

**Description of four new species of *Calliotropis*
(Gastropoda: Trochidae: Eucyclinae: Calliotropini)
from New Caledonia, Fiji and Vanuatu**

Claude VILVENS
Rue de Hermalle, 113 - B-4680 Oupeye, Belgium
cvilvens@prov-liege.be

KEYWORDS. Gastropoda, Trochidae, New Caledonia, Fiji, Vanuatu, *Calliotropis* n. sp.

ABSTRACT. *Calliotropis micraulax* n. sp., *Calliotropis derbiosa* n. sp., *Calliotropis basileus* n. sp. and *Calliotropis excelsior* n. sp. are described and compared with similar eucyclinid species. Recent Indo-Pacific species belonging to the genus *Calliotropis* are also listed.

RESUME. *Calliotropis micraulax* n. sp., *Calliotropis derbiosa* n. sp., *Calliotropis basileus* n. sp. et *Calliotropis excelsior* n. sp. sont décrites et comparées avec des espèces analogues d'Eucyclinae. Une liste des espèces Récentes du genre *Calliotropis* de la région Indo-Pacifique est également fournie.

INTRODUCTION

Since many years, numerous French expeditions conducted by the IRD (Institut de Recherche pour le Développement, Paris - ex-ORSTOM) and the MNHN (Muséum national d'Histoire naturelle, Paris) took place, among others, around New Caledonia, Fiji and Vanuatu. They brought interesting deep water material and more particularly various trochids, among others *Calliotropis* species as, for example, *Calliotropis eucheloides* Marshall, 1979. The present paper reports on new species of *Calliotropis* collected during these expeditions. A list of the Recent *Calliotropis* species of the Indo-Pacific area is also provided as appendix at the end of this paper.

Abbreviations

Repositories

BM(NH) : The Natural History Museum, London, United Kingdom.

IRSNB : Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.

MNB : Museum für Naturkunde, Berlin, Germany.

MNHN : Muséum national d'Histoire naturelle, Paris, France.

NMNZ : Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand.

NSMT : National Museum of Science, Tokyo, Japan.

ZMA : Zoölogisch Museum, Amsterdam, The Netherlands.

Other abbreviations

D : diameter

H : height

HA : height of the aperture

P1, P2, P3, ...: primary cords (P1 is the most adapical)

S1, S2, S3, ...: secondary cords (S1 is the most adapical)

stn : station

lv : live-taken specimens present in sample

dd : no live-taken specimens present in sample

sub : subadult specimen

juv : juvenile specimen

SYSTEMATICS

Family: **TROCHIDAE** Rafinesque, 1815

Subfamily : **EUCYCLINAE** Koken, 1897

Tribe : **Calliotropini** Hickman and Mc Lean, 1990

Genus: *Calliotropis* Seguenza, 1903

Type species: *Trochus otto* Philippi, 1844 (by original designation) – Pliocene-Pleistocene, Italy.

Calliotropis micraulax n. sp.

Figs 1-4

Type material. Holotype (20.1 x 21.7 mm) MNHN.

Paratypes: 5 MNHN, 1 IRSNB (30 134 521), 1 NMNZ (M.273209), 1 NSMT (Mo 73576), 1 coll. C.Vilvens.

Type locality. Southern New Caledonia, BATHUS 2, stn CP767, 22°11'S, 165°59'E, 1060-1450 m.

Material examined. New Caledonia. BATHUS 2: stn CP743, 22°36'S, 166°26'E, 713-950 m, 3 dd, 4 dd sub and 3 dd juv. - Stn CP767, 22°11'S, 165°59'E, 1060-1450 m, 24 dd and 2 dd juv (whom holotype and 9 paratypes). - Stn CP771, 22°10'S, 166°02'E, 610-800 m, 2dd and 1 dd sub. - BATHUS 1:

stn CP660, 21°11'S, 165°53'E, 786-800 m, 8 dd and 2 dd juv. - Stn CP663, 20°59'S, 165°38'E, 730-780 m, 2 dd. - Stn CP709, 21°42'S, 166°38'E, 650-800 m, 3 dd and 1 dd juv. - BATHUS 4: stn CP949, 20°32'S, 164°57'E, 616-690 m, 1 dd. - Stn CP950, 20°32'S, 164°56'E, 705-750 m, 2 dd. - HALIPRO 1 : stn CP867, 21°26'S 166°18'E, 720-950 m, 2 dd. - **Vanuatu.** MUSORSTOM 8: stn CP1074, 15°48'S, 167°24'E, 775-798 m, 3 dd. - Stn CP1080, 15°57'S, 167°28'E, 799-850 m, 3 dd sub. - **South-western Pacific.** MUSORSTOM 7: stn CP621, 12°35'S, 178°11'E, 1280-1300 m, 2 dd sub. - Stn CP623, 12°34'S, 178°15'E, 1280-1300 m, 2 dd sub.

Distribution. Southern and Eastern New Caledonia, 690-1060 m, Vanuatu, 798-799 m and the area at the north-east of Vanuatu, 1280-1300 m.

Diagnosis. A *Calliotropis* species with rather high spire, whitish, broad umbilicus, 3 granular spiral cords on last whorl, the granules of the adapical cord being the strongest, and 5 granular spiral cords on base.

Description. *Shell* rather tall for the genus (height up to 20.4 mm, width up to 22.7 mm), slightly wider than high, rather thin, roundly conical; spire rather high, height 0.9x diameter, 2.3x to 2.7x aperture height; umbilicus deep and large.

Protoconch more or less 200 µm, of about 1 whorl, smooth, glassy.

Teleoconch of 7 or 8 slightly convex whorls, bearing 3 spiral granular cords and prosocline threads; nodules from cords produced by intersections with axial folds on 4 first whorls; additional axial threads

not connecting nodules on last whorls. Suture visible, impressed, not canaliculated. First teleoconch whorl convex, sculptured by about 15 orthocline smooth ribs, interspace between ribs twice as broad as them; primary spiral cords P1 and P2 appearing almost immediately, evenly distributed, similar in size and shape, bearing rounded nodules. On second whorl, P1 and P2 stronger; axial ribs becoming prosocline; subsutural ramp almost horizontal. On third whorl, nodules of P1 and P2 becoming sharp, adapically oriented on P1 and horizontally on P2; P3 emerging from suture, with nodules smaller than nodules of P1 and P2. On fourth and fifth whorls, nodules of P1 larger and less numerous than on P2; nodules of P3 of same number as on P2, but smaller. From sixth whorl, P1 clearly the strongest, P3 the weakest; P2 closer to P3 than to P1; axial ribs from subsutural area and from area between P2 and P3 more sloping, more numerous and more lamellate than ribs between P1 and P2, connected on nodules of P3 only. On last whorl, P3 peripheral; no secondary spiral cords; subsutural ramp still almost horizontal. Aperture subquadrate; outer lip thin, indented by external spiral cords, producing an angle with inner lip. Columella curved at top, almost straight, prosocline, without tooth. Base moderately convex, sculptured with 5 granular spiral cords, innermost one stronger than the others and bordering umbilicus; axial lamellate threads between cords, more numerous than nodules of cords; interspace between cords twice as broad as cords, a little smaller towards umbilical area. Umbilicus wide, diameter measuring 25% to 30% of shell diameter, with crowded axial lamellae. *Colour* of protoconch and teleoconch light beige to ivory, with no maculation.

	H	D	HA	H / D	H / HA
holotype	20.1	21.7	7.4	0.9	2.7
paratype 1 (MNHN)	20.4	22.7	7.8	0.9	2.6
paratype 2 (MNHN)	17.2	19.4	7.1	0.9	2.4
paratype 3 (MNHN)	16.7	18.5	6.9	0.9	2.4
paratype 4 (MNHN)	16.2	18.5	7.2	0.9	2.3
paratype 5 (MNHN)	15.8	18.2	6.4	0.9	2.5
paratype IRSNB	19.0	22.3	8.1	0.9	2.3
paratype NMNZ	18.1	20.5	7.1	0.9	2.5
paratype NSMT	16.7	19.0	6.8	0.9	2.5
paratype CV	18.7	21.1	8.1	0.9	2.3

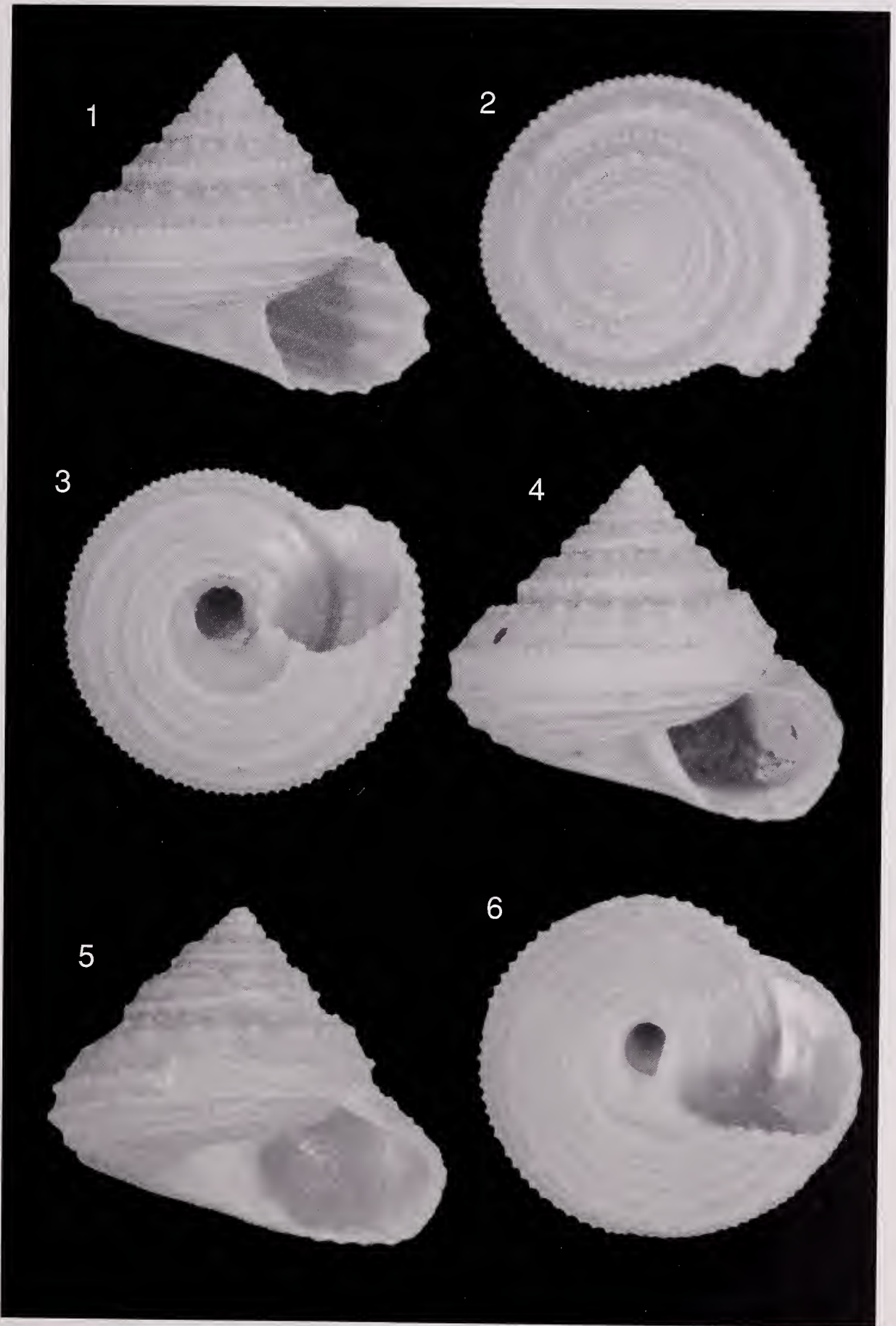
Table 1. - *Calliotropis micraulax* : Shells measurements in mm for types.

Figures 1-6

1-3. *Calliotropis micraulax* n. sp., holotype MNHN, southern New Caledonia, 20.1 x 21.7 mm.

4. *Calliotropis micraulax* n. sp., paratype MNHN, southern New Caledonia, 20.4 x 22.7 mm.

5-6. *Calliotropis glyptus* (Watson, 1879), Australia, New South Wales, coll. C.Vilvens, 19.3 x 22.9 mm.



Discussion. The new species resembles *Calliotropis regalis* (Verrill & Smith, 1880) from the North-East Atlantic, but this species shows an adapical spiral cord much closer to the suture, granules of P3 and especially of P2 larger and more widely distributed, a narrower umbilicus with usually spiral cords within. In the Indo-Pacific area, the new species may weakly remember the well known *C. glyptus* (Watson, 1879) (Figs 5-6) from South-East of Australia, but this species has a lower spire, an umbilicus smooth within and more numerous spiral cords with an adapical one splitting in two.

C. micraulax n.sp. may also be compared to *C. canaliculata* Jansen, 1994 from New South Wales, but this Australian species is smaller, with a canaliculate suture and especially a much narrower umbilicus.

The new species is also superficially similar to *C. blacki* Marshall, 1979 (Figs 7-8) from Kermadec Islands, but this one is much smaller, has 4 spiral cords on whorls (with P1 appearing later than here and detaching slowly from P2), 4 spiral cords on base and thicker axial threads in the umbilicus.

The drawings coming with original descriptions of *Calliotropis* species made by Schepman in 1908 seem to show similarities of *C. micraulax* with several described species. But closer examination of *C. multisquamosa* (Schepman, 1908) (Figs 17-18) from Indonesia shows that this species is much smaller, with granules of spiral cords of same size on all the cords, only 3 spiral cords on the base and a spiral cord in the umbilicus. *C. muricata* (Schepman, 1908) from Indonesia (Figs 29-30) is also much smaller, with a shouldered shape, an horizontal subsutural ramp and 3 big spiral cords on the base. Among the species described by Schepman, *C. concavospira* (Schepman, 1908) from Indonesia can also be compared to the new species, but is much more depressed, with a canaliculated suture.

Etymology. With small furrows (Greek) - with reference to the numerous axial lamellae within the umbilicus.

Calliotropis derbiosa n. sp.

Figs 9-12

Type material. Holotype (22.3 x 25.4 mm) MNHN. Paratypes: 4 MNHN, 1 IRSNB (30 134 522), 1 coll. C.Vilvens.

Type locality. Vanuatu, MUSORSTOM 8, stn CP992, 18°52'S, 168°55'E, 748-775 m.

Figures 7-12

7-8. *Calliotropis blacki* Marshall, 1979, holotype NMNZ (M226932), , 11.3 x 13.0 mm.

9-11. *Calliotropis derbiosa* n. sp., holotype MNHN, Vanuatu, 22.3 x 25.4 mm.

12. *Calliotropis derbiosa* n. sp., paratype MNHN, Vanuatu, 21.3 x 24.4 mm.

Material examined. Vanuatu. MUSORSTOM 8: stn CP992, 18°52'S, 168°55'E, 748-775 m, 7 dd (holotype and 6 paratypes). - Stn CC996, 18°52'S, 168°56'E, 764-786 m, 1 dd. - Stn CP1080, 15°57'S, 167°28'E, 799-850 m, 1 dd and 3 dd juv. - Stn CP1460, 18°47'S, 178°47'E, 750-767 m, 1 dd. - Fiji. BORDAU 1: stn CP1397, 16°33'S, 179°52'E, 674-688 m, 1 dd and 2 dd sub. - Stn CP1502, 18°21'S, 178°27'E, 640-660 m, 2 dd and 1 dd juv. - MUSORSTOM 10: stn CC1335, 16°52.8'S, 177°03.0'E, 729-753 m, 1 dd and 2 dd juv. - Stn. CC1336, 16°58'S, 177°58.4'E, 797-799 m, 1 dd. - Stn CC1337, 17°03.4'S, 177°47.2'E, 635-670 m, 1 dd. - South-western Pacific. MUSORSTOM 7: stn CP621, 12°35'S, 178°11'W, 1280-1300 m, 3 dd sub. - Stn CP623, 12°34'S, 178°15'W, 1280-1300 m, 3 dd sub. - Stn CP628, 11°53'S, 179°32'W, 625-650 m, 1 dd.

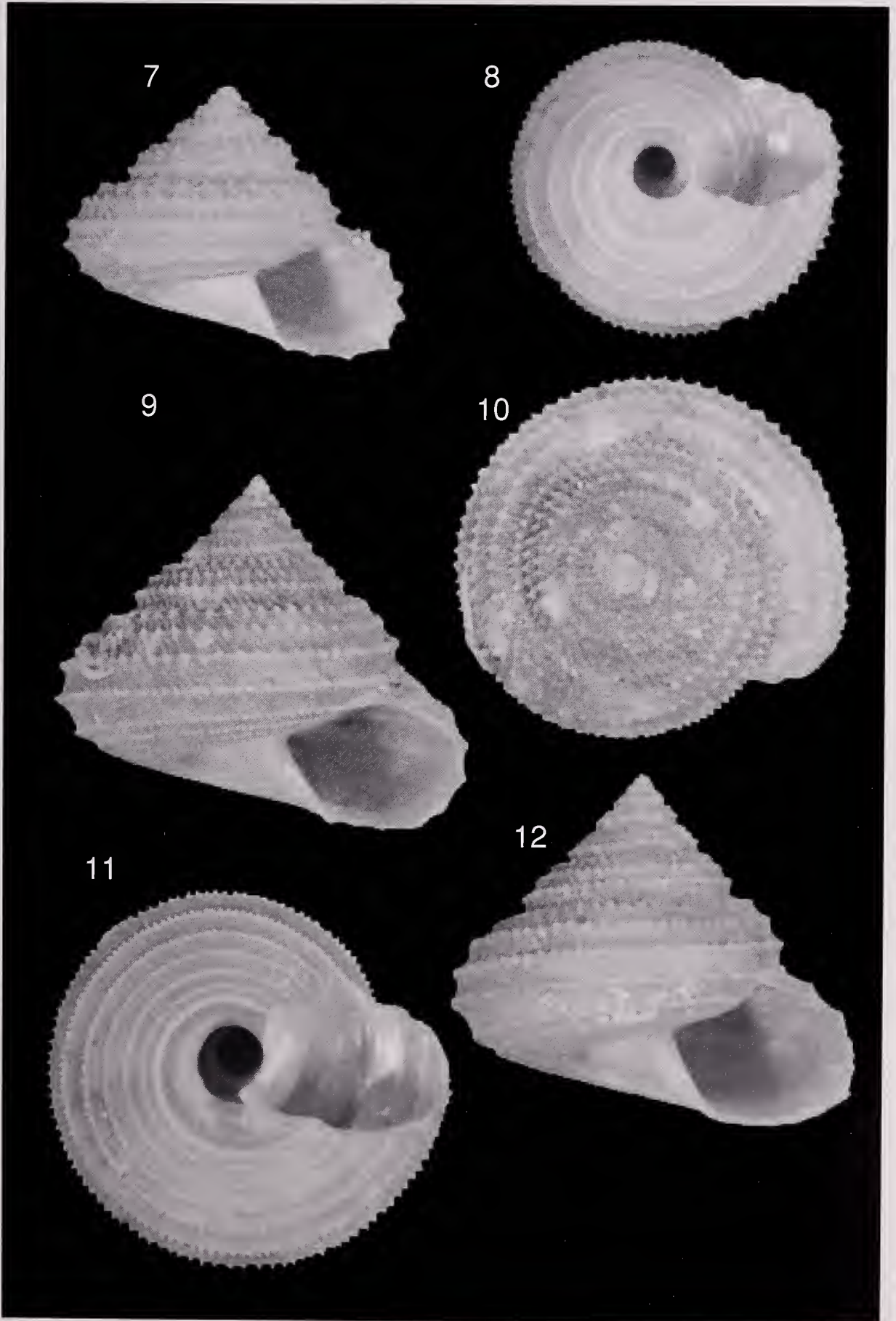
Distribution. Vanuatu, 767-799 m, Fiji, 660-797 m, and the area at the north-east of Vanuatu, 650-1280 m.

Diagnosis. A *Calliotropis* species with rather high spire, whitish, with a large umbilicus, 4 granular spiral cords on last whorl, the granules of the adapical cord being the strongest, and 6 granular spiral cords on base.

Description. *Shell* rather tall for the genus (height up to 22.3 mm, width up to 25.4 mm), slightly wider than high, rather thin, roundly conoidal or slightly coeloconoidal; spire rather high, height 0.9x diameter, 2.3x to 3.3x aperture height; umbilicus deep and large.

Protoconch more or less 200 µm, of about 1 whorl, smooth, glassy.

Teleoconch of 7 or 8 slightly convex whorls, bearing 4 spiral granular cords and prosocline scaly threads; nodules from cords produced by intersections with axial folds on 4 first whorls; additional axial threads not connecting nodules on last whorls. Suture visible, impressed, not canaliculated. First teleoconch whorl convex, sculptured by about 12 weakly prosocline smooth ribs, interspace between ribs twice as broad as them; primary spiral cords P1 and P2 appearing almost immediately, similar in size and shape, bearing rounded nodules; P1 close to suture, P2 at last third of the whorl. On second whorl, P1 and P2 stronger; axial ribs more prosocline; subsutural ramp almost horizontal. On third whorl, nodules of P1 and



P2 becoming sharp, apically oriented on P1 and horizontally on P2; P3 emerging from suture, with nodules smaller than nodules of P1 and P2. On fourth and fifth whorls, nodules of P1 and P2 still similar in number and size; nodules of P3 smaller and more numerous than on P1 and P2; S1 appearing at the end of fourth whorl or at the beginning of fifth whorl, very weak but visible, at the same distance from P1 and P2. On next whorls, P1, S1, P2 and P3 evenly distributed; S1 becoming almost as strong as P1; granules of cords weaker and more numerous towards abapical part of the whorl; axial ribs scaly, more prosocline in the abapical part. On last whorl, P3 peripheral. Aperture subquadrate, outer lip thin,

indented by external spiral cords, producing an angle with inner lip. Columella curved at top, slightly concave, prosocline, without tooth, with a fold inside umbilicus. Base moderately convex, sculptured with 6 granular spiral cords becoming weaker and closer from periphery towards umbilical area, except innermost one larger than the others and bordering umbilicus; axial lamellate threads between cords, slightly more numerous than nodules of cords. Umbilicus wide, diameter measuring 28% to 30% of shell diameter, with crowded axial lamellae.

Colour of protoconch and teleoconch greyish light brown, with no maculation.

	H	D	HA	H / D	H / HA
holotype	22.3	25.4	7.0	0.9	3.2
paratype 1 (MNHN)	21.3	24.4	8.3	0.9	2.6
paratype 2 (MNHN)	20.3	23.0	7.6	0.9	2.7
paratype 3 (MNHN)	21.9	24.6	8.2	0.9	2.7
paratype 4 (MNHN)	15.5	17.0	6.6	0.9	2.3
paratype IRSNB	21.5	24.1	6.6	0.9	3.3
paratype CV	21.6	24.8	7.5	0.9	2.9

Table 2. - *Calliotropis derbiosa* : Shells measurements in mm for types.

Discussion. *Calliotropis derbiosa* n. sp. is very close to *Calliotropis micraulax* n.sp. (Figs 1-4), but this latter differs from *C. derbiosa* n.sp. by the constant characters of number of cords on the whorls (3 instead of 4 for *C. derbiosa*) resulting from presence of S1, and on the base (5 instead of 6 for *C. derbiosa*).

The new species is also superficially similar to *C. blacki* Marshall, 1979 (Figs 7-8) from Kermadec Islands, *Calliotropis multisquamosa* (Schepman, 1908) (Figs 17-18) and *Calliotropis muricata* (Schepman, 1908) (Figs 29-30), both from Indonesia, but are actually rather different (see discussion under *C. micraulax* n.sp.).

The new species may also remember *Calliotropis globosa* Quinn, 1991 from Caribbean, but this species has a higher spire, with P1 and P2 closer and similar, and only 4 spiral cords on the base.

Etymology. Scabby (Latin) - with reference to the fine scale-like axial sculpture.

Figures 13-18

13-15. *Calliotropis basileus* n. sp., holotype MNHN, Fiji, 21.8 x 26.3 mm.

16. *Calliotropis basileus* n. sp., paratype MNHN, Fiji, 21.1 x 24.7 mm.

17-18. *Calliotropis multisquamosa* (Schepman, 1908), holotype ZMA (3.08.060), Indonesia, 4.7 x 4.8 mm.

Calliotropis basileus n. sp.

Figs 13-16

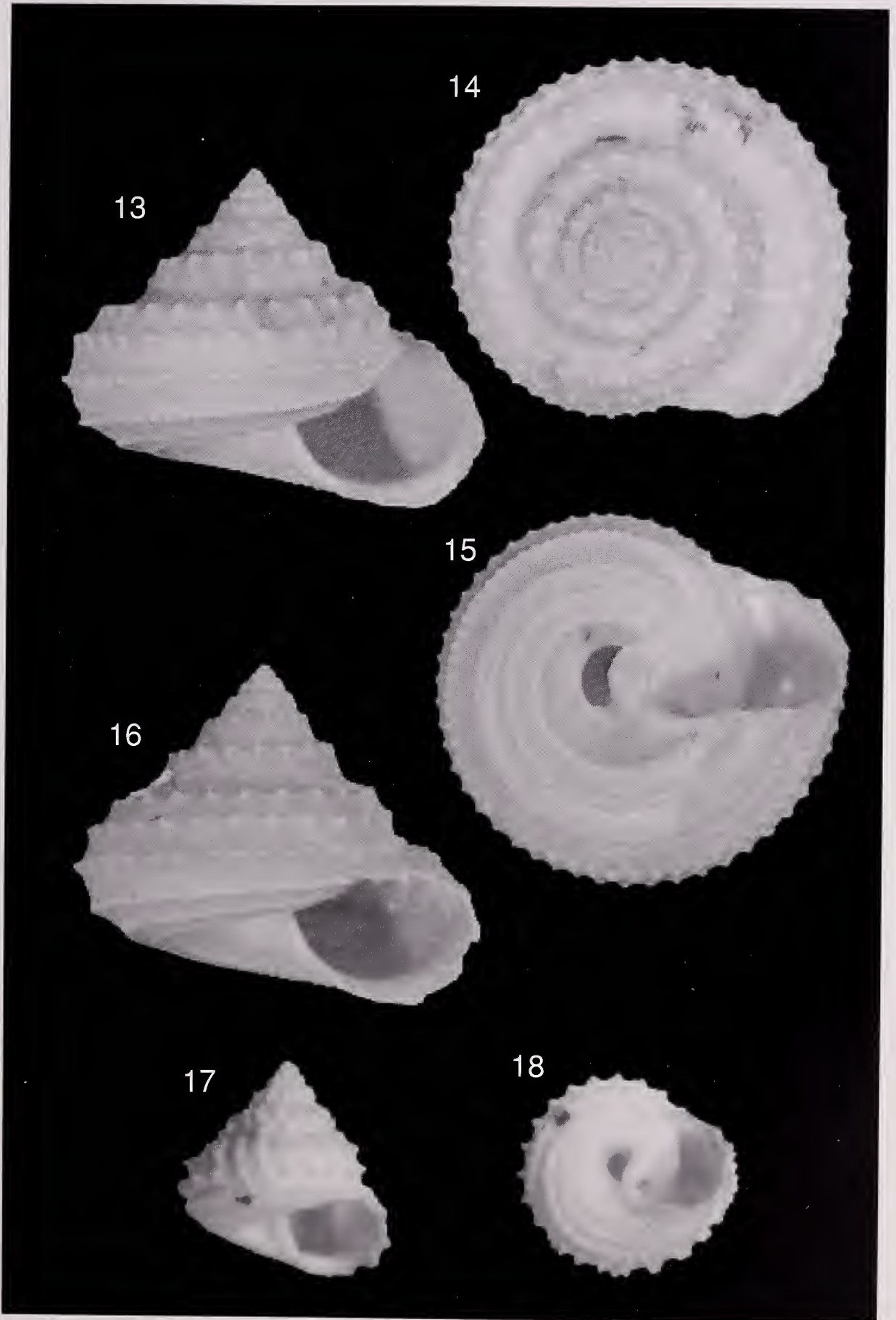
Type material. Holotype (21.8 x 26.3 mm) MNHN. Paratype MNHN (21.1 x 24.7 mm).

Type locality. Fiji, BORDAU 1, stn CP1462, 18°09'S, 178°44'W, 556-560 m.

Material examined. Fiji. BORDAU 1: stn CP1460, 18°47'S, 178°47'W, 750-767 m, 1 dd (paratype). - Stn CP1462, 18°09'S, 178°44'W, 556-560 m, 1 dd (holotype). - New Caledonia. BATHUS 3: stn CP842, 23°05'S, 166°48'E, 830 m, 1 dd juv.

Distribution. Fiji, 560-750 m, and New Caledonia, 830 m.

Diagnosis. A *Calliotropis* species with moderately elevated spire, with a shoulder, light-brownish, with a broad umbilicus, 3 granular spiral cords on last whorl and 4 granular spiral cords on base.



Description. *Shell* rather tall for the genus (height up to 21.8 mm, width 26.3 up to mm), wider than high, rather thin, conoidal with a shoulder at first adapical third; spire rather depressed, height 0.8x to 0.9x diameter, 2.5x to 2.9x aperture height; umbilicus deep and large.

Protoconch unknown (apex of all available specimens damaged).

Teleoconch of 7 or 8 convex whorls, bearing one obvious spiral nodular cord and fine weak prosocline threads; nodules from cords produced by intersections with axial folds on 4 first whorls; additional axial threads not connecting nodules on last whorls. Suture visible, impressed, not canaliculated. First teleoconch whorl convex, with tiny irregular pits and swellings. On second whorl, primary spiral cords P1 and P2 appearing, thin, similar in size and shape, evenly spaced on whorl, bearing rounded nodules; nodules of two cords connected by fine axial prosocline riblets. On third whorl, P1, P2 and axial ribs stronger than on second whorl, giving to the surface a clearly reticulated appearance; ribs on whole surface, connected to P3 that is covered by next whorl; interspace between ribs twice as broad as them; nodules of P1 and P2 becoming sharp, adapically oriented on P1 and horizontally on P2. On fourth whorl, P1 producing a shoulder at first third of the whorl; P3 partially emerging from suture. On fifth whorl, P2 becoming weaker; nodules of P1 becoming larger and more spaced. On the two next whorls, P2 almost disappearing; axial ribs becoming very weak or almost absent. On last whorl, P3 peripheral; P2 becoming suddenly clearly visible strong nodules, much stronger than P3 and slightly weaker than P1. Aperture rounded; outer lip thin, with an extended border; no angle with inner lip. Columella curved at top, concave, without tooth, with callus covering partially umbilicus. Base convex, sculptured with 4 granular spiral cords becoming closer from periphery towards umbilical area; outermost cord granulated, stronger than the others; innermost cord slightly weaker, granulated, bordering umbilicus; intermediate cords weak, almost smooth; axial threads very weak or absent. Umbilicus wide, diameter measuring 30% of shell diameter; inside nearly smooth, with possibly very weak axial threads. *Colour* of protoconch and teleoconch light brown, with no maculation; base paler.

Discussion. The peculiar ontogeny of P2 make the new species apart from its closest relatives. Nevertheless, one can compare it to *Calliotropis*

glypta Watson, 1879 (Figs 5-6), but this species has more numerous cords both on the whorls and on the base.

The new species is rather close to *Calliotropis otto* (Philippi, 1844) from Atlantic, but this latter differs from *C. basileus* n.sp. by a finer subsutural cord and 5 cords on the base. The new species is also rather close to *Calliotropis patula* (von Martens, 1904) from the western Indian Ocean, but this African species has a much more depressed spire and 4 spiral cords on the whorls.

C. basileus n. sp. is superficially similar to *C. blacki* Marshall, 1979 (Figs 7-8) from Kermadec Islands, but this species is much smaller, with granules of the whorls smaller, more lamellose, and all cords of the base granular.

C. basileus n. sp. weakly resembles to *Calliotropis effossima* (Locard, 1896) from West African Atlantic, but in this smaller species P2 never disappears and is closer to P3 than to P1; moreover, the African species has 2 or 3 cords within the umbilicus and an ovate, oblique aperture.

The new species may remember *Calliotropis delli* Marshall, 1979 from Kermadec Islands, but that species is much smaller (about 3.5 mm), with only 2 spiral cords on spire whorls.

Finally, *C. basileus* n. sp. is close to *Calliotropis echidna* Jansen, 1994, which is smaller (about 6 mm), has 3 scaly spiral cords on the base and 2 cords within the umbilicus, this umbilicus being narrower than the one of the new species.

Etymology. King (Greek), used as a noun in apposition - with reference to the large size and crown-like spiral sculpture.

Calliotropis excelsior n. sp.

Figs 19-22

Type material. Holotype (24.4 x 20.9 mm) MNHN. Paratypes: 4 MNHN, 1 IRSNB (30 134 523), 1 coll. C.Vilvens.

Type locality. Fiji, South-East of Viti Levu, MUSORSTOM 10, stn. CP1354, 17°42.6'S, 178°55.0'E, 959-963 m.

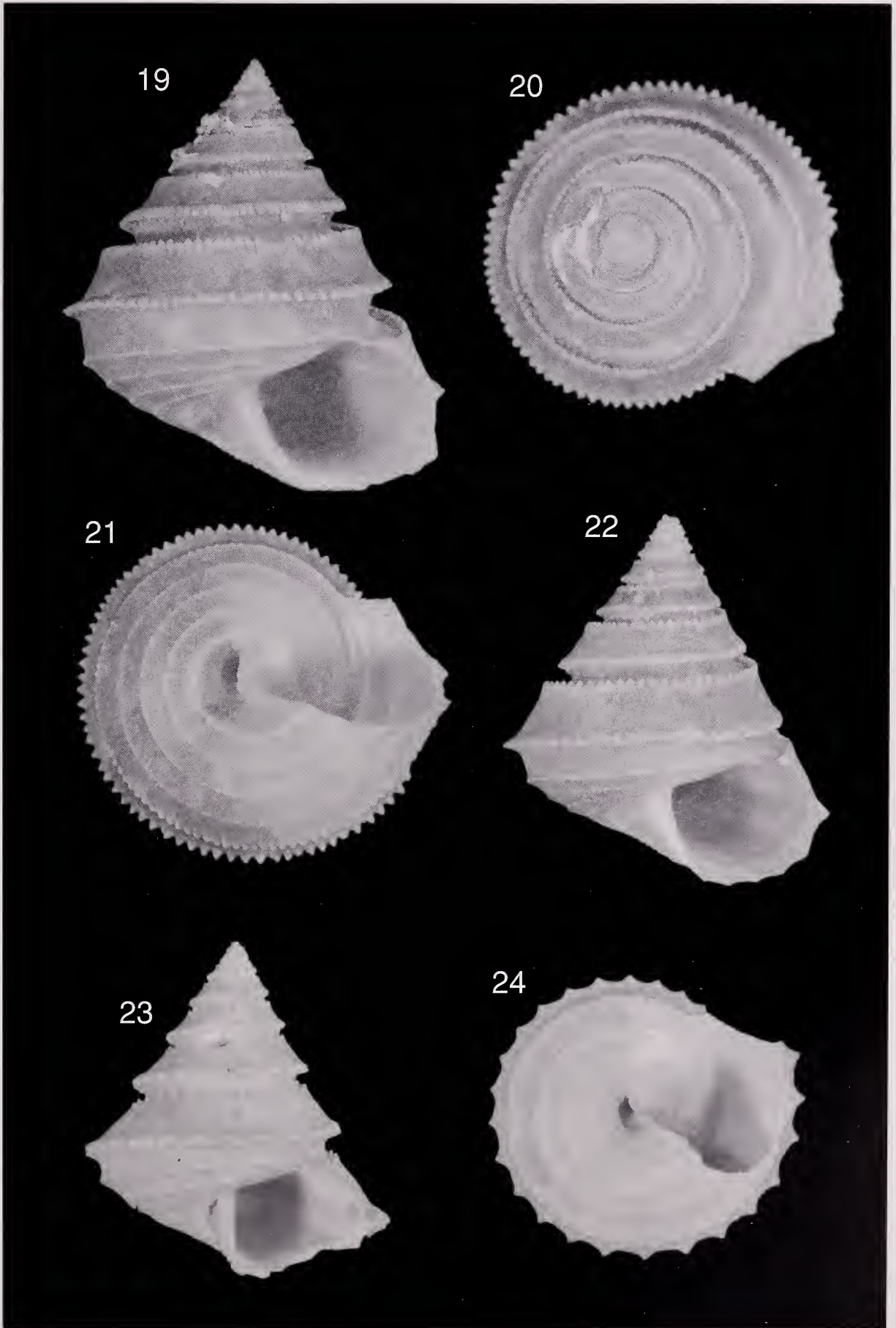
Material examined. Fiji. MUSORSTOM 10: stn. CP1354, 17°42.6'S, 178°55.0'E, 959-963 m, 5 dd and 2 dd sub (holotype and paratypes). - New Caledonia. HALIPRO 1: stn C858, 21°42'S 166°41'E, 1000-1120 m, 1 dd.

Figures 19-24

19-21. *Calliotropis excelsior* n. sp., holotype MNHN, Fiji, 24.4 x 20.9 mm.

22. *Calliotropis excelsior* n. sp., paratype IRSNB, Fiji, 19.0 x 16.5 mm.

23-24. *Calliotropis pagodiformis* (Schepman, 1908), syntype ZMA (3.08.065), Indonesia, 14.1 x 12.7 mm.



Distribution. Fiji, 959-963 m and New Caledonia, 1000-1120 m.

Diagnosis. A conical shell, high elevated, brownish, with a small umbilicus, 3 granular spiral cords on last whorl, a deeply excavated sutural area and 4 granular spiral cords on base.

Description. *Shell* rather tall for the genus (height up to 24.4 mm, width up to 20.9 mm), higher than wide, conical; spire high, height 1.1x to 1.2x diameter, 2.9x to 3.4x aperture height; umbilicus deep and large.

Protoconch about 100 µm, of 1.5 whorl, smooth, glassy, bulbous.

Teleoconch of 8 flat whorls, bearing prosocline threads on first whorls and 3 spiral granular cords; nodules from cords produced by intersections with axial folds on first three whorls. Suture visible, impressed, not canaliculated. First teleoconch whorl convex, sculptured by about 15 slightly prosocline smooth ribs, interspace between ribs twice as broad as them; primary spiral cord P2 appearing almost immediately at second third of the whorl, P1 a little later near the suture; P1 and P2 similar in size and shape, bearing rounded nodules. On second and third whorl P1, P2 and axial ribs stronger, giving a reticulated appearance to the surface. On third whorl, nodules of P1 and P2 becoming sharply pointed, adapically oriented on P1 and horizontally on P2;

nodules of P2 slightly stronger than the ones of P1, and P2 forming a carena. On fourth whorl, nodules of P1 and P2 still stronger, giving to sutural area an excavated shape; P3 emerging partially from suture, with nodules much smaller than nodules of P1 and P2. On fifth whorl, nodules of P2 becoming abapically oriented; nodules of both P1 and P2 prosocline elongated; axial ribs becoming obsolete; sutural area deeply excavated; subsutural ramp almost horizontal. Last three whorls keeping the same shape; area between P1 and P2 almost smooth. On last whorl, P3 peripheral, with nodules weaker than P1 and P2 ones; P2 strongest cord, producing a strong carena; no secondary spiral cords; area between P1 and P2 concave. Aperture almost subcircular; outer lip thin, producing only a very weak angle with inner lip, indented by external spiral cords. Columella curved at top, concave, without tooth; upper part reflected into umbilicus. Base moderately convex, sculptured with 4 granular spiral cords, innermost one stronger than the others and bordering umbilicus; weak axial lamellate threads between cords; interspace between cords at least twice as broad as cords. Umbilicus not very wide, diameter measuring 25% to 28% of shell diameter, with crowded axial lamellae, partially covered by columellar fold.

Colour of protoconch and teleoconch brown, with no maculation.

	H	D	HA	H / D	H / HA
holotype	24.4	20.9	7.8	1.2	3.1
paratype 1 (MNHN)	23.5	19.9	6.9	1.2	3.4
paratype 2 (MNHN)	17.3	15.3	6.0	1.1	2.9
paratype IRSNB	19.0	16.5	6.2	1.2	3.1
paratype CV	17.8	14.6	6.1	1.2	2.9

Table 3. - *Calliotropis excelsior* : Shells measurements in mm for types.

Discussion. The particular shape of the new species make it difficult to confuse with any existing Recent trochid, except maybe with *Calliotropis pagodiformis* (Schepman, 1908) from Indonesia (Figs 23-24), but this species has a concave outline, with the abapical part of each whorl larger than adapical part of the next whorl, and larger, not so sharp, less numerous and more spaced nodules on the cords.

C. excelsior slightly remembers *C. dentata* Quinn, 1991 from Venezuela, but this smaller species has on

P1 stronger and more separated nodules; it has only 3 (instead 4) spiral cords on the base.

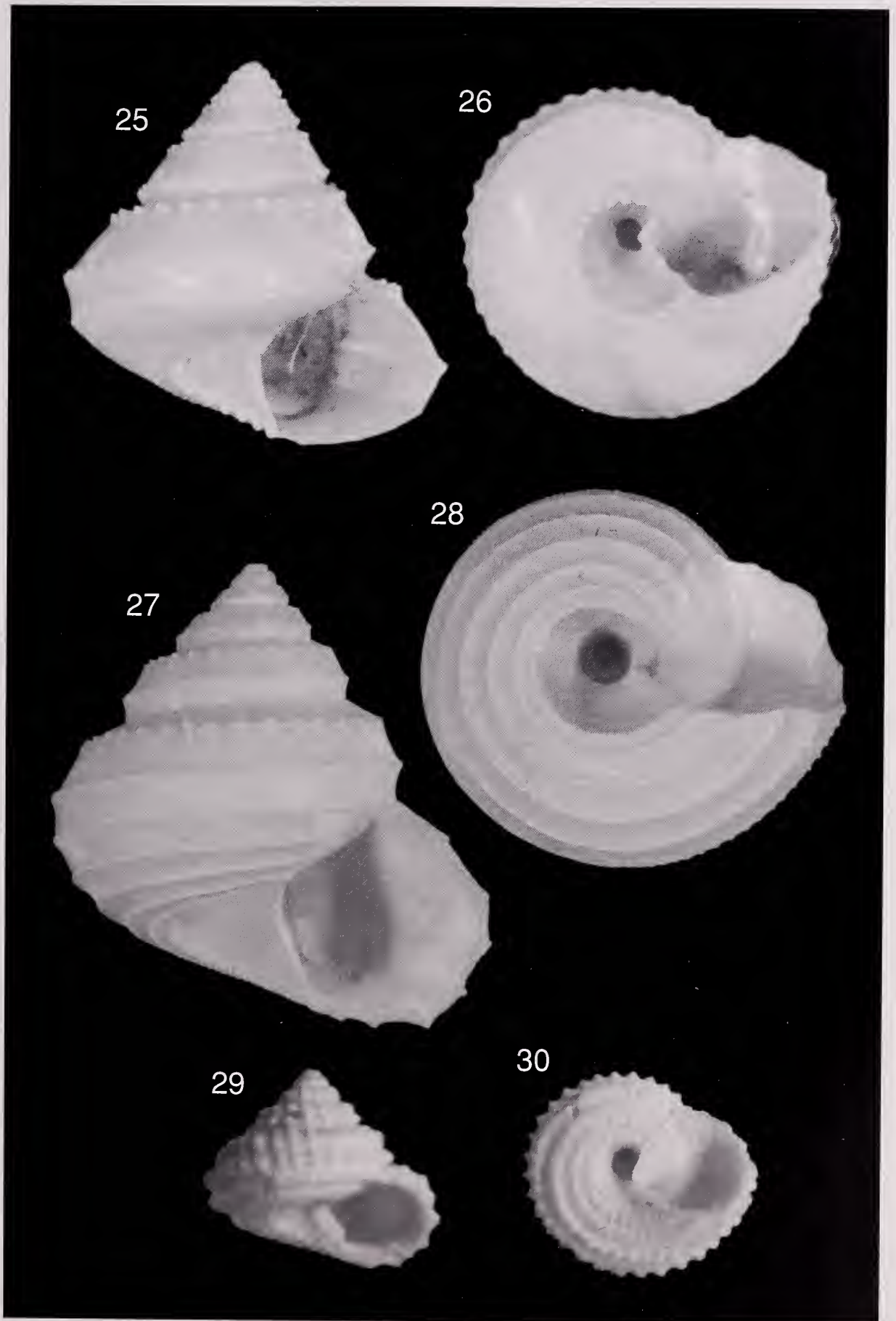
The new species maybe weakly remember *Solariella infralaevis* von Martens, 1898 from East Africa (Figs 25-26), but this species (that further studies could move into the genus *Calliotropis*) has a more depressed spire, nodules of spiral cords not so sharply pointed and not so elongated, and only two cords on the base (one external and one internal).

Figures 25-30

25-26. *Solariella infralaevis* von Martens, 1898, holotype MNB (59.980), off Somalia coast, 10.0 x 9.0 mm.

27-28. *Calliotropis infundibulum* (Watson, 1879), syntype BM(NH) (1887.2.9.328-9), off Marion Is. (Prince Edward Islands), 15.5 x 15.4 mm.

29-30. *Calliotropis muricata* (Schepman, 1908), holotype ZMA (3.08.61), Indonesia, 5.4 x 4.3 mm.



C. excelsior n.sp. may remember *Calliotropis infundibulum* (Watson, 1879) (Figs 27-28) from south-western Indian Ocean, but closer examination shows that this species is very different, with a more convex outline and nodules of spiral cords not so sharply pointed and much more spaced.

Specimens of the new species were found with some specimens of *Calliotropis hataii* Rehder & Ladd, 1973 from Central Pacific, that can be compared with it; but *C. hataii* has more convex whorls with 4 spiral cords, nodules of these cords very different and a larger umbilicus.

Regarding Fossil species, the new species can slightly remember *Calliotropis rewaensis* Ladd, 1982 from Fiji (Pliocene), but this smaller species has 4, instead 3, spiral cords with the two most abapical nearly smooth.

Etymology. Comparative form of *excelsus* (Latin), meaning distinguished – with reference to the very elegant shell shape.

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Appendix

Provisional list of Recent *Calliotropis* species of the Indo-Pacific area

Species	distribution
<i>Calliotropis abyssicola</i> Rehder & Ladd, 1973	Central Pacific, 895–1763 m
<i>Calliotropis acherontis</i> Marshall, 1979	Kermadec Is., 512–549 m
<i>Calliotropis annonaformis</i> Lee & Wu, 2001	Pratas Islands, 400–500 m
<i>Calliotropis basileus</i> Vilvens, 2004	Fiji and New Caledonia, 556–830 m.
<i>Calliotropis bicarinata</i> (Schepman, 1908)	Indonesia, 390 m
<i>Calliotropis blacki</i> Marshall, 1979	Kermadec Is., 366–549 m
<i>Calliotropis calcarata</i> (Schepman, 1908)	Indonesia, 216 m
<i>Calliotropis canaliculata</i> Jansen, 1994	South-eastern Australia, 841–1700 m
<i>Calliotropis carinata</i> Jansen, 1994	Eastern Australia, 322–1097 m
<i>Calliotropis chenoderma</i> Barnard, 1963	South Africa, 86–228 m
<i>Calliotropis chuni</i> (von Martens, 1904)	Indonesia, 660 m
<i>Calliotropis concavospira</i> (Schepman, 1908)	Indonesia, 835–883 m
<i>Calliotropis crystalophora</i> Marshall, 1979	Kermadec Is., 512–549 m
<i>Calliotropis delli</i> Marshall, 1979	Kermadec Is., 135–402 m
<i>Calliotropis derbiosa</i> Vilvens, 2004	Vanuatu and Fiji, 625–1300 m
<i>Calliotropis echidna</i> Jansen, 1994	Eastern Australia and New Caledonia, 115–296 m
<i>Calliotropis eucheloides</i> Marshall, 1979	Kermadec Is., New Caledonia and Philippines, 366–412 m
<i>Calliotropis excelsior</i> Vilvens, 2004	Fiji and New Caledonia, 959–1120 m.
<i>Calliotropis galea</i> (Habe, 1953)	Japan, 100–200m
<i>Calliotropis glypta</i> (Watson, 1879)	Eastern Australia, 366–640 m
<i>Calliotropis granolirata</i> (Sowerby, 1903)	South Africa, 457–1152 m
<i>Calliotropis grata</i> Thiele, 1925	East Africa, 693 m
<i>Calliotropis hataii</i> Rehder & Ladd, 1973	Central Pacific, 1580–1720 m
<i>Calliotropis hondoensis</i> (Dall, 1919)	Japan, 1655 m
<i>Calliotropis infundibulum</i> (Watson, 1879)	Eastern Atlantic, south-eastern Indian Ocean, north-eastern New Zealand and Japan, 230–3259 m
<i>Calliotropis lamellifera</i> Jansen, 1994	South-eastern Australia, 841–1700 m
<i>Calliotropis limbifera</i> (Schepman, 1908)	Indonesia, 522 m
<i>Calliotropis metallica</i> (Wood-Mason & Alcock, 1891)	Indian ocean, 738–2743 m
<i>Calliotropis micraulax</i> Vilvens, 2004	New Caledonia and Vanuatu, 610–1450 m
<i>Calliotropis multisquamosa</i> (Schepman, 1908)	Indonesia, 522 m
<i>Calliotropis muricata</i> (Schepman, 1908)	Indonesia, 390 m
<i>Calliotropis niasensis</i> Thiele, 1925	Indonesia, 132 m
<i>Calliotropis ottoii</i> (Philippi, 1844)	Indonesia, 150–914 m
<i>Calliotropis pagodiformis</i> (Schepman, 1908)	Indonesia, 835–918 m
<i>Calliotropis patula</i> (von Martens, 1904)	East Africa, 977–1019 m
<i>Calliotropis persculpta</i> (Sowerby, 1903)	South Africa, 804 m
<i>Calliotropis pompe</i> Barnard, 1963	Off Cape Point, 2706–3255 m
<i>Calliotropis powelli</i> Marshall, 1979	Kermadec Is., 256–402 m
<i>Calliotropis pulchra</i> (Schepman, 1908)	Indonesia, 397 m
<i>Calliotropis reticulina</i> Dall, 1895	Japan and Hawaii, "deep water"
<i>Calliotropis scalaris</i> Lee & Wu, 2001	Pratas Islands, 400–500 m
<i>Calliotropis spinulosa</i> (Schepman, 1908)	Indonesia, 411 m
<i>Calliotropis stellaris</i> Lee & Wu, 2001	Philippines, 300–400 m