

NOTES ON THE GENUS CYMBIOLACCA (GASTROPODA, VOLUTIDAE), WITH
THE DESCRIPTION OF A NOVEL SPECIES AND A NOVEL FORM

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spec.nov. - Cymbiolacca pulchra houarti n.form.

INTRODUCTION

Since the monograph "The Living Volutes" of Weaver and duPont (1970), new information on the genus Cymbiolacca appeared in various papers. This information has been analyzed and summarized in the present article. The problematics of the genus are discussed. A novel species, Cymbiolacca intruderi, and a novel form of the polytypic Cymbiolacca pulchra (Sowerby I, 1825) are described.

Genus Cymbiolacca Iredale, 1929

1969 Cymbiolacca, Abbottsmith F., Multifarm Australian Volutes.

1970 Genus Cymbiolacca, Weaver and duPont, The Living Volutes, p. 92-94.

1972 Cymbiolacca Iredale, Marzi A., La Conchiglia IV(40), p. 8-9, 12.

1972 Cymbiolacca, Wilson D.F. and Gillett K., Australian Shells, p. 120-139.

The living species in the genus Cymbiolacca fall into two groups. The first group consists of C. pulchra (Sowerby I, 1825) and its allies, and C. intruderi spec.nov. Both these species live along the coast of the Australian continent and near the Great Barrier Reef. Their most distinguishing character is the number of columellar plaits, limited to 4. C. perplicata (Wedley, 1902) and C. thatcheri (McCoy, 1868) form the second group. They live near the open ocean reefs or islands

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respectively Lihou Reef and the Chesterfield Islands. C. perplicata and C. thatcheri not only have more columellar plaits (6 to 7), they also possess a heavier shell and a sharper protoconch.

These characters possibly separate both groups on the sub-generic level, but a revision of the old literature (before 1970) is necessary before a name can be reemployed or created.

Abbottsmith (1969) and Wilson and Gillett (1972) placed C. thatcheri and C. perplicata in Notovoluta Cotton, 1946, but the low spire and axially ribbed protoconch justifies their place in the genus Cymbiolacca.

In the present paper C. pulchra is considered as a polytypic species, living from St. Crispin's Reef in northern Queensland, to Ulladulla, in southern New South Wales.

Abbottsmith used the names C. wisemani, cracenta, peristicta, nielsenii, pulchra, woolacottae, perryi, complexa and provocationis in his Multifiform Australian Volutes, but on page 57, he made a "F.A.V. Affinity Chart of the dot set" proving that he was convinced of the close relationships between all these taxa. Weaver and duPont have split C. pulchra into several species, but they expressed their doubts as to the validity of C. peristicta McMichael, 1963. They remark: "This species is most closely related to some of the more southerly coral cay populations of C. pulchra (Sowerby I, 1825), and at some future date it may prove to be conspecific with Sowerby's species."

Later authors (Marzi, 1972, Wilson and Gillett, 1972) adopt the system of Weaver and duPont, the partial splitting of C. pulchra in species, sometimes with slight personal adaptations. One of these concerns the much discussed "Pseudocymbiola provocationis McMichael, 1961".

Weaver and duPont (1972) figured the radulae of several phenae here all considered as C. pulchra. There are no significant differences in shape between these radulae.

C. pulchra may be elongate or broad. In broad shells, the shoulder tubercles have a tendency to be well developed, while they become smaller or even obsolete in slender shells. There may be a relationship between the depth and the width/length ratio.

Each local population has its own shape and color, but lack of detailed geographic information permits us to recognize only two clear subspecies : C.pulchra wisemani (Brazier, 1870) and C.pulchra cracentae McMichael, 1963.

Other populations easy to distinguish by their color and shape are :

Cymbiolacca pulchra f. woolacottae McMichael, 1958

Cymbiolacca pulchra f. peristicta McMichael, 1963

Cymbiolacca pulchra f. houarti n.form.

Cymbiolacca pulchra f. perryi (Ostergaard and Summers, 1957)

Cymbiolacca pulchra f. provocationis (McMichael, 1961)

Cymbiolacca pulchra f. nielsenii McMichael, 1963

These phenomena are here treated as "forms". Whether one deals with subspecies, ecomorphs or clinal variations remains to be proved by future workers. Field work and extensive data may prove that all these populations are separated from others with small or large geographical gaps. In this case we shall have to consider these forms as subspecies. If one or several taxa are sympatric without intergrades then they should be considered as species.

The name "C.pulchra" is used to indicate all populations found between the Swain Reefs and Tullongong, which do not belong to one of the above mentioned "forms".

Cymbiolacca pulchra (Sowerby I, 1825)
Pl. III, figs. 27, 28, 29.

1969 Cymbiolacca complexa, Abbottsmith, Multiforum Australian Volutes, p. 38-44 and others.

1970 Cymbiolacca pulchra (Sowerby I, 1825), Cymbiolacca complexa (Iredale, 1924), Weaver and duPont, The Living Volutes, p.95, 97, pl. 38, 41.

1972 Cymbiolacca pulchra (Sowerby I, 1825), Cymbiolacca complexa (Iredale, 1924), Marzi A., La Conchiglia IV(40), p.8-9, 12.

1972 Cymbiolacca pulchra Sowerby I, 1825, Cymbiolacca complexa Iredale, 1924, Wilson P.R. and Gillett K., Australian Shells, p. 120-132.

1981 Cymbiolacca pulchra, Thora Whitehead, Austr. Shell News, Nos 35-36.

1962 Cymbiolacca pulchra (Sowerby I, 1825), Cymbiolacca complexa (Iredale, 1924), Abbottsmith F., La Conchiglia, XIV (154-155), p.12.

At present there is no compelling reason to separate the taxa C.pulchra and C.complexa. Pending further detailed zoogeographical information, we shall therefore consider them as variants of a single polytypic species C.pulchra, ranging from the Swain Reefs to Wollongong.

The name C. complexa was formerly used to designate C.pulchra living south of Hervey Bay. Differences with the populations living north of Hervey Bay have not been well defined. In general, the pattern of the southern C.pulchra ("complexa") is finer, and the base color is usually orange to red. The white triangles (often situated at the left of a chocolate brown dot) are small. In northern C.pulchra these triangles are often large, and their base color is more pink to red.

Little is known about the life of C.pulchra. In the Capricorn group, T. Whithead observed this species feeding on Fragum fragum (Cardiidae). According to her statements C.pulchra emerges from sand near small coral heads for only very short periods.

A sinistral specimen was collected, near Cape Moreton, Queensland at a depth of 100 m.

The shell figured by Marzi (1972) does not belong to this phenon but is C.pulchra cracentia McMichael, 1963.

Cymbiolacca pulchra cracentia McMichael, 1963

Pl. III, fig.22.

1969 Cymbiolacca cracentia, Abbottsmith, Multiform Australian Volutes, p.41 and others.

1970 Cymbiolacca cracentia (McMichael, 1963), Weaver and duPont, The Living Volutes, p.95, pl.40.

1972 Cymbiolacca cracentia, Marzi A., La Conchiglia IV(40), p. 8-9, 12.

1972 Cymbiolacca cracentia McMichael, 1963, Wilson B.R. and Gillett K., Australian Shells, p.120-139.

1982 Cymbiolacca cracentia (McMichael, 1963), Abbottsmith F., La

Conchiglia, XIV (154-155), p.13.

C.pulchra cracentia lives from Townsville south to Bowen, Queensland, at depths around 75m. The shell is slender for the species, and has a deep carmin red base color. Its geographical isolation allows us to consider C.pulchra cracentia as a valid subspecies.

Cymbiolacca pulchra wisemani (Brazier, 1870)
Pl. III, fig. 30.

- 1969 Cymbiolacca wisemani, Abbottsmith, Multiform Australian Volutes, p.45 and others.
- 1970 Cymbiolacca wisemani (Brazier, 1870), Weaver and duPont, The Living Volutes, p.90, pl.41.
- 1972 Cymbiolacca wisemani (Brazier, 1870), Marzi A., La Conchiglia IV(40), p.8-9, 12.
- 1972 Cymbiolacca wisemani Brazier, 1870, Wilson D.R. and Gillett K., Australian Shells, p. 120-139.
- 1975 Cymbiolacca wisemani Brazier, 1870 and Cymbiolacca randalli Stokes, 1961, Coleman H., What Shell is that ?, p.256 and 257.
- 1982 Cymbiolacca wisemani (Brazier, 1870), F.Abbottsmith, La Conchiglia XIV (154-159), p. 12-13.

This striking subspecies, of which the main population lives just north of Cairns, is uncommon. All authors agree that C.randalli Stokes, 1961, without any red or orange in the base color, grades into the more colorful C.pulchra wisemani. Coleman (1975) figures a live animal of which the pattern matches that of other phena of C.pulchra.

Cymbiolacca pulchra f. *houarti* new form.
Pl. II, figs. 9 to 17.

- 1982 Cymbiolacca complexa (Iredale, 1924), Abbottsmith F., La Conchiglia, XIV (154-155), p.12.
- 1983 Cymbiolacca, Coucou E., Keppel Bay Tid., Vol.22, N° 1, p.1.

MATERIAL : The 3 type specimens. Two young shells in the Coll. G. Poppe, photographs of two specimens in the Coll. A. Limpus. Illustrations in the above mentioned publications.

TYPE SPECIMENS :

Holotype : length 55 mm, maximum diameter 25,6 mm.
Paratype 1 : length 54.5 mm, maximum diameter 24.5 mm.
Paratype 2 : length 52.5 mm, maximum diameter 22.8 mm.

The type specimens have been trawled at a depth of 73 fathoms in the Capricorn Channel. The holotype is in the Koninklijk Belgisch Instituut voor Natuurwetenschappen, Type N° 419. Paratype 1 is in the coll. G. Poppe, Paratype 2 in the Western Australian Museum.

TYPE LOCALITY : Capricorn Channel.

RANGE : Limited to the type locality.

HABITAT : Shells are trawled at depths between 30 and 170 m.

DIMENSIONS : Adult specimens are between 52 and 69 mm in length.

SHELL CHARACTERISTICS : Shell with about 6 whorls. The general shape is identical to that of other slender pene of C. pulchra. The three protoconch whorls show white radiating ribs. These ribs are especially visible on the second whorl, and disappear on the third whorl. The teleoconch may be smooth, or adorned with a shoulder row of small tubercles. These tubercles are sometimes well developed on the last whorl, and may even form small spiny knobs. The white columella has four oblique plaits. The base color is pale brown. The three broad spiral bands of a slightly darker brown color appear on the last whorl. On the teleoconch whorls there is a band of short axial lines just under the suture. Below these lines the pattern consists of very dark brown spots, widely dispersed. On the left of each spot there is a white area, often triangular in form.

ANIMAL AND RADULA : The radula is unknown. One photograph, recei-

ved of Mr.A.Limpus, shows part of the foot of a living animal. This part, probably the dorsal surface of the foot, looks like dark brown sand.

REMARKS : The constant color and pattern of the shell of C.pulchra f.houarti differentiate it from all other C.pulchra. With one exception, all localities given mention "The Capricorn Channel", but it has not yet been proved that C.pulchra f.houarti is geographically isolated of other populations of C.pulchra. Shells of this population were regularly offered on dealers lists and in correspondence under the name "C.coccellata". Formerly it was known to collectors as the northern form of C.pulchra nielseni McMichael, 1959. Shells found south of the Swain Reefs (northern part of the Capricorn Channel) seem to be larger and slightly paler. (A.Limpus, personal communication). This name has been chosen to honor Mr.Roland Houart, a long time friend and world famous for his contributions to the knowledge of Muricidae.

Cymbiolacca pulchra f. nielseni McMichael, 1959
Pl. III, fig. 21.

- 1959 Cymbiolacca complexa nielseni, McMichael, Australian Zoologist, p.377, pl.44.
1969 Cymbiolacca complexa nielseni form, Abbottsith, Multiform Australian Volutes, n. 30-44 and others.
1970 Cymbiolacca pulchra (Sowerby, 1825), Weaver and duPont, The Living Volutes, p.97.
1972 Cymbiolacca complexa (Iredale, 1924), Marzi A., La Conchiglia IV(40), p.3-9, 12.
1972 Cymbiolacca complexa Iredale, 1924, Wilson B.R. and Gillett K., Australian Shells, p.126.

TYPE : The holotype is in the Australian Museum, Sydney.

TYPE LOCALITY : Hervey Bay, Australia.

RANGE : Limited to the type locality.

ANIMAL AND RADULA : The radula is Cymbiolacca-like, and has been figured by McMichael (1959) and Weaver and duPont (1970).

REMARKS : C.pulchra f.nielseni was described as a form or subspecies of C.complexa (Iredale, 1924). Weaver and duPont (1970) placed it in synonymy of C.pulchra (Sowerby I, 1825). The constant shape and color that differentiate C.nielseni from other Cymbiolacca, and the clear limitation of the population to the Hervey Bay area suggest a valid subspecies, but geographical isolation is not yet proved. Up till now all C.pulchra with a dark pattern, containing a lot of black-brown spots have been called "nielseni" by collectors and/or students. The name C.pulchra f.nielseni should be used for shells of the Hervey Bay population only.

Cymbiolacca pulchra f. peristiota McMichael, 1963
Pl. III, fig.26.

1969 Cymbiolacca peristiota, Abbottsmith, Multifera Australian Volutes, p.41 and others.

1970 Cymbiolacca peristiota (McMichael, 1963), Weaver and duPont, The Living Volutes, p.96, pl.40.

1972 Cymbiolacca peristiota McMichael, 1963, Marzi A., La Conchiglia IV(40), p.8-9, 12.

1972 Cymbiolacca peristiota McMichael, 1963, Wilson D.R. and Gillett K., Australian Shells, p.120-139.

The population of C.pulchra f.peristiota lives on Big Sandy Cay, in the western Swain Reefs. Other populations of C.pulchra have been recorded from this area, and a geographic isolation still has to be proved.

Cymbiolacca pulchra f. perryi (Ostergaard and Summers, 1957)

1969 Cymbiolacca pulchra perryi form, Abbottsmith, Multifera Australian Volutes, p. 38-44 and others.

1970 Cymbiolacca pulchra (Sowerby, 1825), Weaver and duPont, The Living Volutes, p.97.

1972 Cymbiolacca pulchra Sowerby, 1825, Wilson D.R. and Gillett K., Australian Shells, p.126.

The name Cymbiolacca pulchra f. perryi is best used for the slender, very pale colored shells. Abbottsmith mentions these shells from Wistari Reef and Fitzroy lagoon. This form is close to C. pulchra f. woolacottae McMichael, 1958, but is possibly isolated.

Cymbiolacca pulchra f. provocationis (McMichael, 1961)

- 1961 Pseudocymbiola provocationis, McMichael, Journ. Malac. Soc. Austr. (5):54, pl. 4, figs. 9 and 10.
1972 Pseudocymbiola provocationis McMichael, 1961, Wilson F.R. and Gillett K., Australian Shells, p. 120-139.
1969 Cymbiolacca provocationis, Abbottsmith, Multiform Australian Volutes, p. 85 and others.
1970 Cymbiolacca complexa (Dredale, 1924), Weaver and duPont, The Living Volutes, p. 95.
1972 Pseudocymbiola provocationis McMichael, 1961, Marzi A., La Conchiglia IV(40), p. 8-9, 12.

TYPE : The holotype is in the Australian Museum, Sydney.

TYPE LOCALITY : Ulladulla, New South Wales, Australia.

RANGE : Only known from the waters around the type locality.

ANIMAL AND RADULA : unknown.

REMARKS : Abbottsmith suggests that this is a southern variant of "C. complexa". Main differences between C. pulchra f. provocationis and other populations are the larger and more rounded apex, smaller size, fewer nodules on the shoulder and a more orange colored shell. Should geographical isolation be proved, it may become a subspecies.

Cymbiolacca pulchra f. woolacottae McMichael, 1958.

- 1969 Cymbiolacca pulchra form woolacottae, Abbottsmith, Multiform Australian Volutes, p. 38-44 and others.
1970 Cymbiolacca pulchra (Sowerby, 1825), Weaver and duPont, The Living Volutes, p. 97.

- 1972 Cymbiolacca pulchra (Sowerby, 1825), Marzi A., La Conchiglia IV(40), p.8-9, 12.
1972 Cymbiolacca pulchra Sowerby, 1825, Wilson D.R. and Gillett K., Australian Shells, p.126.

Shells of C.pulchra f. woolacottae are usually broad shouldered and have strongly developed spines. The constant color and pattern, containing large white triangles on a pink-brown background distinguish these Cymbiolacca pulchra of all other populations. The main population seems to live near Lady Musgrave Island.

Cymbiolacca intruderi spec. nov.

Pl. I, figs. 1 to 2

- 1984 Voluta turneri (Griffith and Pidgeon), Leehman E., Hawaiian Shell News, Vol. 32(9), p.11.
1985 Voluta species, Gyrinx aruanus (Anonymous), La Conchiglia, XVII (190-191), p.13.

MATERIAL : The 3 type specimens and photographs of 2 shells in the Coll. Vandenbergh, one specimen in the Coll. H. Deute, and 4 specimens in the Coll. A. Limpus. 7 specimens are photographed in the article in La Conchiglia (1985).

TYPE SPECIMENS :

Holotype : length 97.7 mm, maximum diameter 37.3 mm.
Paratype 1 : length 83.1 mm, maximum diameter 33.1 mm.
Paratype 2 : length 77.2 mm, maximum diameter 30.2 mm.

All the type specimens have been trawled dead in the southern Swain Reefs, between 70 and 90 fathoms in 1903. The holotype has been deposited in the Western Australian Museum N° WAM 1141-04, Paratype 1 in the Museum of Victoria and Paratype 2 is in the Coll. G. Poppe.

TYPE LOCALITY : Southern Swain Reefs.

RANGE : Limited to the Southern Swain Reefs. Some shells are said to come from off Townsville, but this locality needs confirmation.

HABITAT : Shells were trawled between 70 and 200 fathoms, on a sandy bottom.

DIMENSIONS : Adult shells measure between 72 mm. and 125 mm. in length.

SHELL CHARACTERISTICS : The slender shaped shell has 5 to 6 whorls, and a small spire in comparison to other members of the genus. There are three to three and a half protoconch whorls, usually adorned with widely spaced axial ribs. On the holotype these ribs are hardly visible, but in paratype 1, they are well developed, and are more than 10 in number. The teleoconch whorls are smooth or bear a row of short pointed tubercles. These tubercles usually become obsolete on the last whorl. (A shell in the Coll.A.Limpus has tubercles on the shoulder of the last whorl). The slightly concave white columella bears 4 oblique plaits. The siphonal notch is narrow and deep. A fasciola is present. The lip is simple and slightly thickened in adult shells. The protoconch whorls are light yellow. The inner side of the aperture is usually pure white. The outer surface of the teleoconch whorls has a creamy white base color, adorned with 3 to 4 bands of yellow brown dashes. A fine pattern of dark brown axial lines covers these base colors. These axial lines are variable in number but cover the entire last whorl from the suture down to the siphonal canal.

ANIMAL AND RADULA : The foot of the animal has a pink to dark brown sandy pattern.

REMARKS : C. intruderi are close to some forms of the C. pulchra but its color and pattern is always very different : C. pulchra never shows the long axial lines in the pattern, and has a more orange or red color in most cases. At first glance the shells of C. intruderi resemble an Amoria species, but a detailed look at the protoconch leaves no doubt as to its real relationship with Cymbiolacca. Amoria are not known to have axial ribs on their generally broad protoconch. Leehman published a short note in U.S.N. concerning a shell now in the Coll.M.Doute: this shell was not dredged in the Coral Sea, but in the Swain Reefs.

C.intruderi is possibly sympatric with C.pulchra f. houarti, because both species are trawled in the same area. The number of axial lines covering the last whorl is variable, and may later prove to be constant for each population (if there is more than one ?) of this species.

The name has been chosen by Mr. and Mrs. Meidke of Bundaberg in honour of Mr. Paul Gardner, who discovered this striking species with his trawler, the "Southern Intruder".

Cymbiolacca perplicata (Wedley, 1902)

Pl. I, fig. 18.

- 1969 Notovoluta perplicata, Abbottsmith, Multiform Australian Volutes, p.80 and others.
- 1970 Cymbiolacca perplicata (Wedley, 1902), Weaver and duPont, The Living Volutes, p.96, pl. 39.
- 1972 Voluta perplicata, Farzi A., La Conchiglia IV(40), p.8-9, 12.
- 1972 Notovoluta perplicata Wedley, 1902, Wilson B.R. and Gillett K., Australian Shells, p. 120-139.
- 1983 Cymbiolacca perplicata (Wedley), Okutani T., Kawamura collection, pl. XXXV, p.10.
- 1985 Cymbiolacca perplicata Wedley, 1902, L.R. Passilia, The Connoisseur, p.21.

In 1974 the elusive C.perplicata was collected for the first time alive. Tom Wilson achieved celebrity with his 8 years search for this Volute, commonly regarded as the most desirable Queensland shell.

The exact locality of C.perplicata seems to be kept secret. Most shells are labeled "Diamond Reef", Coral Sea. This exciting reef name does not exist on official maps. L.R. Passilia thinks that the species lives in the neighbourhood of Hellyer Reef. Other sources, worth of trust, indicate Lihou Reef, in the middle of the Coral Sea, about 500 km north east of Cooktown as main locality. Diamond Reef may be one of the small reefs found around the central Lihou sand cay.

The animal of C.verplicata is orange with an overlaid creamy white pattern. Adult shells measure between 62 and 82 mm. in length. Pattern as well as shape are very constant.

Cymbiolacca thatcheri (McCoy, 1868)

Pl.II, figs. 19,20.

- 1969 Notovoluta thatcheri, Abbottsmith, Multiform Australian Volutes, p.82 and others.
- 1970 Cymbiolacca thatcheri (McCoy, 1868), Weaver and duPont, The Living Volutes, p.97, pl.40
- 1972 Voluta thatcheri McCoy, 1868, Marzi A., La Conchiglia IV(40), p.8-9, 12.
- 1972 Voluta thatcheri, Lillie S., Hawaiian Shell News, Vol.20(4), p.10.
- 1981 Voluta thatcheri, Nielsen T., Hawaiian Shell News, Vol.29(10) p.1.

In the mid-seventies there was a great deal of confusion as to the right locality of C.thatcheri. Finally a few shells with labels indicating the Chesterfield Group as locality reached Europe. This was later confirmed in literature by a few authors, among these Tom Nielsen, a specialist in the field. During the CHALCAL expedition, fresh and dead shells were dredged in and around the Chesterfield Group, on depths varying between 31 and 205 m. (Bouchet, 1985, personal communication).

Tom Nielsen calls our attention on a different form of C.thatcheri, collected "further afield", but still in the Chesterfield Group. This form has a slenderer shape and a different pattern than that of the shells collected in the south. The red spiral bands are more pronounced and the white triangles are fewer and larger.

CONCLUSION

In the genus Cymbiolacca three species are clearly defined : C.thatcheri, C.verplicata and the new species C.intruder, described in this paper.

Specimens of C. pulchra often fall into well recognizable phona,

the status of which is doubtful, pending more data. Two of them (wisemani and cracenta) appear to be good subspecies. The others are provisionally considered as forms. A new form C.pulchra f. houarti is described.

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BIBLIOGRAPHY

ABBOTTSMITH, F.

1969 Multiform Australian Volutes, p.85 and others.

1982 La Conchiglia, XIV(154-155), p.12,13.

1982 La Conchiglia, XIV(158-159), p.12,13.

ANONYMOUS.

1985 Voluta species, article signed Syrinx aruanus, La Conchiglia, XVII (186-191), p.13.

COLEMAN, M.

1981 What Shell is that ? Lansdowne Press, Australia, second edition, p.256 and 257.

CONCOW, E.A.

1983 Recent finds. Keppel Bay Tid., Vol.22, N°1, p.1.

LEEHMAN, E.C.

1984 Too Big ? , Hawaiian Shell News, Vol.32(9), p.11.

LILLICO, S.

1972 Search for a living Voluta thatcheri, Hawaiian Shell News, Vol. 20(4), p.13.

MARZI, A.

1972 A Few notes on the Genus Cymbiolacca Iredale. La Conchiglia IV(40), p.8-9, 12.

MASSILIA, L.F.

1985 Cymbiolacca nerplicatea Medley, 1982, The Connoisseur, p.21.

McMICHAEL.

1959 Cymbiolacca complexa nielsenii, Australian Zoologist, p.377, pl. 44.

1961 Pseudocymbiola provocacionis, Journ.Malac.Soc.Austr. (5):54, pl.4, figs 9 and 10.

NIELSEN, T.

1981 The Van Tho Found Voluta nerplicatea, Hawaiian Shell News, Vol.29(10), p.1.

OKUTANI, T.

1983 Kawamura collection, pl.XXXV, p.10.

WEAVER and duPONT.

1970 The Living Volutes. Delaware Museum of Natural History,
Delaware. Monograph Series N° 1., p.1-375. Cymbiolacca are
extensively treated on p.92-99, and Pl.39-41.

WHITEHEAD, T.

1901 Collecting Volutidae on North West Island. Austr. Shell
News, Nos 35-36.

WILSON, R.D. and GILLETT, K.

1972 Australian Shells, C.E. Tuttle Company Inc., Rutland, Vermont
and Tokyo. p.120-139.

PLATE I

- Fig. 1, 2, 3 - *Cymbiolacca intruderi* spec. nov.
Holotype. 97.7 mm. Trawled in the southern Swain Reefs between 70 and 90 fathoms. 1983. Western Australian Museum, N° WAM 1141-04.
- Fig. 4, 5 - *Cymbiolacca intruderi* spec. nov.
Paratype 2. 77.2 mm. Trawled in the southern Swain Reefs, between 70 and 90 fathoms. 1983. Coll. G. Poppe.
- Fig. 6, 7 - *Cymbiolacca intruderi* spec. nov.
Paratype 1. 83.1 mm. Trawled in the southern Swain Reefs between 70 and 90 fathoms. 1983. Museum of Victoria.
- Fig. 8 - *Cymbiolacca intruderi* spec. nov.
Details of the holotype (left) and paratype 1 (right).

PLATE II

- Fig. 9, 10, 15 - *Cymbiolacca pulchra houarti* n.form.
Holotype. 55 mm. Trawled in the Capricorn Channel, 73 fathoms deep. 1980. Koninklijk Belgisch Instituut voor Natuurwetenschappen.
- Fig. 11, 12 - *Cymbiolacca pulchra houarti* n.form.
Paratype 1. 54.5 mm. Trawled in the Capricorn Channel, 73 fathoms deep. 1980. Coll. G. Poppe.
- Fig. 13, 14 - *Cymbiolacca pulchra houarti* n.form.
Paratype 2. 52.5 mm. Trawled in the Capricorn Channel, 73 fathoms deep. 1980. Western Australian Museum.
- Fig. 16 - *Cymbiolacca pulchra houarti* n.form.
54.7 mm. Trawled in the Capricorn Channel, 73 fathoms deep. 1980. Shell of subadult specimen with smooth last whorl. Coll. G. Poppe.
- Fig. 17 - *Cymbiolacca pulchra houarti* n.form.
33.1 mm. Trawled in the Capricorn Channel, 73 fathoms deep. 1980. Shell of young animal. Coll. G. Poppe.
- Fig. 18 - *Cymbiolacca peralicata* (Noddy, 1902)
39 mm. "Diamond Reef" (sic), Coral Sea, 1979. Coll. G. Poppe.
- Fig. 19, 20 - *Cymbiolacca thatcheri* (McCoy, 1868)
73 mm. Chesterfield Islands, 1978. Coll. G. Poppe.

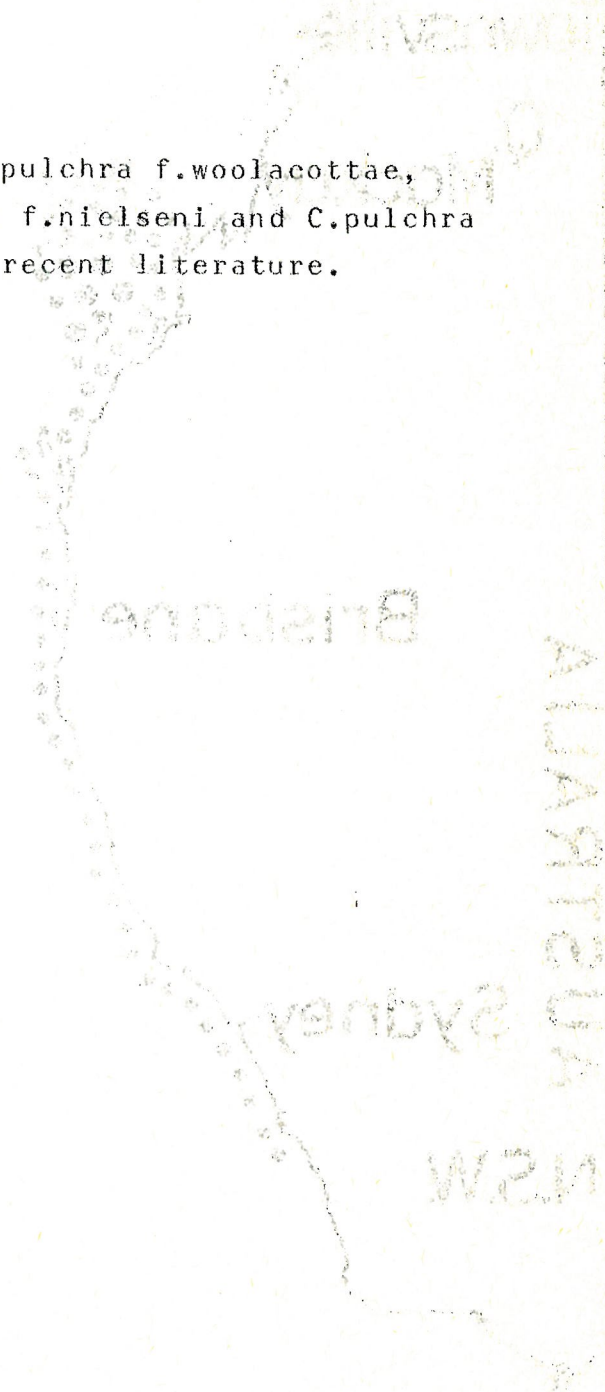
PLATE III

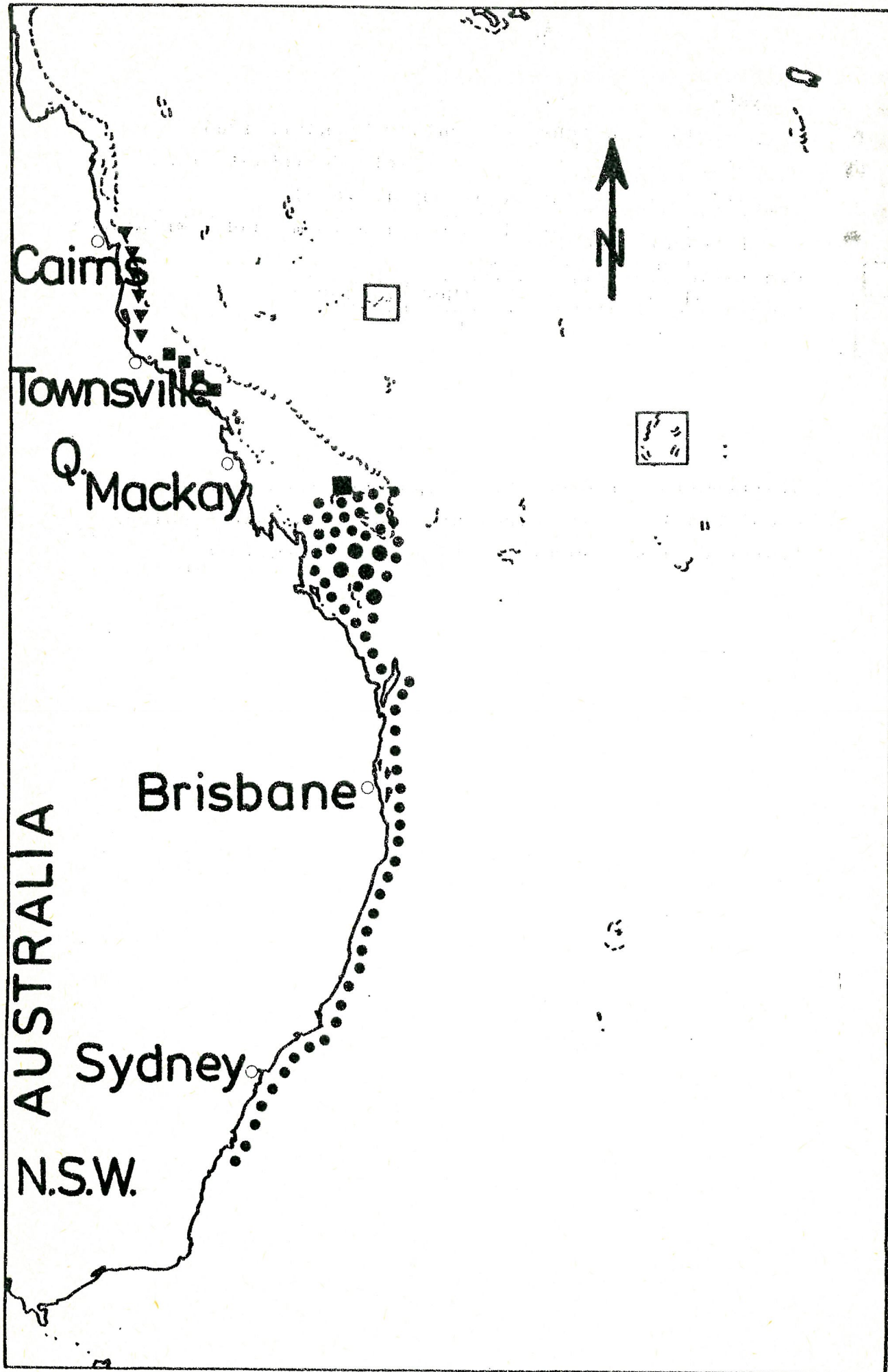
- Fig. 21 - *Cymbiolacca pulchra* f. *nielseni* McMichael, 1959.
61 mm. Exact locality unknown. Probably Harvey Bay +/-
1260. Coll. G. Poppe.
- Fig. 22 - *Cymbiolacca pulchra* *eracenta* McMichael, 1963.
62 mm. Townsville, Queensland. Trawled at a depth of 30
fathoms. Coll. G. Poppe.
- Fig. 23 - *Cymbiolacca pulchra* (Sow. I, 1825).
83 mm. Off Bundaberg, Queensland. Trawled in deep water.
A slender form, with an orange base color and very regular
axial lines below the suture. Shells of this *C. pulchra* are
constant in pattern and shape. Coll. G. Poppe.
- Fig. 24 - *Cymbiolacca pulchra* f. *woolacottae* McMichael, 1958.
76 mm. Exact locality unknown. A form usually called
C. pulchra woolacottae. Coll. G. Poppe.
- Fig. 25 - *Cymbiolacca pulchra* (Sow. I, 1825).
100 mm. Exact locality unknown. Coll. G. Poppe.
- Fig. 26 - *Cymbiolacca pulchra* f. *peristicta* McMichael, 1963.
64 mm. Swain Reefs, Queensland. Coll. G. Poppe.
- Fig. 27 - *Cymbiolacca* (Sow. I, 1825).
81 mm. Off Sandy Cape, Queensland, 35 fathoms deep.
Coll. G. Poppe.
- Fig. 28 - *Cymbiolacca pulchra* (Sow. I, 1825).
82 mm. Trawled off Keppel Island, Queensland, 90 m. deep.
Coll. G. Poppe.
- Fig. 29 - *Cymbiolacca pulchra* (Sow. I, 1825).
85 mm. Exact locality unknown. Coll. G. Poppe.
- Fig. 30 - *Cymbiolacca pulchra wisemani* (Iredale, 1924).
76 mm. Northern Queensland. Exact locality unknown.
Coll. G. Poppe.

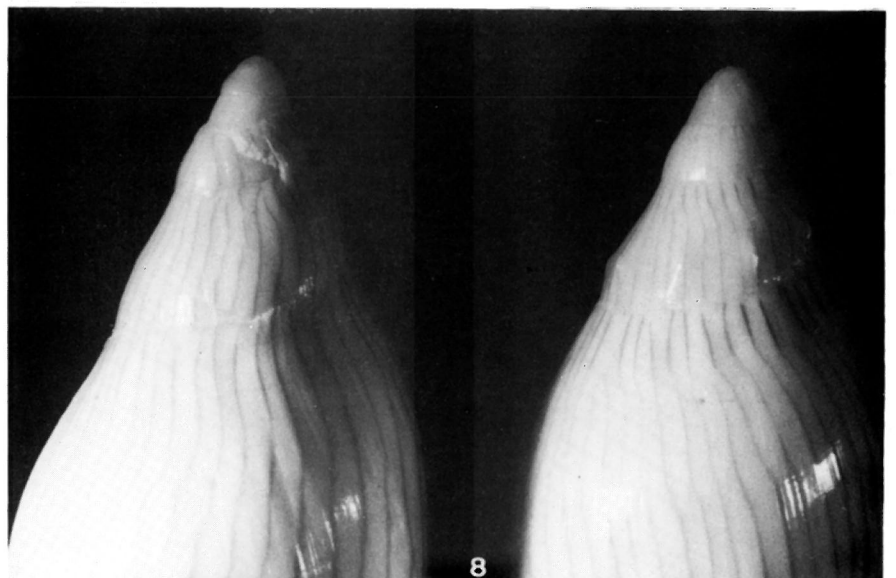
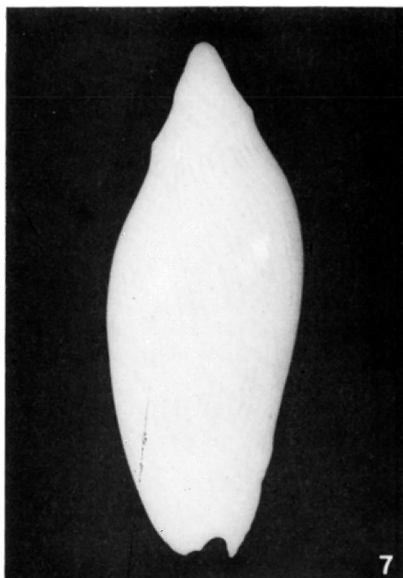
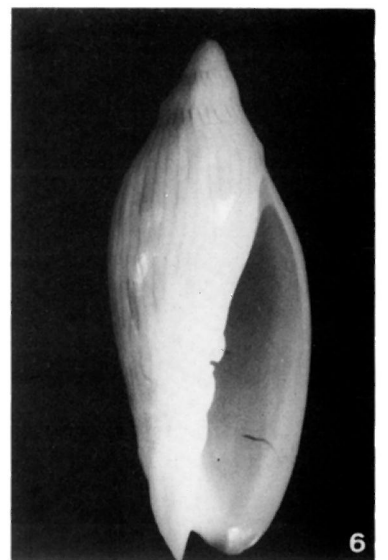
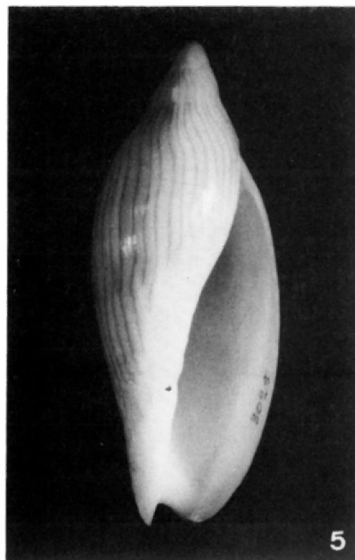
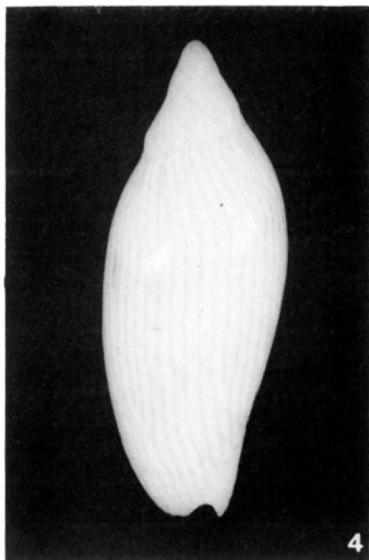
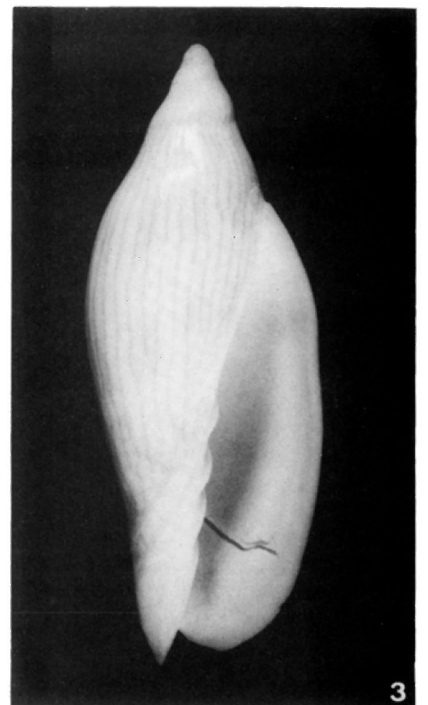
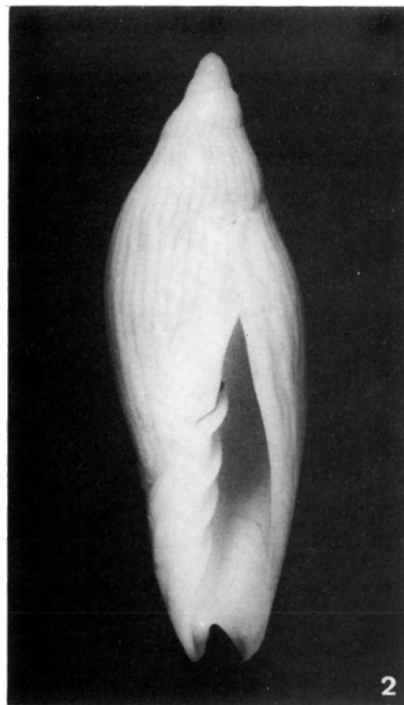
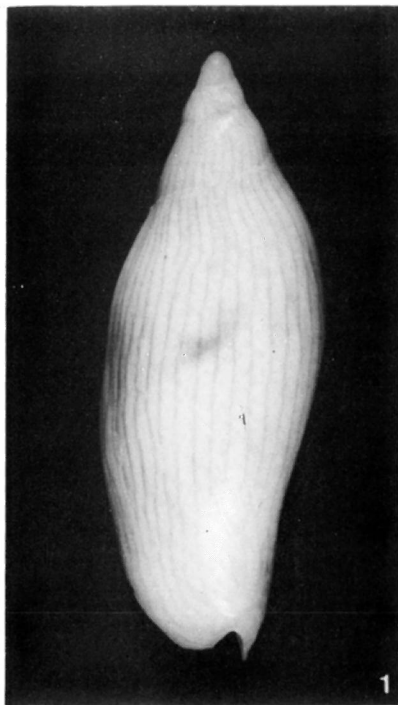
MAP

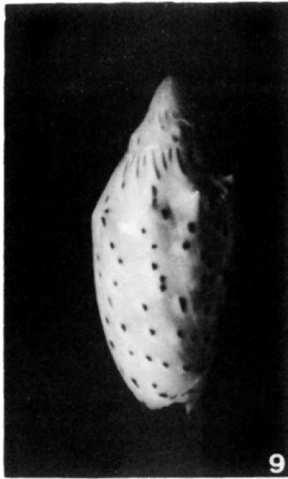
- ▼ Cymbiolacca pulchra wisemani (Brazier, 1870)
- Cymbiolacca pulchra cracentia McMichael, 1963
- Cymbiolacca pulchra f. peristicta McMichael, 1963
- Cymbiolacca pulchra (Sowerby I, 1825) *
- Cymbiolacca pulchra f. houarti n. form, and Cymbiolacca
intruderi spec. nov.
- Cymbiolacca perplicata (Hedley, 1902)
- Cymbiolacca thatcheri (McCoy, 1868)

* Distribution of C. pulchra, C. pulchra f. woolacottae, C. pulchra f. perryi, C. pulchra f. nielsenii and C. pulchra f. provocationis according to recent literature.

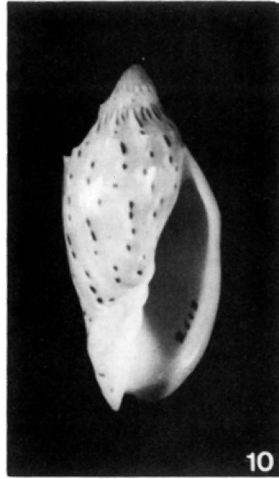




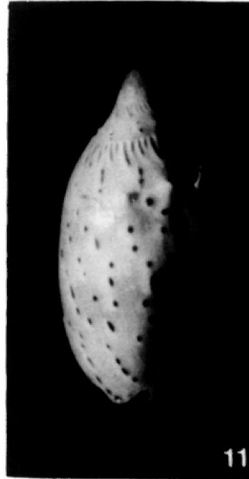




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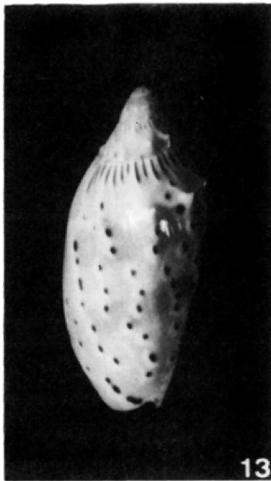
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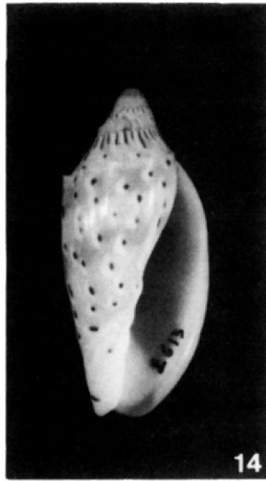
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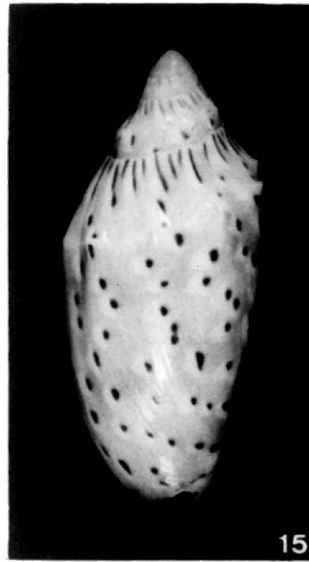
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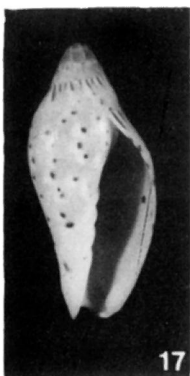
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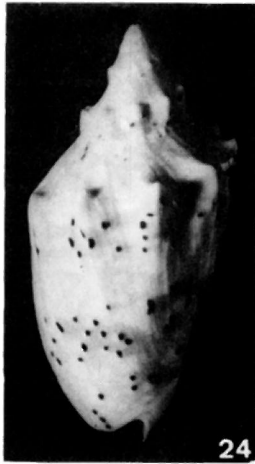
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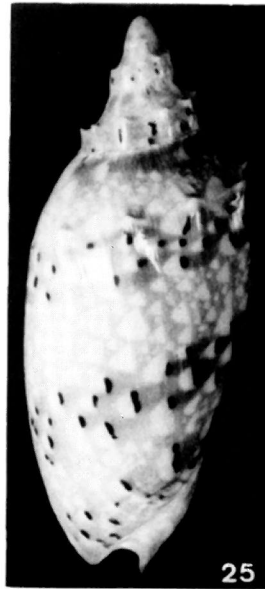
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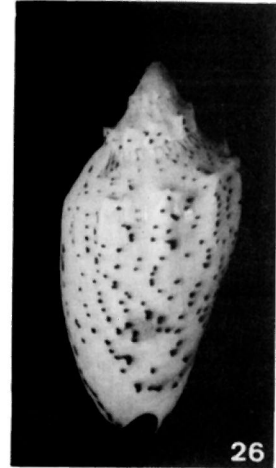
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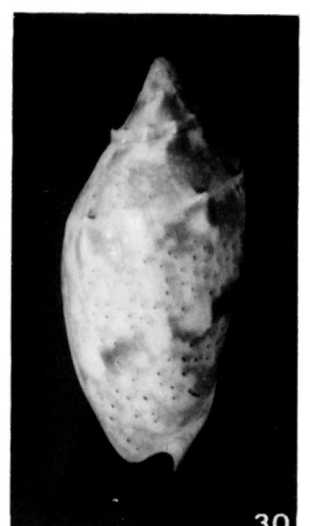
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