

New species of *Latirus* (Montfort, 1810) and taxa with which they have been confused (Gastropoda: Fascioliidae: Peristerniinae)

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ABSTRACT. *Latirus poppei* n. sp. from the Philippines and southern Japan and *L. ornatus* n. sp. from northeastern Australia and Papua-New Guinea are described and distinguished from *L. pictus* (Reeve, 1847) and *L. amplustre* (Dillwyn, 1817), with which they had been confused. *Latirus marrowi* n. sp. from northwestern Australia is described and distinguished from *L. polygonus* (Gmelin, 1791), *L. philberti* (Récluz, 1844) and *L. belcheri* (Reeve, 1847). The identity of *Latirus pictus* is clarified. *Latirus lautus* (Reeve, 1847) is transferred to *Turritelirus* Vermeij & Snyder, 2006.

INTRODUCTION

Snyder & Lyons (2014) discussed relationships of two species of *Latirus* described by Récluz (1844) to two others described by Reeve (1847) and corrected errors concerning those names in contemporary literature. Here we present accounts for *Latirus amplustre* (Dillwyn, 1817) and *L. pictus* (Reeve, 1847), followed by descriptions of three new species with which they have been confused. The new species have also been confused with *L. philberti* (Récluz, 1844), *L. belcheri* (Reeve, 1847) and *L. candelabrum* (Reeve, 1847), whose identities were clarified by Snyder & Lyons (2014). Misidentifications of the new species as *Latirus polygonus* (Gmelin, 1791) and "*Latirus*" *lautus* (Reeve, 1847) are mentioned and those species are figured as well.

Materials and Methods

Specimens were examined at the Academy of Natural Sciences of Drexel University and in the collection of the senior author. Specimens from both sources were acquired principally from commercial shell dealers and amateur collectors. Animals had been removed and discarded but opercula still accompanied many shells; all species were represented by several lots obtained from different sources, and data with the lots are in sufficient agreement to instill confidence in general accuracy. Synonymies are partial and intended to document how

classifications progressed over time and to identify literature containing information pertinent to our discussions and conclusions.

Abbreviations

AM: Museum prefix for Australian Museum
AMS: Australian Museum, Sydney, Australia
ANSP: Academy of Natural Sciences of Drexel University, Philadelphia, Pennsylvania, U.S.A.
BMNH: Museum prefix for The Natural History Museum, United Kingdom
BMSM: Bailey-Matthews National Shell Museum, Sanibel, Florida, U.S.A.
EFG: Emilio F. García, Lafayette, Louisiana, U.S.A.
ICZN: International Commission on Zoological Nomenclature
LC: personal collection of William G. Lyons, St. Petersburg, Florida, U.S.A.
MNHN: Muséum national d'Histoire naturelle, Paris, France
NHMUK: The Natural History Museum, London, United Kingdom
UF: Florida Museum of Natural History, Gainesville, Florida, U.S.A.
USNM: United States National Museum of Natural History, Washington, DC, U.S.A.
WAM: Western Australia Museum, Perth, Australia

Measurements.

Depths of collection are reported in meters (m). Shell sizes are reported in millimeters (mm), measured to nearest 0.1 mm with electronic digital calipers; single

measurements are of shell length (sl), whereas two measures signify shell length and width (sl x w) or a range of shell lengths (sl - sl); lv denotes live-taken specimens, dd empty shells; live-collection is a conservative judgment based on presence of opercula or partial retention of animal remains; well-cleaned shells lacking opercula are necessarily deemed dead-collected.

SYSTEMATICS

Family **FASCIOLARIIDAE** Gray, 1853

Subfamily **PERISTERIINAE** Tryon, 1880

Genus *Latirus* Montfort, 1810

Type species *Latirus aurantiacus* Montfort, 1810, by monotypy, = *Murex gibbulus* Gmelin, 1791, Recent, Indo-West Pacific region.

Latirus amplustre (Dillwyn, 1817)

Figs 1, 2

Buccinum amplustre Martyn, 1784: pl. 3 (Flag *Buccinum* from Friendly Isles); (name unavailable, introduced in nonbinominal work, per ICZN, 1957, Opinion 456; see also ICZN 1987: 319).

[no name]. Lightfoot, 1786: 39 (American Flag *Buccinum* from N.W. coast of America, extremely scarce).

Murex argus var. γ ? Gmelin, 1791: 3547-48 (Flag-*Buccinum*; ref. Martyn univ. Conchol. x.t.3; *Habitat ad insulas amicas et sociales* (= Friendly & Society Islands)); Dillwyn, 1817: 735 (synonymy for *Murex amplustre*; ref. *Murex argus*, var. Gmelin p. 3548); (*non Murex argus* Gmelin, 1791, Recent, South Africa, = type species of *Argobuccinum* Herrmannsen, 1846 (Ranellidae) by monotypy, *fide* Smith, 1970: 458).

Murex amplustre Chemnitz, 1795: 119, 120, pl. 191, figs 1841, 1842 (refs. Martyn Univ. Conchol. Tom. I. Tab. 3. & Catal. Musei Portland. No. 944); (name unavailable, introduced in nonbinominal work, per ICZN 1987: 319).

Vexillulum Americanum Humphreys, 1797: 35 (no. 652; American Flag; Le Pavillon D'Amérique; very rare); (name unavailable; work on Official Index of Rejected and Invalid Works in Zoological Nomenclature, per ICZN Opinion 51; see also ICZN 1987: 318).

Murex amplustre Dillwyn, 1817: 735 (description; ref. earlier unavailable names *Buccinum amplustre* Martyn Univ. Conch. i [1784] t. 3, *Murex argus* var. γ Gmelin [1791], p. 3548; & *Murex amplustre* Chemnitz, xi. [1795] p. 119, t. 191, f. 1841 & 1842; inhabits northwest coasts of America (Humphreys) & Friendly Islands (Martyn)).

Murex argus: Mawe, 1823: frontispiece, fig. 3, p. 135 (fig & caption; Amboina & Mediterranean Sea); (*non Murex argus* Gmelin, 1791, Recent, South Africa).

Turbinella aplustre [sic]: Sowerby, 1825: 59; Cernohorsky, 1972: 155 (synonym of *Latirus amplustris* [sic]).

Buccinum aplustre [sic]: Sowerby, 1825: 59.

Murex amplustris [sic] Chemnitz: Sowerby, 1825: 59.

Murex aplustre [sic] Wood, 1828: 129, pl. 27, fig 111.

Turbinella amplustre: Kiener, 1840-41: 37, 38, 50, pl. 20, fig 2.

Turbinella amplustris [sic]: Lesson, 1842: 206.

Turbinellus amplustre [sic]: Reeve, 1843a: 198; Reeve, 1843b: 371.

Latirus aplustris [sic]: Adams & Adams, 1853: 152.

Lathirus amplustris [sic]: Schaufuss, 1869: 34.

Fasciolaria aplustre [sic]: von Martens, 1872: 12.

Fasciolaria (Leucozonia) aplustre [sic]: von Martens, 1872: 35.

Turbinella (Plicatella) amplustre: Kobelt, 1876: 19.

Latirus amplustris [sic]: Tryon, 1881: 88, 232, 299, pl. 67, figs 115, 116; Couturier, 1907: 136 (Fakahina, Polynesia); Kay, 1971: 263, 266, 267, 276, 279, 280 (Line Islands at Fanning, Palmyra, Washington, Christmas & Jarvis Islands, common but restricted to seaward reefs at Fanning Island; common at Baker & Howland Islands but not at Canton Island); Kay & Switzer, 1972: 131 (Fanning Island); Cernohorsky, 1972: 155, pl. 46, fig 1 (figured shell from Suva Reef, Fiji); Cernohorsky, 1974: 182, fig 57 (syntype figured, dimensions 42.0 x 24.2 mm, in University Zoological Museum, Copenhagen); Kay & Switzer, 1974: 280 (Fanning Island); Salvat & Rives, 1975: 146 (sl to 7 cm; Tuamotu, Polynesia); Lillico, 1981: 11 (Christmas Island); Richard, 1982: 282 (French Polynesia at Society Islands & Marquesas; ecology: Îles hautes; biotope: faciès coralline); Richard, 1985: 427 (French Polynesia: Society Islands, Tuamotu & Marquesas). Bishop, 1993: 114, 115 (numerous under rocks & in coral crevices of inshore reef, Christmas Island); Hardy, 1994: 48 (Kiritimati Island, Kirbati); Higo *et al.*, 1999: 261 (*pars*; type locality Friendly Islands (Tonga); (not records for Japan, Philippines & Australia)); Rosenberg & Petit, 2003: 111 (corrected to *Latirus amplustre*).

Latirus (Turbinella) amplustre: Tapparone Canefri, 1882: 34.

Latirus amplustre: Grasset, 1884: 17; Rosenberg & Petit, 2003: 111 (correct name for *Latirus amplustris* [sic] as used by Kaicher, 1978); Mallard & Robin, 2005: 16, pl. 40 (tropical Pacific; average sl 70 mm); Robin, 2008: 219, figs 12 (French Polynesia); Coltro, 2013: 7 (reef at Kiritimati, Line Islands; specimens taken while snorkeling).

Latirus aplustre [sic]: Pilsbry & Vanatta, 1905: 292 (*pars*; Caroline Island; material also included *L. vexillulum* (Reeve, 1842)); Dautzenberg & Bouge, 1933: 199 (French Oceania: Île Anaa récifs (Cuming), Napuka! & Fakahina (et rec. Seurat, *i.e.*, Couturier, 1907)).

Latirus amplustrus [sic]: Kaicher, 1957: [18, 19], pl. 8, fig 2 (Melanesia & Polynesia).

Leucozonia amplustre: Dance, 1971: 374 (central Pacific: Tuamotu, Society, Tonga (Friendly), Cook & Fiji groups).

Fasciolaria amplustris [sic]: Kay, 1971: 263 (among dominant macromollusks of reef fauna at Danfer Point, Fanning Island).

Non Latirus amplustris [sic]: Hidalgo, 1904: 36, *nec* Faustino 1928: 271 (both Philippines); *nec* Taylor 1999: 1, color photo (Swain Reefs, Australia); *nec* Okutani & Tsuchiya *in* Okutani, 2000: 507, 508, pl. 26 (Japan); all = *Latirus* n. spp.

Non Latirus aplustre [sic] Kirtisinghe, 1978: 94, pl. 53, fig 10: (Sri Lanka), = *Latirus gibbulus* (Gmelin, 1791); *nec Latirus amplustre* Wing 1984: 149 (Hikkaduwa, Sri Lanka).

Type locality. Friendly Islands (Kingdom of Tonga) (Dillwyn, 1817; Higo *et al.*, 1999).

Type material. Syntype at University Zoological Museum, Copenhagen figured by Cernohorsky (1974: 182, fig 57).

Material examined. Kiribati: 4 lv, 60.3-68.2 mm, cable station at Fanning Island (Tabuaeran), Line Islands, 1917, ANSP 117089; 5 dd, 37.6-51.7 mm, Fanning Island, 1957, ANSP 316035; 4 lv, 50.6-65.6 mm, reef bench by Captain Cook Hotel, northeast side of Christmas Island (= Kiritimati), Line Islands, 12/1985, ANSP 360747; 4 lv, 47.4-58.5 mm, near Captain Cook Hotel, Christmas Island, 1-3 m, 2013, LC; 1 dd, 68.1 mm, Christmas Island, low tide, ANSP 461244; 20 lv/dd, 29.7-73.5 mm, Jarvis Island, U. S. Line Islands, 1957-1958, ANSP 315670; 1 dd, 44.7 mm, Canton (= Kanton) Island, Phoenix Islands, LC; 5 dd, 66.9-71.7 mm, Caroline Island, Southern Line Islands, ANSP 80131; **Caroline Islands:** 1 dd, 63.8 mm, Ascension Island (= Pohnpei), ex W.H. Pease, ANSP 35089; 2 lv, 64.6 and 78.7 mm, "Caroline Islands," ANSP 336299; **Marshall Islands:** 1 dd, 38.4 mm, Ebon Island, 7-8 mm, LC; **Polynesia:** 1 dd, 67.0 mm, Ins. Annaa (= Anaa Atoll, Tuamotu Archipelago), ANSP 34959; 4 lv, 43.0-54.7 mm, Otepipi Reef, Rangiroa, Tuamotu Archipelago, low tide, LC; 1 lv, 51.3 mm, same data, ANSP 461573; 2 lv, 40.1 and 55.0 mm, Rangiroa Atoll, 1 m, LC; 2 lv, both 40.7 mm, Rangiroa Atoll, 3-5 m, LC; 2 dd, 57.4 and 67.6 mm, Tuamotu Islands, Pinchot Exped., 1929, ANSP 156142; 1 dd, 67.7 mm, Tuamotu Archipelago, in tide pool, 1990, ANSP 454029; **Samoa:** 1 dd, 63.3 mm, "Samoa Islands," 1986, ANSP 461189; **No data:** 1 lv, 60.0 mm, LC; 1 dd, 51.5 mm, LC.

Distribution. Central Pacific at Kiribati, Caroline Islands, Marshall Islands, and Phoenix Islands; "Samoa Islands;" Tonga; Cook Islands; Fiji; and Tuamotu Archipelago, French Polynesia, on shallow reef platforms.

Description. Shell thick, heavy, of moderate size for genus (to 78.7 mm sl), of about 10 whorls, with short, rapidly expanding spire, undulant periphery, and body whorl tapered to short, broad siphonal process. Protoconch worn or absent on all shells examined, apparently of about 2 whorls. Teleoconch with about 7 low, wide whorls on spire, each whorl with peripheral cord near shallow suture, cord rendered undulant by about 7 low axial ribs; 2-4 lesser spiral cords of various sizes on sutural ramp and between periphery and anterior suture; body whorl widest at periphery, more than half total shell length; large cord separating body whorl from base absent, junction of body whorl with base and short siphonal canal hardly discernible, whorl tapered to blunt anterior tip; large peripheral spiral cord rendered undulant by crossing broad ribs, followed by about 15 lesser cords of various sizes on anterior body whorl and siphonal process, some rather thin and other nearly as stout as peripheral cord. Aperture rather narrow, subtriangular; outer lip angled at periphery, somewhat sinuous anteriorly, inside edge marked with bars corresponding to stripes on outside of whorl; about 20 low, straight lirae emerging from within, not reaching lip edge; inner lip narrow, parietal shield hardly developed, with emergent rib forming callus at posterior junction with outer lip, curving anteriorly to prominent entrance fold; columella with about 5 or 6 plicae of various strengths including entrance fold; siphonal canal canted left, with straight, smooth inner edge; pseudo-umbilicus absent. Exterior shell color dark brown, nearly black, spiral cords white, generally narrower than brown interspaces; interior white except for dark brown and white bars on upper inside edge of outer lip. Operculum reniform, dark brown to black, with anterior terminal nucleus and many concentric growth lines. Periostracum and radula unknown.

Remarks. Reports in early literature cited the locality of *L. amplustre* as the Friendly Islands (Martyn, 1784). Gmelin (1791) mentioned the Friendly and Society Islands for *Murex argus* var. γ , a synonym, and Chemnitz (1795) cited both for *L. amplustre*, Lightfoot (1786) erroneously associated the common name of the species from western North America and was followed by Dillwyn (1817), who repeated the error but also mentioned the Friendly Islands (Tonga) where the species does occur and thus is the type locality, as was noted by Higo *et al.* (1999). Kay's (1971) statement that the type locality of *L. amplustre* is Anaa Island in the Tuamotu Archipelago is incorrect; the first association we found between the "Isle of Annaa" and *L. amplustre* is by Reeve (1847), who reported it as the location where Cuming collected the species.

Dance (1971) described the species' range as central Pacific, at the Tuamotu, Society, Tonga (Friendly), Cook and Fiji Island groups, and Cernohorsky (1972) confirmed its occurrence at Fiji. Concurrently, Kay (1971) reported occurrences at

Fanning Island (Tabuaeran), Palmyra, Washington (Teraina), and Christmas Island (Kiritimati) in what is now known as the Republic of Kiribati, and at nearby Jarvis Island, Baker Island and Howland Island, now U. S. territories. Collectively, most of these locations constitute the Line Islands of the central Pacific. Kay specified that the species was absent at Canton Island in the Phoenix group, but we examined a specimen from Canton Island. Other localities reported for the species include "Ascension Island, Pease!" (Tryon, 1881; Melvill, 1891), which we interpret as an early name for Pohnpei in the Caroline Islands; Caroline Island (Kiribati) in the Southern Line Island group (Pilsbry & Vanatta, 1905); Fakahina Atoll (Couturier, 1907) and Napuka Atoll, both in the Tuamotus (Dautzenberg & Bouge, 1933); and French Polynesia at the Society Islands, Tuamotus and Marquesas (Richard, 1982; 1985). We examined shells from several of these locations, from Ebon Island in the Marshall Islands, and one lot labeled "Samoa Islands." Records we consider to be doubtful include Amboina (Mawe, 1823), the Philippines (Hidalgo, 1904; Faustino, 1928), Queensland and Western Australia (several authors; see *L. ornatus* n. sp., herein), and southern Japan (several authors; see *L. poppei* n. sp., herein). The Sri Lanka record by Kirtisinghe (1978) is revealed by its figure to be *L. gibbulus*, and Wing's (1984) Sri Lankan listing probably echoed Kirtisinghe.

Richard (1982) reported that *L. amplustre* lives in the coralline facies of high islands at the Society Islands and Marquesas, but the species seems equally suited for life on wave-swept coral platforms of low atolls of the Line Islands and less elevated parts of Polynesia. Kay (1971: 263) reported the species among dominant macromollusks at Fanning Island, and Bishop (1993: 114, 115) noted good number of specimens under rocks and in coral crevices of the inshore reef at Christmas Island (Kiritimati), Republic of Kiribati. See Coltro (2013) for another account of the species' environment at Kiritimati.

Latirus pictus (Reeve, 1847)

Figs 3-6

Turbinella picta Reeve, 1847: pl. 4, fig 19 (Feejee Islands (Belcher)); Adams & Reeve, 1850: 43, 87, pl. 7, fig 9 (Feejee Islands); Reeve, 1860: 120, 121; Kobelt in Küster & Kobelt, 1874: 73, 74, pl. 18, figs 10, 11 (Fidschi Inseln); Vermeij & Snyder, 2002: 37 (Indo-Pacific); Snyder, 2003: 161 (tropical Indo-Pacific).

Leucozonia picta: Adams & Adams, 1853: 154.

Lathirus pictus: Schaufuss, 1869: 34 (*M. austral.*).

Turbinella (Peristernia) picta: Kobelt in Küster & Kobelt, 1876: 158; Kobelt, 1876: 25 (Fidschi Inseln).

Peristernia picta: Kobelt, 1877: 59; Tryon, 1881: 79, 264, 297, pl. 64, fig 39 (Viti Islands).

Latirus pictus: Paetel, 1883: 24 (in section *Leucozonia*; I. Viti); Paetel, 1887: 164 (I. Viti); Melvill, 1891: 406 (Ins. Viti); Wilson & Gillett, 1971: 100 (*pars*; original locality Fiji; not Western Australia record); Cernohorsky, 1972: 156, 334, pl. 46, fig 3 (described from Fiji Islands; may prove to be rotund, short-canaled form of *belcheri*; figured specimen from Nadroga reef, Fiji Islands); Santos Galindo, 1977: 222 (Mauritius [in error]); Wilson & Gillett, 1979: 175 (*pars*; original locality Fiji); Wilson & Gillett, 1982: 175 (*pars*; original locality Fiji); Marrow, 1988: 5, fig 3 (*pars*; in *L. polygonus* group; collected at Fiji); Trew, 1990: 3 (NMW, Cardiff; 1 lot, Fiji Islands); Goto & Poppe, 1996: 392 (Indo-Pacific); Higo *et al.*, 1999: 261 (type locality Fiji Islands).

Latirus belcheri auct.: Cernohorsky, 1972: 155, 156, 244, 334, text-fig 15 (radula), pl. 1, fig 6, pl. 46, figs 2, 2a (shells in figs 6 & 2a from Viti Levu Bay; shell in fig 2 from Suva Reef, Fiji); García, 1985: 50 (Rattail Reef, Fiji); (*non Latirus belcheri* (Reeve, 1847), southern Japan).

Type material. Lectotype 33.7 mm, Fiji Islands, BMNH 1968441, here selected.

Other material. Fiji: 3 lv, 20.7, 25.9 and 28.2 mm, "Viti Is.," ex A. Garrett, ANSP 34991; 2 lv, 46.5 and 49.8 mm, 1 dd, 51.5 mm, Malolo Lai Lai, LC; 4 lv, 30.3, 32.0, 34.4 and 36.8 mm, Mana Island, depth 1.3 m, LC; 1 dd, 42.2 mm, Lomalagi, Viti Levu, ex W.O. Cernohorsky, 1961, ANSP 279526; 1 dd, 28.9 mm, Korotago Reef, Sigatoka, Viti Levu, LC; 1 lv, 26.0 mm, 1 dd, 44.6 m, Vatia wharf, Viti Levu, ex Cernohorsky, ANSP 279591; 1 dd, 29.0 mm, Viti Levu, LC.

Distribution. Fiji Islands.

Description. Shell rather stout, small for genus (to 49.8 mm sl) with broad spire and about 8 flat-sided whorls bearing low, broad axial ribs and low spiral cords. Protoconch eroded on all shells examined, evidently of about 2 smooth whorls tapering to sharp tip. Teleoconch of about 6 whorls separated from each other by shallow, nearly indistinguishable suture; whorls of spire much wider than high, with straight sides and sparse, thin spiral cords separated by single fine threads on sutural ramp; peripheral cord much stronger than others, abutting suture anteriorly; sutural ramp of body whorl shallowly concave, with 6 spiral cords of varying strengths, each separated from others by 1 or 2 threads; peripheral cord wide, elevated, undulant, separated into 11 or 12 nodes by broad axial ribs which extend to base; space anterior to peripheral cord with 3 or 4 smaller cords separated from base by another large undulant cord; about 3 spiral cords on base and 5 transverse cords on short, wide siphonal process. Aperture subquadrate, outer lip broadly angled at junction with termini of 2 large cords of

body whorl; inside of outer lip with thin, emergent lirae generally correspondent to cords and interspaces of external surface, inside edge marked with light and dark spots and bars created by termini of cords and interspaces; lirae usually entire but sometimes interrupted; inner lip narrow, adherent, with prominent node-like posterior callus at terminus of large external cord; columella bearing 4 or 5 well-formed plicae including entrance fold; siphonal canal short, wide, with straight inner edge bordering chink-like pseudo-umbilicus, outer edge weakly crenulated by termini of external cords. Shell exterior with largest cords white; irregular axial streaks extending length of shell also white; smaller cords on ramp and body whorl yellow, interspaces between cords brown, presenting appearance of wide brown rectangles bordered top and bottom with yellow and on both sides by white; shell interior peach, light pink or white. Operculum reniform, dark brown, with terminal nucleus and numerous concentric growth lines. Periostracum unknown. Radula figured by Cernohorsky (1972: 156, text-fig. 15) as *L. belcheri*.

Remarks. Despite Reeve's (1847) statement that "Mr. Cuming possesses equally characteristic specimens from other sources [besides Fiji]," all reliable reports of specimens and materials we have seen are from Fiji.

Markings on *L. pictus* shells display considerable variability. Most shells we examined conform to the pattern we describe, but the 28.9-mm shell from Korotago Reef lacks white axial streaks and its yellow cords are hardly discernible; the overall effect is of a brown-banded shell with a few white spiral cords. Cernohorsky (1972: pl. 1, fig 6; pl. 46, figs 2, 2a, 3) figured four shells from Fiji. The shell in his fig 3, which he identified as *L. pictus*, represents a form resembling most shells we examined. Cernohorsky identified shells in his figs 2, 2a and 6 as *L. belcheri*, but true *L. belcheri* (Figs 7, 8) is quite dissimilar from the Fiji shells and that species is restricted to Japan. Cernohorsky's use of *belcheri* was evidently in error for *L. philberti* (Récluz, 1844), but *L. philberti* also differs from the Fiji species. Cernohorsky's fig 2 depicts a shell of *L. pictus* that simply has fewer yellow cords and lacks white axial streaks. The shell in Cernohorsky's fig 2a is also *L. pictus*, as evidenced by its rather low length/width (sl/w) ratio; young shells of *L. philberti* have a greater sl/w ratio caused by a longer siphonal process (Figs 9, 10). The shell in Cernohorsky's fig 6 is a larger example of *L. pictus* with features intermediate between those of the shells in his figs 2a and 3.

A report of *L. belcheri* at Rattail Reef, Fiji by García (1985) is also an error for *L. pictus*. Dr. E.F. García sent a photo (EFG email to WGL 8/3/2010) of the specimen (EFG 7052) which clarified its identity. He also sent a photo of another shell (EFG 16359) that he collected later at Nanuya Lai Lai, Yasawa Archipelago, western Fiji that resembles the one in

Cernohorsky's fig 2a but clearly is *L. pictus*. Other authors who included Fiji within the range of *L. belcheri* (e.g., Eisenberg, 1981; Surya Rao & Subba Rao, 1991; Subba Rao, 2003) probably took that information from the above reports.

Because shells that Cernohorsky figured as *L. belcheri* have proved to be *L. pictus*, it is likely that the radula he illustrated (1972: 156, text-fig 15) and assigned to *L. belcheri* is also of *L. pictus*. That radula is similar to one he figured for *L. polygonus*; both have a typical fasciolarid formula (1:1:1), with a nearly square rachidian bearing 3 small cusps and broad laterals bearing large, medially directed cusps. Sizes of the ten cusps of *L. pictus* increase toward the middle, the innermost cusp being largest, whereas the 12 cusps of *L. polygonus* are of nearly equal size. The laterals of both species are flanked on each end by single, much smaller cusps.

The specific name *pictus* has been applied erroneously to several other *Latirus* species that are described in accounts that follow. Characters that separate *Latirus pictus* from those species are discussed in those accounts.

Latirus poppei n. sp.

Figs 11-14

Latirus pictus auct.: Wolfe, 1978: 6, figs; Higo & Goto, 1993: 240; Delsaerd & Steppe, 1996: pl. 9, fig 4; Higo *et al.*, 1999: 261 (*pars*); Okutani & Tsuchiya *in* Okutani, 2000: 508, 509, pl. 253, fig 24; Hutsell *et al.*, 2001: 54; Mallard & Robin, 2005: 18, pl. 48, figs; Vermeij & Snyder, 2006, 414, 415, fig 1 F; Pisor & Poppe, 2008: 83; Robin, 2008: 222, figs; Snyder & Callomon *in* Poppe, 2008: 22, 106, 107, pl. 348, figs 3, 4; Barbier *et al.*, 2009: 119; (*non Turbinella picta* Reeve, 1847, = *Latirus pictus*, Recent, Fiji; *nec Latirus pictus* auct., Australia, = *Latirus ornatus* n. sp.).

Latirus (Latirus) pictus auct.: Springsteen & Leobrera, 1986: 178, 179, pl. 48, fig 7 (Philippines); (*non Turbinella picta* Reeve, 1847, = *Latirus pictus*, Recent, Fiji).

Latirus amplustris [*sic*] auct.: Wilson, 1994: 71, pl. 11, fig 14 A (*pars*); Okutani & Tsuchiya *in* Okutani, 2000: 508, 509, pl. 253, fig 26 (Japan); (*non Murex amplustre* Dillwyn, 1817, = *Latirus amplustre*, Recent, Line Islands, Melanesia and Polynesia).

Latirus lautus auct.: Robin & Mallard, 2005: pl. 45, 2 figs; Robin, 2008: 221, figs 15; (*non Turbinella lauta* Reeve, 1847, = *Turrilatirus lautus*, new combination, Recent, western Pacific).

Type locality. Coron Bay, Palawan, Philippines, on shallow reef (herein).

Type material. Philippines: Holotype lv, 48.1 x 28.4 mm, Coron Bay, Palawan, shallow reef, ANSP 454025; paratype lv, 44.5 mm, same data, ANSP

454026; paratype lv, 41.7 mm, same data, USNM 1265732; paratype lv, 45.6 mm, same data, UF 481168; 3 paratypes lv, 35.4-43.9 mm, same data, LC; 2 paratypes dd, 32.8 and 44.8 mm, Balabac Island, Palawan, MNHN IM-2012-2793 & 2794; 2 paratypes dd, 35.1 and 41.3 mm, same data, AM C.487769; paratype dd, 38.2 mm, same data, BMSM 17933; paratype dd, 34.5 mm, Palawan, LC; 5 paratypes dd, 38.1-44.4 mm, Balicasag Island, Bohol, tangle nets, 2000, ANSP 454454; 2 paratypes dd, 34.0 and 46.7 mm, Balicasag Island, LC; paratype dd, 40.4 mm, Caubian Island, Bohol, LC; 3 paratypes dd, 28.0-37.3 mm, Mactan Island, Cebu, reef at low tide, 1984, ANSP 454464; 6 paratypes dd, 28.8-36.0 mm, same data, 1986, ANSP 454434; 3 paratypes dd, 30.7-33.6 mm, same data, 1989, ANSP 454452; paratype dd, 37.8 mm, same data, 1992, ANSP 454435; 3 paratypes dd, 36.2-38.2 mm, same data, 2002, ANSP 454453; 2 paratypes dd, 37.8 and 42.0 mm, Oslob, Cebu, tangle nets, 2001, ANSP 454430; paratype dd, 45.8 mm, Laminusa Island, Sulu Sea, depth 6-8 m, WAM S56136; 3 paratypes dd, 28.7-37.7 mm, Siasi, Sulu Sea, 1984, ANSP 454431; paratype dd, 43.4 mm, same data, LC; paratype dd, 34.8 mm, Polillo Island, Calabarzon, LC; 3 paratypes lv, 31.0-37.4 mm, Habungan, Manay, Davao, Mindanao, low tide, ANSP 268434.

Other material. Philippines: 2 dd, 26.0 and 30.9 mm, Ormoc Bay, Leyte, tangle nets, 2007, ANSP 454475; 4 dd, 28.6-35.6 mm, Masbate, LC; 1 dd, 36.2 mm, Mactan Island, Cebu, LC; 1 dd, 33.0 mm, Samar Island, ANSP 390644; 1 dd, 32.9 mm, Samar Island, ANSP 395618. **Vietnam:** 1 dd, 32.4 mm, off Vung Tan, nets, 1998, ANSP 454459. **Thailand:** 8 dd, 26.3-34.1 mm, Phuket, coral reefs, 2/1985, ANSP 454427; 3 dd, 35.3-38.0 mm, Phuket, coral reef, 2-5 m, LC; 2 dd, 32.9 and 38.9 mm, Phuket, coral reef, 2-6 m, 2/1985, ANSP 454428. **Solomon Islands:** 1 dd, 32.6 mm, "Solomon Islands," 1984, ANSP 454429. **No data:** 2 dd, both 31.1 mm, no data, ANSP 120040; 1 dd, 36.0 mm, no locality, ex S.D. Kaicher coll., LC.

Distribution. Widespread in the Philippine Islands, especially in the vicinity of Mactan and Palawan as indicated by specimens examined; Amami Islands and Okinawa, Japan; Vietnam and Thailand; Solomon Islands?; Western Australia?

Description. Shell small for genus, to 48.1 x 28.4 mm, with broad spire, about 8 whorls bearing node-like axial ribs and low, broad spiral cords. Protoconch of adults invariably eroded, evidently of about 2 smooth whorls tapering to sharp tip. Teleoconch of about 6 whorls, each much wider than high, with concave sutural ramp and 8 or 9 prominent, node-like ribs abutting anterior suture; ramp of spire whorls crossed by 5 or 6 low, broad spiral cords of various sizes, cords separated from each other by narrow incisions or grooves; peripheral cord atop ribs and 2

cords between periphery and next suture most prominent; peripheral cord often shaping nodes to blunt points; body whorl nearly as long as spire, ornamented like spire whorls but with about 8 cords on ramp, large cord at periphery and another just anterior, followed by 3 or 4 smaller cords and then by a band of prominent nodes at intersection with base; base tapered to very short siphonal process; base and siphon bearing transverse cords with narrow interspaces and 2 larger cords adjacent to blunt tip. Aperture subquadrate, with narrow posterior sinus at intersection with parietal wall; outer lip biangulate, crenulated by termini of smaller cords from dorsum of body whorl, with more prominent, sinus-like corners at termini of larger cords; inside of outer lip with about 14 to 18 fine ribs posteriorly, becoming interrupted as dashes or pustules near junction with siphon; parietal shield adherent, concave, with prominent node adjacent to posterior sinus; columella with 4 prominent folds; basal fold oblique, others nearly perpendicular to axis of columella; siphon short, straight, smooth within; outer edge crenulated by termini of cords from dorsum; inner lip formed by extension of parietal shield, lip folded axially to completely or partially cover pseudo-umbilicus. Shell apex pink; nodular ribs, large cords, tip of siphon and shell interior white; sutural ramps, band of low cords on body whorl, base, and interspaces between nodes orange or dark yellow (Figs 11, 12); white areas on dorsum of some shells replaced by orange (Figs 13, 14); grooves (incisions) between spiral cords dark brown, usually appearing as interrupted lines but intact on some shells. Operculum black, drop-shaped, broadly rounded posteriorly and tapered anteriorly to terminal nucleus; outer surface bearing many close-packed growth increments; inner surface with prominent attachment scar bearing evenly spaced concentric increments; scar surrounded by smooth callus, especially thick on outer edge. Periostracum and radula unknown.

Etymology. The name honors Guido T. Poppe of Conchology, Inc., Cebu, Philippines, whose support of conchology and malacology has so enriched our knowledge of Philippines Mollusca.

Remarks. *Latirus poppei* has been confused most often with *L. pictus* (e.g., by Springsteen & Leobrera, 1986). Specimens of true *L. pictus* are figured herein, and other specimens were figured by Cernohorsky (1972: pl. 1, fig 6 [as *belcheri*] & pl. 46, figs 2 [as *belcheri*] & 3 [as *pictus*]) and Marrow (1988: fig 3). Okutani & Tsuchiya (in Okutani, 2000) figured shells of *L. poppei* from Okinawa as *L. pictus* and from the Amami Islands as *L. amplustris* (*sic*), thereby verifying the presence of *L. poppei* in Japan. Earlier listings of *L. pictus* from Japan (Kuroda & Habe, 1952; Kuroda, 1960; Higo & Goto, 1993; Higo *et al.*, 1999) probably also represent *L. poppei*.

Latirus poppei differs from *L. pictus* by its larger, rounder peripheral nodes, its less undulant peripheral cords, and by having the principal colors orange and yellow rather than brown or black on the spire, body whorl and base; orange, yellow, and occasionally white cords of *L. poppei* are separated from each other by narrow dark brown grooves, a feature absent in *L. pictus*. External colors, markings, and general shapes of *L. poppei* and *L. amplustre* shells are so different that comparison of their figures seems all that is necessary to distinguish them.

Wilson (1994: pl. 11, fig 14 A) figured what may be an orange morph of *L. poppei* as *L. amplustris* (*sic*) from the Abrolhos Islands, Western Australia, but we have seen no other indication that either species occurs in Australia. See next species account for further comment on Wilson's shell.

A Philippines shell figured in two views and identified by Mallard & Robin (2005: pl. 45) as *L. lautus* (Reeve, 1847) is *L. poppei*. *Turbinella lautus* Reeve, 1847 is usually classified in *Latirus* but is here transferred to *Turritalirus* Vermeij & Snyder, 2006. The species apparently occurs in the Philippines, New Guinea, and southern Japan. Shells of *T. lautus* (Fig 15) are much smaller than *L. poppei* (maximum sl about 23 mm), bulloid in shape, and have nearly straight sides, a shallow suture, and prominent spiral cords separated by distinct grooves; the cords and background color are orange and white or sometimes red ("scarlet" *per* Reeve) and the grooves are brown.

Most lots of *L. poppei* we examined are from the Philippines, many from the vicinities of Palawan and Mactan. Specimens figured by Springsteen & Leobrera (1986) and Delsaerd & Steppe (1996) were also from Palawan. A few lots from Vietnam and Thailand indicate that the species ranges across the South China Sea in addition to ranging northward to Japan. We saw one lot that contains an immature shell of *L. poppei* labeled "Western Australia, diver, rocks, 20 m, 2002" (LC), but we consider those data suspect, as we do data with a specimen labeled "Solomon Islands" (ANSP 454429).

The 48.1-mm holotype of *L. poppei* is near the maximum reported size for the species; the only larger records are 49 mm (Mallard & Robin, 2005; Robin, 2008) and 49.3 mm (Pisor & Poppe, 2008), all as *L. pictus*.

***Latirus ornatus* n. sp.**

Figs 16-21

Latirus candelabrum: Ripplingale & McMichael, 1961: 106-108, pl. 14, fig 2; (*non Turbinella candelabrum* Reeve, 1847, = *Latirus philberti* (Récluz, 1844), Recent, western Pacific).

Latirus pictus: Wilson & Gillett, 1971: 100, 101, pl. 65, fig 4; Wilson & Gillett, 1979: 175-177, pl. 40, fig 4; Wilson & Gillett, 1982: 175-177, pl. 40, fig 4; (*non Latirus pictus* (Reeve, 1847), Recent, Fiji;

nec Latirus pictus auct. = Latirus poppei n. sp., Recent, Japan and Philippines).

Latirus belcheri: Hinton, 1975: 33, fig 7; Hinton, 1978: 41, fig 12; (*non Turbinella belcheri* Reeve, 1847, = *Latirus belcheri*, Recent, Japan).

Latirus amplustris (*sic*) '(Dillwyn)': Loch, 1978: 4; Wilson, 1994: 71, pl. 11, fig 14 B (*pars*); Taylor, 1999: 1, color photo; Jarrett, 2011, 98, fig 347; (*non Murex amplustre* Dillwyn, 1817, = *Latirus amplustre*, Recent, Line Island, Melanesia and Polynesia).

Type locality. Hope Island, Great Barrier Reef, Queensland, Australia, reef at low tide (herein).

Type material. Queensland Australia: Holotype lv, 45.5 x 22.7 mm, Hope Island, Great Barrier Reef, reef at low tide, AM C.488770; paratype dd, 45.0 mm, same data, ANSP 454028; paratype dd, 43.9 mm, same data, BMSM 17932; paratype lv, 40.2 mm, same data, MNHN IM-2012-2796; paratype lv, 46.8 mm, Bushy Island, ANSP 454027; paratype lv, 44.1 mm, same data, USNM 1265733; paratype dd, 49.8 mm, Swain Reefs, UF 481167; paratype dd, 46.2 mm, same data, LC; **Papua-New Guinea:** paratype dd, 55.3 x 27.5 mm, Samarai Island, LC.

Other material. Papua-New Guinea: 3 dd, 22.8-47.0 mm, Samarai Island, LC.

Distribution. Queensland, Australia, from Swain Reefs, Great Barrier Reef, northward to Whitsunday Islands; Papua-New Guinea.

Description. Shell small for genus, to 55.3 x 27.5 mm, approximately twice as long as wide, with about 8 whorls ornamented with bands of up to 5 colors. Protoconch of adult shells invariably eroded, of about 2 whorls tapering to pointed tip. Teleoconch about 6 whorls, each wider than high; spire rather slender, initially with straight sides; beginning at about whorl 3, sutural ramp become somewhat concave and anterior parts of whorls become swollen by about 9 or 10 low, undulant, node-like axial ribs that abut anterior suture; spiral sculpture of 2 or 3 low cords on ramp, followed anteriorly by larger peripheral cord and another between periphery and anterior suture; body whorl much wider than spire, with about 5 low cords on ramp, each separated from the next by single threads; large undulant cord at periphery, followed by an adjacent large cord, a band of 4 smaller cords with faint threads in interspaces, and a prominent undulant cord at junction with base; dorsum of base bearing 2 to 4 cords and threads of various sizes; tapering rapidly to short, stout siphonal process with truncated tip; dorsum of siphon with 4 or 5 large and small oblique, transverse cords. Aperture subquadrate, with narrow posterior sinus at junction with parietal shield; outer lip biangulate, with sinus-like projections at termini of large cords of body whorl, lip edge

crenulated by termini of small cords that sometimes project beyond edge as denticles; inside of lip bearing 10 to 14 thin lirae; lirae usually intact posteriorly but sometimes interrupted near junction with siphon; parietal shield concave, with small node adjacent to posterior sinus; columella with 4 low, rounded anterior folds, occasionally with a fifth fold posterior to others; basal fold at junction with siphon sometimes obscure; siphonal canal short, straight, smooth within, with outer edge crenulated by cords of dorsum; inner edge smooth, formed by extension of parietal shield, folded axially to partially cover chink-like pseudo-umbilicus. Shell apex pink; teleoconch with spiral bands of brown, black, orange, yellow and white; largest cords usually white; smaller cords on ramp, body whorl, base and siphon white, orange or yellow; cord interspaces and threads usually dark brown or black, sometimes interrupted with white spots; interior white except where cords terminate at edge of outer lip. Operculum black, drop-shaped, filling aperture, broadly rounded posteriorly, canted toward axis and tapered to anterior nucleus; outer face bearing numerous concentric growth increments; inner face with attachment scar containing raised concentric ridges; scar bordered by thick callus most developed on outer edge. Radula unknown.

Etymology. The name *ornatus*, -a, -um, Latin, is adjectival, meaning decorated or ornamented, referring to the festive colors of the shell.

Remarks. The color pattern of *L. ornatus* shells seems exceptionally variable for a species of *Latirus* with a relatively restricted range. Typical shells display a harlequin mix of black, brown, orange, yellow and white bands and spots (Figs 16-19). We also examined fresh shells with morphology similar to that of *L. ornatus* but lacking white on the external surface (Figs 20, 21), having instead a pattern that resembles *L. gibbulus* (Gmelin, 1791), but we also saw shells intermediate in color pattern from the same locations,

so we believe the shells lacking white represent variants of *L. ornatus*.

Latirus ornatus differs from *L. pictus* by its more slender spire with convex sides and prominent white peripheral cords. Yellow cords with dark brown interspaces of *L. pictus* are crossed by white axial lines that subdivide the sutural ramp, body whorl and base into rectangles of unequal size, whereas shell markings on *L. ornatus* consist principally of spiral bands of various sizes and colors. The basal entrance fold is usually the smallest of 4 or 5 columellar folds on *L. ornatus*, rather than the largest as in *L. pictus*, and 1 or 2 fold-like swellings may occur along the inner lip of the siphon of large specimens of *L. pictus*, a feature so far unique among western Pacific Peristerniinae.

Latirus ornatus can be distinguished from *L. amplustre* by its lighter-weight shell of smaller maximum size (55.3 vs. 78.7 mm sl) and its possession of a prominent undulant cord between the body whorl and base, producing a subquadrate rather than subtriangular aperture. The harlequin pattern of *L. ornatus* may also distinguish the species from *L. amplustre*, whose stripes are almost always brown and white, but orange and yellow may fade on dead shells of *L. ornatus*, and the dark and light bands that persist may resemble those of *L. amplustre*.

Loch's (1978) report of *Latirus amplustre* in northern Queensland likely involved *L. ornatus*. The specimen figured as *L. amplustre* by Jarrett (2011) from northern Queensland is the typical form of *L. ornatus*, as is one figured as *L. belcheri* by Hinton (1975; 1978) and one figured as *L. candelabrum* (Reeve, 1847) by Rippingale & McMichael (1961). A shell that Wilson (1994) figured as *L. amplustris* (*sic*) from Palm Island, Queensland resembles shells we examined from Hope Island that we consider variants of *L. ornatus*.

Loch (1978) characterized the Queensland population as an uncommon subtidal species living on bommies and reef faces but straying up into the intertidal zone, especially the live coral edge.

Figures 1-15

1-2. *Latirus amplustre* (Dillwyn, 1817). 51.3 mm, Otepipi Reef, Rangiroa Atoll, Tuamotu Archipelago, ANSP 461573.

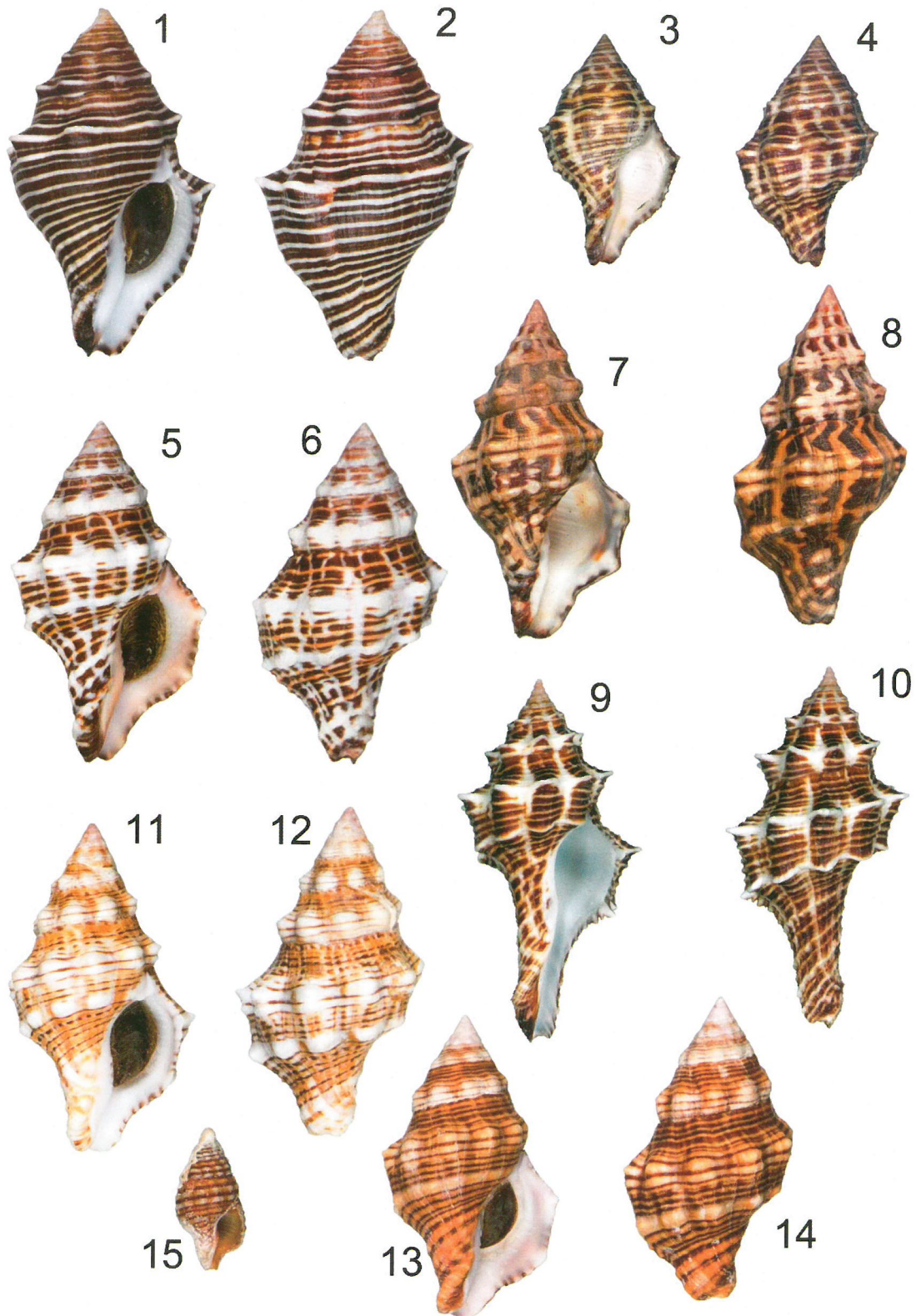
3-6. *Latirus pictus* (Reeve, 1847). 3-4. Syntype of *Turbinella picta* Reeve, 1847, 33.7 mm, Fiji, BMNH 1968441; 5-6. 49.8 mm, reef at east side of Malolo Lai Lai, Fiji, LC.

7-8. *Latirus belcheri* (Reeve, 1847). Lectotype of *Turbinella belcheri* Reeve, 1847, 49.7 mm, NMW 1955.158.01407.

9-10. *Latirus philberti* (Récluz, 1844). 52.9 mm, Calituban Island, Philippines, ANSP 426299.

11-14. *Latirus poppei* n. sp. 11-12. Holotype, 48.1 mm, Coron Bay, Palawan, Philippines, ANSP 454025; 13, 14. Paratype, 44.5 mm, same data, ANSP 454026.

15. *Turrilatirus lautus* (Reeve, 1847). 21.0 mm, SE tip of Maransabadi, Aoeri Island, Geelvink Bay, Dutch New Guinea (= West Irian, Indonesia), ANSP 207497.



Latirus marrowi n. sp.

Figs 22-25

Latirus belcheri: Wilson & Gillett, 1971: 100, 101, pl. 65, fig 1; Dressler, 1972: 29; Coleman, 1975: 65, fig 181; Wilson & Gillett, 1979: 175, 177, pl. 40, fig 1; Wells, 1980: 244; Wells, 1981: 259; Wilson & Gillett, 1982: 175, 177, pl. 40, fig 1; Wells, 1989: 39; Dance, 1992: 149, color figs (*pars*, right fig only); Wilson, 1994: 71, 252, 253, pl. 11, fig 23; Delsaerd & Steppe, 1996: pl. 9, fig 7 (*pars*, fig. only); Dance, 2002: 149, color figs (*pars*); Coleman, 2003: 76, 2 figs; Mallard & Robin, 2005: 17, pl. 41 (*pars*; right fig only).

Latirus polygonus: Marrow, 1988: 5, fig 1; [*non Latirus polygonus* Gmelin, 1791, Recent, Indo-west Pacific].

Type locality. Broome, Western Australia, on intertidal limestone reef (herein).

Type material. Western Australia: Holotype lv, 73.8 x 38.2 mm, Broome, atop limestone reef, intertidal, WAM S56137; paratype lv, 70.7 mm, same data, AM C.487771; 2 paratypes lv, both 66.7 mm, same data, LC; 2 paratypes lv, 68.4 and 81.5 mm, off Broome, ANSP 454043; 4 paratypes lv, 52.4-65.5 mm, off Broome, under ledges, ANSP 454423; paratype lv, 72.2 mm, port of Broome, rocks at low tide, LC; paratype lv, 64.4 mm, Broome, under rubble, low tide, UF 481166; paratype lv, 63.7 mm, Broome, reef at low tide, BMSM 17931; paratype lv, 63.4 mm, Broome, MNHN IM-2012-2795; 2 paratypes lv, 46.9 and 53.8 mm, Broome, intertidal under rocks at wharf, LC; paratype lv, 68.2 mm, Riddell Beach, Minyirr, near Broome, low tide, LC; 2 paratypes lv, 38.2 and 56.9 mm, Broome, LC; paratype dd, 62.7 mm, Shark Bay, under coral slab, intertidal reef, LC; paratype lv, 72.3 mm, Port Hedland, shallow water, USNM 1265734; paratype dd, 62.6 mm, Cygnet Bay, rocks, depth 8 m, LC; paratype lv, 58.9 mm, Cygnet Bay, rocks, depth 8 m, AM C.487772; 2 paratypes lv, 53.3 and 56.2 mm, Cygnet Bay, depth 8 m, ANSP 454049; paratype dd, 57.3 mm, Cape Levesque, reef at low tide, WAM S56138; paratype dd, 51.0 mm, King Sound, ANSP 454426; 2 paratypes lv, 61.3 and 65.7 mm, Price Point, depth 8 m, ANSP 454422.

Other material. Western Australia: 7 lv, 52.9-62.1 mm, Entrance Point, Broome, 9/1958, ANSP 232992; 1 dd, 66.2 mm, Broome, reef at low tide, LC; 2 lv, 49.0 and 62.8 mm, Broome, sand and rock areas, low tide, ANSP 454425; 1 lv, 58.7 mm, Broome, LC; 1 dd,

46.3 mm, Cape Levesque, ANSP 350294; 1 lv, 65.5 mm, "Western Australia," LC; **Northern Territory:** 1 dd, 54.3 mm, Shoal Bay, about 30 km northeast of Darwin, 2/1960, ANSP 245298; **Queensland:** 2 dd, 65.8 and 75.0 mm, Cooktown, low tide, ANSP 454421; 1 lv, 61.5 mm, Keppel Bay, LC.

Distribution. Northern coast of Western Australia to northeastern Queensland.

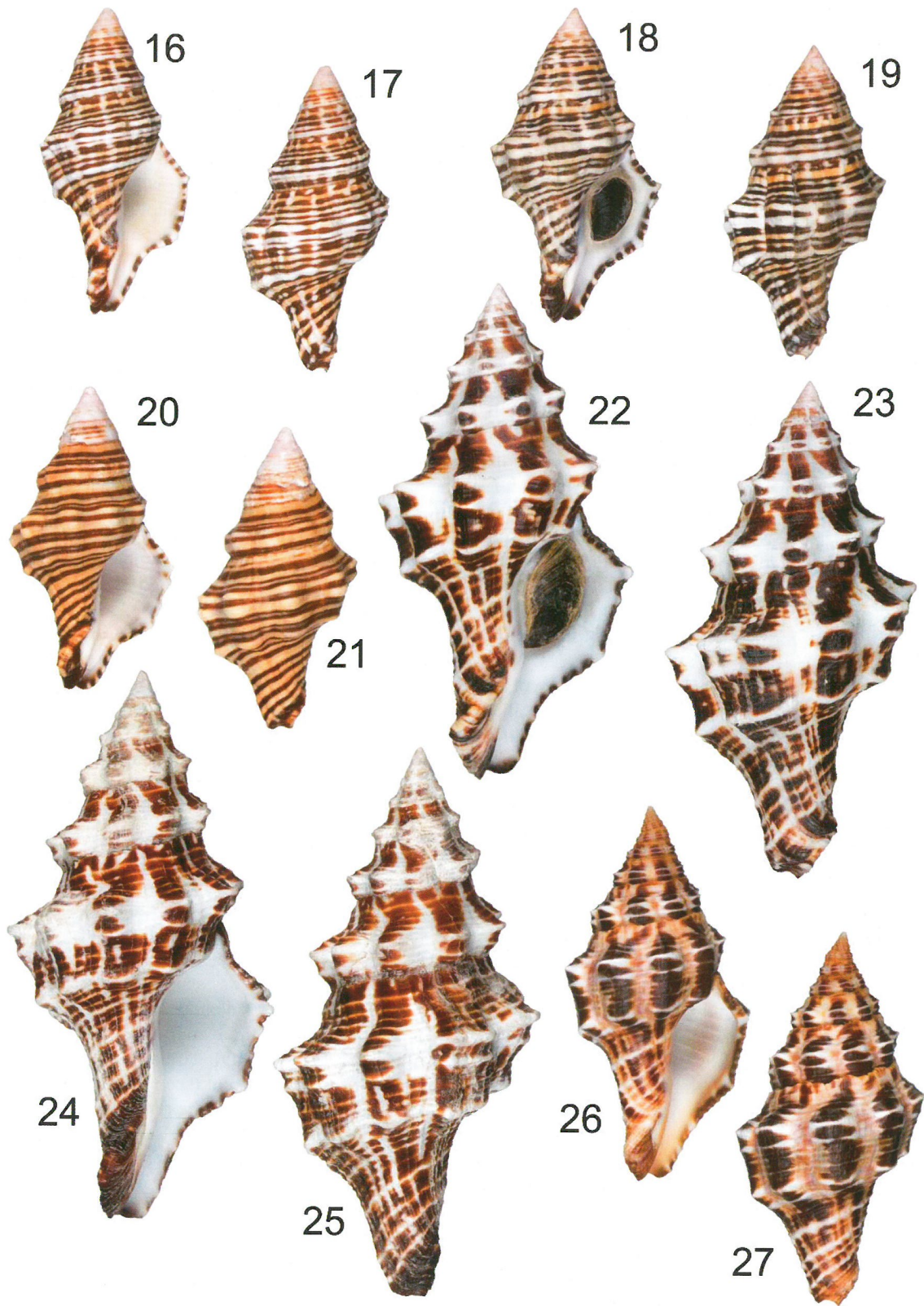
Description. Shells of moderate size for genus, to 81.5 mm sl, broadly fusiform, with about 9 whorls bearing strong, sharply-angled axial ribs and prominent spiral cords; color pattern of contrasting dark brown patches and white lines. Protoconch of about 1.5 smooth whorls. Teleoconch with 8 or 9 broader than high axial ribs extending from suture to suture, generally aligned from whorl to whorl; ribs initially low on concave sutural ramp, then ascending abruptly to sharp points near anterior suture; ribs and interspaces crossed by 2 large primary spiral cords, one at periphery connecting points at apices of ribs, the other slightly weaker and located between peripheral cord and anterior suture; ramp and ribs also bearing 8 or 9 inconspicuous secondary cords; body whorl with sides slanted inward toward long axis between peripheral cords and additional undulant primary cord anteriorly at intersection with base; ribs diminishing in strength as base tapers rapidly to siphonal process; siphonal process rather short with straight sides, bluntly rounded at anterior tip, with dorsal surface crossed by large and small transverse cords. Aperture subquadrate, with narrow, sharply incised sinus at posterior end; outer lip thin, biangulate, with sinus-like channels at termini of anterior and posterior primary cords of body whorl; lip edge crenulated by termini of secondary cords of dorsum, sometimes rendered denticulate by extensions of secondary cords, inside edge marked with light and dark spots and bars created by termini of cords and interspaces of body whorl; inner surface of lip with about 20 emergent lirae increasing in strength anteriorly, posterior-most lirae thin, sometimes bifurcate; parietal shield smooth, adherent, arcuate; columella smooth, marked only by 2 faint fold-like swellings near base; siphonal canal straight, smooth within; outer edge vaguely crenulated by termini of dorsal cords; inner edge produced by extension of parietal shield, straight, elevated, lamellate, forming long, narrow pseudo-umbilicus that extends to anterior tip. Shell apex light tan or pink;

Figures 16-27

16-21. *Latirus ornatus* n. sp. **16-17.** Holotype, 45.5 mm, Hope Island, Great Barrier Reef, Queensland, Australia, reef at low tide, AM C.487770; **18-19.** Paratype, 46.8 mm, Bushy Island, Queensland, ANSP 454027; **20, 21.** Paratype, 45.0 mm, Hope Island, reef at low tide, ANSP 454028.

22-25. *Latirus marrowi* n. sp. **22-23.** Holotype, 73.8 mm, Broome, Western Australia, intertidal, WAM S56137; **24-25.** Paratype, 81.5 mm, Broome, ANSP 454043.

26-27. *Latirus polygonus* (Gmelin, 1791), 55.6 mm, Long Island, Queensland, Australia, ANSP 461244.



teleoconch exterior white, less commonly yellow, with dark brown patches on axial ribs and extending to anterior tip; primary cords of spire, body whorl and base white, dividing ribs and base into series of dark brown patches; secondary cords also occasionally white, further interrupting continuity of brown patches; intercostal areas usually white, especially at whorl periphery; shell interior always pure white. Operculum typical of genus, black, drop-shaped, broadly rounded posteriorly, canted left and tapered to point at anterior terminal nucleus; outer face with numerous indistinct concentric growth increments; inner face occupied by prominent attachment scar, bordered by thick callus on outer edge. Periostracum and radula unknown.

Etymology. The name honors the late Ivan Marrow, who in 1988 first recognized that this species is distinct from *L. belcheri*.

Remarks. Apices of adult specimens are generally eroded, so descriptions of the protoconch and apex are from an immature shell (38.2 mm sl; LC). Eroded tips appear pink, much like those of true *L. belcheri* and *L. poppei*, but unworn tips are tan or light brown.

All but one of the specimens of *L. marrowi* were labeled "*Latirus belcheri*" when we obtained them. As indicated by the synonymy, this species was long confused with *L. belcheri* (Reeve, 1847), which in turn was confused with *L. philberti*; see Snyder and Lyons (2014) for descriptions of those species. Most confusion regarding the new taxon probably involved true *L. philberti*, for in fact northwest Australian specimens resemble *L. belcheri* very little, as shown in Figs 7 & 8. Shells of *L. marrowi* do resemble those of *L. philberti* but differ by having a spire that is relatively taller, shifting the location of its body whorl closer to the anterior end of the shell; sides of the body whorl of *L. philberti* are nearly parallel, whereas those of *L. marrowi* are more reflexed inwardly toward the long axis anteriorly; the large cord separating the body whorl from the base is less undulant on *L. marrowi* than on *L. philberti*; and spiral lines seldom cross the conspicuous dark markings on axial ribs of *L. marrowi*, and when they do occur they do not subdivide the dark areas into neat elongate rectangles as similar lines always do on *L. philberti*.

Marrow's (1988) attempt to correct the identification of the Western Australian species was universally ignored. When he distinguished it from *L. belcheri*, he assigned it to *L. polygonus* (Gmelin, 1791), a widespread Indo-west Pacific species that exhibits much morphological plasticity. *Latirus polygonus* occurs in several forms in various parts of its range (Japan, Philippines and eastern Australia to most Indian Ocean islands, the Red Sea and East Africa). A shell of the Australian form of *L. polygonus* (Figs 26, 27) is provided for comparison.

Western Australian shells do resemble those of *L. polygonus* (Gmelin, 1791), as noted by Marrow.

However, the body whorl of *L. polygonus*, like that of *L. philberti*, has nearly parallel sides, not sloping and compressed abapically toward the long axis as in *L. marrowi*. Unlike *L. marrowi* or *L. philberti*, the anterior cord that separates the body whorl from the base of *L. polygonus* is reduced in strength and interrupted, not entire as on the other two species. The two large cords on spire whorls of *L. marrowi* tend to rest almost directly on the anterior suture, whereas corresponding cords of *L. polygonus* are separated from that suture by a greater amount of exposed rib. Likewise, sutural ramps on spire whorls of *L. marrowi* form a relatively tall, flattened collar that extends to the next posterior suture, whereas the ramp on corresponding whorls of *L. polygonus* are occupied by broad ribs that extend to the preceding suture.

We examined two specimens of true *L. philberti* (ANSP 461191; 67.0 and 67.9 mm, dd) labeled "Broome, WA, low tide" and another specimen (ANSP 461190; 63.1 mm, dd) labeled "off Western Australia," but we doubt that these localities are authentic. Both had been identified as *L. belcheri*. We have also seen specimens of true *L. belcheri* labeled as being from northwestern Australia, but we consider those records suspect as well. True *L. belcheri* lives in southern Japan, principally near Okinawa. All of these Australian records may be examples of incorrect localities assigned to misidentified shells because of faulty literature.

Coleman (1975) reported this species to be fairly common on subtidal and intertidal shore reefs of the Australian northwestern coast, usually in holes or cracks in reefs. In addition to localities cited for material we examined (above), other localities reported for *L. marrowi* include: Port Hedland to Troughton Island (Wilson & Gillett, 1971, 1979, 1982); north coast eastward from North-West Cape (Wells, 1980); Admiralty Gulf, Kimberly region (Wells, 1981); vicinity of Kimberley Islands at Robroy Reef, Condillac Island, Institute Islands, Long Reef; western side of Cassini Island, an unnamed island in the Prudhoe Islands group, Montague Sound, 3 km northeast of Keraudren Island, near a small island southwest of Lucas Island, and Brunswick Bay (Wells, 1989); Port Hedland eastward, rocky shores and coral reefs, intertidal zone (Wilson, 1994); and Exmouth (Coleman, 2003). To these localities we add King Sound and Price Point (see material examined).

Wilson (1994: 71) cited the range of this species as Western Australia eastward to Queensland, but records become scarce east of Western Australia. We examined one specimen from east of Darwin, Northern Territory (ANSP 245298) and two lots from Queensland; of the latter, one specimen labeled "Keppel Bay, Queensland" was included in a lot with a specimen of the typical northeastern Australian form of *Latirus polygonus* (Gmelin, 1791), and a lot of two dead shells was labeled "Cooktown, Queensland." The shell that Delsaerdt & Steppe (1996: pl. 9, fig 7) figured as *L. belcheri* was also from Queensland.

A "Philippines" locality cited for a specimen of *L. marrowi* that Mallard & Robin (2005: pl. 41) misidentified as *Latirus belcheri* is probably an error.

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