

NEW SPECIES AND NEW RECORDS OF DEEP-WATER *FUSOLATIRUS* (NEOGASTROPODA: FASCIOLARIIDAE) FROM THE WEST PACIFIC

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Abstract The neogastropod fascioliid genus *Fusolatirus* Kuroda & Habe, 1971, is redescribed based on shell and radula characters. Fourteen species are tentatively placed in the genus, nine of them for the first time, all from moderately deep water (50-300 meters) in the tropical Indo-West Pacific. Additional species currently placed in *Latirus* or *Peristernia* may also be referable to *Fusolatirus* when the range of shell and radula characters are better understood. However, we do not regard as congeneric *Fusolatirus kurodai* (Okutani & Sakurai, 1964) nor *Fusolatirus kuroseanus* Okutani, 1975. *Fusolatirus luteus* n. sp. and *Fusolatirus pachyus* n. sp., both from the New Caledonia area, are described. *Latirus cloveri* Snyder, 2003 [June] is a new synonym of *Euthria suduirauti* Fraussen, 2003 [April], originally described as a buccinid and here referred to *Fusolatirus*. The ranges of *Fusolatirus balicasagensis* (Bozzetti, 1997), *F. kandai* (Kuroda, 1950), and *F. rikae* (Fraussen, 2003), earlier known only from Japan and/or the Philippines, are extended to the South Pacific.

Key words Gastropoda, Fascioliariidae, *Fusolatirus*, new species, New Caledonia

INTRODUCTION

Fascioliariids are not known for having extensively penetrated and radiated into deep water. The family is essentially characteristic of warm temperate to tropical seas, from the intertidal to offshore subtidal depths. Most species of fascioliariids form rather sparse populations, and they are usually represented in museum collections by lots with one or just a few specimens, making it difficult to assess the value of characters in terms of within-population and between-population variation. This is especially true of the representatives of the subfamily Peristerniinae, which form the subject of the present paper. Our study is based on considerably more material than has been available to workers before us, and this comes essentially from two sources: (1) material from deep-water oceanographic expeditions in the West and South-West Pacific over the last 20 years or so (MNHN), and (2) material originating from tangle nets and other commercial operations in the Philippines (Snyder Collection). Background information on the expeditions, with narratives of the cruises, station lists, maps, etc. can be found in Richer de Forges (1990, 1991, 1993) and Richer de Forges & Chevillon (1996: New Caledonia cruises), Richer de Forges & Menou (1993: MUSORSTOM 7 cruise to Wallis and Futuna), and Richer de Forges *et al.* (1996: MUSORSTOM 8 cruise to Vanuatu; 1999:

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MUSORSTOM 9 cruise to the Marquesas; 2000a and b: Fiji cruises). As a result of these expeditions, over 400 new species of molluscs have been described from the deep waters off New Caledonia alone (see, among others, Crosnier & Bouchet 1991, Bouchet 1994, Bouchet & Marshall 2001).

As it has already been stressed several times (e.g., Vermeij & Snyder 2002), the value of characters and the genus-level systematics of peristerniine fascioliariids are still poorly understood. Limits between species groups are not clearly marked and many nominal genera have been proposed for shallow-water taxa that at one time or another have been treated as subgenera or synonyms of *Latirus*, *Leucozonia*, *Peristernia*, or *Dolicholatirus*. Whereas there has obviously been much redundancy in the supraspecific naming of these shallow-water taxa, by contrast the newly discovered deep-water species are not easily placed in any of these genera, and we may well be facing a shortage of appropriate generic names to classify them. The present paper is concerned with *Fusolatirus*. Papers to follow will deal with *Pseudolatirus* and *Dolicholatirus*.

The genus *Fusolatirus* was established on the grounds that the type species "has the shell of *Latirus*-form and the radula of *Peristernia*-formula". We use it as a valid genus for peristerniine fascioliariids with long, recurved siphonal canal; imbricated subsutural spiral ridge, adpressed to preceding whorl; and radula with central tooth

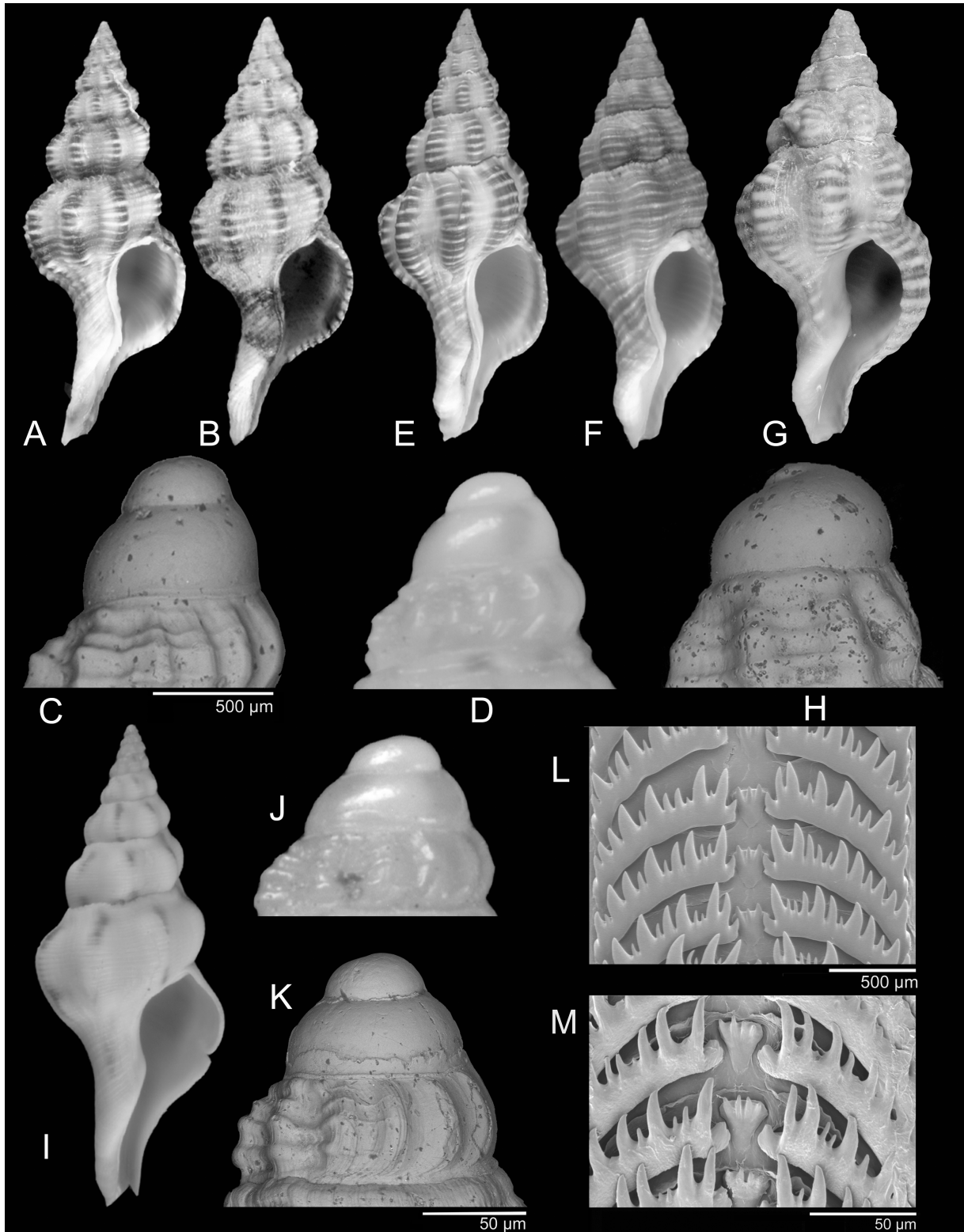


Figure 1 A-D *Fusolatirus balicasagensis* (Bozzetti, 1997). A Philippines, Balut I., 40.1 mm. B New Caledonia, Norfolk Ridge, 245-261 m [LITHIST: sta. CP10], 45.0 mm. C-D Protoconch (C, SEM and D, natural) of specimen from Mindanao, Balut I. E-H *F. kandai* (Kuroda, 1950). E Philippines, Mactan, Punta Engano, 51.3 mm. F Philippines, Panglao, 80 fms, 43.3 mm. G Solomon Islands, 182-277 m [SALOMON 2: sta. DW2234], juvenile, 26.7 mm. H Protoconch (SEM) of specimen from Bohol-Cebu area, 50-150 m. I-L *Fusolatirus elsiae* (Kilburn, 1975). I Natal, off Park Rynie, 150m, 42.5 mm. J-K Protoconch (B, natural and C, SEM) of specimen from Natal, off Park Rynie, 100m. L Radula. Specimen from Natal, NE of Green Point, 75m. M *Fusolatirus luteus* n. sp. Radula. Specimen from North of New Caledonia, 280 m [MUSORSTOM 4: sta. DW183].

with broad basal plate and 2 or 3 pointed cusps, and very long, arched, lateral teeth with strong cusps alternating with smaller ones. We currently know the radulae of five species that fit this description (*Fusolatirus pilsbryi* and *F. kandai*, see Azuma 1973: textfig. 6; *F. elsiae*, *F. luteus* n. sp., and *F. suduirauti*, this paper), and other species are placed in *Fusolatirus* based on the similarity of shell characters to these five species.

As a result of this re-evaluation of the extension of the genus, new records, new synonymies, new combinations and new descriptions are presented in this paper for the following:

Fusolatirus balicasagensis (Bozzetti, 1997) comb. nov.

Fusolatirus elsiae (Kilburn, 1975) comb. nov.

Fusolatirus kandai (Kuroda, 1950) comb. nov.

Fusolatirus luteus n. sp.

Fusolatirus pachyus n. sp.

Fusolatirus rikae (Fraussen, 2003) comb. nov.

Fusolatirus suduirauti (Fraussen, 2003) comb. nov. [= *L. cloveri* Snyder, 2003].

Beside these, we have examined material of the following species, which appear to be referable to *Fusolatirus*:

F. coreanicus (E.A. Smith, 1879) [= *F. pilsbryi* (Kuroda & Habe, 1952)]; Japan. [First placed in *Fusolatirus* by Higo & Goto 1993: 239 where they placed *pilsbryi* in synonymy with *coreanicus*].

F. formosior (Melvill, 1891) comb. nov.; Western Indian Ocean, Philippines (?), "deep water".

F. nanus (Reeve, 1847); Philippines, "deep water". [First placed in *Fusolatirus* by Springsteen & Leobrera 1986: 178].

F. paetelianus (Küster & Kobelt, 1874) comb. nov.; Western Australia, Philippines, Queensland.

F. pagodaeformis (Melvill, 1899) comb. nov.; Northern Arabian Sea and Persian Gulf.

F. pearsoni (Snyder, 2002) comb. nov.; Philippines, Viet Nam, Japan, "deep water".

F. sarinae (Snyder, 2003) comb. nov.; Philippines, "deep water".

Additional species currently placed in *Latirus* or *Peristernia* may also be referable to *Fusolatirus* when the range of shell and radula characters are better understood. However, we do not regard as congeneric *Pseudolatirus kurodai* [placed in *Fusolatirus* by Okutani 1975: 193], nor *Fusolatirus kuroseanus* Okutani, 1975, which will be treated in a separate paper on the genus *Pseudolatirus*.

ABBREVIATIONS

AMS The Australian Museum, Sydney

NM Natal Museum, Pietermaritzburg

MNHN Muséum National d'Histoire Naturelle

SYSTEMATICS

Family FASCIOLARIIDAE Gray, 1853

Subfamily PERISTERNIINAE Tryon, 1880

Genus *Fusolatirus* Kuroda & Habe, 1971

Fusolatirus Kuroda & Habe, 1971: 182.

Type species *Peristernia pilsbryi* Kuroda & Habe, 1952; by original designation.

Remarks The name *Peristernia pilsbryi* was based on Hirase's (1907: fig. 106, 106a) description and illustration of *Fusus coreanicus* E.A. Smith, 1879. Kuroda & Habe did not give any reason for separating this as a separate species, but beginning with Habe (1961: 68, pl. 33 fig. 2; 1964: 104, pl. 33 fig. 2), Japanese authors started to use the name *Latirus pilsbryi* for a species differing from *L. coreanicus* by its long siphonal. However, Hirase's original illustration clearly illustrates the species with short siphonal canal, and *Peristernia pilsbryi* was synonymized with *Fusus coreanicus* by Higo et al. (1999), a decision with which we agree. The species that has generally been called *L. pilsbryi* in the Japanese literature is a different species, *Fusolatirus. higo* Snyder & Callomon 2005. When they established the genus *Fusolatirus*, Kuroda & Habe used the name *Peristernia pilsbryi* in the sense of the second species with long siphonal canal. Under Art. 70.3 of the Code, we here select as type species *Peristernia pilsbryi* Kuroda & Habe, 1952 as defined by Hirase's illustration, i.e. the species with short siphonal canal, and not the different species with long siphonal canal (*F. higo*).

***Fusolatirus balicasagensis* (Bozzetti, 1997) comb. nov.**
(Fig. 1 A-D)

Latirus balicasagensis Bozzetti, 1997: 55, pl. 19, figs 3-6.

Type material Holotype in MNHN (MNHN 6789).

Type locality Philippines, Bohol, Balicasag I., 180 m.

Material examined A total of 48 specimens. **Philippines** The holotype — Pamilacan, Bohol, tangle nets, 90-145 m, 3 spms (AMS C324272).— Bohol, Panglao, tangle nets, 1 spm (NM J3498 ex Peled 1982).— Panglao, tangle nets, 120 m, 1 spm.— Panglao, tangle nets, 160 m, 1 spm.— Balicasag, tangle nets, 160 m, 16 spms.— Balicasag, tangle nets, 150-180 m, 2 spms.— Balicasag, tangle nets, “deep water”, 3 spms.— Mactan, Punta Engano, “up to 240 m”, 3 spms.— Mindanao, Balut I., tangle nets, 2 spms.— Mindanao, Balut I., tangle nets, “deep water”, 2 spms (Fig. 1 A).— Mindanao, Balut I., tangle nets, “deep water”, 1 spm (Fig. 1 C-D).— Taligod, Davao, “deep water”, 1 spm.— Mindanao, Aliguay I. [also spelled Aligbay I.], 150 m, 1 spm.— Bantayan Is, “in coral, 10-12 m”, 1 spm.— no data, tangle nets, 4 spms. (All Snyder collection).

Solomon Islands SALOMON 2: sta. DW2254, 08°08' S, 157°03' E, 150 m, 1 dd.— Sta. DW2255, 08°08' S, 157°02' E, 185-196 m, 1 dd. (Both MNHN).

New Caledonia SMIB 8: sta. DW157, 24°46' S, 168°08' E, 251-255 m, 1 dd.

LITHIST: sta. CP10, 24°48' S, 168°09' E, 245-261 m, 1 dd (Fig. 1 B).— Sta. DW11, 24°47' S, 168°03' E, 254-283 m, 1 dd. (All MNHN).

Distribution Known only from the Philippines, the Solomon Islands and New Caledonia, empty shells in 100-250 m.

Diagnosis A species of *Fusolatirus* with multispiral protoconch of 2 ¼ whorls. Teleoconch with very convex whorls, narrow, recurved siphonal canal, and narrow axial ribs that are regularly rounded along their axial extension. Colour pattern with brown colour restricted to crest of axial ribs and brown band just below periphery.

Remarks *Fusolatirus balicasagensis* can be confused with the light forms of *F. kandai*; see remarks under that species.

Fusolatirus elsiae (Kilburn, 1975) **comb. nov.**
(Fig. 1 I-L)

Latirus elsiae Kilburn, 1975: 595, figs 11a-b.

Type material Holotype in Natal Museum, Pietermaritzburg, NM T1838.

Type locality Mozambique, north of Beira, 18-35 m [10-20 fms].

Material examined A total of 20 specimens. **South Africa** The holotype.— Off Natal coast, 150 m, 1 lv.— Natal, off Park Rynie, 150 m, 1 spm (Fig. 1 I).— Natal, off Park Rynie, 150-200 m, 1 lv.— Natal, off Park Rynie, 100 m, 1 spm (Fig. 1 J-K).— Off Durban, 70 m, 1 spm.— Off Durban, 1 lv.— Off Natal coast, 150 m, 1 spm. (All in Snyder collection). NE of Liefeldt's Rocks, Zululand, 27°43.2' S, 32°40.6' E, 110 m, 3 dd (NM E3932).— Natal, NE of Green Point, 30°14.3' S, 30°54.3' E, 75 m, 1 lv (NM D3879) (Fig. 1 L).— Natal, off Park Rynie, 30°23.8' S, 30°50.0' E, 101 m, 1 lv(?), 2 dd (NM C1560).— Off Port Shepstone, 70 m, 1 dd (NM B3612).— Zululand, off Lala Nek, 27°13.5' S, 32°49.5' E, 74 m, 1 lv(?) (NM S7437).— Natal, off Trafalgar, 30°01.2' S, 30°22.9' E, 120 m, 2 lv (NM B5977).

In addition, the Natal Museum has the following holdings of *F. elsiae* (material listed by R. Kilburn, not examined by us):

Off S. Mozambique, ca 250 m, trawled. K7349, F. Amorim, 1 dd.— Off Rocktail Bay, Zululand (27° 11.4'S, 32° 51.0'E), 100 m, sandstone rubble, R. Kilburn, D7632, 1 dd juv.— Off Rocktail Bay, Zululand (27° 11.1'S, 32° 50.9'E), 100 m, sand, R. Kilburn, S5168, 1 dd juv.— Off Island Rock, Zululand (27° 17.3'S, 32° 48.3'E), 100 m, sandstone rubble, R. Kilburn, E5314, 1 dd.— Off Gypsy Hill, Zululand (27° 48.7'S, 32° 39.4'E), 100-125 m, broken shell, R. Kilburn, E3260, 1 juv. lv.— NE of Leven Point, Zululand (27° 54.8'S, 32° 38.5'E), 170 m, sandstone rubble, broken shell, coarse sand, R. Kilburn, E3692, 1 dd.— Off Umlaas Canal, S. of Durban, 65-70 fathoms, dredged A. Connell, B6277, 1 lv.— Off Durban, (29° 50.0'S, 31° 14.2'E), 130 m, sandstone gravel and some rocks, R. Kilburn, D4224, 1 juv. lv.— Off Park Rynie, southern Natal (30° 23.2'S, 30°50.8'E), 140 m, some sand, sponge rubble, R. Kilburn, C1579, 1 juv. lv.— Off Park Rynie, southern Natal (30° 23.7'S, 30°50.2'E), 119 m, some sand, sponge rub-

ble, R. Kilburn, C1609, 1 juv. lv.— Off Park Rynie, southern Natal, 110 m, sponge rubble, R. Kilburn, B3835, 1 dd.— Off Park Rynie, southern Natal, 100-110 m, sponge rubble, R. Kilburn, B3937, 1 dd.— Off Park Rynie, southern Natal, 110-130 m, eroded shell and conglomerate, R. Kilburn, B3569, 2 dd.— Off Port Edward, southern Natal, (31° 06.8'S, 30°17.8'E), 120-125 m, living sponges, R. Kilburn, D1370, 1 juv. lv.

Madagascar *Vauban* 1971, sta. P2, chalutage 14, 12°43.3' S, 48°15.7' E, 245-255 m, A. Crosnier coll., 1 dd (MNHN).

Distribution South-West Indian Ocean, Mozambique Channel to Natal, alive in 75-140 m.

Diagnosis A *Fusolatirus* with multispiral protoconch of 2 ¼ whorls. Teleoconch with shouldered whorls, 6-7 broad axial ribs on last whorl, and even but very weak spiral cords. Background colour creamy white to light pink, brown axial stripe on adapical side of axial rib interrupted by broad uncoloured peripheral band.

Remarks *F. elsiae* is easily recognized by its heavy, sturdy shell, with indistinct columellar plication, and characteristic colour pattern.

***Fusolatirus kandai* (Kuroda, 1950)**

(Fig. 1 E-H)

Latirus kandai Kuroda, 1950: 51, text fig.

Peristernia kandai – Azuma 1973: pl. 1 fig. 4, text-fig. 6 [radula].- Okutani 1975: 185.

Latirus kandai – Abbott & Dance 1982: 182, fig. [as *Latirus kanda* (sic)].- Springsteen & Leobrera 1986: 178, pl. 48 fig. 10 [„sporadically found throughout the Philippines“].- Okutani 2000: 511, pl. 254 fig. 28.

Type material Potentially in the Kanda collection, Shirazaki Park Center, Wakayama Prefecture (K. Hasegawa, pers comm.)

Type locality Cape Shirozaki, Wakayama Pref., Japan.

Material examined A total of 69 specimens.

Japan. 28 spms from the known part of the range

(Snyder Coll.).

Taiwan. R/V *Fishery Researcher No.1*, TAIWAN 2000 sta. DW36, 21°54.8' N, 120°36.2' E, 305 m, Bashi Channel, 2 worn dd (MNHN).

Philippines. Mactan, Punta Engano, tangle nets, “up to 240 m”, 2 spms.— Mactan, Punta Engano, tangle nets, “up to 240 m”, 3 spms.— Mactan, Punta Engano, “in deep water”, 2 spms (Fig. 1 E).— Punta Engano, tangle nets, 160 m, 1 dd.— Bohol, Panglao, 80 fms, tangle nets 1987, 1 spm (Fig. 1 F).— Bohol, Balicasag, in tangle nets, 160 m, 1 spm.— Bohol, Balicasag, in tangle nets, 160 m, 1 spm.— Bohol, Balicasag, 160 m, tangle nets, 5 spms.— Balut, tangle nets, 240 m, 1 spm.— no data, 1 lv.— no data, 1 spm. (All Snyder collection).— Bohol-Cebu area, 50-150 m, 3 spms (MNHN, ex Guido Poppe) (Fig. 1 H).— Palawan, trawled in deep water, 1 spm (NM J3378 ex Springsteen 1982).— Bohol, Panglao, tangle nets, 1 spm (NM L1304 ex Springsteen), 1 spm (NM J3498 ex Peled 1982).

Viet Nam Off Vung Tau, by local trawlers, 1 spm (Snyder coll.).

Solomon Islands SALOMON 2: sta. DW2234, 06°51' S, 156°24' E, 182-277 m, 4 lv (Fig. 1 G), 1 dd (MNHN).

Vanuatu MUSORSTOM 8: sta. DW1021, 17°43' S, 168°37' E, 124-130 m, 1 dd.— Sta. DW1030, 17°52' S, 168°30' E, 180-190 m, 2 dd. (Both MNHN).

Tonga BORDAU 2: sta. DW1514, 21°18' S, 175°05' W, 130-133 m, 1 dd.— Sta. DW1521, 21°19' S, 175°01' W, 225-233 m, 1 dd.— Sta. DW1586, 18°34' S, 173°55' W, 440-487 m, 1 dd worn.— Sta. DW1587, 18°37' S, 173°54' W, 309-400 m, 1 dd.— Sta. DW1603, 22°12' S, 175°20' W, 189-196 m, 1 dd. (All MNHN).

Distribution From Kii Peninsula, middle Japan, southwards to Taiwan, the Philippines, Solomon Islands, Vanuatu and Tonga. In Japan, subtidal; in tropical seas, in deeper water, essentially in 130-250 m.

Description Shell fusiform, very solid, consisting of 1.5 protoconch and 8 teleoconch whorls. Protoconch paucispiral, ending with 3 strong axial ribs before the distinct protoconch/teleoconch discontinuity. Teleoconch whorls moderately convex, adpressed to preceding whorl, suture bordered abapically by low and

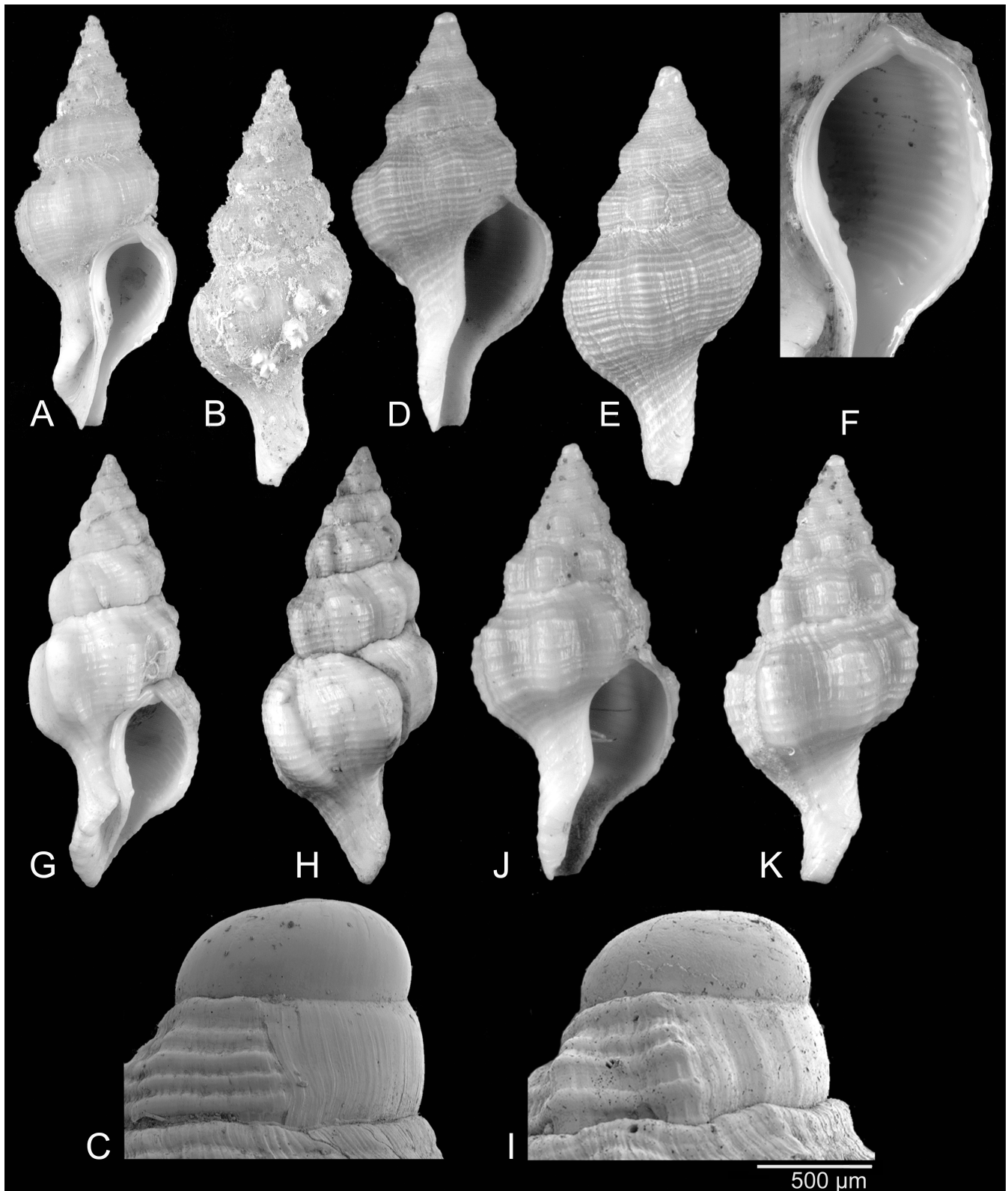


Figure 2 A-F *Fusolaticus luteus* n. sp. A-B Holotype, North of New Caledonia, 252-258 m, 46.5 mm. C Protoconch (SEM) of specimen from North of New Caledonia, 264-270 m [BATHUS 4: sta. DW942]. D-E Juvenile, North of New Caledonia, 215-225 m [SMIB 6: sta. DW109], 21.2 mm. F Detail of apertural liriation, North of New Caledonia, 210 m, total height of specimen 42.3 mm. G-K *Fusolaticus pachyus* n. sp. G-H Holotype, New Hebrides Arc, 195-250 m, 52.8 mm. J-K Juvenile paratype, New Hebrides Arc, 195-250 m [VOLSMAR: sta. DW41], 21.7 mm. I Protoconch (SEM) of specimen from same locality.

broad, indistinctly imbricated spiral ridge. Axial sculpture of broad, prominent axial ribs that are regularly rounded both in their axial extension and spiral cross-section, 7 ribs per whorl on earlier spiral whorls, 8 on penultimate and last whorls; and of much lower incremental riblets, indistinct on most of whorl periphery and base, distinct only in subsutural area where they form low and solid adapical imbrications, 3 or 4 riblets between two adjacent ribs and 3 or 4 overlaying each rib. Spiral sculpture of narrow, raised primary spiral cords, 6 on spire whorls, 18 on last whorl, and much weaker secondary cords, one between two adjacent primary cords. Siphonal canal open, long, recurved abaxially from aperture. Aperture lirate, 16 lirae extending spirally as far as one can see, corresponding with primary and secondary cords, most abapical lira stronger, forming a spirally elongated tooth constricting the base of the siphonal canal. Outer lip dentate. Inner lip detached, forming very oblique, narrowly open slit-like umbilicus, with one columellar plica and trace of a second.

Color of protoconch and interior of aperture white. Teleoconch background colour creamy white, with narrow, light brown basal band below periphery and light brown siphonal canal; axial ribs dark brown, with very distinctly set off white primary spiral cords.

The largest specimen reaches 51.3 mm.

Remarks *Fusolatirus kandai* is variable in colour, with extreme specimens almost uniformly orange-brown and others with brown colouration restricted to the axial ribs; although most of the specimens from Japan belong to the dark form, and most of those from the South Pacific belong to the lighter form, both forms and intermediates apparently coexist in the Philippines. The number of axial ribs is also a variable character, from a low of 7 on the last whorl in Japan, to 9, and occasionally 10, in the Philippines and Tonga. The number of spiral cords, by contrast, seems to be fairly constant throughout the range.

Fusolatirus kandai superficially resembles *F. balicasagensis*, and lives sympatrically with it in the Philippines. In *F. balicasagensis*, the shell is less solid, the siphonal canal is narrower, and the whorls are much more convex. *F. kandai* has a paucispiral protoconch, indicating non-planc-

totrophic larval development (Fig. 1 H), whereas the protoconch of *F. balicasagensis* is multispiral (Fig. 1 C-D), indicating planctotrophic larval development.

Fusolatirus luteus n. sp.

(Fig. 1 M, Fig. 2 A-F)

Type material Holotype (MNHN 9339) and two paratypes (MNHN 9340 and MNHN 9341), one paratype in Snyder Collection.

Type locality North of New Caledonia, 19°04' S, 163°28' E, 252-258 m [BATHUS 4: sta. CP936].

Material examined A total of 21 specimens.

New Caledonia MUSORSTOM 4: sta. DW183, 19°02' S, 163°26' E, 280 m, 2 dd, 1 lv (Fig. 1 M).— Sta. DW185, 19°06' S, 163°29' E, 230 m, 1 dd (paratype Snyder Coll.), 1 lv.

LAGON: sta. 1147, 19°08' S, 163°30' E, 210 m, 1 lv (Fig. 2 F).— Sta. 1151, 19°01' S, 163°27' E, 280 m, 1 dd.

SMIB6: sta. DW109, 19°06' S, 163°30' E, 215-225 m, 1 dd (Fig. 2 D-E).— Sta. DW115, 19°00' S, 163°27' E, 280-285 m, 1 lv, 1 dd (paratypes MNHN).

BATHUS 4: sta. CP936, 19°04' S, 163°28' E, 252-258 m, 2 lv (holotype, Fig. 2 A-B), 1 dd.— Sta. CP937, 19°03' S, 163°28' E, 257-261 m, 3 dd.— Sta. DW941, 19°02' S, 163°27' E, 270 m, 1 lv, 1 dd, 1 juv. dd.— Sta. DW942, 19°04' S, 163°27' E, 264-270 m, 3 dd, 1 juv. lv (Fig. 2 C).

HALICAL1: sta. DW01, 18°56' S, 163°24' E, 380-400 m, 1 dd. (All MNHN).

Distribution North of New Caledonia, Grand Passage channel, alive in 210-280 m.

Description (Holotype) Shell fusiform, solid, consisting of 1.5 protoconch and 7 ¼ teleoconch whorls. Teleoconch whorls very convex, slightly shouldered adapically, hardly adpressed to preceding whorl, suture very weakly bordered by low, indistinctly imbricated spiral ridge. Axial sculpture of low, very broad, and poorly defined axial ribs, rather indistinct on first whorls, 8 on last whorl; and of still more indistinct incremental riblets, except in subsutural area where they form short, low imbrications. Spiral sculpture of

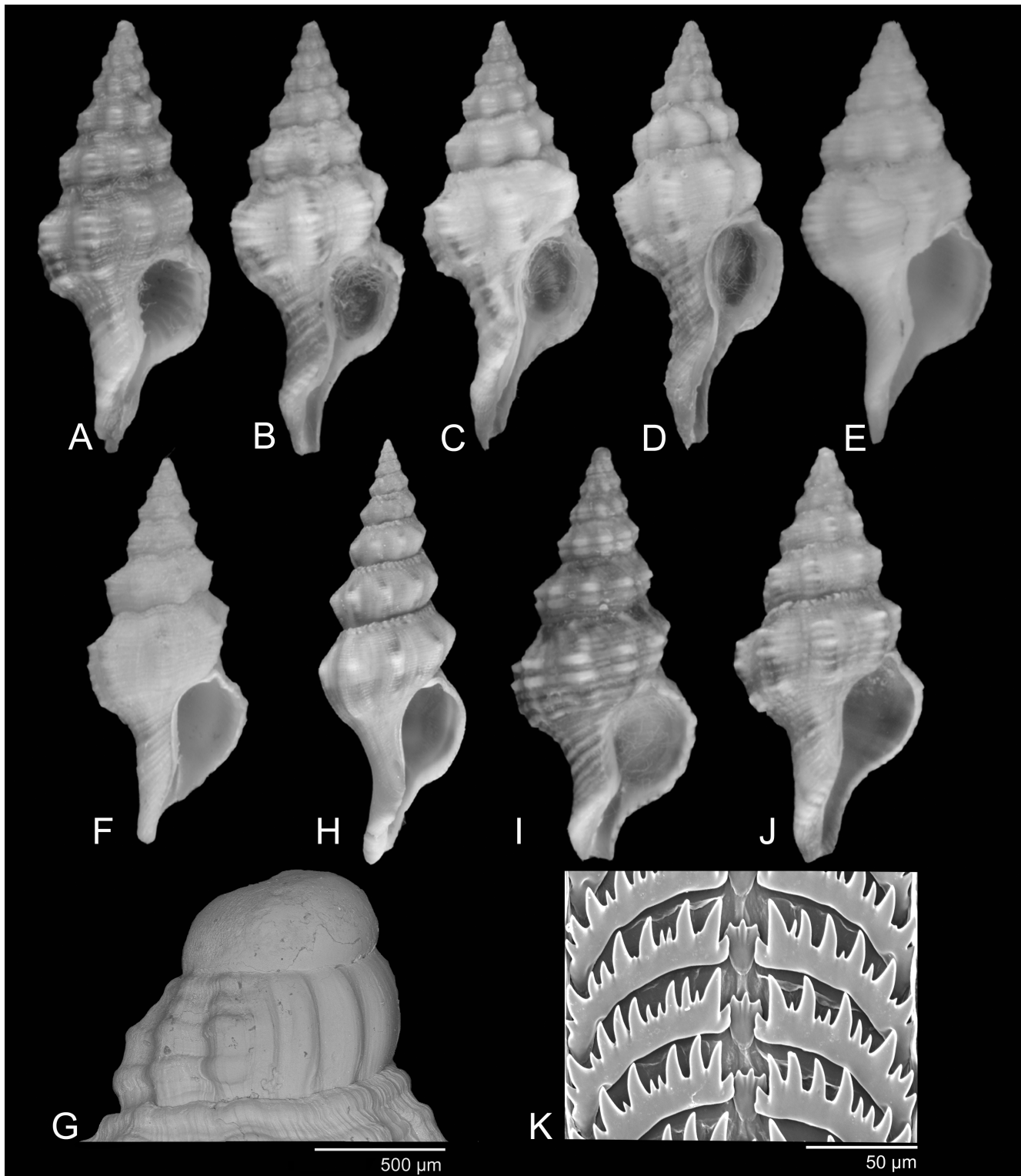


Figure 3 A-G, J *Fusolaticus rikaе* (Fraussen, 2003). A-C Philippines, Panglao I., 25.7, 25.6 and 32.3 mm respectively. D Japan, Nada, Wakayama Pref., 60-100m, 32.6 mm. E South Pacific, Wallis & Futuna, 210-245 m [MUSORSTOM 7: sta. DW512], 21.7 mm. F New Caledonia, 140-150 m [BATHUS1: sta. DW692], 21.8 mm. G Protoconch (SEM) of fragmentary specimen from Wallis & Futuna [MUSORSTOM 7: sta. DW512]. H, K *Fusolaticus suduirauti* (Fraussen, 2003). H Holotype, Philippines, Balicasag I., 56.2 mm. K Radula. Specimen from the Philippines, 188-195 m [MUSORSTOM 3: sta. CP108]. I *Fusolaticus coreanicus* (E.A. Smith, 1879). Specimen from Japan, Takeshima Beach, Nagasaki Pref., 22.9 mm. J *Fusolaticus rikaе* (Fraussen, 2003). Holotype, Bohol, Balicasag I., 22.4 mm.

low and ill-defined spiral cords, 5 primary cords with one secondary cord in interspace on first whorls, about 12, of uneven strength, on penultimate whorl, and about 25 on last whorl, very indistinct on base and canal. Siphonal canal narrowly open, moderately long, recurved abaxially from aperture. Aperture lirate, 15 lirae extending spirally as far as one can see, most abapical lira only slightly stronger. Outer lip sharp. Inner lip detached, forming oblique umbilicus, with one very weak but columellar plica and a short tooth at base of siphonal canal.

Color of the shell yellowish, a little darker on axial ribs.

Dimensions Holotype height 46.5 mm, diameter 17.6 mm, last whorl height (from peristome suture to tip of canal) 23.5 mm, aperture height 14.6 mm.

Remarks *Fusolatirus luteus* is easily recognized by its poorly developed axial sculpture, with an overall resemblance to buccinids classified in *Euthria* or *Buccinulum*. The radula is typical of *Fusolatirus*.

Fusolatirus luteus resembles *F. sarinae*, but it has a considerably larger protoconch and its axial sculpture is obsolete. In *F. sarinae*, the inner lip is adherent to the columella up to the apical end of the umbilicus, whereas in *F. luteus* it is erect and unattached from the apical end of the umbilicus to 2/3 of the distance to the posterior canal. Despite the superficial dissimilarity, *F. luteus* may be closely related to *F. pachyus*, which differs by its larger adult size and strong and sturdy axial sculpture. The two species occupy two different, strictly allopatric areas in the New Caledonia region.

Derivation of name *luteus*, -a, -um, Latin adjective meaning yellow, with reference to the colour of the shell.

***Fusolatirus pachyus* n. sp.**
(Fig. 2 G-K)

Type material Holotype (MNHN 9342) and one paratype (MNHN 9343).

Type locality New Hebrides Arc, near Hunter

& Matthew Is, 22°19' S, 168°41' E, 195-250 m [VOLSMAR, sta. DW41].

Material examined A total of 8 specimens. VOLSMAR: sta. DW41, 22°19' S, 168°41' E, 195-250 m, 3 dd (holotype, Fig. 2 G-H), 4 juv. dd (1 paratype, Fig. 2 J-K; Fig. 2 I).

SMIB 5: sta. DW95, 23°00' S, 168°20' E, 200 m, 1 juv. dd.

Distribution Loyalty Ridge and New Hebrides Arc at 22°-23°S, empty shells in 200 m.

Description (Holotype) Shell fusiform, very solid and heavy, consisting of 7+ teleoconch whorls (protoconch and tip of teleoconch eroded). Teleoconch whorls moderately convex, rather flat at periphery, shouldered adapically and adpressed to preceding whorl, suture bordered by low and broad, coarsely imbricated spiral ridge. Axial sculpture of very broad, prominent axial ribs that are regularly rounded in cross-section but distinctly flattened at periphery in their axial extension, 7 ribs per whorl on earlier spiral whorls, 6 on penultimate and last whorls; and of much lower incremental riblets, indistinct on most of whorl periphery and base, distinct only in subsutural area where they form low and solid adapical imbrications, 4-6 riblets between two adjacent ribs and 4-6 overlaying each rib. Spiral sculpture of broad and ill-defined spiral cords, 7 on spire whorls, 8 or 9 on penultimate whorl and 25 on last whorl; no second order spiral sculpture. Siphonal canal open, rather short, recurved abaxially from aperture. Aperture strongly lirate, 14 lirae extending spirally as far as one can see, most abapical lira only slightly stronger. (Outer lip chipped.) Inner lip detached, forming oblique umbilicus, with one weak but distinct, and two incipient, columellar plicae and a short tooth at base of siphonal canal.

Color of the shell entirely creamy white.

Dimensions Holotype height 52.8 mm, diameter 20.5 mm, last whorl height (from peristome suture to tip of canal) 27.5 mm, aperture height 16.4 mm.

Remarks The protoconch of a juvenile paratype has 1 ¼ whorl, it is smooth with a couple of terminal varices; protoconch/teleoconch discontinuity distinct.

Fusolatirus pachyus superficially resembles *F. paetelianus*, but it has fewer axial ribs (6-7 vs 8 on

last whorl) and fewer, much less distinct spiral cords (8-9 vs 10 on penultimate whorl). In *F. pachyus*, the siphonal canal is recurved dorsally away from the plane of the aperture and is also twisted abaxially; in *F. paetelianus*, the siphonal canal is shorter, more open, and less recurved.

Derivation of name *pachys*, Greek for heavy, with reference to the thickness and solidity of the shell. Treated as a Latin adjective.

***Fusolatirus rikae* (Fraussen, 2003) comb. nov.**
(Fig. 3 A-G, J)

Euthria rikae Fraussen, 2003: 35, pl. 2 figs 9-12.

Type material Holotype in MNHN (MNHN 6832) (Fig. 3 J).

Type locality Philippines, Bohol, off Balicasag I., from tangle nets in 200-250 m.

Material examined The holotype and 24 other spms.

Japan Nada, Wakayama Pref., 60-100 m, 2 spms (Fig. 3 D).— Gobo City, Wakayama Pref., at low tide, 4 spms.— Off Minabe, Wakayama Pref., 130 m, 4 spms. (All Snyder Coll.).

Philippines Bohol, Panglao I., tangle nets in 150 m, 2 spms (Fig. 3 A).— Panglao, tangle nets, 2 spms (Fig. 3 B, C).— no data, 6 spms.— Mindanao, Aliguay I., 150 m, 1 spm.— Bohol, Balicasag I., tangle nets in 160 m, 1 spm. (All Snyder Coll.).

Wallis & Futuna MUSORSTOM 7: sta. DW512, 14°13' S, 178°10' W, 210-245 m, 1 dd (Fig. 3 E), 2 fragm. (Fig. 3 G).

New Caledonia BATHUS 1: sta. DW682, 20°35' S, 164°59' E, 140-150 m, 1 dd (Fig. 3 F).

Diagnosis A species of *Fusolatirus* with paucispiral protoconch of 1.5 whorl. Teleoconch whorls distinctly shouldered, with rather narrow, open, siphonal canal. Colour pattern with creamy to light brown background, darker, discontinuous band below periphery and darker siphonal canal.

Remarks *Fusolatirus rikae* was described in the buccinid genus *Euthria*. Although we did not examine its radula, we transfer the species to *Fusolatirus* based on the characters of apertural

liration, columellar plication, and pattern of imbrication of the subsutural spiral ridge, all of which suggest a placement in Fasciolaridae rather than Buccinidae. In fact, *F. rikae* is very similar to *F. coreanicus* (E.A. Smith, 1879) (Fig. 3I), which differs by its very short siphonal canal, coarser spiral sculpture and blotched colour pattern. On average Japanese specimens here attributed to *F. rikae* differ from specimens from the Philippines essentially by a larger adult size and lighter color, but the range of variation of *F. rikae* in the Philippines includes specimens that are indistinguishable from Japanese specimens.

***Fusolatirus suduirauti* (Fraussen, 2003) comb. nov.**
(Fig. 3 H, K)

Euthria suduirauti Fraussen, 2003 [April]: 23, pl. 1 figs 1-5, pl. 2 figs 13-14.

Latirus cloveri Snyder, 2003 [June]: 2, figs 1-2. (**syn. nov.**)

Type material *Euthria suduirauti*: holotype in MNHN (MNHN 6839). *Latirus cloveri*: holotype in ANSP 408331.

Type locality *Euthria suduirauti* and *Latirus cloveri*: both Philippines, Bohol, Balicasag I., the former said to be from 200-340 m, the second from 150 m.

Material examined The holotypes of *Euthria suduirauti* (Fig. 3H) and *Latirus cloveri*.

Philippines Mindanao, Aliguay I. [also spelled Aligbay I.], trawled in 150 m, 2 spms (Snyder Coll.).— MUSORSTOM 3: sta. CP108, 14°01' N, 120°18' E, 188-195 m, 1 lv (Fig. 3K).

Diagnosis A species of *Fusolatirus* with paucispiral protoconch of 2 whorls. Teleoconch whorls with channelled suture, twin, smoothly imbricated subutural cords, and sharp, angular periphery. Colour pattern with light brown background, creamy white band on periphery, flanked by two darker, discontinuous bands that are distinct essentially on axial ribs.

Remarks The protoconch, of two smooth whorls with axial riblets in the last ¼ whorl, white mottled with light brown, is very similar to that of *F.*

elsiae and *F. balicasagensis*.

Fusolatirus suduirauti was described in the buccinid genus *Euthria*. Based on its radula, we transfer the species to *Fusolatirus*, with which it also shares the usual characteristics of the protoconch and teleoconch apertural liriation.

REFERENCES

- ABBOTT RT & DANCE SP 1982 *Compendium of seashells: a color guide to more than 4,200 of the world's marine shells*. New York: E.P. Dutton. ix, 411 pp., unnumbered pls.
- AZUMA M 1973 On the radulae of some remarkable gastropods from off Kirimezaki, Kii Peninsula, Japan with the description of a new cone shell. *Venus* 32(1): 9-19, pl. 1, text figs. 1-11.
- BOUCHET P & MARSHALL B (eds) 2001 Tropical Deep-Sea Benthos, volume 22. *Mémoires du Muséum National d'Histoire Naturelle* 185: 1-406.
- BOUCHET P (ed.) 1994 Résultats des Campagnes MUSORSTOM, volume 14. *Mémoires du Muséum National d'Histoire Naturelle* 167: 1-654.
- BOZZETTI L 1997 Study of the collection of Mr. Emmanuel Guillot de Suduiraut with the descriptions of three new gastropod species (Fascioliariidae, Trochidae and Turridae). *Bulletin of the Institute of Malacology*, Tokyo 3(4): 55-58.
- CROSNIER A & BOUCHET P (eds) 1991 Résultats des Campagnes MUSORSTOM, volume 7. *Mémoires du Muséum National d'Histoire Naturelle*, series A, 150: 1-259.
- FRAUSSEN K 2003 Two new *Euthria* (Gastropoda: Buccinidae) from the Philippine Islands. *Gloria Maris – Bulletin* 42(1): 22-31, pls. 1-2.
- HABE T 1961 Coloured Illustrations of The Shells of Japan, Vol. II. Osaka: Hoikusha. xii, 148 pp., appendix 42 pp., index 149-183, 66 pls. [English edition in 1964, with a larger page size: *Shells of the western Pacific in Color*, Vol. II. Osaka: Hoikusha. 233 pp., 66 pls.].
- HIGO S & GOTO Y 1993 *A systematic list of molluscan shells from the Japanese Is. and the adjacent area*. Osaka: Elle Corporation. 3, xxii, 693 pp., bibliography 1-13, index 149 pp., [in Japanese.]
- HIGO S, CALLOMON P & GOTO Y 1999 *Catalogue and bibliography of the marine shell-bearing Mollusca of Japan*. Gastropoda, Bivalvia, Polyplacophora, Scaphopoda. Osaka-fu, Japan: Elle Scientific Publications. pp. 1-749, 5 maps.
- HIRASE Y 1907 On Japanese marine molluscs (IX). *The Conchological Magazine* 1(9): 239-295, [in Japanese].
- KILBURN RN 1975 Taxonomic notes on South African marine Mollusca (5), including descriptions of new taxa of Rissoidae, Cerithiidae, Tonnidae, Cassidae, Buccinidae, Fascioliariidae, Turbinellidae, Turridae, Architectonicidae, Epitoniidae, Limidae and Thraciidae. *Annals of the Natal Museum* 22(2): 577-622, figs. 1-25.
- KURODA T 1950 Descriptions of two new species of marine gastropods, dedicated to Mr. K. Kanda on his 77th birthday. *Venus* 16(1-4): 49-52.
- KURODA T & HABE T 1952 *Checklist and bibliography of the Recent marine Mollusca of Japan*. Tokyo: L.W. Stach. 210 pp.
- KURODA T & HABE T 1971 Descriptions of genera and species. In KURODA T., HABE T. & OYAMA K. *The Sea Shells of Sagami Bay*. Tōkyō: Maruzen. xix, 741 pp. [Japanese text], 121 pls., 489 pp. [English text], 51 pp., index, map.
- KÜSTER HC & KOBELT W 1844-1876 Die geschwänzten unbewehrten Purpurschnecken. Erste hälfte: *Turbinella* und *Fasciolaria*. In MARTINI F.H.W. & CHEMNITZ J.H. *Systematisches Conchylien-Cabinet* 2nd ed., ed. H.C. Küster, 3(3a): 1-164, pls. 1-32, 9a, 9b, 13b.
- MELVILL JC 1891 An historical account of the genus *Latirus* (Montfort) and its dependencies, with descriptions of eleven new species, and a catalogue of *Latirus* and *Peristernia*. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Fourth Series 4: 365-411, pl. 2.
- OKUTANI T (editor) 2000 *Marine mollusks in Japan*. Tōkyō: Tōkai University Press. i-xlvi, 1-1174, color pls. and figs., map.
- OKUTANI T 1975 Glimpse of benthic molluscan fauna occupying the submarine bank, Kurose, near Hachijo Island, Japan. *Venus* 33(4): 185-205.
- REEVE LA 1847 [Monograph of the genus *Turbinella*]. *Conchologia Iconica* 4: [unpaginated text], pls. 1-13.
- RICHER DE FORGES B & CHEVILLON C 1996 Les campagnes d'échantillonnage du benthos bathyal en Nouvelle-Calédonie, en 1993 et 1994 (BATHUS 1 à 4, SMIB 8 et HALIPRO 1). In CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 15. *Mémoires du Muséum National d'Histoire Naturelle*, 168: 33-53.
- RICHER DE FORGES B & MENOUE JL 1993 La campagne MUSORSTOM 7 dans la zone économique des îles Wallis et Futuna. *Compte rendu et liste des stations*. In: CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 10. *Mémoires du Muséum National d'Histoire Naturelle* 156: 9-25.
- RICHER DE FORGES B 1990 Explorations for bathyal fauna in the New Caledonian economic zone.). In: CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 6. *Mémoires du Muséum National d'Histoire Naturelle*, series A 145: 9-54.
- RICHER DE FORGES B 1991 Les fonds meubles des lagons de Nouvelle-Calédonie: généralités et échantillonnage par dragages. In RICHER DE FORGES B. (ed.), *Le benthos des fonds meubles des lagons de Nouvelle-Calédonie* volume 1: 7-148. Etudes et Thèses, ORSTOM, Paris.
- RICHER DE FORGES B 1993 Campagnes d'exploration de la faune bathyale faites depuis mai 1989 dans la zone économique de la Nouvelle-Calédonie. *Listes des stations*. In: CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 10. *Mémoires*

- du *Muséum National d'Histoire Naturelle* **156**: 27-32.
- RICHER DE FORGES B, FALIEUX E & MENOU JL 1996 La campagne MUSORSTOM 8 dans l'archipel de Vanuatu. Compte rendu et liste des stations. In: A. Crosnier (ed.), Résultats des Campagnes MUSORSTOM, volume 15. *Mémoires du Muséum National d'Histoire Naturelle* **168**: 9-32.
- RICHER DE FORGES B, POUPIN J & LABOUTE P 1999 La campagne MUSORSTOM 9 dans l'archipel des îles Marquises (Polynésie française). Compte rendu et liste des stations. In: A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, volume 20. *Mémoires du Muséum National d'Histoire Naturelle* **180**: 9-29.
- RICHER DE FORGES B, BOUCHET P, DAYRAT B, WAREN A. & PHILIPPE J.S. 2000b La campagne BORDAU 1 sur la ride de Lau (îles Fidji). Compte rendu et liste des stations. In: CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 21. *Mémoires du Muséum National d'Histoire Naturelle* **184**: 25-38.
- RICHER DE FORGES B, NEWELL P, SCHLACHER-HOENLINGER M, SCHLACHER T, NATING D, CESA F & BOUCHET P 2000b La campagne MUSORSTOM 10 dans l'archipel des îles Fidji. Compte rendu et liste des stations. In: CROSNIER A. (ed.), Résultats des Campagnes MUSORSTOM, volume 21. *Mémoires du Muséum National d'Histoire Naturelle* **184**: 9-23.
- SMITH EA 1879 On a collection of Mollusca from Japan. *Proceedings of the Zoological Society of London* **1879**: 181-218, pls. 19, 20.
- SNYDER MA 2002 A new species of *Latirus* Montfort, 1810 (Gastropoda: Fascioliariidae) from the Western Pacific Ocean. *La Conchiglia* **34(304)**: 50-52, figs. 1-12.
- SNYDER MA 2003 Four new species of *Latirus* (Gastropoda: Fascioliariidae) from the Philippine Islands and the southern Caribbean. *Iberus* **21(1)**: 1-9, figs. 1-12.
- SNYDER MA & CALLOMON P 2005 On some *Fusolatirus* from Japan and the Philippines, with description of *F. higoï* sp. nov. (Gastropoda: Fascioliariidae). *Venus* **63(3-4)**: 109-119.
- SPRINGSTEEN FJ & LEOBRERA FM 1986 *Shells of the Philippines*. Manila: Carfel Seashell Museum. 377 pp., 100 pls.
- VERMEIJ GJ & SNYDER MA 2002 *Leucozonia* and related genera of Fascioliariidae (Gastropoda): shell-based taxonomy and relationships. *Proceedings of the Academy of Natural Sciences of Philadelphia* **152**: 23-44, figs. 1-45.