

SYSTEMATICS OF SOME WEST PACIFIC *Lyria* (MOLLUSCA: VOLUTIDAE) WITH DESCRIPTION OF A NEW SPECIES

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Abstract. The taxa *Lyria taiwanica* Lan and *L. kawamurai* Habe, are placed in the synonymy of *L. santoensis* Ladd, and *L. kuniene* Bouchet is a suspected immature individual of the same species. *L. grangei* is described as a new species from the S.W. Pacific and is compared with the fossil *L. mallicki* Ladd.

The discovery during the last 5 years of both fossil and living specimens of new *Lyria* species from the west and southwest Pacific gave rise to several descriptions of new species, all published during the last 3 months of 1975. In this paper the validity of these "species" is evaluated on the basis of their original descriptions, type-figures or type-specimens and subsequently collected material.

Family VOLUTIDAE

Subfamily LYRIINAE Pilsbry & Olsson, 1954

Genus **Lyria** Gray, 1847

Lyria Gray, 1847, Proc. Zool. Soc. Lond. Pt. 15: 141. Type species by OD *Voluta nucleus* Lamarck, 1811. Recent, West Pacific.

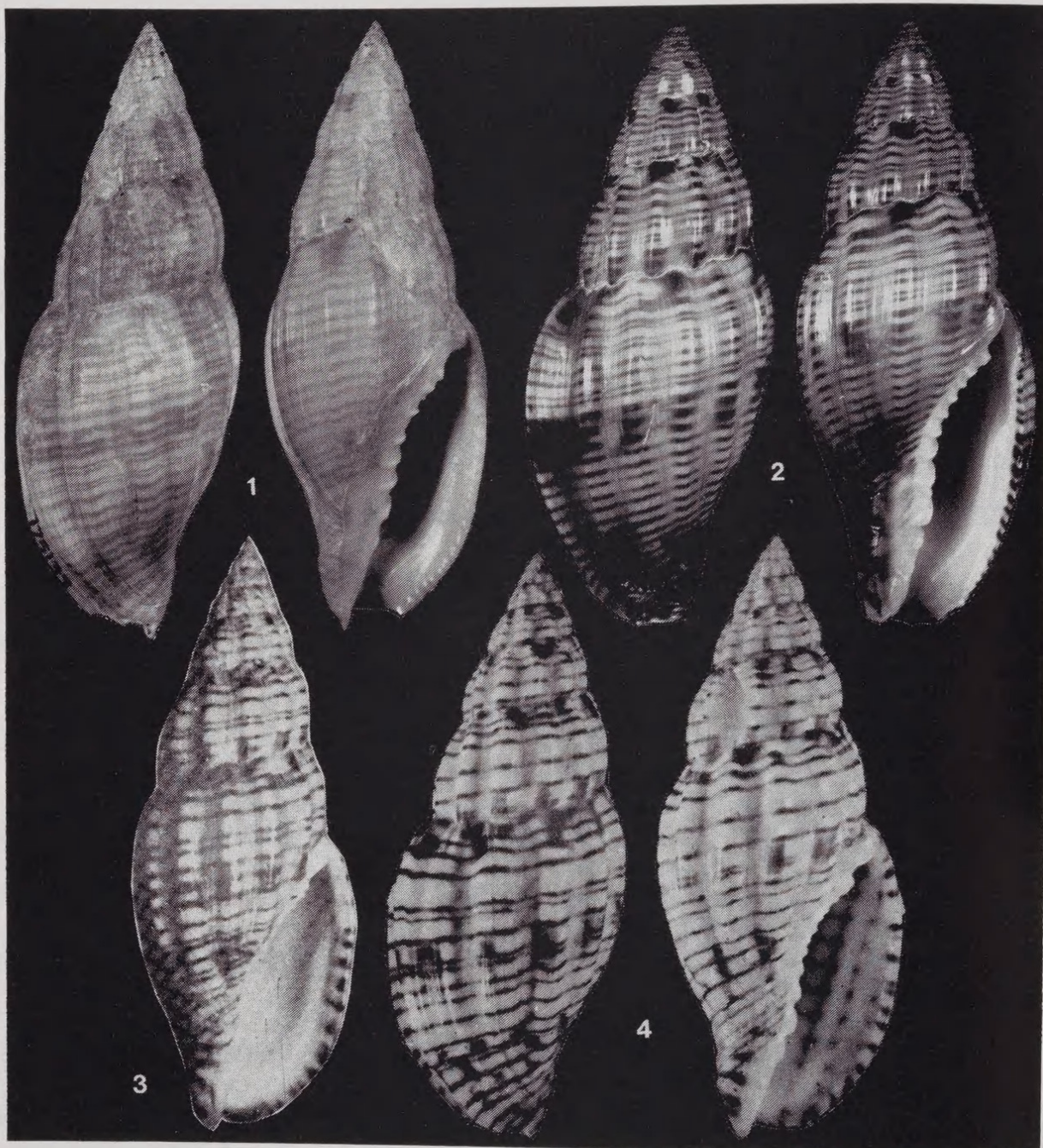
Lyria (Lyria) santoensis Ladd, 1975 (Figs. 1-6)

- 1974. *Voluta* n.sp. Leehman, Hawaiian Shell News 22 (10): 9, figs. on left.
- 1975. *Lyria santoensis* Ladd, Veliger 18 (2): 137, figs. 10-15 (publ. 1 October 1975).
- 1975. *Lyria (Lyria) taiwanica* Lan, Bull. Malac. Soc. China 2: 103, textfigs. (publ. 30 November 1975).
- 1975. *Lyria (Lyria) kawamurai* Habe, Bull. Nat. Sci. Mus. Tokyo (A), Zool. 1 (4): 195, pl. 1, figs. 1, 2 (publ. 22 December 1975).
- 1975. *Lyria kawamurai* Habe, Publ. commem. Anniv. R. Kawamura, p. 6, pl. 3, figs. 1, 4 (publ. 31 December 1975).
- 1977. *Lyria taiwanica* Lan, Weaver, Hawaiian Shell News 25 (11): 1, textfig.
- 1977. *Lyria kawamurai* Habe, Weaver, ibid. 25 (11): 1, lower figure (synonymized with *L. taiwanica* Lan).

TYPE LOCALITY. Kere River, Santo I, near St. SM 242, 166°56.7'E & 15°34'S, elevation 70 m, Pleistocene/Holocene of New Hebrides (*santoensis*); W. of Tiao-yu-tai Isle, off Taiwan, 96-120 m (*taiwanica*); off Suo, Taiwan (*kawamurai*).

DISTRIBUTION. Fossil from the Pleistocene/Holocene of New Hebrides. Living from Taiwan to the Philippines, Sabah, Indonesia to the Solomon Is.

Type specimens. The holotype of *L. santoensis* Ladd, is in the National Museum of Natural History, Washington, No. USNM 175138, dimensions 87.7 x 29.6 x 48.2 mm, together with the illustrated paratype No. USNM 175139, dimensions 79.7 x 29.3 x 43.0 mm (Fig. 1). The holotype of *L. taiwanica* Lan, dimensions 75.4 x 27.2 mm is in Lan's private collection (Fig. 3). The holotype of *L. kawamurai* Habe, dimensions 65.8 x 27.2 x 44.8 mm, is in Kawamura's private collection (Fig. 4).



Figs. 1-4. *Lyria santoensis* Ladd. 1. Paratype USNM No. 175139; 79.7 mm. 2. Specimen from Russel I, Solomon Is, 24-31 m; 75.0 mm. 3. Holotype of *L. taiwanica* Lan; 75.4 mm (from Lan, 1975, textfig.). 4. Holotype of *L. kawamurai* Habe; 65.8 mm (from Habe, 1975, pl. 1, figs. 1, 2).



Figs. 5-8. 5, 6. *Lyria santoensis* Ladd. Off Kota Kirabalu, Sabah; 55.0 mm. 7, 8. *L. kuniene* Bouchet. Holotype MNHN Paris; 64.0 mm (immature — from Bouchet, 1979, figs. 1, 2).

Ladd (1975) described *Lyria santoensis* from fossiliferous marls of the Kere River on Santo I, Solomon Is, and the age determination yielded a tentative figure of between 14,000 and 25,280 years. Ladd's description appeared in October 1975, and was soon followed by descriptions of living specimens from Taiwan by Lan (30 November 1975) and Habe (22 December 1975).

Weaver (1977) has in the meantime correctly synonymized *L. kawamurai* Habe with *L. taiwanica* Lan, but Ladd's prior description was either overlooked or has not been associated with those of living specimens. The species has, however, been reported from Panlao, Bohol, Philippines (Weaver, 1977) and specimens have been taken in fish-traps at Russel I, Solomon Is, 24-31 m (ex-coll. N. Potter [Fig. 2], off Tulagi I, Solomon Is, 92 m (leg. B. Bailey — B. Parkinson, pers. comm.), and off Kota Kinabalu, Sabah, Nth. Borneo (leg. V. Wee) [Figs. 5, 6].

Although somewhat variable in colour pattern, *L. santoensis* shows little variation in the number of axial ribs which number from 10-12 on the penultimate and from 9-13 on the body whorl. The chocolate-brown spiral lines number from 4-10 on the penultimate and from 18-26 on the body whorl, and lines are usually more numerous and closer set in specimens from Melanesia. In some individuals the spiral lines are present only on the axial ribs and are faint or absent in the interspaces.

In the accompanying table (Table 1) comparative diagnostic characters are given as described or observed in the type specimens although the actual range of variation is considerably greater. The features present in the three described forms are all well within the range of variation of *Lyria* species, and the taxa *L. santoensis*, *L. taiwanica* and *L. kawamurai* are considered to be conspecific.

***Lyria (Lyria) kuniene* Bouchet, 1979**

(Figs. 7, 8)

1979. *Lyria kuniene* Bouchet, Veliger, 22 (1): 49, figs. 1-3.

TYPE LOCALITY. West of Isle of Pines, southern New Caledonia, 22°49'S & 167°12'E, in 390-395 m.

Type specimen. The holotype of *L. kuniene* Bouchet is in the Muséum National d'Histoire Naturelle, Paris, dimensions 64.0 x 25.5 x 39.0 mm (Figs. 7, 8).

The species has been described (Bouchet 1979) on the basis of a single specimen which appears to be a very immature individual closely resembling *L. santoensis*. The inflated whorls, broad aperture, unthickened outer lip, weakly calloused columella and incomplete columellar denticles are characters of an immature state. In some specimens of *L. santoensis*, e.g. the specimen from Sabah (Figs. 5, 6), the brown spiral lines do not intrude on to the interspaces of the axial ribs. Further recovery of mature specimens is required before *L. kuniene* can be considered as a valid biospecies.

***Lyria (Lyria) mallicki* Ladd, 1975**

(Fig. 9)

1975. *Lyria mallicki* Ladd, Veliger, 18 (2): 137, figs. 2-9.

TYPE LOCALITY. Kere River, Santo I, near station SM242, 166°56.7'E & 15°34'S, elevation 70 m, Pleistocene/Holocene of the New Hebrides.

Type specimens. The holotype of *L. mallicki* Ladd is in the National Museum of Natural History, Washington, No. USNM 175096, dimensions 48.0 x 19.2 mm, together with the paratype No. USNM 214226, dimensions 45.8 x 16.6 x 26.0 mm (Fig. 9).

Lyria mallicki is similar to *L. planicostata* (Sowerby, 1903) and shares with this species 7 mature whorls and 2 minute, pointed embryonic whorls and yellowish-orange spiral lines and a similar shape, size, formation of aperture and absence of spiral striae in the interspaces. *L. planicostata* has only 3 fewer axial ribs on the penultimate whorl than *L. mallicki* (see Table 1), and the columella is edged with brown. The width-ratio of *L. mallicki* ranges from 36%-47% of length, that of *L. planicostata* is 42% of length.

Table 1. Main characters of some west Pacific *Lyria* species.

Characters	santoensis*	<i>taiwanica</i>	<i>kawamurai</i>	kuniene	mallicki	planicostata	grangei sp.n.
Size of type (mm)	87.7	75.4	65.8	64.0	48.0	53.0	61.7
Protoconch whorls	1¾-2	1½	2½	2½	2 (conical)	2	1¼-1½ (globose)
Teleoconch whorls	8¾-9	7-8	8	6	7	7	7-7½
Axial ribs on penult whorl	12	—	10-11	9	18	15	17-21
Axial ribs on body whorl	9-12	12-13	11-12	9	20	—	17-20
Spiral striae on penult whorl	none	none	none	none	none	none	23-41
Spiral striae on body whorl	none — only weak basal cords	none — only weak basal cords	none — only weak basal cords	none — only weak basal cords	none — only weak basal cords	none — only weak basal cords	40-58
Columellar folds	10	12-13	12	10	15-22	13-15	10-14
Spiral lines on penult whorl	8	10	4-5	7	traces of spiral lines	spiral lines present (not counted)	17-22
Spiral lines on body whorl	24-26	18-23	19-20	c. 18	traces of spiral lines	spiral lines present (not counted)	46-51

* Valid and tentatively valid species in bold type

Although Weaver and du Pont (1970) suggest that the unique holotype of *L. planicostata* (Sowerby) may prove to be a synonym of the Caribbean *L. beaulti* (Fischer & Bernardi, 1857), it is suspected that the species could be a survivor of the group of species comprising *L. hanzawai* MacNeil, 1960, from Mio/Pliocene deposits of the Ryukyu Is, *L. rex* Hirase, 1908, from the Pliocene of the Ryukyu Is, and *L. mallicki* from the Pleistocene/Holocene of the New Hebrides.

Lyria (Lyria) grangei sp. n.

(Figs. 10-13)

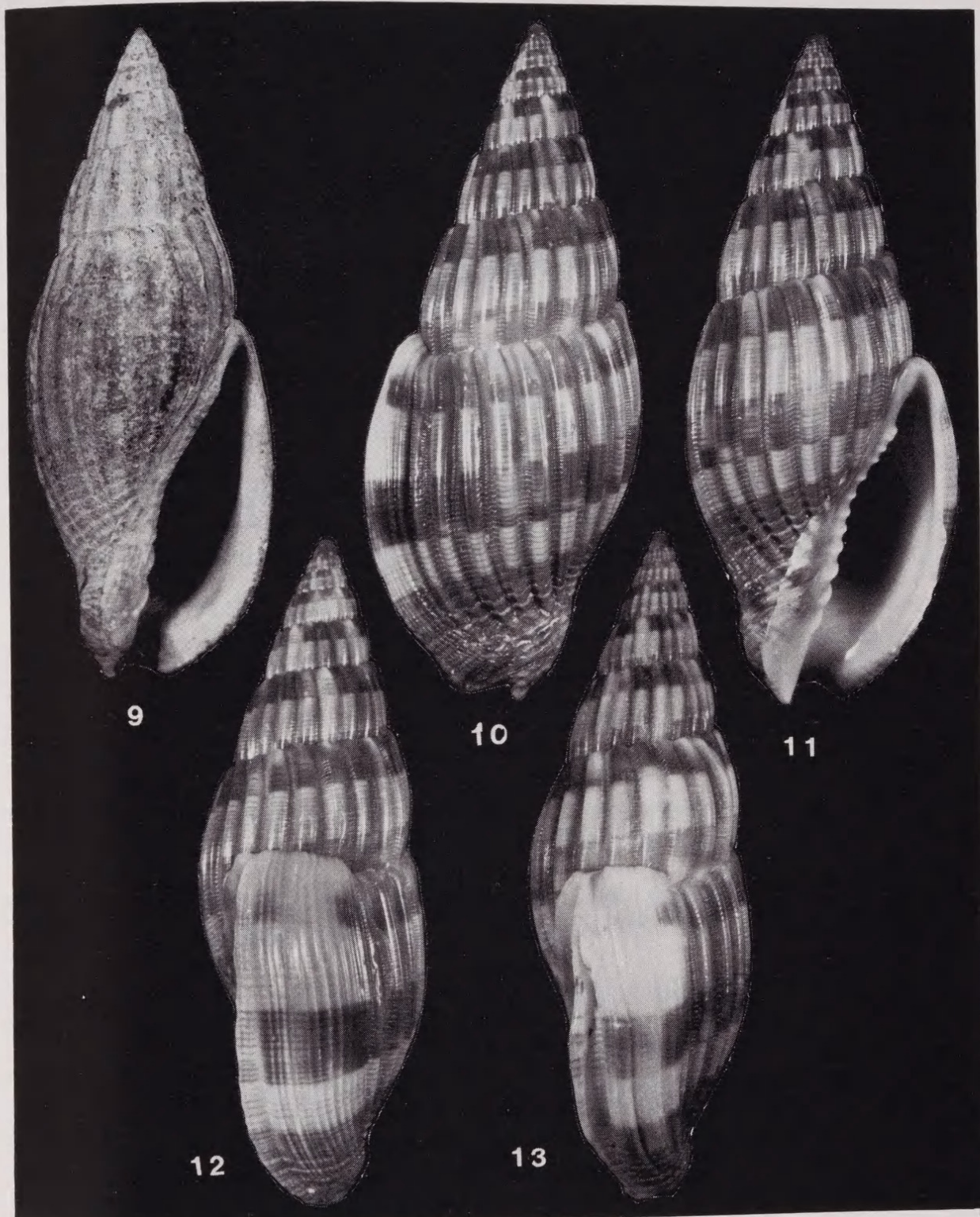
Shell up to 74.0 mm in length, solid and moderately heavy, width 37%-40% of length, teleoconch of 7-7½ convex whorls, protoconch of 1¼-1½ orange-brown, bulbous embryonic whorls, sutures distinct without being canaliculate. Sculptured with close-set, moderately thickened and rounded axial ribs which number from 17-21 on the penultimate and from 17-20 on the body whorl; outer lip with an extremely broad, upswept varix which contains from 7-12 slender axial riblets. Interspaces of axial ribs narrow and containing numerous, very fine and crisp spiral striae which do not quite reach the summits of the axial ribs and which number from 23-41 on the penultimate and from 40-58 on the body whorl; base of body whorl with 5-9 stronger and step-like spiral cords and an additional 6-9 crowded cords on the siphonal fasciole. Aperture moderately wide, height 50%-53% of total length, smooth within, edge of outer lip simple and slightly reflexed, columella calloused and with 10-14 lirate denticles plus 2-5 intercalate denticles, denticles becoming gradually thicker towards the anterior with the ultimate three denticles the largest. Siphonal canal straight, siphonal notch prominent. Base colour cream to fawn, ornamented with 1 broad, orange-brown sutural band on upper spire whorls, 2 sutural bands on the penultimate and three bands on the body whorl; varix yellowish-white to creamy-white, posterior body whorl band extending only a short distance across varix and lower 2 bands extending towards the outer lip. Superimposed over this pattern are numerous, close-set, darker orange-brown spiral lines which are confined to the axial ribs and which number from 17-22 on the penultimate and from 46-51 on the body whorl; aperture cream to pale yellow, columellar denticles white, interspaces pale orange-brown.

TYPE LOCALITY. NZOI station 1763, small pinnacle out from the lagoon on the southern side of the eastern South Bellona reef, between New Caledonia and Queensland, Australia, 21°50.7'S & 159°31.6'E, in 15 m, on sand, water temperature 22.7°C (*leg.* K.R. Grange, 18-5-1979).

Holotype. In the New Zealand Oceanographic Institute, Wellington, No. H-251, length 61.7 mm, width 24.9 mm, height of aperture 33.0 mm (Figs. 10-12).

Paratypes. No. 1 from the same locality as the holotype, dimensions 70.8 x 27.0 x 35.2 mm in the Auckland Institute and Museum No. P-508A (Fig. 13); No. 2 from the outer reef slope on the N.W. side of western South Bellona reef, in 17 m, dimensions 73.4 x 27.6 x 36.8 mm, in the N.Z. Oceanographic Institute No. P-508C; No. 3 from the south side of the lagoon, western South Bellona reef, dimensions 62.7 x 24.3 x 32.7 mm, in the National Museum of New Zealand, Wellington, No. P-508B.

All specimens were collected during the R.V. Tangaroa "Tasman Seamounts 1979" cruise 1093 during May 1979. The isolated position of the Bellona reefs in the Coral Sea may account for the belated discovery of such a large and colourful *Lyria* species. *L. grangei* is perhaps most similar in shape, sculpture and colouring to *L. delessertiana* (Petit de la Saussaye, 1842) [synonym *L. tulearensis* Cosel & Bloecher, 1977], a species which appears to be confined to the Seychelles Is — Madagascar area of the west Indoan Ocean.



Figs. 9-13. 9. *Lyria mallicki* Ladd. Paratype USNM No. 214226; 45.8 mm. 10-13. *L. grangei* sp. n. South Bellona reef, between New Caledonia and Queensland, Australia. 10-12. Holotype NZOI No. H-251; 61.7 mm. 13. Paratype showing broad varix; 70.8 mm.

This species has a considerably broader columellar callus with larger and closer set lirae, a dozen dark brown spiral lines on the edge of the outer lip, and the numerous, crisp spiral striae, broad varix and numerous orange-brown spiral lines are all absent in *L. delessertiana*. *L. grangei* can also be compared with the fossil *L. mallicki* Ladd (Fig. 9), but this species is smaller, considerably less solid and lighter in weight, has a small conical protoconch of 2 whorls, narrower axial ribs and lacks the numerous spiral striae in the interspaces (see Table 1).

The species is named for Mr K.R. Grange, N.Z. Oceanographic Institute, Wellington, who collected the species during the "Tasman Seamounts 1979" cruise to Belona reef.

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