

Deep-water Cones (Gastropoda: Conidae) from the New Caledonia region

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ABSTRACT

The New Caledonian species of *Conus* with a main distribution below 100 m are surveyed. This fauna consists of 39 species, of which 5 are new and 18 represent significant range extensions. In addition, eight species, mostly represented by single specimens, remain unidentified. Ten species (*Conus boucheti*, *C. kanakinus*, *C. luciae*, *C. plinthis*, *C. richeri*, and the five new ones) are so far only known from the New Caledonia region and may be endemic. *Conus smirna* and *C. profundorum* are regarded as distinct, and two additional species are described in this species complex: *C. vaubani* sp. nov., from South of New Caledonia and of the New Hebrides Arc in 440-775 m; and *C. loyaltiensis* sp. nov. from the Loyalty Islands in 480-575 m. Three other new species, and one subspecies, are named: *Conus alisi* sp. nov. from the New Caledonia area, in 200-525 m; *C. estivali* sp. nov. from the Chesterfield Islands, Coral Sea, in 355-410 m; *C. gondwanensis* sp. nov. from the Norfolk Ridge, South New Caledonia, in 170-260 m; and *C. orbigny coriolisi* ssp. nov., from the Coral Sea, New Caledonia and Loyalty Islands, in 225-550 m.

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RÉSUMÉ

Les cônes profonds (Gastropoda: Conidae) de la région néo-calédonienne.

Les cônes de la région néo-calédonienne sont examinés, en se limitant aux espèces vivant normalement à des profondeurs supérieures à 100 m. Cette faune comprend 39 espèces, dont 5 nouvelles et 18 signalées pour la première fois de ce secteur géographique, auxquelles s'ajoutent 8 espèces, pour la plupart représentées par des exemplaires uniques, laissées indéterminées. Dix espèces (*Conus boucheti*, *C. kanakinus*, *C. luciae*, *C. plinthis*, *C. richeri*, et les 5 espèces nouvelles) ne sont connues que de la région néo-calédonienne et peuvent actuellement être considérées comme endémiques. *Conus smirna* et *C. profundorum* sont traitées comme des espèces distinctes, et deux autres espèces sont décrites dans ce complexe : *C. vaubani* sp. nov., du Sud de la Nouvelle-Calédonie et de l'arc néo-hébridais par 440-775 m; et *C. loyaltiensis* sp. nov., des îles Loyauté par 480-575 m. Trois autres espèces et une sous-espèce nouvelles sont décrites : *Conus alisi* sp. nov., de Nouvelle-Calédonie par 200-525 m; *C. estivali* sp. nov. des îles Chesterfield, en mer du Corail, par 355-410 m; *C. gondwanensis* sp. nov. de la Ride de Norfolk, au Sud de la Nouvelle-Calédonie, par 170-260 m; et enfin *C. orbignyi coriolisi* ssp. nov., de la mer du Corail, de Nouvelle-Calédonie et des îles Loyauté par 225-550 m.

INTRODUCTION

The species of the family Conidae of New Caledonia were listed and illustrated by ESTIVAL (1981) in a review focussing on the species collected intertidally or by SCUBA. Exploratory dredgings in 1978-1979 revealed the existence of a rich and largely undescribed deep-sea fauna, including two new species of *Conus* (RICHARD, 1983). Since 1984, several expeditions and dredging programmes have generated an outstanding collection of shallow and deep-sea molluscs from the waters surrounding New Caledonia and its satellite islands and reefs. Narratives of these cruises and station lists were compiled by RICHER DE FORGES (1990, 1991, 1993).

Of these cruises, CHALCAL 1, MUSORSTOM 5 and CORAIL 2 surveyed the seamounts and banks of the Lord Howe Ridge, inclusive of the partly emerged Chesterfield plateau, in the Coral Sea. The Norfolk Ridge, south of the Isle of Pines, has been sampled by the largest number of expeditions: BIOCAL (in part), MUSORSTOM 4 (in part), CHALCAL 2, SMIB 1-5, SMIB 8 and BERYX 11. BIOCAL (in part), BIOGEOCAL, MUSORSTOM 6 and CALSUB explored the slopes of the Loyalty basin and the Loyalty Ridge. The area North of the New Caledonia mainland, known as "Grand Passage", was surveyed during MUSORSTOM 4 (in part) and SMIB 6. Finally, the volcanic islands of Hunter and Matthew, on the westernmost rim of the Pacific plate, were sampled by the VOLSMAR expedition. As a result, new species of *Conus* were described by MOOLENBEEK (1986), RICHARD & MOOLENBEEK (1988), RÖCKEL, KORN & RICHARD (1993), and new records were presented by RICHER DE FORGES & ESTIVAL (1986).

This paper summarizes already published records on the deep-water *Conus* of the New Caledonia region, and presents many additions. The distinction between shallow and deep-water fauna has been arbitrarily placed at about 100 m, *i.e.* only species with their main distribution below 100 m are treated. Another paper will present and discuss new records of shallow-water species. Unless otherwise stated the material is in MNHN. In contrast with collections of shallow-water cones, the present material contains a rather high proportion of shells with well preserved protoconchs, even in adults of small to medium-sized species. Therefore, we have used protoconch characters in the descriptions of new taxa, even when similar data for already named species are unknown. Additional protoconch data will be presented in a forthcoming monograph on the Indo-Pacific species of *Conus*.

The taxonomy of higher taxa in the family Conidae is still far from settled. DA MOTTA (1991) introduced a new, controversial genus-level classification of the family, recognizing many new subgenera. Until this classification has been thoroughly evaluated, we prefer to use a single genus *Conus*, in its traditional, conservative, acceptance. For pragmatic reasons we use alphabetical order in species treatment.

ABBREVIATIONS AND TEXT CONVENTIONS

Repositories

- AMS : Australian Museum, Sydney
 BMNH : The Natural History Museum, London
 DR : Dieter Röckel's collection, to be deposited in the Staatliches Museum für Naturkunde, Stuttgart
 MNHN : Muséum national d'Histoire naturelle, Paris
 NMNZ : Museum of New Zealand Te Papa Tongarewa, Wellington
 ZMA : Zoölogisch Museum, Amsterdam

Other abbreviations

- D : Diameter
 H : Height
 L : Length
 RD : Relative diameter of last whorl (maximum diameter of last whorl/aperture height)
 RSH : Relative spire height (shell length minus aperture height/aperture height)
 W : Width
 spm : specimen(s), doubtful if alive or dead collected
 lv : live collected specimen(s)
 dd : dead collected specimen(s).

SYSTEMATIC ACCOUNT

Family CONIDAE Fleming, 1822

Genus *Conus* Linné, 1758*Conus alisi* Moolenbeek, Röckel & Richard sp. nov.

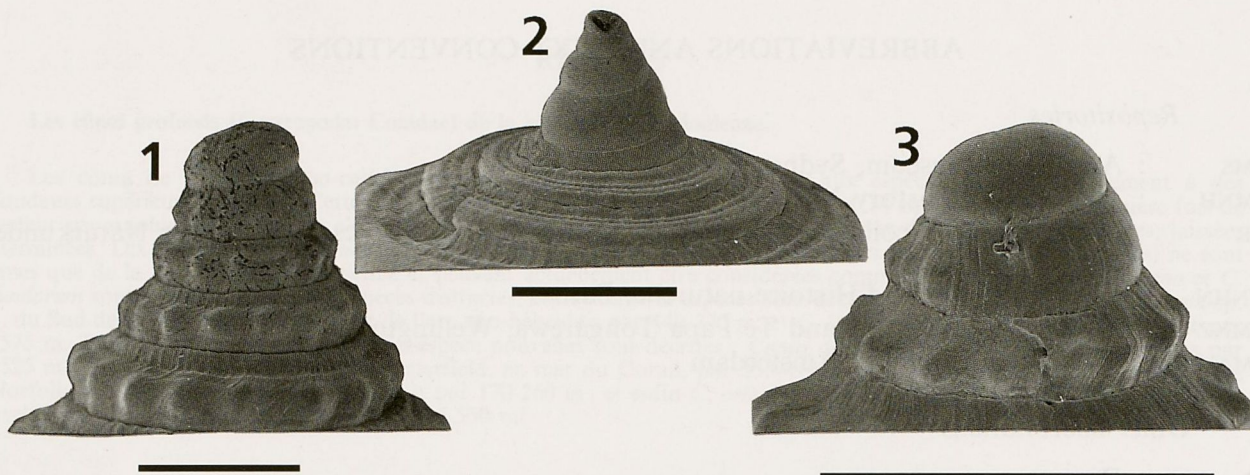
Figs 2, 4-5

Conus sp. C — RICHER DE FORGES & ESTIVAL, 1986: 16, figs.

TYPE MATERIAL. — Holotype MNHN. Paratypes: 2 MNHN, 1 ZMA 3.94.024, 1 NMNZ M268539, 1 AMS C201716, 1 DR.

TYPE LOCALITY. — Norfolk Ridge, SMIB 8, stn DW 183, 23°18' S, 168°05' E, 330-367 m.

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4: stn DW 162, 18°35' S, 163°10' E, 525 m, 1 dd. — Stn DW 163, 18°34' S, 163°11' E, 350 m, 2 dd. — Stn DW 164, 18°33' S, 163°13' E, 255 m, 1 dd. — Stn DW 181, 18°57' S, 163°22' E, 350 m, 5 dd. — Stn DW 196, 18°55' S, 163°24' E, 450 m, 4 dd. — Stn DW 230, 22°52' S, 167°12' E, 390-420 m, 1 lv.
 SMIB 1: stn DW 2, 22°52' S, 167°13' E, 415 m, 1 dd.
 SMIB 2: stn DW 3, 22°56' S, 167°15' E, 412-428 m, 4 dd. — Stn DW 5, 22°56' S, 167°14' E, 398-410 m, 2 dd. — Stn DW 8, 22°54' S, 167°12' E, 435-447 m, 1 dd. — Stn DW 17, 22°51' S, 167°14' E, 428-448 m, 1 dd.
 SMIB 3: stn DW 10, 24°42' S, 168°07' E, 235 m, 2 spms. — Stn DW 14, 23°40' S, 168°00' E, 246 m, 11 dd. — Stn DW 18, 23°42' S, 167°59' E, 338 m, 7 dd.



Figs 1-3. — Protoconchs. — 1, *Conus loyaltiensis*, MUSORSTOM 6: stn CP 467. — 2, *C. alisi*, SMIB 8: stn DW 189. — 3, *C. vaubani*, BIOCAL: stn DW 46. Scale lines 0.5 mm.

SMIB 4: stn DW 50, 23°42' S, 168°01' E, 260-295 m, 6 dd. — Stn DW 53, 23°40' S, 168°00' E, 250-270 m, 7 spms. — Stn DW 55, 23°21' S, 168°04' E, 215-260 m, 1 dd. — Stn DW 56, 23°21' S, 168°05' E, 230-260 m, 1 dd. — Stn DW 65, 22°55' S, 167°14' E, 400-420 m, 1 dd. — Stn DW 67, 22°51' S, 167°16' E, 450-460 m, 1 lv.

SMIB 5: stn DW 72, 23°42' S, 168°01' E, 400 m, 8 spms. — Stn DW 73, 23°41' S, 168°01' E, 240 m, 2 dd. — Stn DW 75, 23°41' S, 168°01' E, 270 m, 5 spms. — Stn DW 76, 23°41' S, 168°00' E, 280 m, 2 dd. — Stn DW 80, 23°42' S, 168°00' E, 300 m, 2 dd. — Stn DW 89, 22°19' S, 168°41' E, 265-295 m, 1 dd. — Stn DW 97, 23°01' S, 168°18' E, 300 m, 1 dd. — Stn DW 98, 23°02' S, 168°16' E, 335 m, 7 dd. — Stn DW 101, 23°21' S, 168°05' E, 270 m, 6 dd. — Stn DW 102, 23°20' S, 168°05' E, 305 m, 3 dd. — Stn DW 104, 23°16' S, 168°04' E, 335 m, 2 dd. — Stn DW 105, 23°14' S, 168°04' E, 310 m, 2 dd.

SMIB 6: stn DW 121, 18°58' S, 163°26' E, 315 m, 5 dd. — Stn DW 122, 18°58' S, 163°25' E, 325-330 m, 1 dd.

SMIB 8: stn DW 156, 24°46' S, 168°08' E, 275-300 m, 1 dd. — Stn DW 159, 24°46' S, 168°08' E, 241-245 m, 1 spm. — Stn DW 171, 23°40' S, 168°01' E, 233-250 m, 1 dd. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 1 lv (paratype AMS, 18.8 × 10 mm), 7 dd (1 paratype MNHN, 19.7 × 10.4 mm). — Stn DW 177, 23°39' S, 168°00' E, 320-370 m, 5 dd (1 paratype ZMA, 20.7 × 11.8 mm), 1 lv (paratype NMNZ, 20.2 × 11.1 mm). — Stn DW 174, 23°40' S, 168°01' E, 235-240 m, 1 dd. — Stn DW 178, 23°46' S, 168°17' E, 400 m, 1 dd. — Stn DW 179, 23°47' S, 168°17' E, 400-405 m, 2 dd. — Stn DW 181, 23°18' S, 168°05' E, 311-330 m, 1 dd (paratype DR, 17.7 × 9.2 mm). — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 7 dd. — Stn DW 183, 23°18' S, 168°05' E, 330-367 m, 1 spm (holotype). — Stn DW 182-184, 23°18' S, 168°05' E, 305-367 m, 3 dd (1 paratype MNHN, 17.6 × 9.2 mm). — Stn DW 185, 23°16' S, 168°04' E, 311-355 m, 1 dd. — Stn DW 189, 23°18' S, 168°06' E, 400-402 m, 6 dd. — Stn DW 198, 22°52' S, 168°13' E, 414-430 m, 1 dd.

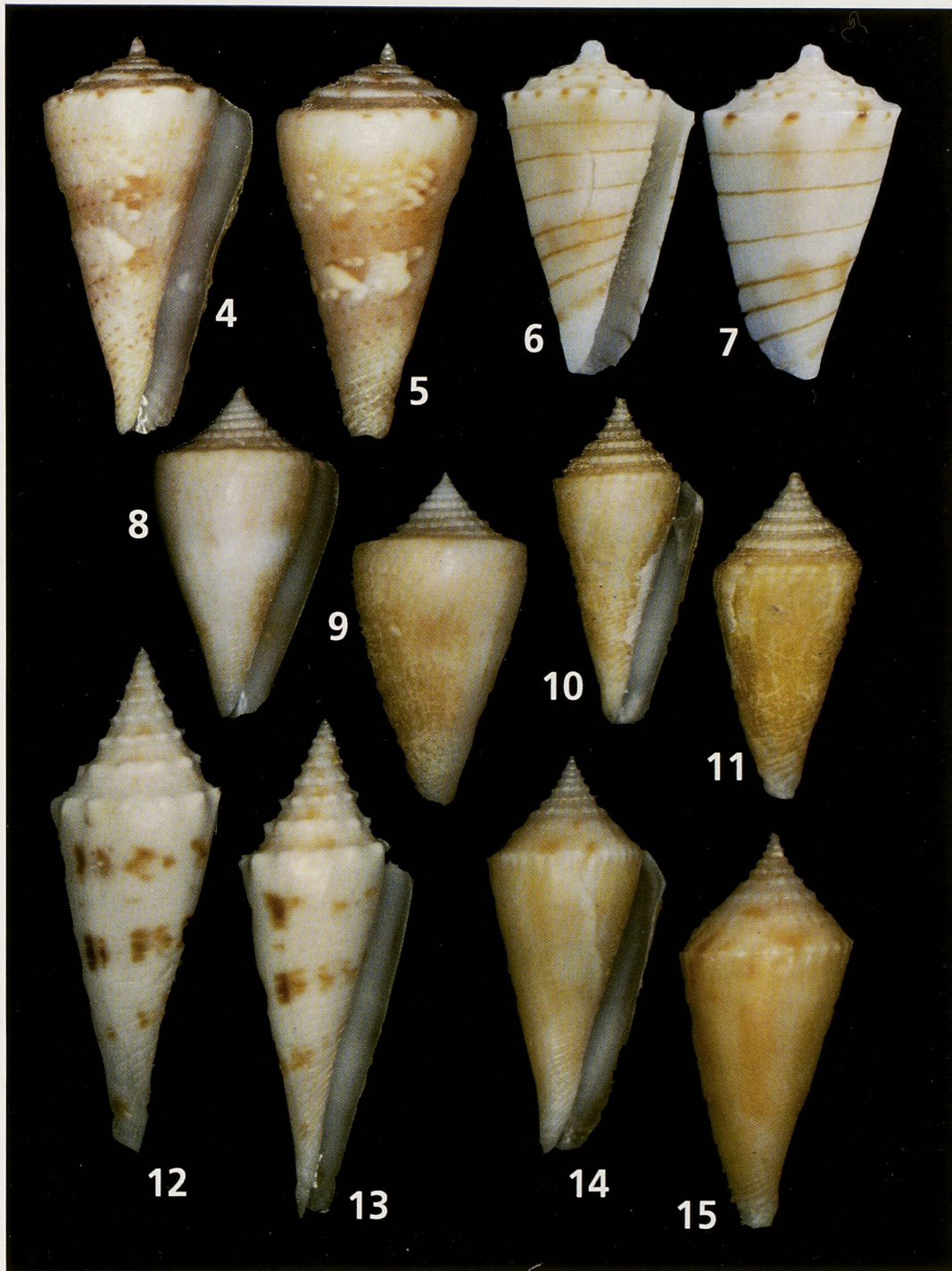
BIOCAL: stn DW 38, 23°00' S, 167°15' E, 360 m, 2 dd. — Stn CP 45, 22°47' S, 167°15' E, 430-465 m, 2 dd. — Stn DW 64, 24°48' S, 168°09' E, 250 m, 2 dd.

LAGON: stn 444, 18°15' S, 162°59' E, 300-350 m, 5 dd.

CHALCAL 2: stn DW 71, 24°42' S, 168°10' E, 230 m, 1 dd. — Stn DW 78, 23°41' S, 168°00' E, 233 m, 2 spms. — Stn DW 81, 23°20' S, 168°03' E, 311 m, 1 spm. — Stn DW 82, 23°14' S, 168°04' E, 304 m, 1 dd. — Stn DW 83, 23°20' S, 168°05' E, 200 m, 1 spm.

Loyalty Islands. MUSORSTOM 6: stn DW 472, 21°09' S, 167°55' E, 300 m, 1 dd.

BIOGEOCAL: stn KG 252, 21°31' S, 166°22' E, 330 m, 1 dd.



FIGS 4-15. — Endemic deep-sea cones of New Caledonia. — 4-5, *Conus alisi*, holotype, 22.2 × 12.3 mm. — 6-7, *C. estivali*, holotype, 10.4 × 6.0 mm. — 8-9, *C. gondwanensis*, holotype, 21.4 × 11.6 mm. — 10-11, *C. loyaltiensis*, holotype, 21.8 × 10.1 mm. — 12-13, *C. orbigny coriolisi*, holotype, 44.6 × 16.0 mm. — 14-15, *C. vaubani*, holotype, 25.8 × 11.7 mm.

DISTRIBUTION. — Southern New Caledonia, Norfolk Ridge and Loyalty Islands, in 200-525 m; alive in 290-460 m.

DESCRIPTION. — Holotype length 22.2 mm, width 12.3 mm; aperture height 19.3 mm. *Shell* small, low biconic, slightly pyriform, fragile. *Protoconch*, diameter 1.1 mm, pointed and shiny, 3.2 convex whorls, initial part missing. Colour of protoconch opaque white with a peculiar brown blotch on second whorl. *Teleoconch* consists of 6.0 whorls, spire slightly stepped. First teleoconch whorl with two spiral grooves, gradually increasing to 3 on the last spire whorl; grooves rather strong. Whorls slightly stepped with a strong, smooth

adapical rim above suture. Outline of spire slightly convex. Body whorl slightly pyriform with about 11 spiral grooves at the base. Sculpture smooth with very fine hardly visible spiral striae. Aperture straight, rather wide, outer lip thin. Colour light violet-grey, with about 18 spiral rows of very fine brown spots; in the middle an irregular band of white and brown cloudy blotches. Smaller white blotches are situated on the upper part. Shoulder rim white, with 12 brown spots. These spots are also visible on the earlier whorls.

REMARKS. — Paratypes and other specimens of *Conus alisi* attain a shell length of 30 mm, their relative diameter ranges from 0.62-0.68 and the relative spire height from 0.13-0.18. The colour is often pure white, but sometimes light orange or violet-grey, with irregular and cloudy white and brown spots and often also with spiral lines of brown dots.

Conus alisi is very similar to *C. dayriti* Röckel & Da Motta, 1983. *C. alisi* can be distinguished mainly by its larger (maximum diameter 1.1 mm vs 0.80-0.95 mm) and differently coloured (white with a brown blotch vs light brown) protoconch, slightly stepped spire whorls, stronger spiral grooves on spire whorls, and its often pure white colouration.

ETYMOLOGY. — The new species is named after R.V. "Alis", the vessel used for ORSTOM cruises since 1988.

Conus aphrodite Petuch, 1979

Fig. 25

Conus aphrodite Petuch, 1979: 11, 17, figs 34-35.

Conus aphrodite — COOMANS *et al.*, 1981: 4, fig. 107.

MATERIAL EXAMINED. — **New Caledonia.** LAGON: stn 872, 20°37' S, 165°58' E, 105 m, 2 dd.

MUSORSTOM 4: stn DW 163, 18°34' S, 163°11' E, 350 m, 1 dd.

SMIB 4: stn DW 53, 23°40' S, 168°00' E, 250-270 m, 1 dd.

SMIB 5: stn DW 70, 23°41' S, 168°01' E, 270 m, 1 dd. — Stn DW 87, 22°19' S, 168°41' E, 370 m, 1 dd. — Stn DW 92, 22°20' S, 168°41' E, 280 m, 2 dd. — Stn DW 93, 22°20' S, 168°42' E, 255 m, 2 dd. — Stn DW 97, 23°01' S, 168°18' E, 300 m, 1 dd.

SMIB 8: stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 2 dd. — Stn DW 175, 23°41' S, 168°01' E, 235-240 m, 1 spm.

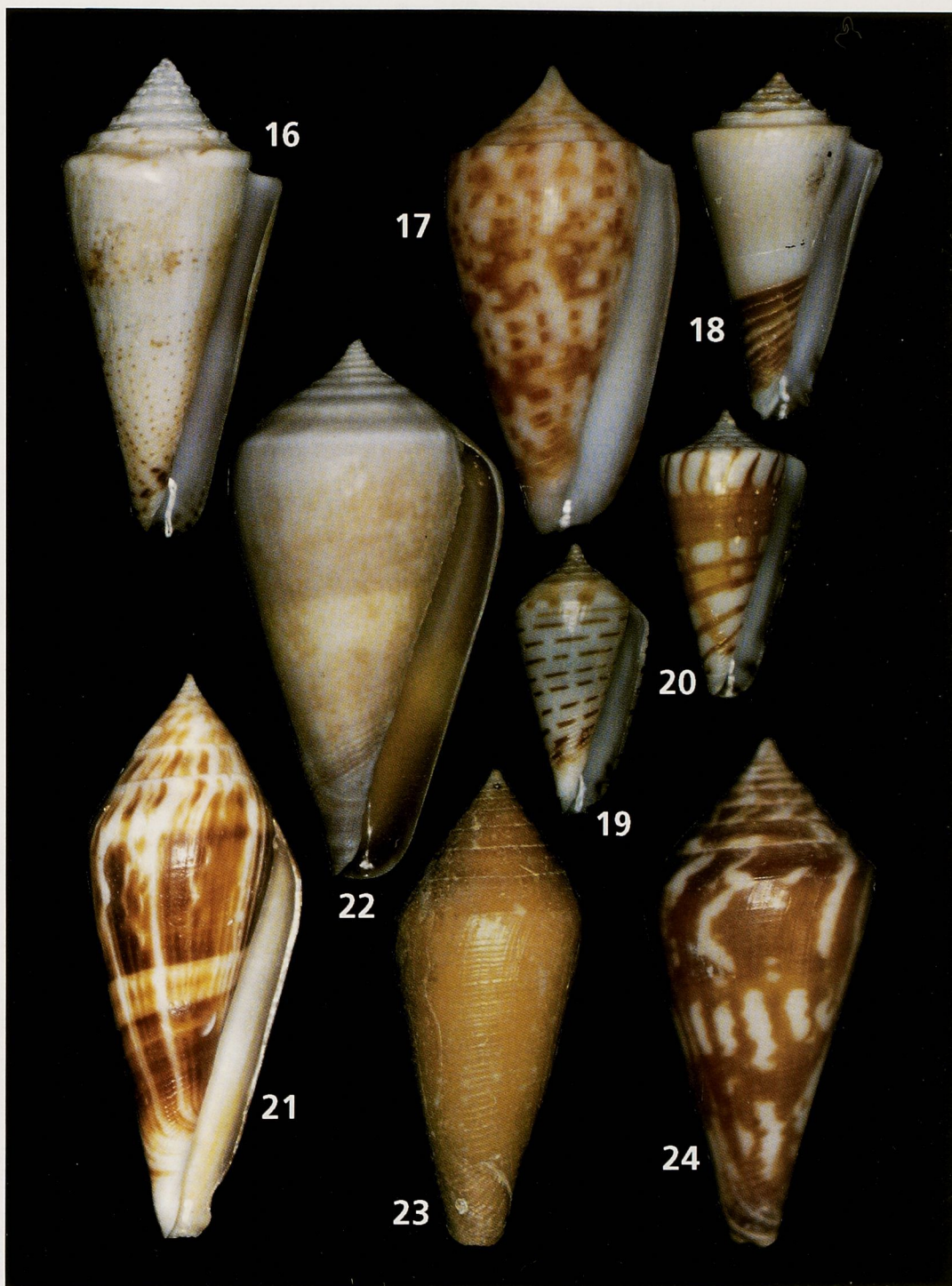
Loyalty Islands. MUSORSTOM 6: stn DW 418, 20°42' S, 167°03' E, 283 m, 1 dd. — Stn DW 451, 20°59' S, 167°25' E, 330 m, 8 dd. — Stn DW 480, 21°08' S, 167°56' E, 380 m, 1 spm.

New Hebrides Arc. VOLSMAR: stn DW 40, 22°20' S, 168°41' E, 275-295 m, 1 dd.

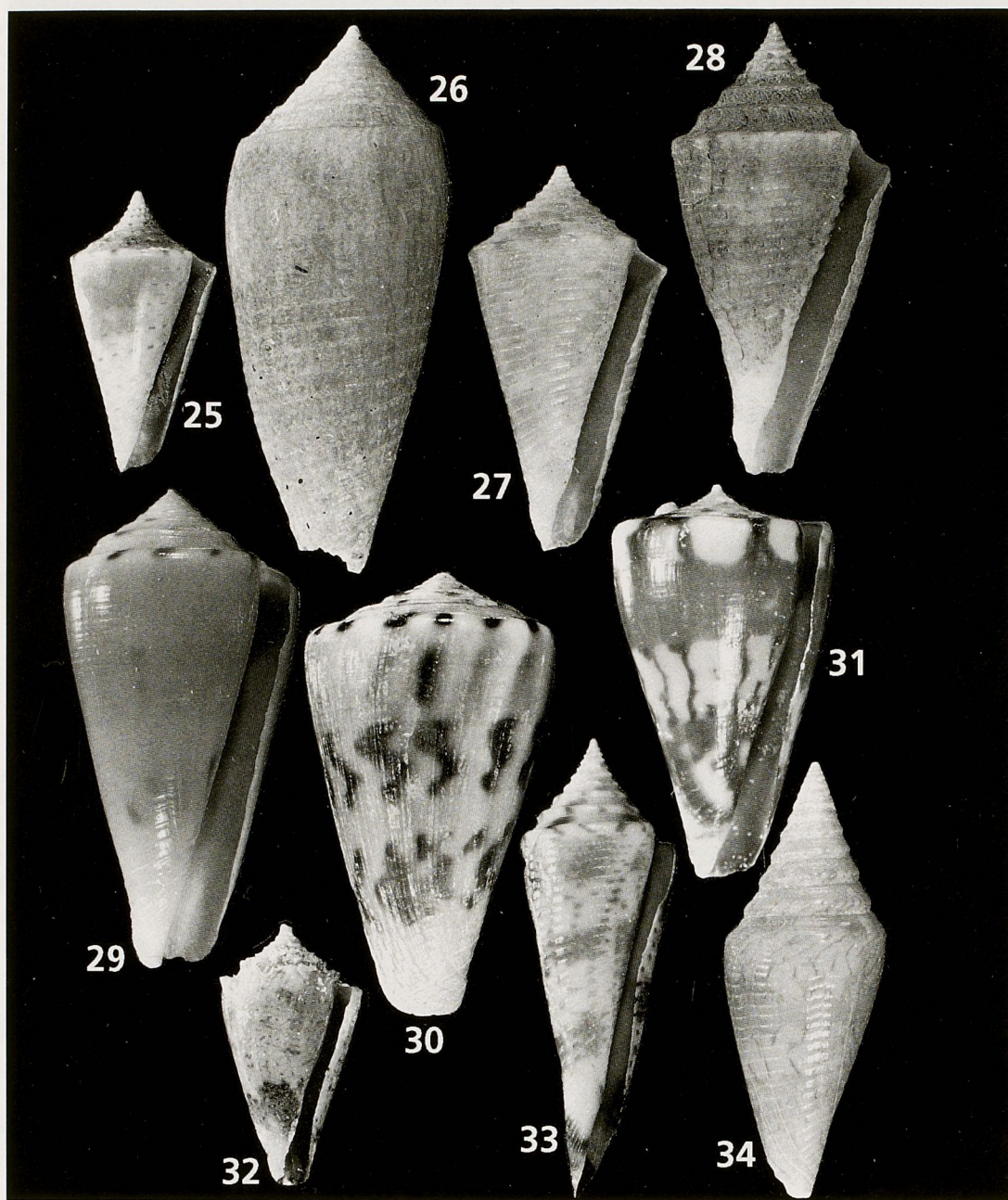
GEMINI: stn DW 59, 21°00' S, 170°17' E, 320 m, 1 dd.

DISTRIBUTION. — Southern Japan (Ryukyu Is.) and Philippines; now New Caledonia, in 105-380 m (dead).

REMARKS. — This is the first record from Melanesia. The colour pattern is faded due to the fact that all specimens were dead when collected. The largest shell has a length of 19 mm.



FIGS 16-24. — Endemic and other deep-sea cones of New Caledonia. — **16**, *Conus luciae*, Coral Sea, 55.9 × 24.1 mm. — **17**, *C. richeri*, New Caledonia, 53.8 × 26.2 mm. — **18**, *C. boucheti*, New Caledonia, 24 × 12.8 mm. — **19**, *C. kanakinus*, South New Caledonia, 17.7 × 8.7 mm. — **20**, *C. plinthis*, Loyalty Islands, 21.3 × 9.5 mm. — **21**, *C. smirna*, South New Caledonia, 75.0 × 30.0 mm. — **22**, *C. profundorum*, Loyalty Islands, 65.0 × 33.0 mm. — **23**, *C. lani*, Loyalty Islands, 54.2 × 22.3 mm. — **24**, *C. darkini*, Loyalty Islands, holotype, 55.7 × 24.4 mm.



FIGS 25-34. — 25, *Conus aphrodite*, South of Vanuatu, GEMINI: stn DW 59, 16.7 × 8.7 mm. — 26, *Conus armadillo*, Loyalty Islands, MUSORSTOM 6: stn DW 428, 54.2 × 22.4 mm. — 27, *Conus baileyi*, Loyalty Islands, MUSORSTOM 6: stn DW 451, 24.0 × 12.4 mm. — 28, *Conus boholensis*, New Caledonia, BIOCAL: stn CP 108, 29.5 × 14.5 mm. — 29, *Conus bruuni*, New Caledonia, CALSUB: pl. 21, 65.3 × 33.1 mm. — 30, *Conus bruuni*, Loyalty Islands, MUSORSTOM 6: stn DW 417, 48.9 × 29.2 mm. — 31, *Conus capitanellus*, South New Caledonia, BERYX 11: stn CP 21, 31.6 × 18 mm. — 32, *Conus chiangi*, New Caledonia, Norfolk Ridge, SMIB 5: stn DW 158, 13.7 × 7.7 mm. — 33, *Conus comatosa*, Loyalty Islands, MUSORSTOM 6: stn DW 453, 41.6 × 14.6 mm. — 34, *Conus excelsus*, Loyalty Islands, MUSORSTOM 6: stn DW 391, 43.5 × 13.3 mm.

Conus armadillo Shikama, 1971

Fig. 26

Conus (Asprella) armadillo Shikama, 1971: 34, fig. 2.*Conus armadillo* — COOMANS *et al.*, 1981: 19, figs 99, 133.

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6: stn DW 428, 20°24' S, 166°13' E, 420 m, 1 dd.

DISTRIBUTION. — Taiwan, Philippines, East Australia, and now New Caledonia, in 420 m (dead).

REMARKS. — This is the first record of *C. armadillo* from Melanesia. The specimen from Loyalty Islands has a length of 53 mm, smaller than those from the Philippines which vary from 60 to 79 mm.

Conus baileyi Röckel & Da Motta, 1979

Fig. 27

Conus baileyi Röckel & Da Motta, 1979: 9, text figs*Conus baileyi* — COOMANS *et al.*, 1982: 6, figs 177, 189. — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **Chesterfield Islands**. MUSORSTOM 5: stn DW 280, 24°10' S, 159°36' E, 270 m, 1 dd.

New Caledonia. LAGON: stn 387, 22°39' S, 167°07' E, 225 m, 4 dd. — Stn 396, 22°40' S, 167°09' E, 284 m, 2 dd. — Stn 539, 19°05' S, 163°17' E, 230-240 m, 1 dd.

MUSORSTOM 4: stn DW 204, 22°37' S, 167°06' E, 120 m, 1 dd. — Stn DW 208, 22°40' S, 167°08' E, 275-280 m, 3 dd. — Stn DW 222, 22°58' S, 167°33' E, 410-440 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 dd. — Stn DW 392, 20°47' S, 167°05' E, 340 m, 2 dd. — Stn DW 398, 20°47' S, 167°06' E, 370 m, 3 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 1 spm. — Stn DW 417, 20°42' S, 167°04' E, 283 m, 1 dd. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 1 spm. — Stn DW 423, 20°26' S, 166°41' E, 280 m, 1 dd. — Stn DW 451, 20°59' S, 167°25' E, 330 m, 1 spm. — Stn DW 453, 21°00' S, 167°27' E, 250 m, 2 dd. — Stn DW 462, 21°05' S, 167°27' E, 200 m, 4 dd. — Stn DW 481, 21°22' S, 167°50' E, 300 m, 1 dd. — Stn DW 485, 21°23' S, 167°59' E, 350 m, 1 dd. — Stn DW 487, 21°23' S, 167°46' E, 500 m, 1 dd.

SMIB 6: stn DW 113, 19°03' S, 163°30' E, 250 m, 1 dd. — Stn DW 126, 18°59' S, 163°23' E, 320-330 m, 1 dd. — Stn DW 130, 19°05' S, 163°21' E, 225-230 m, 1 dd. — Stn DW 132, 19°03' S, 163°19' E, 235-240 m, 1 dd.

DISTRIBUTION. — Solomon Islands, Queensland, and New Caledonia, in 120-440 m (dead).

REMARKS. — *Conus baileyi* resembles to *C. memiae* Habe & Kosuge, 1960, but can be distinguished by its broader and often pyriform last whorl and different colour pattern. Another similar taxon is *C. nereis* Petuch, 1979 from the Philippines, provisionally considered a local form of *C. wakayamaensis* (Kuroda, 1956). *Conus nereis* has a broader last whorl, a less carinate shoulder, and lacks the distinct spiral grooves on the ultimate spire whorl.

Length of specimens from New Caledonia and Loyalty Islands ranges from 20 to 24 mm.

Conus boholensis Petuch, 1979

Fig. 28

Conus boholensis Petuch, 1979: 12, figs 20-21.*Conus boholensis* — COOMANS *et al.*, 1982: 32, figs 175, 250.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DC 381, 19°38' S, 158°47' E, 620 m, 1 dd.

New Caledonia. "Vauban" 1978-79: stn 39, 22°29' S, 166°23' E, 375-550 m, 1 dd.

BIOCAL: stn CP 108, 22°03' S, 167°06' E, 335 m, 3 lv, 1 dd.

MUSORSTOM 4: stn CC 246, 22°08' S, 167°11' E, 410-420 m, 3 lv.

Coll. Tirard: 22°40' S, 167°10' E, 200-350 m, 1 dd.

Loyalty Islands. BIOGEOCAL: stn DW 253, 21°32' S, 166°29' E, 310-315 m, 1 dd.

MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 2 dd. — Stn DW 393, 20°48' S, 167°10' E,

420 m, 3 dd. — Stn DW 397, 20°47' S, 167°05' E, 380 m, 1 spm. — Stn DW 406, 20°41' S, 167°07' E,

373 m, 4 dd. — Stn DW 411, 20°41' S, 167°03' E, 424 m, 8 dd. — Stn DW 413, 20°40' S, 167°03' E,

463 m, 3 dd. — Stn DW 428, 20°24' S, 166°13' E, 420 m, 7 dd.

DISTRIBUTION. — Philippines, South Vietnam, North West Australia, North Somalia; now New Caledonia, in 310-620 m, alive in 335-420 m.

REMARKS. — This is the first record of *C. boholensis* from Melanesia. COOMANS *et al.* (1982) considered *C. boholensis* a synonym of *C. borneensis* Adams & Reeve, 1848. However, the lectotype of *C. borneensis*, in BMNH, has a broader last whorl (RD 0.67 vs. 0.57-0.63 in *C. boholensis*), its spire outline is concave and the adapical part of its last whorl is smooth. The lectotype of *Conus borneensis* was found in a depth of 18 m [10 fms], and there has been no additional bathymetrical data in the literature. Provisionally, we consider *C. boholensis* a valid species.

The largest specimen measures 30 × 15 mm.

Conus boucheti Richard, 1983

Fig. 18

Conus boucheti Richard, 1983: 53, 57, figs 1-4.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 301, 22°07' S, 159°25' E, 487-610 m, 4 dd. — Stn DW 305, 22°09' S, 159°24' E, 430-440 m, 1 dd. — Stn DW 306, 22°08' S, 159°21' E, 375-415 m, 1 dd. — Stn DC 372, 19°53' S, 158°39' E, 400 m, 1 dd. — Stn DC 381, 19°38' S, 158°47' E, 620 m, 1 dd.

CORAIL 2: stn DE 16, 20°48' S, 160°56' E, 500 m, 1 lv.

New Caledonia. "Vauban" 1978-79, 22°50' S, 167°15' E, 400 m (holotype and 4 paratypes).

BIOCAL: stn DW 82, 20°31' S, 166°50' E, 440-460 m, 1 dd.

MUSORSTOM 4: stn DW 162, 18°35' S, 163°10' E, 525 m, 1 dd. — Stn CC 175, 18°59' S, 163°17' E,

370 m, 1 dd. — Stn DW 222, 22°58' S, 167°37' E, 410-440 m, 1 dd. — Stn DW 223, 22°57' S,

167°30' E, 545-560 m, 2 dd. — Stn DW 226, 22°47' S, 167°22' E, 390 m, 1 dd. — Stn CC 246,

22°08' S, 167°11' E, 410-420 m, 1 dd.

SMIB 2: stn DW 20, 22°44' S, 167°42' E, 415-470 m, 1 dd. — Stn DW 21, 22°40' S, 167°41' E, 460-

500 m, 2 dd. — Stn DW 23, 22°31' S, 167°36' E, 410-420 m, 1 dd.

SMIB 3: stn DW 16, 23°41' S, 168°00' E, 426 m, 1 dd.

SMIB 5: stn DW 87, 22°19' S, 168°41' E, 370 m, 1 dd.

SMIB 8: stn DW 160, 24°46' S, 168°08' E, 280-282 m, 2 dd. — Stn DW 189, 23°18' S, 168°06' E, 400-402 m, 16 dd, 4 lv.

BERYX 11: stn DW 11, 24°44' S, 168°10' E, 320-350 m, 8 dd. — Stn CP 21, 24°44' S, 168°07' E, 430-450 m, 3 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 392, 20°47' S, 167°05' E, 340 m, 1 dd. — Stn DC 402, 20°30' S, 166°49' E, 520 m, 8 dd. — Stn DW 407, 20°41' S, 167°07' E, 360 m, 1 dd. — Stn DW 411, 20°41' S, 167°03' E, 424 m, 2 dd. — Stn DW 413, 20°40' S, 167°03' E, 463 m, 8 dd. — Stn DW 416, 20°42' S, 167°00' E, 343 m, 1 dd. — Stn DW 428, 20°24' S, 166°13' E, 420 m, 1 dd. — Stn DW 457, 21°00' S, 167°29' E, 353 m, 3 dd. — Stn DW 458, 21°01' S, 167°30' E, 400 m, 1 dd. — Stn DW 459, 21°01' S, 167°31' E, 425 m, 37 dd, 1 lv. — Stn DW 460, 21°02' S, 167°31' E, 420 m, 9 dd. — Stn DW 464, 21°02' S, 167°32' E, 430 m, 9 dd. — Stn DW 487, 21°23' S, 167°46' E, 500 m, 9 dd.

New Hebrides Arc. GEMINI: stn DW 51, 20°58' S, 170°03' E, 450 m, 2 dd.

DISTRIBUTION. — Apparently restricted to the SW Pacific, from the Coral Sea (Chesterfield Islands) through New Caledonia to the New Hebrides Arc, in 280-620 m, alive in 400-500 m.

Dimensions of the largest specimen 27 × 14.5 mm.

Conus bruuni Powell, 1958

Figs 29-30

Conus bruuni Powell, 1958: 84, pl. 10, fig. 3.

Conus bruuni — COOMANS *et al.*, 1982: 45, figs 184, 268. — DAVENPORT, 1991: 7.

Conus kinoshitai — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **Chesterfield Islands.** CHALCAL 1: stn DC 64, 22°11' S, 159°15' E, 305 m, 1 dd.

MUSORSTOM 5: stn DW 260, 25°29' S, 159°44' E, 285 m, 1 dd. — Stn CP 276, 24°49' S, 159°41' E, 269-258 m, 1 dd. — Stn DW 277, 24°11' S, 159°35' E, 270 m, 1 dd. — Stn DW 304, 22°10' S, 159°26' E, 385-420 m, 1 dd.

New Caledonia. CHALCAL 2: stn CP 18, 24°47' S, 168°09' E, 274 m, 3 lv. — Stn DW 71, 24°42' S, 168°10' E, 230 m, 3 spms. — Stn CH 5, 24°44' S, 168°09' E, 223 m, 1 spm. — Stn DW 78, 23°41' S, 168°00' E, 233 m, 1 dd. — Stn DW 79, 23°40' S, 168°00' E, 243 m, 3 dd. — Stn DW 81, 23°20' S, 168°03' E, 311 m, 1 lv. — Stn DW 82, 23°14' S, 168°04' E, 304 m, 1 spm. — Stn DW 83, 23°20' S, 168°05' E, 200 m, 1 spm. — Stn DW 84, 23°24' S, 168°07' E, 170 m, 1 dd.

SMIB 3: stn DW 8, 24°45' S, 168°08' E, 233 m, 3 dd. — Stn DW 9, 24°42' S, 168°08' E, 265 m, 1 dd. — Stn DW 10, 24°42' S, 168°07' E, 235 m, 1 spm. — Stn DW 14, 23°40' S, 168°00' E, 246 m, 8 spms. — Stn DW 16, 23°41' S, 168°00' E, 426 m, 1 dd. — Stn DW 18, 23°42' S, 167°59' E, 338 m, 31 dd. — Stn DW 20, 23°40' S, 168°00' E, 280 m, 13 spms. — Stn DW 28, 22°47' S, 167°12' E, 394 m, 1 spm.

SMIB 4: stn DW 43, 24°47' S, 168°09' E, 235-245 m, 1 spm. — Stn DW 44, 24°46' S, 168°08' E, 270-300 m, 1 spm. — Stn DW 46, 24°47' S, 168°08' E, 245-260 m, 2 spms. — Stn DW 47, 24°46' S, 168°08' E, 250-280 m, 4 spms. — Stn DW 49, 24°45' S, 168°08' E, 240-300 m, 3 spms. — Stn DW 50, 23°42' S, 168°01' E, 260-295 m, 6 dd. — Stn DW 51, 23°41' S, 168°01' E, 245-260 m, 11 spms. — Stn DW 52, 23°41' S, 168°00' E, 235-250 m, 2 spms. — Stn DW 53, 23°40' S, 168°00' E, 250-270 m, 24 lv. — Stn DW 54, 23°40' S, 168°00' E, 230-235 m, 7 dd. — Stn DW 56, 23°21' S, 168°05' E, 230-260 m, 2 dd. — Stn DW 57, 23°21' S, 168°05' E, 210-260 m, 1 dd.

SMIB 5: stn DW 70, 23°41' S, 168°01' E, 270 m, 8 dd. — Stn DW 71, 23°41' S, 168°01' E, 265 m, 7 dd. — Stn DW 72, 23°42' S, 168°01' E, 400 m, 4 dd. — Stn DW 73, 23°41' S, 168°01' E, 240 m, 8 dd. — Stn DW 74, 23°40' S, 168°01' E, 245 m, 2 dd. — Stn DW 75, 23°41' S, 168°01' E, 270 m, 8 dd. — Stn DW 76, 23°41' S, 168°00' E, 280 m, 1 lv, 5 spms. — Stn DW 77, 23°41' S, 168°01' E, 270 m, 2 dd. — Stn DW 78, 23°41' S, 168°00' E, 245 m, 1 dd. — Stn DW 79, 23°41' S, 168°01' E, 285 m, 4 dd. — Stn DW 80, 23°42' S, 168°00' E, 300 m, 1 dd. — Stn DW 87, 22°19' S, 168°41' E, 370 m, 1 dd. — Stn DW 89, 22°19' S, 168°41' E, 295 m, 1 dd. — Stn DW 91, 22°18' S, 168°41' E,

340 m, 2 dd. — Stn DW 92, 22°20' S, 168°41' E, 280 m, 1 dd. — Stn DW 93, 22°20' S, 168°42' E, 255 m, 1 dd. — Stn DW 94, 22°20' S, 168°43' E, 275 m, 3 dd.

SMIB 6: stn DW 110, 19°05' S, 163°30' E, 225-230 m, 1 dd. — Stn DW 112, 19°06' S, 163°30' E, 220-225 m, 1 dd. — Stn DW 113, 19°03' S, 163°30' E, 250 m, 1 dd. — Stn DW 128, 19°06' S, 163°22' E, 205-215 m, 1 dd.

SMIB 8: stn DW 154, 24°46' S, 168°08' E, 235-252 m, 1 dd. — Stn DW 155, 24°46' S, 168°08' E, 257-262 m, 3 dd. — Stn DW 156, 24°46' S, 168°08' E, 275-300 m, 8 dd. — Stn DW 158, 24°47' S, 168°08' E, 262-290 m, 13 dd. — Stn DW 159, 24°46' S, 168°08' E, 241-245 m, 7 dd. — Stn DW 160, 24°47' S, 168°08' E, 280-282 m, 2 dd. — Stn DW 163, 24°49' S, 168°09' E, 310-460 m, 4 dd. — Stn DW 165, 24°47' S, 168°10' E, 372-660 m, 1 dd. — Stn DW 170, 23°41' S, 168°00' E, 241-244 m, 1 dd. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 36 dd. — Stn DW 171, 23°40' S, 168°01' E, 233-250 m, 1 dd. — Stn DW 173, 23°41' S, 168°00' E, 234-242 m, 13 dd. — Stn DW 174, 23°40' S, 168°01' E, 235-240 m, 6 dd. — Stn DW 175, 23°41' S, 168°01' E, 235-240 m, 1 lv. — Stn DW 177, 23°39' S, 168°00' E, 320-370 m, 2 dd. — Stn DW 181, 23°18' S, 168°05' E, 311-330 m, 2 dd. — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 2 dd. — Stn DW 184, 23°18' S, 168°05' E, 305-320 m, 2 dd. — Stn DW 185, 23°15' S, 168°04' E, 311-355 m, 1 dd.

MUSORSTOM 4: stn DW 185, 19°06' S, 163°29' E, 230 m, 1 lv.

BERYX 11: stn DW 11, 24°44' S, 168°10' E, 320-350 m, 1 dd.

BIOCAL: stn DW 64, 24°48' S, 168°09' E, 250 m, 2 dd. — Stn DW 65, 24°48' S, 168°09' E, 245-275 m, 1 spm. — Stn CP 84, 20°43' S, 167°01' E, 150-210 m, 1 dd.

LAGON: stn 490, 18°55' S, 163°24' E, 230 m, 2 spms.

CALSUB: dive 21, 22°45' S, 167°09' E, 340 m, 1 spm.

Loyalty Islands. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 dd. — Stn DW 398, 20°47' S, 167°06' E, 370 m, 1 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 3 spms. — Stn DC 402, 20°30' S, 166°49' E, , 520 m, 1 spm. — Stn DW 407, 20°41' S, 167°07' E, 360 m, 1 dd. — Stn DW 417, 20°42' S, 167°04' E, 283 m, 1 lv. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 1 dd. — Stn DW 422, 20°26' S, 166°40' E, 257 m, 1 spm. — Stn DW 423, 20°26' S, 166°40' E, 280 m, 3 spms. — Stn DW 457, 21°00' S, 167°29' E, 353 m, 1 dd. — Stn DW 482, 21°21' S, 167°47' E, 375 m, 2 dd. — Stn DW 485, 21°23' S, 167°59' E, 350 m, 1 dd.

New Hebrides Arc. VOLSMAR: stn DW 38, 22°22' S, 168°43' E, 380-420 m, 3 dd. — Stn DW 40, 22°20' S, 168°42' E, 275-295 m, 1 dd.

DISTRIBUTION. — Kermadec Islands and New Caledonia area, in 170-520 m, alive in 230-310 m.

REMARKS. — *Conus bruuni* is very similar to *C. kinoshitai* (Kuroda, 1956); however the latter species grows larger (95 vs. 60 mm), has a generally narrower last whorl (RD 0.48-0.58 vs. 0.55-0.66), a narrower protoconch (maximum diameter 1.0 vs. 1.2 mm), and a more diverse speckled colour pattern. Further studies may support the status of *Conus bruuni* as a geographical subspecies of *Conus kinoshitai*. Provisionally we consider *Conus bruuni* a valid species.

The largest specimen measures 49 × 26 mm.

Conus capitaneus Fulton, 1938

Fig. 31

Conus capitaneus Fulton, 1938: 55, pl. 3, figs 1-1a.

Conus capitaneus — COOMANS *et al.*, 1983: 82, figs 297, 334-336.

MATERIAL EXAMINED. — **New Caledonia.** LAGON: stn 476, 18°51' S, 163°25' E, 300-350 m, 1 dd. BIOCAL: stn DW 64, 24°48' S, 168°09' E, 250 m, 2 dd. — Stn DW 65, 24°48' S, 168°09' E, 245-275 m, 3 spms.

SMIB 3: stn DW 8, 24°45' S, 168°08' E, 233 m, 2 dd. — Stn DW 10, 24°42' S, 168°07' E, 235 m, 1 dd.
 SMIB 4: stn DW 41, 24°44' S, 168°09' E, 230-235 m, 3 dd. — Stn DW 43, 24°47' S, 168°09' E, 235-245 m, 4 dd. — Stn DW 44, 24°46' S, 168°08' E, 270-300 m, 2 dd. — Stn DW 46, 24°47' S, 168°08' E, 245-260 m, 3 spms. — Stn DW 49, 24°45' S, 168°08' E, 240-300 m, 2 spms. — Stn DW 50, 23°42' S, 168°01' E, 260-295 m, 1 dd. — Stn DW 51, 23°41' S, 168°01' E, 245-260 m, 1 lv. — Stn DW 53, 23°40' S, 168°00' E, 250-270 m, 2 dd.

SMIB 5: stn DW 75, 23°41' S, 168°01' E, 270 m, 1 lv. — Stn DW 77, 23°41' S, 168°01' E, 270 m, 1 dd. — Stn DW 80, 23°42' S, 168°00' E, 300 m, 1 lv. — Stn DW 85, 22°20' S, 168°53' E, 260 m, 1 dd. — Stn DW 87, 22°19' S, 168°41' E, 370 m, 1 lv. — Stn DW 90, 22°19' S, 168°42' E, 340 m, 1 dd. — Stn DW 94, 22°20' S, 168°43' E, 275 m, 3 dd. — Stn DW 98, 23°02' S, 168°16' E, 335 m, 1 lv. — Stn DW 102, 23°20' S, 168°05' E, 305 m, 1 dd.

SMIB 8: stn DW 154, 24°46' S, 168°08' E, 235-252 m, 5 lv, 3 dd. — Stn DW 156, 24°46' S, 168°08' E, 275-300 m, 1 lv. — Stn DW 158, 24°47' S, 168°08' E, 262-290 m, 3 lv, 1 dd. — Stn DW 159, 24°46' S, 168°08' E, 241-245 m, 9 lv, 2 dd. — Stn DW 160, 24°47' S, 168°08' E, 280-282 m, 1 dd. — Stn CP 161, 24°47' S, 168°09' E, 232-251 m, 1 lv. — Stn DW 163, 24°50' S, 168°09' E, 310-460 m, 1 dd. — Stn DW 165, 24°47' S, 168°10' E, 372-660 m, 3 lv. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 17 lv. — Stn DW 173, 23°41' S, 168°00' E, 234-242 m, 1 dd. — Stn DW 175, 23°41' S, 168°01' E, 235-240 m, 1 lv. — Stn DW 177, 23°39' S, 168°00' E, 320-370 m, 2 lv, 2 dd. — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 1 dd.

BERYX 11: stn CP 21, 24°44' S, 168°07' E, 430-450 m, 1 dd. — Stn CP 45, 23°40' S, 168°01' E, 270-290 m, 1 dd.

CHALCAL 2: stn DW 69, 24°44' S, 168°08' E, 260 m, 2 lv. — Stn DW 70, 24°46' S, 168°09' E, 232 m, 1 dd. — Stn DW 71, 24°42' S, 168°10' E, 230 m, 2 lv. — Stn DW 78, 23°41' S, 168°00' E, 233 m, 1 spm.

Loyalty Islands. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 lv. — Stn DW 392, 20°47' S, 167°05' E, 340 m, 1 dd. — Stn DW 397, 20°47' S, 167°05' E, 380 m, 1 dd. — Stn DW 398, 20°47' S, 167°06' E, 370 m, 4 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 4 spms. — Stn DW 406, 20°41' S, 167°07' E, 373 m, 1 dd. — Stn DW 416, 20°42' S, 167°00' E, 343 m, 1 dd. — Stn DW 417, 20°42' S, 167°04' E, 283 m, 2 dd. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 3 dd. — Stn DW 422, 20°26' S, 166°40' E, 257 m, 2 dd. — Stn DW 423, 20°26' S, 166°40' E, 280 m, 7 dd. — Stn DW 451, 20°59' S, 167°24' E, 330 m, 2 dd. — Stn DW 452, 21°00' S, 167°25' E, 300 m, 1 dd. — Stn DW 472, 21°09' S, 167°55' E, 300 m, 1 lv. — Stn DW 478, 21°09' S, 167°54' E, 400 m, 1 dd. — Stn DW 480, 21°08' S, 167°56' E, 380 m, 5 lv. — Stn DW 482, 21°21' S, 167°47' E, 375 m, 2 dd.

DISTRIBUTION. — Japan to Philippines and around New Caledonia, in 230-430 m, alive in 230-390 m.

REMARKS. — *Conus capitaneus* is a rather common deep-water species in the northwestern Pacific.

The largest specimen measures 34 × 19 mm.

Conus cervus Lamarck, 1822

Conus cervus Lamarck, 1822: 510.

Conus cervus — MERMOD, 1947: 175. — COOMANS *et al.*, 1983: 108, figs 306, 398-399. — KOHN, 1988: 26, fig. 2.

MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6: stn CP 454, 21°01' S, 167°26' E, 260 m, 1 dd (fragment).

DISTRIBUTION. — Philippines to Indonesia, in 180-400 m; now New Caledonia in 260 m (dead).

REMARKS. — This is the first record of *C. cervus* from Melanesia. The length of the fragment is 95 mm.

Conus chiangi (Azuma, 1972)

Fig. 32

Taranteconus chiangi Azuma, 1972: 56, 59, figs 5-6.
Conus chiangi — COOMANS *et al.*, 1983: 114, figs 308, 407.

MATERIAL EXAMINED. — **New Caledonia**. SMIB 5: stn DW 95, 23°00' S, 168°20' E, 200 m, 1 lv.
 SMIB 8: stn DW 158, 24°47' S, 168°08' E, 262-290 m, 2 lv.

DISTRIBUTION. — Japan to Philippines in 200-400 m; now New Caledonia, in 200-260 m (alive).

REMARKS. — This is the first record of this peculiar and rarely found deep-water species from Melanesia. The largest specimen measures 12.7 × 7.1 mm.

Conus comatosa Pilsbry, 1904

Fig. 33

Conus dormitor Pilsbry, 1904a: 6, pl. 1, figs 9-9a.
Conus comatosa Pilsbry, 1904b: 550 (*nom. nov. pro C. dormitor*).
Conus comatosa — COOMANS *et al.*, 1985a: 247, figs 439, 503-504.

MATERIAL EXAMINED. — **New Caledonia**. SMIB 8: stn DW 154, 24°46' S, 168°08' E, 235-252 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 392, 20°47' S, 167°05' E, 340 m, 3 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 1 dd. — Stn DW 417, 20°42' S, 167°04' E, 283 m, 1 lv. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 3 dd. — Stn DW 453, 21°00' S, 167°27' E, 250 m, 1 lv.

DISTRIBUTION. — Japan, Philippines, Northwest Australia, Solomon Islands; now New Caledonia in 250-340 m, alive in 250-280 m.

REMARKS. — This is the first record of this deep-water species from the New Caledonia region. The largest specimen measures 48 × 17 mm, which is like material from Japan and Philippines.

Conus darkini Röckel, Korn & Richard, 1993

Fig. 24

Conus darkini Röckel, Korn & Richard, 1993: 48, figs 1-4.

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6: stn CP 465, 21°04' S, 167°32' E, 480 m, 1 dd (paratype). — Stn CP 467, 21°05' S, 167°32' E, 575 m, 1 dd (holotype).

DISTRIBUTION. — Loyalty Islands in 480-575 m (dead), Philippine Sea (Kita-Koho area, E. of Ryukyu Islands) and Philippines (Balut Island).

REMARKS. — The 56 mm holotype and 49 mm paratype from the Loyalty Islands agree in all other aspects with the material from the Philippines and Philippine Sea, which measures up to 87 mm.

Conus dusaveli (H. Adams, 1872)

Leptoconus (Phasmoconus) dusaveli H. Adams, 1872: 12, pl. 3, fig. 17.

Conus dusaveli — COOMANS *et al.*, 1985b: 179, figs 224, 594, 662-664. — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **New Caledonia**. LAGON: stn 490, 18°55' S, 163°24' E, 230 m, 1 dd (fragment).

SMIB 5: stn DW 100, 23°23' S, 168°05' E, 120 m, 1 dd (fragment).

Loyalty Islands. MUSORSTOM 6: stn DW 440, 20°49' S, 167°17' E, 288 m, 1 dd (fragment).

DISTRIBUTION. — Ryukyu Islands (Japan) to Philippines and New Caledonia, in 120-290 m (dead).

REMARKS. — Length of the fragment from stn DW 100 is 57 mm.

Conus estivali Moolenbeek & Richard sp. nov.

Figs 6-7

TYPE MATERIAL. — Holotype MNHN. Paratypes: 5 MNHN, 1 ZMA 3.94.019, 1 NMNZ M268540, 1 AMS C201717, 1 DR.

TYPE LOCALITY. — Coral Sea, MUSORSTOM 5, stn DC 361, 19°53' S, 158°38' E, 400 m.

MATERIAL EXAMINED. — **Chesterfield Islands**. MUSORSTOM 5: stn DC 361, 19°53' S, 158°38' E, 400 m, 1 lv (holotype), 3 dd (paratypes: ZMA, 9.5 × 5.5 mm; AMS, 9.8 × 5.7 mm; NMNZ, 9.7 × 5.5 mm). — Stn DC 362, 19°53' S, 158°40' E, 410 m, 1 dd (paratype DR, 9.8 × 5.7 mm). — Stn DC 378, 19°54' S, 158°38' E, 355 m, 3 dd (paratypes MNHN, 13 × 7.2 mm, 12 × 7 mm, 12.2 × 7.3 mm). — Stn DC 379, 19°53' S, 158°40' E, 370-400 m, 2 dd (paratypes MNHN, 12 × 6.8 mm, 12.5 × 7 mm).

DISTRIBUTION. — Only known from the Chesterfield Islands, Coral Sea, in 355-410 m, alive in 400 m.

DESCRIPTION. — Holotype length 10.4 mm, width 6.0 mm; shell small, thin, and shiny. Last whorl conical, RD 0.67. Sides almost straight. Shoulder sharply angulate to carinate; spire of moderate height, outline straight. *Protoconch* of about 2 whorls, maximum diameter 0.9-1.0 mm. First postnuclear whorl with 0-1 spiral groove gradually increasing to 6 grooves on top of body whorl. Just above sutures a well

developed ridge, giving the spire a stepped outline. Last whorl smooth with 10-11 hardly visible striae on the anterior part. Aperture narrow, almost uniform in width. Last whorl white with some diffuse white and light brown blotches and 6 fine brown spiral lines. *Protoconch* milky white. Spire with brown spots along the margins of the abapical ridge.

REMARKS. — The length of paratypes ranges from 8.0 to 12.3 mm, relative diameter of last whorl from 0.63-0.69 and the relative spire height 0.09-0.16; the number of brown spiral lines on last whorl can vary from 6 to 8.

Conus estivali has no close similarities to already known species. Its shape is similar to *C. boucheti* but this species lacks the spiral sculpture on its sutural ramp and has a brown base. The colour pattern of the new species resembles *C. kanakinus* but the latter species grows larger (length up to 21 mm), has a more slender last whorl (RD ≤ 0.60) and a more rounded shoulder.

ETYMOLOGY. — This new species is named after Jean-Claude ESTIVAL, well known cone collector in New Caledonia, whose collection is now in MNHN.

Conus excelsus Sowerby III, 1908

Fig. 34

Conus excelsus Sowerby III, 1908: 465, text figs.

Conus excelsus — CERNOHORSKY, 1974: 133. — COOMANS *et al.*, 1986: 131. — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **New Caledonia**. LAGON: stn 537, 19°07' S, 163°22' E, 200 m, 1 dd. **Loyalty Islands**. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 dd. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 2 dd. — Stn DW 423, 20°26' S, 166°41' E, 280 m, 1 dd. — Stn DW 456, 21°01' S, 167°26' E, 240 m, 2 dd. — Stn DW 462, 21°05' S, 167°27' E, 200 m, 1 dd. —

DISTRIBUTION. — Japan to Philippines; Solomon Islands, New Caledonia, in 200-390 m (dead), and Queensland, Australia; Andaman Sea, off Burma.

The largest specimen measures 55 × 21 mm.

Conus gondwanensis Röckel & Moolenbeek sp. nov.

Figs 8-9, 54

TYPE MATERIAL. — Holotype MNHN. Paratypes: 2 MNHN, 1 AMS C201718, 1 NMNZ M268541, 1 ZMA 3.94.020, 1 DR.

TYPE LOCALITY. — South New Caledonia, SMIB 5, stn DW 73, 23°41' S, 168°01' E, 240 m.

MATERIAL EXAMINED. — **New Caledonia**. CHALCAL 2: stn CH 5, 24°44' S, 168°09' E, 223 m, 1 dd. — Stn DW 71, 24°42' S, 168°10' E, 230 m, 1 dd (paratype DR, 22.3 × 11.8 mm). — Stn DW 84, 23°24' S, 168°07' E, 170 m, 1 lv (paratype AMS, 19.8 × 10.5 mm). SMIB 4: stn DW 41, 24°44' S, 168°09' E, 230-235 m, 1 spm (paratype MNHN, 19.8 × 10.9 mm). — Stn DW 43, 24°47' S, 168°09' E, 235-245 m, 1 spm (paratype MNHN, 21.7 × 11.2 mm). — Stn DW 57, 23°22' S, 168°05' E, 210-260 m, 1 lv. SMIB 8: stn DW 154, 24°46' S, 168°08' E, 235-252 m, 1 lv, 3 dd. — Stn DW 155, 24°46' S, 168°08' E, 257-262 m, 1 spm. — Stn DW 158, 24°47' S, 168°08' E, 262-290 m, 5 spms. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 1 dd (paratype ZMA 24.8 × 13.8 mm). — Stn DW 173, 23°41' S, 168°00' E, 234-242 m, 1 dd (paratype NMNZ, 28 × 14.8mm).

DISTRIBUTION. — South New Caledonia, Norfolk Ridge, in 170-260 m, alive in 170-235 m.

DESCRIPTION. — *Shell* moderately small (L 18-28 mm) and light. Spire of moderate height (RSH 0.17-0.23). Outline of spire deeply concave. *Protoconch* of more than 3 whorls, maximum diameter 0.9 mm. Postnuclear whorls (7-8) tuberculate, shoulder slightly tuberculate to carinate. Postnuclear sutural ramps with 2 increasing to 3-4 weak spiral grooves. Last whorl broadly conical (RD 0.63-0.69) to slightly pyriform, sides convex above shoulder and slightly attenuate basally. Surface of last whorl smooth; other specimens from

the same locality with about 20 fine granulated spiral ribs. Ground colour white, last whorl with 2 broad light brown spiral bands, below and above centre. Holotype 21.4 × 11.6 mm.

Radula with 44 slender teeth of the vermivore type. Apical point short, with blade extending over 66%, furnished with 14 denticles.

REMARKS. — *C. granarius* Kiener, 1845 from the western Atlantic is most similar to *Conus gondwanensis*. *C. granarius* differs in its higher spire (RSH 0.22-0.33), its protoconch of less than

3 whorls and its colour pattern. Similar in shape and size are *Conus sennottorum* Rehder & Abbott, 1951 and *C. cancellatus* Hwass in Bruguière, 1792, both from the western Atlantic, which differ in having smooth instead of tuberculate spire whorls and shoulders.

ETYMOLOGY. — As suggested by RICHER DE FORGES (1990), the area where this species lives may represent the eastern rim of the ancient continent of Gondwanaland.

Conus howelli Iredale, 1929

Fig. 35

Conus howelli Iredale, 1929: 182, pl. 40, figs 1, 8.
Conus howelli — MARSHALL, 1981: 495, figs.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 255, 25°15' S, 159°55' E, 280-295 m, 1 dd.

New Caledonia. SMIB 3: stn DW 8, 24°45' S, 168°08' E, 233 m, 2 dd.

SMIB 5: stn DW 85, 22°20' S, 168°43' E, 260 m, 1 dd.

SMIB 8: stn DW 159, 24°46' S, 168°08' E, 241-245 m, 4 dd. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 1 dd. — Stn DW 174, 23°40' S, 168°01' E, 235-240 m, 1 dd.

DISTRIBUTION. — Southern Queensland to New South Wales, North of New Zealand, and New Caledonia in 230-280 m (dead).

REMARKS. — This is the first Melanesian record of this rare species. The largest specimen (partly broken) measures 26 mm.

Conus ichinoseana (Kuroda, 1956)

Fig. 36

Asprella (*Conasprella* ?) *ichinoseana* Kuroda, 1956: 10, pl. 1, fig. 5.
Conus ichinoseana — RICHER DE FORGES & ESTIVAL, 1986: 16, fig. 3.

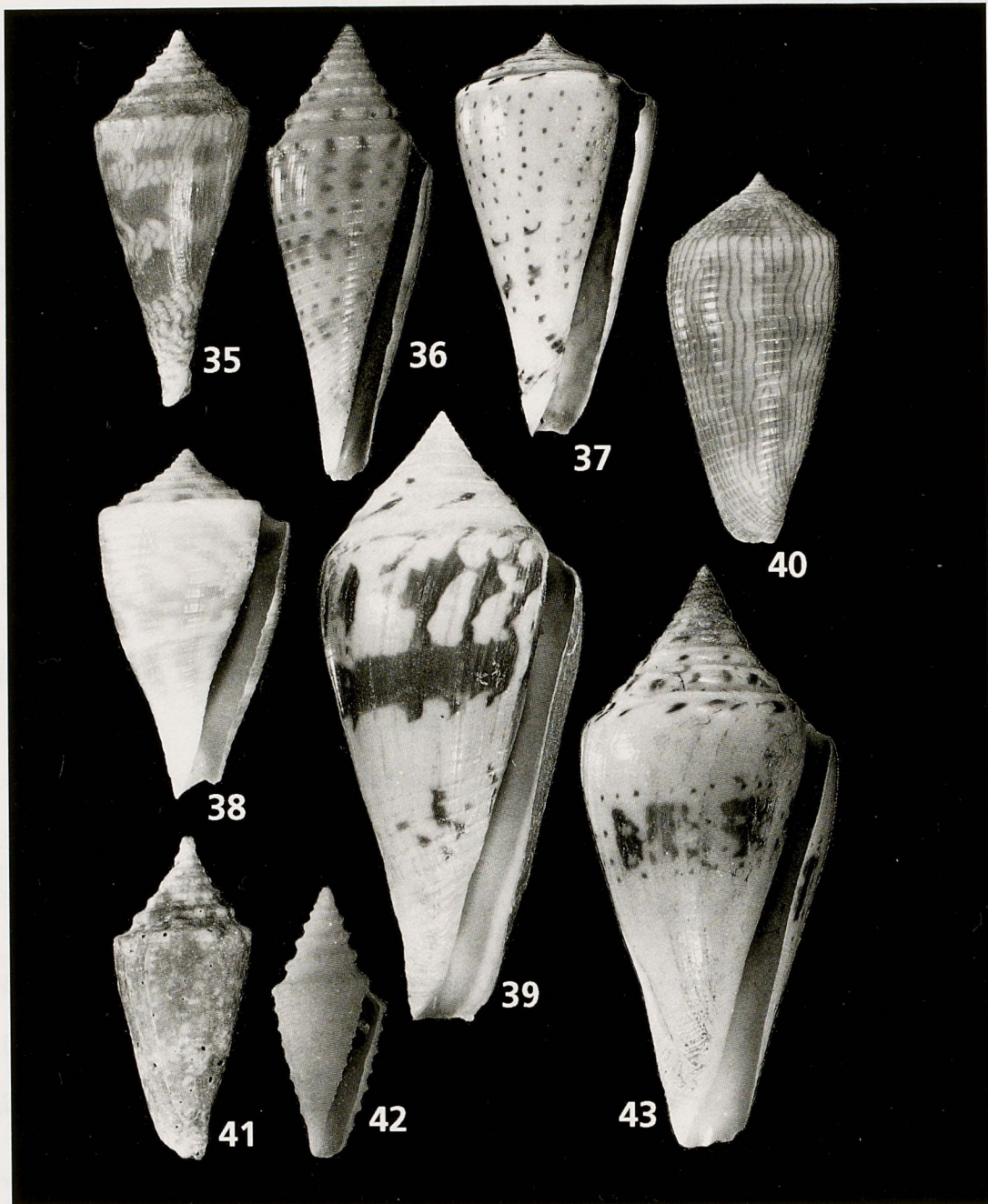
MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTORM 5: stn DC 361, 19°53' S, 158°38' E, 400 m, 1 dd. — Stn DC 372, 19°53' S, 158°39' E, 400 m, 1 dd.

New Caledonia. MUSORSTOM 4: stn CP 179, 18°57' S, 163°14' E, 475 m, 1 dd. — Stn CC 201, 18°56' S, 163°14' E, 490 m, 1 lv. — Stn CC 246, 22°08' S, 167°11' E, 410-420 m, 1 lv.

Loyalty Islands. MUSORSTOM 6: stn DW 428, 20°24' S, 166°13' E, 420 m, 1 lv. — Stn CP 467, 21°05' S, 167°32' E, 575 m, 2 dd.

DISTRIBUTION. — Japan to Philippines; Northwest Australia and New Caledonia, in 400-575 m, alive in 420-490 m.

REMARKS. — Largest specimen measures 46 × 18 mm. Specimens from Taiwan may reach 105 mm in length.



FIGS 35-43. — 35, *Conus howelli*, New Caledonia, Norfolk Ridge, SMIB 8: stn DW 174, 23.7 × 9.5 mm. — 36, *Conus ichinoseana*, New Caledonia, MUSORSTOM 4: stn CC 246, 46.5 × 17.4 mm. — 37, *Conus ione*, New Caledonia, MUSORSTOM 4: stn DW 210, 46.3 × 24.2 mm. — 38, *Conus pagodus*, New Caledonia, "Vauban" 1978-79: stn 9, 27.0 × 15.3 mm. — 39, *Conus pergrandis*, Loyalty Islands, MUSORSTOM 6: stn DW 391, 116.8 × 50.8 mm. — 40, *Conus kuroharai*, Loyalty Islands, MUSORSTOM 6: stn DW 422, 41.4 × 20.1 mm. — 41, *Conus polongimarumai*, New Caledonia, LAGON: stn 476, 23 × 10 mm. — 42, *Conus raoulensis*, Coral Sea, MUSORSTOM 5: stn 255, 15.0 × 6.2 mm. — 43. — *Conus stupa*, Loyalty Islands, MUSORSTOM 6: stn CP 464, 77.5 × 25.1 mm.

Conus ione Fulton, 1938

Fig. 37

Conus ione Fulton, 1938: 55, pl. 3, fig. 2.*Conus ione* — RICHER DE FORGES & ESTIVAL, 1986: 16, fig.

MATERIAL EXAMINED. — **New Caledonia.** BIOCAL: stn DW 38, 23°00' S, 167°15' E, 360 m, 1 dd. MUSORSTOM 4: stn DW 181, 18°57' S, 163°22' E, 350 m, 1 lv. — Stn DW 210, 22°44' S, 167°09' E, 340-345 m, 1 dd. — Stn DW 223, 22°57' S, 167°30' E, 545-560 m, 1 spm. — Stn DW 226, 22°47' S, 167°22' E, 390 m, 1 dd. — Stn DW 230, 22°52' S, 167°12' E, 390-420 m, 2 lv. SMIB 3: stn DW 17, 23°41' S, 167°59' E, 238 m, 1 dd. SMIB 8: stn DW 181, 23°18' S, 168°05' E, 311-330 m, 1 lv. — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 1 lv. — Stn DW 184, 23°18' S, 168°05' E, 305-320 m, 1 lv. — Stn DW 185, 23°15' S, 168°04' E, 311-355 m, 2 lv. — Stn DW 187, 23°17' S, 168°06' E, 390-540 m, 1 lv. — Stn DW 189, 23°18' S, 168°06' E, 400-402 m, 2 lv. BERYX 11: stn CH 54, 23°45' S, 168°17' E, 390-420 m, 1 dd. **Loyalty Islands.** MUSORSTOM 6: stn DW 398, 20°47' S, 167°06' E, 370 m, 1 dd. — Stn DW 406, 20°41' S, 167°07' E, 373 m, 3 dd. — Stn DW 457, 21°00' S, 167°29' E, 353 m, 1 dd. — Stn DW 487, 21°23' S, 167°46' E, 500 m, 1 dd.

DISTRIBUTION. — Japan to Philippines; New Caledonia, in 240-560 m, alive in 320-400 m; off Northwest Australia, and Mozambique.

REMARKS. — Largest specimen 46 × 24 mm. Shells from Japan can reach 76 mm in length.

Conus kanakinus Richard, 1983

Fig. 19

Conus kanakinus Richard, 1983: 55, 58, figs 5-9.

MATERIAL EXAMINED. — **New Caledonia.** "Vauban" 1978-79: 22°49' S, 167°12' E, 390-395 m (holotype and 2 paratypes). — 22°46' S, 167°12' E, 390-400 m (2 paratypes). LAGON: stn 444, 18°15' S, 162°59' E, 300-350 m, 4 lv. — Stn 475, 18°36' S, 163°11' E, 415-460 m, 3 dd, 1 spm. — Stn 1152, 18°58' S, 163°24' E, 335 m, 5 spms. — Stn 1153, 18°58' S, 163°23' E, 330 m, 1 dd. BIOCAL: stn DW 44, 22°47' S, 167°14' E, 440-450 m, 3 lv, 23 dd. MUSORSTOM 4: stn DW 156, 18°54' S, 163°19' E, 525 m, 1 dd. — Stn DW 159, 18°46' S, 163°16' E, 585-600 m, 3 dd. — Stn DW 162, 18°35' S, 163°10' E, 525 m, 4 dd. — Stn DW 181, 18°57' S, 163°22' E, 350 m, 1 lv. — Stn DW 183, 19°02' S, 163°26' E, 280 m, 1 lv, 3 dd. — Stn DW 184, 19°04' S, 163°27' E, 260 m, 1 lv, 4 dd. — Stn DW 196, 18°55' S, 163°24' E, 450 m, 7 dd. — Stn DW 197, 18°51' S, 163°21' E, 550 m, 13 dd. — Stn DW 212, 22°47' S, 167°10' E, 375-380 m, 2 dd. — Stn DW 221, 22°59' S, 167°37' E, 535-560 m, 1 dd. — Stn DW 222, 22°58' S, 167°33' E, 410-440 m, 3 lv. — Stn DW 223, 22°57' S, 167°30' E, 545-560 m, 1 dd. — Stn DW 224, 22°55' S, 167°27' E, 575-595 m, 1 dd. — Stn DW 230, 22°52' S, 167°12' E, 390-420 m, 1 dd. SMIB 1: stn DW 2, 22°52' S, 167°13' E, 415 m, 1 lv, 5 dd. SMIB 2: stn DW 3, 22°56' S, 167°15' E, 412-428 m, 6 dd. — Stn DW 4, 22°53' S, 167°13' E, 410-417 m, 4 dd. — Stn DW 5, 22°56' S, 167°14' E, 398-410 m, 1 lv, 8 dd. — Stn DW 6, 22°57' S, 167°16' E, 442-460 m, 1 dd. — Stn DW 8, 22°54' S, 167°12' E, 435-447 m, 1 dd. — Stn DW 10, 22°55' S, 167°16' E, 490-495 m, 1 dd. — Stn DW 12, 22°53' S, 167°14' E, 445-460 m, 1 lv. — Stn DW 14, 22°53' S, 167°13' E, 405-444 m, 2 dd. — Stn DW 16, 22°51' S, 167°12' E, 390 m, 2 dd.

SMIB 3: stn DW 21, 22°59' S, 167°19' E, 525 m, 1 dd. — Stn DW 29, 22°47' S, 167°12' E, 405 m, 8 dd. — Stn CP 4, 24°54' S, 168°21' E, 530 m, 2 dd.
 SMIB 4: stn DW 66, 22°56' S, 167°15' E, 400-430 m, 2 lv.

DISTRIBUTION. — New Caledonia in 260-585 m, alive in 260-445 m.

REMARKS. — The largest specimen measures 20 mm in length.

Conus kimioi (Habe, 1965)

Rhizoconus kimioi Habe, 1965: 47-48, pl. 4, figs 1-2.

Conus kimioi — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **Chesterfield Islands**. CHALCAL 1: stn DC 38, 20°00' S, 158°46' E, 250 m, 1 dd.

New Caledonia. LAGON: stn 490, 18°55' S, 163°24' E, 230 m, 1 dd.

MUSORSTOM 4: stn DW 205, 22°38' S, 167°07' E, 140-160 m, 1 dd.

DISTRIBUTION. — Japan to Philippines, New Caledonia in 160-250 m (dead).

REMARKS. — The largest specimen from Lagon Nord (New Caledonia) measures 16 × 7 mm whereas specimens from Philippines can reach a length up to 23 mm.

Conus kuroharai (Habe, 1965)

Fig. 40

Asprella kuroharai Habe, 1965: 46, pl. 4, figs 3-4.

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 2 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 1 dd. — Stn DW 422, 20°26' S, 166°40' E, 257 m, 1 dd. — Stn DW 452, 21°00' S, 167°25' E, 300 m, 2 dd.

New Hebrides Arc. VOLSMAR: stn DW 40, 22°20' S, 168°41' E, 275-295 m, 1 dd.

DISTRIBUTION. — A deep-water species so far known only from Japan to Philippines; now New Caledonia, in 257-390 m (dead).

REMARKS. — This is the first record of this species from Melanesia. The largest specimen measures 51.3 mm in length.

Conus lani Crandall, 1979

Fig. 23

Conus lani Crandall, 1979: 113, figs 1-2.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4: stn DW 223, 22°57' S, 167°30' E, 545-560 m, 1 dd.

Loyalty Islands. BIOGEOCAL: stn DW 253, 21°32' S, 166°29' E, 310-315 m, 1 dd.

DISTRIBUTION. — Taiwan, Philippines, Solomon Islands, now New Caledonia in 315-545 m (dead).

REMARKS. — This is the first record of this rarely found species from the New Caledonian region. The largest specimen measures 54 mm in length.

Conus loyaltiensis Röckel & Moolenbeek sp. nov.

Figs 1, 10-11, 55

TYPE MATERIAL. — Holotype MNHN. Paratypes: 4 MNHN, 1 ZMA 3.94.025, 1 NMNZ M268542, 1 AMS C201719, 1 DR.

TYPE LOCALITY. — Loyalty Ridge, MUSORSTOM 6, stn CP 465, 21°04' S, 167°32' E, 480 m.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DC 357, 19°37' S, 158°46' E, 630 m, 1 dd. — Stn DC 380, 19°38' S, 158°44' E, 555-570 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn CP 465, 21°04' S, 167°32' E, 480 m, 1 lv (holotype), 4 dd (paratypes: ZMA, 23.1 × 11.1 mm; NMNZ, 24.5 × 11.1 mm; AMS, 21.2 × 10 mm; DR, 22.5 × 10.7 mm). — Stn CP 467, 21°05' S, 167°32' E, 575 m, 3 dd (paratypes MNHN, 21.0 × 9.6 mm; 22.4 × 10.3 mm; 20.6 × 9.8 mm), 1 spm (paratype MNHN, 21.6 × 10.2 mm).

DISTRIBUTION. — Known with certainty only from the Loyalty Islands in 480 (live) — 575 m. The two specimens from the Chesterfield Islands, in 570-630 m, are dead collected, possibly subfossil, and are tentatively identified as *C. loyaltiensis*.

DESCRIPTION. — Holotype: shell small, light, and biconic (shell length 21.8 mm, width 10.1 mm, aperture height 16.6 mm, RD 0.61). *Protoconch* of 1.75 glossy whorls, maximum diameter 1.0 mm. Spire of moderate height (RSH 0.24), consisting of 7.25 postnuclear whorls; outline deeply concave. Postnuclear whorls nodulose and slightly stepped; first whorls with 12 nodules. Postnuclear sutural ramps concave; gradually a subsutural groove is formed, which is already well represented on the 2nd ramp, increasing to 4 strong and deeply incised spiral grooves with axial opisthocline riblets in later ramps. Nodules which are prominent

on 2-6 whorls gradually diminish toward shoulder. Shoulder weakly tuberculate and carinate, with a ridge just below it. Sides of last whorl slightly sigmoid, attenuated near base. Basal half of last whorl with about 20 distinct spiral ribbons with flat surface, separated by axially striate grooves. Upper part smooth, with only microscopic spiral striae and hardly visible axial growth lines. Aperture straight, outer lip thin. Colour uniformly milky white. Periostracum greyish brown, thin, translucent, and smooth.

Radula with relatively large teeth (0.6 mm for a 22.4 mm shell). Apical part very short, base oblique.

REMARKS. — Shell length of paratypes 21.5-26 mm, RD 0.61-0.63, RSH 0.22-0.24; number of postnuclear whorls 7.25-8, number of spiral grooves on late sutural ramps 3-4. Shape, sculpture, and colour otherwise homogeneous. The two specimens from Chesterfield Islands differ slightly from those from the Loyalty Islands by having a lower spire and less pronounced nodules.

Conus loyaltiensis is similar to *C. vaubani* in size and colour, and also in its paucispiral protoconch, but differs in having slightly stepped spire whorls, 4 strong spiral grooves instead of 8-9 weak spiral grooves or striae on late spire whorls, deeply concave instead of rather sigmoid spire outline, last whorl with ribbons on basal half or third instead of fine ribs basally changing to spiral striae up to shoulder. Axial costae below shoulder and brown streaks are absent. *Conus teramachii*, *C. ione*, *C. smirna*, and *C. profundorum* differ from the new species in having multispiral protoconchs.

Conus luciae Moolenbeek, 1986

Fig. 16

Conus luciae Moolenbeek, 1986: 211, figs 1-3.

MATERIAL EXAMINED. — **Chesterfield Islands.** CHALCAL 1: stn DC 66, 22°27' S, 159°20' E, 320 m (paratype). — Stn DC 68, 22°35' S, 159°16' E, 296 m (holotype).

MUSORSTOM 5: stn DW 255, 25°15' S, 159°55' E, 280-295 m, 3 dd. — Stn DW 256, 25°18' S, 159°53' E, 290-300 m, 1 dd. — Stn DW 261, 300 m, 2 spms. — Stn DW 270, 24°49' S, 159°34' E, 223 m, 1 dd. — Stn DW 274, 24°45' S, 159°41' E, 285 m, 1 dd. — Stn CP 275, 24°47' S, 159°40' E, 285 m, 1 lv. — Stn DW 277, 24°11' S, 159°35' E, 270 m, 1 spm. — Stn DW 281, 24°11' S, 159°34' E, 272 m, 1 dd. — Stn CP 287, 24°05' S, 159°36' E, 270 m, 1 spm. — Stn DW 299, 22°48' S, 159°24' E, 360-390 m, 1 dd. — Stn DW 300, 22°48' S, 159°24' E, 450 m, 1 dd. — Stn DW 301, 22°07' S, 159°25' E, 487-610 m, 1 lv. — Stn DW 303, 22°12' S, 159°23' E, 332 m, 1 dd. — Stn DW 304, 22°10' S, 159°26' E, 385-420 m, 1 dd. — Stn DW 306, 22°08' S, 159°21' E, 375-415 m, 1 dd. — Stn CP 311, 22°14' S, 159°24' E, 320 m, 1 lv. — Stn CP 315, 22°25' S, 159°27' E, 330-335 m, 1 lv.

New Caledonia. SMIB 3: stn DW 8, 24°45' S, 168°08' E, 233 m, 1 dd. — Stn DW 18, 23°42' S, 167°59' E, 338 m, 1 dd. — Stn DW 20, 23°40' S, 168°00' E, 280 m, 2 dd.

SMIB 4: stn DW 38, 24°55' S, 168°22' E, 510 m, 2 dd. — Stn DW 44, 24°46' S, 168°08' E, 270-300 m, 1 lv. — Stn DW 46, 24°47' S, 168°08' E, 245-260 m, 2 lv. — Stn DW 48, 24°46' S, 168°09' E, 240-245 m, 1 dd. — Stn DW 52, 23°41' S, 168°00' E, 235-250 m, 1 lv. — Stn DW 56, 23°21' S, 168°05' E, 230-260 m, 1 lv.

SMIB 5: stn DW 74, 23°40' S, 168°01' E, 245 m, 1 dd. — Stn DW 76, 23°41' S, 168°00' E, 280 m, 1 dd. — Stn DW 98, 23°02' S, 168°16' E, 335 m, 1 spm.

SMIB 8: stn DW 160, 24°47' S, 168°08' E, 280-282 m, 1 dd. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 1 dd. — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 1 lv. — Stn DW 187, 23°17' S, 168°06' E, 390-540 m, 1 lv. — Stn DW 189, 23°18' S, 168°06' E, 400-402 m, 1 lv.

CHALCAL 2: stn DW 69, 24°44' S, 168°08' E, 260 m, 2 spms. — Stn DW 70, 24°46' S, 168°09' E, 232 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 418, 20°42' S, 167°03' E, 283 m, 1 dd. — Stn DW 457, 21°00' S, 167°29' E, 353 m, 1 dd.

BIOGEOCAL: stn KG 252, 21°31' S, 166°21' E, 330 m, 2 dd.

DISTRIBUTION. — Previously known only from two empty shells from the Coral Sea, *Conus luciae* is now shown to be a regionally widespread species, from the Coral Sea to the Loyalty Is, in 225-510 m, alive in 245-485 m.

REMARKS. — The larval shell of *Conus luciae* has about 3 whorls, maximum diameter is 0.9 mm, indicating a planktotrophic larval development.

Conus orbignyi coriolisi Moolenbeek & Richard ssp. nov.

Figs 12-13

Conus orbignyi — RICHER DE FORGES & ESTIVAL, 1986: 16, fig.

TYPE MATERIAL. — Holotype MNHN. Paratypes: 1 ZMA 3.94.021, 1 AMS C201720, 1 NMNZ M268543, 1 DR, 1 MNHN.

TYPE LOCALITY. — Coral Sea, Lord Howe Rise, Capel Bank, MUSORSTOM 5, stn DW 266, 25°29' S, 159°46' E, 240 m.

MATERIAL EXAMINED. — **Chesterfield Islands.** CHALCAL 1: stn DC 64, 22°11' S, 159°15' E, 305 m, 1 spm.

MUSORSTOM 5: stn 258, 25°33' S, 159°46' E, 300 m, 4 dd. — Stn DW 260, 25°29' S, 159°44' E, 285 m, 1 dd. — Stn DW 261, 25°27' S, 159°46' E, 300 m, 1 lv. — Stn DW 263, 25°21' S, 159°46' E, 225-150 m, 1 lv. — Stn DW 265, 25°21' S, 159°45' E, 190-260 m, 2 dd. — Stn DW 266, 25°29' S, 159°46' E, 240 m, 1 lv (holotype), 5 spms (paratypes: 43.2 × 15.6 mm, ZMA; 42.8 × 15.6 mm, AMS; 36.3 × 13.7 mm, NMNZ; 38.7 × 14.9 mm, DR; 41.7 × 16.5 mm, MNHN). — Stn 268, 24°45' S,

159°39' E, 280 m, 1 dd. — Stn DW 274, 24°45' S, 159°41' E, 285 m, 1 dd. — Stn DW 284, 24°10' S, 159°33' E, 225-230 m, 2 dd. — Stn DW 285, 24°09' S, 159°34' E, 245-255 m, 2 dd. — Stn 290, 23°06' S, 159°26' E, 300 m, 1 dd. — Stn DW 294, 23°11' S, 159°30' E, 272 m, 1 dd. — Stn 302, 22°10' S, 159°23' E, 345-360 m, 1 dd. — Stn 303, 22°12' S, 159°23' E, 332 m, 2 dd. — Stn 306, 22°08' S, 159°21' E, 375-415 m, 1 dd juv. — Stn CP 318, 22°27' S, 159°21' E, 330 m, 1 dd.

New Caledonia. LAGON: stn 539, 19°05' S, 163°17' E, 240 m, 2 dd.

MUSORSTOM 4: stn CP 172, 19°01' S, 163°16' E, 275-330 m, 1 dd. — Stn DW 220, 22°58' S, 167°38' E, 505-550 m, 1 dd juv.

SMIB 6: stn DW 130, 19°05' S, 163°21' E, 225-230 m, 1 dd. — Stn DW 132, 19°03' S, 163°19' E, 235-240 m, 1 dd. — Stn DW 136, 19°01' S, 163°18' E, 300-320 m, 2 dd.

BERYX 11: stn DW 11, 24°44' S, 168°10' E, 320-350 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 395, 20°48' S, 167°05' E, 400 m, 1 dd. — Stn DW 398, 20°47' S, 167°06' E, 370 m, 2 dd. — Stn DW 452, 21°00' S, 167°25' E, 300 m, 1 dd. — Stn DW 481, 21°22' S, 167°50' E, 300 m, 1 dd.

DISTRIBUTION. — Coral Sea, New Caledonia and Loyalty Ridge, alive in 225-330 m.

DESCRIPTION. — Holotype length 44.6 mm, width 15.0 mm; shell thin. Last whorl narrowly conical, RD 0.46, outline slightly convex below shoulder tapering toward the base. Spire high (Relative spire height 0.27), outline concave. Protoconch of 3 or more smooth and glossy whorls. Teleoconch of 9 1/2, tuberculate whorls. Teleoconch sutural ramps slightly concave with 1 increasing to 5-7 spiral grooves,

crossed by axial threads. Last whorl with spiral grooves containing axial riblets; grooves becoming obsolete in adapical third. Aperture narrow, outer lip thin. Colour of protoconch transparent white, spire white with a few irregular brown blotches. Last whorl with 3 spiral bands or irregular brown blotches. Aperture white.

REMARKS. — Shells of paratypes and other specimens are very homogeneous in sculpture and pattern. Length of adult specimens 35-53 mm, relative diameter of last whorl 0.45-0.55, relative spire height 0.24-0.30.

Conus orbigny coriolisi ssp. nov. differs from the nominal subspecies *Conus o. orbigny* Audouin, 1831 (NW Pacific) and from *Conus orbigny elokismenos* Kilburn, 1975 (West Indian Ocean; see KILBURN, 1973) in its smaller size (53 mm vs. 87 mm and 65 mm respectively), last whorl almost smooth adapically, and its colour pattern usually reduced to 3 interrupted brown spiral bands.

ETYMOLOGY. — This new subspecies is named after R.V. "Coriolis" aboard which the MUSORSTOM 5 expedition was carried.

Conus pagodus Kiener, 1845

Fig. 38

Conus pagodus Kiener, 1845: pl. 70, fig. 4; 1849-1850: 310.

Conus pagodus — KOHN, 1968: 445, pl. 3, fig. 22. — COOMANS *et al.*, 1983: 77-78, figs 295, 329, 332-333. — VINK & RÖCKEL, 1984: 5.

Conus cancellatus — RICHER DE FORGES & ESTIVAL, 1986: 16.

MATERIAL EXAMINED. — **New Caledonia.** "Vauban" 1978-79: stn 9, 22°20' S, 167°10' E, 175-200 m, 2 dd. — Stn 30, 22°39' S, 167°07' E, 170-190 m, 1 spm.

LAGON: stn 372b, 22°41' S, 167°03' E, 215 m, 1 dd.

BIOCAL: stn CP 105, 21°31' S, 166°22' E, 330-335 m, 1 dd. — Stn CP 108, 22°03' S, 167°06' E, 335 m, 1 lv.

Loyalty Islands. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 dd, 1 lv. — Stn DW 398, 20°47' S, 167°06' E, 370 m, 1 dd. — Stn DW 442, 20°54' S, 167°17' E, 200 m, 1 lv.

DISTRIBUTION. — Japan to Philippines; New Caledonia in 190-390 m, alive in 200-390 m; southern Red Sea.

REMARKS. — The nomenclature of this species is a matter of discussion. COOMANS *et al.* (1983) preferred to retain the name *Conus cancellatus* Hwass in Bruguière, 1792. However, the holotype of *C. cancellatus*, selected by KOHN (1968), represents the western Atlantic species *C. austini* Rehder & Abbott, 1951. COOMANS *et al.* suspect for several reasons that the (original) holotype of *Conus cancellatus* is lost and replaced by a specimen of *C. austini*. The problem cannot be unequivocally solved at present, and a decision of the ICZN will be necessary. Hence, we prefer to use the first available name *Conus pagodus* Kiener, 1845.

Conus pergrandis (Iredale, 1937)

Fig. 39

Embrikena pergrandis Iredale, 1937: 407, pl. 18.

MATERIAL EXAMINED. — **New Caledonia.** SMIB 5: stn DW 87, 22°19' S, 168°41' E, 370 m, 1 dd. — Stn DW 92, 22°20' S, 168°41' E, 280 m, 1 dd.

Loyalty Islands. CALSUB: dive 16, 20°38' S, 167°03' E, 509 m, 1 lv.

MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 lv. — Stn DW 392, 20°47' S, 167°05' E, 340 m, 1 dd. — Stn DW 418, 20°42' S, 167°03' E, 283 m, 1 lv.

New Hebrides Arc. VOLSMAR: stn DW 7, 22°26' S, 171°44' E, 325-400 m, 1 dd.

DISTRIBUTION. — Taiwan, Philippines, Papua New Guinea, and Queensland; now New Caledonia in 283-509 m (alive).

REMARKS. — This is the first record of this species from the New Caledonia region. The largest specimen measures 117 mm in length.

Conus plinthis Richard & Moolenbeek, 1988

Fig. 20

Conus plinthis Richard & Moolenbeek, 1988: 235, pl. 1, figs 6-9, 11.

Conus sp. B — RICHER DE FORGES & ESTIVAL, 1986: 15, figs.

MATERIAL EXAMINED. — **New Caledonia.** "Vauban" 1978-79: stn 7, 22°19' S, 167°11' E, 300-315 m, 2 dd.

BIOCAL: stn DW 64, 24°48' S, 168°09' E, 250 m (paratype AMS). — Stn DW 65, 24°48' S, 168°09' E, 245-275 m (paratype MNHN).

MUSORSTOM 4: stn DW 164, 18°33' S, 163°13' E, 225 m (paratype ZMA 388018). — Stn DW 210, 22°44' S, 167°09' E, 340-345 m (holotype MNHN). — Stn DW 222, 22°58' S, 167°33' E, 410-440 m, 1 dd. — Stn DW 234, 22°15' S, 167°08' E, 350-365 m (paratype NMNZ).

CHALCAL 2: stn DW 69, 24°44' S, 168°08' E, 260 m, 2 dd. — Stn DW 70, 24°46' S, 168°09' E, 232 m (paratype NMNZ). — Stn DW 78, 23°41' S, 168°00' E, 233 m, 1 lv. — Stn DW 79, 23°41' S, 168°00' E, 243 m, 1 dd.

SMIB 3: stn DW 9, 24°42' S, 168°08' E, 265 m (paratype MNHN). — Stn DW 10, 24°42' S, 168°07' E, 235 m, 2 dd. — Stn DW 14, 23°40' S, 168°00' E, 246 m, 3 lv. — Stn DW 17, 23°41' S, 167°59' E, 238 m, 1 dd. — Stn DW 18, 23°42' S, 167°59' E, 338 m, 4 dd. — Stn DW 20, 23°40' S, 168°00' E, 280 m, 15 dd.

SMIB 4: stn DW 40, 24°46' S, 168°09' E, 240-260 m, 1 dd. — Stn DW 41, 24°44' S, 168°09' E, 230-235 m, 1 dd. — Stn DW 43, 24°47' S, 168°09' E, 235-245 m, 2 spms. — Stn DW 44, 24°46' S, 168°08' E, 270-300 m, 1 dd. — Stn DW 45, 24°46' S, 168°09' E, 245-260 m, 2 dd. — Stn DW 46, 24°47' S, 168°08' E, 245-260 m, 1 spm. — Stn DW 47, 24°46' S, 168°08' E, 250-280 m, 1 spm. — Stn

DW 49, 24°45' S, 168°08' E, 240-300 m, 1 dd. — Stn DW 50, 23°42' S, 168°01' E, 260-295 m, 1 dd. — Stn DW 51, 23°41' S, 168°01' E, 245-260 m, 4 dd. — Stn DW 52, 23°41' S, 168°00' E, 235-250 m, 2 dd. — Stn DW 53, 23°40' S, 168°00' E, 250-270 m, 12 lv. — Stn DW 54, 23°40' S, 168°00' E, 230-235 m, 1 spm. — Stn DW 55, 23°21' S, 168°04' E, 215-260 m, 2 dd. — Stn DW 56, 23°21' S, 168°05' E, 230-260 m, 1 lv. — Stn DW 57, 23°21' S, 168°05' E, 216-260 m, 1 dd.

SMIB 5: stn DW 70, 23°41' S, 168°01' E, 270 m, 5 dd. — Stn DW 71, 23°41' S, 168°01' E, 265 m, 2 dd. — Stn DW 72, 23°42' S, 168°01' E, 400 m, 3 dd. — Stn DW 73, 23°41' S, 168°01' E, 240 m, 2 dd. — Stn DW 75, 23°41' S, 168°01' E, 270 m, 4 dd. — Stn DW 79, 23°41' S, 168°01' E, 285 m, 2 dd. — Stn DW 85, 22°20' S, 168°53' E, 260 m, 1 dd. — Stn DW 87, 22°19' S, 168°41' E, 370 m, 1 dd. — Stn DW 90, 22°19' S, 168°42' E, 340 m, 1 dd. — Stn DW 92, 22°20' S, 168°41' E, 280 m, 1 dd. — Stn DW 93, 22°20' S, 168°42' E, 255 m, 1 lv. — Stn DW 94, 22°20' S, 168°43' E, 275 m, 4 dd. — Stn DW 98, 23°02' S, 168°16' E, 335 m, 3 spms. — Stn DW 101, 23°21' S, 168°05' E, 270 m, 1 dd. — Stn DW 102, 23°20' S, 168°05' E, 305 m, 2 lv, 1 dd. — Stn DW 104, 23°16' S, 168°04' E, 335 m, 1 dd.

SMIB 8: stn DW 154, 24°46' S, 168°08' E, 235-252 m, 1 lv. — Stn DW 158, 24°47' S, 168°08' E, 262-290 m, 4 dd. — Stn DW 159, 24°46' S, 168°08' E, 241-245 m, 2 dd. — Stn DW 160, 24°47' S, 168°08' E, 280-282 m, 2 dd. — Stn CP 161, 24°47' S, 168°09' E, 232-251 m, 1 dd. — Stn CP 162, 24°48' S, 168°09' E, 254-264 m, 1 dd. — Stn DW 163, 24°50' S, 168°09' E, 310-460 m, 4 spms. — Stn DW 170-172, 23°41' S, 168°01' E, 233-290 m, 20 dd, 4 spms. — Stn DW 171, 23°40' S, 168°01' E, 233-250 m, 1 lv. — Stn DW 173, 23°41' S, 168°00' E, 234-242 m, 2 spms. — Stn DW 174, 23°40' S, 168°01' E, 235-240 m, 7 spms. — Stn DW 176, 23°42' S, 168°01' E, 283-290 m, 1 lv. — Stn DW 177, 23°39' S, 168°00' E, 320-370 m, 1 dd. — Stn DW 181, 23°18' S, 168°05' E, 311-330 m, 2 lv, 2 dd. — Stn DW 182, 23°19' S, 168°05' E, 314-330 m, 2 lv, 5 dd. — Stn DW 183, 23°18' S, 168°05' E, 330-367 m, 4 lv. — Stn DW 184, 23°18' S, 168°05' E, 305-320 m, 6 dd. — Stn DW 185, 23°15' S, 168°04' E, 311-355 m, 3 lv, 1 dd. — Stn DW 187, 23°17' S, 168°06' E, 390-540 m, 2 lv. — Stn DW 189, 23°18' S, 168°06' E, 400-402 m, 3 dd.

BERYX 11: stn DW 11, 24°44' S, 168°10' E, 320-350 m, 2 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 391, 20°47' S, 167°06' E, 390 m, 1 dd. — Stn DW 399, 20°42' S, 167°00' E, 282 m, 2 dd. — Stn CP 400, 20°42' S, 167°00' E, 270 m, 1 lv. — Stn DW 482, 21°21' S, 167°47' E, 375 m, 1 lv.

New Hebrides Arc. VOLSMAR: stn DW 7, 22°26' S, 171°44' E, 325-400 m, 3 dd.

DISTRIBUTION. — New Caledonia, in 230-410 m, alive in 233-390 m; Norfolk Island, Kermadec Islands, dead in 135-259 m.

REMARKS. — Largest specimen (holotype) 43.9 × 24.0 mm; mean length of live taken specimens about 20 mm.

Conus polongimarumai Kosuge, 1980

Fig. 41

Conus polongimarumai Kosuge, 1980: 63, pl. 18, figs 6-8.

MATERIAL EXAMINED. — **New Caledonia.** LAGON: stn 476, 18°51' S, 163°26' E, 300-350 m, 1 dd.

DISTRIBUTION. — West Thailand, Philippines and Marshall Islands (JOHNSON, 1992: 10); now New Caledonia, dead in ca. 300 m.

REMARKS. — This rare species, once only known from the Philippines, was recently found in Thailand and the Marshall Islands. The only specimen from New Caledonia is a dead collected

specimen with an encrusted apex. Nevertheless its size (23 × 9.5 mm), shape, sculpture and pattern suggest conspecificity with *Conus polongimarumai*. It is the first record of this species from Melanesia.

Conus profundorum (Kuroda, 1956)

Fig. 22

Chelyconus (?) (*Profundiconus*) *profundorum* Kuroda, 1956: 4, textfigs 8-9.

MATERIAL EXAMINED. — **New Caledonia.** BIOCAL: stn DW 66, 24°55' S, 168°22' E, 505-515 m, 3 spms.
 MUSORSTOM 4: stn DW 234, 20°15' S, 167°08' E, 350-365 m, 1 dd. — Stn DW 235, 22°13' S, 167°12' E, 405-415 m, 1 dd.
 CHALCAL 2: stn DW 76, 23°40' S, 167°45' E, 470 m, 1 dd. — Stn DW 77, 23°38' S, 167°43' E, 435 m, 1 dd. — Stn DW 82, 23°14' S, 168°04' E, 304 m, 1 lv, 1 dd. — Stn CC 1, 24°55' S, 168°22' E, 500 m, 1 lv.
 SMIB 3: stn DW 1, 24°56' S, 168°22' E, 520 m, 2 dd. — Stn DW 3, 24°55' S, 168°22' E, 513 m, 1 dd. — Stn DW 5, 24°55' S, 168°22' E, 502-512 m, 3 dd. — Stn DW 9, 24°42' S, 168°08' E, 265 m, 2 dd. — Stn DW 22, 23°03' S, 167°19' E, 503 m, 2 dd.
 SMIB 4: stn DW 34, 24°55' S, 168°22' E, 510-515 m, 2 dd. — Stn DW 36, 24°56' S, 168°22' E, 500-530 m, 1 dd. — Stn DW 37, 24°55' S, 168°22' E, 515-540 m, 3 spms.
 SMIB 8: stn DW 146, 24°55' S, 168°22' E, 514-522 m, 4 dd. — Stn DW 148, 24°56' S, 168°21' E, 510 m, 1 dd. — Stn DW 149, 24°55' S, 168°22' E, 508-510 m, 3 dd. — Stn DW 150, 24°54' S, 168°22' E, 519-530 m, 2 dd. — Stn DW 167, 23°38' S, 167°43' E, 430-452 m, 1 dd. — Stn DW 179, 23°47' S, 168°17' E, 400-405 m, 1 dd. — Stn DW 181, 23°18' S, 168°05' E, 311-330 m, 1 dd. — Stn DW 197, 23°52' S, 168°13' E, 414-436 m, 1 dd.
 BERYX 11: stn CH 54, 23°45' S, 168°17' E, 390-420 m, 2 dd.
Loyalty Islands. MUSORSTOM 6: stn DW 406, 20°41' S, 167°07' E, 373 m, 1 lv.
 CALSUB: dive 15, 20°37' S, 166°58' E, 538 m, 1 dd.

DISTRIBUTION. — Japan to Philippines; New Caledonia, in 265-540 m, alive in 305-500 m.

REMARKS. — This is the first record of *C. profundorum* from Melanesia. Largest specimen measures 72 mm in length.

Conus profundorum has been synonymized with *C. smirna* by WALLS (1979). However, both taxa occur sympatrically off the coast of New Caledonia. *Conus smirna* is more elongate (RD 0.49-0.53 vs. 0.60-0.63 in *C. profundorum*) and has a higher spire (RSH 0.21-0.28 vs. 0.16-0.17 in *C. profundorum*). Apart from this difference in shape, both species differ in their colouration. *Conus smirna* has brown axial streaks which are lacking in *C. profundorum*. Shells of the latter from the New Caledonian region generally have a broader last whorl than shells from other regions (RD 0.60-0.63 vs. 0.54-0.57).

Conus raoulensis Powell, 1958

Fig. 42

Conus (Kermasprella) raoulensis Powell, 1958: 83, pl. 9, fig. 1.
Conus raoulensis — MARSHALL, 1981: 495, figs 3a-c.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 255, 25°15' S, 159°55' E, 280-295 m, 1 dd.

DISTRIBUTION. — Norfolk Island to Wanganella Bank and Kermadec Islands; New Caledonia, dead in ca. 280 m.

REMARKS. — The single specimen from the Coral Sea is subadult (14.5 × 6.0 mm) and colourless. It cannot be unequivocally identified as *Conus raoulensis*, as *C. raoulensis* and *C. howelli* are sometimes indistinguishable (MARSHALL, 1981). However, the specimen from the Coral Sea is strongly sculptured, a character typical of *C. raoulensis*. It is the first record of this species from Melanesia.

Conus richeri Richard & Moolenbeek, 1988

Fig. 17

Conus richeri Richard & Moolenbeek, 1988: 233, pl. 1, figs 1-5, 10.

Conus gabelishi — RICHER DE FORGES & ESTIVAL, 1986: 15, figs.

MATERIAL EXAMINED. — **Chesterfield Islands**. MUSORSTOM 5: stn DW 284, 24°10' S, 159°33' E, 225-230 m, 1 dd.

New Caledonia. LAGON: stn 378, 22°40' S, 167°10' E, 70-72 m, (paratype MNHN). — Stn 387, 22°39' S, 167°07' E, 225 m, 1 spm. — Stn 500, 19°04' S, 163°30' E, 225 m, 1 dd (holotype MNHN). — Stn 537, 19°07' S, 163°22' E, 200 m, 1 dd. — Stn 1146, 19°08' S, 163°31' E, 185 m, 1 dd. — Stn 1147, 19°08' S, 163°30' E, 210 m, 1 dd. — Stn 1148, 19°07' S, 163°30' E, 220 m, 1 spm.

MUSORSTOM 4: stn DW 185, 19°06' S, 163°29' E, 230 m, 4 spms (paratypes ZMA 388017, NMNZ). — Stn DW 186, 19°07' S, 163°30' E, 190 m, 9 dd. — Stn CP 189, 19°07' S, 163°29' E, 210 m, 5 dd. — Stn DW 205, 22°38' S, 167°07' E, 140-160 m (paratype AMS). — Stn DW 207, 22°39' S, 167°07' E, 220-235 m, (paratype MNHN).

SMIB 1: stn DW 2, 22°52' S, 167°13' E, 415 m, 2 dd.

SMIB 2: stn DW 15, 22°53' S, 167°11' E, 375-402 m, 1 dd.

SMIB 4: stn DW 57, 23°22' S, 168°05' E, 210-260 m, 1 dd.

SMIB 6: stn DW 107, 19°08' S, 163°30' E, 195-205 m, 1 dd. — Stn DW 108, 19°07' S, 163°30' E, 210-220 m, 3 dd. — Stn DW 112, 19°06' S, 163°30' E, 220-225 m, 5 dd. — Stn DW 128, 19°06' S, 163°22' E, 205-215 m, 1 dd.

DISTRIBUTION. — New Caledonia and Chesterfield Islands, in 70-415 m (dead).

REMARKS. — *Conus richeri* was misidentified as *C. gabelishi* by RICHER DE FORGES & ESTIVAL (1986). The latter species has a mamillated protoconch (less than 2 whorls, maximum diameter 1.1-1.2 mm vs. about 3 whorls, maximum diameter 0.8 mm in *Conus richeri*), a lighter shell, attaining a maximum length of 35 mm, and a much broader last whorl (RD 0.64-0.71 vs. 0.53-0.60).

Conus smirna Bartsch & Rehder, 1943

Fig. 21

Conus smirna Bartsch & Rehder, 1943: 87.

Conus smirna — MARSHALL, 1981: 499, figs 3 h-j. — RICHER DE FORGES & ESTIVAL, 1986: 16, fig.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4: stn DW 197, 18°51' S, 163°21' E, 550 m, 1 dd.

CHALCAL 2: stn CC 1, 24°55' S, 168°22' E, 500 m, 2 dd. — Stn DW 74, 24°40' S, 168°38' E, 650 m, 1 dd. — Stn DW 75, 24°39' S, 168°40' E, 600 m, 1 dd.

SMIB 3: stn DW 1, 24°56' E, 168°22' E, 520 m, 2 dd. — Stn DW 9, 24°42' S, 168°08' E, 265 m, 1 dd. — Stn DW 21, 22°59' S, 167°19' E, 525 m, 2 dd.

SMIB 4: stn DW 38, 24°54' S, 168°22' E, 510 m, 1 dd. — Stn DW 50, 23°42' S, 168°01' E, 260-295 m, 1 dd. — Stn DW 62, 23°00' S, 167°22' E, 490-540 m, 1 dd. — Stn DW 63, 22°59' S, 167°21' E, 580 m, 2 dd. — Stn DW 65, 22°55' S, 167°15' E, 400-420 m, 1 dd.

SMIB 8: stn DW 150, 24°54' S, 168°22' E, 519-530 m, 1 dd. — Stn DW 167, 23°38' S, 168°43' E, 430-452 m, 1 dd. — Stn DW 169, 23°37' E, 168°42' E, 447-450 m, 1 spm. — Stn DW 187, 23°17' S, 168°06' E, 390-540 m, 1 spm.

Loyalty Islands. MUSORSTOM 6: stn DW 410, 20°38' S, 167°07' E, 490 m, 1 dd. — Stn CP 467, 21°05' S, 167°32' E, 575 m, 1 dd.

CALSUB: dive 9, 20°53' S, 167°03' E, 256 m, 1 dd.

New Hebrides Arc. VOLSMAR: stn DW 5, 22°26' S, 171°46' E, 620-700 m, 3 dd. — Stn DW 37, 22°22' S, 168°42' E, 500-550 m, 1 dd.

DISTRIBUTION. — Hawaii, New Zealand (Wanganella Bank, Kermadec Ridge), and New Caledonia, dead in 255-650 m.

REMARKS. — The specimens from New Caledonia agree with the holotype of *Conus smirna* from Kauai, Hawaii, in size and shape, but they differ in being more ventricose, lacking spiral grooves on spire whorls, and in the axial as well as spiral arrangement of their colour pattern. Provisionally we consider them a local form of *C. smirna*.

Conus stupa (Kuroda, 1956)

Fig. 43

Embrikena stupa Kuroda, 1956: 1-3, pl. 1, fig. 1.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 255, 25°15' S, 159°55' E, 280-295 m, 1 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 392, 20°47' S, 167°05' E, 340 m, 1 lv. — Stn CP 464, 21°02' S, 167°32' E, 430 m, 1 lv.

DISTRIBUTION. — Japan to Philippines, Solomon Islands, and New Caledonia in 295-430 m, alive in 390-430 m.

REMARKS. — This is the first record of *C. stupa* from the New Caledonia region. The largest specimen (77.7 × 34.6 mm) differs from specimens from the other regions (Japan to Philippines, Solomon Islands) by its lighter weight (0.37 g/mm vs. 0.60-0.70 g/mm) and its narrower last whorl (RD 0.60 vs. 0.63-0.73).

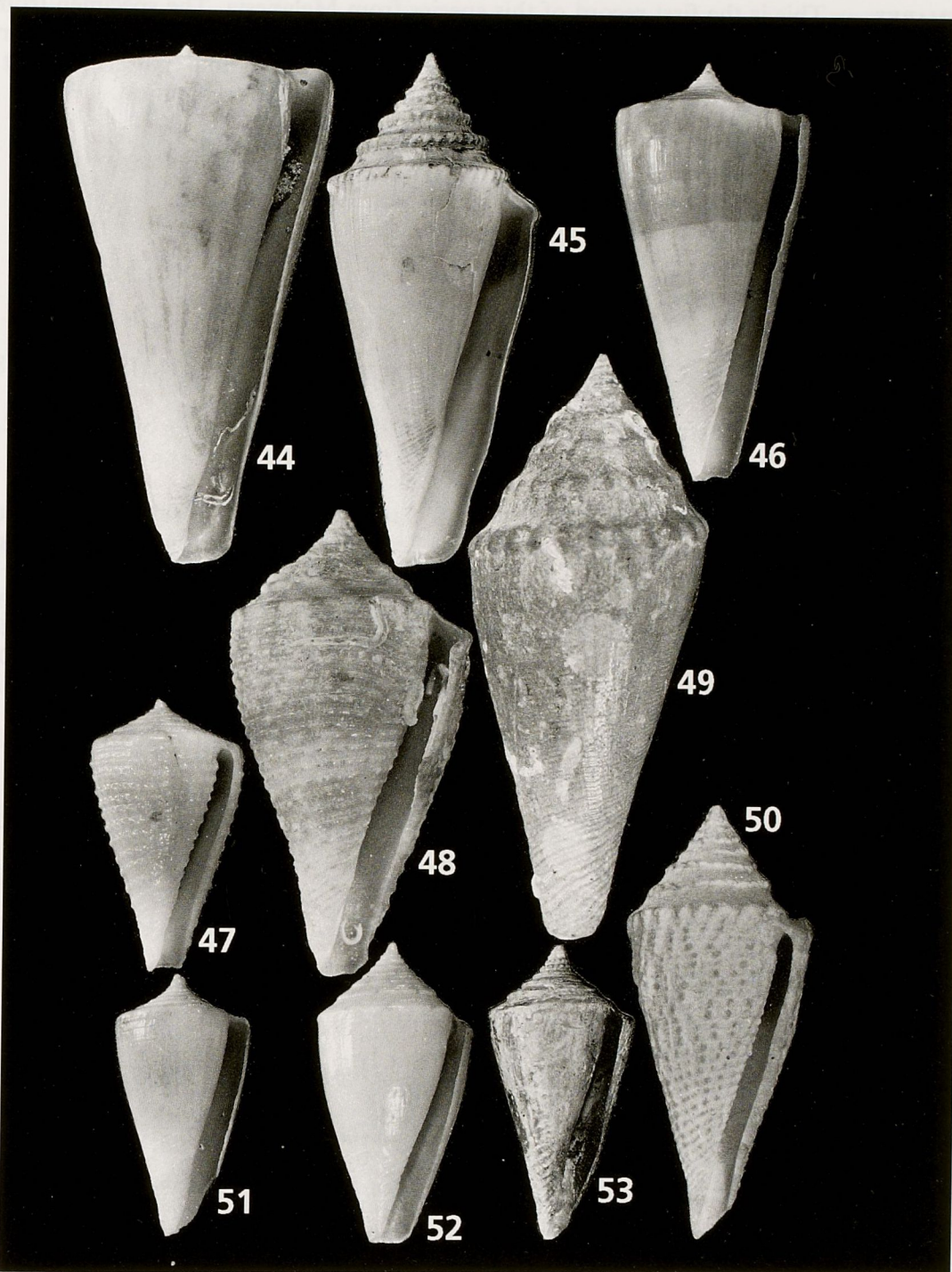
Conus sugimotonis Kuroda, 1928

Fig. 44

Conus sugimotonis Kuroda, 1928: pl. 1, fig. 6; 1929: 81.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 274, 24°45' S, 159°41' E, 285 m, 1 lv. — Stn CP 311, 22°14' S, 159°24' E, 320 m, 1 dd.

DISTRIBUTION. — Japan to Philippines and Queensland; now New Caledonia, in 285 (live) - 320 m.



FIGS 44-53. — 44, *Conus sugimotonis*, Coral Sea, MUSORSTOM 5: stn 274, 66.7 × 36.0 mm. — 45, *Conus teramachii*, Coral Sea, MUSORSTOM 5: stn 364, 68 × 28.5 mm. — 46, *Conus tribblei queenslandis*, New Caledonia, MUSORSTOM 4: stn DW 149, 46.6 × 29.9 mm. — 47, *Conus species A*, South New Caledonia, CHALCAL 2: stn DW 83, 16.3 × 9.6 mm. — 48, *Conus species B*, Coral Sea, MUSORSTOM 5: stn 266, 29.3 × 15.6 mm. — 49, *Conus species C*, New Caledonia, MUSORSTOM 4: st DW 224, 43.2 × 18.2 mm. — 50, *Conus species D*, Coral Sea, CHALCAL 1984: stn D 11, 22.5 × 9.8 mm. — 51, *Conus species E*, New Hebrides Arc, VOLSMAR: stn DW 17, 14.7 × 7.6 mm. — 52, *Conus species F*, South New Caledonia, SMIB 4: stn DW 57, 19.2 × 10.2 mm. — 53, *Conus species G*, South of Vanuatu, GEMINI: stn DW 49, 17.3 × 8.3 mm.

REMARKS. — This is the first record of this species from Melanesia. The specimen from Coral Sea (66.7 × 36.0 mm) is suffused with very pale violet like specimens from Queensland described as *Conus whiteheadae* Da Motta, 1985. Provisionally, we consider this colour pattern is part of the variability of the species, and does not warrant formal nomenclatural recognition.

Conus teramachii (Kuroda, 1956)

Fig. 45

Asprella (*Endemoconus*?) *teramachii* Kuroda, 1956: 8-9, pl. 1, fig. 4.
Conus teramachii — MARSHALL, 1981: 499.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn CP 364, 19°45' S, 158°47' E, 675 m, 1 lv.

Loyalty Islands. MUSORSTOM 6: stn DW 394, 20°49' S, 167°09' E, 570 m, 1 dd. — Stn CP 467, 21°05' S, 167°32' E, 575 m, 1 dd.

DISTRIBUTION. — South and East Africa from Natal to Somalia, West Australia, Japan to Taiwan, and Australia (Queensland) to North of New Zealand; New Caledonia in 570-675 m, alive in 675 m.

REMARKS. — This is the first record of *C. teramachii* from Melanesia. This species lives in even deeper waters as was proven by specimens collected by the "Valdivia" during the Deutsche Tiefsee-Expedition from depths of 1134 m (dead) and 977 m (live). The present specimens attain a length of 65-70 mm.

Conus tribblei queenslandis Da Motta, 1984

Fig. 46

Conus queenslandis Da Motta 1984: 25, text figs 3a-b.

MATERIAL EXAMINED. — **Chesterfield Islands.** MUSORSTOM 5: stn DW 347, 19°39' S, 158°28' E, 260 m, 2 dd.

New Caledonia. LAGON: stn 500, 19°04' S, 163°30' E, 225 m, 1 dd.

MUSORSTOM 4: stn DW 149, 19°08' S, 163°23' E, 155 m, 1 lv.

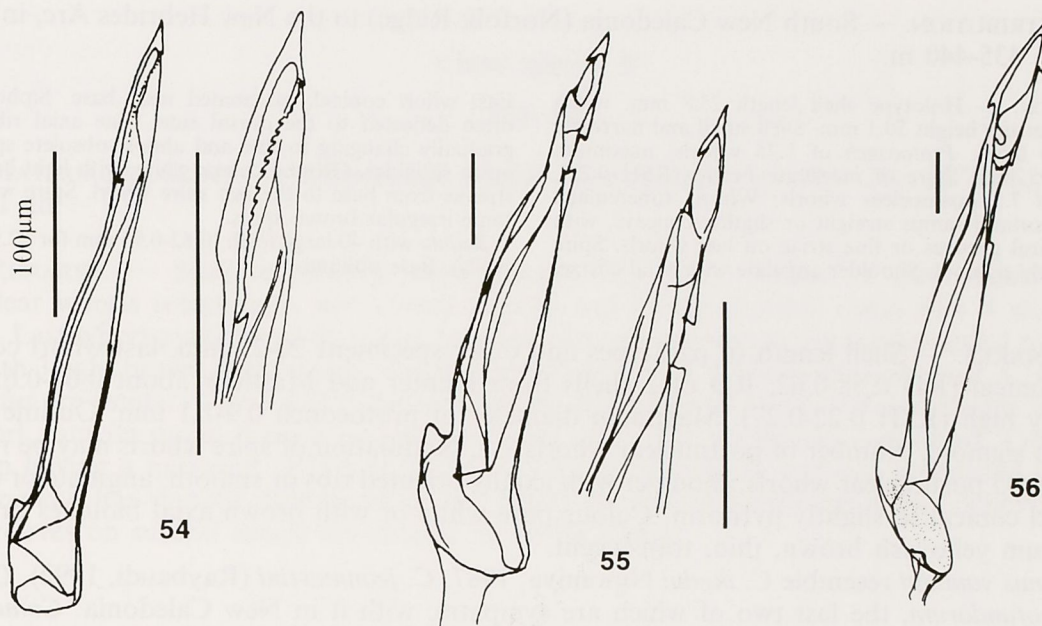
CHALCAL 2: stn DW 83, 23°20' S, 168°05' E, 200 m, 1 lv.

SMIB 6: stn DW 127, 19°07' S, 163°23' E, 190-205 m, 2 dd.

Loyalty Islands. MUSORSTOM 6: stn DW 462, 21°05' S, 167°27' E, 200 m, 2 dd.

DISTRIBUTION. — The nominal subspecies *Conus tribblei tribblei* Walls, 1977, from Japan to Philippines, North-West Australia, Solomon Islands; *Conus tribblei queenslandis*, from off the coast of Queensland, Australia, now New Caledonia in 155-260 m, alive in 155-200 m.

REMARKS. — *Conus tribblei queenslandis* can be distinguished from the nominate subspecies by its cream to orange-brown colour bands on its last whorl, but neither by its shape nor in its sculpture, as suggested by DA MOTTA (1984). We consider it a geographical subspecies of *C. tribblei*. It is the first record of this subspecies in Melanesia.



Figs 54-56. — Radulae. — 54, *Conus gondwanensis*. — 55, *C. loyaltiensis*. — 56, *C. vaubani*. Scale lines: 100 μ m. [Drawings courtesy of Emilio Rolan].

Conus vaubani Röckel & Moolenbeek, sp. nov.

Figs 3, 14-15, 56

TYPE MATERIAL. — Holotype MNHN. Paratypes: 2 MNHN, 1 ZMA 3.94.022, 1 AMS C201721, 1 NMNZ M268544, 1 DR.

TYPE LOCALITY. — South New Caledonia, CHALCAL 2, stn DW 77, 23°38' S, 167°43' E, 435 m.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn DW 8, 20°34' S, 166°54' E, 435 m, 1 dd. — Stn DW 46, 22°53' S, 167°17' E, 570-610 m, 35 dd. — Stn DW 48, 23°00' S, 167°29' E, 775 m, 3 dd.

MUSORSTOM 4: stn DW 220, 22°58' S, 167°38' E, 505-550 m, 2 dd. — Stn DW 223, 22°57' S, 167°30' E, 545-560 m, 1 dd.

CHALCAL 2: stn DW 76, 23°41' S, 167°45' E, 470 m, 9 dd. — Stn DW 77, 23°38' S, 167°43' E, 435 m, 1 lv (holotype), 1 spm (paratype ZMA 29.3 \times 13.4 mm).

SMIB 2: stn DW 10, 22°55' S, 167°16' E, 490-495 m, 1 dd (paratype MNHN, 19.8 \times 9.7 mm). — Stn DC 26, 22°59' S, 167°23' E, 500-535 m, 1 dd.

SMIB 3: stn DW 12, 23°38' S, 167°42' E, 470 m, 1 spm. — Stn DW 21, 22°59' S, 167°19' E, 525 m, 16 dd. — Stn DW 23, 22°58' S, 167°20' E, 530 m, 3 dd.

SMIB 4: stn DW 60, 23°00' S, 167°22' E, 500-535 m, 1 dd (paratype NMNZ, 22.8 \times 10.4 mm), 1 spm (paratype AMS, 20.7 \times 9.5 mm).

SMIB 8: stn DW 166, 23°38' S, 167°43' E, 433-450 m, 3 dd. — Stn DW 168, 23°38' S, 168°43' E, 433-450 m, 1 dd (paratype DR, 24.7 \times 10.7 mm). — Stn DW 169, 23°37' S, 168°42' E, 447-450 m, 1 dd (paratype MNHN, 24.3 \times 10.4 mm).

BERYX 11: stn CP 31, 23°39' S, 167°44' E, 430-440 m, 1 lv.

New Hebrides Arc. VOLSMAR: stn DW 5, 22°26' S, 171°46' E, 620-700 m, 2 dd.

DISTRIBUTION. — South New Caledonia (Norfolk Ridge) to the New Hebrides Arc, in 435-775 m, alive in 435-440 m.

DESCRIPTION. — Holotype shell length 25.8 mm, width 11.7 mm; aperture height 20.1 mm. Shell small and narrowly conical (RD 0.58). *Protoconch* of 1.75 whorls, maximum diameter 0.95 mm. Spire of moderate height (RSH 0.22), consisting of 7.5 postnuclear whorls. Whorls tuberculate. Postnuclear sutural ramps straight or slightly concave, with 8-9 weak spiral grooves or fine striae on late whorls. Spire outline slightly sigmoid. Shoulder angulate with axial costae.

Last whorl conical, attenuated near base. Siphonal canal often deflected to the dorsal side. Fine axial ribs basally, gradually changing to fine and almost obsolete spiral striae up to shoulder. Ground colour white, with light brown axial streaks from base to the last spire whorl. Spire whorls with some irregular brown spots.

Radula with 40 large teeth (0.82-0.95 mm for 22.9-29.3 mm shells). Base oblique.

REMARKS. — Shell length of paratypes and other specimens 20-29 mm, last whorl conical to broadly conical (RD 0.58-0.62; RD of 2 shells from Hunter and Matthew about 0.64-0.65). Spire moderately high (RSH 0.22-0.27). Maximum diameter of protoconch 0.9-1.1 mm. Outline of spire concave to sigmoid. Number of postnuclear whorls 7-8. Nodulation of spire whorls may be restricted to the first 4-5 postnuclear whorls; shoulder with axially oriented ribs or smooth, angulate or carinate. Last whorl conical to slightly pyriform. Colour pure white or with brown axial blotches or streaks. Periostracum yellowish brown, thin, translucent.

Conus vaubani resemble *C. ikedai* Ninomiya, 1987, *C. jeanmartini* (Raybaudi, 1992), *C. smirna* and *C. profundorum*, the last two of which are sympatric with it in New Caledonia. *Conus ikedai*, known only from its type locality, Sagami Bay, Japan, is of similar size (L 25-30 mm), but differs in having only 5 (instead of 7-8) postnuclear whorls of which only 3 are tuberculate; its shoulder is rounded, and its periostracum is white (NINOMIYA, 1987). *Conus smirna* can be distinguished by its larger size (length to about 100 mm), multispiral and brown protoconch, convex spire outline, and the absence of spiral grooves on postnuclear whorls. *Conus profundorum* differs in having a multispiral protoconch (more than 3 whorls) and a brownish beige colour pattern with a white central band. *Conus jeanmartini*, from off Réunion, differs by having a higher, more stepped and more strongly nodulated spire. Later postnuclear whorls are straight to slightly concave, without regular spiral grooving.

ETYMOLOGY. — The cruises MUSORSTOM 4 and SMIB 1, 2, and 3 have been carried out aboard the R.V. "Vauban".

SPECIMENS NOT ASSIGNABLE TO KNOWN SPECIES

Conus species A

Fig. 47

MATERIAL EXAMINED. — **New Caledonia**. SMIB 4: stn DW 46, 24°47' S, 168°09' E, 245-260 m, 1 dd.

CHALCAL 2: stn DW 69, 260 m, 1 dd. — Stn DW 83, 23°20' S, 168°06' E, 200 m, 1 dd.

REMARKS. — Shell small (length 16.3-22.5 mm), outline of spire straight, maximum diameter of protoconch 0.9-1.0 mm. Spire whorls and shoulder tuberculate, sutural ramp with 2-4 spiral grooves. Last whorl pyriform with about 12 granulated ribs. Colour white or slightly pink on both sides of centre. Resembles *Conus alisi* in colour and outline but the granulations and a smaller protoconch separate it from that species.

Conus species B

Fig. 48

MATERIAL EXAMINED. — **Chesterfield Islands**. MUSORSTOM 5: stn DW 266, 25°20' S, 159°46' E, 240 m, 1 dd.

REMARKS. — Shell moderately small (length 29.3 mm); outline of spire concave; first 6 postnuclear whorls tuberculate, last whorls smooth and keeled. Sutural ramp with 4 strong spiral grooves. Last whorl pyriform, with about 25 spiral grooves and strong granulated spiral ribs. Colour white with 3 light brown spiral bands, shoulder regularly dotted. *Conus wakayamaensis*, *C. baileyi* and *C. pagodus* are similar. *Conus wakayamaensis* can be distinguished by the almost straight sides of the last whorl, arcuate radial threads on sutural ramps and a less sculptured last whorl. *Conus baileyi* differs in having a narrower (RD 0.51-0.62 vs. 0.68), more conical, and less sculptured last whorl. *Conus pagodus* has smooth ribbons on its last whorl, its sutural ramps are deeply concave, and the spiral grooves on sutural ramps are crossed by radial riblets.

Conus species C

Fig. 49

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4: stn DW 224, 22°55' S, 167°27' E, 575-595 m, 1 dd.

REMARKS. — Shell medium sized (length 43.2 mm); outline of spire straight. Maximum diameter of protoconch about 0.8 mm; spire high (RSH 0.30), whorls and shoulder coronate. Sutural ramp concave with 8-10 weak spiral grooves on later whorls. Last whorl with 15-20 spiral striae basally, which diminish toward the shoulder. Colour white. The sympatric *Conus teramachii* is less biconic and has more stepped spire whorls. Additional material and research may prove whether *Conus* species C is an aberrant specimen.

Conus species D

Fig. 50

MATERIAL EXAMINED. — **Chesterfield Islands**. CHALCAL 1: stn DC 11, 20°32' S, 161°07' E, 83 m, 1 dd.

REMARKS. — Shell small (length 22.5 mm) and heavily eroded; outline of spire slightly concave. Spire slightly scalariform, spire whorls and shoulder finely tuberculate. Sutural ramps with about 4 spiral grooves. Last whorl conical, outline slightly concave to pyriform, with about 30 spiral grooves and granulated ribs in between. Colour white.

Conus species E

Fig. 51

MATERIAL EXAMINED. — **New Hebrides Arc**. VOLSMAR: stn DW 17, 22°23' S, 171°41' E, 260-300 m, 1 dd.

REMARKS. — Shell small (length 14.7 mm), eroded; outline of spire concave. Protoconch of more than 3 whorls, maximum diameter 1.0 mm. First 2-3 postnuclear whorls tuberculate, later ramps carinate; sutural ramps with 3 strong spiral grooves. Outline of last whorl slightly convex above shoulder, last whorl smooth except some spiral cords basally. Colour brownish white. This specimen shows resemblance to *Conus sazanka* Shikama, 1970 which has a less carinate shoulder, an even smaller protoconch and a different colour-pattern.

Conus species F

Fig. 52

MATERIAL EXAMINED. — **New Caledonia**. SMIB 4: stn DW 57, 23°22' S, 168°05' E, 210-260 m, 1 spm.

REMARKS. — Shell small (length 19.2 mm); outline of spire straight to slightly concave. Protoconch of about 3.5 whorls, maximum diameter 0.9 mm. Sutural ramps with 2-3 spiral grooves, obsolete in later whorls. Shoulder carinate. Last whorl bulbous to slightly pyriform, smooth except for 8-9 spiral grooves basally. Colour white, with weak brown markings on spire and last whorl.

Conus species G

Fig. 53

MATERIAL EXAMINED. — **New Hebrides Arc.** GEMINI: stn DW 49, 21°00' S, 170°04' E, 285 m, 1 dd.

REMARKS. — Shell small (length 17.3 mm); spire of moderate height, outline concave; protoconch of about 2.5 whorls, maximum diameter about 0.8 mm. First 2-3 postnuclear whorls tuberculate, later whorls and shoulder keeled. Last whorl conical with almost straight sides, smooth except base. Colour dark brown to beige, with 6-8 dotted spiral lines.

Identification of this shell is difficult since it is not fullgrown and is eroded. It might be related to the *Conus wakayamaensis-nereis* group.

Conus species H

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6: stn DW 453, 21°01' S, 167°27' E, 250 m, 1 dd. — Stn DW 462, 21°05' S, 167°27' E, 200 m, 1 dd.

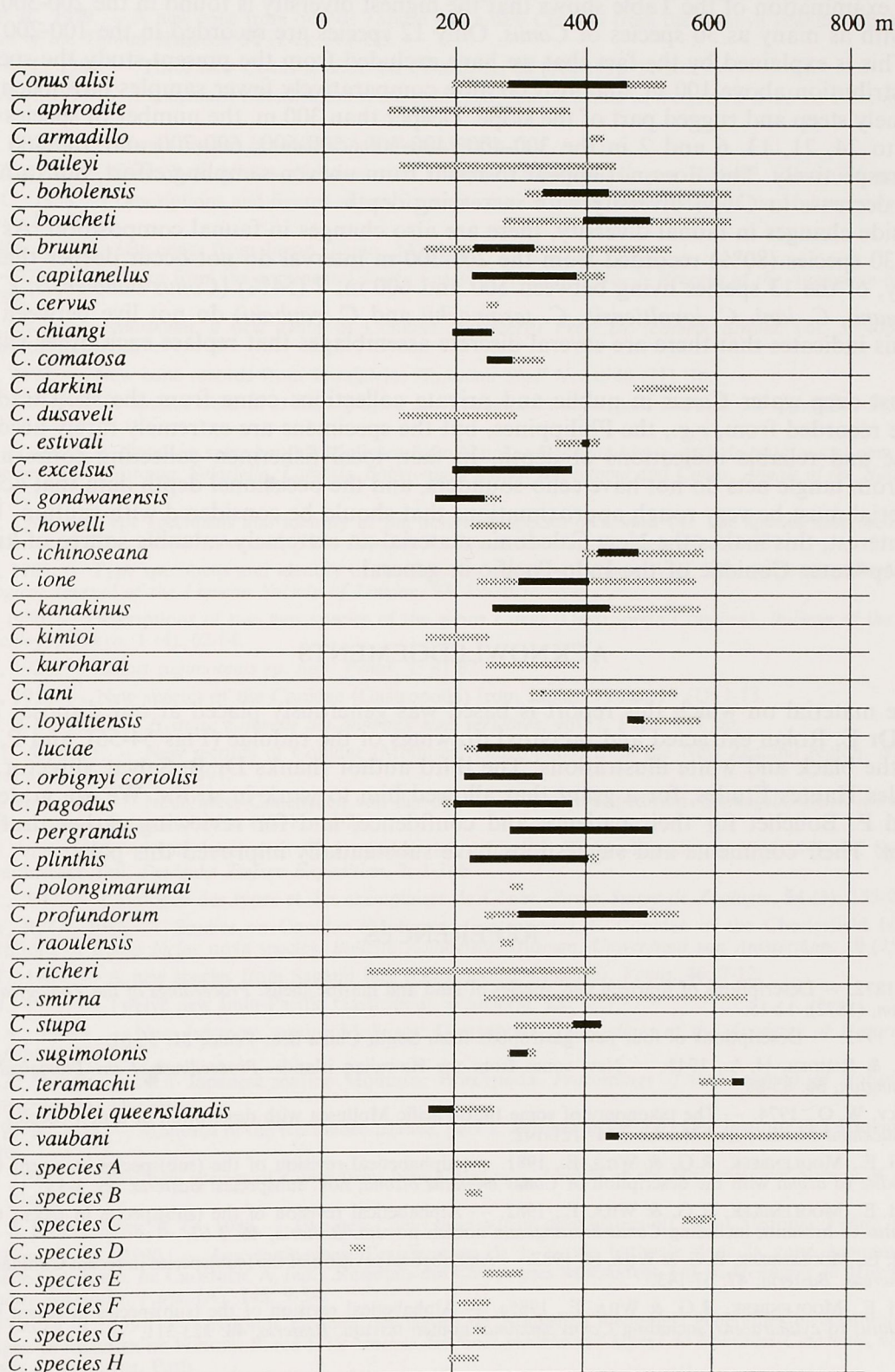
REMARKS. — Our first impression was that these two shells belong to *C. praecellens* A. Adams, 1854. However, a comparison between shallow-water material from the Philippines and these cones from deep-water off the Loyalty Islands convinced us that there are at least two taxa in this complex. The shallow-water species has a paucispiral protoconch whereas the deep-water species has a multispiral protoconch. Additional research has been initiated (MOOLENBEEK & RÖCKEL, in prep.) to disentangle this complex.

SUMMARY OF DISTRIBUTION DATA

The more than 600 records of deep-water *Conus* from the New Caledonia region are summarized in Table 1. Of the 39 identified species, 24 are represented by live taken material, and

TABLE 1. — Bathymetric range of *Conus* species from depths greater than 100 m in the New Caledonian region (New Caledonia, Chesterfield Islands, Loyalty Islands).

Solid bar: confirmed living depth range; stippled: depth range indicated by empty shells only.



15 by empty shells only. Records of empty shells appear to be consistent with live records. Although some records may belong to empty shells carried downslope by water movements, gravity or animals, it is likely that most belong to thanatocoenoses that have accumulated more or less *in situ*.

An examination of the Table shows that the highest diversity is found in the 200-300 m depth interval, with as many as 30 species of *Conus*. Only 12 species are recorded in the 100-200 m depth interval. This is explained by the fact that we have excluded from the present study the species with a main distribution above 100 m, and also because comparatively fewer samples have been taken in this extremely steep and rugged part of the slope. Deeper than 300 m, the number of species recorded decreases to 24, 21, 13, 6 and 2 in the 300-400, 400-500, 500-600, 600-700 and 700-800 m depth intervals, respectively. This does not appear to result from uneven sampling effort, but rather reflect a gradual decrease in *Conus* diversity with increasing depth.

Beside changes in faunal diversity, there are also changes in faunal composition. As many as 24 of the 30 species (80%) recorded from the 200-300 m interval do not occur deeper than 500 m. Conversely, of the 13 species living between 500 and 600 m, 7 (54%) (*Conus bohollensis*, *C. darkini*, *C. ichinoseana*, *C. lani*, *C. loyaltiensis*, *C. teramachii* and *C. vaubani*) do not live between 200 and 300 m. This indicates that there are several discrete assemblages that replace each other with depth.

Most deep-water *Conus* in public and private collections come from the shell trade. Many species are recorded from, e.g., the Philippines, but the specimens are extremely rarely accompanied by genuine and reliable indications of depth. In fact, local fishermen collecting cones and other molluscs from tangle nets do not have echo-sounders, and the occasional depth data that accompany some material must be very rough approximations that should be considered with caution. Beside its regional interest, this makes the New Caledonia material an extremely valuable source of knowledge for the deep-water Conidae of the Indo-Pacific in general.

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