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Report on Crassispirinae Morrison, 1966 (Mollusca: Neogastropoda: Turridae) from the China Seas

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Report on Crassispirinae Morrison, 1966 (Mollusca: Neogastropoda: Turridae) from the China Seas

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The present paper reports 32 turrid species from the China Seas, belonging to eight genera of the subfamily Crassispirinae of the family Turridae. Four new species are described: *Funa cretea* sp. nov., *Inquisitor plurivaricis* sp. nov., *Inquisitor vividus* sp. nov. and *Ptychobela resticula* sp. nov. Eight species are recorded for the first time from the China Seas.

Keywords: Turridae; Crassispirinae; Mollusca; *Funa cretea* sp. nov.; *Inquisitor plurivaricis* sp. nov.; *Inquisitor vividus* sp. nov.; *Ptychobela resticula* sp. nov.; China Seas; new records

Introduction

Taylor et al. (1993), in their reclassification of the superfamily Conoidea, recognised several subfamilies within the restricted family Turridae H. and A. Adams, 1853. Of these, the largest is the subfamily Crassispirinae Morrison, 1966, which contains those genera with claviform shells and “wishbone-shaped” marginal teeth to their radula. At the generic level, shell characters are of limited value, and confirmation of generic placements is often dependent on study of the radula of each species.

In China, the family Turridae has been poorly studied since 1942, with no systematic research except for a few reports on some common turrid species in molluscan monographs (Yen 1941; Ma 1983, 2004; Chang and Wu 2000). When we sorted the mollusc collection in the Institute of Oceanology, Chinese Academy of Sciences (IOCAS), numerous turrid specimens that had been collected from the Bohai Gulf, Yellow Sea, and East and South China Seas were separated out and identified. As part of a series of reports on this turrid material (Li and Li 2007a, b, 2008a, b), this paper reports 32 species of the subfamily Crassispirinae. Four new species are described and eight species are recorded for the first time from the China Seas.

Material and methods

The material was collected during investigations carried out since the 1950s, including the “National Comprehensive Oceanography Survey” (NCOS 1958–1960), the

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“China–Vietnam Marine Resource Investigation Cooperative of the Beibu Gulf” (1959–1962), and the “China–Germany Marine Biota Cooperative Investigations of Hainan Island, China” (1990–1992), from the East and South China Seas, including the areas off Fujian, Guangdong, Beibu Gulf (Gulf of Tonkin), Hainan Island, Xisha Islands (=Paracel Islands), Nansha Islands (=Spratly Islands), as well as the Yellow Sea and Bohai Gulf.

All the specimens examined by B.Q. Li and X.Z. Li are deposited in the Marine Biological Museum, Chinese Academy of Sciences (MBMCAS) in the IOCAS. The genera and species are arranged alphabetically in the text. Measurements are given for no more than five specimens of each species to shorten the text; if more than five are available, the largest, the smallest and three medium-sized specimens were measured.

The following abbreviations are used throughout the text: BMNH, Natural History Museum, London, UK; IOCAS, Institute of Oceanology, Chinese Academy of Sciences; LMD, Löbbecke-Museum and Aquazoo, Düsseldorf, Germany; MBM-CAS, Marine Biological Museum of the Chinese Academy of Sciences in the IOCAS; NMGW, National Museums and Galleries of Wales, Cardiff, UK; NSMT, National Science Museum, Tokyo, Japan; WAMP, Western Australian Museum, Perth, Australia; ZMAN, Zoological Museum of Amsterdam, the Netherlands; AT, Agassiz trawl; BT, beam trawl; CN, preliminary registration number when the sample(s) was collected; ECS, the East China Sea; loc., locality; RN, museum registration number; SCS, the South China Sea; spm(s), specimen(s).

Species list (with records from China Seas)

Eight genera, 32 species; the species marked with an asterisk are new records for the China Seas and those in bold type are new species.

Aguilaria subochracea (Smith, 1877) (records: Taiwan, see Chang and Wu 2000)

Cheungbeia kawamura (Habe and Kosuge, 1966) (records: Taiwan, see Habe 1977; Chang and Wu 2000)

**Cheungbeia laterculata* (Sowerby, 1870) comb. nov. (records: China Seas, see Smith 1884; Chang and Wu 2000)

Epideira multiseriata (Smith, 1877) comb. nov. (records: SCS, see Yen 1941)

**Epideira sibogae* (Schepman, 1913) comb. nov.

***Funa cretea* sp. nov.**

Funa jeffreysii (Smith, 1875) (records: Hong Kong, see Taylor and Wells 1994)

Funa latisinuata (Smith, 1877) (records: Taiwan, SCS, see Yen 1941; Chang and Wu 2000)

Inquisitor aesopus (Schepman, 1913) (records: China Seas, see Powell 1966)

Inquisitor angustus Kuroda and Oyama, 1971 (records: Taiwan, SCS, see Chang and Wu 2000; Ma 2004)

**Inquisitor incerta* (Smith, 1877)

Inquisitor intertinctus (Smith, 1877) (records: China Seas, see Smith 1877; Chang and Wu 2000)

**Inquisitor japonicus* (Lischke, 1869)

Inquisitor latifasciata (Sowerby, 1870) (records: Hong Kong, see Sowerby 1870; Yen 1941; Taylor and Wells 1994)

Inquisitor nudivaricosus Kuroda and Oyama, 1971 (records: Taiwan, SCS, Chang and Wu 2000)

***Inquisitor plurivaricis* sp. nov.**

Inquisitor cf. *solomonensis* (Smith, 1876)

Inquisitor sp. 1

**Inquisitor varicosus* (Reeve, 1843)

***Inquisitor vividus* sp. nov.**

Paradrillia patruelis (Smith, 1875) (records: China Seas, see Ma 1989 as *Vexitomina chinensis*)

**Paradrillia sultana* (Thiele, 1925)

Paradrillia sp. 1

Paradrillia sp. 2

Paradrillia sp. 3

Ptychobela flavidula (auctt non Lamarck, 1822)

**Ptychobela minimarus* (Kosuge, 1993)

***Ptychobela resticula* sp. nov.**

Ptychobela suturalis (Gray, 1838) (records: Hong Kong, see Taylor and Wells 1994)

Ptychobela vexillum (Habe and Kosuge, 1966) (records: Taiwan, see Habe and Kosuge 1966b; Chang and Wu, 2000)

Turridrupa deceptrix Hedley, 1922 (records: China Seas, see Powell 1967)

**Turridrupa prestoni* Powell, 1967

Systematic account

Family **TURRIDAE** H. and A. Adams, 1853
Subfamily **CRASSISPIRINAE** Morrison, 1966
Genus ***Aguilaria*** Taylor and Wells, 1994

Remarks

This genus is characterised by its radula. Although the spelling “*Aguilaria*” was used in the heading of Taylor and Wells’ description, elsewhere in the text it appeared as *Aguilaria*, and the derivation was given as “Cape d’Aguilar” (Taylor and Wells 1994).

Aguilaria subochracea (Smith, 1877)
(Figure 1A)

Pleurotoma (Drillia) subochracea Smith, 1877, p 493. Type loc.: China Seas (probably).

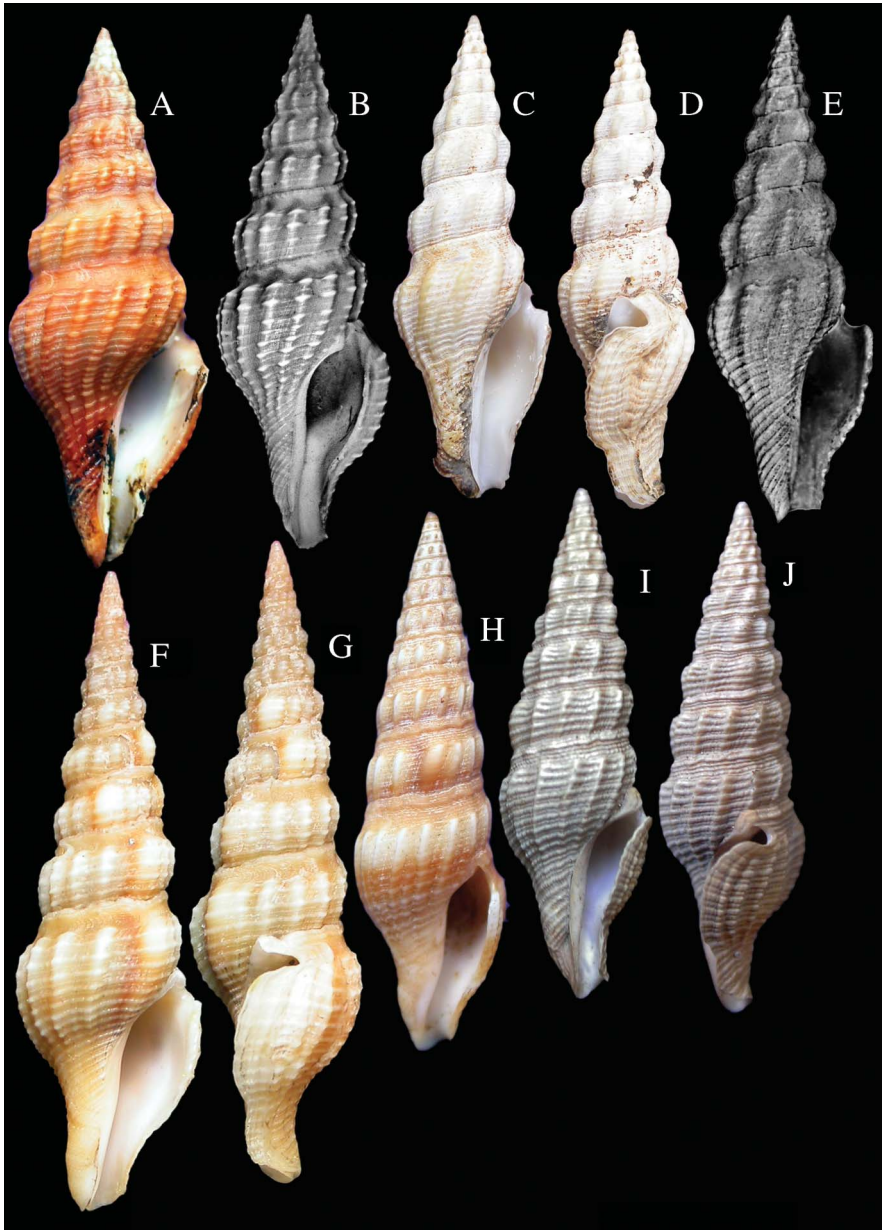


Figure 1. Species of subfamily Crassispirinae. (A) *Aguilaria subochracea* (SCS, CN 54–779); (B) lectotype (Taylor and Wells, 1994, as “Holotype”) of *Pleurotoma (Drillia) subochracea*, BMNH 1988065, China Seas (probably); 38.8 × 12.3 mm; (C, D) *Inquisitor incerta* (SCS, CN 54–671); (E) syntype of *Pleurotoma (Drillia) incerta*, BMNH 1854.4.10.59, New Guinea; 25.0 × 7.9 mm; (F, G) *Inquisitor plurivariis* (holotype, ECS, CN 553B–35, 114 m, 41.5 × 12.5 mm); (H) *Inquisitor latifasciata* (ECS, CN 57–658); (I) *Inquisitor aesopus* (Beibu Gulf, CN Q21B-22); (J) lectotype of *Drillia aesopus*, ZMAN (des. Kilburn, 1988), Kwandang Bay, west of entrance, north coast of Sulawesi, Indonesia, 72 m, fine sand with mud; 36.5 × 9.1 mm.

Ptychobela subochracea: Springsteen and Leobrera 1986, p 270, pl. 77, fig. 13.

Aguilaria subochracea: Taylor and Wells 1994, p 114, pl. 1j, 2j-1 (radula).

Inquisitor subochracea: Chang and Wu 2000, pl. 19, fig. 21.

Material examined

SCS. CN 54-779, Luzhou, Guangxi province, 1 December 1954; 1 spm, CN 54-779, Luzhou, Guangdong province, 1 December 1954; 1 spm, CN 58-N0437, Haitangtou, Hainan Is., 21 April 1958; 2 spms, CN X35B-19, 18°30' N, 108°15' E, muddy sand, 58 m, AT, 10 December 1959; 1 spm, CN R35B-37, 18°12' N, 109°45' E, silty mud, 62 m, AT; 1 spm, CN 3-41, 21°00' N, 112°30' E, muddy sand, 52 m, AT; 1 spm, CN 21-19, 21°45' N, 114°30' E, 61.2 m, AT; 1 spm, CN L46B-101, 20°00' N, 111°30' E, sandy mud, 76.5 m, AT, 12 April 1959; 1 spm, 28-34, 22°00' N, 115°00' E, 63 m, AT, 21 March 1959; 1 spm, CN SIII6B-54, 21°15' N, 114°30' E, silty mud, 73 m, AT, 10 July 1959; 1 spm, CN S64B-42, 22°00' N, 115°00' E, 63 m, AT, 8 April 1959; 1 spm, CN 5-14, 20°30' N, 111°30' E, silt, 62 m, BT, 25 January 1959; 1 spm, CN SII15B-52, 22°00' N, 115°00' E, silt, 67.1 m, AT, 13 July 1959; 1 spm, CN 16-105, 17°45' N, 109°30' E, sandy mud, 91.6 m, AT, 29 January 1959; 1 spm, CN R36B-5, 18°00' N, 109°30' E, muddy sand, 70 m, AT, 14 July 1959; 2 spms, CN S191B-18, 21°30' N, 114°30' E, silt, 75 m, AT, 9 January 1960; 1 spm, CN S206B-39, 21°15' N, 114°30' E, silt, 68.5 m, AT, 8 April 1960; 1 spm, CN N120B-25, 19°15' N, 111°00' E, muddy sand, 80 m, AT, 10 February 1960; 1 spm, CN S198B-38, 21°30' N, 114°00' E, silt, 54.6 m, AT, 10 January 1960.

Beibu Gulf. One specimen, CN X143B-17, 18°20' N, 108°15' E, fine sandy silty clay, 82 m, AT.

Nansha Islands. Three specimens, CN SSVIII8-19, 7°24' N, 104°52' E, muddy sand, 44 m, AT, 9 June 1990; 2 spms, CN SSB10-6, 4°30' N, 110°30' E, 100 m, 23 September 1994.

Type material

Lectotype (Taylor and Wells 1994, as "Holotype") BMNH 1988065 (checked by Kilburn); one paralectotype NMGW 1955.158.953.

Measurements

See Table 1.

Distribution

Beibu Gulf, SCS, Nansha Islands; Japan, Philippines.

Remarks

Our specimens agree well with the descriptions of Taylor and Wells (1994) and other authors. The lectotype (Figure 1B) shows small differences that are presumably within the range of variation. The present specimens were collected from the SCS, including Beibu Gulf and Nansha Islands.

Table 1. Measurements (in mm) for all Crassispirinae specimens from the China Seas.

Species	Specimens/type materials	Height	Width	Aperture	W/L	A/L
<i>Aguilaria subochracea</i> (Smith, 1877)	CN 54-779	35.6	12.9	18.0	0.36	0.51
	CN SSB10-6-1	31.2	11.1	15.5	0.36	0.50
	CN SSB10-6-2	29.0	10.8	14.8	0.37	0.51
	CN SSVIIIB8-19-1	24.9	9.5	12.2	0.38	0.49
	CN SSVIIIB8-19-2	37.8	19.2	19.0	0.51	0.50
<i>Cheungbeia kawamurai</i> (Habe and Kosuge, 1966)	CN 55-902-1	32.0	12.2	15.4	0.38	0.48
	CN 55-902-2	25.2	8.6	11.3	0.34	0.45
	CN X45B-15	28.0	10.2	13.8	0.36	0.49
	CN Q145-27	33.5	12.5	16.5	0.37	0.49
	CN K286B-28	37.1	13.7	18.2	0.37	0.49
<i>Cheungbeia laterculata</i> (Sowerby, 1870) comb. nov.	CN SSBV27-14	21.0	7.5	10.2	0.36	0.49
	CN SSB13-2	20.8	7.4	9.8	0.36	0.47
	CN NS4B-13	21.3	7.2	10.4	0.34	0.49
	CN SSBIV-23-1	22.0	7.5	10.5	0.34	0.48
	CN SSBIV-23-2	21.5	7.1	10.0	0.33	0.47
<i>Epeideira multiseriata</i> (Smith, 1877) comb. nov.	CN Q225B-7	13.5	5.2	5.9	0.39	0.44
	CN Q299B-34	14.5	6.1	7.3	0.42	0.50
	CN Q239B-9	13.5	5.3	6.0	0.39	0.44
	CN Q159-32	16.2	6.9	5.8	0.43	0.36
	CN N99B-17	12.9	5.1	5.7	0.40	0.44
<i>Epeideira sibogae</i> (Schepman, 1913) comb. nov.		14.8	5.9	6.6	0.40	0.45
<i>Funa cretea</i> sp. nov.	Holotype	21.9	7.8	9.3	0.36	0.42
	Paratypes 1	34.1	11.1	14.9	0.33	0.44
	Paratypes 2	22.2	7.5	9.8	0.34	0.44
<i>Funa jeffreysii</i> (Smith, 1875)	CN N177B-47	26.7	10.5	13.2	0.39	0.49
	CN 3-21	26.4	9.5	12.0	0.36	0.45
	CN S41B-46	31.5	11.6	15.5	0.37	0.49
	CN K77B-53	35.6	13.0	18.0	0.36	0.51
	CN N129B-24	32.6	11.5	16.3	0.35	0.50
<i>Funa latisinuata</i> (Smith, 1877)	CN Q119B-7-1	28.0	9.5	12.8	0.34	0.46
	CN Q119B-7-2	29.0	10.2	13.7	0.35	0.47
	CN R27B-12	18.2	6.5	8.3	0.36	0.46
	CN N127B-82-1	35.0	11.2	16.2	0.32	0.46
	CN N127B-82-2	30.3	10.3	14.8	0.34	0.49
<i>Inquisitor aesopus</i> (Schepman, 1913)	CN Q21B-22	30.5	9.2	12.3	0.30	0.40
	CN Q162B-30	27.8	8.4	6.5	0.30	0.23
	CN Q239B-48	22.3	6.8	9.4	0.30	0.42
	CN Q232B-16	19.1	6.2	8.4	0.32	0.44
	CN X11B-33	18.5	6.3	8.2	0.34	0.44

Table 1.

Species	Specimens/type materials	Height	Width	Aperture	W/L	A/L
<i>Inquisitor angustus</i> Kuroda and Oyama, 1971	CN V560B-79-1	39.8	10.3	14.0	0.26	0.35
	CN V560B-79-2	35.3	8.3	11.5	0.24	0.33
	CN SSB10-6	42.9	12.6	17.2	0.29	4.01
	CN N178B-45	37.5	11.8	15.7	0.31	0.42
	CN V570B-56	25.4	7.5	10.8	0.30	0.43
<i>Inquisitor incerta</i> (Smith, 1877)	CN SIII36B-77	31.2	10.5	14.5	0.34	0.46
	CN N28B-29-1	21.9	8.1	10.5	0.37	0.48
	CN N28B-29-2	16.5	5.9	8.0	0.36	0.48
	CN 57-111-1	24.3	8.8	12.0	0.36	0.49
	CN 57-111-2	22.5	8.5	10.0	0.38	0.44
<i>Inquisitor intertinctus</i> (Smith, 1877)	Q62B-4-1	37.5	12.0	16.5	0.32	0.44
	K284B-22	22.5	6.3	9.0	0.28	0.40
	K278B-21-1	21.8	6.2	8.1	0.28	0.37
	K278B-21-12	23.8	7.4	9.8	0.31	0.41
	X151B-26	25.8	8.5	10.5	0.33	0.41
<i>Inquisitor japonicus</i> (Lischke, 1869)	CN V462B-24-1	28.3	9.4	11.6	0.33	0.41
	CN V462B-24-2	26.6	9.0	11.9	0.34	0.45
	CN 51-719	23.8	8.8	11.0	0.37	0.46
<i>Inquisitor latifasciata</i> (Sowerby, 1870)	CN 57-658	32.3	9.2	12.7	0.28	0.39
	—	23.5	6.9	9.6	0.29	0.41
	CN 53-056	21.5	6.8	10.2	0.32	0.47
	—	27.5	8.2	12.0	0.30	0.44
<i>Inquisitor nudivaricosus</i> Kuroda and Oyama, 1971	CN 0031	34.5	9.5	13.5	0.28	0.39
	CN V527B-35-1	25.5	7.9	9.8	0.31	0.38
	CN V527B-35-2	23.2	7.0	9.5	0.30	0.41
	CN SSIV46-20-1	35.8	10.3	15.2	0.29	0.42
	CN K124B-55-1	20.1	6.2	8.2	0.33	0.43
<i>Inquisitor plurivaricus</i> sp. nov.	CN SSB 2-5	32.5	10.2	13.0	0.31	0.40
	CN 553B-35	41.5	12.5	16.8	0.30	0.40
	K78B-57	34.3	9.5	14.8	0.28	0.43
	CN L65B-74	30.1	8.5	11.9	0.28	0.40
	CN 1Y97B-18	37.5	10.5	15.5	0.28	0.41
	CN S219B-51-1	41.5	12.0	16.8	0.29	0.40
<i>Inquisitor</i> sp. cf. <i>solomonensis</i> (Smith, 1876)	CN S219B-51-2	26.2	8.0	10.5	0.31	0.40
		38.0	10.0	14.3	0.26	0.38
<i>Inquisitor</i> sp. 1		21.0	6.1	8.2	0.29	0.39

(Continued)

Table 1. (Continued).

Species	Specimens/type materials	Height	Width	Aperture	W/L	A/L
<i>Inquisitor varicosus</i> (Reeve, 1843)		24.1	7.2	9.3	0.3	0.38
<i>Inquisitor vividus</i> sp. nov.	Holotype	23.2	7.0	9.5	0.30	0.41
	Paratypes 1	21.5	6.8	8.8	0.32	0.41
	Paratypes 2	18.5	5.5	7.6	0.30	0.41
	Paratypes 3	16.9	5.3	6.7	0.31	0.40
	Paratypes 4	18.7	5.6	7.2	0.30	0.39
<i>Paradrillia patruelis</i> (Smith, 1875)	CN Y405B-7	23.6	8.1	9.3	0.34	0.39
	–	11.5	4.2	4.5	0.37	0.39
	–	27.0	9.9	9.8	0.37	0.36
	CN H281B-3	22.9	8.6	9.0	0.38	0.39
	CN D142B-37	16.8	6.1	7.2	0.36	0.42
<i>Paradrillia sultana</i> (Thiele, 1925)	ECS	6.5	2.7	3.3	0.42	0.51
	Yellow sea	8.2	2.7	3.3	0.33	0.40
	K156A	6.4	2.1	2.7	0.33	0.42
<i>Paradrillia</i> sp. 1		11.7	4.2	5.1	0.36	0.44
<i>Paradrillia</i> sp. 2	Changjiang River Estuary	4.8	2.5	2.5	0.52	0.52
	Yellow River Estuary 1	5.3	2.2	2.3	0.42	0.43
	Yellow River Estuary 2	5.2	1.9	2.0	0.37	0.38
	Yellow River Estuary 3	4.9	1.8	1.9	0.37	0.39
	Qinhuangdao	9.1	3.1	3.7	0.34	0.41
	Beidaihe 1	7.0	2.6	3.0	0.37	0.43
	Beidaihe 2	6.8	2.5	2.9	0.37	0.43
<i>Paradrillia</i> sp. 3	Yantai 1	10	3.5	3.7	0.35	0.37
	Yantai 2	10.1	3.5	3.9	0.35	0.39
<i>Ptychobela flavidula</i> (auctt non Lamarck, 1822)	CN X192B-33	37.2	12.2	16.3	0.33	0.44
	CN X152B-17	29.8	10.8	14.9	0.36	0.5
	CN Q203B-4	35.0	12.5	17.2	0.36	0.49
	CN X7AB-20	29.3	8.1	10.9	0.28	0.37
	CN K280B-16	31.3	9.9	11.8	0.32	0.38
<i>Ptychobela minimarus</i> (Kosuge, 1993)		14.3	4.5	5.8	0.31	0.41
<i>Ptychobela resticula</i> sp. nov.	Holotype	41.5	14.3	20.8	0.10	0.50
	Paratypes 1	33.0	11.8	15.0	0.36	0.45
<i>Ptychobela suturalis</i> (Gray, 1838)	Hele harbour 1	39.1	12.1	16.8	0.31	0.43
	Hele harbour 2	31.5	10.5	15.6	0.33	0.50
	Hele harbour 3	25.5	8.0	9.7	0.31	0.38
	Hele harbour 4	40.0	12.8	17.5	0.32	0.44
	Hele harbour 5	28.0	10.5	13.5	0.38	0.48

Table 1.

Species	Specimens/type materials	Height	Width	Aperture	W/L	A/L
<i>Ptychobela vexillum</i> (Habe and Kosuge, 1966)	CN N31B-13	46.5	14.5	20.1	0.31	0.43
	–	39.8	13.5	18.3	0.34	0.46
	CN K237B-47	24.0	8.5	10.5	0.35	0.44
	–	28.3	10.5	11.9	0.37	0.42
	CN 55–691	33.2	12.4	16.5	0.37	0.49
<i>Turridrupa deceptrix</i> Hedley, 1922	CN X202B-18-1	22.5	17.9	8.2	0.80	0.36
	CN X202B-18-2	17.0	6.2	6.5	0.36	0.38
	CN X207B-176	17.5	6.5	7.2	0.37	0.41
	CN SHI33B-52	17.8	6.5	6.6	0.37	0.37
	CN S76B-92	12.9	4.8	5.1	0.37	0.40
<i>Turridrupa prestoni</i> Powell, 1967		27.5	10.4	13.3	0.38	0.48

***Cheungbeia* Taylor and Wells, 1994**

Remarks

This genus is characterised by its radula characters and very long proboscis. The type species has been recorded from the SCS (see Taylor and Wells 1994, p 111, pl. 1h, 2f,g, Hong Kong), as have several other species, which resemble *Cheungbeia mindanensis* (Smith, 1877) in shell characters, particularly in their strongly oblique, sinuous axial ribs. Although their foregut anatomy remains unknown, these can provisionally be referred to *Cheungbeia*, and are briefly discussed below.

***Cheungbeia kawamurai* (Habe and Kosuge, 1966)
(Figure 1G)**

Brachytoma kawamurai Habe and Kosuge, 1966a, p 321, pl. 29, fig. 9; Habe and Kosuge 1966b, p 96, pl. 38, fig. 14; Habe 1975, pl. 2, fig. 9 (holotype); Habe 1977, p 58. Type loc.: Anpin, Formosa [Taiwan].

Ptychobela kawamurai: Springsteen and Leobrera 1986, p 271, pl. 77, fig. 9.

Inquisitor kawamurai: Chang and Wu 2000, p 19, fig. 22.

Material examined

SCS. One specimen, CN 54-418, Shanwei (Guangdong), 11 April 1954; 3 spms, CN 55-902, Xincun, Hainan Island, 24 December 1955; 8 spms, CN K47B-65, 21°30' N, 112°00' E, silt, 21 m, 12 July 1959; 6 spms, CN S201B-28, 22°00' N, 114°00' E, silt, 34.5 m, AT, 5 April 1960.

Beibu Gulf. One specimen, CN R10H-13, 20°00' N, 108°30' E, sta. 6217, silty mud, 60.5 m, AT, 4 December 1959; 1 spm, CN Q301-B10, 18°30' N, 108°15' E, silty mud,

34 m, AT, 13 November 1960; 1 spm, CN X48B-15, 19°45' N, 109°00' E, fine sand, 26 m, AT, 3 February 1960; 1 spm, CN Q145-27, 20°30' N, 108°30' E, sandy mud, 48 m, AT, 14 February 1960; 1 spm, CN K286B-28, 18°15' N, 108°15' E, sandy mud, 81 m, AT, 23 October 1960; 1 spm, CN Q128-24, 20°03' N, 109°15' E, silty mud, 26 m, AT, 8 February 1960; 1 spm, CN X50B-57, 19°45' N, 108°30' E, sandy mud, 65.5 m, AT, 4 February 1960; 1 spm, CN Q188B-107, 20°30' N, 107°30' E, muddy sand, 34 m, AT, 18 April 1960; 1 spm, CN K249B-11, 19°45' N, 108°45' E, fine sandy mud, 58 m, AT, 8 May 1960; 2 spms, CN X 190, 18°30' N, 107°30' E, silty mud, 71 m, 10 April 1962; 1 spm, CN K268B-16, 19°00' N, 108°15' E, fine sandy mud, 37 m, AT; 1 spm, CN X176B-38, 20°50' N, 108°15' E, silt, 41 m, AT, 22 January 1962; 1 spm, CN Q151-17, 20°45' N, 108°30' E, mud, 47 m, AT, 15 February 1960; 1 spm, CN X25B-33, 20°00' N, 108°30' E, silt, 67 m, 25 August 1962.

Nansha Islands. 1 spm, CN SSVIIB7-13, 5°53' N, 104°44' E, silty mud, 62 m, AT, 9 June 1990.

Measurements

See Table 1.

Distribution

China (Hainan Islands, Beibu Gulf, Nansha Islands) to Vietnam and Philippines.

Remarks

Although Taylor and Wells (1994) synonymised *C. kawamurai* with *Cheungbeia mindanensis* (Smith, 1877), the latter (holotype, Figure 2H) has a smoother appearance, *C. kawamurai* having coarser spiral sculpture, which forms low but distinct nodules where the spiral cords cross the axial ribs; the subsutural concavity is also deeper in *kawamurai*. A third member of this complex, *Cheungbeia laterculata* (Sowerby 1870) (holotype, Figure 2I), differs from both *mindanensis* and *kawamurai* in being (typically) strongly striped with dark brown or black, and in its stronger spiral ridges (which cross the intervals between the axial ribs), whose interstices bear a distinct spiral microsculpture, lacking in the other two species; *C. laterculata* also attains a larger size and has a more prominently alate outer lip.

Cheungbeia laterculata (Sowerby, 1870) comb. nov. (Figure 2F)

Pleurotoma laterculata Sowerby, 1870, p 253; Smith 1884, p 38, pl. 4, fig. E. Type loc.: China Seas.

Drillia laterculata: Schepman 1913, p 408 (no fig.).

Inquisitor laterculata: Hedley 1922, p 243 (no fig.).

Inquisitor zonata (*non* Reeve, 1843): Chang and Wu 2000, p 20, fig. 25.



Figure 2. Species of subfamily Crassispirinae. (A) *Funa jeffreysii* (Beibu Gulf, CN N177B-47); (B) *Funa latisinuata* (SCS, CN Q119B-7-1); (C) *Inquisitor japonicus* (Yellow Sea, CN V462B-24-1); (D) *Inquisitor nudivaricosus* (ECS, CN V527B-35-1); (E) *Inquisitor varicosus* (Hainan Island); (F) *Cheungbeia laterculata* (Nansha Islands, SSBV27-14); (G) *Cheungbeia kawamurai* (CSC, CN 55-902-1); (H) *Cheungbeia mindanensis* (holotype, BM2); (I) holotype of *Pleurotoma laterculata*, BMNH 1874.12.11.293, Lombe Taylor collection, China Seas; length 30 mm; (J) *Turridrupa prestoni* (Nansha Islands, CN SSVIII8-16).

Material examined

Nansha Islands. Three specimens, CN SSBIV-23, 5°00' N, 111°17' E, silty mud, 110 m, AT, 14 May 1987; 1 spm, CN SSBV27-14, 4°00' N, 112°06' E, muddy sand,

56 m, AT, 8 August 1988; 1 spm, CN NS4B-13, 6°00' N, 111°20' E, fine sand, silty mud and shell debris, 105 m, 7 December 1993; 1 spm, CN SSB13-2, 7°15' N, 111°45' E, 142 m, 23 September 1995.

Measurements

See Table 1.

Distribution

Nansha Islands; Vietnam, Queensland to south-east India. Not previously recorded from the China Seas.

Remarks

Cheungbeia laterculata is very similar to *C. kawamurai* in shell profile, oblique axial ribs and shell colour (although typically with darker stripes), but differs in having more numerous spiral ridges crossing the axial ribs, which produces a coarser surface than the smooth surface of *C. kawamurai*. *Cheungbeia laterculata* was recorded from Taiwan by Chang and Wu (2000), who misidentified it as *Inquisitor zonata* (Reeve, 1843), a species (probably referable to genus *Ptychobela*) that differs from *laterculata* in its squarely truncate siphonal canal, spiral ridges that are weak between the axial ribs and a different colour pattern.

Genus *Epideira* Hedley, 1918

Remarks

Most authors have followed Powell (1964, 1966) in preferring the name *Epidirona* Iredale, 1931, to the earlier *Epideira* Hedley, 1918, as he regarded the type species of the latter genus as “indeterminate”. However, in the type collection of the BMNH is a specimen from the Gray collection labelled *Pleurotoma owenii* Reeve, 1843, which Watson (1886: 312) and Hedley (1922: 230) regarded as a synonym of Gray’s (1826) *Clavatula striata*. There is even a possibility that it was based on the same specimen. Although *C. striata* has not subsequently been recognised, it appears to be congeneric with *Epidirona hedleyi* Iredale, 1931, the type species of *Epidirona*.

Epideira multiseriata (Smith, 1877) comb. nov.

(Figure 3C, D)

Pleurotoma multiseriata Smith, 1877, p 491; Yen 1941, p 238.

Turris (Gemmula) multiseriata: Melvill 1917, p 145, pl. 8, fig. 3.

Epidirona multiseriata: Powell 1964, p 299, pl. 230, fig. 3.

NOT *Epidirona multiseriata*: Kilburn 1983, p 583, figs 5–8.

Material examined

Beibu Gulf. One specimen, CN Q159-32, 21°15' N, 108°06' E, sandy mud, 22 m, AT, 17 February 1960; 1 spm, CN Q225B-7, 20°04' N, 109°30' E, coarse sand, 26 m, AT,



Figure 3. Species of subfamily Crassispirinae. (A, B) *Epideira sibogae* (ECS, CN V525B-53); (C, D) *Epideira multiseriata* (Beibu Gulf, CN Q225B-7); (E) *Inquisitor* sp. 1 (ECS, CN H21B-45); (F, G) *Inquisitor vividus* sp. nov. (holotype, Nansha Islands, CN SSVIIB8-30-1, 44 m, 23.2 × 7.0 mm); (H) *Ptychobela minimarus* (Hainan Island); (I) *Paradrillia patruelis* (Yellow Sea, CN Y405B-7); (J) *Turridrupa deceptrix* (Beibu Gulf, CN X202B-18-1).

10 July 1960; 1 spm, CN Q239B-9, 20°15' N, 109°30' E, sandy mud, 24.5 m, 14 July 1960; 1 spm, CN Q299B-34, 21°00' N, 109°24' E, muddy sand, 15 m, 12 November 1960.

SCS. One specimen, 20°30' N, 111°00' E, 31 m, sandy mud, 28 January 1959; 1 spm, CN N99B-17, 20°15' N, 111°00' E, fine sand, 23 m, AT, 29 October 1959; 1 spm, CN

S225B-25, 22°30' N, 116°00' E, fine sand, 37.3 m, AT, 22 April 1960; 1 spm, CN N129B-4, 21°45' N, 114°00' E, sandy mud, 23 m, AT, 11 February 1960.

Measurements

See Table 1.

Distribution

Beibu Gulf, SCS to the Persian Gulf.

Remarks

Our specimens agree well with photographs of the syntypes (Kilburn manuscript). Powell (1964) reported the range of this species as being from the Persian Gulf to the SCS. This paper confirms the occurrence of this species in Chinese waters.

**Epipeira sibogae* (Schepman, 1913) comb. nov.
(Figure 3A, B)

Drillia sibogae Schepman, 1913, p 415, pl. 27, fig. 2.

Epidirona sibogae: Fukuda, 1995, p 109, pl. 65; Higo et al. 1999, p 306.

Material examined

ECS. One specimen, CN V525B-53, 123°30' E, 27°30' N, fine sand, 150 m, AT, 28 August 1976.

Measurements

See Table 1.

Distribution

ECS; Indonesia (type locality), Philippines and Japan. Not previously recorded from the China Seas.

Type material (checked by Kilburn)

Three syntypes in ZMAN: these comprise a fresh adult and a worn juvenile (ZMAN 3.13.101) from Siboga Stn 51, and a worn syntype from Stn 260 (near northern point of Nuhu Jaan, Kei Islands, 90 m).

Remarks

Only one specimen has been collected from the ECS; this agrees well with photographs of the freshest syntype (Kilburn manuscript). The species has subsequently been recorded from Japanese waters.

Genus *Funa* Kilburn, 1988

Funa cretea sp. nov.

(Figure 4A, B)

Type material

Holotype: Yellow Sea: 1 spm, CN Y285B-59, 36°00' N, 121°00' E, coarse sand, 29 m, AT, 13 July 1959. Paratypes: SCS: 1 spm, CN 54-789, Wailuo, Guangdong Province, 6 December 1954; 1 spm, CN N97B-20, 19°45' N, 111°15' E, sandy mud, 73 m, AT, 29 October 1959.

Measurements

See Table 1.

Description

Shell medium-sized (up to 34.1 mm in length), elongated fusiform, heavy. Spire high, 0.56–0.58 total length; periphery of last whorl and spire whorls strongly convex (less so on early whorls), siphonal canal narrow and tapering. Teleoconch of 10 whorls. Suture narrow, adpressed, distinct. Sculpture of very strong, rounded axial ribs, which almost reach upper suture, forming their periphery at mid-whorl but are still strong at lower suture; nine on penultimate whorl, 10 on last whorl, where they continue to about mid-columella level; ribs tend to line up on adjacent whorls, their intervals deep. Axials crossed by numerous low, flat and thin spiral threads, which become indistinct in shoulder concavity, but slightly stronger on lower part of last whorl. Interstitial spiral striae absent. Numerous axial growth lines. Aperture elongate, subrectangular. Outer lip broken, anal sinus unknown. Columella straight, narrow. Anterior canal short, deep, narrow, anterior tip shallowly notched. Protoconch high, conical, two whorls, smooth; breadth 0.91–1.01 mm. Off-white in colour.

Etymology

Latin adjective, *creteus*, meaning chalky.

Distribution

Known only from the type locality, Yellow Sea and SCS.

Remarks

This species appears to resemble material from Hong Kong reported by Taylor and Wells 1994: 106, pl. 1d,e, as *Funa spectrum* (Reeve, 1845), but apparently differs in its more convex whorls and more strongly rounded axial ribs and uniformly dull white colour. Furthermore, the identity of the Hong Kong specimens requires confirmation, as the type figure of *Pleurotoma spectrum* (Reeve 1845: pl. 25, sp. 222) differs greatly in shape from them, and the shell labelled as holotype (BMNH 1968604) is a faded immature shell with broken lip that does not appear to much resemble Reeve's figure. *Pleurotoma spectrum* should probably be regarded as a *nomen dubium*.



Figure 4. Species of subfamily Crassispirinae. (A, B) *Funa cretea* sp. nov. (holotype, Yellow Sea, CN Y285B-59, 29 m, 21.9 × 7.8 mm); (C) *Inquisitor angustus* (ECS, CN V560B-79-1); (D) *Inquisitor intertinctus* (Beibu Gulf, CN Q62B-4-1); (E) *Inquisitor* cf. *solomonensis* (SCS, CN S219B-51); (F) *Ptychobela flavidula* (Beibu Gulf, CN X192B-33), 1822; (G) lectotype of *Pleurotoma flavidula*, MHNG 1097/51, Red Sea, 38.8 × 11.5 mm; transparency courtesy of Yves Finet.

Funa jeffreysii (Smith, 1875)
(Figure 2A)

Drillia jeffreysii Smith, 1875, p 417. Type loc.: Goza Harbour, Ago Bay, Mie Prefecture, central Honshu, Japan, 3–43 fath.

Inquisitor jeffreysii: Kuroda et al. 1971, p 215, pl. 56, figs 5,6; Hasegawa et al. 2000, p 623, pl. 310, fig. 2; Higo et al. 2001, p 103, fig. G3583 (syntype).

Funa jeffreysi: Taylor and Wells 1994, p 103, pl. 1a–b and 2, fig a (radula); Taylor 1994, p 195, pl. 1 f (labelled in error as *F. flavidula*), 6a (radula), Textfigs 8–9 (foregut).

Material examined

Yellow Sea. One specimen, Qingdao, Shandong Province, Mar. 10, 1951; 2 spms, CN H0037-2, 36°15' N, 121°00' E, mud, 23 m, BT, 27 January 1959.

ECS. Five specimens, CN V229B-23, 29°00' N, 122°15' E, silty mud, 26 m, B.T., 2 April 1959; 3 spms, CN C61B-37, 33°00' N, 123°30' E, muddy sand, 38 m, AT, 23 October 1959.

Beibu Gulf. One specimen, CN Q259B-7, 21°30' N, 108°30' E, 12 m, AT, 18 July 1960.

SCS. One specimen, CN 3-21, 20°15' N, 110°45' E, coarse sand, 50 m, 14 January 1959; 1 spm, CN 16-15, 21°24' N, 109°00' E, coarse sand, 12 m, AT, 22 January 1959; 1 spm, CN 5-28, 18°45' N, 110°30' E, sandy mud, 44 m, AT, 27 January 1959; 1 spm, CN 39-35, 21°30' N, 113°30' E, coarse sand and shell debris, 39.5 m, AT, 20 February 1959; 2 spms, CN S41B-46, 23°24' N, 117°00' E, 14 m, AT, 2 April 1959; 1 spm, CN K47B-63, 21°30' N, 112°00' E, silty, 21 m, BT, 2 July 1959; 4 spms, CN K77B-53, 22°00' N, 113°30' E, silty mud, 7 m, AT, 16 July 1959; 1 spm, CN Q93B-63, 18°45' N, 110°30' E, coarse sand, 31 m, AT, 29 November 1959; 1 spm, CN S119B-85, 23°30' N, 117°30' E, fine sand, 37.9 m, AT, 16 November 1959; 1 spm, CN S197B-36, 21°30' N, 113°45' E, fine sand, 44.5 m, AT, 10 January 1960; 1 spm, CN N129B-24, 20°48' N, 110°45' E, sandy mud, 23 m, AT, 11 February 1960; 6 spms, CN N134B-11, 19°15' N, 110°45' E, fine sand, 35 m, AT, 8 March 1960; 1 spm, CN N177B-47, 19°15' N, 111°00' E, coarse sand and shell debris, 67 m, AT, 8 April 1960; 1 spm, CN S237B-14, 23°24' N, 117°00' E, silty, 14 m, AT, 24 April 1960; 1 spm, S236B-30, 23°15' N, 117°00' E, muddy sand, 23 m, AT, 24 April 1960; 1 spm, CN N109B-13, 20°45' N, 110°30' E, silty, 47 m, BT, 7 February 1960; 2 spms, CN N191B-17, 19°15' N, 110°45' E, fine sand and shell debris, 36 m, AT, 6 May 1960; 1 spm, CN N127B-50, 20°30' N, 111°00' E, fine sand, 30 m, AT, 11 February 1960; 1 spm, CN K170B-13, 22°00' N, 113°30' E, silty, 5.5 m, BT, 10 April 1960; 1 spm, CN Q259B-7, 21°30' N, 118°30' E, sandy mud, 12 m, AT, 18 July 1960; 1 spm, CN Q154-33, 20°45' N, 109°30' E, sandy mud, 18 m, AT, 16 February 1960; 1 spm, CN 192B-33, 18°30' N, 106°15' E, sand and shell debris, 28 m, AT, 11 April 1960; 1 spm, CN S208B-43, 21°00' N, 114°30' E, muddy sand, 83 m, AT, 8 April 1960; 1 spm, CN K134B-25, 22°00' N, 113°30' E, silty mud, 7 m, BT; 1 spm, CN N191B-12, 19°15' N, 110°45' E, fine sand, shell debris, 36 m, AT, 6 May 1960; 2 spms, CN K138B-159, 21°30' N, 113°30' E, muddy coarse sand, 39.5 m, AT, 16 February 1960; 1 spm, CN N158B-3, 18°15' N, 108°45' E, muddy coarse sand, 38 m, AT, 12 March 1960.

Nansha Islands. One specimen, CN SSIVB45-17, 107 m, 15 May 1987.

Measurements

See Table 1.

Distribution

Yellow Sea, ECS and SCS, Beibu Gulf, Nansha Islands; Korea and Japan.

Type material

Three syntypes BMNH 1873.8.6.6 (checked by Kilburn), one syntype NMGW 1955.158.1483.

Remarks

Taylor and Wells (1994) reported “this species is common in sublittoral silts and muds around eastern and southern Hong Kong”. It is very variable in shape.

Funa latisinuata (Smith, 1877) (Figure 2B)

Pleurotoma (*Drillia*) *latisinuata* Smith, 1877, p 494; Watson 1886, p 304, pl. 18, fig. 6 (possibly a syntype but not stated). Type loc.: China.

Brachytoma latisinuata: Yen 1941, p 239.

Funa latisinuata: Taylor and Wells 1994, p 105, pl. 1, fig. c; pl. 2, fig. b.

Inquisitor latisinuata: Chang and Wu 2000, p 15, fig. 4.

Material examined

SCS. One specimen, CN L46B-100, 20°00' N, 111°30' E, sandy mud, 76.5 m, AT, 12 April 1959; 1 spm, CN R27B-12, 18°45' N, 110°30' E, fine sand, AT, 10 July 1959; 6 spms, CN N99B-21, 20°15' N, 111°00' E, fine sand, 33 m, AT, 29 October 1959; 3 spms, CN Q93B-12, 18°45' N, 110°30' E, coarse sand, 31 m, AT, 24 November 1959; 2 spms, CN Q119B-7, 22°45' N, 116°30' E, muddy sand, 35 m, AT, 10 January 1960; 3 spms, CN N127B-82, 20°30' N, 111°00' E, muddy fine sand, 30 m, AT, 11 February 1960; 2 spms, CN S111, 21°30' N, 113°45' E, A. T; 8 spms, CN N134B-89, 19°15' N, 110°45' E, fine sand, 35 m, AT, 8 March 1960; 1 spm, CN X168B-150, 21°30' N, 113°30' E, muddy sand, 39 m, AT, 10 April 1960; 2 spms, CN N182B-57, 111°00' E, fine sand, fine sand, 32 m, 9 April 1960; 1 spm, CN S223B-20, 22°30' N, 115°30' E, muddy sand and shell debris, AT, 14 April 1960; 1 spm, CN N177B-49, 19°15' N, 111°00' E, coarse sand and shell debris, 8 April 1960; 2 spms, CN Q119B-21, 22°45' N, 116°30' E, muddy sand, 135 m, AT, 10 January 1960; 1 spm, CN S181B-14, 23°15' N, 117°00' E, fine sand, AT, 5 January 1960.

Measurements

See Table 1.

Distribution

Presently known only from SCS.

Type material

Syntypes BMNH 196437, one marked with a red dot (checked by Kilburn).

Remarks

The present material has been compared with photographs (Kilburn, in manuscript) of a syntype. It appears to be somewhat variable in shape.

Genus *Inquisitor* Hedley, 1918*Remarks*

Although characterised by radula characters, the strong subsutural cord of *Inquisitor* spp. may prove useful in distinguishing from *Funa* spp.

Inquisitor aesopus (Schepman, 1913)
(Figure 11,J)

Drillia aesopus Schepman, 1913, p 46(410), pl. 26, fig. 6. Type loc.: Kwandang Bay, west of entrance, north coast of Sulawesi, Indonesia, 72 m, fine sand with mud.

?*Crassispira aesopus*: Powell 1966, p 76, D.100 (radula) (“?*Crassispira* cf. *aesopus*” in caption).

Inquisitor (Inquisitor) aesopus: Shuto 1970, p 163, pl. 10, figs 9–13 (syntype); Kilburn 1988, p 261, figs 215–216 (lectotype).

Material examined

Beibu Gulf. Two specimens, CN N42B-70, 20°30' N, 108°30' E, medium sand, 50.5 m, AT, 19 April 1959; 1 spm, CN X11B-33, 19°30' N, 106°15' E, muddy sand, 30 m, AT, 5 December 1959; 2 spms, CN X28B-18, 18°45' N, 106°00' E, sand, 25.3 m, AT, 9 December 1959; 1 spm, CN Q21B-22, 19°45' N, 106°30' E, muddy sand, 31 m, AT, 13 May 1960; 1 spm, CN Q162B-30, 21°15' N, 109°24' E, sand, 12 m, AT, 17 February 1960; 1 spm, CN Q239B-48, 20°15' N, 109°30' E, sandy mud, 24.5 m, AT, 14 July 1960; 2 spms, CN Q232B-16, 20°00' N, 106°45' E, silty mud, AT, 12 July 1960; 1 spm, CN Z24B-8, 18°30' N, 106°15' E, muddy sand, 27 m, AT, 16 May 1960; 1 spm, CN X54B-29, 20°00' N, 106°30' E, muddy sand, 33 m, AT, 8 February 1960; 1 spm, CN 84B-11, 19°30' N, 106°00' E, muddy sand, 23.6 m, AT, 13 May 1960; 1 spm, CN X99B-31, 19°45' N, 107°30' E, muddy sand, 49 m, AT, 19 April 1960; 1 spm, CN Q126-26, 20°05' N, 109°45' E, coarse sand, 40 m, AT, 8 February 1960; 1 spm, CN X7AB-21, 19°00' N, 105°45' E, muddy sand, 12.8 m, AT, 11 February 1960; 2 spms, CN Q149B-32, 20°45' N, 107°30' E, mud, 31 m, AT, Feb. 16, 1960.

SCS. Two specimens, CN X5B-64, 21°45' N, 114°00' E, sand, 51.5 m, 4 December 1959; 1 spm, CN S185B-11, 22°00' N, 115°00' E, silt, 62 m, AT, 8 January 1960; 2 spms, CN S229B-19, 22°00' N, 116°30' E, fine sand, 88 m, AT, 23 April 1960.

Measurements

See Table 1.

Distribution

Beibu Gulf, SCS; Indonesia, Philippines.

Type material

Lectotype (described by Kilburn, 1988) ZMAN, Siboga Exped. 3.13.019, stn 116, 31.2 × 8.8 mm. Two paralectotypes ex Stn 116 in ZMAN, one ex Stn 114, 72 m.

Remarks

This material appears to agree with figures and photographs of type specimens of *Inquisitor aesopus* (Figure 1J). This species might also be compared with *Clavatula sinensis* Hinds, 1843, but although the name *sinensis* was frequently used in old literature, it should be rejected as a *nomen dubium*, for the following reasons. The type figure (Hinds 1844: 17, pl. 5, Figure 11) is lacking in details, and no types can now be traced (the type locality – New Guinea, Straits of Macassar and China Sea, 5–21 fathoms – indicates that at least three syntypes were available to Hinds). Moreover, it is likely that the type set was composite, as Reeve's figure (1843: pl. 18, fig. 153), poor as it is, appears to show a species different from that of Hinds, despite Reeve's claim that variability accounted for the differences.

***Inquisitor angustus* Kuroda and Oyama, in Kuroda et al., (1971) (Figure 4C)**

Inquisitor angustus Kuroda and Oyama, in Kuroda et al. 1971, p 333 and 216, pl. 56, fig. 9, pl. 110, fig. 13; Kosuge 1992, p 169, 170, pl. 59, figs 8, 9, text fig. 1; Hasegawa et al. 2000, p 625, pl. 311, fig. 31; Higo et al. 2001, p 194, figure (holotype); Wells 1994, p 92, pl. 4, figs 9–10. Type loc.: Barane, Sagami Bay, Japan, 70–80 m.

Material examined

ECS. One specimen, CN V554B-29, 28°30' N, 126°30' E, fine sand, 126 m, 21 September 1976; 2 spms, CN V560B-79, 32°31' N, 126°59' E, fine sand, 120 m, A.T., 29 May 1978; 1 spm, CN V570B-56, 26°34' N, 124°01' E, fine sand, 138 m, AT, 11 July 1978.

SCS. Three specimens, 19°30' N, 112°30' E, 156 m, 5 July 1959; 1 spm, CN N178B-45, 19°30' N, 111°00' E, fine sand, 32 m, AT, 9 April 1960; 1 spm, CN N123B-15, 19°45' N, 111°15' E, muddy sand, 70 m, AT, 10 February 1960; 2 spms, CN S188B-76, 21°00' N, 115°00' E, coarse sand, 108 m, AT, 9 January 1960.

Nansha Islands. Two specimens, CN SSB10-6, 4°30' N, 111°30' E, 100 m, 23 September 1994.

Measurements

See Table 1.

Distribution

ECS and SCS, Nansha Islands; Japan.

Remarks

The specimens agree with the original description of Kuroda and Oyama, in Kuroda et al. (1971). However, apparent variability in this species needs careful study.

****Inquisitor incerta*** (Smith, 1877)
(Figure 1C, D)

Pleurotoma (Drillia) incerta Smith, 1877, p 496. Type loc.: New Guinea.

Drillia incerta: Schepman 1913, p 408 (44); Melvill 1917, p 153, pl. 8, fig. 5.

Brachytoma incerta: Gravely 1942, p 75.

Material examined

SCS. One specimen, CN 54-671, Dongping, Guangdong, 12 November 1954; 5 spms, CN 57-111, Pingtan, Fujian, 21 March 1957; 3 spms, CN N28B-29, 20°48' N, 110°45' E, sandy mud, 18 m, AT, 17 April 1959; 1 spm, CN SIII36B-77, 23°15' N, 117°00' E, coarse sand, 23.5 m, AT, 21 July 1959.

Measurements

See Table 1.

Distribution

SCS; India to Papua New Guinea. Not previously recorded from the China Seas.

Remarks

Specimens from the China Seas agree with photographs (Figure 1E) of a syntype of *Pleurotoma incerta* (BMNH 1854.4.10.59). This species may prove referable to genus *Funa*.

Inquisitor intertinctus (Smith, 1877)
(Figure 4D)

Pleurotoma (Drillia) intertincta Smith, 1877, p 497. Type loc.: China Seas and Philippine Islands.

Drillia intertincta: Melvill 1917, pl. 8, fig. 6 (but not his material).

NOT: *Inquisitor intertincta*: Chang and Wu 2000, p 17, fig. 15a.

Material examined

Beibu Gulf. CN Q62B-4-1, 18°45' N, 108°15' E, muddy coarse sand, 29 m, AT, 17 April 1959; 2 spms, CN X44B-43, 18°00' N, 106°50' E, muddy sand, 39.5 m, AT, 12 December 1959; 1 spm, CN K284B-22, 18°30' N, 108°30' E, coarse sand, 25 m, AT; 1 spm, CN X76B-30, 18°30' N, 106°00' E, muddy sand, 18.5 m, AT, 11 February 1960; 3 spms, CN K278B-21, 18°30' N, 106°00' E, muddy sand, 20 m, AT, 20 October 1960; 1 spm, CN X72B-44, 19°00' N, 106°00' E, muddy sand, 28 m, 11 February 1960; 1 spm, CN K265B-30, 19°00' N, 108°30' E, muddy sand, 21 m, AT, 18 October 1960; 1 spm, CN K277B-92, 19°00' N, 105°45' E, muddy sand, 25 m, AT, 20 October 1960; 1 spm, CN X151B-26, 18°30' N, 106°15' E, silty mud, 32 m, AT, 12 January 1962; 1 spm, CN X222B-25, 21°00' N, 108°00' E, coarse sand, 29 m, 24 April 1962; 2 spms, CN X229B-25, 18°00' N, 106°35' E, silty mud, 35 m, AT, 17 August 1962; 2 spms, CN X188B-17, 18°00' N, 106°35' E, silty mud, 33 m, AT, 10 April 1962; 1 spm, CN X194B-6, 19°00' N, 106°00' E, silt, 27 m, AT, 11 April 1962; 1 spm, CN X147B-48, 18°00' N, 106°35' E, silt, 37 m, AT, 7 January 1962.

Measurements

See Table 1.

Distribution

Beibu Gulf to Philippines, and west to the Gulf of Thailand and Andaman Islands.

Remarks

Although this species has frequently been misidentified, the Chinese material agrees with photographs of the holotype (Kilburn manuscript) and with Thai and Andaman specimens. *Inquisitor intertinctus* is characterised by its prominent, wavy and crested spiral cords, which cross the axial cords, each whorl having a strong varix.

****Inquisitor japonicus* (Lischke, 1869)**
(Figure 2C)

Drillia japonica Lischke, 1869, p 32–33; Smith 1879, p 191, pl. 19, fig. 15; Cosel 1998, p 27. Type loc.: Nagasaki, west Kyushu, Japan.

Inquisitor japonicum: Kira 1964, p 124, pl. 39, fig. 25.

Clavus (Tylotiella) japonicus: Kuroda et al. 1971, p 205, pl. 55, fig. 3; Hasegawa et al. 2000, p 621, pl. 309, fig. 7.

Tylotiella japonica: Higo et al. 1999, p 297.

(See Tucker 2004: 512, for further references.)

Material examined

Yellow Sea. One specimen, CN 51-719, Qingdao, Shandong, 22 February 1951; 2 spms, CN V462B-24, 31°30' N, 123°00' E, silty mud, 43 m, AT, 8 October 1975.

Measurements

See Table 1.

Distribution

Yellow Sea, ECS; Japan, Korea. Not previously recorded from the China Seas.

Remarks

We have not been given access to the syntypes of this species, and they have evidently never been illustrated. Our identification is based on the figures cited above, and a specimen in the BMNH from the Sykes collection. Furthermore, the systematic position of this species cannot be resolved from the shell alone, and it may prove to belong to the family Drilliidae.

Inquisitor latifasciata (Sowerby, 1870)

(Figure 1H)

Pleurotoma latifasciata Sowerby, 1870, p 253. Type loc.: Hong Kong.

Brachytoma? Latifasciata: Yen, 1941, p 239.

Inquisitor latifasciata: Taylor and Wells, 1994, p 108, pl. 1g, 3a (radula); Taylor, 1994, p 201, pl. 1 e, 7 (radula), Textfigs 11–12 (foregut).

Crassispira pseudoprincipalis (*non* Yokoyama, 1920): Ma, 2004, p 113, pl. 067, fig. E.

Material examined

Bohai Gulf. One specimen, Beidaihe, Hebei province, intertidal zone, 5 May 1950; 17 spms, Beidaihe, Hebei province, intertidal zone, 2 May 1950; 3 spms, CN 0221, Qinhuangdao, Hebei province, intertidal zone, 6 June 1950; 5 spms, Beidaihe, Hebei province, intertidal zone, 1 May 1950; 5 spms, CN 0030, Beidaihe, Hebei province, intertidal zone, 2 May 1950; 2 spms, Beidaihe, Hebei province, intertidal zone, 4 May 1950; 4 spms, CN H221B-8, 39°18' N, 121°20' E, silt, 19 m, AT, 18 April 1959; 12 spms, CN H226B-5, 40°00' N, 121°18' E, sandy mud, 23.5 m, AT, 18 July 1959.

Yellow Sea. One specimen, Qingdao, intertidal zone, 23 April 1951; 1 spm, Cangkou, Qingdao, intertidal zone, 18 October 1951; 2 spms, CN 53-056, Cangkou, Qingdao, intertidal zone, 4 July 1953; 1 spm, Cangkou, Qingdao, intertidal zone, 10 December 1959; 2 spms, CN 18–31, 35°00' N, 120°30' E, sta. 3059, 36 m, AT, 20 October 1959.

ECS. One specimen, CN 57-658, Pingtan, Fujian province, intertidal zone, 14 March 1957; 4 spms, CN 104B-15, 32°30' N, 124°00' E, 43 m, AT, 9 December 1959; 2 spms, 30°00' N, 122°45' E, silty mud, 42 m, AT, 8 December 1959; 1 spm, CN Ck-7, Estuary of Changjiang, silty mud, 27 m, 8 August 1985.

SCS. Two specimens, CN K77B-42, 22°00' N, 113°30' E, silt, 7 m, AT, 16 July 1959; 1 spm, Xinying, Hainan Isl., 6 m, 4 May 1958; 3 spms, CN Q184B-39, muddy sand, 16 m, 17 April 1960; 5 spms, CN Q195B-30, 20°45' N, 109°30' E, sandy mud, 19 m, AT, 20 April 1960.

Measurements

See Table 1.

Distribution

Bohai Gulf, Yellow Sea, ECS and SCS; Japan.

Remarks

This distinctive species has a wide range in the China Seas. The present material agrees with photographs and a description of the syntypes (Kilburn, manuscript). It was erroneously recorded from China as *Inquisitor pseudoprincipalis* (Yokoyama, 1920) by Ma (1983, 2004).

Inquisitor nudivaricosus Kuroda and Oyama, in Kuroda et al., (1971)
(Figure 2D)

Inquisitor nudivaricosus Kuroda and Oyama, in Kuroda et al. 1971, p 333, 215, pl. 56, fig. 10, pl. 110, fig. 14; Higo et al. 1999, p 308; Hasegawa et al. 2000, p 625, pl. 311, fig. 26; Higo et al. 2001, p 103, Figure G3585. Type loc.: Amadaiba-Maruyamadashi, Sagami Bay, central Honshu, Japan.

Material examined

ECS. One specimen, CN V469B-40, 27°30' N, 126°00' E, fine sand, 162 m, AT, 10 October 1975; 1 spm, CN V473B-36, 27°30' N, 124°00' E, fine sand, 100 m, AT, 10 October 1975; 1 spm, CN V 474B-9, 27°30' N, 123°00' E, fine sand, 90 m, 11 October 1975; 5 spms, CN V527B-35, 26°33' N, 122°30' E, fine sand and shell debris, 105 m, AT, 11 June 1978.

SCS. One specimen, CN S79B-53, 21°00' N, 114°00' E, 78 m, AT, 10 April 1959; 5 spms, CN L68B-19, 19°45' N, 111°15' E, muddy sand, 78 m, AT, 25 April 1959; 1 spm, CN SIII18B-51, 21°00' N, 115°00' E, sandy mud, 103 m, AT, 14 July 1959; 2 spms, CN N66B-41, 19°30' N, 111°15' E, sandy mud, 90 m, BT, 13 July 1959; 1 spm, CN K55B-95, 19°30' N, 112°30' E, sand, 156 m, AT, 5 July 1959; 4 spms, CN K124B-55, 20°00' N, 112°30' E, muddy sand, 104 m, AT, 8 February 1960; 1 spm, CN N161B-52, 17°45' N, 108°30' E, muddy coarse sand, 80 m, AT, 13 March 1960; 1 spm, 20°00' N, 112°30' E, muddy sand, 108 m; 5 spms, CN K123B-27, 19°30' N, 112°30' E, coarse sandy mud, 174 m, AT, 8 February 1960; 1 spm, CN K146B-61, 20°30' N, 112°00' E, sandy mud, 68 m, AT, 4 April 1960.

Nansha Islands. Two specimens, CN SSIV46-20, 4°00' N, 110°00' E, muddy sand, 99 m, AT, 15 May 1987; 2 spms, CN SSIVB45-17, 4°30' N, 110°00' E, 107 m, AT, 15 May 1987; 2 spms, CN SSB9-2, 4°30' N, 109°30' E, 108 m, 23 September 1994.

Measurements

See Table 1.

Distribution

ECS and SCS, Nansha Islands; Japan.

Remarks

This species appears to have no major distinctive characters, but the Chinese specimens appear to agree with the original description and published photographs of the holotype, apart from weaker axial ribs and paler colour. *Inquisitor nudivaricosus* may be distinguished from *Funa jeffreysii* (Smith, 1875) in its finer shell sculpture, and may similarly prove to belong to the genus *Funa*.

Inquisitor plurivaricis sp. nov.

(Figure 1F, G)

Type material

Holotype. ECS. One specimen, CN 553B-35, 28°30' N, 127°30' E, fine sand, 114 m, AT, 20 September 1976.

Paratypes. SCS. One specimen, CN K78B-57, 22°00' N, 113°30' E, silty mud, 7 m, BT, 18 October 1959; 1 spm, CN L65B-74, 19°15' N, 111°00' E, sandy mud, 78 m, AT, 25 April 1959; 1 spm, CN 1Y97B-18, 20°15' N, 111°00' E, sandy mud, 73 m, AT, 29 October 1959; 4 spms, CN S219B-51, 20°15' N, 111°15' E, muddy sand, 115 m, AT, 13 April 1960; 1 spm, CN Q84B-43, 17°45' N, 109°30' E, muddy sand, 87 m, AT, 21 November 1959; 1 spm, CN N74B-16, 19°00' N, 111°30' E, fine sandy mud, 160 m, AT, 16 July 1959; 1 spm, 20°00' N, 112°30' E, muddy sand, 108 m; 1 spm, CN SIII19B-61, 21°30' N, 115°30' E, sandy mud, 115 m, AT, 14 July 1959; 1 spm, CN L6873-150, 19°45' N, 111°15' E, muddy sand, 78 m, AT, 25 April 1959; 1 spm, CN 17-19, 17°30' N, 109°30' E, sandy mud, 110 m, AT, 29 January 1959; 1 spm, CN N150B-7, 17°30' N, 109°30' E, sandy mud, 111 m, AT, 11 March 1960; 1 spm, CN 172B-9, 19°00' N, 111°30' E, sandy silt, 162 m, AT, 7 April 1960; 1 spm, CN 162N-41, 20°00' N, 113°00' E, muddy sand, 125 m, AT, 8 September 1960; 1 spm, CN N120B-35, 19°15' N, 111°00' E, muddy sand, 80 m, AT, 10 February 1960.

Nansha Islands. One specimen, CN SSB2-5, 8°30' N, 109°00' E, 143 m, 17 September 1994; 2 spms, CN SSB2-6, 8°30' N, 109°00' E, 143 m, 17 September 1994.

Measurements

See Table 1.

Description

Shell medium to large (up to 41.5 mm in length), elongated fusiform, heavy. Spire high, 0.57–0.60 of total length; whorls convex, particularly body whorl, with a slight, rounded shoulder below sulcus, which is shallow; suture bordered by a slight cord. Suture narrow, distinct, slightly undulated. Teleoconch of 14 whorls. Sculpture of narrow, strong axial ribs, 15 on penultimate whorl, 13 on body whorl, which extend to about mid-columella level; ribs weakly opisthocline, tending to line up on adjacent

whorls. Varices two to three per whorl, situated about one-third of last whorl behind lip. Numerous thin and crisp, wavy spiral ridges overriding axial ribs, five on penultimate whorl, 12 on body whorl, but absent on shoulder ramp; subsutural cord weak. Spiral striae absent. Dense growth lines. Aperture narrowly elliptical, subrectangular, gradually tapering to siphonal canal. Outer lip thin, edge weakly crenulated, stromboid notch evenly concave. Anal sinus deeply V-shaped with rounded apex, expanding at edge, its apex on lower side of shoulder ramp. Columella straight, callus narrow, forming a narrow false umbilicus, parietal callus thin. Siphonal canal relatively long, deep, narrow, recurved; anterior tip shallowly notched.

Protoconch high, three whorls, the first two smooth, the last one present with sparse axial ribs; breadth 1.13–1.42 mm.

Ground colour yellowish-brown, early whorls darker, interior of aperture and axial ribs off-white, with darker brown maculations next to varices.

Distribution

ECS and SCS, Nansha Islands.

Etymology

Latin compound noun, *plurivaricis* meaning several (*plures*) + varicoid (*varicis*), referring to the two or three varices on the shell surface.

Remarks

This species is somewhat similar to *Inquisitor aesopus* (Schepman, 1913) in shell profile, but differs in its more convex whorls, slightly stronger axial ribs which terminate in a weak, not angular shoulder below the subsutural convexity, and the presence of two to three varices on each whorl instead of only one varix on the back of the last whorl as in *I. aesopus*; the end of the siphonal canal in *I. aesopus* is notched, unlike *I. plurivaricis*. *Inquisitor plurivaricis* is also comparable with *I. rufovaricosa* (Kuroda and Oyama, in Kuroda et al., (1971), from Japan and southern China (recorded by Chang and Wu 2000, from Taiwan); the latter species differs from *I. plurivaricis* in its long, recurved siphonal canal, stronger subsutural cord, more numerous axial ribs, reddish-brown base and elongate, dark reddish-brown blotches adjacent to the varices.

***Inquisitor* sp. cf. *solomonensis* (Smith, 1876)** (Figure 4E)

?*Pleurotoma*(?) *solomonensis* Smith, 1876, p 537, pl. 30, fig. 6. Type loc.: San Cristoval [Cristobal], Makira Province, Solomon Islands

Material examined

SCS. One specimen, CN S219B-51, 21°30' N, 115°30' E, muddy sand, 115 m, AT, 13 April 1960.

Measurements

See Table 1.

Distribution

SCS; Solomon Islands.

Remarks

The only specimen collected from SCS is immature and has major repaired fractures, hence it cannot be identified with certainty. It shows closest resemblance to *Inquisitor solomonensis* (Smith, 1876), a species known to range from the Solomon Islands and New Britain to south Moluccas, with an unconfirmed record from Fiji. The holotype (BMNH 1876.1.10.140) has been examined by Kilburn (manuscript).

Inquisitor sp. 1

(Figure 3E)

Material examined

ECS. One specimen, CN H21B-45, 31°00' N, 123°30' E, muddy sand, 50.5 m, AT, 10 February 1959.

Measurements

See Table 1.

Distribution

ECS.

Remarks

The single specimen collected from ECS in 1959, was reported by Hasegawa et al. (2000) as *Inquisitor chocolatus* (Smith, 1875), but is very different to the holotype of *Pleurotoma (Drillia) chocolata* (BMNH 1873.8.6.8, examined by Kilburn). This specimen displays no obvious distinctive characters, and more material is obviously needed.

***Inquisitor varicosus* (Reeve, 1843)**

(Figure 2E)

Pleurotoma varicosa Reeve, 1843, pl. 17, fig. 141a, b. Type loc.: Calapan, Mindoro Island, Philippines, 15 fath. [27 m].

?*Inquisitor varicosa*: Springsteen and Leobrera, 1986, p 270, pl. 77, fig. 16.

Material examined

One specimen, Xincun, Hainan Island.

Measurements

See Table 1.

Distribution

SCS; Philippines, Indonesia. Not previously recorded from the China Seas.

Type material

Three syntypes BMNH 1963873 (checked by Kilburn).

Remarks

Although the shell surface is somewhat worn, the specimen appears to agree with photographs of syntypes (Kilburn, manuscript), although the base is somewhat narrower.

***Inquisitor vividus* sp. nov.**

(Figure 3F, G)

Type material

Holotype. Nansha Islands. CN SSVIIIIB8-30-1, 7°24' N, 104°52' E, muddy sand, 44 m, AT, 9 June 1990.

Paratypes. Nansha Islands. One specimens, CN SSVIIIIB8-30-2, 7°24' N, 104°52' E, muddy sand, 44 m, AT, 9 June 1990; 1 spm, CN SSB5-8, 5°30' N, 108°30' E, 93 m, 17 September 1994.

SCS. Two specimens, CN SIII23B-91, 22°15' N, 115°30' E, sandy mud, 47.2 m, AT, 17 July 1959; 1 spm, CN S140B-39, 21°15' N, 114°30' E, silty mud, 75 m, AT, 10 December 1959.

Measurements

See Table 1.

Description

Shell medium-sized, up to 23.2 mm in height, fusiform, with high (1.4 to 1.5 times length of aperture including canal). Suture narrow, distinct, undulating, with a distinct, relatively low, nodular subsutural cord; sulcus moderately deep, initially crossed by axial ribs, but incising them on last two whorls. Teleoconch of 11 whorls, early whorls weakly convex, later ones strongly so. Sculpture of narrow, angular axial ribs, 13 on penultimate whorl, 14 on last whorl, which extend to parietal level; ribs slightly opisthocline, tending to line up on adjacent whorls, bases of ribs on last whorl thin and curved (vermiculate); ribs randomly forming one to two distinct varices on each whorl, that on back of last whorl particularly strong. Numerous flat and wavy spiral ridges override axial ribs, forming coarse nodules; five to six spirals on penultimate whorl, 12 on body whorl, plus several fine spiral threads continuing to tip of anterior canal; interspaces between each pair of primary spiral ridges with one relatively fine intermediary thread. Spiral striae absent. Numerous axial growth lines. Aperture elongate-ovate. Outer lip thick, crenulated, with distinct stromboid

notch near anterior tip. Anal sinus lacrimiform (deeply U-shaped with strongly constricted opening), its rounded apex on the side of shoulder ramp. Columella straight, with thin, narrow callus. Anterior canal relatively short, deep, anterior tip notched, strongly recurved to right. Protoconch high, conical, three whorls, smooth, breadth 1.52–1.63 mm.

Ground colour light reddish-brown, apical whorls darker brown, axial ribs off-white, forming a broad, interrupted white band around middle of each whorl, lower on earlier whorls, base of last whorl with pale nodules, one row whiter than others, with darkish brown maculations besides the varices; subsutural cord with white nodules and brown intervals.

Distribution

Only known from northern part of the SCS and Nansha Islands.

Etymology

Latin adjective, *vividus*, meaning vividly coloured.

Remarks

Somewhat similar to *Inquisitor rubrozonatus* (Schepman, 1913), a widely-distributed species (Arabian Gulf to Indonesia), which is smaller, without distinct granules on its base, with a less recurved siphonal canal and a more open anal sinus; it also lacks the broad white zone on the axial ribs of *I. vividus*. There is also a slight similarity to *Inquisitor taivaricosa* Chang and Wu, 2000, of southern China and the Philippines, but that has brown spiral lines, lacks the conspicuous white ribs and has a shorter siphonal canal and less constricted anal sinus.

Genus *Paradrillia* Makiyama, 1940

Remarks

This genus contains many problematic species, some of which are based on poorly preserved fossils.

Paradrillia patruelis (E. A. Smith, 1875) (Figure 3I)

Pleurotoma patruelis Smith, 1875, p 419. Type loc.: Japanese Seas, 34°06'N, 136°15'E, 11 fath. [20 m].

Paradrillia patruelis: Habe 1964, 119, pl. 38, fig. 7; Powell 1969, p 315, pl. 243, figs 1–4.

Vexitomina chinensis Ma 1989, p 163–164, fig. 1.

Material examined

Bohai Gulf and Yellow Sea. One specimen, CN H213B-4, 121°00' E, 38°03' N, 19 m, clay, AT, 17 July 1959; 1 spm, CN Y405A-8, 122°30' E, 34°00' N, brown mud, 42 m, AT, 28 October 1959; 5 spms, CN H281B-3, 121°49' E, 38°51' N, 28.4 m, mud, AT, 22 October

1959; 3 spms, CN Y316B-13, 122°30' E, 34°00' N, 54 m, clay, AT, 21 July 1959; 7 spms, CN Y379B-35, 123°30' E, 37°00' N, 29 m, mud, AT, 22 October 1959; 1 spm, CN H0050, 122°30' E, 34°00' N, 44 m, mud, 31 January 1959; 1 spm, CN Y265B-33, 37°00' N, 123°00' E, silt, 27 m, AT, 11 July 1959; 1 spm, CN Y376B-3, 37°15' N, 123°00' E, silt, 30 m, AT, 20 October 1959; 3 spms, CN Y405B-7, 122°30' E, 34°00' N, 42 m, silty mud, AT, 28 October 1959; 1 spm, CN Y180B-6, 37°50' N, 121°30' E, silt, 21 m, AT, 23 April 1959; 6 spms, CN H198B-10, 122°10' E, 37°39' N, 21 m, clay, AT, 20 October 1959; 5 spms, CN H284B-2, 37°40' N, 122°31' E, silt, 25 m, AT, 20 October 1959.

ECS. One specimen, CN D142B-37, 31°30' N, 124°00' E, 77 m, mud, AT, 9 December 1959; 1 spm, CN 06-18, 28°00' N, 123°30' E, sand and shell debris, 86 m, AT, 8 January 1959; 1 spm, CN C71B-45, 33°30' N, 123°00' E, muddy sand, 47 m, AT, 25 October 1959; 1 spm, CN D41B-46, 28°00' N, 122°00' E, silt, 52 m, AT, 3 July 1959.

SCS. One specimen, CN S221B-49, 22°00' N, 115°30' E, silt, 78 m, AT, 14 April 1960; 2 spms, CN Y282B-9, 36°15' N, 121°30' E, silty mud, 31 m, 13 July 1959; 1 spms, CN Y389A-12, 121°30' E, 36°15' N, silty mud, 31 m; 1 spm, CN 8-20, 18°00' N, 101°30' E, silty mud, 169 m, AT, 27 January 1959; 5 spms, CN SIII21B-51, 22°00' N, 115°30' E, silty mud, 74.2 m, AT, 15 July 1959; CN S216B-53, 21°45' N, 115°00' E, silty mud, 81.5 m, AT, 13 April 1960.

Measurements

See Table 1.

Distribution

Bohai Gulf, Yellow Sea, ECS and SCS; Japan to Philippines.

Type material

Holotype of *Pleurotoma patruelis* is BMNH 1873.8.6.14 (checked by Kilburn).

Remarks

After examining the type specimens of *Vexitomina chinensis* Ma, 1989, Li and Li found that it closely resembles the variable *Paradrillia patruelis* (E. A. Smith, 1875) (Powell 1969: 312, pl. 243, figs 1–4). Ma (1989) did not compare the two.

***Paradrillia sultana* (Thiele, 1925)**

(Figure 5B)

Crassispira sultana Thiele, 1925, p 199 (233), pl. 24 (36), fig. 5. Type loc.: Tanzania: off Zanzibar/Pemba, 5°55.8'S, 39° 01.2'E, 50 m.

Material examined

Yellow Sea. Three specimens, Jianggezhuang, Qingdao, Shandong, 13 September 1973.

ECS. One specimen, 21°30' to 32°00' N, 114°00' to 127°00' E, 1973.

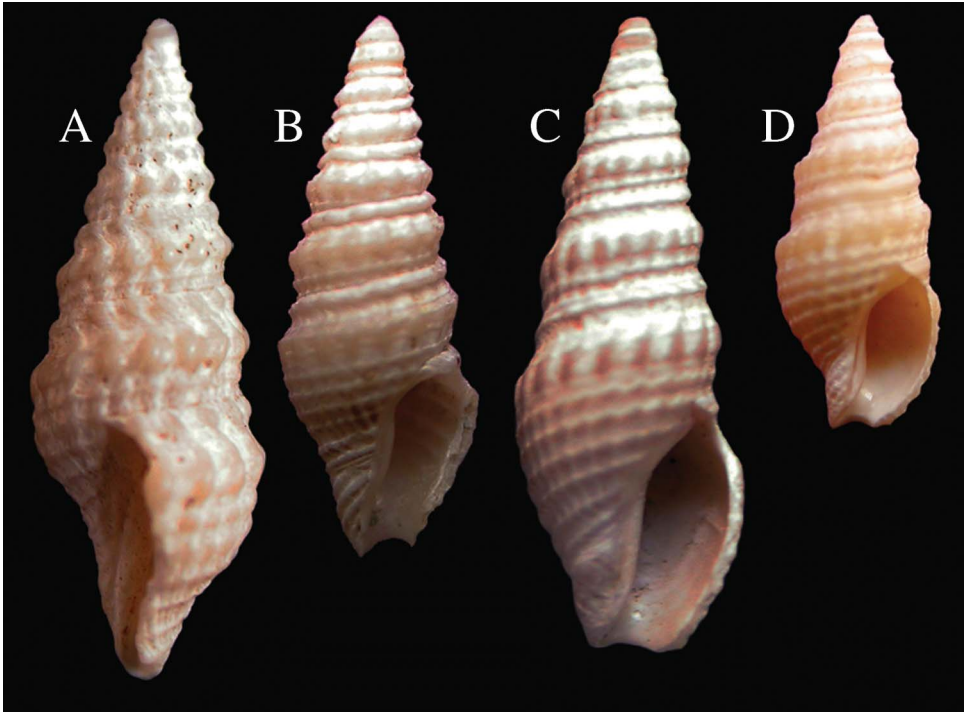


Figure 5. Species of subfamily Crassispirinae. (A) *Paradrillia* sp. 1 (ECS, CN 0034-2); (B) *Paradrillia sultana* (ECS); (C) *Paradrillia* sp. 3 (Bohai Gulf); (D) *Paradrillia* sp. 2.(ECS).

SCS. One specimen, CN K156A, 112°30' E, 21°30' N, silty mud, 23 m, 7 April 1960.

Measurements

See Table 1.

Description

Taken from Kilburn manuscript, based on freshest syntypes of *Crassispira sultana* Thiele, 1925.

Shell claviform, base relatively short and broad, siphonal canal slightly obliquely truncate, deeply indented, outer lip thin, anal sinus deep, tongue-shaped, slightly apically inclined, apex broadly rounded, occupying most of sulcus, parietal pad small; stromboid notch shallow; interior of outer lip with six or seven thin, sharp spiral ridges. Early whorls with a subsutural cord separated by a shallow sulcus from a series of node-like ribs, which are not divided by a furrow to form a second row of nodules posteriorly. Subsutural cord compressed but strong on later whorls, sulcus wider, deep and concave. Axial ribs narrow, opisthocline, becoming weak and pro-curved below suture, forming compressed tubercles at periphery, 13–14 on penultimate whorl, extending onto base; penultimate whorl without a peripheral cord. Base of spire whorls with one to two thin spiral ridges, another in sulcus and several between tubercles; base of last whorl with 10–12 spiral ridges, wide-set except on

rostrum, where close and smooth. Basal spiral ridges and axial ribs forming a weak nodose-cancellate sculpture (except on rostrum), their interstices somewhat fenestrate at parietal level. Microsculpture of fine collabral threads.

Glossy, uniform white. Protoconch papillate, of 2.0 whorls, first tilted, smooth, second with a weak angle below midwhorl, and 10 arcuate, opisthocline axial riblets, breadth 0.44–0.46 mm.

Dimensions: 7.9×2.9 mm, aperture 1.9 mm.

Distribution

Yellow Sea, ECS and SCS; east Africa. Not previously recorded from the China Seas.

Remarks

A full description of the freshest syntype is given, as this species has been overlooked in the literature. It may have been confused with *Paradrillia inconstans* (Smith, 1875) from which it differs in its prominent, angular subsutural cord and deep, narrow sulcus (subsutural groove), which contains only one spiral thread.

Paradrillia sp. 1 (Figure 5A)

Material examined

ECS. One specimen, CN 0034-2, Changjiang River estuary, muddy sand, 40 m, 11 September 1985.

Measurements

See Table 1.

Distribution

Changjiang River estuary.

Remarks

The only specimen resembles *Paradrillia dainichensis* (Yokoyama, 1923) in shell profile, but differs in having a nodular subsutural cord, and the latter (Powell's interpretation of a decayed fossil of *P. dainichensis*) has practically no cord at all. Because of its worn shell, the specimen cannot be identified to species level.

Paradrillia sp. 2 (Figure 5D)

Material examined

Bohai Gulf. One specimen, CN H249A-6, 39°05' N, 118°58' E, silt, 15 m, 21 July 1959; 3 spms, Yellow River Estuary, no date recorded.

ECS. One specimen, CN 10-980, 31°50' N, 122°30' E, Changjiang River Estuary, silty mud, 26 m, 30 June 1986.

Measurements

See Table 1.

Distribution

Estuaries of Yellow River and Changjiang River.

Remarks

Originally identified as *Paradrillia melvilli* Powell, 1969, the present specimens differ from the holotype of that species (in BMNH, examined by Kilburn) in the distinct subsutural cord, lack of dense axial threads on the base, and 3.5 protoconch whorls, instead of three.

***Paradrillia* sp. 3**

(Figure 5C)

Material examined

Bohai Gulf. One specimen, CN 0199, Qinhuangdao, Hebei, 6 May 1950; 4 spms, Beidaihe, Hebei; 4 spms, CN 0031, Beidaihe, Hebei, 2 May 1950.

Yellow Sea. Four specimens, Yantai, Shandong; 2 spms, CN 315, Yantai, Shandong; 7 spms, Jianggezhuang, Qingdao, Shandong, 13 September 1973.

SCS. One specimen, CN K3A-8, 112°30' E, 21°00' N, muddy sand, 52 m, 26 February 1959.

Measurements

See Table 1.

Distribution

Coast of Hebei (Qinhangdao, Beidaihe), Bohai Gulf, Shandong (Yantai, Qingdao), Yellow Sea, northern SCS.

Remarks

The specimens included here are not in fresh condition, although they are perhaps comparable with *Drillia prunulum* Melvill and Standen, 1901, which Powell (1969) regarded as a subspecies of *Paradrillia inconstans* (Smith, 1875). However, the apparent sympatry and extreme variation claimed by Powell does not lend support to such a relationship. Compared with *inconstans* the last whorl in these specimens is more elongated and subcylindrical.

Genus *Ptychobela* Thiele, 1925
Ptychobela flavidula (auctt non Lamarck, 1822)
 (Figure 4F)

Material examined

Yellow Sea. Three specimens, CN 40-12, 36°45' N, 122°15' E, silty clay, 20 m, AT, 29 October 1958; 1 spm, CN H102B-12, 36°00' N, 121°00' E, sandy mud and gravel, 35 m, B.T., 24 April 1959; 2 spms, CN Y275B-16, 36°30' N, 122°00' E, silty clay, 24 m, AT, 12 July 1959.

ECS. Twenty-eight specimens, CN V311A-5, 32°00' N, 122°30' E, coarse sand and shell debris, 25 m, AT, 24 October 1959; 36 spms, VN C50B-27, 32°30' N, 122°15' E, fine sand, 27 m, AT, 22 October 1959; 3 spms, CN 222-40, 31°30' N, 123°00' E, silt, 59 m, BT, 4 February 1959; 10 spms, CN F48B-10, 30°00' N, 120°45' E, silt, 42 m, AT, 8 December 1959.

Beibu Gulf. One specimen, CN X152B-17, 19°00' N, 106°30' E, 40 m, sand, AT, 26 October 1960; 1 spms, CN X172B-21, 20°00' N, 108°30' E, fine sandy mud and slit, 62 m, AT, 21 January 1962; 1 spm, CN X192B-33, 18°30' N, 106°15' E, sandy mud and shell debris, 28 m, AT, 11 April 1962; 1 spm, CN X192, 18°30' N, 106°15' E, shell debris and sand, 20 m, AT, 11 April 1962.

SCS. Three specimens, CN K81B-17, 21°15' N, 114°00' E, sand, 52 m, AT, 18 October 1959; 1 spm, CN K104B-59, 20°30' N, 112°00' E, sandy mud, 65 m, AT, 28 October 1959; 1 spm, CN K102B-18, 19°30' N, 112°00' E, muddy sand, 122 m, AT, 28 October 1959; 1 spm, CN K13B-86, 21°30' N, 111°30' E, muddy coarse sand, 39.5 m, AT, 16 February 1960; 1 spm, CN S175B-48, 23°30' N, 117°30' E, fine sand, 34 m, AT, 4 January 1960; 1 spm, CN K152B-32, 20°00' N, 112°30' E, muddy sand, 101 m, AT, 6 April 1960; 1 spm, CN Q203B-4, 21°24' N, 109°00' E, muddy sand, 11 m, AT, 22 April 1960; 1 spm, CN X7AB-20, 19°00' N, 105°45' E, muddy sand, 128 m, AT, 11 February 1960; 1 spm, CN N15B-84, 18°15' N, 108°45' E, coarse sand, 38 m, AT, 12 March 1960; 1 spm, CN K280B-16, 18°30' N, 106°30' E, sand, 40 m, AT, 26 October 1960.

Measurements

See Table 1.

Distribution

Yellow Sea, ECS and SCS, Beibu Gulf, Nansha Islands.

Remarks

This and several similar species have been commonly misidentified as *Pleurotoma flavidula* Lamarck, 1822 (1822: 92, type loc.: Red Sea), a species only briefly described by its author, without figures or figure references. However, the lectotype of that species in the MHNG (which according to Dr Yves Finet is accompanied by a label in Lamarck's own handwriting) shows little resemblance to *P. flavidula* auctt. It has a short,

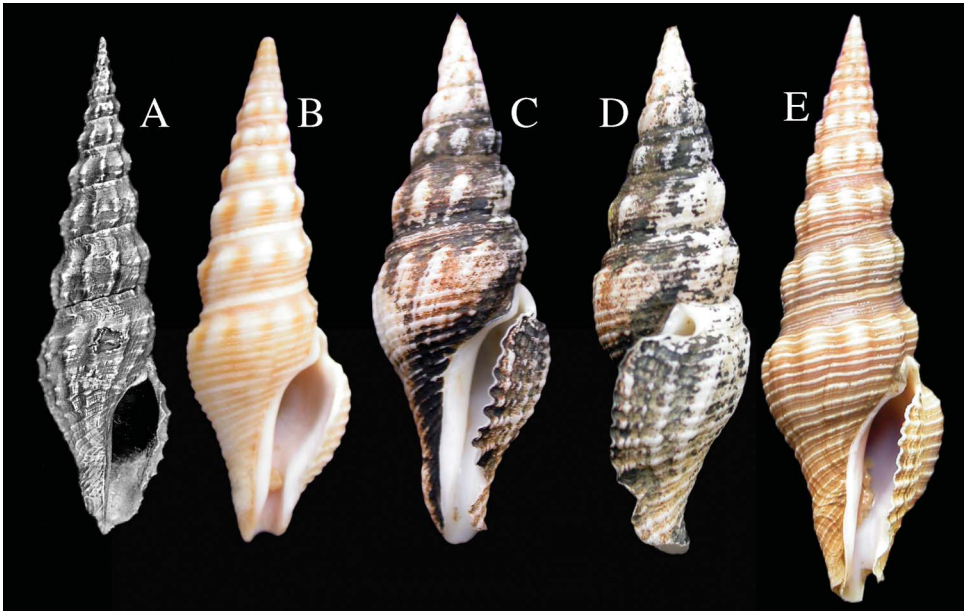


Figure 6. (A) Syntype of *Pleurotoma (Drillia) concolor* Smith, 1877, BMNH 1964227, Moluccas; 42.1 × 11.2 mm; (B) *Ptychobela suturalis* (Hainan Island); (C, D) *Ptychobela resticula* sp. nov. (holotype, SCS, CN S208B-42, 83 m, 41.5 × 14.3 m); (E) *Ptychobela vexillum* (SCS, CN N31B-13).

broad siphonal canal and a wide, weakly concave subsutural region (see Figure 4G), and appears close to *Ptychobela concolor* (Smith, 1877) (syntype see Figure 6A), a rare species apparently known only from Indonesia. Previous misidentifications were probably initiated by early authors following Kiener (1840: 30, pl. 6, fig. 2), who despite having access to Lamarck's holotype ("Coll. Mass. et Mus."), illustrated as this species a shell with a long, tapering siphonal canal, very different to the holotype of *P. flavidula*.

Pleurotoma (Drillia) pseudoprincipalis Yokoyama, 1920, from the Pleistocene of Japan, sometimes cited as a synonym of *P. flavidula*, has a well-developed subsutural cord which not only distinguishes the two species at a glance, but indicates that *P. (D.) pseudoprincipalis* might be an *Inquisitor*.

References to figures of *Pleurotoma flavidula* of authors are not given here, as there appear to be several (if not many) similar but undescribed species belonging to this complex. A new name is not proposed because an in-depth study of the species-complex is clearly required. The present specimens from China show great variation in shell outline, number of axial ribs, spiral ridges and proportions (see Table 1). This species is abundant in the Yellow Sea, ECS and SCS.

****Ptychobela minimarus* (Kosuge, 1993)**
(Figure 3H)

Inquisitor minimarus Kosuge, 1993, p 11, 12, pl. 5, figs 1, 2, text fig. 1 (protoconch); Wells 1994: p 91, pl. 4, figs 7, 8.

Material examined

One specimen, Xincun, Hainan Island.

Measurements

See Table 1.

Distribution

Hainan Islands, Australia. Not previously recorded from the China Seas.

Remarks

The specimen agrees well with photographs (Kilburn manuscript) of the holotype. Although only the radula will confirm its generic position, its shell characters appear closer to several *Ptychobela* spp than to *Inquisitor*. Wells (1994) noted that the species was “known only from 154 to 200 m depth N. of Port Hedland, Western Australia”. The present specimen was definitely collected in shallower water.

***Ptychobela resticula* sp. nov.**
(Figures 6C, D)

Type material

Holotype. SCS. One specimen. CN S208B-42, 21°00' N, 114°30' E, muddy sand, 83 m, AT, 8 April 1960.

Paratypes. SCS. One specimen, CN N126B-12, 20°15' N, 110°45' E, medium sand, 55 m, AT, 10 February 1960.

Measurement

See Table 1.

Description

Shell biconic-fusiform, heavy; medium to large (adult length 33.0–41.5 mm). Spire high, approximately equal in length to aperture (including canal); body whorl convex, and anterior canal relatively short, slightly flexed. Teleoconch with 10 evenly convex whorls, body whorl most strongly so. Suture narrow, adpressed, distinct. Sculpture of strong, opisthocline, rounded axial ribs, beginning below sulcus, extending to base of whorl, on last whorl these ribs weaken and evanesce at about midwhorl; with nine ribs on penultimate and last whorls. Subsutural cord very strong, slightly wider than sulcus, bearing three or four fine spiral threads. Spiral ridges strong, rounded, crossing the axial ribs, five to six on penultimate whorl, and 18–19 between the last suture and the tip of the base. Sulcus and interspaces between main ridges with thinner and weaker spiral ridges. Growth lines forming coarse threads. Aperture moderately narrow, outer lip slightly flared, thickened, with low crenulations along its edge and a deep stromboid notch. Anal sinus asymmetrically

U-shaped, directed slightly adapically, parietal nodule pronounced. Siphonal canal relatively short and deep, end rounded.

Protoconch high conical, of two to three whorls, smooth; breadth 1.21–1.29 mm. Colour orange-brown, interior of aperture and parietal callus porcellanous-white.

Etymology

Latin *resticula*, noun, rope-like, referring to the strong subsutural cord.

Distribution

Only known from the type locality, the SCS.

Remarks

Ptychobela resticula sp. nov. is characterised by its proportionally low spire, strong spiral ridges and a rope-like subsutural cord comprising three or four fine spiral threads. The new species is somewhat similar to *Ptychobela suturalis* (Gray, 1838) but differs in proportions (such as a lower spire) and a stronger subsutural cord.

***Ptychobela suturalis* (Gray, 1838)**

(Figure 6B)

Drillia suturalis Gray, 1838, p 29. Type loc. unknown.

Ptychobela suturalis: Kilburn 1989, p 190, figs 5, 6 (holotype), not 7–8 [= *P. vexillum*].

Non *P. suturalis*: Taylor and Wells 1994, p 110, pl. 1, fig. f, pl. 2, figs c–e.

Material examined

SCS. Three specimens, Hainan Island; 1 spm, CN 58-M0440, Haitangtou (Hianan Island), 21 April 1958; 5 spms, Hele Harbour, Hainan Island; 1 spm, Xincun, Hainan Island.

Measurements

See Table 1.

Distribution

Hainan Island, Taiwan, SCS; Indonesia, Singapore, Malaysia, Philippines, Australia.

Remarks

The species illustrated by Taylor and Wells (1994) as *Ptychobela suturalis* may be undescribed, as it lacks the strongly arched outer lip, well-defined subsutural cord, truncate siphonal canal and peripheral nodules of true *suturalis*. *Ptychobela suturalis* resembles *P. vexillum* (Habe and Kosuge, 1966) in shell profile and sculpture (Habe and Kosuge 1966a), but differs from the latter with the weaker spiral ridges and much narrower siphonal canal.

Ptychobela vexillum (Habe and Kosuge, 1966)
(Figure 6E)

Brachytoma vexillum Habe and Kosuge, 1966 (January), p 96, pl. 38, fig. 15. Type loc. not given [= Anpin, Formosa [Taiwan], *fide* Habe and Kosuge 1966b (May)].

Brachytoma vexillum Habe and Kosuge, 1966b (May), p 321, pl. 29, fig. 5. Type loc.: Anpin, Formosa [Taiwan].

Ptychobela vexillum: Springsteen and Leobrera 1986, p 279, pl. 80, fig. 2.

Inquisitor vexillum: Chang and Wu 2000, p 19, fig. 19.

Material examined

SCS. One specimen, CN 54-832, Wushi (Guangdong), 11 December 1954; 3 spms, Xincun, Hainan Island; 1 spm, CN 55-561, Sanya, Hainan Island, 16 April 1955; 1 spm, CN 55-691, Yingehai (Hainan Island), 6 May 1955; 1 spm, CN 55-223, Fangcheng (Guangxi), 7 February 1955; 1 spm, CN N31B-13, 20°12' N, 110°30' E, coarse sand, shell debris, 64 m, AT, 17 April 1959; 1 spm, CN 2-23, 20°48' N, 110°45' E, muddy sand, 21 m, AT, 14 January 1959; 1 spm, CN 2-23, 20°48' N, 110°45' E, muddy sand, 21 m, AT, 14 January 1959.

Beibu Gulf. Five specimens, CN K237B-47, 18°45' N, 108°30' E, muddy sand, 22 m, AT, 11 July 1960; 1 spm, CN Q195B-36, 20°45' N, 109°30' E, sandy mud, 46 m, AT, 20 April 1960; 1 spm, CN Q206B-75, 18°45' N, 108°15' E, muddy sand, 41 m, AT 18 May 1960; 2 spms, CN X74B-29, 19°00' N, 105°45' E, muddy sand, 12.8 m, AT, 11 February 1960; 1 spm, CN K264B-16, 19°15' N, 108°30' E, muddy sand, 38 m, AT, 17 October 1960; 1 spm, CN Q126B-76, 20°05' N, 109°45' E, coarse sand, 40 m, AT, 8 February 1960; 4 spms, CN X202B-18, 19°40' N, 107°30' E, fine sand, 46 m, AT, 14 April 1962; 2 spms, CN X240B-11, 19°00' N, 108°30' E, coarse sand and silt, 20 m, AT, 19 August 1962.

Measurements

See Table 1.

Distribution

SCS; Japan, Philippines.

Remarks

This species shows resemblances to both *Ptychobela suturalis* (Gray, 1838) and *Ptychobela nodulosa* (Gmelin, 1791). *Ptychobela suturalis* differs in its strongly constricted siphonal canal and stronger subsutural cord. *Ptychobela nodulosa*, a species mainly characteristic of the Bay of Bengal, has a distinctive colour pattern, comprising a pale peripheral band, with a darker band on both sides, and more rib-like peripheral nodules.

Although the specific name “*vexillum*” was probably a misspelling, this is not indicated in the text, and it has five months priority over “*vexillum*”.

Genus *Turridrupa* Hedley, 1922

Remarks

The status of this group is controversial, but the latest molecular evidence (Puillandre et al. 2008) suggested that most of the forms in the genus *Turridrupa* probably belong to the subfamily Turrinae rather than to the subfamily Crassispirinae. However, as their status remains uncertain, we provisionally position this group in the subfamily Crassispirinae in the present paper.

Turridrupa deceptrix Hedley, 1922
(Figure 3J)

Turridrupa deceptrix Hedley, 1922, p 227; pl. 42, fig. 14; Powell 1967, p 422; pl. 301, fig. 2.

Material examined

Beibu Gulf. Two specimens, CN X202B-18, 19°40' N, 107°30' E, fine sand, 46 m, AT, 14 April 1962; 1 spm, CN X207B-176, 19°30' N, 106°30' E, coarse sand, 32 m, AT, 15 April 1962.

SCS. One specimen, CN SIII33B-52, 22°30' N, 117°00' E, coarse sand, 47.6 m, AT, 20 July 1959; 1 spm, CN S76B-92, 21°30' N, 113°45' E, 45 m, AT, 9 April 1959.

Measurements

See Table 1.

Distribution

Beibu Gulf, SCS; Japan, Indonesia, West New Guinea, Australia, Andaman Islands.

Remarks

The specimens agree with the illustrations of Powell (1967). This species is similar to *Turridrupa bijubata* (Reeve, 1843), but differs in its longer siphonal canal.

Turridrupa prestoni Powell, 1967
(Figure 2J)

Turridrupa prestoni Powell, 1967, p 423; pl. 301, fig. 4; Springsteen and Leobrera 1986, p 272; pl. 77, fig. 19.

Material examined

Nansha Islands. One specimen, CN SSVIII B8-16, 7°24' N, 104°52' E, muddy sand, 44 m, 9 June 1990.

Measurements

See Table 1.

Distribution

Nansha Islands; Philippines. Not previously recorded from the China Seas.

Remarks

This species is very similar to *Turridrupa jubata* (Hinds, 1843) and their relationship needs investigation. The only Chinese specimen available has a broken lip and eroded apex. This is the first Chinese record of the species.

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