.

Numbers: QHS (-), QBS (2), Ql (-).

Feeding type: unknown.

Habitat: Shell were found in sand with seagrass and in sand from a *Porites*-dominated reef slope.

Occurrence: *95/31*, *B5/8*.

Range: Red Sea, Arabian Seas.

***Plesiothyreus evansi* (BIGGS, 1973)**
(pl. 19, fig. 8)

1973 *Phenacolepas evansi* BIGGS: 354, pl. 2, figs 3-4.
1988 *Phenacolepas evansi* – CHRISTIAENS: 74, figs 3-4, 22.
1995 *Plesiothyreus evansi* – BOSCH et al. : 44, fig. 109.

Remarks: Characterized by its rather circular shell with overhanging apex and dense sculpture of prickly radial riblets.

Numbers: QHS (-), QBS (1), Ql (-).

Feeding type: unknown.

Habitat: A single shell was found in sand between coral patches.

Occurrence: *94/1b*.

Range: Red Sea, Arabian Seas.

Plesiothyreus pararabicus (Christiaens, 1988)
(pl. 19, fig. 9)

1984 *Phenecolepas* sp. – Sharabati: pl. 6, fig. 14.
1988 *Phenacolepas pararabica* Christiaens: 72, figs 7-9, 18.
1995 *Plesiothyreus pararabicus* – Bosch et al.: 45, fig. 112.
2008 *Plesiothyreus pararabica* – Rusmore-Villaume: 32, fig.

Remarks: The shell is elongate-oval, with rather coarse radial sculpture of granulated ribs.

Numbers: QHS (-), QBS (1), Ql (-).

Feeding type: unknown.

Habitat: A single shell was found in sand between coral patches.

Occurrence: *94/1a*.

Range: Red Sea, Arabian Seas.

Acknowledgements

This monograph would not have been possible without the supporting activity of many colleagues and institutions. The mapping of bottom facies in the 1980s by R. Golebiowski, K. Kleemann, A. Mansour, J.H. Nebelsick, P. Pervesler, W.E. Piller, C. Rupp and F. Steininger provided the base for the detailed survey on molluscs. In the course of the mapping, many mollusc samples were taken by these colleagues, most notably R. Golebiowski and F. Steininger. O. Schultz identified gastropods collected from these initial surveys; we dedicate this monograph to his 65th birthday.

A. Mansour, W.E. Piller, M. Rasser and B. Riegl supported later fieldwork of MZ from 1994 to 1997. O. Abdelghany, S. Salek and U. Sattler helped process the sediment samples. E. Neubert contributed to the gastropod identifications, R. Gold, S. Neuhuber, and P. Strauss did some of the photographic work. We like to thank D. Geiger and H. Dekker for their very constructive review of our manuscript. It helped to eliminate some identification errors.

The help of the Austrian Cultural Institute of the Austrian Embassy in Cairo, the Department of Geology of the University of Assiut/Qena and the Department of Geology of the South Valley University, Qena, made field work possible. The study was financially supported by three projects funded by the Austrian Fonds zur Förderung der wissenschaftlichen Forschung (FWF): projects P5877 and P10715-Geo to F.F. Steininger, and project P19013-B17 to MZ.

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Plate 1

Nacelloidea - Nacellidae

***Cellana rota* (Gmelin, 1791)**

Fig. 1a Fotomacroscope external view (L = 36.9 mm)

Fig. 1b Fotomacroscope lateral view

Lottioidea - Lottiidae

***Eoacmaea* nov. spec.**

Fig. 2 SEM external view (L = 4.03 mm)

Fig. 3a Fotomacroscope external view (L = 3.82 mm)

Fig. 3b Fotomacroscope internal view

Fig. 3c Fotomacroscope lateral view

***Eoacmaea rolani* (Christiaens, 1987)**

Fig. 4 SEM external view (L = 2.1 mm)

Fig. 5a Fotomacroscope external view (L = 3.30 mm)

Fig. 5b Fotomacroscope lateral view

Haliotoidea - Haliotidae

***Haliotis pustulata* Reeve, 1846**

Fig. 6a External view (L = 21.9 mm)

Fig. 6b Internal view

***Haliotis unilateralis* Lamarck, 1822**

Fig. 7a External view (L = 10.5 mm)

Fig. 7b Internal view

Fig. 8a External view (L = 7.8 mm)

Fig. 8b Internal view

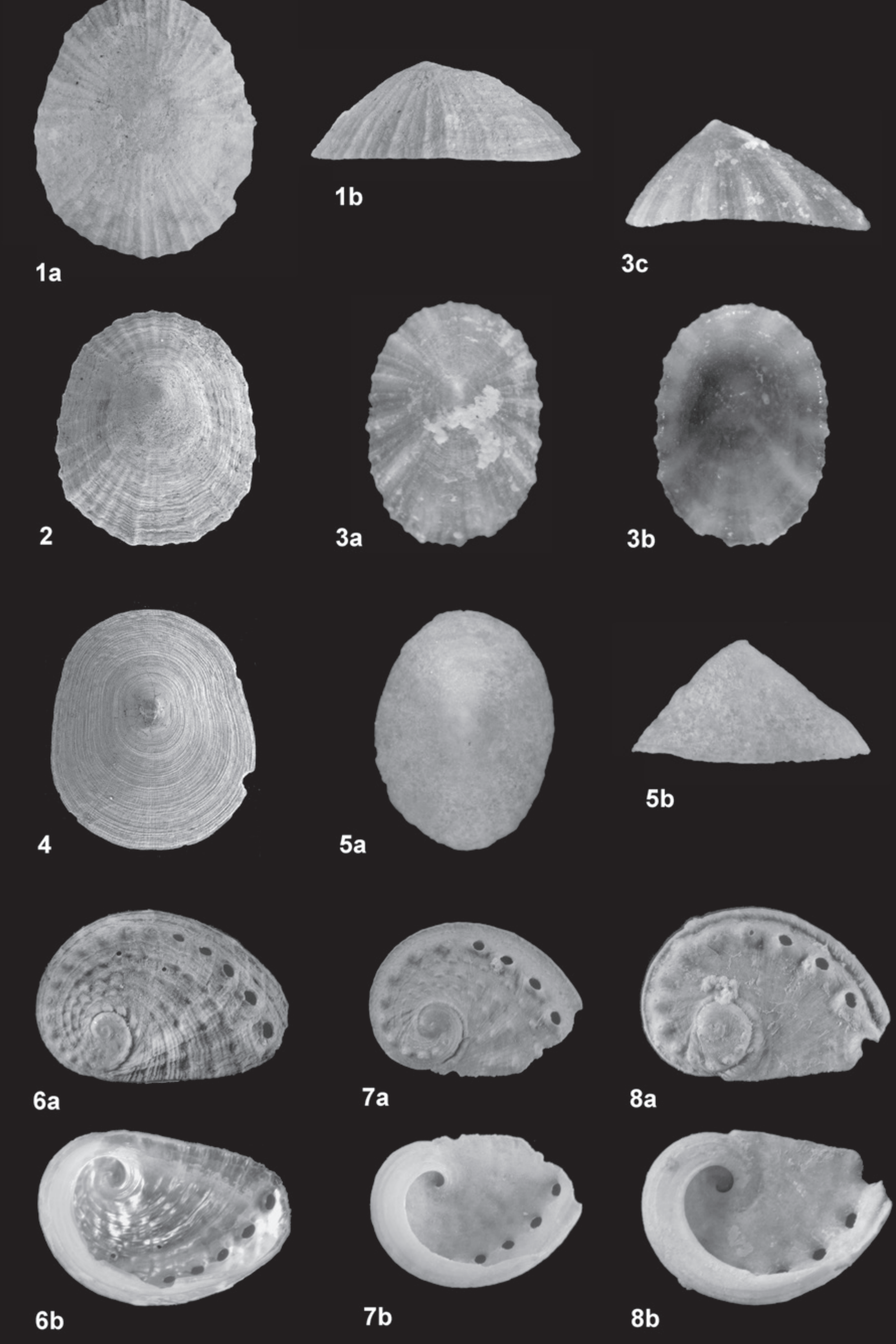
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Plate 2

Scissorelloidea - Scissurellidae

***Scissurella* sp.**
L = 0.94 mm / D = 1.30 mm
Fig. 1a SEM frontal view
Fig. 1b Fotomacroscope frontal view
Fig. 1c SEM apical view
Fig. 1d Fotomacroscope apical view

***Scissurella* aff. *reticulata* Philippi, 1853**
L = 0.9 0mm / D = 1.56 mm
Fig. 2a SEM frontal view
Fig. 2b Fotomacroscope frontal view
Fig. 2c SEM apical view
Fig. 2d Fotomacroscope apical view

***Scissurella rota* Yaron, 1983**
L = 0.60 mm / D = 1.14 mm
Fig. 3a SEM frontal view
Fig. 3b Fotomacroscope frontal view
Fig. 3c SEM apical view
Fig. 3d Fotomacroscope apical view

***Sukashitrochus dorbignyi* (Audouin, 1826)**
L = 1.36 mm / D = 1.85 mm
Fig. 4a SEM frontal view
Fig. 4b Fotomacroscope frontal view
Fig. 4c SEM apical view
Fig. 4d Fotomacroscope apical view

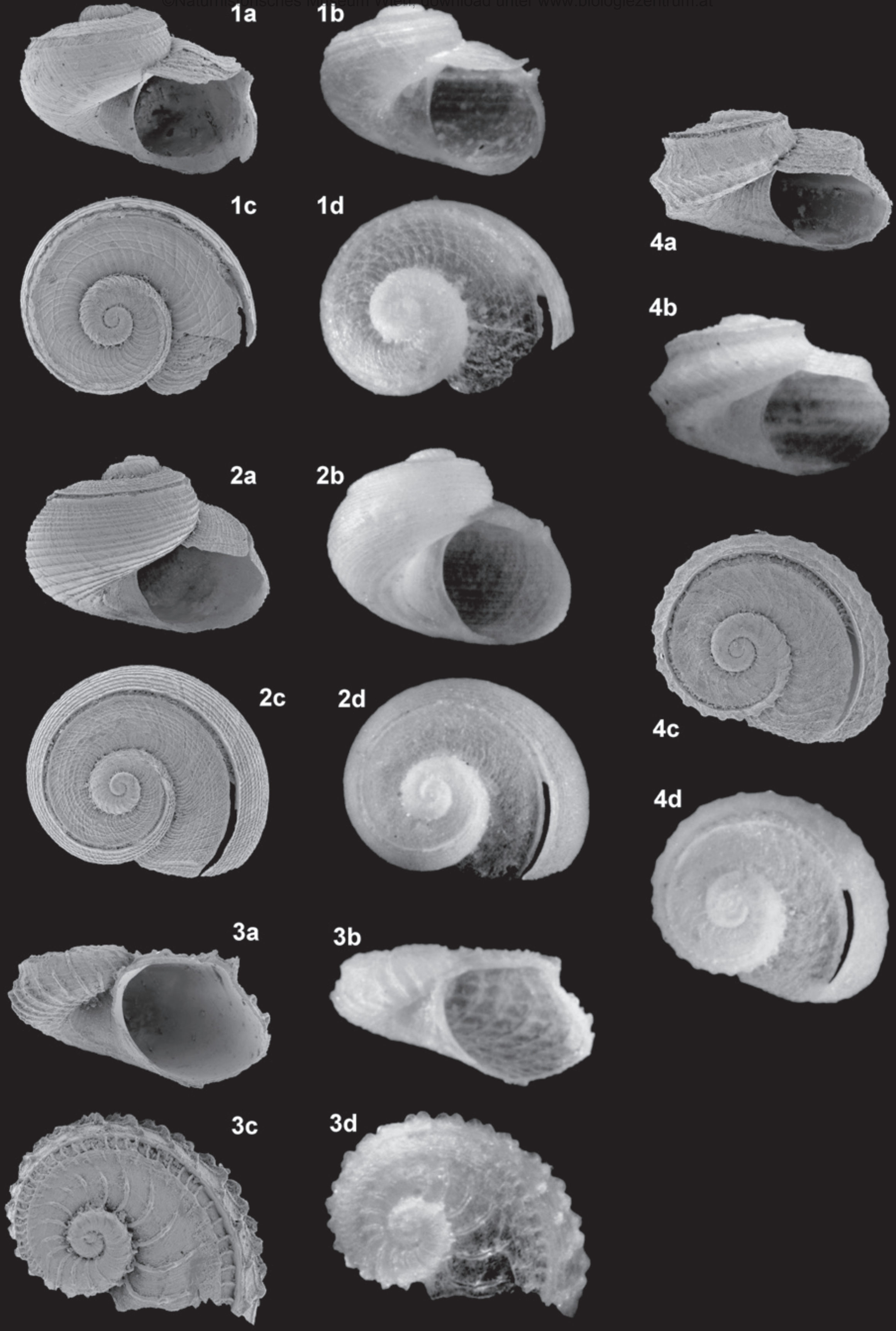
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Plate 3

Fissurelloidea - Fissurellidae

***Diodora imbricata* (Sowerby, 1862)**
Fig. 1a external view (L = 3.00 mm)
Fig. 1b internal view
Fig. 1c lateral view

***Diodora ruppellii* (Sowerby, 1834)**
Fig. 2a external view (L = 8.5 mm)
Fig. 2b internal view
Fig. 2c lateral view

***Emarginella cuvieri* (Audouin, 1826)**
Fig. 3a external view (L = 3.29 mm)
Fig. 3b internal view

***Emarginula* sp. 1**
Fig. 4a external view (L = 7.2 mm)
Fig. 4b internal view
Fig. 4c lateral view

***Emarginula* sp. 2**
Fig. 5a external view (L = 2.44 mm)
Fig. 5b internal view
Fig. 5c lateral view

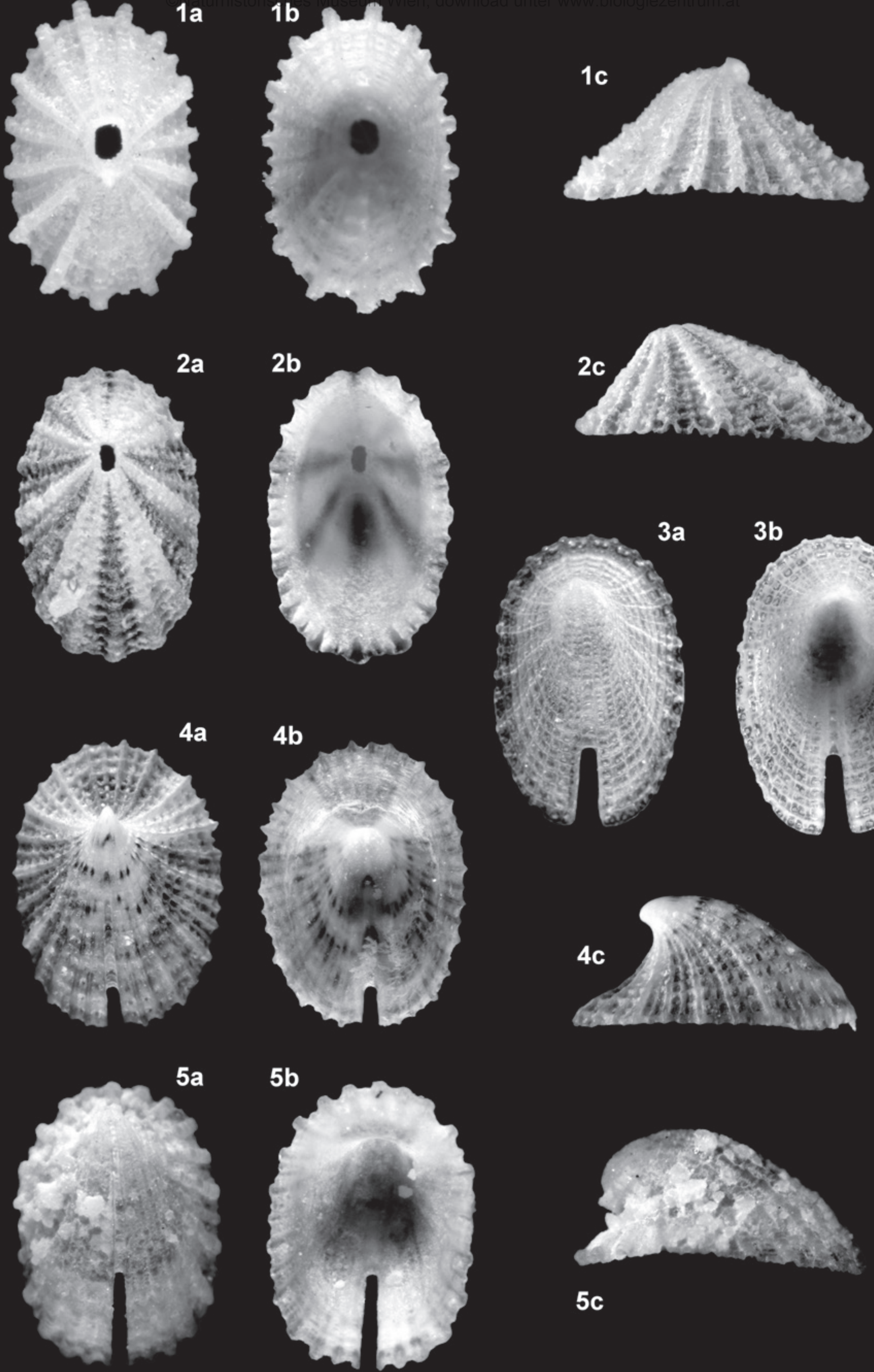
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Plate 4

Fissurelloidea - Fissurellidae

Hemitoma arabica **(A. Adams, 1852)**

Fig. 1a external view (L = 4.65 mm)

Fig. 1b internal view

Hemitoma modesta **(H. Adams, 1872)**

Fig. 2a external view (L = 5.1 mm)

Fig. 2b internal view

Fig. 3a external view (L = 4.4 mm)

Fig. 3b internal view

Hemitoma panhi **(Quoy & Gaimard, 1834)**

Fig. 4a external view (L = 7.4 mm)

Fig. 4b internal view

Fig. 4c lateral view

Fig. 5a external view (L = 16.1 mm)

Fig. 5b lateral view

Hemitoma simpla **Christiaens, 1987**

Fig. 6a external view (L = 5.9 mm)

Fig. 6b internal view

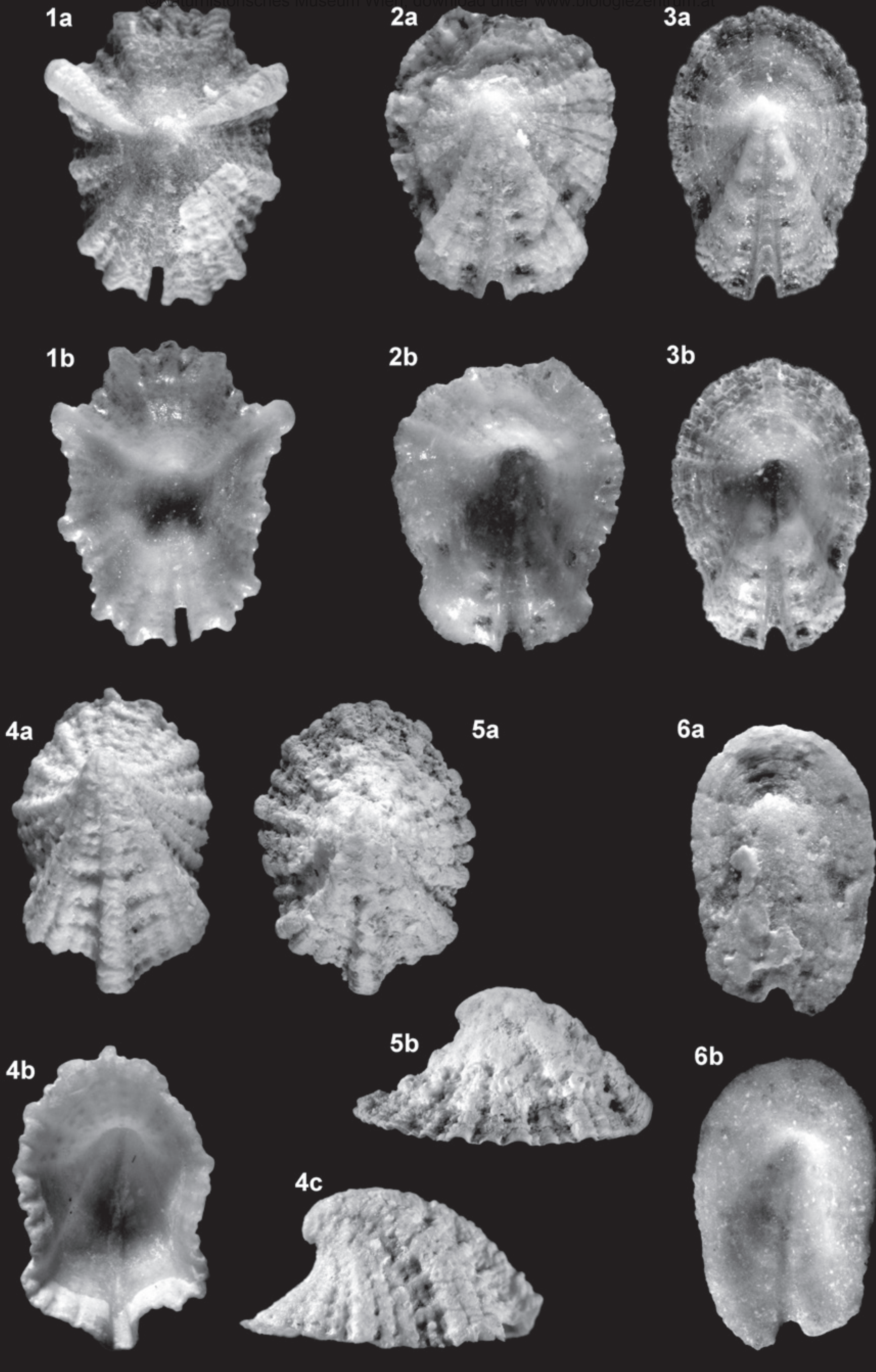
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Plate 5

Fissurelloidea - Fissurellidae

***Hemitoma subrugosa* THIELE, 1916**
Fig. 1a external view (L = 18.8 mm)
Fig. 1b internal view
Fig. 1c lateral view

***Macroschisma compressa* A. ADAMS, 1851**
Fig. 2a external view (L = 8.5 mm)
Fig. 2b internal view
Fig. 2c lateral view

***Medusafissurella* ? sp.**
Fig. 3a external view (L = 2.88 mm)
Fig. 3b internal view
Fig. 3c lateral view

***Scutus rueppelli* (PHILLIPI, 1851)**
Fig. 4a external view (L = 25.4 mm)
Fig. 4b internal view
Fig. 4c lateral view

***Zeidora* (*Nesta*) *nesta* (PILSBRY, 1891)**
Fig. 5a external view (L = 4.8 mm)
Fig. 5b internal view
Fig. 5c lateral view

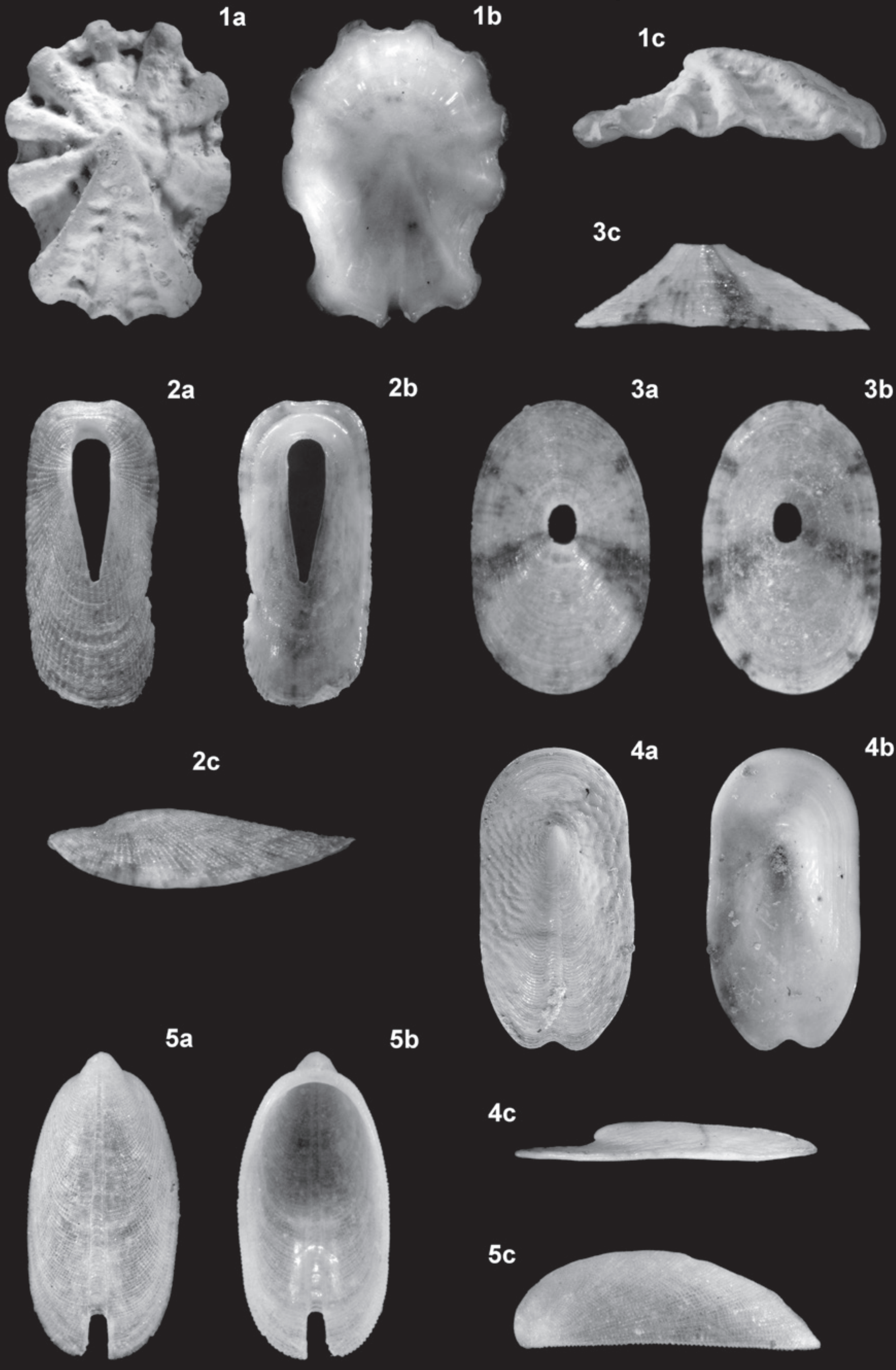
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Plate 6

Seguenzoidea - Chilodontidae

***Vaceuchelus* sp.**

Fig. 6a SEM frontal view (L = 1.46 mm)

Fig. 6b SEM of protoconch (Scale bar equals 100 µm)

Trochoidea - Trochidae

***Fossarina mariei* (Fischer 1890)**

Fig. 2a frontal view (L = 1.69 mm)

Fig. 2b back view

Fig. 3 SEM frontal view (L = 1.64 mm)

Fig. 4 SEM apical view (L = 1.26 mm / D = 1.24 mm)

***Stomatella auricula* Lamarck, 1816**

Fig. 5a external view (L = 5.3 mm)

Fig. 5b internal view

Fig. 5c detail of apex

Fig. 6a external view (L = 21.2 mm)

Fig. 6b internal view

***Stomatella modesta* H. Adams & A. Adams, 1864**

Fig. 7a frontal view (L = 2.0 mm)

Fig. 7b back view

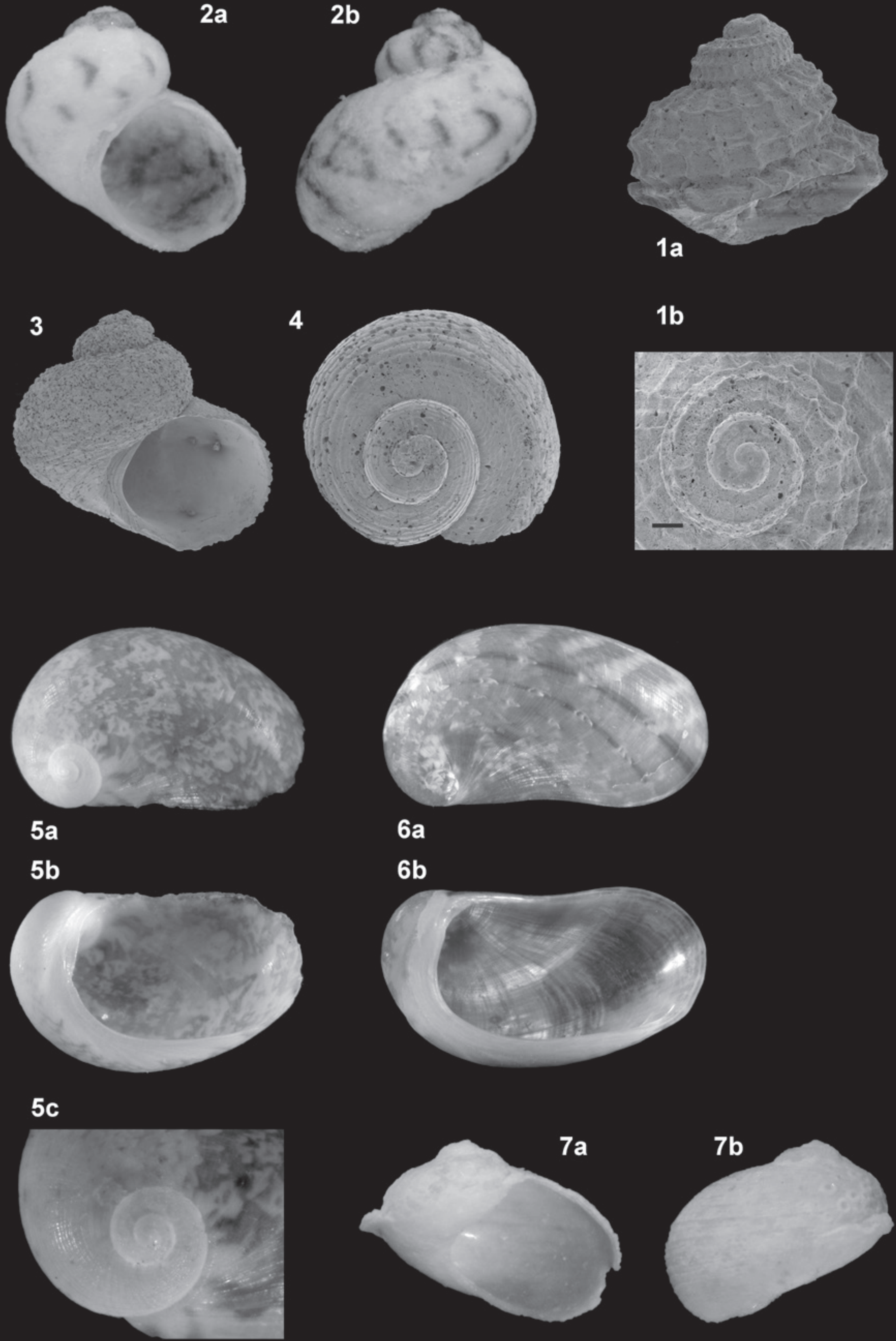
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Plate 7

Trochoidea - Trochidae

***Stomatia duplicata* (Sowerby, 1825)**
Fig. 1a frontal view (L = 5.2 mm)
Fig. 1b back view
Fig. 1c apical view

***Stomatia phymotis* Helbling, 1779**
Fig. 2a external view (L = 17.8 mm)
Fig. 2b internal view

***Synaptocochlea concinna* (Gould, 1845)**
Fig. 3a SEM frontal view (L = 1.58 mm)
Fig. 3b SEM of protoconch (Scale bar equals 100 µm)

***Agagus* nov. spec.**
Fig. 4a frontal view (L = 2.9 mm)
Fig. 4b back view
Fig. 4c apical view
Fig. 4d adapical view
Fig. 5 SEM frontal view, juvenile (L = 1.66 mm / D = 3.32 mm)

***Calliotrochus marmoreus* (Pease, 1861)**
Fig. 6a frontal view (L = 4.8 mm)
Fig. 6b back view
Fig. 6c apical view
Fig. 6d adapical view

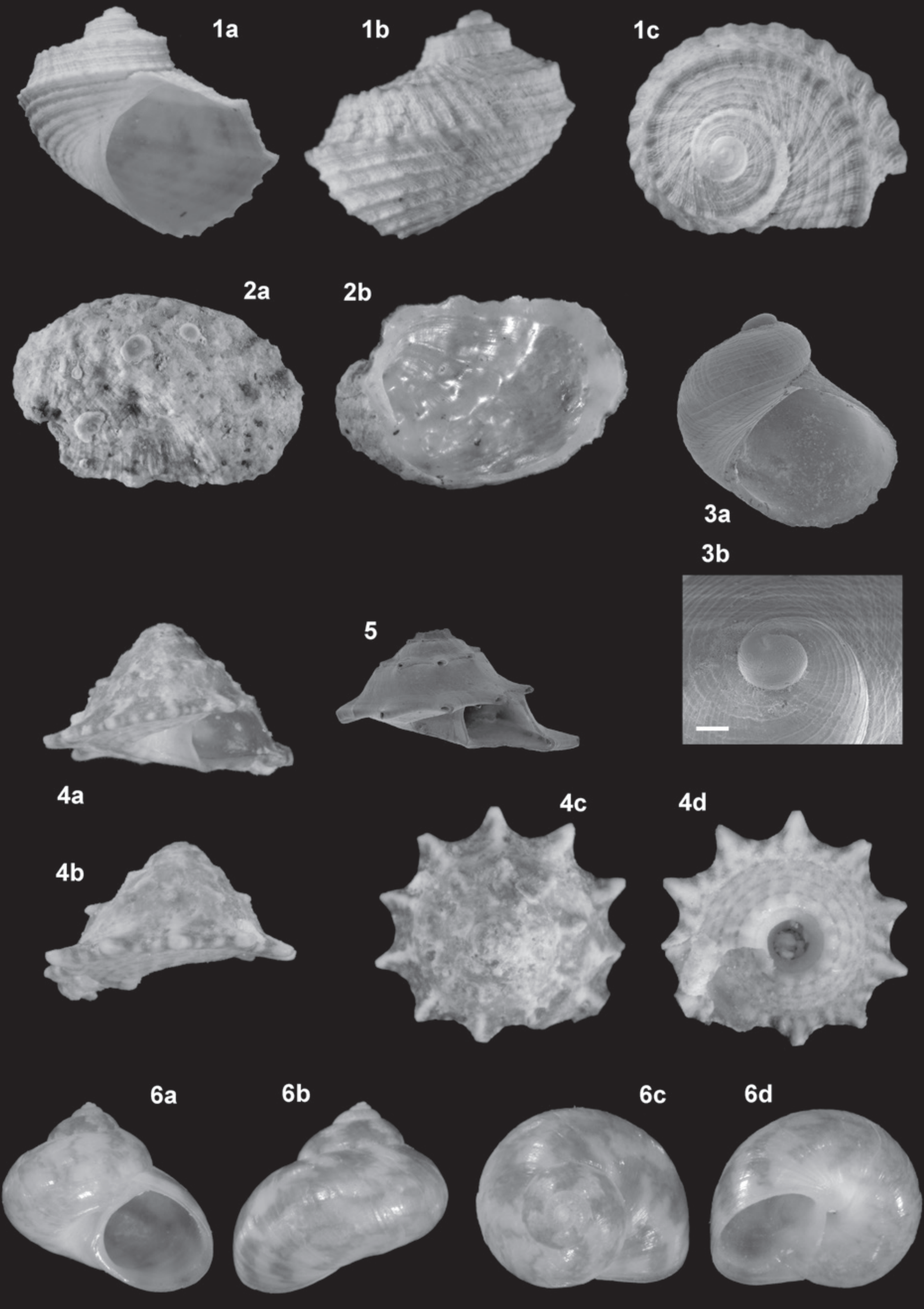
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Plate 8

Trochoidea - Trochidae

***Clanculus pharaonius* (Linnaeus, 1758)**
Fig. 1a frontal view (L = 16.0 mm)
Fig. 1b back view
Fig. 2 detail of adapical view (L = 18.2 mm / D = 20.2 mm)

***Clanculus tonnerei* (G. & H. Nevill, 1874)**
Fig. 3a SEM frontal view, juvenile (L = 1.77 mm)
Fig. 3b protoconch (Scale bar equals 100 µm)
Fig. 4 SEM frontal view, juvenile (L = 1.86 mm)
Fig. 5a frontal view (L = 4.9 mm)
Fig. 5b back view
Fig. 5c apical view
Fig. 5d adapical view
Fig. 5e detail of back view
Fig. 5f detail of apex
Fig. 6a frontal view (L = 7.3 mm)
Fig. 6b back view
Fig. 6c apical view
Fig. 6d adapical view

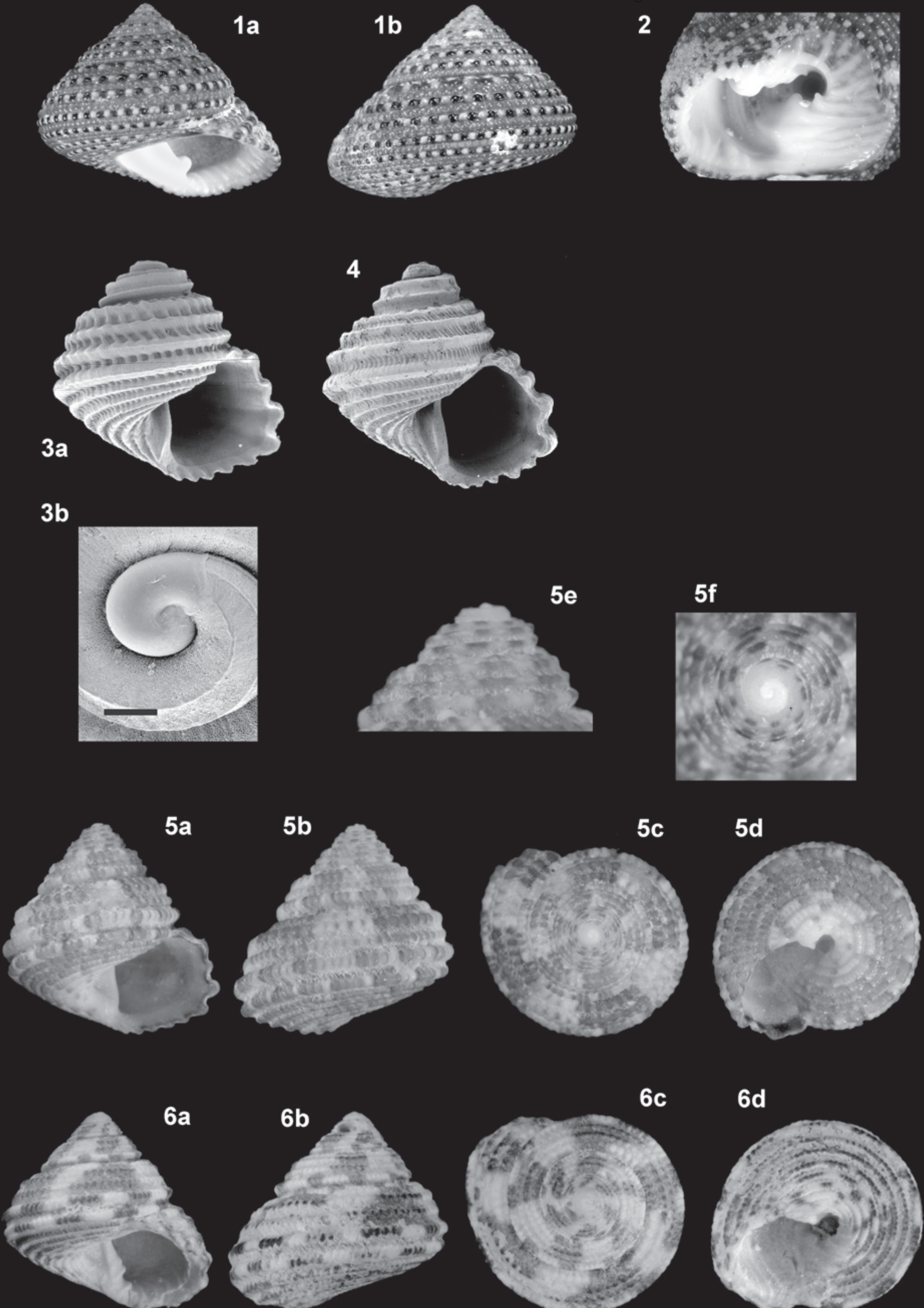
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Plate 9

Trochoidea - Trochidae

***Pagodatrochus variabilis* (H. ADAMS, 1873)**

Fig. 1a frontal view (L = 4.34 mm)

Fig. 1b back view

Fig. 2 frontal view (L = 3.92 mm)

Fig. 3 SEM frontal view (L = 4.2 mm)

Fig. 4a SEM frontal view (L = 3.11 mm)

Fig. 4b SEM protoconch (Scale bar equals 100 µm)

***Perrinia stellata* (A. ADAMS, 1864)**

Fig. 5a frontal view (L = 10.7 mm)

Fig. 5b back view

Fig. 6a frontal view (L = 4.4 mm)

Fig. 6b back view

Fig. 7a SEM frontal view (L = 2.61 mm)

Fig. 7b SEM detail of apex

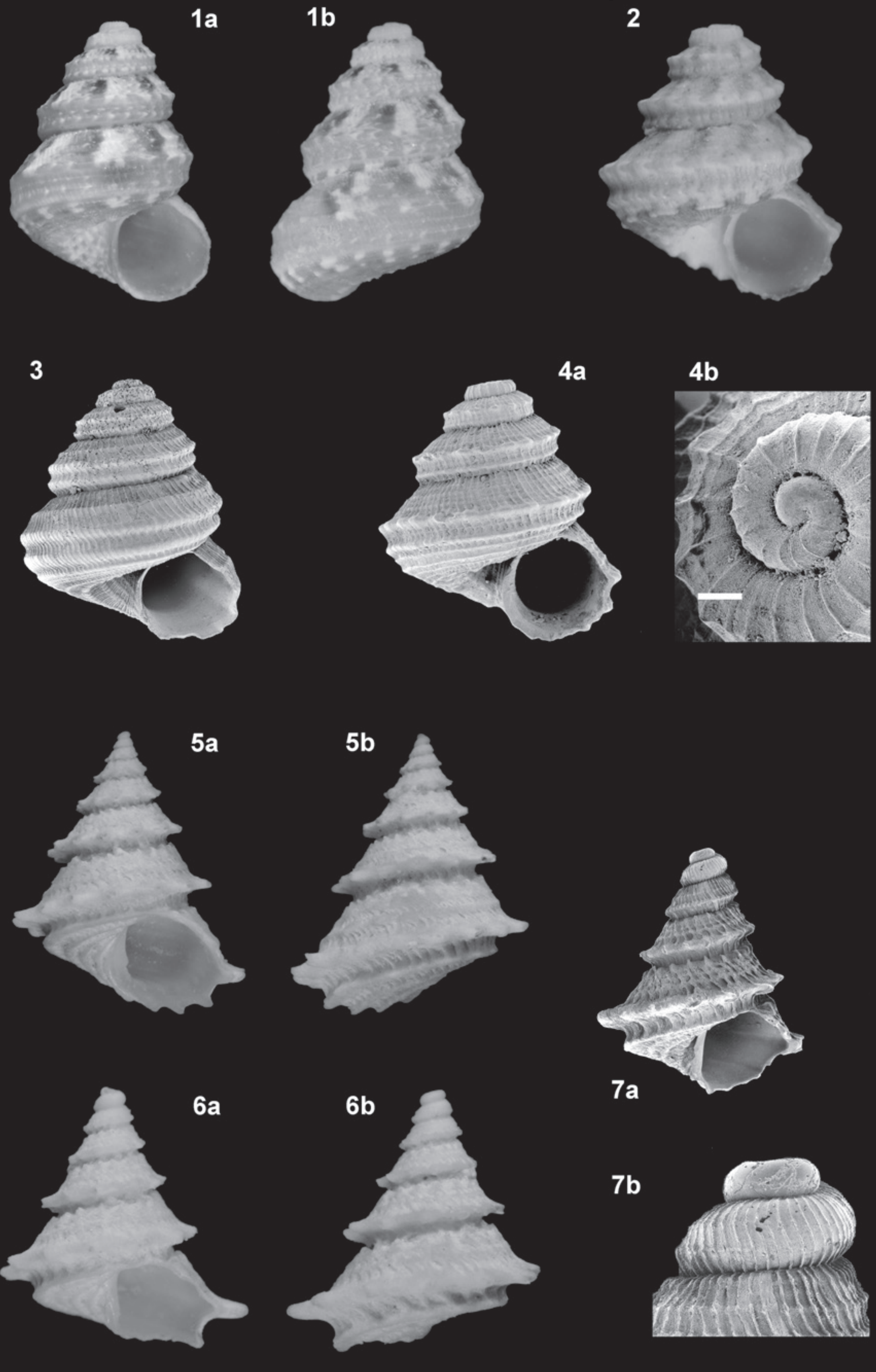
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Plate 10

Trochoidea - Trochidae

***Rubritrochus declivis* (Forsskål, 1775)**

Fig. 1a SEM frontal view, juvenile (L = 1.44 mm / D = 2.42 mm)

Fig. 1b SEM protoconch (Scale bar equals 100 µm)

Fig. 2a frontal view (L = 11.5 mm)

Fig. 2b back view

Fig. 2c apical view

Fig. 2d adapical view

Fig. 3a frontal view (L = 12.5 mm)

Fig. 3b back view

Fig. 3c apical view

Fig. 3d adapical view

***Tectus dentatus* (Forsskål, 1775)**

Fig. 4a frontal view (L = 13.3 mm)

Fig. 4b back view

Fig. 4c apical view

Fig. 4d adapical view

Fig. 5a frontal view (L = 107.6 mm)

Fig. 5b back view

Fig. 6 in situ photograph of living *Tectus dentatus* on coral colony

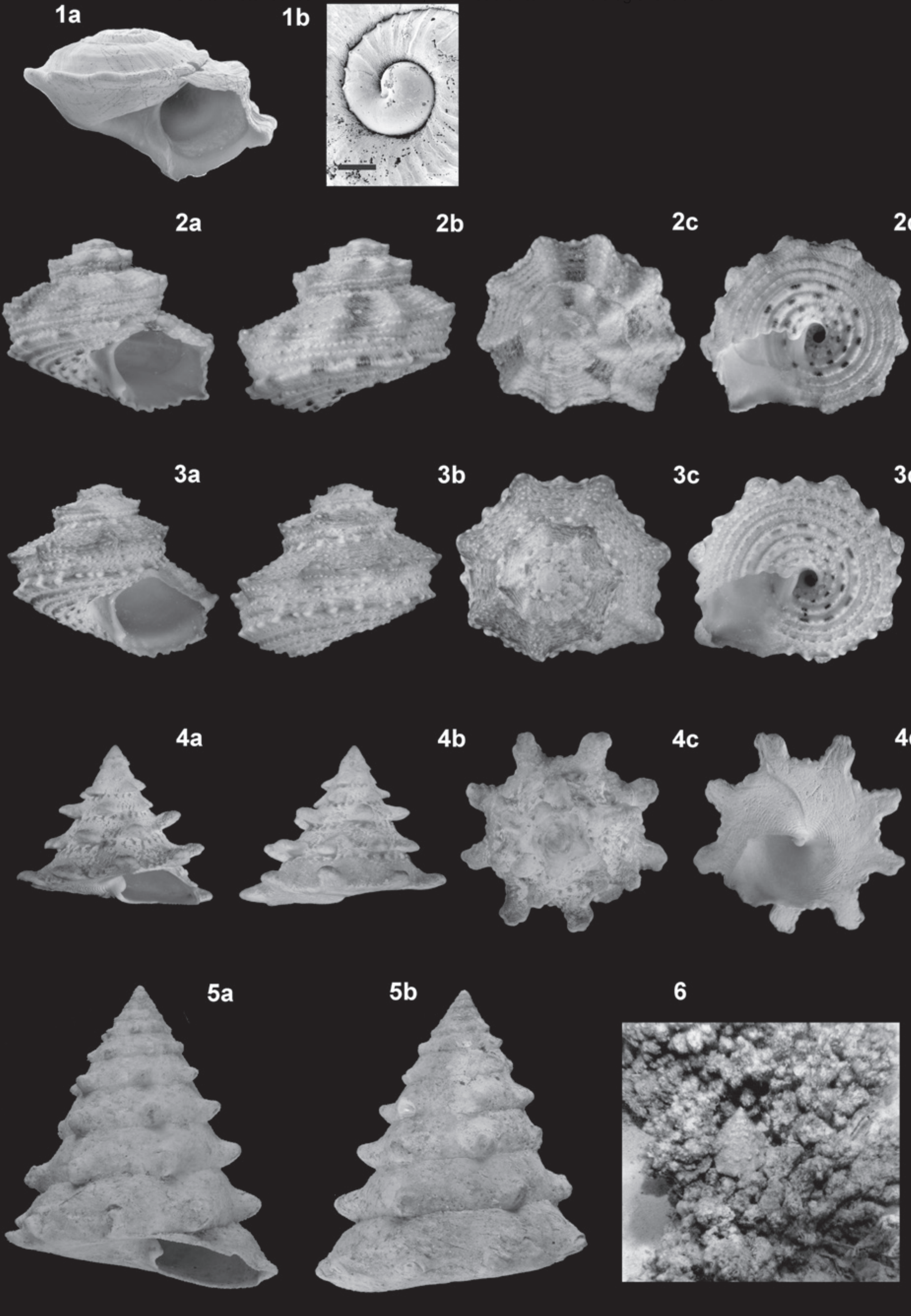
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Plate 11

Trochoidea - Trochidae

***Trochus erithreus* Brocchi, 1821**

Fig. 1 SEM frontal view, juvenile (L = 1.99 mm / D = 2.69 mm)

Fig. 2a frontal view (L = 11.8 mm)

Fig. 2b back view

Fig. 2c adapical view

***Trochus maculatus* Linnaeus, 1758**

Fig. 3a frontal view (L = 24.9 mm)

Fig. 3b back view

Fig. 3c adapical view

Fig. 4 adapical view (L = 55.9 mm)

***Trochus submorum* (Abrard, 1942)**

Fig. 5a frontal view (L = 6.4 mm)

Fig. 5b back view

Fig. 5c detail of apex

Fig. 5d apical view

Fig. 6a frontal view (L = 14.9 mm)

Fig. 6b back view

Fig. 6e adapical view

Fig. 7 SEM of protoconch (L = 1.94 mm, Scale bar equals 100 µm)

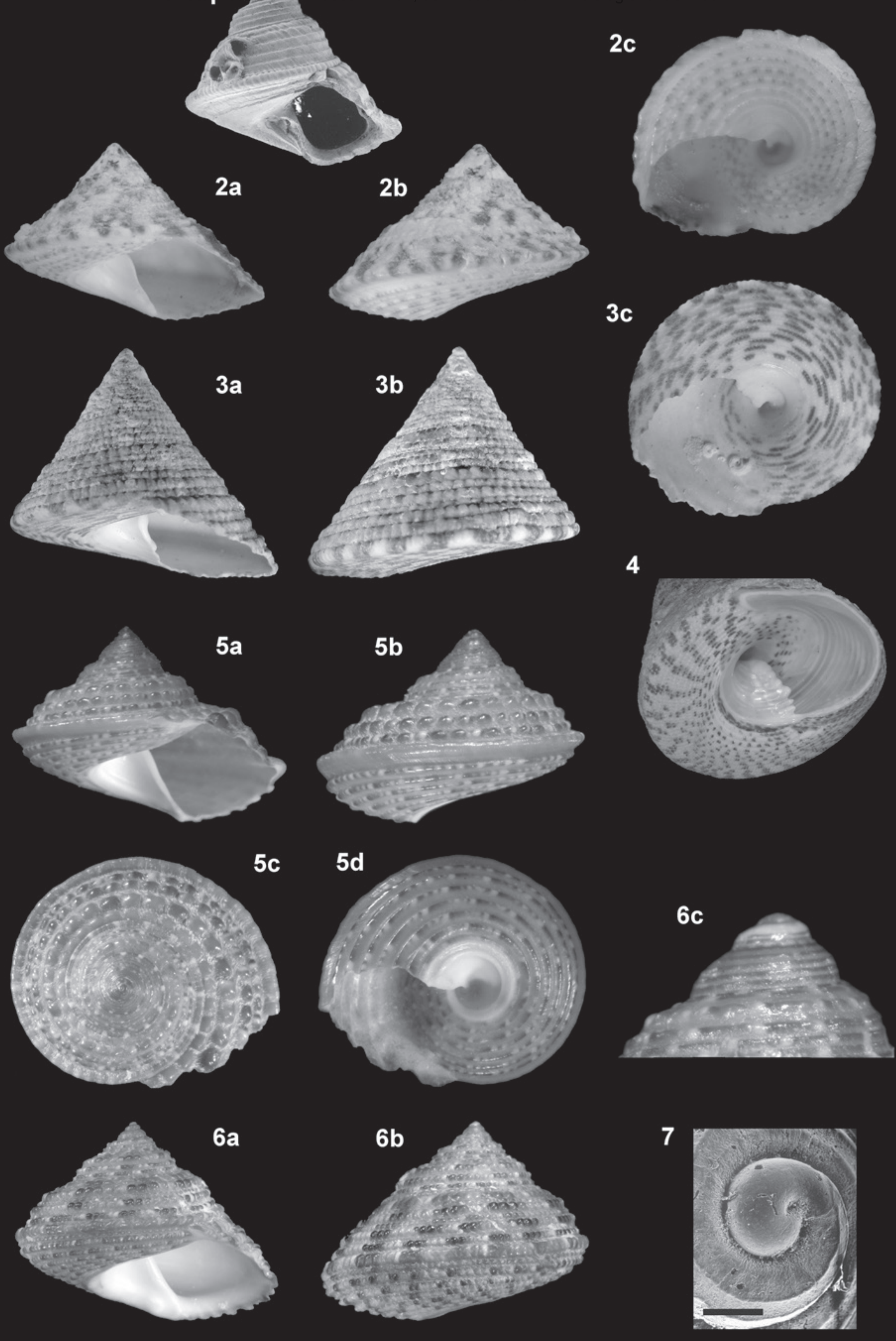
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Plate 12

Trochoidea - Trochidae

***Trochus virgatus* (Gmelin, 1791)**

Fig. 1 SEM frontal view, juvenile (L = 1.49 mm)
Fig. 2a frontal view (L = 6.6 mm)
Fig. 2b back view
Fig. 2c apical view
Fig. 2d adapical view
Fig. 3a frontal view (L = 46.9 mm)
Fig. 3b back view
Fig. 3c adapical view

***Ethalia* sp.**

Fig. 4a frontal view (L = 7.3 mm)
Fig. 4b back view
Fig. 4c apical view
Fig. 4d adapical view
Fig. 5a frontal view (L = 8.2 mm)
Fig. 5b back view
Fig. 5c adapical view
Fig. 6 SEM frontal view (L = 2.72 mm / D = 3.65 mm)

***Ethminolia degregorii* (Caramagna, 1888)**

Fig. 7a frontal view (L = 2.35 mm)
Fig. 7b back view
Fig. 7c apical view
Fig. 7d adapical view
Fig. 8 SEM frontal view (L = 1.08 mm / D = 1.57 mm)

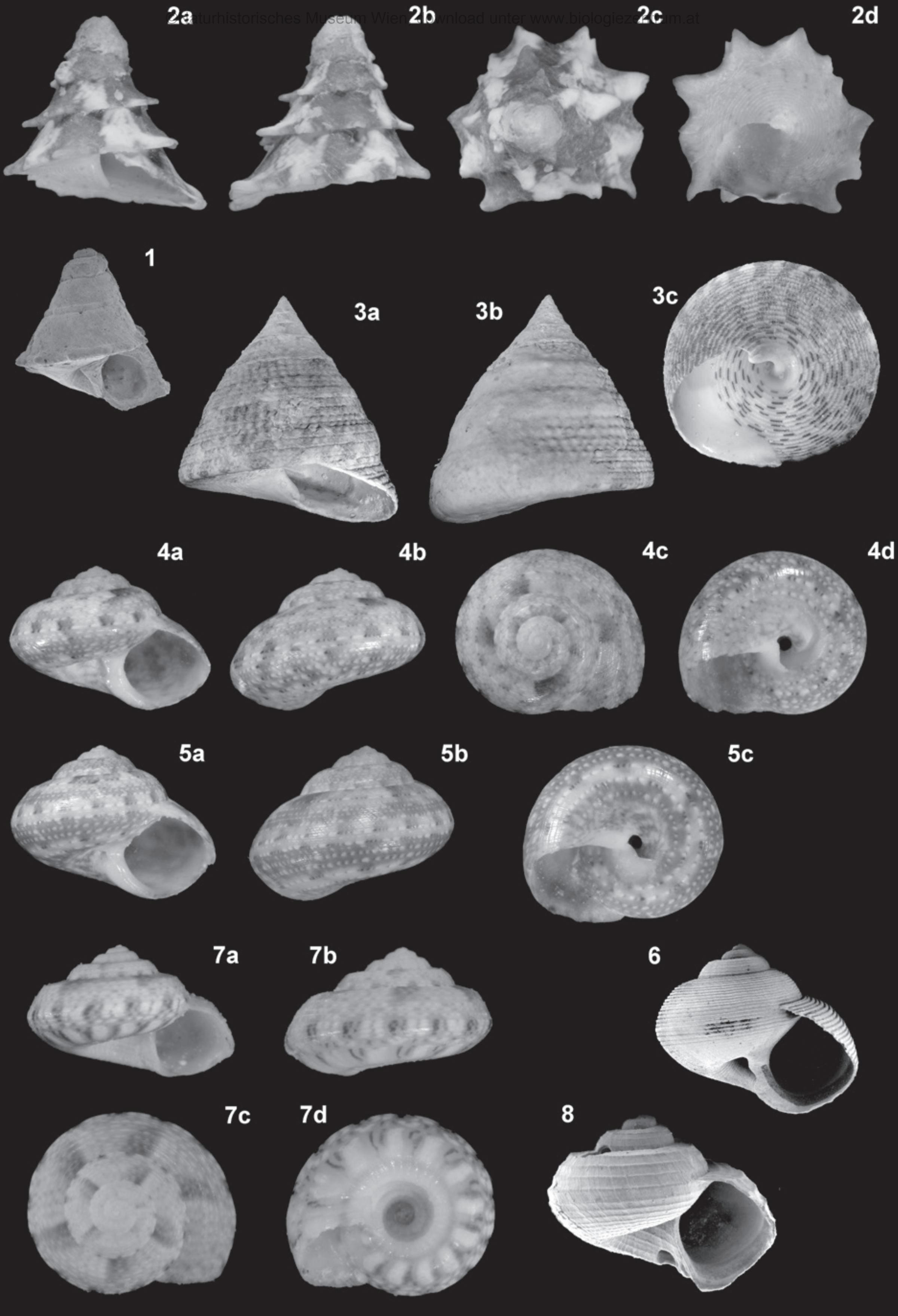
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Plate 13

Trochoidea - Trochidae

***Ethminolia hemprichii* (Issel, 1869)**
Fig. 1a frontal view (L = 1.57 mm)
Fig. 1b back view
Fig. 1c apical view
Fig. 1d adapical view
Fig. 2 SEM frontal view (L = 1.35 mm)
Fig. 3a SEM frontal view (L = 2.34 mm / D = 2.76 mm)
Fig. 3b SEM apical view
Fig. 3c SEM protoconch (Scale bar equals 180 µm)

***Priotrochus obscurus* (Wood, 1828)**
Fig. 4 SEM frontal view (L = 1.65 mm)

***Pseudominolia gradata* (Sowerby, 1895)**
Fig. 5a frontal view (L = 2.84 mm)
Fig. 5b back view
Fig. 5c apical view
Fig. 5d adapical view
Fig. 6 SEM frontal view (L = 2.44 mm)

***Pseudominolia nedyma* (Melvill, 1897)**
Fig. 7a SEM apical view (L = 2.31 mm / D = 2.69 mm)
Fig. 7b SEM of Protoconch (Scale bar = 100 µm)
Fig. 8 adapical view (L = 2.19 mm / D = 2.40 mm)
Fig. 9a frontal view (L = 7.1 mm)
Fig. 9b back view
Fig. 9c apical view
Fig. 9d adapical view

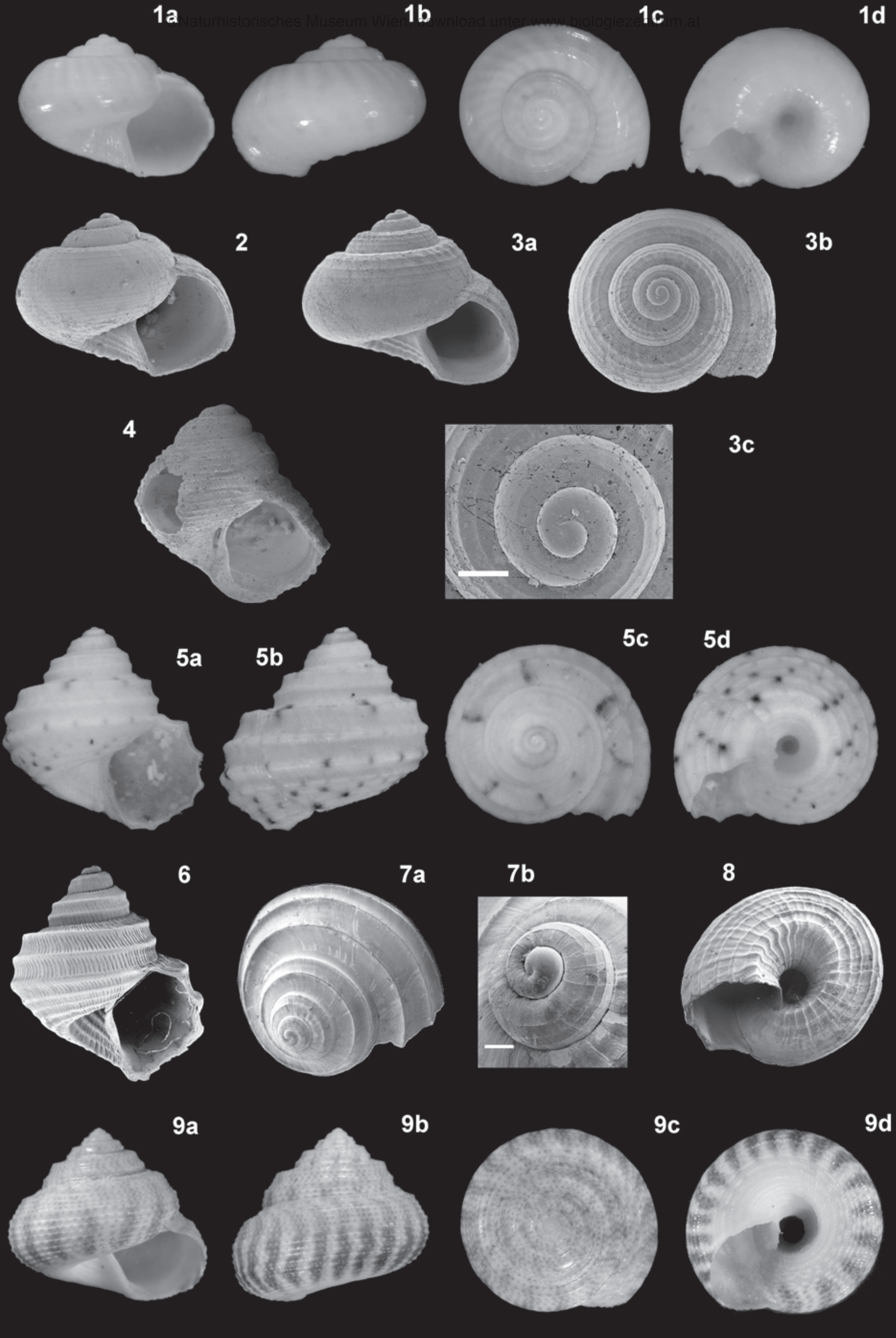
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Plate 14

Turbinoidea - Turbinidae

“*Bothropoma*” *bellula* (H. Adams, 1873)

Fig. 1a apical view (L = 1.19 mm / D = 2.10 mm)

Fig. 1b adapical view

Fig. 1c frontal view

Fig. 2a SEM apical view (L = 1.31 mm / D = 2.41 mm)

Fig. 2b SEM frontal view

***Bothropoma* cf. *munda* (H. Adams, 1873)**

Fig. 3a frontal view (L = 5.0 mm)

Fig. 3b back view

Fig. 3c apical view

Fig. 3d adapical view

Fig. 4a SEM frontal view (L = 3.87 mm)

Fig. 4b SEM protoconch (Scale bar equals 100 µm)

Fig. 5 SEM frontal view (L = 1.72 mm)

***Bothropoma* cf. *pilula* (Dunker, 1860)**

Fig. 6a frontal view (L = 3.60 mm)

Fig. 6b back view

Fig. 6c apical view

Fig. 6d adapical view

***Bothropoma* sp. indet.**

Operculum (D = 1.99 mm)

Fig. 7a outside

Fig. 7b inside

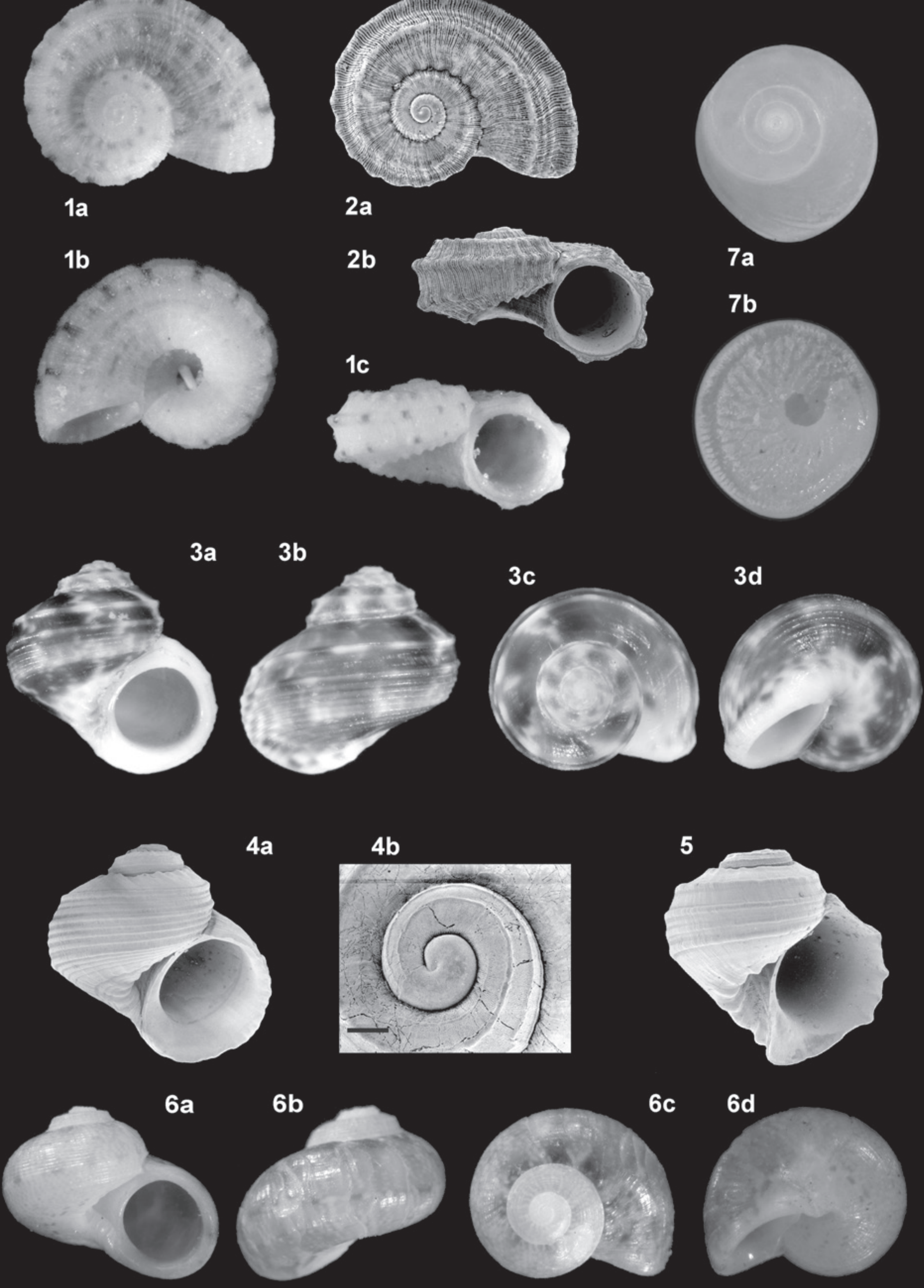
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Plate 15

Turbinoidea - Turbinidae

***Collonista arsinoensis* (ISSEL, 1869)**
Fig. 1a frontal view (L = 1.83 mm)
Fig. 1b back view
Fig. 1c apical view
Fig. 1d adapical view
Fig. 2a SEM frontal view (L = 1.80 mm / D = 2.13mm)
Fig. 2b SEM Protoconch (Scale bar equal 100 µm)

***Homalopoma pustulatum* (BROCCHI, 1821)**
Fig. 3a frontal view (L = 8.2 mm)
Fig. 3b back view
Fig. 3c detail of apex
Fig. 3d apical view

***Turbo petholatus* LINNAEUS, 1758**
Fig. 4a frontal view (L = 48.2 mm)
Fig. 4b back view

***Turbo* sp. indet.**
Operculum (D = 4.15 mm)
Fig. 5a outside
Fig. 5b inside

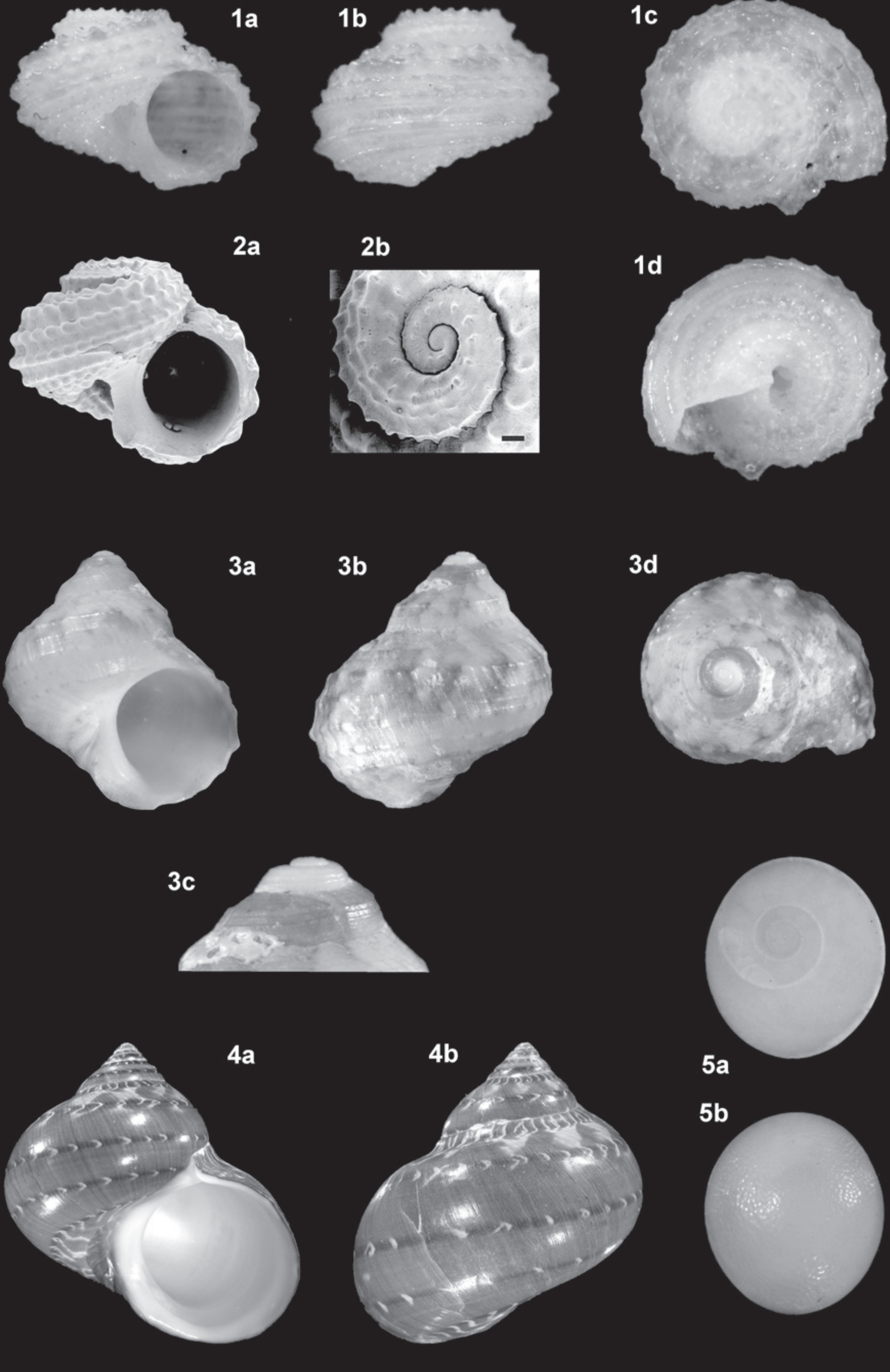
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Plate 16

Turbinoidea - Turbinidae

***Turbo radiatus* Gmelin, 1791**

Fig. 1a SEM frontal view, juvenile (L = 1.18 mm / D = 1.71 mm)

Fig. 1b SEM apical view, juvenile

Fig. 2a frontal view (L = 6.3 mm)

Fig. 2b back view

Fig. 3a frontal view (L = 14.3 mm)

Fig. 3b back view

Fig. 3c detail of apex

Fig. 4a frontal view (L = 32.5 mm)

Fig. 4b back view

Turbinoidea - Skeneidae

***Cirsonella* sp. 1**

Fig. 5a SEM frontal view (L = 1.28 mm / D = 1.83 mm)

Fig. 5b SEM of protoconch (Scale bar equals 100 µm)

***Cirsonella* sp. 2**

Fig. 6a SEM apical view (L = 1.08 mm / D = 1.39 mm)

Fig. 6b SEM frontal view

Fig. 7a apical view (L = 1.46 mm / D = 1.76 mm)

Fig. 7b frontal view

Fig. 7c adapical view

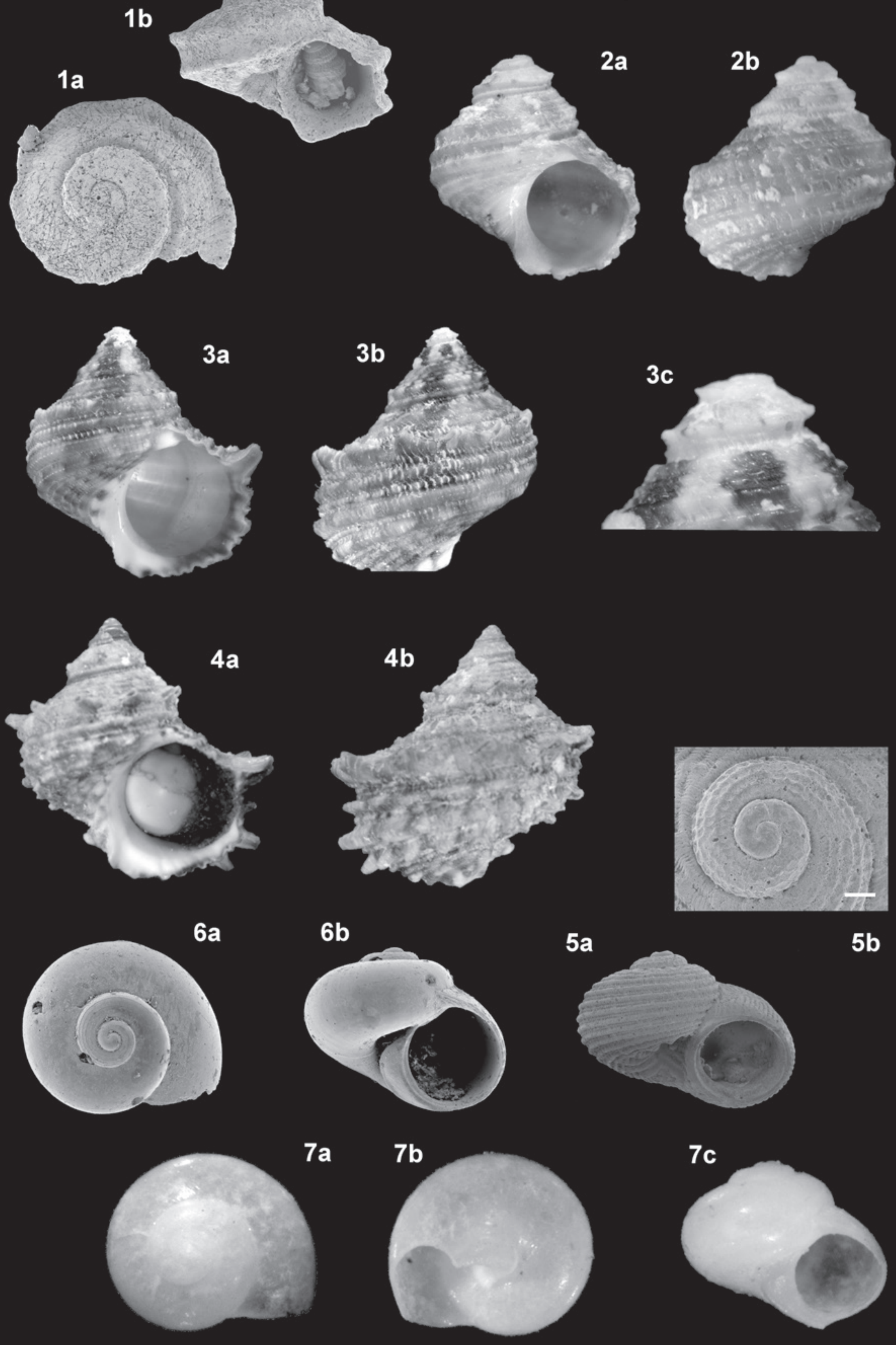
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Plate 17

Trochoidea - Phasianellidae

Phasianella solida **(Born, 1778)**

Fig. 1a frontal view (L = 16.0 mm)

Fig. 1b back view

Fig. 1c detail

Fig. 2a frontal view (L = 11.2 mm)

Fig. 2b back view

Fig. 2c detail

Fig. 3a frontal view (L = 5.0 mm)

Fig. 3b back view

Fig. 3c detail

Fig. 4a frontal view, juvenile (L = 2.18 mm)

Fig. 4b back view, juvenile

Fig. 5 SEM frontal view, juvenile (L = 2.5 mm)

Phasianella **sp. indet.**

Operculum (L = 4.66 mm)

Fig. 6a outside

Fig. 6b inside

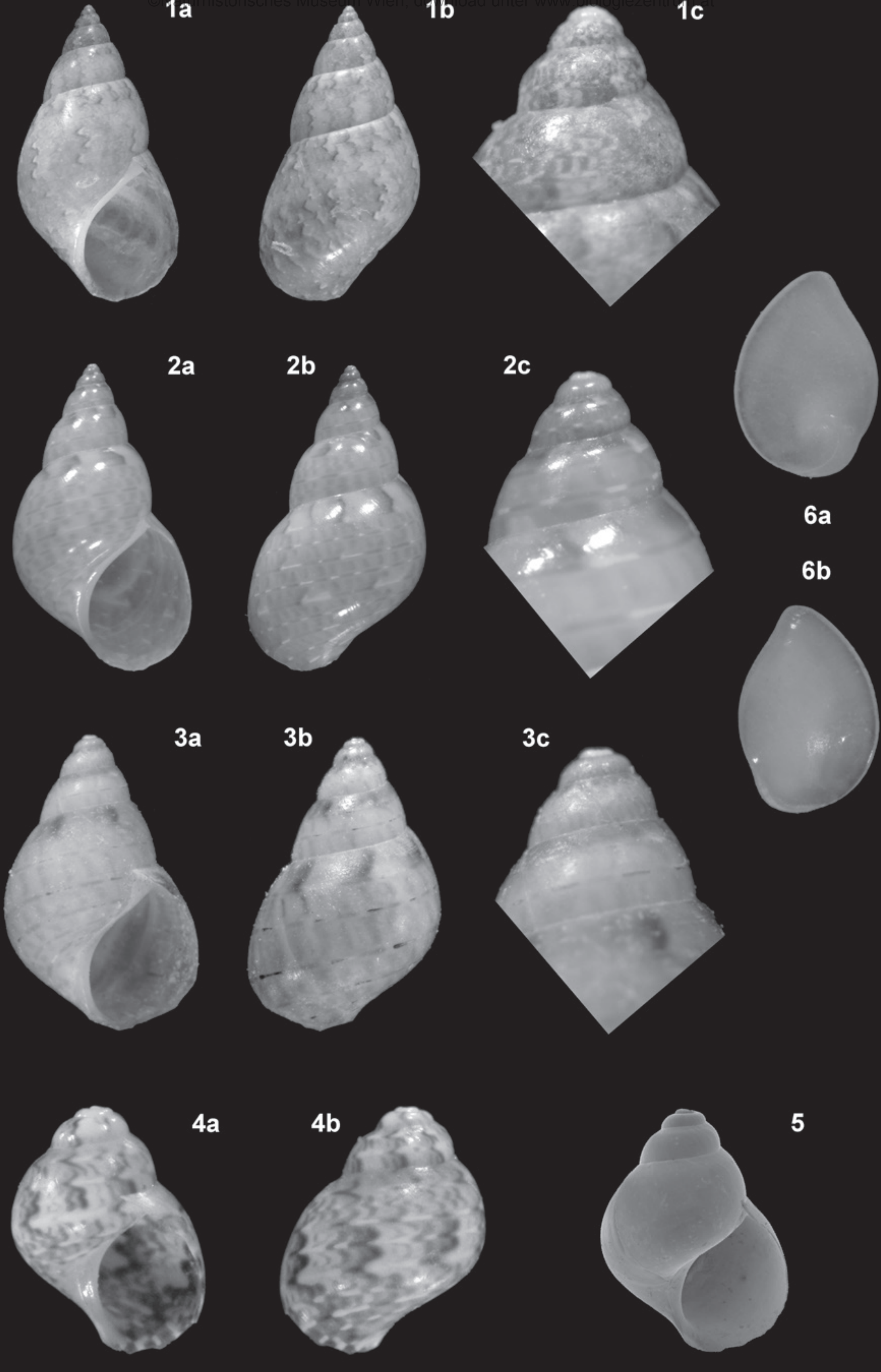
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Plate 18

Helicinoidea - Neritiliidae

***Pisulina adamsiana* G. & H. NEVILL, 1869**

Fig. 1a frontal view (L = 1.72 mm / D = 2.02 mm)

Fig. 1b back view

Fig. 2 SEM frontal view (L = 2.16 mm / D = 2.55 mm)

Fig. 3a SEM back view (L = 2.28 mm / D = 2.73 mm)

Fig. 3b SEM of protoconch (Scale bar equals 100 µm)

Neritoidea - Neritopsidae

***Neritopsis aqabaensis* BANDEL, 2007**

Fig. 4a frontal view (L = 3.96 mm / D = 4.15mm)

Fig. 4b back view

Fig. 4c detail of sculpture

Fig. 5a frontal view (L = 13.0 mm / D = 13.70 mm)

Fig. 5b back view

Neritoidea - Neritidae

***Nerita orbignyana* RÉCLUZ, 1841**

Fig. 6a frontal view (L = 15.8 mm / D = 18.3 mm)

Fig. 6b back view

Fig. 6c apical view

***Nerita sanguinolenta* MENKE, 1829**

Fig. 7a frontal view (L = 15.1 mm / D = 18.5 mm)

Fig. 7b back view

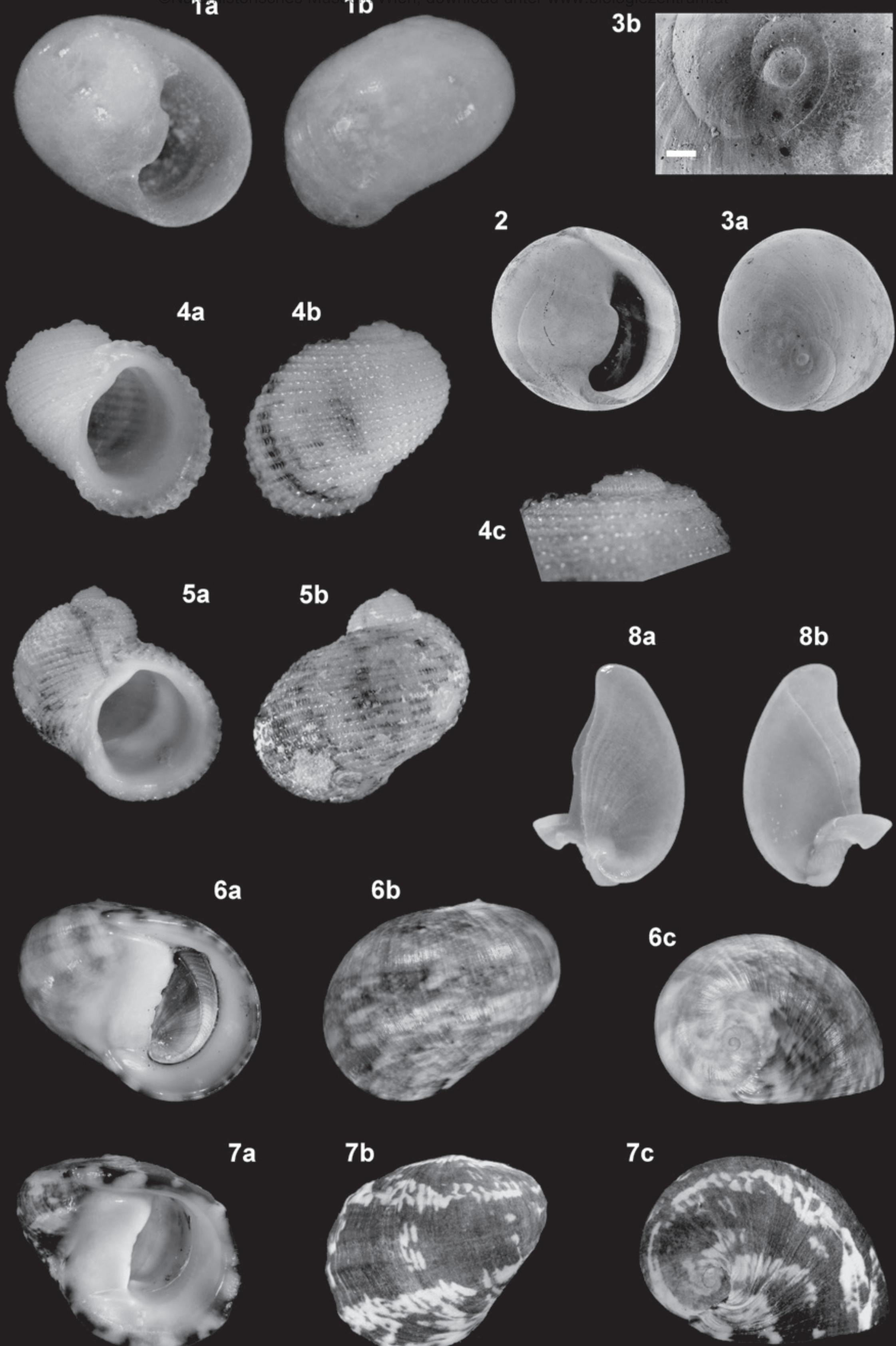
Fig. 7c apical view

***Nerita* sp. indet.**

Operculum (L = 2.62 mm)

Fig. 8a outside

Fig. 8b inside


1a
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3b
2
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7a
7b
7c

Plate 19

Neritoidea - Neritidae

***Smaragdia purpureomaculata* (Dekker, 2000)**

Fig. 1a SEM frontal view (L = 3.23 mm / D = 3.42 mm)

Fig. 1b SEM apical view

Fig. 1c SEM protoconch (Scale bar equals 100 µm)

Fig. 2a frontal view (L = 3.57 mm / D = 4.15 mm)

Fig. 2b back view

***Smaragdia rangiana* (Récluz, 1841)**

Fig. 3a frontal view (L = 4.1 mm)

Fig. 3b back view

Fig. 4 back view (L = 4.4 mm)

Fig. 5a back view (L = 3.06 mm)

Fig. 5b SEM frontal view

***Smaragdia souverbiana* (Montrouzier, 1863)**

Fig. 6a frontal view (L = 2.15 mm)

Fig. 6b back view

***Plesiothyreus elongatus* (Thiele, 1909)**

Fig. 7 external view (L = 4.7 mm)

***Plesiothyreus evansi* (Biggs, 1973)**

Fig. 8a external view (L = 5.7 mm)

Fig. 8b internal view

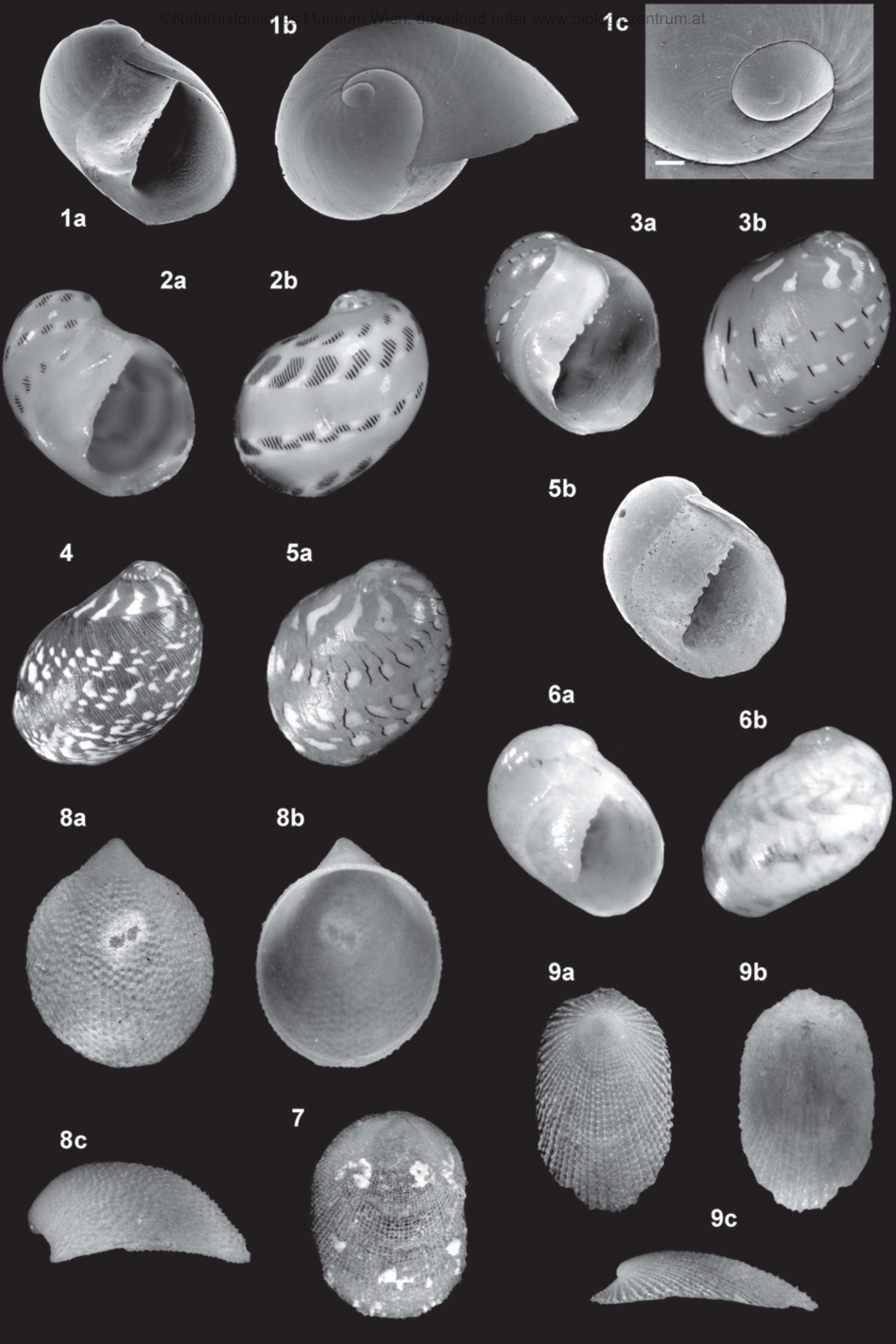
Fig. 8c lateral view

***Plesiothyreus pararabicus* (Christiaens, 1988)**

Fig. 9a external view (L = 9.0 mm)

Fig. 9b internal view

Fig. 9c lateral view


1b
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9b
7
8c
9c

Zeitschrift/Journal: Annalen des Naturhistorischen Museums in Wien

Jahr/Year: 2009

Band/Volume: 111A

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Artikel/Article: Gastropods and their habitats from the northern Red Sea (Egypt: Safaga) Part 1: Patellogastropoda, Vetigastropoda and Cycloneritimorpha 73-158