

**New species of turrid conoideans (Gastropoda: Conoidea)
from the Red Sea and Arabia**

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The following 12 new species are described from the northern Red Sea (Egypt) or the southern Red Sea (Yemen), or from the south coast of Yemen and Oman. Family Drilliidae: *Clavus* (*Tylotiella*) *glaucozona*, *C. (T.) infuscatus*. Family Turridae, subfamily Crassispirinae: *Ptychobela dancei*, *Crassispira safagaensis*. Family Conidae, subfamily Raphitominae: *Kermia aegyptiaca*; subfamily Clathurellinae: *Etrema cratis*; subfamily Mangeliinae: *Eucithara capillaris*, *E. villaumeae*, *E. (s.l.) makadiensis*, *E. perhumerata*, *Pseudorhaphitoma unciocostata*, *P. perplexior*. *Clavatulula fulva* Hinds, 1843, a name commonly misapplied to various species of *Clavus*, is here regarded as a nomen dubium in the genus *Paradrillia* Makiyama, 1940. Reasons are given for rejecting *Pleurotoma mica* Philippi, 1850, as a nomen dubium. A syntype of *Glyphostoma aliciae* var. *tenera* Hedley, 1899 [= *Etrema tenera*] is figured for the first time.

INTRODUCTION

The Red Sea is a nearly 2000 km long arm of the north-western Indian Ocean. The warm water, high salinity and narrow connection with the Indian Ocean has resulted in a molluscan fauna with its own character. Many endemic species occur, next to many which have a much wider distribution, particularly into Eastern Africa, Southern Arabia, Arabian Gulf and/or Indian Ocean. An uncritical overview of the species known to occur in the Red Sea is given by Dekker & Orlin (2000). Bosch et al. (1995) discuss most of the commoner molluscs from Southern Arabia and the Arabian Gulf. However, many species remain unidentified and need to be studied, especially those from the insufficiently known families like Pyramidellidae, Triphoridae and Turridae.

The second author (HD) collected molluscs a number of times in Egypt, but also in Yemen (Tibia-I and Tibia-II Expeditions), Oman, and the United Arab Emirates (Tibia-III Expedition) to enlarge the knowledge of the marine species occurring around Arabia. Collecting was done only in the littoral zone, including collection of shell grit samples to be sorted for micromolluscs.

Amongst the Red Sea material examined is a number of species, belonging to three turrid families, which prove to be undescribed. Such a claim might be viewed with skepticism when applied to members of such a huge, taxonomically chaotic group, particularly as the majority of Indo-Pacific turrid species cannot be identified with certainty from the literature alone (which as a result is cluttered with an overwhelming number of misidentifications). As the only solution, over the past few decades the senior author (RK) has assembled photographs and descriptions of types or potential types of all shallow Indo-Pacific turrid species that could be traced in most of the major collections worldwide. As far as possible, this material has been studied personally, but where this was not

practical photographs were generously contributed by the curators responsible. Although the worn, faded or damaged state of many older types may introduce an element of uncertainty, the new species in the present study are described with some degree of confidence.

Literature references to the species cited in our discussions and comparative remarks may be found in Tucker (2004). The number of specimens is listed after the catalogue number.

The following abbreviations are used: a/l = ratio of total length and aperture length; b/l = ratio of total length and breadth; ca = circa [approximately]; f = fide [according to]; m = by monotypy; o.d. = by original designation; s.d. = by secondary designation. For collections and institutes: AMS = Australian Museum, Sydney; ANSP = Academy of Natural Sciences, Philadelphia; BMNH = The Natural History Museum, London; HD = Henk Dekker collection, Winkler; ISNB = Institut Royal des Sciences Naturelles de Belgique, Brussels; MHNG = Muséum National d'Histoire Naturelle, Geneva; MMUE = Manchester Museum, University of Manchester; MNHN = Muséum National d'Histoire Naturelle, Paris; NMSA = Natal Museum, Pietermaritzburg; ZMA = Zoological Museum Amsterdam, Amsterdam; ZSI = Zoological Survey of India, Calcutta.

Family Drilliidae Olsson, 1964

Clavus Montfort, 1810.

Clavus Montfort, 1810, type species (o.d.): *Clavus flammulatus* Montfort, 1810.

Tylotiella Habe, 1958.

Tylotiella Habe, 1958, type species (o.d.): *Drillia subobliquata* E.A. Smith, 1879.

Remarks. – Although *Tylotiella* is commonly regarded as a full genus, there are simply too many species that display borderline characters for that status to be maintained, and the group is here treated as a subgenus of *Clavus*.

Clavus (Tylotiella) glaucozona spec. nov. (figs 1-3)

? *Drillia (Crassispira) tessellata* Hinds; McAndrew, 1870: 433.

? *Drillia formosa* Reeve; Cooke, 1885: 35 (refers to McAndrews specimens).

Tylotiella aff. *pica* (Reeve, 1843); Dekker & Orlin, 2000: 32.

Clavus formosa (Reeve, 1846); Verbinnen & Dirx, 2004: 9, fig. 4.

Type material.– Holotype: ZMA Moll. 4.08.002; 11.0 × 3.7 mm; Egypt, 4 km N of Port Safâga, 26°48'31"N, 33°56'53"E, sandy beach above reef flat; x.2001, leg. H. & S. Dekker and C. Dekker-Rentenaar. Paratypes: Egypt, Red Sea, data as holotype, HD 6894/5 juveniles; Sharm-el-Nâga, 26°53'50"N 33°57'50"E, reef flat with stones; 2001, leg. H. & S. Dekker & C. Dekker-Rentenaar, HD 6640/6; Ras Abu Soma, 26°50'44"N 34°00'01"E, x.2001, leg. H. & S. Dekker and C. Dekker-Rentenaar, coral reef flat, HD 6729/1; el-Qalawi, 30.5 km S. of Port Safâga, 26°30'33"N 34°04'06"E, x.2001, leg. H. & S. Dekker and C. Dekker-

Rentenaar, HD 6595/3.

Other material.– Egypt, Red Sea: data as holotype, HD 21047/5; el-Qalawi (30.5 km S of Port Safâga), 26°30'33"N 34°04'06"E, HD 3101/7; sharm 13 km N of Quseir, 26°12'16"N 34°13'14"E, HD 3034/6; 16 km S of Hurghada, 27°05'N 33°52'E, HD 12823/4; Sinai, Gulf of Aqaba, Dahab, S side Ras el-Kura, 27°55'36"N 34°22'E, HD 12826/7; Sinai, Gulf of Aqaba, Shark's Bay, 27°55'36"N 34°22'E, HD 12825/2; Egypt, Red Sea, Marsa Abu Makhadiq (Makadi Bay), 26°59'20"N 33°54'13"E, HD 6498/3; el-Qalawi, 30.5 km S. of Port

Safâga, 26°30'33"N 34°04'06"E, x.2001, HD 21048/4; Ras Abu Soma, 26°50'44"N 34°00'01"E, x.2001, HD 21049/6; Naam Beach [5 km S Hurghada], 27°11'N 33°50'E, HD 12824/2; Hurghada, 1 km N of Sheraton hotel, viii.1988, HD 12822/1 juvenile, 2 in Kilburn colln.

Distribution.— Northern Red Sea: Gulf of Suez to Port Safâga area, and Gulf of Aqaba to Strait of Tiran, littoral.

Description.— Shell narrowly claviform (b/l 0.31-0.37, a/l 0.32-0.38), with a somewhat blunt, acute, orthoconoid spire and short, truncate base; suture shallow but distinct, teleoconch whorls about 6, subsutural region shallowly but evenly concave, basal 2-3 of whorl gently and evenly convex, periphery median, on later whorls slightly angular, without shoulder; left side of base of body whorl concave, fasciole slight, without false umbilicus. Aperture oblong-ovate, greatest width more or less median, outer lip somewhat straight medially; siphonal canal moderately wide, truncate, short, termination not indented; inner lip with a thick callus, forming a strong parietal nodule in posterior angle of aperture, constricting anal sinus; outer lip thin, rather straight in side-view, with deep stromboid notch and moderately shallow, openly U-shaped anal sinus, directed slightly adapically.

Glossy, sculptured by low axial ribs, spiral sculpture restricted to 4-6 relatively strong ridges on rostrum. Microsculpture of rather coarse, pliculate collabral threads (particularly strong on last whorl), crossed by much finer spiral striae. Axial ribs on first teleoconch whorl straight, orthocone and suture-to-suture, thereafter slightly opisthocline, shallowly arcuate, becoming sigmoid on last whorl, recurved below suture, crests angular, narrower than intervals, on last 3 teleoconch whorls becoming progressively weaker below suture, on base of body whorl evanescing at parietal level, 12 on first whorl, 11-13 on later whorls. Base of ribs with a row of very slight nodules. Terminal varix close to lip, thick, strongly rounded, trailing face somewhat concave.

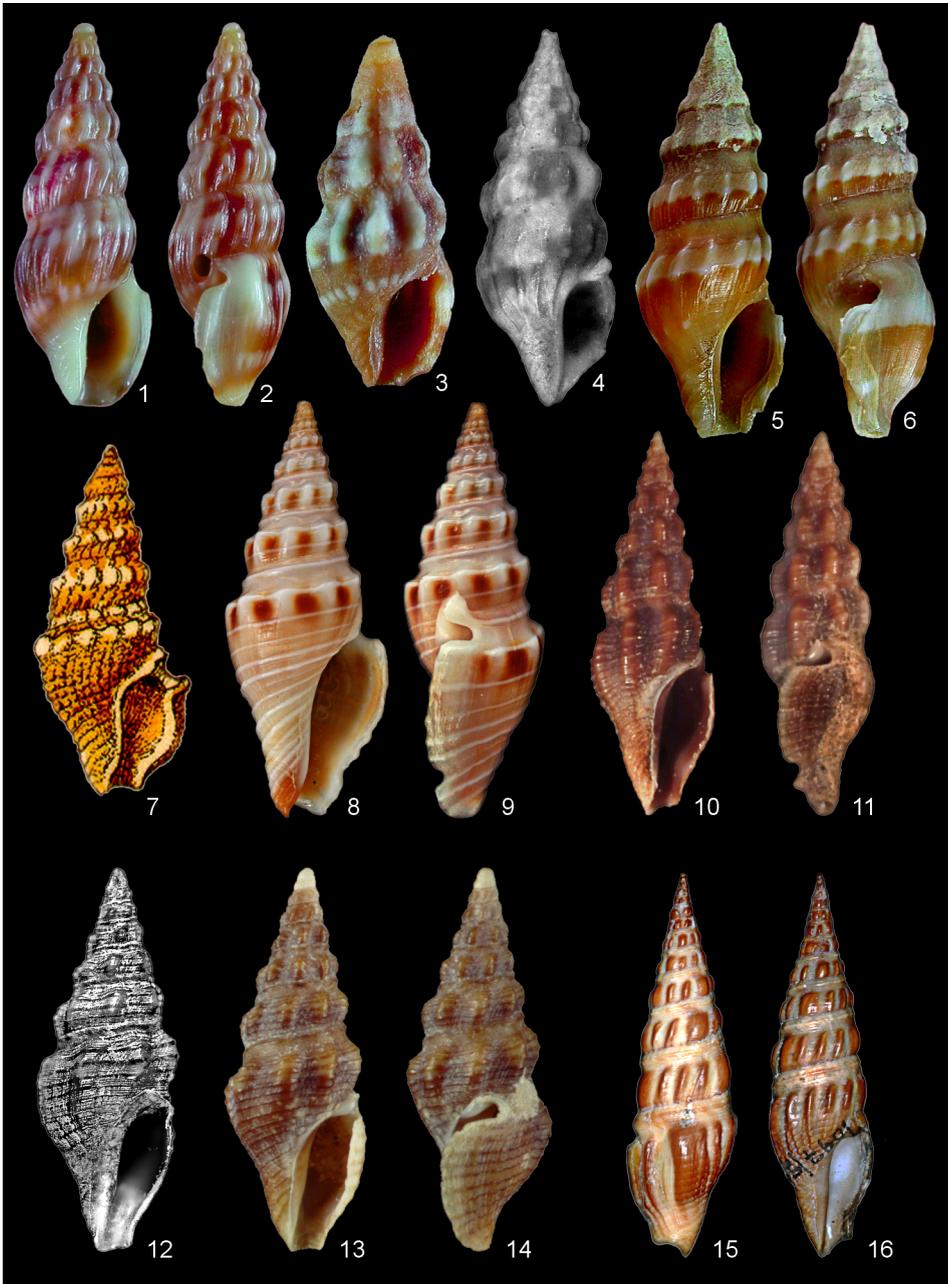
Colour usually pale grey to greyish-white, mid-body whorl with a broad band of medium- to greyish-brown; all whorls with irregularly spaced, axially oblong blotches of medium to dark brown, with a brown line or row of dots above periphery; basal granules white; base and area behind lip white; protoconch initially white, then brown; aperture deep brown. Sometimes uniform brown, with ribs and basal granules white.

Protoconch domed, of about 1.5 convex whorls, the first somewhat depressed; smooth except for last quarter whorl, where there are a few thin, arcuate axial riblets; breadth 0.68-0.72 mm.

Largest and smallest paratypes are 16.2 × 5.0 mm and 7.2 × 2.8 mm.

Remarks.— *Clavus (Tylotiella) glaucozona* spec. nov. is most similar to *Clavus (Tylotiella) burnupi* (Sowerby, 1897) from south-east Africa (see Kilburn, 1988: 189, figs 90-93), but its axial ribs are less opisthocline, the whorls have a slight median angle, spiral striae are stronger and more extensive, and colouration is different. Whorls are more concave subsuturally than in *Clavus (Tylotiella) decaryi* (Dautzenberg, 1932) from Madagascar (see Kilburn, 1988: 190, figs 95-96). In *Clavus (Tylotiella) formosus* (Reeve, 1846) (fig. 4) the axial ribs extend well onto the base but evanesce in the subsutural concavity, and are weakly but distinctly shouldered. Faded shells may somewhat resemble worn *Clavus laetus* (Hinds, 1843) or *C. nodifera* (Pease, 1860), but lack hooked shoulder angles. *Clavus (Tylotiella) pica* (Reeve, 1843), according to syntypes in the BMNH (figured by Wells, 1991: 30, pl. 6 figs 7-8), and other Philippine material, is distinguished by its definite colour pattern of spiral and axial brown lines and its wide, smooth subsutural region.

Four worn examples (fig. 3) from Dahab, Gulf of Aqaba, appear to represent a morph of *C. glaucozona* spec. nov. (worn typical examples occur in the same sample). These are small (8.7 × 3.4 mm, 10.7 × 4.2 mm), biconical (b/l 0.39-0.41, a/l 0.33-0.43) with only 9-10



Figs 1-16. Turrids. 1-3, *Clavus (Tylotiella) glaucozona* spec. nov.; 1-2, holotype (ZMA Moll. 4.08.002), Egypt, 4 km N of Port Safâga, 11.0 × 3.7 mm; 3, small dark morph, Egypt, Gulf of Aqaba, Dahab, 8.7 × 3.4 mm, HD 12826. 4, *Clavus (Tylotiella) formosus* (Reeve, 1846), syntype (BMNH 19631062) of *Pleurotoma tessellata* Reeve, 1846 (non Hinds, 1843), Philippines, Capul Island, 13.9 × 5.5 mm. 5-6, *Clavus (Tylotiella) infuscatus* spec. nov., holotype (ZMA Moll. 4.08.003), Egypt, Sinai, Gulf of Aqaba, near Dahab, 15.4 × 5.3 mm ▶

ribs on the penultimate whorl. Moreover they are coloured reddish-brown overall, except for contrasting white ribs and a row of conspicuous white basal granules. Several show intermediate characters (e.g. dark brown blotches), and a similar brown base may occur in typical specimens.

Etymology: glaucus (bluish-grey) + zona (a belt), Latin noun.

Clavus (Tylotiella) infuscatus spec. nov. (figs 5-6)

Type material.— Holotype: ZMA Moll. 4.08.003; 15.4 × 5.3 mm, aperture 5.2 mm; Egypt, Sinai, Gulf of Aqaba, near Dahab, under dead coral, sandy bottom, 3 m depth; 2000, obtained from I. Yeroslavski. Paratype, same data: 17.8 [apex lost] × 6.3 mm; HD 4759/1.

Distribution.— Gulf of Aqaba, northern Red Sea.

Description.— Shell claviform (b/l 0.34, a/l 0.34), with an acute, almost orthoconoid spire, and moderately short, truncate, not or slightly oblique base; suture shallow; teleoconch whorls about 9; whorls convex, with a deep, evenly concave subsutural region, periphery initially submedian, on later whorls median, forming a distinct angle below subsutural concavity; left side of base of body whorl shallowly to strongly concave, fasciole not developed, no false umbilicus. Aperture oblong, greatest width at about posterior third, labrum slightly flattened medially, columella slightly convex; siphonal canal wide, short, termination very shallowly concave; inner lip with a moderately thin callus, forming a strong tubercle in posterior angle of aperture, constricting anal sinus, outer edge of callus not free on columella. Outer lip thin, gently curved in side-view, with deep stromboid notch (anterior to which the lip forms a feeble denticle) and rather deep, rounded, U-shaped anal sinus, directed somewhat apically. Sculptured by strong but largely peripheral axial ribs and 5-6 narrow, angular, wide-set spiral ridges on rostrum; microscopic collabral and even finer spiral striae. Axial ribs evanescent at lower edge of subsutural concavity, on last whorl extending weakly onto base, terminating in a very weak, irregular angle or tubercle, not vermiculate; ribs strongly opisthocline, almost straight, in t/s sharply angular, more or less narrower than intervals; 13-14 on penultimate whorl. Terminal varix well behind lip, thick, composed of finer ribs, moderately high, trailing side concave.

Glossy, medium- to yellowish-brown with a pale brown peripheral band, its lower edge with darker brown spots or dashes, its upper edge with a fine, indistinct, broken line, subsutural concavity and base pale yellowish-brown; feeble basal tubercles white; aperture and callus of inner lip pale brownish.

Protoconch unknown.

Remarks.— In the two type specimens of *Clavus infuscatus* the apical whorls are worn, so that protoconch and initial teleoconch characters are unknown. Nevertheless, adult characters are sufficiently diagnostic for the recognition of a new species. *Clavus (Tylotiella) infuscatus* spec. nov. resembles a number of Indo-Pacific species, mostly unnamed, but often misidentified as *Clavus fulvus* (Hinds, 1843). Unfortunately, no types of *Clavatulula fulva* are extant amongst the Belcher material in the BMNH. Moreover, if the

- ◀ **7**, *Paradrillia fulva* (Hinds, 1843), nomen dubium, type figure of *Clavatulula fulva* after Hinds, 1844: pl. 7 fig. 13, magnified, Indonesia, Straits of Macassar, 18 m. **8-9**, *Ptychobela dancei* spec. nov., holotype (ZMA Moll. 4.08.004), Yemen, S coast, al-Musayna'ah, 17.4 × 6.7 mm. **10-11**, *Crassispira safagaensis* spec. nov., holotype (ZMA Moll. 4.08.005), Egypt, Port Safâga, 16.0 × 5.2 mm. **12-14**, *Crassispira latiriformis* (Melvill, 1923); **12**, holotype (BMNH 19642) of *Drillia latiriformis*, New Caledonia, 16.7 × 5.3 mm; **13-14**, fresh specimen (MNHN), New Caledonia, Lagoon off Poelho, 20°22'S, 164°38'E, 20 m, ORSTOM stn 888, 15.4 × 5.3 mm. **15-16**, *Crassispira* (?) *vibicina* (Helbling, 1779), possible syntype (MHNG 1097/52/2) of *Pleurotoma interrupta* Lamarck, 1816 (non *Murex interruptus* Brocchi, 1814), 34.0 × 9.8 mm; photo courtesy of Dr Y. Finet.

type figure (Hinds, 1844: pl. 7 fig. 13) is magnified (fig. 7), it is seen to possess a peripheral row of nodules, a subsutural series of smaller tubercles, and on the base of its last whorl a fine, granose-cancellate sculpture. It appears that *C. fulva* is a nomen dubium, not within the genus *Clavus*, but in the very poorly studied genus *Paradrillia* Makiyama, 1940.

Clavus infuscatus spec. nov. belongs to a group of *Tylotiella* species with a broad white supra-peripheral band and spiral sculpture that is restricted to the rostrum. This complex includes *Clavus papilio* (Kilburn, 1988), *C. powelli* Kay, 1979, *C. isibopho* (Kilburn, 1988), *C. jucundus* (E.A. Smith, 1888), and *C. humilis* (E.A. Smith, 1879). In all of these species the axial ribs reach the suture, unlike *C. infuscatus* spec. nov.

Etymology: *infuscatus* = suffused with brownish, Latin adjective.

Family Turridae H. & A. Adams, 1853

Subfamily Crassispirinae Morrison, 1966

Ptychobela Thiele, 1925.

Ptychobela Thiele, 1925, type species (o.d.): *Pleurotoma crenularis* (auct., non Lamarck, 1816) [= *Murex nodulosus* Gmelin, 1791].

Ptychobela dancei spec. nov. (figs 8-9)

Ptychobela opisthocetus Kilburn; Bosch et al., 1995: 169, fig. 757 (non Kilburn, 1989).

Type material.— Holotype: ZMA Moll. 4.08.004; 17.4 × 6.7 mm (b/l 0.39), aperture 7.9 mm (a/l 0.45); Yemen, south coast, Hadramawt, Musayna'ah, 26°48'31"N 33°56'53"E; 11-12.x.1995, Tibia-II Expedition. Paratypes: same data, HD 9743/4 (14.7 × 5.3 mm [b/l 0.36], aperture 6.3 mm [a/l 0.43], and 3 juveniles); Oman, Masirah Island, Sur Masirah, at low tide between algae and stones, 22.xi.1991, leg. R.G. Moolenbeek & H. Dekker, ZMA Moll. 4.08.026/23, HD 21045/6, Kilburn colln/6.

Other material.— Yemen, south coast, al-Mahrah, Sayhut, 10.x.1995, Tibia-II Expedition, HD 9742/1, now in Kilburn colln; Yemen, south coast, al-Mahrah, 6 km W of Sayhut, 11.x.1995, Tibia-II Expedition, HD 9753/9; Somalia, without details, obtained 1996, HD 8928/1.

Distribution.— South Yemen to Oman, Masirah Island, and Somalia.

Description.— Shell biconic-fusiform, spire orthoconoid, acute, a/l 0.43-0.45, b/l 0.36-0.39, aperture large, siphonal canal moderately long and thick, constricted above, its termination wide and deeply notched. Outer lip alate below sinus but not flaring, posterior angle of aperture forming a deep, constricted spout that extends high up penultimate whorl, parietal pad large; edge of outer lip not crenulate or serrated, anal sinus in side-view moderately deep, linguiform with parallel sides, posterior end of lip forming an adapically inclined, lobate projection; termination of lip sharp, not foreshortened against end of columella, which is equally sharp; stromboid notch deep. Glossy, sculptured by strong shoulder nodules, forming axial ribs on spire whorls, and thin, widely-spaced spiral ridges. Whorls shouldered, sulcus wide, slopingly concave, with a narrow, sharp, well-defined subsutural cord. Axial ribs reaching subsutural cord on first teleoconch whorl, becoming progressively obsolete in sulcus, on penultimate (5-6th teleoconch whorl) also obsolete above suture; opisthocline, in t/s initially angularly rounded, on last whorl low and rounded, 8-9 per whorl, prelabral varix broad, low and rounded. Spiral ridges thin and close on first 2-3 whorls, about 5 in number (plus subsutural cord); weaken and evanesce on 4-5th whorls, but a shoulder and suprasutural ridge begin to develop; penultimate whorl with 3 ridges, the one on shoulder undulating, the other two weaker, all much narrower than their intervals; base of last whorl with 14-16, upper ones alternately more or less weaker and stronger, those on rostrum thick and close. Collabral threads fine

and very low, lunulate in sulcus, strongest on base of last whorl.

Colour pale greyish brown (early whorls tinged with orange-brown), axial ribs and spiral ridges white, intervals between ribs below shoulder on penultimate whorl reddish-brown, reduced to a series of spots on last whorl; base of rostrum with a brown blotch.

Protoconch papilliform, of about 1.5 whorls, smooth except for a few, fine, close axial riblets at termination; breadth 0.50 mm. Maximum length 36.5 mm.

Remarks.— This new species closely resembles *Ptychobela opisthocetos* Kilburn, 1989, of Mozambique, in possessing a similar long, spout-like posterior canal. It differs from *P. opisthocetos* in a number of characters, such as its squatter shape (b/l 0.36-0.39 against 0.34-0.36) and high gloss and smaller size (15-21 mm against about 30 mm). Furthermore, spiral ridges are fewer in *P. dancei* spec. nov.; the subsutural cord bears only a single ridge instead of two; the penultimate whorl shows 2-3 spiral ridges (against 4-6), the base of the last whorl has ca 14 ridges against 19-22 (of which those on the rostrum are coarser in *P. dancei*). Finally the base of the rostrum has a brown blotch, evidently not present in *P. opisthocetos*, and there are usually conspicuous brown peripheral spots on the last whorl. All fresh examples seen from Yemen are as described above; Bosch et al. (1995) reported 2 other colour forms on Masirah Island.

Etymology: this species is dedicated to S. Peter Dance of the United Kingdom.

Crassispira Swainson, 1840.

Crassispira Swainson, 1840, type species (S.D. Herrmannsen, 1847: 318): *Pleurotoma bottae* Kiener, 1840 [= *Pleurotoma incrassata* Sowerby I, 1834].

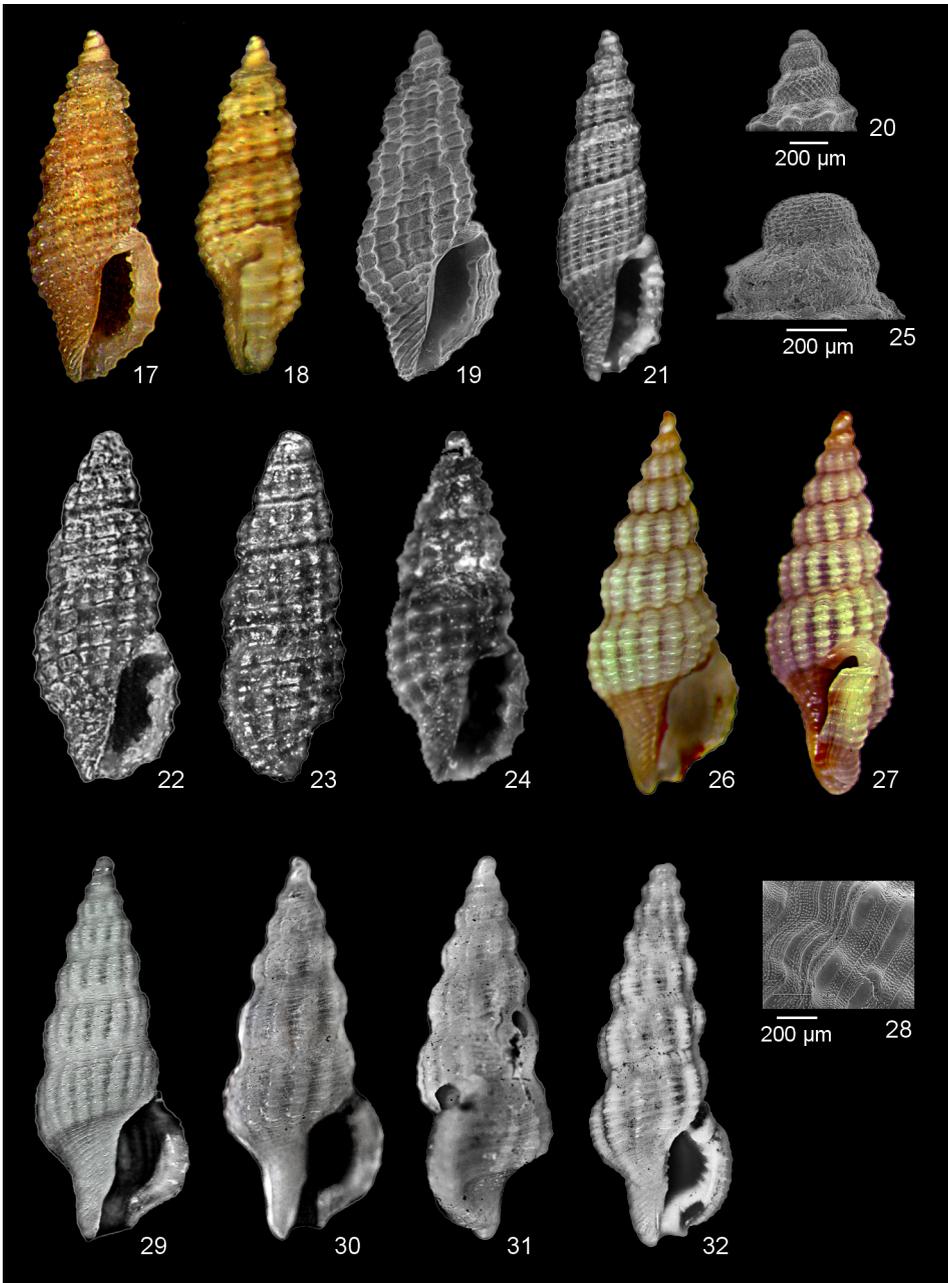
Remarks.— The following species is somewhat intermediate in shell characters between the genera *Inquisitor* Hedley, 1918, and *Crassispira*. The shiny brown, almost periostracum-like, outer shell surface is more suggestive of the latter. Of described Indo-Pacific species it shows most resemblance to *Drillia latiriformis* Melvill, 1923, from New Caledonia, whose shell characters are fairly typical of *Crassispira* (or perhaps *Strictispira* McLean, 1971). There is also some overall similarity to several of the non-decollated West African *Crassispira* species (see Fernandes et al., 1995). Study of the radulae of *Crassispira latiriformis* and *C. safagaensis* spec. nov. would clarify their status. Unfortunately although the operculum of the holotype of *C. safagaensis* spec. nov. is visible deep inside the shell interior, attempting to reconstitute and extract the dried remains might entail the risk of damage to this unique specimen.

Crassispira safagaensis spec. nov. (figs 10-11)

Type material.— Holotype: ZMA Moll. 4.08.005; 16.0 × 5.2 mm, aperture 6.2 mm; Red Sea, Egypt, Port Safâga, 26°46'08"N 33°56'26"E, seagrass; leg. H. Dekker, W. C. Regter & B. Gras, 22.ix.1999.

Distribution.— Known from only the type locality.

Description.— Shell fusiform with b/l 0.33, a/l 0.39, whorls convex, not shouldered, outer lip flattened, somewhat alate, siphonal canal moderately long, tip obliquely truncate with a feeble notch; aperture narrow, fasciole absent. Outer lip with crenulate edge, stromboid notch a deep, asymmetrical sinus; anal sinus very deep, asymmetrically and openly U-shaped, adapically directed. Inner lip with a moderately thick callus glaze, its outer edge well-defined, forming a convex parietal pad inside anal sinus, base of callus with a small denticle inside siphonal canal. Whorls with periphery median. Suture undulating, most strongly on early whorls. Subsutural cord distinct on early whorls, becoming less well-defined with growth, somewhat undulating, sulcus shallow, asymmetrically con-



Figs 17-32. Turrids. 17-20, *Kermia aegyptiaca* spec. nov.; 17-18, holotype (ZMA Moll. 4.08.006), Egypt, 7 km S of Hurghada, 4.0 × 1.4 mm; 19, ESEM photograph of same; 20, protoconch of same, SEM photograph. 21, *Kermia edychroa* (Hervier, 1897), MNHN, Lifou, Baie du Santal, 12-32 m, Atelier Lifou strn 1432, 3.7 × 1.1 mm. 22-25, *Pseudodaphnella cnephaea* (Melville & Standen, 1896); 22-23, figured syntype (MMUE EE3719) of *Clathurella cnephaea*, Loyalty Islands, 4.4 × 2.0 mm; 24, New Caledonia, F.J. Springsteen, 5.2 × 1.9 mm; ►

cave, barely differentiated on last whorl. Axial ribs strong, on spire orthocone, straight and aligned across whorls, becoming arcuate, opisthocline and non-aligned on last whorl, evanescent in sulcus and abruptly at parietal level, 7 per spire whorl, 8 on last whorl, absent between terminal varix and lip; varix high, convex, situated to right of midline. Spiral sculpture of low, rounded ridges, higher where they cross ribs but not forming nodules, ridges mostly 0.3-0.5 width of their intervals; some intervals with weaker, slightly granular ridges; penultimate whorl with about 7 main spiral ridges, subsutural region with weak, somewhat ill-defined spiral threads, 2-3 on subsutural cord. Collabral striae present. Medium brown, intervals between ribs darker, spiral ridges paler where they cross the ribs, base yellowish-brown; aperture and inner lip violaceous-brown.

Protoconch papilliform, of about 1.5 whorls, eroded; breadth 0.54 mm.

Remarks.— Although only a single specimen is available, it is in fresh condition, and displays characters that are sufficiently diagnostic to permit its description as a new species. The most closely comparable species appears to be *Crassispira latiriformis* (Melvill, 1923), apparently endemic to New Caledonia (figs 12-14); that species has a much shorter siphonal canal, a lower spire, a larger protoconch (breadth about 0.80 mm), a mid-dorsal varix, only a slight stromboid notch and a non-alate outer lip; finally, the axial ribs in *C. safagaensis* spec. nov. are weaker below the suture than in *C. latiriformis*. The only other similar glossy brown Indo-West Pacific species appears to be *Crassispira* (?) *vibicina* (Helbling, 1779) (= *Pleurotoma interrupta* Lamarck, 1816, non *Murex interruptus* Brocchi, 1814) from Indonesia and the Philippines (figs 15-16). This is a much larger species (exceeding 34 mm in length), narrower with a more strongly defined subsutural cord, less convex whorls, a shallow but wide sulcus, short peripheral axial ribs and close-set spiral ridges.

Etymology: this species is named after its type locality, Port Safâga.

Family Conidae Fleming, 1882

Subfamily Raphitomininae Bellardi, 1875

Kermia Oliver, 1915.

Kermia Oliver, 1915, type species (o.d.): *Kermia benhami* Oliver, 1916.

Kermia aegyptiaca spec. nov. (figs 17-20)

Type material.— Holotype: ZMA Moll. 4.08.006; 4.0 × 1.4 mm, aperture 1.6 mm; Egypt, Red Sea, 7 km south of Hurghada (at El-Samaka Hotel), 27°10'14"N 33°49'40"E; 22-31.viii.1989; HD 12840. Paratypes: Egypt, Red Sea, 4 km north of Port Safâga (north of Shams Hotel), 26°48'31"N 33°56'53"E, 22.ix-5.x.2001, HD 7071/1 (5.2 × 1.9 mm, aperture 1.8 mm) + 1 juvenile.

Other material.— Egypt, Red Sea, Sharm el-Nâga, 26°53'50"N 33°57'50"E, 28.viii.1989, HD 12841/1, another in Kilburn colln.

Distribution.— Egyptian coast of Red Sea.

Description.— Shell narrowly semi-fusiform with a short base (b/l 0.35-0.37, a/l 0.35 - 0.40), sharp apex and strongly rounded, flaring outer lip; aperture sinuous. Whorls asymmetrical, evenly convex on right side, periphery basal on left side; base of body whorl with a shallow constriction at parietal level; siphonal canal short and wide, constricted,

- ◀ **25**, protoconch of fig 24. **26-28**, *Etrema cratis* spec. nov. **26-27**, holotype (ZMA Moll. 4.08.007), Egypt, Marsa Abu Makhadiq, 6.8 × 2.6 mm; **28**, SEM photograph of microsculpture of holotype. **29-31**, *Etrema tenera* (Hedley, 1899); **29**, syntype (AMS C.6063) of *Glyphostoma aliciae* var. *tenera*, Funafuti Atoll, Tuvalu, dimensions not available; photograph courtesy of Des Beechey; **30-31**, Tuamotus, O. Peel, 5.3 × 2.5 mm. **32**, *Etrema aliciae* (Melvill & Standen, 1895), syntype (MMUE) of *Mangilia* (*Glyphostoma*) *aliciae*, Lifou, 11.8 × 4.1 mm.

termination obliquely truncate and shallowly indented. Inner lip very slightly sinuous, parietal region concave, with large parietal tubercle, fused with end of lip. Outer lip preceded by a narrow, arcuate varix; inner edge of lip with 5-6 blunt, low denticles, the posterior 3-4 stronger, the others weaker; anal sinus somewhat spout-like, at about 100° to aperture axis, shallowly linguiform, opening constricted, directed anteriorly. Sculpture cancellate, with narrow axial ribs crossed by thinner spiral ridges, which do not expand into nodules; base of last whorl with a furrow, demarcating the rostrum. Axial ribs straight, slightly opisthoclinal, from suture (which they weakly crenulate) to basal furrow; in t/s strongly rounded, slightly compressed, wider than intervals, 8 on first teleoconch whorl, 11-12 on penultimate whorl. Spiral ridges strongly rounded but sharply incised, ca 0.3-0.5 width of their intervals, ca 0.3 width of axial ribs; 2 on first teleoconch whorl, increasing to 5-6 on penultimate whorl (subsutural one weak); base of body whorl with 2 ridges above the groove, plus 5-8 ridges on rostrum, the upper ones nodulose; back of lip with a total of 8-9 spiral ridges. Interstices with microscopic collabral threads.

Uniform light brown, outer lip paler.

Protoconch conical, of 2.4 slightly convex whorls, apparently mostly smooth, with extremely fine diagonally reticulate sculpture on last whorl; breadth 0.27 mm.

Remarks.— The reticulate sculpture on the protoconch is extremely fine and only clearly visible in one type specimen. The most similar species is *Kermia edychroa* (Hervier, 1897), a species widely distributed in the Indo-Pacific; that, however, has a distinct basal keel and a flattened outer lip (fig. 21). There is a superficial resemblance to *Pseudodaphnella cnephaea* (Melville & Standen, 1896) from New Caledonia, but that species is dark brown (even when worn), and has only 4 lip denticles and a protoconch that is spirally striate (figs 22-25). It is not impossible that this was the species on which the inadequately described *Pleurotoma mica* Philippi, 1850, from Aden, was based. The types of that, if still surviving, should be in the MNNC, but have never been reported. Although Philippi (1850: 31) cited as a figure reference the specimen illustrated by Savigny (1817: pl. 4 fig. 15), that figure (original vellum painting seen in MNHN by Kilburn) is far too small to have been recognised by Philippi with any certainty. As there is no indication (nor any likelihood) that the actual specimen portrayed by Savigny was seen by Philippi, it has no value as a potential lectotype. The Savigny specimen, extant in the MNHN collection, is a juvenile *Kermia* sp., most similar to *Kermia selli* (Preston, 1908), described from the Andaman Islands (holotype in ZSI, seen by senior author), but differing from that in lacking nodules on its rostrum. *Pleurotoma mica* should be rejected as a nomen dubium.

Etymology: named after Egypt (Latin Aegyptus), the country where it was found.

Subfamily Clathurellinae H. & A. Adams, 1858

Etrema Hedley, 1918.

Etrema Hedley, 1918, type species (o.d.): *Mangilia (Glyphostoma) aliciae* Melville & Standen, 1895.

Remarks.— This genus is used here in its broadest sense, as encompassing a wide range of protoconch types. No example of the type species retaining a fresh protoconch has been seen by us, but Powell (1966, textfig. A2.9) figured it as bluntly conical, with 2.5 or 3 smooth whorls; no peripheral keel was described or illustrated, except for one on the first teleoconch whorl. The protoconch of the species described here is bulbous with a strongly tilted protoconch I, which is characteristic of *Acrista* Hedley, 1922 (type species [o.d.] *Lienardia punctilla* Hedley, 1922 [= *Mangilia latirella* Melville & Standen, 1896]). However, as the two types of protoconch occur in different members of the *Etrema crassilabrum* (Reeve, 1843) species-complex, the taxonomic significance of this is unknown.

Etrema cratis spec. nov. (figs 26-28)

Type material.— Holotype: ZMA Moll. 4.08.007; 6.8 × 2.6 mm, aperture 2.0 mm; Egypt, Red Sea, Marsa Abu Makhadiq (now known as Makadi Bay), 26°59'20"N 33°54'13"E; 24.ix-4.x.1999, leg. H. Dekker, B. Gras & W.C. Regter. Paratypes: same data as holotype; HD 6495/3 (5.9 × 2.1 mm, aperture 1.9 mm; 6.0 × 2.4 mm, aperture 1.8 mm; 5.9 × 2.2 mm, aperture 1.9 mm), one in Kilburn collection.

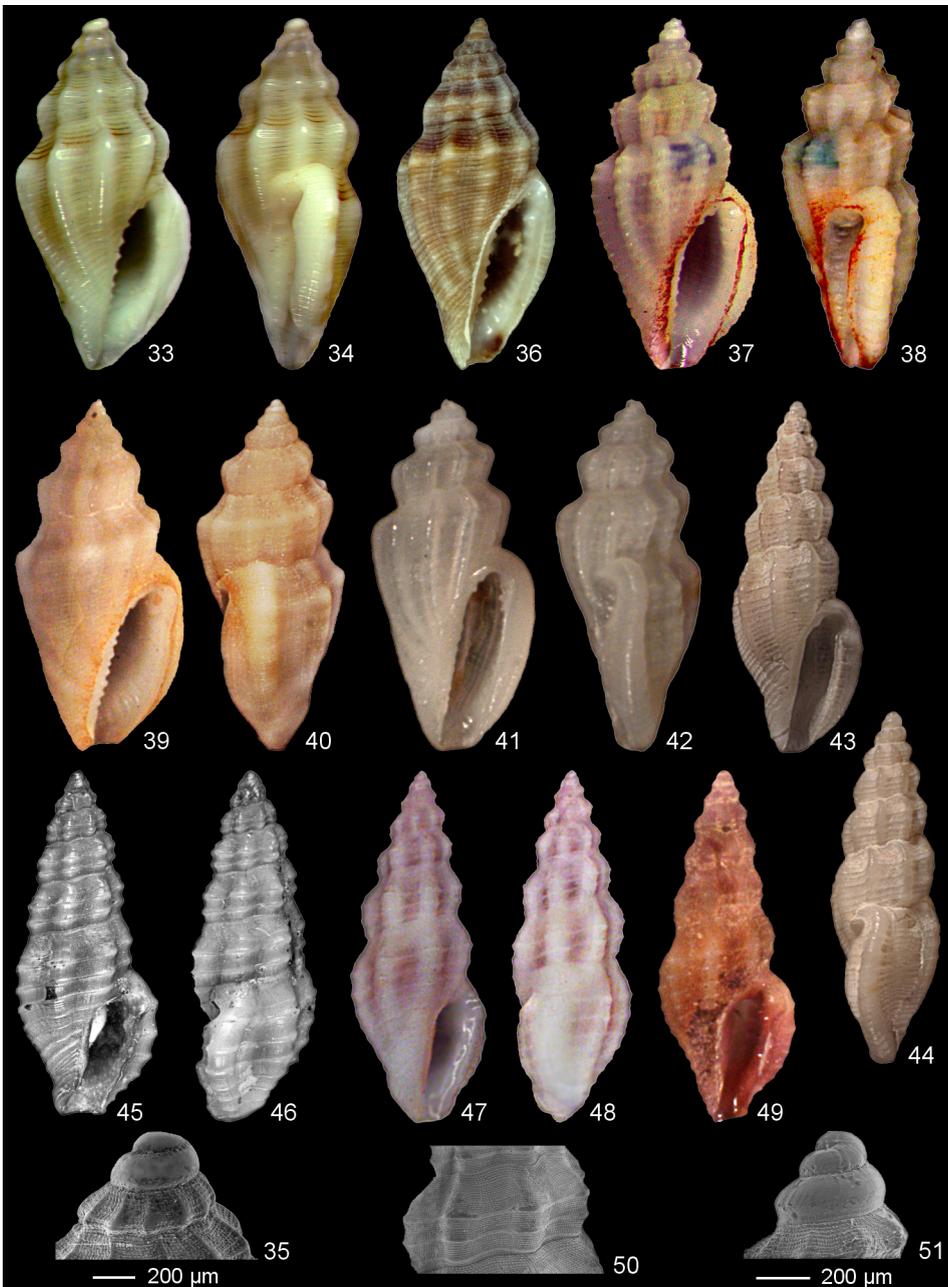
Distribution.— Northern Red Sea, Egypt, only known from its type locality.

Description.— Spire high, orthoconoid, apex acute, b/l 0.36-0.40, a/l 0.29-0.32; outer lip strongly arched; siphonal canal strongly constricted, curved to right, termination expanded, obliquely truncate, deeply notched. Outer lip very thick, reinforced by terminal varix, which is high and angular with its trailing side concave; lip strongly convex in side view, anal sinus moderately deep, linguiform, slightly to distinctly constricted by parietal pad; stromboid notch feeble; aperture with 6-7 fine spiral ridges, forming small teeth on lip, except for two strong teeth at each end. Inner lip with a blunt angle at entrance to siphonal canal, columella with 2-7 pustules or weak plicae. Whorls convex, the uppermost main spiral ridge forming a very slight shoulder angle; subsutural region somewhat flattened, suture shallow, crenulated. Sculpture cancellate, with fairly dense axial ribs, crossed by narrower spiral ridges. Axial ribs weakly arcuate to straight, slightly opisthoclinal, ending slightly below suture or at it, and on base at parietal level, in t/s strongly rounded, compressed, wider than intervals, 13-15 on penultimate whorl. Main spiral ridges strongly rounded, first whorl with 2 at periphery, 4-5 main ridges on penultimate whorl, their intervals with an occasional single or double fine thread, subsutural slope with 4-5 fine ridges, base of last whorl with about 10-13 ridges, upper ones somewhat granular or crenulated, those on rostrum even, rounded and equal to their intervals.

Pale to very pale brown, base of last whorl orange-brown; parietal nodule, columella and base of outer lip darker orange-brown.

Protoconch subcylindrical, moderately blunt, of ca 1.4 slightly scalariform whorls, first strongly tilted, smooth except for a faint terminal keel; breadth 0.33 mm.

Remarks.— *Etrema cratis* spec. nov. is very similar to *E. tenera* (Hedley, 1899) from Tuvalu and the Tuamotus (figs 29-31), but differs in details. *Glyphostoma aliciae* var. *tenera* Hedley (1899: 471; from Funafuti Atoll, Tuvalu) does not appear to have been recognised after its original description. The name was omitted by Tucker (2004), presumably as it has remained unfigured, and Hedley's descriptive comments were very brief. However, a scanned photograph of one of five syntypes (AMS C.6063), kindly submitted by Des Beechey, and reproduced here (fig. 29), indicates *Etrema tenera* to be a valid species, agreeing very well with fresher specimens from the Tuamotus (ex O. Peel) (figs 30-31). From *E. aliciae* (Melvill & Standen, 1895) (fig. 32), *E. tenera* differs in its much finer and more numerous axial ribs (about 15 on the penultimate whorl instead of 8-10) and less concave subsutural region. The protoconch in *E. tenera* is globular and not, or only faintly, carinate, and the first whorl is strongly tilted, as in *E. cratis* spec. nov. The sculpture is more cancellate in *E. cratis* spec. nov., with stronger, distinctly compressed axial ribs (lower and much less rounded in *tenera*), which extend to the suture or slightly below it (evanescing in the subsutural concavity in *E. tenera*); the spiral sculpture in *E. cratis* spec. nov. comprises strongly rounded main ridges, with weak or irregular intermediary threads (low, close-set with dense intermediary threads in *tenera*), ridges on rostrum are more widely spaced than in the latter species; the columella in *E. cratis* spec. nov. has pustules or weak plicules, absent in *E. tenera*. There is also a superficial similarity between *Etrema cratis* spec. nov. and *E. scalarina* (Deshayes, 1863), but that has a keeled, conical protoconch and a shorter, less constricted base (no authentic types have been located, but topotypes have



Figs 33-51. Turrinids. 33-35, *Eucithara capillaris* spec. nov.; 33-34, holotype (ZMA Moll. 4.08.008), Egypt, Gulf of Aqaba, Dahab, 5.7 × 2.9 mm; 35, SEM photograph of protoconch of paratype, HD 6474, Egypt, Sharm el-Nâga. 36, *Eucithara capillata* (Hervier, 1897), MNHN, New Caledonia, Thiem coast, Touho, 9-11 m, fine sand, Exped. Montrouzier stn 1268, 6.8 × 3.2 mm. 37-38, *Eucithara makadiensis* spec. nov., holotype (ZMA Moll. 4.08.009), Egypt, Marsa Abu Makhadiq, 6 × 2.3 mm. 39-40, *Eucithara villaumeae* spec. nov., holotype ▶

been received from Dr Maurice Jay).

It is possible that *E. cratis* spec. nov. was the basis for Cooke's record (1885: 36) of *Defrancia polynesiensis* from the Straits of Jubal. Unfortunately the types of *Pleurotoma polynesiensis* Reeve, 1845 (type locality Lord Hood's Island [= South Marutea, Tuamotu Islands]) appear to have been lost and the original figure and description are of little diagnostic value. However, if Reeve's figure is magnified, a much more coarsely granose sculpture than in either *E. cratis* or *E. tenera*, is indicated, although the accuracy of such details as figured remains doubtful.

Etymology: *cratis* = a wicker frame, Latin noun.

Subfamily Mangeliinae Fischer, 1883

Euclithara Fischer, 1883.

Euclithara Fischer, 1883., type species (by monotypy): *Mangelia stromboides* Reeve, 1846.

Euclithara capillaris spec. nov. (figs 33-35)

Type material.— Holotype: ZMA Moll. 4.08.008; 5.7 × 2.9 mm, aperture length 3.3 mm; Egypt, Red Sea, Sinai, Gulf of Aqaba, Dahab, bay, 28°28'42"N 34°30'E; 16-24.ix.1993, leg. H. & S. Dekker & C. Dekker-Rentenaar. Paratypes: Egypt, Red Sea, Sharm el-Nâga, 26°53'50"N 33°57'50"E, 25.viii.1989, leg. H. & S. Dekker & C. Dekker-Rentenaar, HD 6474/1 (3.8 × 1.9 mm, aperture length 2.1 mm; 4.5 × 2.1 mm, aperture length 2.2 mm.), one in Kilburn colln.

Distribution.— Northern Red Sea, from the Gulf of Aqaba to the Egyptian mainland.

Description.— Shell angularly biconic with orthoconoid, blunt spire, b/l 0.46-0.51, a/l 0.49-0.58, whorls with rounded, median angle, subsutural slope slightly concave; suture strongly undulating on last whorl; base tapering rapidly, end obliquely rounded, not indented. Outer lip evenly convex, interior with 7-9 denticles, posteriorly the strongest; lip preceded by a moderately high, rounded terminal varix; anal sinus shallowly and asymmetrically concave, no stromboid notch; inner lip strongly calloused, columella straight, with 6-8 transverse plicae on outer edge, forming 4-6 denticles. Axial ribs from suture to base, orthocone and straight, not aligned across suture, in t/s high, rounded-angular, slightly wider than evenly concave intervals, 8-9 ribs per whorl. Spiral ridges low and thin, much narrower than their intervals, which are filled with microscopic spiral threads bearing minute granules on early whorls, 10-13 main ridges on penultimate whorl, ca 18 on base of last whorl.

White, apex grey-tinged, subsutural slope with 3-5 brown-tinged spiral threads, interrupted by axial ribs.

Protoconch domed, of ca 2 whorls, with short orthocone plicules at the upper suture visible under ESEM (fig. 35), opisthocone plicules at the lower one; breadth 0.40-0.46 mm. Teleoconch whorls 4.2.

Remarks.— The characteristic group of dark brown spiral threads on the shoulder slope in this species is otherwise found only in *Euclithara capillata* (Hervier, 1897), a common Indo-Pacific species (Fig. 36) that also occurs in the Red Sea. But although *E. capilla-*

◀ (ZMA Moll. 4.08.010), Egypt, Sharm-el-Nâga, 5.7 × 2.6 mm. **41-42**, *Euclithara perhumerata* spec. nov., holotype (ZMA Moll. 4.08.011), Yemen, Red Sea, al-Murk Island, 4.8 × 2.2 mm. **43-44**, *Pseudorhaphitoma uncostata* spec. nov., holotype (ZMA Moll. 4.08.012), Egypt, Marsa Abu Makhadiq, 8.1 × 3.1 mm. **45-46**, *Pseudorhaphitoma perplexa* (G. & H. Nevill, 1875), syntype (ZSI) of *Clathurella perplexa*, India, Bombay (Mumbai), 6.1 × 2.6 mm. **47-51**, *Pseudorhaphitoma perplexior* spec. nov.; **47-48**, holotype (ZMA Moll. 4.08.013), Egypt, Port Safâga, 5.6 × 2.2 mm; **49**, brown paratype (HD 7143), same locality, 5.3 × 1.9 mm; **50**, SEM photograph of microsculpture; **51**, protoconch.

ta varies a good deal in shell breadth, the combination of biconic shape, weaker columella denticles and domed, paucispiral protoconch (instead of rounded-conical), adequately distinguish *E. capillaris* spec. nov.; furthermore, the outer edge of the columella has 6-8 denticles, instead of 9-13 as in *E. capillata*, and the interstitial sculpture is spiral, not cancellate as in the latter species. A probable syntype of *Mangelia capillata* was illustrated by Kilburn (1992: fig. 133).

Etymology: capillaris = hair-like, Latin adjective.

***Eucithara makadiensis* spec. nov. (figs 37-38)**

Type material.— Holotype: ZMA Moll. 4.08.009; 6 × 2.3 mm; Egypt, Red Sea, Marsa Abu Makhadiq (now Makadi Bay), 26°59'20"N 33°54'13"E; 24.ix-4.x.1999, leg. H. Dekker, B. Gras & W.C. Rejter. Paratype: same data, HD 13672/1.

Other material: same data, HD 20339/2, one in Kilburn colln (juveniles).

Distribution.— Egypt, only known from the type locality.

Description.— Biconic-fusiform, b/l 0.44-0.50, a/l 0.46-0.48; aperture linear, siphonal canal rounded truncate, not indented; whorls with strong, slopingly tabulate shoulder, median on early whorls, at subsutural third on later ones. Outer lip convex in side view, with slight trace of stromboid notch, anal sinus shallow, broadly U-shaped; edge of lip sharp, preceded by a high, compressed varix; interior of outer lip with 9-12 short transverse pleats, those below anal sinus denticle-like; inner lip with 10-12 transverse denticles, weak in lower parietal area, crossing lip to form weak nodules on interior. Sculptured by strong axial ribs, not aligned across whorls, crenulating suture on later whorls, crossed by narrow, high spiral ridges. Axial ribs extending from suture to base, arcuate, slightly procurved below suture, in t/s high, compressed, somewhat angular, much narrower than the flattened intervals; 12-13 on first teleoconch whorl, 9-10 ribs on penultimate whorl. Spiral sculpture fine and even on first teleoconch whorl, later whorls with widely spaced main ridges, their intervals with fine, close spiral threads, cancellated by collabral threads; main ridges rounded but with sharply incised edges, 5-6 on penultimate whorl, subsutural concavity with fine, dense threads. Dimensions: 4.6 × 2.3 mm, aperture 2.2 mm; 3.9 × 1.7 mm, aperture 1.8 mm.

Dull white, dorsal side of last whorl with irregular brown to pale orange-brown blotch, back of outer lip with rust-coloured stain.

Protoconch conical, with 2 strongly convex whorls, first one depressed, smooth, breadth 0.33-0.36 mm.

Remarks.— *Eucithara makadiensis* spec. nov. superficially resembles some members of the genus *Heterocithara* Hedley, 1922, in shape, but differs in possessing a row of denticles on the inner lip. *Eucithara* (s.l.) *vittata* (Hinds, 1843) lacks a strongly angular shoulder and is zoned with brown (see Kilburn, 1992: 556, figs 157-159). There is some slight resemblance to *Eucithara capillata* (Hervier, 1897), but *E. makadiensis* spec. nov. has a much stronger shoulder and coarser, more widely spaced spiral ridges.

Etymology: after Makadi Bay, the name presently used for Marsa Abu Makhadiq.

***Eucithara villaumeae* spec. nov. (figs 39-40)**

Type material.— Holotype: ZMA Moll. 4.08.010; 5.7 × 2.6 mm, aperture 2.7 mm; Egypt, Red Sea, Sharm el-Nāga, 26°53'50"N 33°57'50"E; 25.viii.1989, leg. H. & S. Dekker & C. Dekker-Rentenaar. Paratypes: Egypt, Red Sea, Sharm el-Nāga, 26°53'50"N 33°57'50"E, 25.viii.1989, leg. H. & S. Dekker & C. Dekker-Rentenaar, HD 12848/1 (5.8 × 2.8 mm, aperture 2.8 mm); Egypt, Red Sea, Sinai, Ras Mohamed,

Yolande Beach, 27°44'N 34°15'18"E, 22.ix.1992, leg. H. & S. Dekker & C. Dekker-Rentenaar, ex HD 12849/1, in Kilburn colln (protoconch damaged).

Other material: Egypt, Red Sea, Marsa Abu Makhadiq (now Makadi Bay), 26°59'20"N 33°54'13"E, 24.ix-4.x.1999, HD 13665/1 (abnormally thick-shelled and angular individual).

Distribution.— Northern Red Sea, Egyptian coast.

Description.— Shell ovate-biconic with slightly cyrtoconoid spire, b/l 0.46-0.48, a/l 0.47-0.48, apex somewhat mucronate, whorls with rounded, adapically directed angle medially, convex anteriorly, subsutural slope concave; suture undulating; outer lip strongly and evenly convex, base broadly tapering, fasciole and slight false umbilicus present, end slightly constricted, somewhat truncate, not indented. Aperture rather linear, relatively wide. Interior of outer lip with 9-11 pleats, posterior ones denticle-like, that at anal sinus strongest; in side-view medially convex, preceded by a thick, high varix; anal sinus shallowly and widely U-shaped, anteriorly directed; stromboid notch wide and shallow. Inner lip with a strong, flattened callous deposit, its outer edge slightly free, with 9-11 transverse, tooth-like plicae, weak and irregular internally. Axial ribs from suture to base, but weaker above shoulder, slightly opisthocline (procurved below suture) on spire whorls, sinuous on last whorl, not aligned across suture, in t/s high, rounded-angular, sides gradually sloping, intervals more or less evenly concave, 11-12 ribs per whorl. Spiral ridges fine, close, uniform, equal in width to their intervals, which contain microscopic collabral threads, ca 18-20 ridges on penultimate whorl.

Dull off-white, with extremely faint, very slightly darker spiral bands; one paratype with a few orange-brown spots below suture on dorsum of last whorl.

Protoconch conical, of ca 2.0 whorls, smooth except for weak opisthocline riblets on last half whorl; breadth 0.40 mm. Teleoconch whorls ca 4.0.

Remarks.— In general characters *E. villaumeae* spec. nov. resembles the Pacific *Eucithara delacouriana* (Crosse, 1869), but is much smaller, with the subsutural region sloping and narrow, instead of forming a wide, impressed 'collar'; the axial ribs reach the suture, and the outer lip is more strongly arched, even in side view (where it is flattened in *E. delacouriana*). There is some resemblance to *E. capillata* (Hervier, 1897) (fig. 36), although it lacks the dark subsutural lines of that, has finer, close-set spiral threads without cancelate interstices, and the shoulder angle is slightly hooked. In size it is closer to *Eucithara ringens* (Sowerby, 1893) from China and Indonesia, but in that species the axial ribs evanesce above the shoulder and the whorls are more angular, the whorl periphery being basal rather than median. Types of the above three species were illustrated by Kilburn (1992).

Etymology: named after Mary Lyn Rusmore-Villaume, who is making a study of Egyptian Red Sea shells and published a book on them earlier this year.

Eucithara perhumerata spec. nov. (figs 41-42)

Type material.— Holotype: ZMA Moll. 4.08.011; 4.8 × 2.2 mm, aperture 2.0 mm; Yemen, Red Sea, al-Murk Island, 15°38'N 42°38'E, beached, 11-12.iv.1993, Tibia-I Expedition. Paratypes: same data, HD 8003/2 (5.8 × 2.5 mm, aperture 3.0 mm; 5.4 × 2.4 mm, aperture 2.6 mm), 1 in Kilburn colln (4.5 × 1.9 mm, aperture 2.3 mm).

Description.— Shell oblong-biconic (b/l 0.42-0.46, a/l 0.42-0.52), spire turreted, somewhat cyrtoconoid; early whorls strongly convex, developing on later whorls into a prominent, rounded shoulder at about 0.3 whorl below suture, subsutural region strongly sloping; end of siphonal canal obliquely rounded-truncate, not indented; teleoconch whorls to

about 3.6. Aperture narrowly elliptical, inner lip with a thin callus, thickening slightly in parietal region, length of lip bearing about 12 fine, rather weak and irregular transverse pleats, those in parietal region sharpest, inner edge of columella with a few denticles; outer lip smooth or with up to 14 weak pleats, usually strongest below anal sinus; edge of lip in side view gently convex, with wide, very shallow stromboid notch, anal sinus rather shallow, widely, asymmetrically U-shaped. Varix strong, in t/s rounded, trailing edge steep. Sculpture of narrow axial ribs, crossed by very fine spiral threads. Axial ribs narrow, opisthoclinal, shallowly sinuous on last whorl, slightly arcuate on spire whorls, extending from suture to base, in t/s rather low, somewhat compressed, angularly rounded, more or less equal to intervals, 11-12 per whorl. Spiral sculpture throughout of fine threads, 6-8 on penultimate whorl, their intervals densely filled with even finer spiral threads; collabral threads absent. Translucent white, dorsum of last whorl with a faint yellowish tinge or a few short pale yellowish-brown bars.

Protoconch bluntly domed (helicoid), of about 1.5 whorls, protoconch I tilted, smooth, except for a few weak terminal riblets, breadth 0.31 mm.

Remarks.— This species shows some similarity to *Eucithara eumerista* (Melvill & Standen, 1895) and *E. abakcheutes* (Kilburn, 1992), but *E. perhumerata* spec. nov. differs from these in its prominent shoulder, translucent shell and finer apertural teeth. The protoconch in *E. perhumerata* spec. nov. is unusual among the species referred to *Eucithara*. In overall appearance this species seems somewhat intermediate between *Eucithara* and *Agathotoma* Cossmann, 1899, a genus to which many of the Indo-Pacific species of *Eucithara* auct. appear to be referable.

Etymology: per (very) + humeratus (shouldered), Latin adjective.

Pseudorhaphitoma Boettger, 1895

Pseudorhaphitoma Boettger, 1895, [as subgenus of *Clathurella*]. Type species (o.d.) *Mangelia fairbanki* G. & H. Nevill, 1875.

Pseudorhaphitoma uncicostata spec. nov. (figs 43-44)

Type material.— Holotype: ZMA Moll. 4.08.012; 8.1 × 3.1 mm, aperture 3.1 mm; Egypt, Red Sea, Marsa Abu Makhadiq (now Makadi Bay), 26°59'20"N 33°54'13"E, beached; 24.ix-4.x.1999, leg. H. Dekker, B. Gras & W.C. Regter. Paratype: same data, HD 13675/1 (9.8 × 3.5 mm, aperture 3.5 mm, worn).

Distribution.— Egypt, Red Sea, only known from the type locality.

Description.— Shell mangeliform (b/l 0.36-0.38, a/l 0.36-0.38), with a distinctly produced base and fairly acute, orthoconoid spire; teleoconch whorls nearly 6 in number; suture moderately deep, more or less undulating, whorls convex, periphery more or less median, the peripheral ridge forming a very slight keel, shoulder slope more or less convex, no subsutural ridge; siphonal canal moderately short, strongly tapering, its termination obliquely truncate, not indented, left side of base very shallowly concave, fasciole weak. Aperture narrowly oblong, somewhat semilunate, greatest width median; columella straight, callus moderately thin, flat, with a small parietal tubercle in posterior angle of aperture; outer lip in side view weakly convex, not crenulated, preceded by a high, compressed but massive varix; inner edge of outer lip bears a single blunt, angular nodule immediately anterior to the entrance to the anal sinus, followed anteriorly by a long, very low ridge; anal sinus moderately deep, openly U-shaped, occupying lower two-thirds of shoulder slope, stromboid notch broad and shallow. Sculptured by moderately strong axial ribs, discontinuous from whorl to whorl, crossed by thin, wide-set spiral ridges, the main ones forming very slight nodules where they cross, and whose inter-

vals bear dense, microscopic spiral threads. Axial ribs slightly opisthocline, rather straight except for a distinct protractive curvature below suture, on base terminating on rostrum; in t/s compressed, angularly rounded, equal to their intervals; 9-10 ribs per teleoconch whorl. Spiral ridges thin, low, ca 7 on penultimate whorl, their intervals and subsutural region covered by minute spiral threads (3-8 in each interval); plus 18 main ridges on base, continuing onto rostrum without decreasing in strength. Spiral threads crossed by even finer collabral threads, visible in places. Dull white.

Protoconch cyrtoconoid, of about 1.7 convex whorls, surface worn, breadth ca 0.46 mm.

Remarks.— This species is characterised by its elongated last whorl and base, and by axial ribs that are distinctly procurved below the suture, and which undulate the latter. The most similar species is *Pseudorhaphitoma bipyramidata* Hedley, 1922 (see Kilburn, 1992: 352, fig. 58), which differs from *P. uncicostata* spec. nov. in shape, in its less convex whorls, and its straight axial ribs.

Etymology: uncus (a hook) + costatus (ribbed)

Pseudorhaphitoma perplexior spec. nov. (figs 47-51)

“Mangelia” iodolabiata Hornung & Mermod, 1928; Dekker & de Ceuninck van Capelle, 1994: 132.

Type material.— Holotype: ZMA Moll. 4.08.013; 5.6 × 2.2 mm, aperture 1.9 mm; Egypt, Red Sea, Port Safâga, north side of town, 26°46'8"N 33°56'26"E, beached; 22.ix-3.x.1999, leg. H. Dekker, W.C. Regter & B. Gras. Paratypes: Egypt, Red Sea, Port Safâga, north side of town, 26°46'8"N 33°56'26"E, beached, 22.ix-3.x.1999, leg. H. Dekker, W.C. Regter & B. Gras, HD 7143/1 (5.3 × 1.9 mm, aperture 2.2 mm); Yemen, Red Sea, al-Durayhimi, 14°40'N 42°59'E, beached, 16.iv.1993, Tibia-I Expedition, HD 7986/1, now in Kilburn colln (5.5 × 2.1 mm, aperture 2.1 mm).

Distribution.— Red Sea, from Egypt south to western Yemen.

Description.— Shell biconic-fusiform (0.35-0.39, a/l 0.34-0.42), with acute, orthoconoid spire; teleoconch whorls ca 5 in number; suture moderately deep, more or less undulating, whorls convex, periphery more or less median, the peripheral ridge forming a slight keel, shoulder slope flattened, no subsutural ridge; siphonal canal moderately long, strongly tapering, its termination obliquely truncate, not indented, left side of base shallowly concave, fasciole moderately convex to absent. Aperture narrowly linear, greatest width median; columella almost straight, callus moderately thick, with a faint trace of a pleat on mid columella; posterior angle of aperture with a strong parietal tubercle; outer lip in side view weakly convex, not crenulated, preceded by a high, massive varix; inner edge of outer lip bears a single rounded nodule immediately anterior to the entrance to the anal sinus, followed anteriorly by a long, very low ridge divided into two weak denticles; anal sinus moderately deep, openly U-shaped, occupying lower two-thirds of shoulder slope, stromboid notch deep and wide. Sculptured by strong axial ribs, initially discontinuous from whorl to whorl, adult whorls more aligned, crossed by thin, wide-set spiral ridges, the main ones forming low nodules where they cross. Axial ribs slightly opisthocline, straight or slightly arcuate, with or without protractive curvature below suture, on base terminating at about mid-parietal level; in t/s angularly rounded, equal to their intervals, which are evenly concave; 9 ribs on 1st teleoconch whorl, 8 ribs on later whorls. Main spiral ridges 2 below midwhorl on early whorls, 3 on later ones, with a weak additional one slightly above these; last whorl with 10 main ridges on base, becoming weak on end of rostrum. Subsutural region and intervals between main ridges covered by close, minute spiral threads, crossed by even finer opisthocline threads, rendering them

microscopically granular (fig. 50).

Several colour forms: (a) violaceous-white with white aperture, (b) pale orangebrown with darker base and aperture, and (c) reddish-brown with darker lip and apex.

Protoconch conical, of 3 strongly convex whorls, the first small and tilted, the last with a weak submedian keel, terminal half-whorl with low, opisthocyrt riblets (fig. 51); breadth ca 0.41 mm.

Remarks.— This species most closely resembles *Pseudorhaphitoma perplexa* (G. & H. Nevill, 1875) from India (figs 45-46), and *P. sienna* Kilburn, 1993, from South East Africa, but has a different protoconch. In *P. perplexa* this is larger (breadth ca 0.51 mm against 0.41 mm), more bulbous (not sharply conical), with only 2 whorls and only a very slight keel, but stronger axial riblets; the teleoconch has a thin subsutural cord and more strongly rounded axial ribs. *Pseudorhaphitoma perplexa* was not discussed by Kilburn (1993), but syntypes from Mumbai and Sri Lanka in ZSI were studied subsequently (figs 45-46). The variable *Pseudorhaphitoma sienna* has non-basal spiral ridges (the uppermost spiral ridge is situated above the mid-whorl), axial ribs that are more strongly distinctly arched below the suture, and a larger, more cyrtocooid protoconch (breadth 0.53-0.65 mm against 0.41 mm), without a keel. Compared with the type figure of the problematic *Mangilia* (*Clathurella*) *iodolabiata* Hornung & Mermod, 1929 (see note in Kilburn, 1993: 326), *P. perplexior* spec. nov. is more biconical, with thicker axial ribs and non-median spiral ridges.

Etymology: *perplexior* = more puzzling, Latin adjective.

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