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Alphabetical revision of the (sub)species in recent Conidae
4. aphrodite to azona
with the description of Conus arenatus bizona, nov. subspecies

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INTRODUCTION

This is the fourth part in the series on (sub)specific names in recent Conidae. For general remarks we refer to the introductions to the first and second parts (Basteria 43: 9-10, and 81, 1979).

In this part several *Conus* names, proposed by Nowell-Usticke (1959, 1968, 1971), will be discussed. There has been serious doubt (Abbott, 1969: 147-148; Bullock, 1969: 76, III) whether these names can be considered valid. After Usticke's death (1979) his collection, including the types, was deposited in the American Museum of Natural History (New York). For this reason, and because his (sub)specific names are used in malacological literature, we will treat the Usticke names as valid.

Lamarck (1822) often mentioned 'varieties' in the Conidae, with the intention to denote the variability of the species (for instance: var. 'spira elevata', var. 'punctis sparsis'). He also used the same names (var. 'alba' for white specimens, var. 'citrina' for yellow shells, etc.) These names have not been accepted to be valid by later authors, neither by us. Some of these Lamarckian varieties were validated and described by Dautzenberg (1937), see ***articulata, aurantia,*** and ***australis*** in this publication. They must be considered subspecific names according to the ICZN (article 45 e, i); see also the 'var. ***punctisminutissimus*** Lamarck' under ***Conus arenatus*** Hwass.

Since 1979 another revision of the Conidae (loose leaf) is being published by Röckel (1979: 1-39, 1980: 40-96, to be continued). Some of these pages are reprinted in the 'Informationen' of the Club Conchylia (W. Germany).

Assistance from colleagues for the loan of specimens, literature, advice or otherwise, is acknowledged with the species concerned. The photographs were made by Mr. L. van der Laan, the maps were drawn by Mr. J. Zaagman.

GENUS *CONUS* LINNÉ, 1758

Valid names of species, subspecies, and formae are printed in heavy type in the alphabetical list. A junior synonym, homonym, nomen dubium or nomen nudum is printed in normal type.

aphrodite
fig. 107

Conus aphrodite Petuch, 1979, Nemouria 23: 11-12, figs. 34-35

Type. - Holotype (21 x 11 mm) and one paratype (length 13 mm) in Delaware Museum of Natural History (nos. 126398, 126399). The type figure is reproduced here (fig. 107).

Type locality. - 'Approximately 250 m depth off Panglao, Bohol Is., Philippines'.

Distribution. - Philippines to Taiwan.

Remarks. - We have not yet seen any specimen of this recently described species, of which a colour photograph is published in Walls (1979: 516, below left, as *'C. otohimeae'*). According to Petuch *Conus aphrodite* differs from *C. otohimeae* Kuroda & Ito, 1961, in being smaller, having a higher spire with a proportionately larger protoconch, and a purple colour. The possibility of *C. aphrodite* being a juvenile of *C. otohimeae* must be studied.

aplustre
figs. 94, 108

Conus aplustre Reeve, 1843, Proc. zool. Soc. Lond. 11: 171; Conch. Icon. 1, Conus, pl. 30, spec. 170

Type. - There are three syntypes in BMNH, dimensions 28 x 17, 27 x 18, and 26 x 16 mm. None of these is exactly like the specimen figured by Reeve, which measured 26½ x 14 mm, is pear-shaped with a sharp apex, and brightly coloured ('the little flag cone' according to Reeve). The specimen of 26 x 16 mm is herewith designated lectotype of *Conus aplustre*.

Type locality. - Not mentioned. We designate Woody Head, New South Wales, type locality of *C. aplustre*.

Remarks. - *C. aplustre* Reeve is considered a valid species (fig. 108). It cannot be placed in the synonymy of *C. anemone* Lamarck (vide Basteria 44: 37, 1980), as is sometimes suggested.

Distribution. - This species has a limited range along the coast of New South Wales, Australia (fig. 94).

We have studied specimens from Shellharbour (ZMA), Port Macquarie and Woody Head (RMNH), and Lennox Head (Coll. Wils).

apogrammatus
figs. 110-111

Conus princeps var. *apogrammatus* Dall, 1910, Proc. U.S. natn. Mus. 38 (1741): 224

Type. - The holotype (fig. 110) is present in USNM (no. 37.404); the measurements are 35.5 x 22.0 mm. The specimen was not figured by Dall, but a colour picture is given

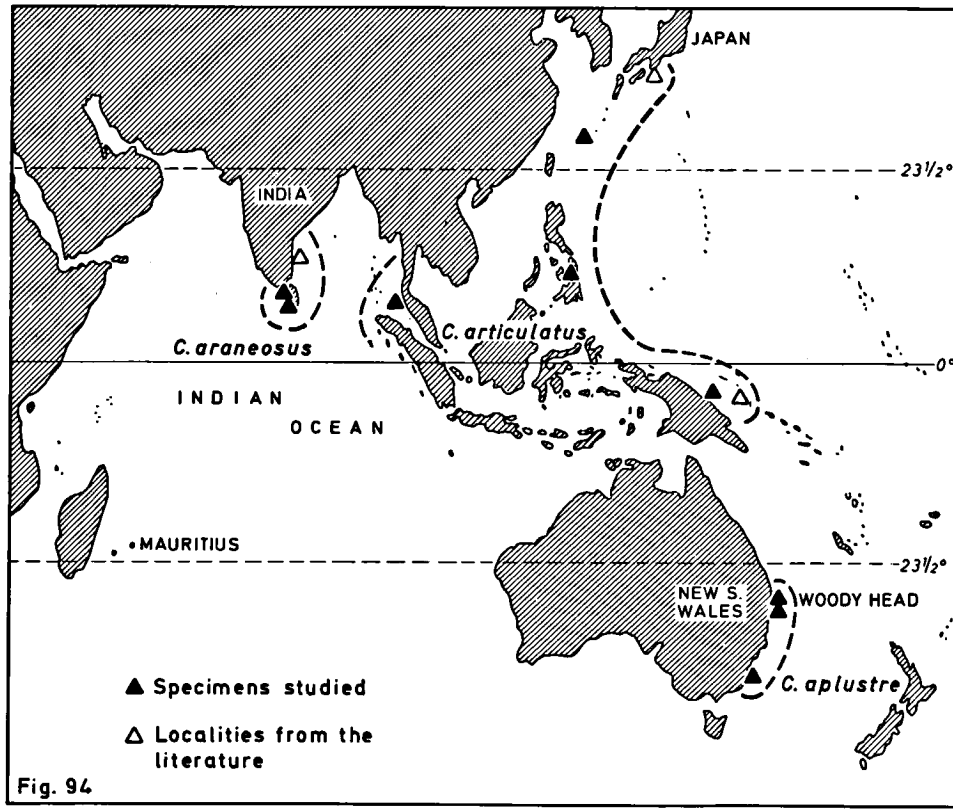

Fig. 94. Distribution of *Conus aplustre*, *C. araneosus*, and *C. articulatus*.

by Hanna (1963: pl. 5 fig. 4). The original type material consisted of several specimens, as Dall stated: 'Our specimens of this type are from Panama'.

Type locality. – 'Panama'.

Remarks. – Since the variety *apogrammatus* was described before 1961, it must be interpreted as of subspecific rank (ICZN, art. 45 e, i). Hanna (1963: 24) recorded it as a subspecies, which, however, he stated 'is hardly worthy of a separate name'. The shell of *Conus princeps* var. *apogrammatus* is of a uniform yellow colour, without the striped design on the body whorl like in *C. princeps* Linné, 1758. We consider it a colour form. *C. princeps* forma *apogrammatus* is known from the Gulf of California to Panama. ZMA has specimens from Panama (fig. 111).

The authors are grateful to Dr. R.S. Houbrick (USNM) for the loan of the type specimen.

approximatus

Conus lavendulus var. *approximata* Turton, 1932, Marine shells Port Alfred: 13

Type. – The holotype is in the Oxford University Museum. It was not figured by Tur-

ton. The length of the shell is 32 mm.

Type locality. - 'P.A.', Port Alfred, South Africa.

Remarks. - We have not studied the type specimen. According to Turton: 'This shell is a variety with a few plain bands'. *Conus lavendulus* Bartsch, 1915, is a lavender coloured *C. tinianus*, which species is known for its colour variation. Therefore *C. approximatus* Turton also is a junior synonym of *C. tinianus* Hwass, 1792.

arabicus
fig. 109

Conus arabicus Lamarck, 1810, Annls Mus. Hist. nat. Paris 15: 40, no. 46

Type. - No type specimen is available. From the references of Lamarck and the figures in the Tableau Encyclopédique et Méthodique (pl. 323 figs. 1, 4, pl. 324 fig. 5) a lectotype will be designated by Kohn (in press).

Type locality. - 'l'Océan asiatique'.

Remarks. - According to the description the shell of *Conus arabicus* is like *C. litteratus*, but distinguished by three yellowish or orange bands. From the figures cited by Lamarck the shell on pl.323 fig. 1, which specimen is figured from the apertural side on pl. 315 fig 3, is the most characteristic in showing these bands.

The present authors have examined many specimens of *C. litteratus* from a number of localities. It is concluded that juvenile to subadult shells (with a length of approximately 4-8 cm) most clearly show the three orange-yellow bands (fig. 109). Juveniles of smaller size (to about 3 cm) were described as *C. grueneri* Reeve, 1843. In adult shells these bands become vague, which was also stated by Linné (1758: 712) in the description of *C. litteratus*: 'Testa nivea fasciis obsoletis flavis' (shell white with vague yellow bands). Very rarely these bands are pink; ZMA has such a specimen of 67 mm from Pulu Panaitan, Indonesia.

We must conclude that *C. arabicus* Lamarck is a junior synonym of *C. litteratus* Linné, 1758.

arachnoideus

Conus arachnoideus Gmelin, 1791, Syst. Nat. ed. 13, 1: 3388, no. 34

Type. - Gmelin did not possess a specimen. From his references a lectotype was designated by Kohn (1966: 80-81, pl. 1 fig. 7), viz. the shell figured in Knorr (1772: pt. 6, pl. 4 fig. 4); the measurements are 49 x 28 mm.

Type locality. - Not mentioned.

Remarks. - The original spelling of the name is *Conus 'acachnoideus'*; however, being a

misspelling it was altered by Gmelin (1792, index: 3949) to *C. arachnoideus*, the spider-web cone, after the pattern on the body whorl of the shell.

We agree with Kohn (1966: 81) that *C. arachnoideus* Gmelin is a junior synonym of *C. araneosus* Solander, 1786, discussed hereafter.

araneosus
figs. 94, 112

Conus araneosus Solander in Lightfoot, 1786, Cat. Portland Mus.: 76, no. 1714; 106, no. 2328

Type. - The Portland Catalogue mentioned three specimens and referred to a figure in Martini. Because these three shells are lost, Kohn (1964: 160, pl. 2 fig. 14) designated the specimen figured in Martini (1773: vol. 2, pl. 61 fig. 676) lectotype of *Conus araneosus*. The dimensions are 70 x 43 mm.

Type locality. - 'China, Coromandel'. This species is known from the Coromandel coast of India, but not from China.

Distribution. - *C. araneosus* has a limited range along the south-east coast of India, and Ceylon (fig. 94). ZMA has specimens from India (Rameswaram) and Ceylon.

Remarks. - *C. araneosus* Solander (fig. 112) is a valid species. The relationship to *C. nicobaricus* Hwass, 1792, is still a matter of discussion. The distributions are disjunct; the range of *C. nicobaricus* covers the Moluccas and Philippines (ZMA). Both species are not known from the western coast of Thailand (da Motta & Lenavat, 1979).

arangoi
figs. 95, 113

Conus arangoi Sarasúa, 1977, Poeyana 165: 1-3, fig. 1, A-B

Type. - The holotype (34 x 18 mm) and one paratype (32 x 16 mm) are in the Instituto de Zoología, Academia de Ciencias de Cuba, Havanna.

Type locality. - 'Marianao, Habana, dragados frente a la costa, de 10-15 m de profundidad' (Marianao, Havanna, dredged off the coast, depth 10-15 m), Cuba.

Remarks. - Our request to study the type material was not granted, and because the type figure is unrecognizable, it is difficult to give an opinion on *Conus arangoi*. Parts of the description (translated from the Spanish by Mr. B. Bujama) are given here: 'Shell thin, length to 35 mm; 2 nuclear and 8 postnuclear whorls; spire straight and low; body whorl calyx-shaped, largest width below the shoulder, surface with spiral lines at some distance from each other, base grooved; shoulder with small nodules; spire whorls with one or a few spiral lines, crossed by fine growthlines; outer lip often damaged; aperture somewhat wider at the base. Colour yellowish, sometimes rose, base white; last whorl with three bands of irregular orange dots, one band below the shoulder, one below the middle, and one at the base; between these bands interrupted spiral lines of orange colour may be present; the spire has dots of the same colour'. From its description *C. arangoi* seems to be close to the shell figured in Abbott (1974: 258, no. 2805 = pl. 14 fig. 2805) and in

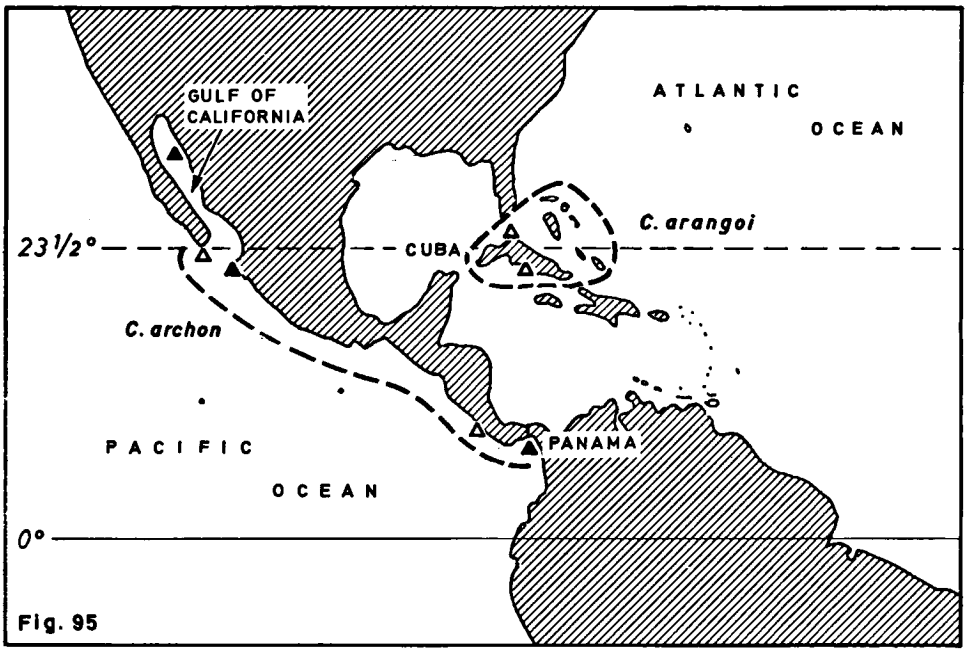

Fig. 95. Distribution of *Conus arangoi* and *C. archon*.

Lozet & Pétron (1977: 108, fig. 192a) as *C. 'abbotti'* from the Bahamas (fig. 113).

Provisionally we consider *C. arangoi* Sarasúa a valid species.

Distribution. - *C. arangoi* is known from Cuba (fig. 95), on the north coast: Marianao and Bacuranao Beach, Havanna, at the south coast: Cienfuegos. The species may also live around the Bahamas.

aratus

Conus orbignyi aratus Kilburn, 1973, Ann. Natal Mus. 21: 575-576, figs. 15-16 (non *aratus* Gabb, 1873, a fossil)

Type. - Holotype (60 x 21.8 mm) and many paratypes in the Natal Museum. Two paratypes in ZMA, measurements 58.4 x 21.8 and 57.3 x 21.7 mm.

Type locality. - 'off Tongaat in 150 fathoms', Natal, South Africa.

Remarks. - Kilburn described *Conus orbignyi aratus* as the sulcate southeast African subspecies of the lirate *C. orbignyi* Audouin, 1831, from Japan and the South China Sea. Because the name *C. aratus* was preoccupied in 1873 by Gabb for a fossil species, Kilburn (1975: 50) renamed the subspecies *C. orbignyi elokismenos*. More specimens were collected from off NW Madagascar and off Inhaca, Mozambique.

The authors are grateful to Mr. R.N. Kilburn for donating to ZMA two paratypes of this subspecies. They will be discussed later under *elokismenos*.

arausiensis

Conus arausiensis 'Chemnitz' Reeve, 1843, Conch. Icon. 1, Conus, pl. 20, spec. 114

Remarks. – Reeve considered *Conus arausiensis* a synonym of *C. daucus* Hwass, 1792. He referred to Chemnitz (1788, vol. 10: 92, pl. 144 A fig. L), where this shell is named 'Conus Arausiacus sive Arausionensis'. Therefore the name *C. arausiensis* in Reeve is an error for *'arausionensis'*. In addition it is an objective junior synonym of *C. daucus*, as the above-mentioned figure in Chemnitz was designated lectotype of *C. daucus* by Clench (1942: 22).

arbornatalis
figs. 116-117

Conus arbornatalis Da Motta, 1978, Centre Thai nat. Study: 5, 7, Addenda

Type. – The holotype is in the collection Da Motta, to be deposited later in an 'International Conidae Society Museum'. The measurements are 64 x 30 mm. According to the Addenda, the figure of the shell on p. 7 lower left is the holotype, whereas the five specimens figured in p. 5 are paratypes. No paratypes are mentioned in the description, and there is no indication where these shells are kept.

Type locality. – 'Trawled in a depth of 40 to 60 fathoms off the coastal waters arching from Ranong S.W. Thailand toward Bangladesh in the Bay of Bengal'.

Remarks. – The name *Conus arbornatalis* was already discussed with *C. amadis* (vide Basteria 44: 24-26, 1980). Da Motta mentioned the resemblance of *C. castaneofasciatus* and *C. arbornatalis*, of which the latter is distinguished by a higher spire and furrowed body whorl (fig. 116). Since the taxa are sympatric, Da Motta considered them distinct species. However, the present authors have studied intermediates (fig. 117), including smooth shelled *arbornatalis*, in the collections of RMNH and ZMA.

We must conclude that *arbornatalis* is a deep water form of *C. amadis castaneofasciatus* Dautzenberg, 1937. For the distribution see fig. 52 (Basteria 44: 25, 1980).

archetypus
fig. 114

Conus archetypus Crosse, 1865, J. Conchyl., Paris 13: 313-314, pl. 10 fig. 7

Type. – The type specimen is present in BMNH (no. 1979181); the measurements are 24.9 x 15.0 mm (fig. 114).

Type locality. – Not mentioned.

Remarks. – Before Crosse described *Conus archetypus*, this shell was mentioned by Sowerby (1857-1858: 18, pl. 14 fig. 330) as a variety of the West Indian *C. daucus*. But afterwards Sowerby (1866: 329, p. 27 fig. 645) considered them distinct species. Later authors (Weinkauff, 1873-1875: 312; Tomlin, 1937: 214) placed *C. archetypus* in the synonymy of *C. daucus* Hwass, 1792. Crosse did not mention any resemblance between *C. archetypus* and *C. daucus*.

We have studied the holotype of *C. archetypus* (fig. 114), and an identical specimen in IRScNB, also without a locality. The shell looks intermediate between *C. daucus* and *C. mayaguensis* Usticke, 1968, from the SW coast of Puerto Rico. Some adult specimens of *C. daucus* (fig. 115) may exhibit an identical pattern as *C. archetypus*. However, juvenile shells of *C. daucus*, with the same length as *C. archetypus*, cannot be matched. The body whorl of a juvenile *C. daucus* is more straight and orange, whereas *C. archetypus* is convex and brownish yellow. In both species the apex and inside of the aperture are pink, and the spiral whorls are grooved.

We conclude that *C. archetypus* Crosse represents an extreme variant of *C. daucus* Hwass, and thus the name is a junior synonym.

Our thanks are due to Mrs. K.M. Way (BMNH) permitting us to study the holotype of *C. archetypus*.

archiepiscopus
fig. 118

Conus archiepiscopus Hwass in Bruguière, 1792, Encycl. Méth.: 747-748, no. 141

Type. - Hwass had two specimens, which he described as the varieties A and B. They are figured in the Tableau Encyclopédique (vol. 23, pl. 346 figs. 1, 7). The shell of var. B is present in MHNG, and designated lectotype of *Conus archiepiscopus* by Kohn (1968: 440, pl. 2 fig. 7), the measurements are 68 x 36 mm.

Type locality. - 'mers des grandes Indes' (seas of the great Indies), Indian Ocean.

Remarks. - The shell of *C. archiepiscopus* is characterized by its bulbous shape, small and numerous brown tent marks, with two or three rather wide bands on the last whorl. Occasionally rose or violet tinges are present, inside of aperture white. It was considered a valid species for a long time, but modern authors unite it with *C. textile* Linné, 1758. We consider it a form. The bulbous shape distinguishes the forma *archiepiscopus* from the more elongate typical *C. textile*, which has larger tent marks of a golden yellow colour.

It appears that *C. textile* forma *archiepiscopus* has a smaller range than the typical *C. textile*, which is widely distributed in the Indo-Pacific. ZMA has specimens of *C. textile* forma *archiepiscopus* from Indonesia (fig. 118). Most shells have somewhat larger tent marks than the type specimen.

architalassus
figs. 119-120

Conus architalassus Solander in Lightfoot, 1786, Cat. Portland Mus.: 189, no. 4017

Type. - The Portland Catalogue mentioned one specimen, which is lost. A lectotype was designated by Kohn (1964: 161, pl. 2 fig. 15), being the shell figured in Argenville (1757: Appendix pl. 1 fig. M), reproduced here as fig. 119. The measurements of the type figure are 37 x 16 mm.

Type locality. - Not given by Solander. Marsh (1964: 148) mentioned 'Amboina' as type locality of *Conus architalassus* Solander. However, the specimen figured by Marsh (pl. 21 fig. 19) is *C. ammiralis blainvillii* from East Africa (vide Basteria 44: 31, 1980). We

herewith designate the Moluccas as type locality of *C. architalassus* Solander.

Remarks. – *C. architalassus* was generally considered the granulated (non-coronated) form of *C. ammiralis* Linné, 1758 (Kohn, 1964: 161). After the studies of Dunn (1971), Kohn (1976: 41) concluded that *C. architalassus* is a junior synonym of *C. cedonulli* Linné, 1767, from the Caribbean. This incorrect conclusion was accepted by later authors (Wagner & Abbott, 1978: 25-011; Walls, 1979: 294). However, Dunn (1971: 291) clearly stated after his description of *C. ammiralis*: 'The above definition applies to all forms of *Conus ammiralis* ....., including the *architalassus* form of Solander ....., distinguished only by being pustulate'.

We have discussed *C. architalassus* before (Basteria 44: 31, fig. 77, 1980), as the granulate form of *Conus ammiralis*. To justify this opinion, the type figure of *architalassus* (fig. 119) is compared with an almost identical shell (fig. 120) of a granulated *C. ammiralis* from the Moluccas.

Reeve (1843: spec. 11 var. d, pl. 3 fig. 11a) mentioned that 'The granulated variety appears to be always of smaller size'. This is correct, the average length of *C. a. ammiralis* is 55-70 mm, maximum 80 mm. The lengths of ten shells of forma *architalassus* (ZMA) range from 23 to 54 mm. Some shells are only partially granulated.

C. ammiralis forma *architalassus* is known from Indonesia, Moluccas (ZMA), Timor, and the Indian Ocean (RMNH); Walls (1979: 85) figured a specimen from Guadalcanal, Solomon Is.

C. petreus (Röding, 1798) can be added to the synonyms of *C. architalassus* mentioned before (Basteria 44: 31, 1980).

archithalasssius

Conus archithalassius Link, 1807, Beschr. Nat. Samml. Univ. Rostock 3: 102

Type. – Link stated (translated from the German): 'We possess one fine specimen of this rare shell'. He also referred to 'Bolten p. 43' and to the shell figured in Chemnitz (1788) vol. 10, pl. '142' (error for 138) figs. 1282, 1283. A lectotype will be designated by Kohn (in press).

Type locality. – Not mentioned.

Remarks. – Link did not describe this species, which he named the 'Contre Admiral Kegelschnecke'. *Conus archithalassius* Link (non *C. archithalassus* Hwass, 1792) is a junior synonym of *C. pulcher* Lightfoot, 1786.

archithalassus

Conus ammiralis archithalassus Hwass in Bruguière, 1792, Encycl. Méth.: 659, no. 57, F, 662

Type. – The type specimen is present in the Hwass collection (MHNG); the measurements are 42 x 21 mm. The shell is figured in the Tableau Encyclopédique (1798, vol. 23: 159, pl. 328 fig. 4).

Type locality. – 'aux mers des grandes Indes' (in the seas of the great Indies), Indian Ocean.

Remarks. - The holotype is a granulated (non-coronated) specimen of *Conus ammiralis* Linné, therefore *C. archithalassus* Hwass is a junior synonym of *architalassus* Solander (which see above).

archon
figs. 95, 121

Conus archon Broderip, 1833, Proc. zool. Soc. Lond. 1: 54

Type. - The type specimen is present in BMNH; the dimensions are 52 x 28 mm.

Type locality. - 'in Americâ Centrali. (Bay of Montija)', Panama. The specimen was 'taken from sandy mud at a depth of twelve fathoms'.

Remarks. - *Conus archon* Broderip is a valid species (fig. 121). The shell has a pattern with large blotches of yellow, tan, brownish red or chestnut colour. It is the Eastern Pacific analogue of *C. cedonulli* Linné, 1758, from the Caribbean.

Distribution. - Offshore from the Gulf of California to Panama (fig. 95).

ZMA has specimens from off Guaymas, Sonora, Mexico. We have studied shells from Jalisco (Mexico), and south of Balboa (Panama) in coll. Wils.

arcuatus
figs. 96, 122-123

Conus arcuatus Broderip & Sowerby I, 1829, Zool J. Lond. 4: 379

Type. - The holotype was in the Museum of the Zoological Society of London; the measurements are given as 2 x 9/10 poll. (= 50.6 x 22.8 mm). Most of the collections of the Zoological Society are now part of those of the BMNH, but the type of *Conus arcuatus* is not present there; it must be considered lost. The shell was not figured by the original authors.

Although the identity of *C. arcuatus* Broderip & Sowerby is presently well known, the designation of a neotype seems to be advisable, because ten years after the description of *C. arcuatus* this name was used by Gray for another species (see below). We herewith designate the specimen figured by Reeve (1843, Conch. Icon. 1, Conus, pl. 15, fig. 77b) neotype of *Conus arcuatus* Broderip & Sowerby. Reeve's figure is reproduced here (fig. 122); the neotype is present in BMNH, dimensions 43,5 x 21 mm.

Type locality. - 'Pacific Ocean, near Mazatlan', Mexico.

Remarks. - *C. arcuatus* Broderip & Sowerby is a valid species.

Distribution. - Gulf of California to N.W. Colombia (fig. 96), in depths of about 50 m. ZMA has specimens (fig. 123) from off Guaymas, Mexico. Additional material was studied from Mazatlan (coll. Wils), and Manzanillo, Mexico (coll. H. Saesen).

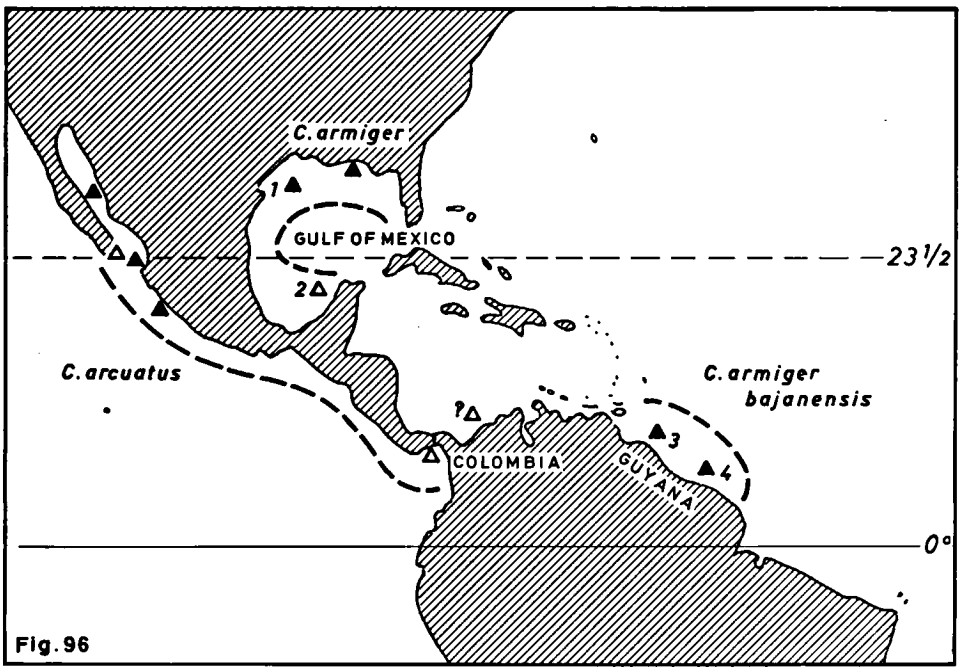

Fig. 96. Distribution of *Conus arcuatus* and *C. armiger*. Numbers of type localities: 1 = *C. clarki*, 2 = *C. frisbeyae*, 3 = *C. bajanensis*, 4 = *C. guyanensis*.

arcuatus
fig. 124

Conus arcuatus 'Brod. & Sow.' Gray, 1839, Zool. Beechey Voy.: 119, pl. 36 fig. 22
(non *arcuatus* Broderip & Sowerby, 1829)

Type. – The holotype was figured by Gray, the shell was in the Sowerby collection. Reeve (1844: pl. 43, spec. 232) renamed and described it as *Conus emarginatus*. He figured the same specimen stating that it was in the Cuming collection. The holotype is not in BMNH and its present whereabouts are unknown. The type figure is reproduced here (fig. 124); the dimensions are 50 x 23 mm.

Type locality. – 'Pacific Ocean'. We herewith restrict the type locality to Cape San Lucas, Baja California, Mexico.

Remarks. – Since *C. arcuatus* Broderip & Sowerby was not illustrated (see above), Gray misidentified his shell. Reeve discovered this mistake and replaced the junior homonym *C. arcuatus* Gray by *C. emarginatus*.

In American literature (Hanna, 1963: 27; Keen, 1971: 665) *C. emarginatus* is considered a junior synonym of *C. recurvus* Broderip, 1833. In our opinion this is not correct. After studying the type specimen of *C. recurvus* in BMNH, we conclude that this shell is conspecific with, and thus a junior synonym of, *C. regularis* Sowerby I, 1833. The syno-

nymy of *C. recurvus* and *C. regularis* was already established by Tomlin (1937: 301). Therefore *Conus emarginatus* Reeve becomes a valid species; it will be discussed under that name.

ardisiaceus

figs. 97, 125-126

Conus ardisiaceus Kiener, 1845, Coq. viv. 2: 316-317, pl. 108 fig. 1

Type. - The holotype was in the Lorois collection and its present whereabouts are unknown. The type figure is reproduced here (fig. 125); the dimensions are 35 x 19 mm.

Type locality. - Not mentioned. We herewith designate Masirah Island, Oman, type locality of *Conus ardisiaceus*.

Remarks. - The identity of *C. ardisiaceus* has puzzled malacologists. Kiener mentioned similarity to *C. cinereus* Hwass, 1792. Later authors have synonymized it with *C. anemone* Lamarck, 1810. However, the last whorl in *C. ardisiaceus* is smooth, whereas the shell of *C. anemone* (fig. 88) is grooved. In shape, smooth sculpture, colour pattern, and white base, the type figure of *C. ardisiaceus* shows some resemblance to *C. tinianus* Hwass, 1792.

Walls (1979a: 2-3) considered *C. ardisiaceus* a subspecies of *C. biliosus* (Röding, 1798) from Oman. W.E. Old (in litt., 1980) also suggested that *C. ardisiaceus* is a species from that region. We have studied a number of specimens from Masirah Island, Oman, of which one shell (fig. 126) matches the holotype of *C. ardisiaceus*. Its type figure (fig. 125b) shows that the base of the columella has a fold-like thickening, which is also present in the shells from Oman.

Conus ardisiaceus Kiener is considered a valid species.

Distribution. - The species is known from the coast of Oman (fig. 97). ZMA has specimens from Masirah Island, donated by Dr. and Mrs. Donald T. Bosch. The species is also reported from Muscat.

arenaria

Conus mediterraneus var. *arenaria* Monterosato, 1917, Boll. Soc. zool. ital. (3) 4: 23, pl. 1 fig. 23

Type. - The author mentioned one specimen from Bu-Kemmásc, which he had compared with many from Lampedusa. The shell from Bu-Kemmásc was figured by Monterosato, and is herewith designated lectotype of *Conus mediterraneus* var. *arenaria*. The dimensions are 20 x 11 mm. The present whereabouts of this specimen are unknown. The type figure is too bad to be reproduced.

Type locality. - 'Bu-Kemmásc', Libya.

Remarks. - The date of publication of Monterosato's article is difficult to ascertain. It was intended to be published in 1915, which year is printed on the plate. Due to World War I the issue appeared only in 1919. However, reprints were already distributed in 1917.

From the poor figure and the short description we can only conclude that *C. mediterraneus* var. *arenaria* Monterosato must belong to *C. mediterraneus* Hwass, 1792, of which

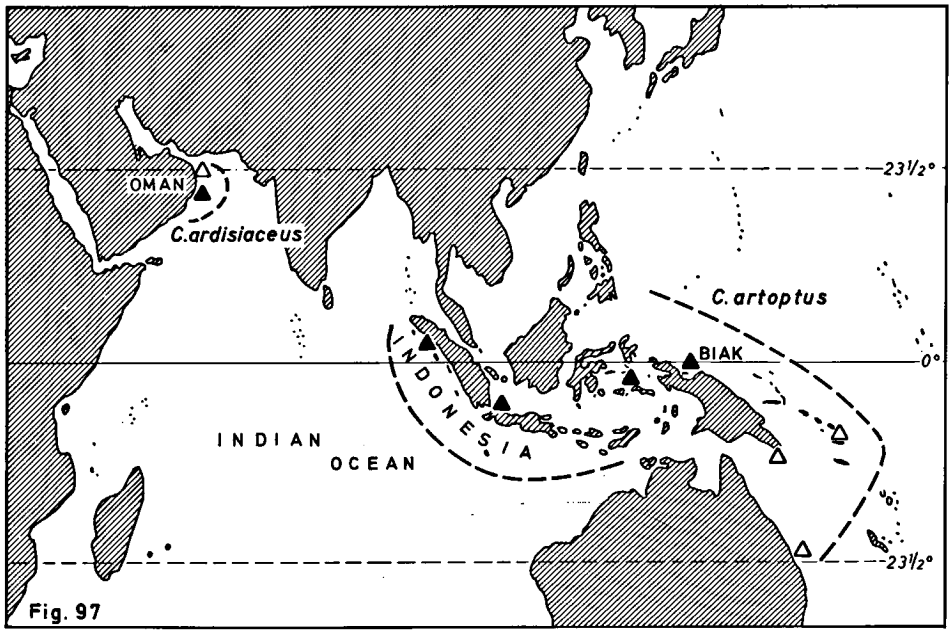

Fig. 97. Distribution of *Conus ardisiaceus* and *C. artoptus*.

it is considered a junior synonym.

The authors are grateful to Mr. H.K. Mienis (Zool. Mus. Hebrew Univ., Jerusalem) for providing us with a reprint of Monterosato's article and information about publication dates.

arenatus

figs. 98, 128-130

Conus arenatus Hwass in Bruguière, 1792, Encycl. Méth.: 621, no. 16

Type. - Hwass recognized three varieties in *Conus arenatus*. They are figured in the Tableau Encyclopédique (vol. 23, 1798): var. A (pl. 320 fig. 6) is the normal form, var. B (pl. 320 figs. 3, 7) is covered with very fine spots ('punctis minutissimus'), var. C (pl. 320 fig. 4) is granulated ('testa granulosa'). The specimen of var. C is present in MHNG (no. 1106/41), and designated lectotype of *C. arenatus* by Kohn (1968: 441, pl. 2 fig. 8). The measurements are 35.5 x 19.5 mm.

Type locality. - Kohn (1968: 441) designated the locality of var. C, 'des Isles Philippines', type locality of *C. arenatus*.

Remarks. - Although the lectotype is a granulated specimen, normally the shell of *C. arenatus* is smooth. It is a valid species, in which we recognize three subspecies: *arenatus* s.s., *aequipunctatus*, and *bizona*.

C. arenatus arenatus. The shell has a roundish body whorl with irregular distributed

spots, and rather small nodules at the shoulder (fig. 128).

In the forma *undata* Dautzenberg, 1937, the spots are arranged in a zigzag pattern (fig. 129).

Granulated specimens, like the lectotype, are sometimes referred to a forma *granulosa* Dautzenberg, 1937 (fig. 130), non *C. granulosus* (Röding, 1798).

Walls (1979: 123) introduced the name 'var. *punctisminutissimus* Lamarck, 1822', being the var. B in Hwass. However, Lamarck (1822: 452) did not use this name in a binominal sense (according to ICZN art. 5), and therefore it is not valid.

Tryon (1884: 18, pl. 27 fig. 2) named the variety *mesokatharos* after a specimen which had the middle portion of the body whorl unspotted. We agree with Dautzenberg (1937: 32) that this shell is not *C. arenatus*, as the spire is not coronated.

C. arenarius in Hanley (1855: 173) is an error for *C. arenatus* Hwass (vide Dodge, 1953: 45).

Distribution. – *C. arenatus* s.s. and its formae have a large range in the tropical Indo-Pacific from India to the Tuamotu Archipelago, and from S. Japan to N. Australia (fig. 98). ZMA has specimens from Ceylon, Indonesia (Batu Is., Djakarta Bay, Flores, Timor, Moluccas, Amboina, New Guinea), N. Borneo (Malawali), the Philippines (Tayabas Bay), Okinawa, Solomon Is. (Malaita), and Queensland. In addition we have studied material from Banka, Biliton, Tjilatjap, Bali, Celebes (in RMNH), Fiji (MNHN), and Rowley Shoals, W. Australia (W. Austr. Mus.)

Granulated shells in ZMA are from the Moluccas, and New Guinea (Jajapura).

Conus arenatus aequipunctatus Dautzenberg, 1937. This subspecies from the Red Sea and Gulf of Aden has been discussed before (Basteria 43: 86, figs. 26, 38, 1979). No records of *C. arenatus* are known to us from the Gulf of Arabia and the Persian Gulf.

See also under *C. armatus* Smith in this publication.

Conus arenatus bizona
nov. subsp.
figs. 98, 131

Type. – Holotype in ZMA, measurements of the shell 35.1 x 20.2 mm (fig. 131). One paratype 37.2 x 22.4 mm (ZMA).

Type locality. – Coral reefs at Malindi, Kenya (collected by Dr. M.I. Gerhardt, July 1967).

Description. – Like *Conus arenatus* s.s., but the body whorl has almost straight sides, the nodules at the shoulder are more pronounced, the spots are at equal distances, and two darker bands are visible on the last whorl.

Remarks. – *C. arenatus bizona* and *C. a. aequipunctatus* are distinct from the nominal species in the same characters, with the exception that *bizona* has only two darker bands on the last whorl (after which the subspecies has been named), whereas *aequipunctatus* shows three bands (fig. 38, Basteria 43: 102, 1979). The geographical ranges are disjunct (fig. 98).

Distribution. – *C. arenatus bizona* is found on the coast of East Africa from Kenya to Natal, the Seychelles, Madagascar, and Mauritius (fig. 98). In addition to the type material, we have studied specimens from Sandy Id., Kenya (ZMA), Inhaca Id., Mozambique,

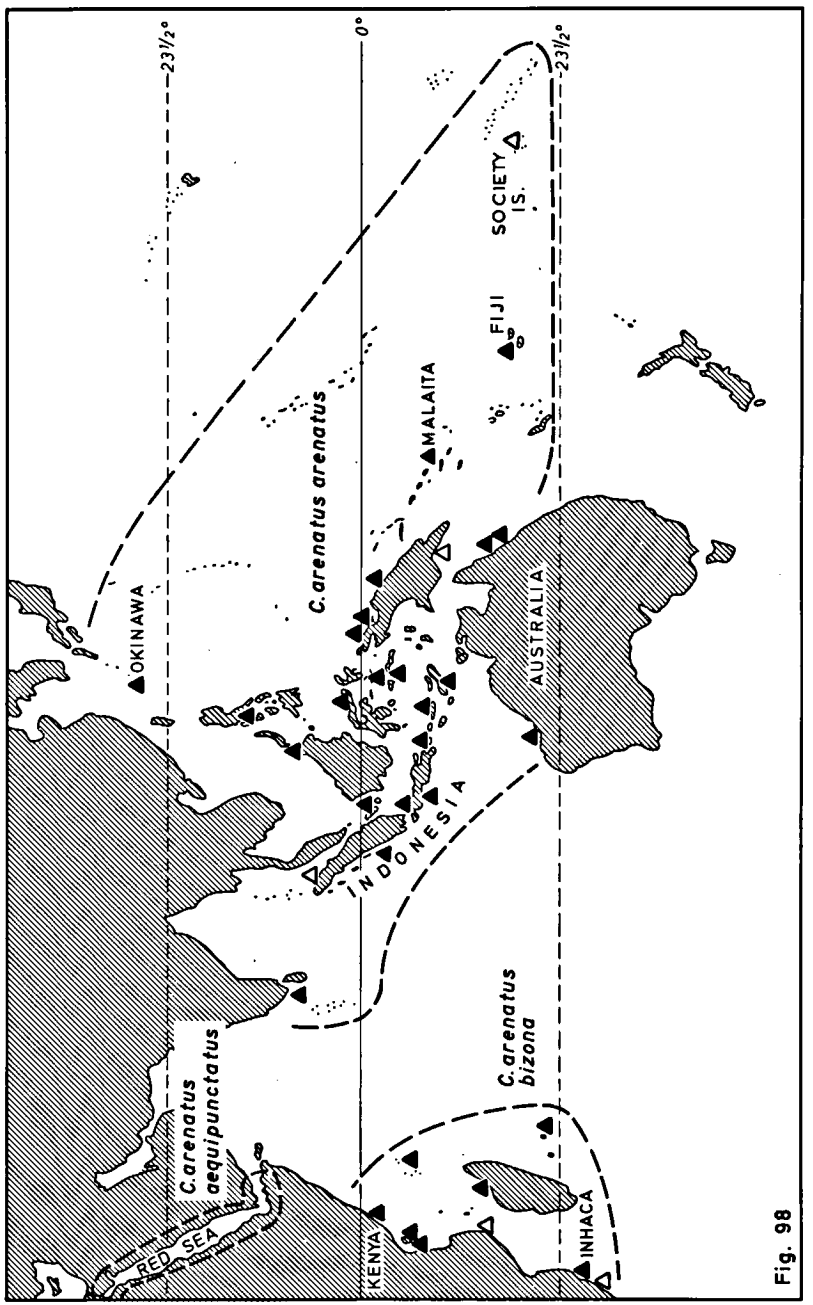

Fig. 98. Distribution of *Conus arenatus arenatus* and *C. a. bizona* nov. subsp.
See also Fig. 26 (Basteria 43: 85, 1979).

and Nossi Bé, Madagascar (RMNH), from Zanzibar and Dar es Salaam, Tanzania, the Seychelles, and Mauritius (coll. Wils).

Colour figures of *bizona* are found in Kensley (1973: 205, fig. 811) from Durban, and in Walls (1979: 105, below right) from Mozambique.

The authors are grateful to Mrs. Dr. M.I. Gerhardt for the donation of the type material.

arenatus

Cucullus arenatus Röding, 1798, Mus. Boltenianum 2: 49, no. 627/116

Type. - Although Röding mentioned nine specimens, at present no type specimen is available. A lectotype was designated by Kohn (1975: 194-195, pl. 1 fig. 4), being the shell figured in Martini (1773: pl. 64 fig. 711-712); measurements 50 x 27 mm.

Type locality. - Not mentioned.

Remarks. - We agree with Kohn (1975) that *Conus arenatus* (Röding) is a junior synonym of *C. stercusmuscarum* Linné, 1758. The name *arenatus* Röding is a junior secondary homonym of *C. arenatus* Hwass, 1792.

arenosus

Cucullus arenosus Röding, 1798, Mus. Boltenianum 2: 40, no. 494/20

Type. - Röding mentioned two specimens in the Bolten collection, these shells are lost. A lectotype was designated by Kohn (1975: 195, pl. 1 fig. 5), being the shell figured in Martini (1773: pl. 63 fig. 696). The dimensions are 48 x 33 mm.

Type locality. - Not mentioned.

Remarks. - We agree with Kohn (1975) that *Conus arenosus* (Röding) is a junior synonym of *C. arenatus* Hwass, 1792.

argillaceus
fig. 127

Conus argillaceus Perry, 1811, Conchology: pl. 24, no. 6

Type. - The holotype was figured by Perry, the specimen is lost. The type figure is reproduced here (fig. 127), dimensions 46 x 21½ mm.

Type locality. - 'East Indies'.

Remarks. - The publication date of Perry's work is 1 January 1811, although on the plates is printed: 'London, Pub. by W. Miller, 1810'. From the rather poor figure and short description ('Shell white and pale red, richly striped and spotted') the identity of *Conus argillaceus* is difficult to establish. We are not convinced that this shell is conspecific with *C. splendidulus* Sowerby I, 1833, and prefer to consider *C. argillaceus* Perry as nomen dubium. This is also the opinion of Cernohorsky (1978: 4) and Röckel (1979: 13).

aristophanes
fig. 132

Conus aristophanes 'Duclos' Sowerby II, 1857, Thes. Conch. 3: 9, spec. 63, pl. 4 figs. 81, 82

Type. - Three syntypes are present in BMNH, measurements 35.3 x 23.2, 30.5 x 17.8, and 29.0 x 17.4 mm. The largest shell and one of the smaller ones were figured by Sowerby. We herewith designate the largest specimen (fig. 81 in Sowerby) lectotype of *Conus aristophanes* (fig. 132).

Type locality. - 'Philippine and Sandwich Islands'. *C. aristophanes* is known from the Philippines, but not from the Hawaiian (= Sandwich) Islands, although *C. coronatus* is rarely found there (Weaver, 1963: 6).

Remarks. - Sowerby compared *C. aristophanes* to *C. minimus*, of which *aristophanes* should be a variety, distinct by fewer and wider cross-lines of black and white spots (*Conus minimus* Linné, 1758, has been declared a nomen dubium, cf. Bull. zool. Nomencl. 22: 226-227, 1965; the species meant by Sowerby is *C. coronatus* Gmelin, 1791). Next to the differences mentioned by Sowerby, the shell of *C. aristophanes* grows larger than that of *C. coronatus*. Our largest *C. aristophanes* measures 47.8 mm, the maximum size of *C. coronatus* is about 35 mm.

Cernohorsky (1964: 67) considered *C. aristophanes* and *C. coronatus* distinct and valid species. However, he might have studied specimens from one locality only. We have compared series of both from a number of localities, and found that the shells integrate. Therefore we consider *aristophanes* a form only.

ZMA has specimens of *C. coronatus* forma *aristophanes* from Ceylon, N. Borneo, and Indonesia (Djakarta Bay, S. Java, Celebes, Moluccas, New Guinea). Additional material was studied from the Red Sea and the Seychelles (coll. Wils).

The authors are grateful to Mrs. K.M. Way for the loan of the type material.

armadillo
figs. 99, 133

Conus (Asprella) armadillo Shikama, 1971, Science Rep. Yokohama natn. Univ. (II) 18: 34-35, fig. 2

Type. - The type specimen was in the Shikama collection, but will be deposited in the Kanagawa Prefectural Museum at Yokohama. At present the holotype is not available for study. The measurements are 73.0 x 32.6 mm (fig. 133). A colour photograph of the holotype is published in Walls (1979: 269, below left).

Type locality. - 'Taiwan'.

Remarks. - Shikama considered *Conus australis* Holten, 1802 (see below) the nearest relative of *C. armadillo*. Walls (1979: 407) placed *C. armadillo* in the synonymy of *C. duplicatus* Sowerby I, 1823.

We have studied three shells of *C. armadillo* from off Davao, Philippines, and compared to specimens of *C. duplicatus* from the Solomon Islands. *C. duplicatus* has spiral grooves on the body whorl, in each interspace between these grooves an accessory groove is present. In *C. armadillo* only the anterior grooves have a extra groove in the interspaces.

Provisionally we consider *C. armadillo* a valid species. When more specimens and the

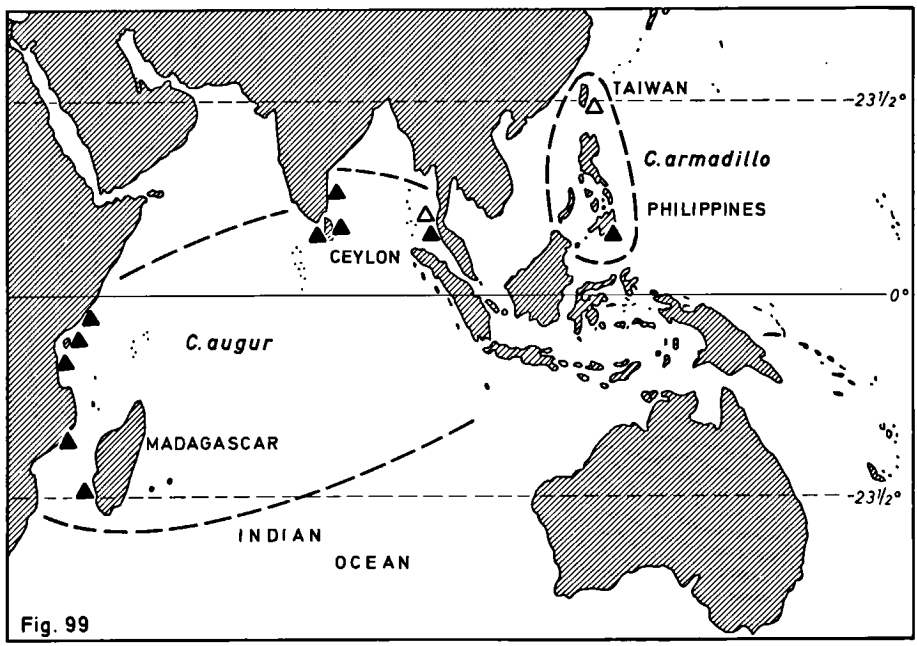

Fig. 99. Distribution of *Conus armadillo* and *C. augur*.

holotype become available, relationships with *C. duplicatus* and *C. kuroharai* (Habe, 1965) should be studied.

Distribution. - *C. armadillo* is known from Taiwan and Mindanao (fig. 99). Mr. R Martin informed us (in litt.) that this species is dredged in southern Philippine waters.

armatus

Conus armatus 'Hwass' E.A. Smith, 1891, Proc. zool. Soc. Lond. 1891: 402, no. 18

Remarks. - *Conus armatus* Smith is a printing error for *C. arenatus*. Smith did not supply a description, and he mentioned Hwass as the author. The shells were reported from Aden.

Wils c.s. (1969: 16) used the name *C. arenatus armatus* for specimens of *C. arenatus* from the Red Sea and the Gulf of Aden, which are 'armed' ('armatus') with strong sharp nodules at the shoulder. These shells from that region are now considered to belong to the subspecies *C. arenatus aequipunctatus* Dautzenberg, 1937 (vide Basteria 43: 86, figs. 26, 38; and this publication under *C. arenatus*).

armiger
figs. 96, 135-136

Conus armiger Crosse, 1858 (nom. nov.), Revue Mag. Zool. (2) 10: 200

Type. – *C. armiger* Crosse is a new name for *Conus crenulatus* Kiener, 1845 (non Deshayes, 1835, a fossil). The holotype of *C. crenulatus* is the specimen figured and described by Kiener (1845: pl. 109 fig. 1; 1849: 355-356), dimensions 30 x 13 mm. The shell was in the Lorois collection; its present whereabouts are unknown. The type figure is reproduced here (fig. 135).

Type locality. – Not mentioned by Kiener and Crosse; we herewith designate the coast of Louisiana in the Gulf of Mexico type locality of *C. armiger*.

Remarks. – Although there is no type specimen available and no locality mentioned, the description and figure in Kiener are sufficient to identify this species. Its typical shape, dimensions, the number of nodulose spiral lines on the body whorl, the colour, and the grooved spiral whorls of the shell are sufficiently convincing to consider *C. armiger* a valid species. *C. clarki* Rehder & Abbott, 1951, and *C. frisbeyae* Clench & Pulley, 1952, both described from the Gulf of Mexico, are synonyms.

The relation of *C. armiger* to *C. bajanensis* Usticke, 1968 (syn. *C. guyanensis* Van Mol, 1973) has been studied. Their shells are very similar. In addition to the differences mentioned by Walls (1979: 134), the number of nodules at the shoulder of the last whorl in *C. armiger* is less than 20 and in *C. bajanensis* more than 20. Also the radulae are slightly different (cf. Rehder & Abbott, 1951a: fig. 3; Van Mol, 1973: fig. 1B). Since the ranges are disjunct, division of *C. armiger* into two subspecies seems likely.

Conus pseudoaustini Usticke, 1968, may be conspecific. The type material, present in AMNH, only consists of 'a badly broken fragment', according to W.E. Old (in litt.).

Distribution. – *Conus armiger* s.s. lives in the Gulf of Mexico, off the coast from Florida to Yucatan (fig. 96). We have studied the holotype of *C. clarki* (in USNM), and specimens of *C. armiger* from off Pensacola, Florida (fig. 136). The subspecies *C. armiger bajanensis* is found off the coast of the Guyanas, S. America. We have studied the holotype of *C. bajanensis* (in AMNH) and type material of *C. guyanensis* (in RMNH). We have not seen specimens from off Colombia, from where this subspecies is recorded (Walls, 1979: 134).

The authors are grateful to Dr. E. Gittenberger (RMNH), Dr. R.S. Houbrick (USNM), and Mr. W.E. Old (AMNH) for the loan of type material.

armillatus
figs. 137-138

Conus armillatus C.B. Adams, 1850, Contrib. Conch. 4: 59

Type. – Adams described one specimen, dimensions 0.59 x 0.32 inch (= 14.9 x 8.1 mm), it was not figured. The shell was rediscovered in USNM (no. 107876); according to the label it is originally from the C.B. Adams' collection, locality Jamaica, and marked 'Type'. The measurements are 14.1 x 8.2 mm (fig. 137). This specimen was designated lectotype by Clench & Bullock (1970: 373-375, pl. 176, fig. 5). However, Adams had

described only one specimen; because the shell in USNM has about identical measurements, it must be the holotype of *Conus armillatus*.

(Another specimen was supposed to be the holotype by Clench & Turner, 1950: 258, pl. 31 fig. 10. This mistake was corrected later on by Clench & Bullock, 1970: 373-375. That shell is a juvenile of *C. regius* Gmelin, the dimensions are 24 x 13 mm.)

Type locality. – 'Jamaica'. Except for the type specimen, no other records of *C. armillatus* are known from this island.

Remarks. – The identity of *C. armillatus* has long been unknown. Abbott (1958: 117-118) recognized it as a distinct Caribbean species, after receiving material from Aruba. At present *C. armillatus* is considered a junior synonym of *C. hieroglyphus* Duclos, 1833. The species seems to be endemic around the islands Aruba and Curaçao, Netherlands Antilles. ZMA has many specimens from recent collecting at these islands.

We recognize two colour forms in this species: *C. hieroglyphus* s.s. and forma *armillatus*. Sowerby (1857-1858: pl. 14, figs. 318-319) already figured both. The background colour in the shell of *C. hieroglyphus* s.s. is blackish brown, with two or three rows of white spots. *C. hieroglyphus* forma *armillatus* has a white ground colour with small irregular orange brown spots which sometimes become axially confluent, as in the type specimen. Other shells become gradually darker, at times with a zigzag pattern (fig. 138).

Our thanks are due to Dr. R.S. Houbrick (USNM) for the loan of the type specimen.

arrowsmithensis
fig. 134

Conus kenyonae var. *arrowsmithensis* Brazier, 1896, Proc. Linn. Soc. N.S.W. 21: 346

Type. – The holotype, originally in the Kenyon collection, is now in the South Australian Museum at Adelaide. The measurements are 35.6 x 20.4 mm (fig. 134).

Type locality. – 'Arrowsmith Isl., Marshall Islands'.

Remarks. – We have studied the type specimens of *Conus kenyonae* Brazier, 1896, and of its variety *arrowsmithensis*. Both are juveniles of *C. distans* Hwass, 1792.

The juvenile shell of *C. distans* is grooved and looks different from its adult stage. This is the reason that they were described as distinct species. Even in recent years a juvenile *C. distans* was described as *C. chinoi* Shikama, 1970.

Our thanks are due to Dr. W. Zeidler (South Australian Museum) for the loan of type specimens.

articulata
fig. 139

Conus bullatus Linné var. *articulata* 'Lamarck' Dautzenberg, 1937, Mém. Mus. r. Hist. nat. Belg. hors série 2 (18): 55

Type. – Dautzenberg did not possess a specimen of the variety, he only gave some literature references. From these we designate the specimen of *Conus bullatus* var. B Hwass, 1792, figured in the Tableau Encyclopédique (vol. 23, 1798: pl. 339 fig. 6) lecto-

type of *C. bullatus* var. *articulata* Dautzenberg. The type figure is reproduced here (fig. 139a), the dimensions are 57 x 27 mm.

Type locality. – Not mentioned.

Remarks. – Dautzenberg stated that the shell of *C. bullatus* var. *articulata* is characterized by three dark zones, with two alternating lighter zones. In addition the body whorl is covered by many rows of black dots and stripes. In *C. bullatus* Linné, 1758, the pattern is more cloudy, without the black dots.

The name *C. bullatus* var. *articulata* Dautzenberg is a junior homonym of *C. articulatus* Sowerby III, 1873. Because the var. *articulata* Dautz. is considered a colour form of *C. bullatus*, and therefore of infrasubspecific rank, there is no need to give it a new name. We have studied specimens from the New Hebrides (fig. 139b).

articulatus
figs. 94, 140-141

Conus articulatus Sowerby III, 1873, Proc. zool. Soc. Lond. 1873: 146, pl. 15, fig. 3

Type. – The type specimen was sold by Sowerby to Roeters van Lennep in the Netherlands (vide Basteria 44: 23). The shell was lost after this collection was auctioned in 1876. The type figure is reproduced here (fig. 140), dimensions 18 x 10 mm.

Type locality. – 'Mauritius'; this locality is dubious.

Remarks. – *Conus articulatus* Sowerby is considered a valid species. According to the original description the shell has finely articulated lines which are scarcely visible to the unassisted eye through the dark chestnut colour of the surface (fig. 141).

Distribution. – In the tropical Western Pacific from South Japan to New Guinea (fig. 94). We have studied specimens from Hansa Bay, northern New Guinea (ZMA), Bohol, Philippines, and Phuket, Thailand (coll. Wils), and Okinawa (coll. H. Saesen). ZMA and RMNH also have specimens, from old collections, with the dubious locality 'Mauritius'.

artoptus
figs. 97, 142-143

Conus artoptus Sowerby I, 1833, in Sowerby II, Conch. Ill. (Conus): 2, pl. 33 fig. 35

Type. – There is no type specimen available, the shell is not present in BMNH. The type figure is reproduced here (fig. 142), dimensions 41½ x 15½ mm.

Type locality. – 'S. Seas'. The type locality is restricted here to Biak, New Guinea.

Remarks. – *Conus artoptus* Sowerby is a valid species. The cylindrical shell is covered with many spiral ridges. The last whorl has three wide, irregular bands of a golden yellowish to purplish brown colour, on a light background (fig. 143).

C. spectabilis A. Adams, 1854 is a junior synonym.

Distribution. – The species is known from Indonesia to the Solomon Islands, and Queensland (fig. 97). ZMA has specimens from Indonesia (Sibolga, Djakarta Bay, Moluccas, and Biak).

arubaensis
fig. 144

Conus spurius arubaensis Usticke, 1968, Caribbean Cones: 12, pl. 1 fig. 995

Type. – A holotype was not designated in the original description. In a later publication, Usticke (1971: 17) mentioned a holotype, '40.0 mm long, breadth 22.0 mm'. At present this specimen is in AMNH; the correct measurements are 38.6 x 22.6 mm (fig. 144).

Type locality. – 'Aruba, dredged in about 25 feet', Netherlands Antilles. This locality was restricted later (Usticke, 1971: 17) to 'Barcadera, Aruba'.

Remarks. – For the validity of the (sub)species named by Usticke, we refer to the introduction of this publication.

Although he originally described the taxon as a subspecies, Usticke (1971: 17) subsequently without further comments changed the status of *Conus spurius arubaensis* to that of a full species. According to the author *C. arubaensis* is characterized by about 15 rows of squarish patches, and double rows of 'Characters', about four or five dotted rows, and hardly any smudgy blotches. We have studied specimens of *C. spurius* Gmelin, 1791, from localities throughout its range in the Caribbean, including the island of Aruba. The pattern of this species is very variable, which has resulted in a number of synonyms and subspecific names. Our conclusion is that *C. arubaensis* Usticke is a junior synonym of *C. spurius*.

Our thanks are due to Mr. W.E. Old (AMNH) for the loan of the type specimen of *C. arubaensis*.

asper

Conus asper Lamarck, 1810, Annls Mus. Hist. nat. Paris 15: 39-40, no. 44

Type. – Lamarck did not have a specimen. He referred to two figures of *Conus costatus* in Chemnitz (1795, vol. 11: 47, pl. 181 figs. 1745-1747). A lectotype will be designated by Kohn (in press).

Type locality. – 'les mers de la Chine' (the seas of China).

Remarks. – *C. asper* Lamarck is a junior synonym of *C. sulcatus* Hwass, 1792.

aspersus
fig. 145

Conus aspersus Sowerby I, 1833, in Sowerby II, Conch. Ill. (Conus): 1, pl. 28 fig. 16

Type. – There is no type specimen available, the shell is not present in BMNH. The type figure is reproduced here (fig. 145), the dimensions are 94 x 49 mm.

Type locality. – 'St. Croix. W.I.' (= West Indies).

Remarks. – From the type figure and the type locality it is evident that *Conus aspersus* must be considered a junior synonym of *C. ermineus* Born, 1778.

assimilis
fig. 146

Conus assimilis A. Adams, 1854, Proc. zool. Soc. Lond. 21: 118

Type. – There are two syntypes in BMNH (no. 198084), measurements 53.0 x 27.1 and 44.4 x 22.0 mm. We herewith designate the largest specimen lectotype of *Conus assimilis* (fig. 146).

Type locality. – 'Australia'.

Remarks. – We have studied the type material, from which is concluded that *C. assimilis* must be considered a colour form of the polymorphic *C. magus* Linné, 1758. The forma *assimilis* is characterized by its white background with irregular greyish dots, body whorl encircled with many brown punctated spiral lines.

ZMA has specimens of *C. magus* forma *assimilis* from the Philippines and several localities in Indonesia (Moluccas: Amboina; Aroe Is.: Dobo; Flores: Endeh; New Guinea: Sorong).

Our thanks are due to Mrs. K.M. Way (BMNH) for the loan of the type material.

ater
fig. 65

Conus mediterraneus var. *ater* Philippi, 1836, Enum. Moll. Sicil.: 238, pl. 12 figs. 20, 21

Type. – Philippi figured two specimens of this variety, dimensions 41 x 18 and 33 x 12½ mm. We herewith designate the largest shell lectotype of *Conus mediterraneus* var. *ater*. This specimen was also designated lectotype of *C. mediterraneus* var. *alticonica* Pallary by the present authors (fig. 65).

Type locality. – 'Pantano del Faro prope Messinam' (Swamp of the lighthouse near Messina), Sicily.

Remarks. – As already discussed under *C. alticonica* (vide Basteria 44: 23, 1980) the shell of the var. *ater* Philippi is the high spired form of *C. mediterraneus* Hwass, 1792. Philippi mentioned that forma *ater*, next to its fusiformous shape, has a violet-tinged aperture with a distinct light violaceous band.

ateralbus
figs. 100, 147-148

Conus ateralbus Kiener, 1845, Coq. viv. 2: 313-314, pl. 108 figs. 4-4a

Type. – Kiener figured two specimens from the Lorois collection, but at present the whereabouts of these shells are unknown. We herewith designate the largest shell figured in Kiener (1845: pl. 108 fig. 4) lectotype of *Conus ateralbus*. The type figure is reproduced here (fig. 147), the dimensions are 45 x 31 mm.

Type locality. – Not mentioned. We designate the island of Sal, Cape Verde Islands, type locality of *C. ateralbus*.

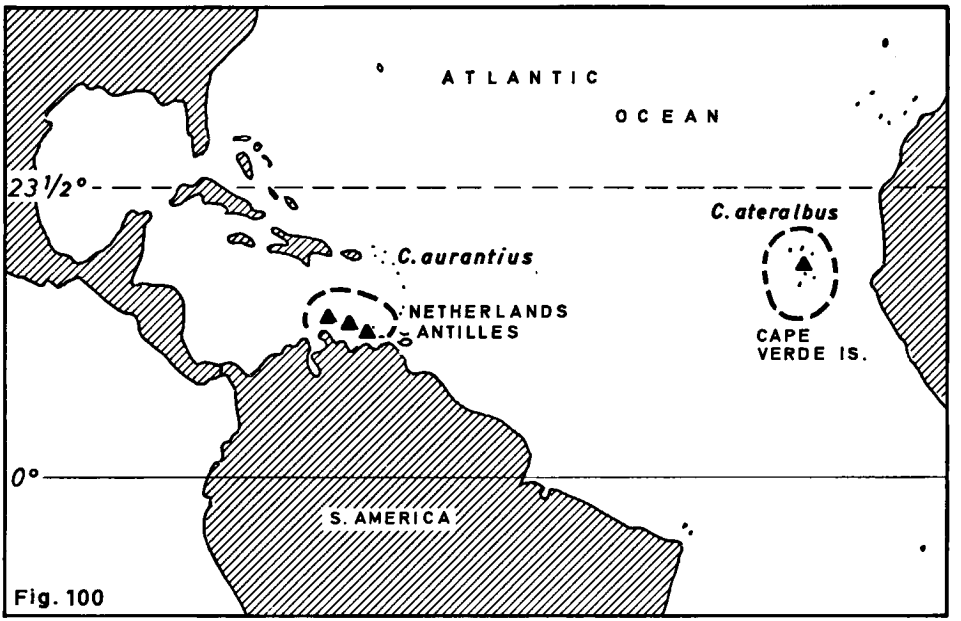

Fig. 100. Distribution of *Conus ateralbus* and *C. aurantius*.

Remarks. – *C. ateralbus* belongs to a species complex of West African Conidae, also including *C. venulatus* Hwass, 1792, *C. nivosus* Lamarck, 1810, *C. nivifer* Sowerby I, 1833, and *C. trochulus* Reeve, 1844. The material we have studied in this complex does not warrant uniting them into one single species *C. venulatus* as is sometimes proposed. However, we have not yet seen enough specimens to give a definite opinion. Provisionally we consider *C. ateralbus* a valid species.

Distribution. – *C. ateralbus* is restricted to the Cape Verde Islands (fig. 100). ZMA has specimens from the island of Sal (fig. 148).

atlanticus
fig. 149

Conus spurius atlanticus Clench, 1942, Johnsonia 1 (6): 20, pl. 10 figs. 1-3

Type. – The holotype is present in MCZ (no. 140787), measurements 50 x 27 mm. Paratypes were mentioned, although not stated where deposited.

Type locality. – 'Bonita Springs, Florida'. The paratypes are from several localities on the west coast of Florida, U.S.A.

Remarks. – Clench considered *Conus spurius atlanticus* the continental subspecies of *C. spurius* Gmelin, 1791, to be found along the coast of Florida and southern Mexico to Venezuela. *C. s. spurius* should occur in the Bahamas and Greater Antilles. Typical *C. spurius atlanticus* has a pattern in which the spots are more or less evenly grouped, even re-

sulting in solid areas that are quite regular (fig. 149).

We have studied specimens of *C. spurius* from a number of localities in the Caribbean, and conclude that this species shows a great variability in shell patterns. This has resulted in more than ten synonyms. Subdividing *C. spurius* into characteristic and distinct subspecies seems to be impossible (see also sub *arubaensis* in this publication). We therefore consider *C. spurius atlanticus* a junior synonym of *C. spurius*.

atomarius

Conus atomarius Solander in Lightfoot, 1786, Cat. Portland Mus.: 165, no. 3585

Type. – The Portland Catalogue mentioned a large and a small specimen; both are lost. There are no literature references.

Type locality. – 'China'.

Remarks. – The common name of this species was 'studded flea-bitten Cone'. Without a type specimen or references, and no description, *Conus atomarius* appears to be a nomen nudum.

atractus
fig. 150

Conus atractus Tomlin, 1937 (nom. nov.), Proc. malac. Soc. Lond. 22: 206

Type. – *Conus atractus* Tomlin is a new name for *C. fusiformis* Lamarck, 1810 (non Fischer von Waldheim, 1807). The type specimen of *C. fusiformis* Lam. is present in MHNG; the measurements are 48 x 21 mm (fig. 150). The shell was figured by Kiener (1845: pl. 76 fig. 3). Together with the holotype is another specimen (Mermod, 1947: 182), which was not mentioned by Lamarck.

Type locality. – 'je le croix de l'Océan pacifique' (I believe from the Pacific Ocean).

Remarks. – Tomlin does not give any more information about *C. atractus* but the new name. Dr. Cl. Vaucher (MHNG) kindly sent us colour photographs of the holotype. After studying these, together with Lamarck's description, we must conclude that *C. atractus* Tomlin (= *C. fusiformis* Lamarck) is a junior synonym of *C. anemone* forma *compressus* Sowerby II, 1866 (vide Basteria 44: 37-38, 1980). Shape, size, texture, colour and type locality of *C. atractus* agree with the forma *compressus*. The pattern on fa. *compressus* is maculate, which is vaguely visible in the type specimen of *C. fusiformis* Lamarck.

Walls (1979: 116-117, 146) considered *C. atractus* a valid species, being the first available name for *C. capricorni* Van Mol, Tursch & Kempf, 1967. However, Lamarck's description and type specimen (fig. 150) do not agree with this Brazilian shell (vide *C. austini* in this publication).

(atramentosus)

Conus atramentosus Reeve, 1849, Conch. Icon. 1, suppl. Conus: pl. 7, spec. 265

Remarks. – *Conus atramentosus* does not belong to the Conidae. This species with its cone shaped shell was transferred to the Turridae as *Mitromorpha atramentosa* (Reeve).

attenuatus
fig. 151

Conus attenuatus Reeve, 1843, Proc. zool. Soc. Lond. 11: 180; Conch. Icon. 1(1844), Conus: pl. 47, spec. 263

Type. – There is no type specimen available. It was originally in the Stainforth Museum, but now lost. The type figure is reproduced here (fig. 151), dimensions 19 x 8½ mm.

Type locality. – Not mentioned.

Remarks. – According to Reeve's description the shell is 'smooth, yellow or light orange-brown, longitudinally ornamented with a very few broad, waved, white stripes.' The identity of *Conus attenuatus* has long been unknown. After the description of *C. ustickei* Miller in Usticke, 1959, some authors (Walls, 1979: 147) favour the opinion that *C. attenuatus* is the first available name for *C. ustickei* from the Caribbean. Although the shape and dimensions of both species are about equal, we are not yet convinced about the two taxa being conspecific. The type figure of *C. attenuatus* does not show the wide bands of *C. ustickei*.

Without a type specimen and no locality we prefer to consider *C. attenuatus* Reeve a nomen dubium.

augur
figs. 99, 152

Conus augur Solander in Lightfoot, 1786, Cat. Portland Mus.: 44, no. 1046

Type. – A lectotype was designated by Kohn (1964: 161, pl. 2 fig. 16) being the shell figured in Knorr (pt. 6, 1772: pl. 13 fig. 6). The dimensions are 46 x 24 mm.

Type locality. – Not mentioned. We herewith designate the island of Ceylon type locality of *C. augur*.

Remarks. – *Conus augur* Solander is a valid species (fig. 152).

Distribution. – *C. augur* is found in the Indian Ocean from East Africa to Indonesia (fig. 99). ZMA has specimens from Ceylon (Colombo, Hikkaduwa), and from the 'Moluccas', which locality is questionable. In addition we have studied material from Zanzibar (RMNH), and Mozambique, Tanzania (Dar es Salaam), Kenya, Madagascar (Tuléar), India (Madras), and the Andaman Sea (coll. Saesen, Wils).

C. auger Hwass, 1792, is a misspelling.

aulicus
figs. 101, 153-155

Conus aulicus Linné, 1758, Syst. Nat. ed. 10, 1: 717, no. 279

Type. – Since no specimen is present in the Linnean collection, a lectotype was designated by Kohn (1963: 744-745, pl. 1 figs. 3-4), being the shell figured in Gualtieri (1742: pl. 25 fig. Z). The dimensions are 96 x 40 mm.

Type locality. – 'Asia', which is restricted here to the Moluccas, Indonesia.

Remarks. – *Conus aulicus* is a valid species with a large shell. The specimen figured (fig. 153) is the largest in ZMA, it measures 144.2 x 56.9 mm. Most shells are reddish brown to dark brown with white tentmarks. Some formae are recognized:

forma *aurantia* Dautzenberg, 1937 (see this publication), with a yellow to orange shell (fig. 154);

forma *propenudus* Melvill, 1900, the white markings are very large;

forma *roseus* Sowerby I, 1834 (non *C. roseus* Fischer von Waldheim, 1807), with a pink background.

See also under *C. auratus* in this publication (fig. 155).

Distribution. – *C. aulicus* covers a large area in the Indo-Pacific from East Africa to the Tuamotu Archipelago in French Polynesia, and south of the Ryukyu Islands to Queensland (fig. 101). ZMA has specimens from localities in Indonesia (Sumatra, Java, Flores, the Moluccas, New Guinea), the Philippines (Sulu Archipelago), and Ceylon. In addition we have studied material from Banka (RMNH), and from Kenya (Mombasa), the Philippines (E. Samar, Marinduque), Solomon Islands (Malaita), and Tuamotu (coll. Wils).

aurantia

Dautzenberg (1937) used the name *aurantia* two times in one publication for varieties of *Conus amadis* Gmelin, 1791, and *C. aulicus* Linné, 1758. Since these varieties were described before 1961, they should be treated as subspecific names, and for this reason they become junior homonyms of *C. aurantius* Hwass, 1792. Because we consider both varieties *aurantia* of Dautzenberg colour forms, and therefore of infrasubspecific rank, there is no need to create new names for them. Dautzenberg cited Lamarck as author of both *aurantia*; for this problem see the introduction of this publication.

Conus amadis var. *aurantia* 'Lamarck' Dautzenberg, 1937, Mém. Mus. r. Hist. nat. Belg. hors série 2 (18): 14-15
figs. 156-157

Type. – From the references cited by Dautzenberg, we designate the specimen of the 'gelbe Amadistutte' in Knorr (1772, pt. 6: 11, pl. 5 fig. 3) lectotype of *Conus amadis* var. *aurantia* Dautzenberg. The type figure is reproduced here (fig. 156), dimensions 71 x 33 mm.

Type locality. – Not mentioned.

Remarks. – Specimens of *C. amadis* with a yellow to orange coloured shell may be referred to as the forma *aurantia* (vide Basteria 44: 24-26, 1980). ZMA has specimens

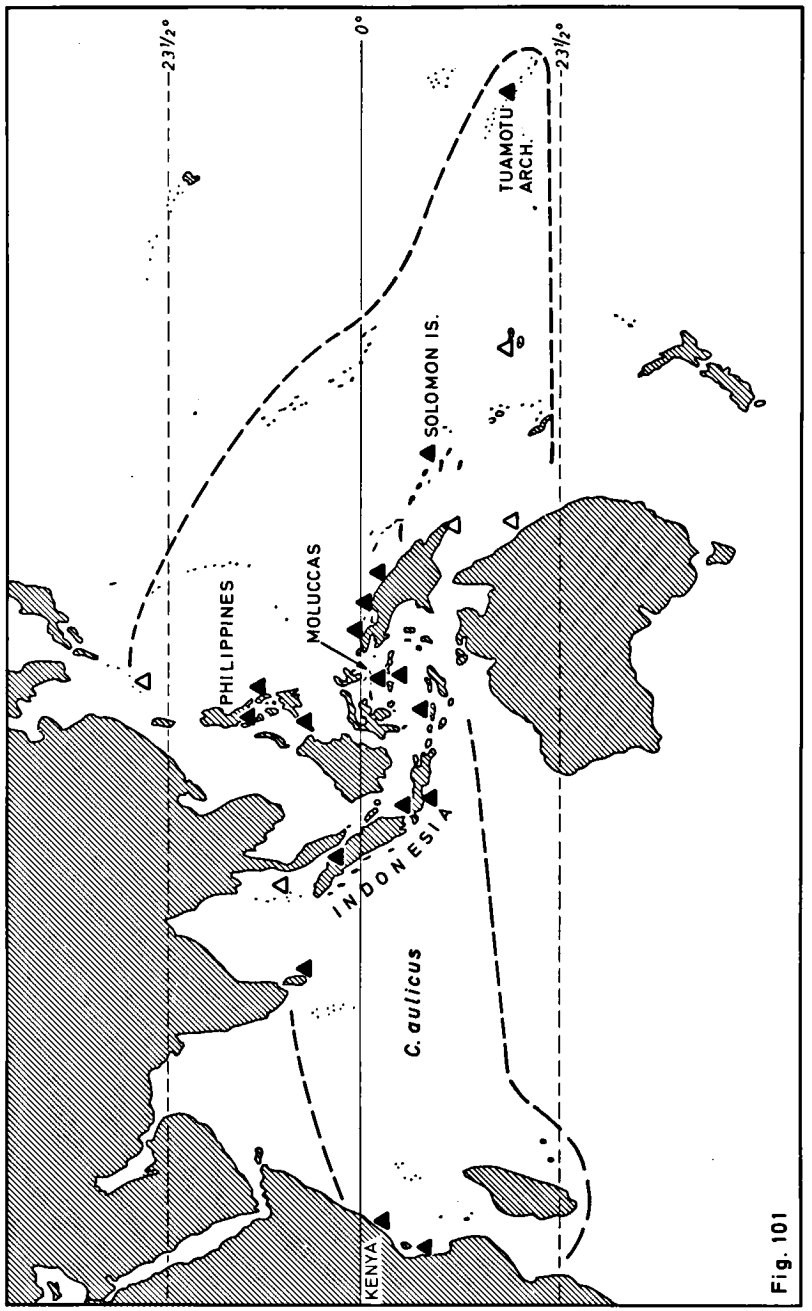

Fig. 101. Distribution of *Conus aulicus*.

from Ceylon (fig. 157).

Conus aulicus var. *aurantia* 'Lamarck' Dautzenberg, 1937, Mém. Mus. r. Hist. nat. Belg. hors série 2 (18): 36
fig. 154

Type. – From the references cited by Dautzenberg we designate the specimen figured in Knorr (1764, pt. 2: pl. 1 fig. 1) lectotype of *Conus aulicus* var. *aurantia* Dautzenberg. The type figure is reproduced here (fig. 154), dimensions 64 x 27 mm.

Type locality. – Not mentioned.

Remarks. – The shell of *C. aulicus* generally has a brown colour. Specimens with a yellow to orange shell belong to the colour forma *aurantia*. ZMA has specimens from Djakarta Bay and the Moluccas, Indonesia. See also under *C. auratus* Hwass var. B.

aurantius
figs. 100, 159-160

Conus aurantius Hwass in Bruguière, 1792, Encycl. Méth.: 606, no. 2

Type. – A lectotype was designated by Kohn (1968: 441-442, pl 2 fig. 9), the specimen is present in MHNG (no. 1106/42), and figured in the Tableau Encyclopédique (vol. 23, 1798: pl. 317, fig. 7). The measurements are 49 x 25 mm.

Type locality. – 'l'Océan Asiatique ... aux iles Philippines'. This locality is incorrect. Clench & Bullock (1970: 375) designated the island of Curaçao, Netherlands Antilles, type locality of *Conus aurantius*.

Remarks. – *C. aurantius* has long been considered an East Indian species, based on its erroneous type locality. In the last decades the species was rediscovered in the West Indies, and united with *C. cedonulli* Linné, 1758, for some years (Van Mol, Tursch & Kempf, 1967: 244-245; Holeman & Kohn, 1970). At present *C. aurantius* is considered a distinct and valid species. The shell is granulated, and named after its orange yellowish colour (fig. 159), although light brown to blackish brown specimens are known (fig. 160).

Distribution. – *C. aurantius* Hwass has a limited range in the southern Caribbean around the islands Aruba, Curaçao and Bonaire (fig. 100). After its rediscovery the shells were overcollected and therefore at the moment rare. ZMA has specimens from these islands; the largest shell measures 71.8 x 33.2 mm.

auratus
fig. 155

Conus auratus Hwass in Bruguière, 1792, Encycl. Méth.: 740-741, no. 134

Type. – Hwass described the varieties A and B; Kohn (1968: 442, pl. 2, figs. 10-11) designated a lectotype of *Conus auratus*, being the shell of var. A, figured in the Tableau Encyclopédique (vol. 23, 1798: pl. 343 fig. 3). This shell is present in MHNG (no. 1106/44), measurements 106 x 49 mm.

Type locality. – 'l'Océan Indien'.

Remarks. – The lectotype of *C. auratus* is conspecific with *C. aulicus* Linné, 1758, thus *C. auratus* is a junior synonym of *C. aulicus*.

However, the name *'Conus auratus'* is still in use for shells with a yellow colour, of a smaller size (length about 5-8 cm), and narrower (width about 2-3 cm) than *C. aulicus*. For these shells one is referred to the var. B of *C. auratus* Hwass, as figured in the Tableau Encyclopédique (1798: pl. 343 fig. 1). Kohn (1968: 442) discussed this specimen, which has a malformed spire. However, normal specimens are known (fig. 155). These shells of *C. auratus* var. *B* are juveniles of *C. aulicus*.

C. aulicus forma *aurantia* Dautzenberg (see this publication) must be identical to *C. auratus* var. *B* in Hwass, because both authors referred to the same literature.

auratus

Cucullus auratus Röding, 1798, Mus. Boltenianum 2: 50, no. 635/122
(non *Conus auratus* Hwass)

Type. – The seven specimens in the Bolten collection are lost. From the references a lectotype was designated by Kohn (1975: 195, pl. 1 fig. 6), being the shell figured in Knorr (pt. 2, 1765: pl. 8 fig. 3). The dimensions are 60 x 23 mm.

Type locality. – Not mentioned.

Remarks. – The lectotype is a specimen of *Conus textile*, which makes *C. auratus* (Röding) a junior synonym of *C. textile* Linné, 1758. The name *C. auratus* (Röding) is a junior secondary homonym of *C. auratus* Hwass.

aurelius

Cucullus aurelius Röding, 1798, Mus. Boltenianum 2: 47, no. 604/98

Type. – Röding mentioned three specimens in the Bolten collection. Because these shells are lost, a lectotype was designated by Kohn (1975: 195-196, pl. 1 fig. 7), being the shell figured in Martini (1773: pl. 56 fig. 621). The dimensions are 19 x 11 mm.

Type locality. – Not mentioned.

Remarks. – We agree with Kohn that *Conus aurelius* (Röding) is a junior synonym of *C. mercator* Linné, 1758.

aureofasciatus

fig. 158

Conus spurius aureofasciatus Rehder & Abbott, 1951, Revta Soc. malac. Carlos de la Torre 8 (2): 64-65, pl. 9 figs. 3-4

Type. – Holotype and one paratype are present in USNM (nos. 597521, 597522), two other paratypes are in coll. of Mrs. Sennott and of Mr. H.M. Woolsey. Measurements of

holotype 65.0 x 33.5 mm, two paratypes 59.5 x 29.0 and 34.5 x 18.5 mm.

Type locality. – 'Off Dry Tortugas, Florida, in 20 fathoms'. One paratype is from the type locality, two others are from the Gulf of Campeche, Yucatan, and from Sanibel Id., Florida.

Remarks. – We have studied the holotype (fig. 158). The pattern of the shell in *Conus spurius aureofasciatus* differs from typical *C. spurius* Gmelin, 1792, in having cream-orange spiral bands in stead of mottling on the body whorl. The original authors already stated that *aureofasciatus* might possibly represent a colour form. We agree with that opinion: *C. spurius* forma *aureofasciatus*.

The authors are grateful to Dr. R.S. Houbrick (USNM) for the loan of the holotype.

aureolus
fig. 161

Conus aureolus Sowerby II, 1858, Thes. Conch. 3: pl. 17, fig. 395

Type. – The holotype is present in BMNH (no. 1979180), the measurement are 19.1 x 10.7 mm (fig. 161).

Type locality. – Not mentioned.

Remarks. – *Conus aureolus* was named and figured by Sowerby, but not described. Reference is made to species no. 141 both with the figure and in the index. Probably due to an error of the printer, there is no description of *C. aureolus*. This mistake also caused a disorder in the numbering of the descriptions of species nos. 141 and 142, as compared to the numbers referred to on the plates, i.e. the description of species no. 141 applies to *C. coffea* Gmelin, 1791.

A latin description of *C. aureolus* was supplied by Weinkauff (1873-1875: 368).

We have studied the holotype (fig. 161): The shell is turbinated with a low and concave spire; shoulder angulated; nine whorls, last whorl smooth, at the base with eight ridges; aperture straight and narrow, width about 2 mm. The body whorl is golden yellow, with a lighter band just below the middle; 16 rows of lightbrown spots encircle the body whorl; nuclear whorls white; spire white with brown blotches, these blotches are darker than the spots on the last whorl, the blotches of the last whorl above the shoulder are running somewhat over the shoulder downward; inside of aperture white.

The holotype of *C. aureolus* was compared with the Conidae in ZMA, we only can conclude that the shell bears resemblance to *C. floridensis* Sowerby III, 1870, but has a flat spire.

Synonymy with other taxa (*C. fumigatus* Hwass, and *C. splendidulus* Sowerby), as suggested in literature, cannot be upheld. *'Conus aureolus'* in Hinton (1972: 82, pl. 40, figs. 21-22) is not *C. aureolus* Sowerby. Provisionally we consider *C. aureolus* Sowerby a valid species.

The authors are grateful to Mrs. K.M. Way (BMNH) for the loan of the type specimen.

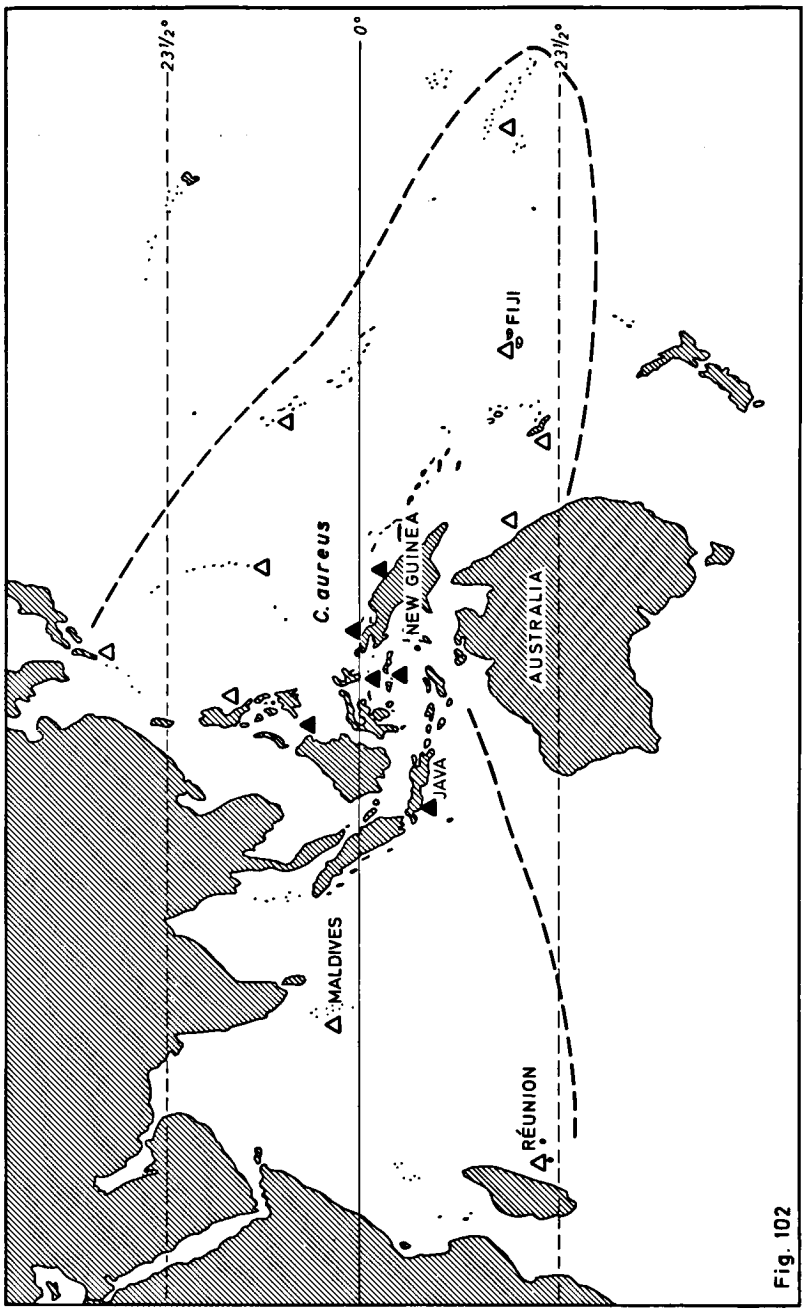

Fig. 102. Distribution of *Conus aureus*.

aureus
figs. 102, 162

Conus aureus Hwass in Bruguière, 1792, Encycl. Méth.: 742, no. 135

Type. – A neotype was selected by Kohn (1968: 442-443, pl.3 fig. 16). The specimen is present in MHNG (no. 1107/86); the measurements are 56½ x 23 mm. This shell is also figured in Kiener (1845: pl.82 fig.2a).

Type locality. – 'l'Océan Indien, sur les côtes de la Chine.'

Remarks. – *Conus aureus* Hwass is a valid species (fig. 162). The colour of the shell ranges from golden yellow to light brown.

Distribution. – Although this species covers a wide range in the Indo-Pacific, it is rather rare and locality data are scarce (fig. 102): ZMA has specimens from Indonesia (Java, Moluccas, Amboina, New Guinea: Manokwari and Jajapura). Specimens from Jolo Id., Sulu Archipelago are in coll. Wils.

C. aureus (Röding, 1798, non Hwass) is a junior synonym of *C. aulicus* Linné, and a junior secondary homonym of *C. aureus* Hwass

auricomus
figs. 103, 163

Conus auricomus Hwass in Bruguière, 1792, Encycl. Méth.: 742-743, no. 136

Type.– The holotype is present in MHNG (no. 1106/45); the measurements are 56½ x 21 mm. The shell is figured in the Tableau Encyclopédique (vol. 23, 1798: pl. 346 fig. 3), and by Kohn (1968: pl.3 fig.17).

Type locality. – 'des mers des grandes Indes'. The type locality is restricted here to the Sulu Sea.

Remarks. – *Conus auricomus* Hwass is a valid species (fig. 163). It is not a junior synonym of *C. clavus* Linné, 1758, which name is suppressed by the ICZN (Bull. zool. Nomencl. 22: 226-227, 1965).

Distribution. – *C. auricomus* is mentioned to occur in the Indo-Pacific; however, we have no definite records from the Indian Ocean. The species is uncommon in the tropical Western Pacific (fig. 103). There are no Australian records.

ZMA has specimens from Indonesia (Moluccas, Ceram, New Guinea: Jajapura, Waren). We have studied shells from the Philippines (Palawan and Zamboanga in the Sulu Sea) in coll. Wils.

C. auricomus Lamarck, 1810 (non Hwass) is a junior synonym of *C. aureus* Hwass, 1792.

aurifer

Cucullus aurifer Röding, 1798, Mus. Boltenianum 2: 49, no. 634/121

Type. – Bolten had 16 specimens, which are lost. Kohn (1975: 196, pl. 1 fig.8) de-

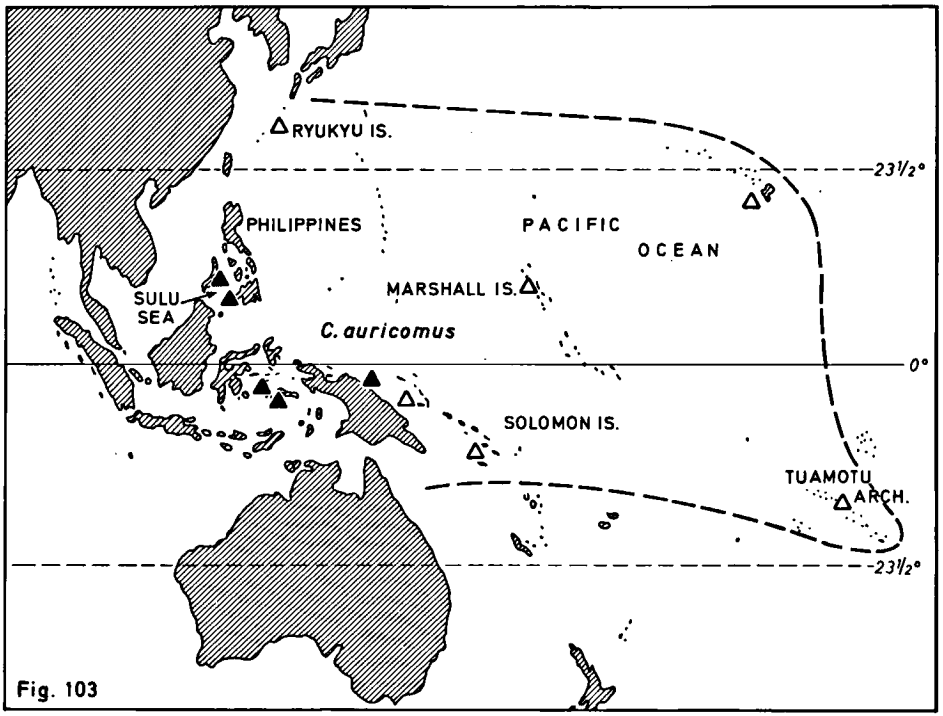

Fig. 103. Distribution of *Conus auricomus*.

signated the shell figured in Knorr (1768, pt. 3: pl. 19 fig. 1) lectotype of *Conus aurifer* (Röding). The dimensions are 84 x 33 mm.

Type locality. - Not mentioned.

Remarks. - The name *'aurifer'* is omitted in the lists of Conidae by Tomlin (1937) and Kohn & Riggs (1979). We agree with Kohn (1975: 196) that *C. aurifer* is a junior synonym of *C. aulicus* Linné, 1758.

auriger

Cucullus auriger Röding, 1798, Mus. Boltenianum 2: 49, no. 632/119

Type. - Bolten had six specimens, which are lost. Kohn (1975: 196, pl.1 fig. 9) designated the shell figured in Martini (1773: pl. 54 fig. 599) lectotype of *Conus auriger* (Röding). The dimensions are 58 x 34 mm.

Type locality. - Not mentioned.

Remarks. - We agree with Kohn that *C. auriger* (Röding) is a junior synonym of *C. textile* Linné, 1758.

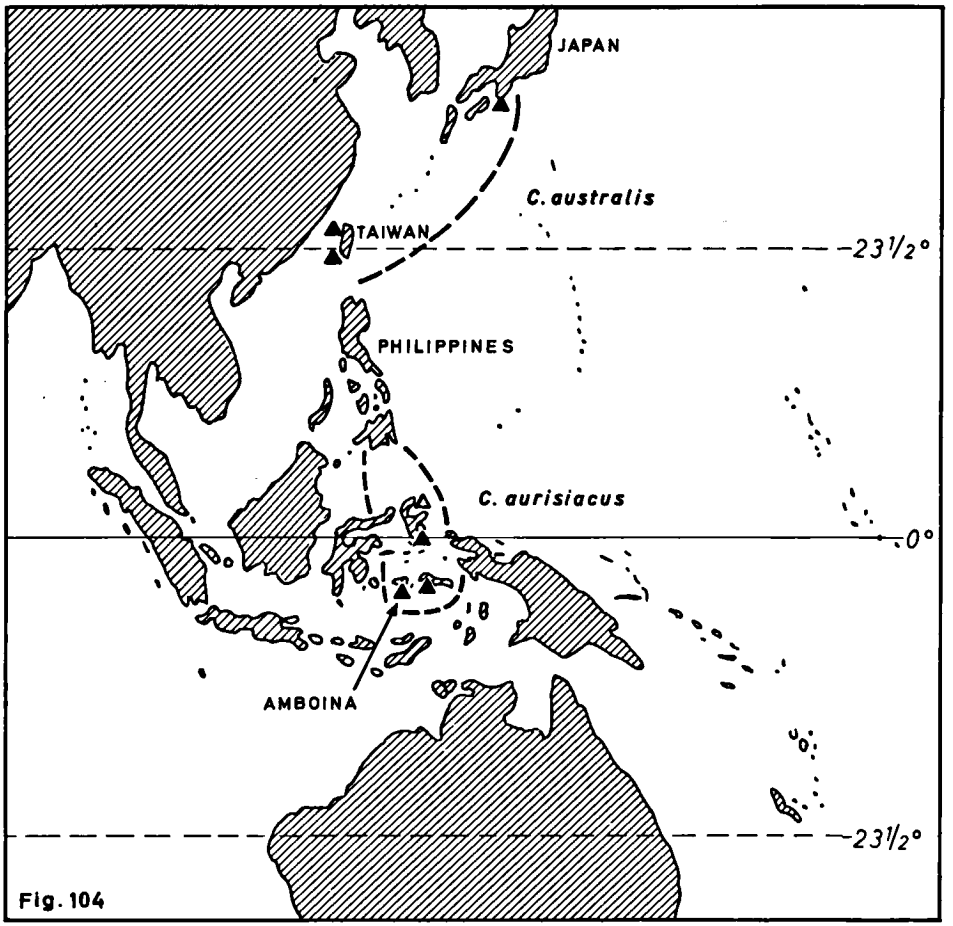

Fig. 104. Distribution of *Conus aurisiacus* and *C. australis*.

aurisiacus
figs. 104, 164

Conus aurisiacus Linné, 1758, Syst. Nat. ed. 10, 1: 716, no. 275

Type. – There is no specimen in the Linnean collection. Kohn (1963: 745-746, pl. 1 fig. 5) designated the shell figured in Rumphius (1705: pl. 34 fig. A) lectotype of *Conus aurisiacus*. The dimensions are 68 x 33 mm.

Type locality. – Not mentioned. We herewith designate the island of Amboina, Moluccas, type locality for *C. aurisiacus*. Rumphius' shell also was described from Amboina.

Remarks. – *C. aurisiacus* is a valid species (fig. 164). The beautiful shell was known in the 18th century as the orange admiral.

Distribution. – This rare species has a limited range around the Moluccan islands in

eastern Indonesia to the southern Philippines (fig. 104). ZMA has specimens from the Moluccas (Ceram and Amboina), all collected in the 18th and 19th centuries.

We did not study the fragments of *'C. aurisiacus'*, which were dredged off Hawaii (Kohn & Weaver, 1962: 70, 72).

Conus arausiacus Gmelin, 1791 is an error for *C. aurisiacus*.

aurora
fig. 167

Conus aurora Lamarck, 1810, Annls Mus. Hist. nat. Paris 15: 423-424, no. 131

Type. – Lamarck referred to a specimen in MNHN ('Mus., n. 89') and to the figure of *'Conus rosaceus'* in Chemnitz (Vol. 11, 1795: pl. 181 figs. 1756-1757). A lectotype will be designated by Kohn (in press).

Type locality. – Not mentioned by Lamarck. Chemnitz (1795: 52) stated that his specimen was from 'ostindischen Meeren' (East Indian Seas), which cannot be correct.

Remarks. – Lamarck described *C. aurora* as a uniform scarlet species with two whitish bands, one at the shoulder, the other just below the middle of the body whorl; the shell is thin with some grooves at the base.

C. aurora Lamarck is generally considered the reddish colour form of *C. tinianus* Hwass, 1792, known from the southeastern coast of S. Africa. Shells with a uniform orange colour (fig. 167) are mostly beach-worn; in live collected specimens brown spots are often present on the body whorl.

austini
figs. 105, 165-166

Conus austini Rehder & Abbott, 1951, J. Wash. Acad. Sci. 41: 22-24, fig. 7

Type. – Holotype and two paratypes in USNM at Washington (nos. 603017, 603018, 421721). Measurements of the holotype are 55.5 x 25.3 mm, paratypes 51.0 x 25.5 and 43.1 x 22.0 mm.

Type locality. – 'Southeast of Loggerhead Key, Dry Tortugas, Florida. Dredged in 40 to 46 fathoms.' One paratype is from Antigua, Lesser Antilles.

Remarks. – *Conus austini* is a valid species (fig. 166). The shell is white, occasionally with some light brown bands on the last whorl. The body whorl is covered with raised spiral cords and fine axial striae between the cords. Juveniles have axial wrinkles on the body whorl (fig. 165).

The shell of the subspecies *C. austini capricorni* Van Mol, Tursch & Kempf, 1967, is larger (70-80 mm), more elongate, and with fine spiral grooves (vide *C. atractus* in this publication).

Distribution. – *C. austini austini* is found in deeper water (50-100 m) in the West Indies, from the Gulf of Mexico to N. Brazil (fig. 105). ZMA has specimens from the Gulf of Mexico (off Horn Island, Miss., and Campeche, Yucatan). We have studied specimens from off Surinam (RMNH), the coast of Alabama, Florida Keys, and off N. Brazil

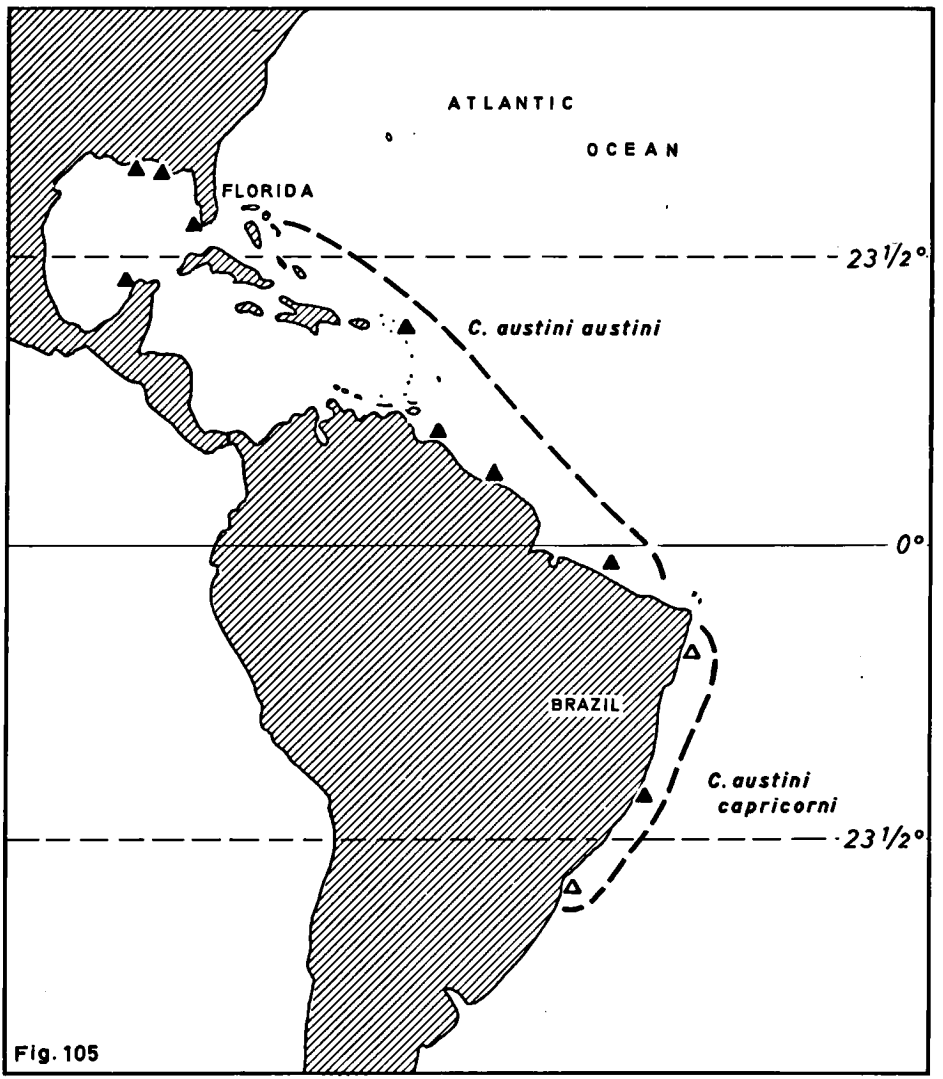

Fig. 105. Distribution of *Conus austini austini* and *C. austini capricorni.*

(coll. Saesen, Wils).

C. austini capricorni lives on the East coast of Brazil (Old, 1978: 21). We have studied shells from Estado Espiritu Santo (coll. Wils).

australis
figs. 104, 168

Conus australis Holten, 1802, Enum. Syst. Conch.: 39, no. 87

Type. – Holten had two specimens, and referred to the shell figured in Chemnitz (vol. 11, 1795: pl. 183 figs. 1774-1775). A lectotype will be designated by Kohn (in press).

Type locality. – Not mentioned. We herewith designate Taiwan type locality of *Conus australis* Holten.

Remarks. – *C. australis* Holten is a valid species (fig. 168). *C. alabasteroides* (Shikama, 1963), vide Basteria 43: 93, 1979, is a junior synonym.

Distribution. – The species has a limited range in the Western Pacific, off S. Japan to Taiwan (fig. 104). Locality records from Australia are incorrect. ZMA has specimens from Taiwan (Kaohsiung), and Taiwan Strait. RMNH has specimens from Japan (Wakayama).

australis

Conus australis Schröter, 1803, Arch. Zool. Zoot. 3 (2): 71
(non *australis* Holten, 1802)

Type. – The type specimen was discovered recently in Gotha (D.D.R.) by Dr. A.J. Kohn. The dimensions are 19 x 13 mm. For more details about the Schröter collection we may refer to Kohn (in press).

Type locality. – 'aus den Südländern' (from the Southlands).

Remarks. – The identity of *Conus australis* Schröter has long been unknown, although the original author gave a thorough description. Schröter did not refer to any figure. After the discovery of the holotype in 1979, Dr. Kohn informed us (in litt.) that this shell is a specimen of *C. mustelinus* Hwass, 1792, and therefore *C. australis* Schröter is a junior synonym of *C. mustelinus*. The name *C. australis* Schröter is a junior homonym of *C. australis* Holten, 1802.

We are grateful to Dr. A.J. Kohn (Univ. Washington) for his information and a photograph of the holotype of *C. australis* Schröter.

australis
fig. 169

Conus ammiralis var. *australis* 'Lamarck' Dautzenberg, 1937, Mém. Mus. r. Hist. nat. Belg. hors série 2 (18): 18-19 (non *australis* Holten, 1802)

Type. – Dautzenberg gave some literature references, and indicated that a specimen was present in his collection, which is now in the IRScNB. We herewith designate the specimen, figured in the Tableau Encyclopédique (1798, vol. 23: pl. 328 fig. 6) lectotype of *Conus ammiralis* var. *australis* Dautzenberg. The type figure is reproduced here (fig. 169). The dimensions are 66 x 31 mm.

Type locality. – 'Moluques' (Moluccas), Indonesia.

Remarks. – The shell of *australis* Dautzenberg is characterized by very large triangular dots. We consider it a form of *C. ammiralis* Linné, 1758 (vide Basteria 44: 30-33, 1980). ZMA has specimens from the Moluccas, and Siasi, Sulu Archipelago.

It is not necessary to create a new name for the forma *australis* Dautzenberg, being a junior homonym of *C. australis* Holten, because it is an infrasubspecific taxon.

axelrodi
figs. 106, 170

Conus axelrodi Walls, 1978, Pariah 2: 1, 5 (fig.)

Type. – Holotype in Delaware Museum of Natural History, measurements 16.0 x 9 mm. Paratypes in the collections of the Natal Museum (fig. 170) and of P. Clover, E. Petuch and J.G. Walls.

Type locality. – 'Philippines, Palawan'. Paratypes from Taiwan and Samarai, New Guinea, are figured in Walls (1979: 137, 186).

Remarks. – This species was identified for some time as *'Conus puncturatus'*. After Kohn (1968: 479) considered *C. puncturatus* Hwass, 1792, a nomen dubium, the name *'C. papillosus'* was used (Hinton, 1972: 72-73, pl. 35 figs. 27-28; Röckel, 1980: 110). However, *C. papillosus* Kiener, 1845, is a West Indian species.

After studying specimens of *C. axelrodi*, including one paratype (fig. 170), we conclude that it is a valid species.

Distribution. – From Taiwan and the Philippines through the Indonesian area to New Guinea (fig. 106). No specimens in ZMA. We have studied shells from the Philippines: Palawan (Natal Museum), Coron Id. (coll. Wils), and Samar (coll. H. Saesen).

The authors are grateful to Mr. R.N. Kilburn (Natal Museum) for the loan of a paratype.

azona
fig. 171

Conus thalassiarchus var. *azona* Wils c.s. 1972, Fam. Conidae: 73, no. 122, pl. 13 fig. 2

Type. – The specimen on which this variety is based was deposited in ZMA (fig. 171), measurements 51.6 x 24.9 mm.

Type locality. – 'Siasi - Sulu, zuidelijke Filippijnen' (Siasi, Sulu Archipelago, southern Philippines).

Remarks. – Because *Conus thalassiarchus* var. *azona* was described after 1961, this name is of infrasubspecific rank. We consider it to be a colour form of *C. thalassiarchus* Sowerby I, 1834.

The forma *azona* is characterized by a regular pattern without bands (fig. 171), whereas the shell of *C. thalassiarchus* is decorated with a number of light coloured bands.

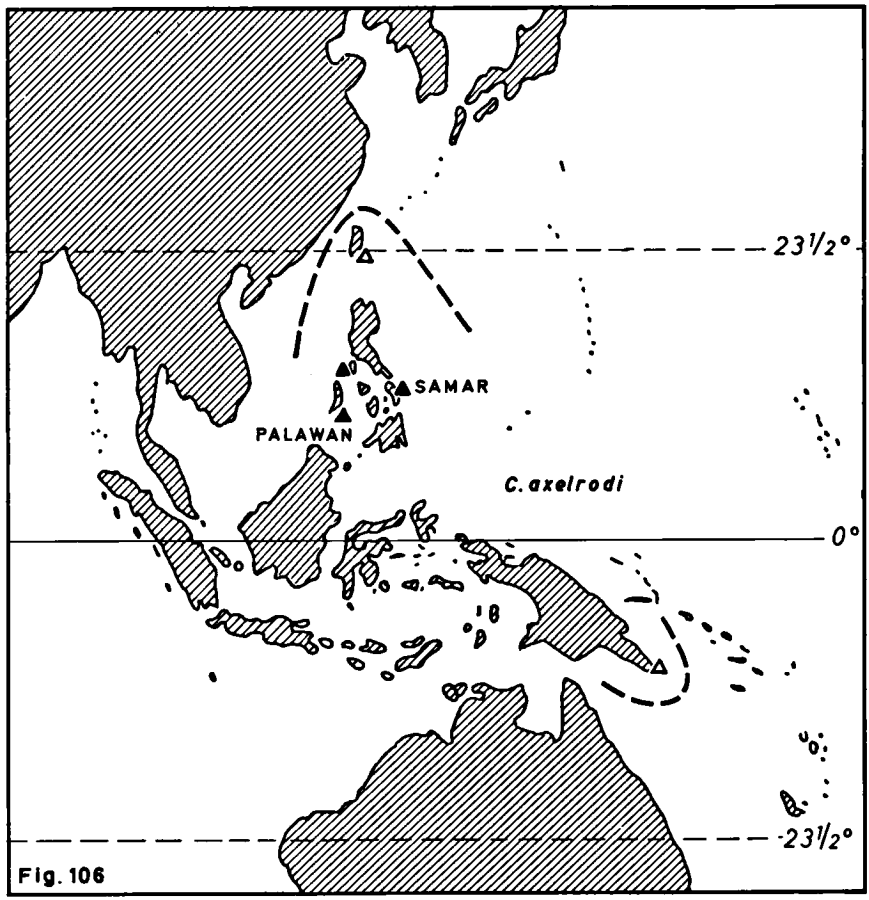

Fig. 106. Distribution of *Conus axelrodi*.

SUMMARY

Based on the type material and the original descriptions, the *Conus* collection of the Zoological Museum, Amsterdam, and other museum and private collections, the (sub)specific names in the recent Conidae are revised. Illustrations and distribution maps are supplied. In the fourth part the following *Conus* names are discussed:

aphrodite Petuch - possibly a juvenile of *C. otohimeae* Kuroda & Ito.

aplustre Rve - valid species, lectotype designated - New South Wales, Woody Head designated type locality.

apogrammatus Dall - colour form of *C. princeps* L.

approximatus Turton - junior synonym of *C. tinianus* Hw.

arabicus Lam. - junior synonym of *C. litteratus* L.

arachnoideus Gmel. - junior synonym of *C. araneosus* Sol.

araneosus Sol. - valid species - S.E. India and Ceylon.

arangoi Sarasúa - provisionally considered a valid species - Cuba.

aratus Kilburn - junior homonym, renamed *elokismenos* Kilburn.

arausiensis Rve - objective junior synonym of *C. daucus* Hw.

arbornatalis da Motta – deep water form of *C. amadis castaneofasciatus* Dautz.
archetypus Crosse – junior synonym of *C. daucus* Hw.
archiepiscopus Hw. – a form of *C. textile* L.
architalassus Sol. – granulated form of *C. ammiralis ammiralis* L. – Moluccas designated type locality.
architalassius Link – junior synonym of *C. pulcher* Lightfoot.
architalassus Hw. – junior synonym of *architalassus* Sol.
archon Brod. – valid species – W. Mexico to Panama.
arcuatus Brod. & Sow. – valid species, neotype designated – W. Mexico to Colombia.
arcuatus Gray – junior homonym, renamed *C. emarginatus* Rve, a valid species – type locality restricted to Cape San Lucas, Mexico.
ardisiaceus Kien. – valid species – Oman, Masirah Id. designated type locality.
arenaria Monterosato – junior synonym of *C. mediterraneus* Hw., lectotype designated.
arenatus Hw. – valid species. Three subspecies recognized: *C. a. arenatus* – India to Tuamotu Archipelago; *C. a. aequipunctatus* Dautz. – Red Sea; *C. a. bizona* nov. subsp. – East Africa.
arenatus (Röding) – junior secondary homonym, junior synonym of *C. stercusmuscarum* L.
arenosus (Röding) – junior synonym of *C. arenatus* Hw.
argillaceus Perry – nomen dubium.
aristophanes Sow. – a form of *C. coronatus* Gmel., lectotype designated.
armadillo Shikama – provisionally considered a valid species.
armatus E.A. Smith – error for *C. arenatus* Hw.
armiger Crosse – valid species, new name for *C. crenulatus* Kien. – coast of Louisiana designated type locality.
armillatus C.B. Ads – colour form of *C. hieroglyphus* Duclos.
arrowsmithensis Brazier – junior synonym of *C. distans* Hw., juvenile.
articulata Dautz. – a colour form of *C. bullatus* L., lectotype designated, junior homonym.
articulatus Sow. – valid species – tropical western Pacific.
artoptus Sow. – valid species – Indonesian Archipelago, type locality restricted to Biak, New Guinea.
arubaensis Usticke – junior synonym of *C. spurius* Gmel.
asper Lam. – junior synonym of *C. sulcatus* Hw.
aspersus Sow. – junior synonym of *C. ermineus* Born.
assimilis A. Ads – colour form of *C. magus* L., lectotype designated.
ater Philippi – a form of *C. mediterraneus* Hw., lectotype designated.
ateralbus Kien. – provisionally considered a valid species, lectotype designated – Cape Verde Is., Sal designated type locality.
atlanticus Clench – junior synonym of *C. spurius* Gmel.
atomarius Sol. – nomen nudum.
atractus Tomlin – new name for *C. fusiformis* Lam., junior synonym of *C. anemone* forma *compressus* Sow.
(*atramentosus* Rve) – not a *Conus* species, is *Mitromorpha atramentosa*, fam. Turridae.
attenuatus Rve – nomen dubium.
augur Sol. – valid species – Indian Ocean, Ceylon designated type locality.
aulicus L. – valid species – Indo-Pacific, type locality restricted to the Moluccas.
aurantia Dautz. – colour form of *C. amadis* Gmel. and of *C. aulicus* L., lectotypes designated, junior homonyms.
aurantius Hw. – valid species – southern Caribbean.
auratus Hw. – junior synonym of *C. aulicus* L.
auratus (Röding) – junior synonym of *C. textile* L., junior secondary homonym.
aurelius (Röding) – junior synonym of *C. mercator* L.
aureofasciatus Rehd. & Abb. – colour form of *C. spurius* Gmel.
aureolus Sow. – provisionally considered a valid species.
aureus Hw. – valid species – Indo-Pacific.
aureus (Röding) – junior synonym of *C. aulicus* L., junior secondary homonym.
auricomus Hw. – valid species – tropical western and central Pacific, type locality restricted to Sulu Sea.
aurifer (Röding) – junior synonym of *C. aulicus* L.
auriger (Röding) – junior synonym of *C. textile* L.
aurisiacus L. – valid species – Moluccas and S. Philippines, Amboina designated type locality.

aurora Lam. - colour form of *C. tinianus* Hw.
austini Rehd. & Abb. - valid species - West Indies to Brazil.
australis Holten - valid species - S. Japan to Taiwan, Taiwan designated type locality.
australis Schröter - junior synonym of *C. mustelinus* Hw. - junior homonym.
australis Dautz. - a form of *C. ammiralis* L., lectotype designated, junior homonym.
axelrodi Walls - valid species - Taiwan to New Guinea.
azona Wils - colour form of *C. thalassiarchus* Sow.

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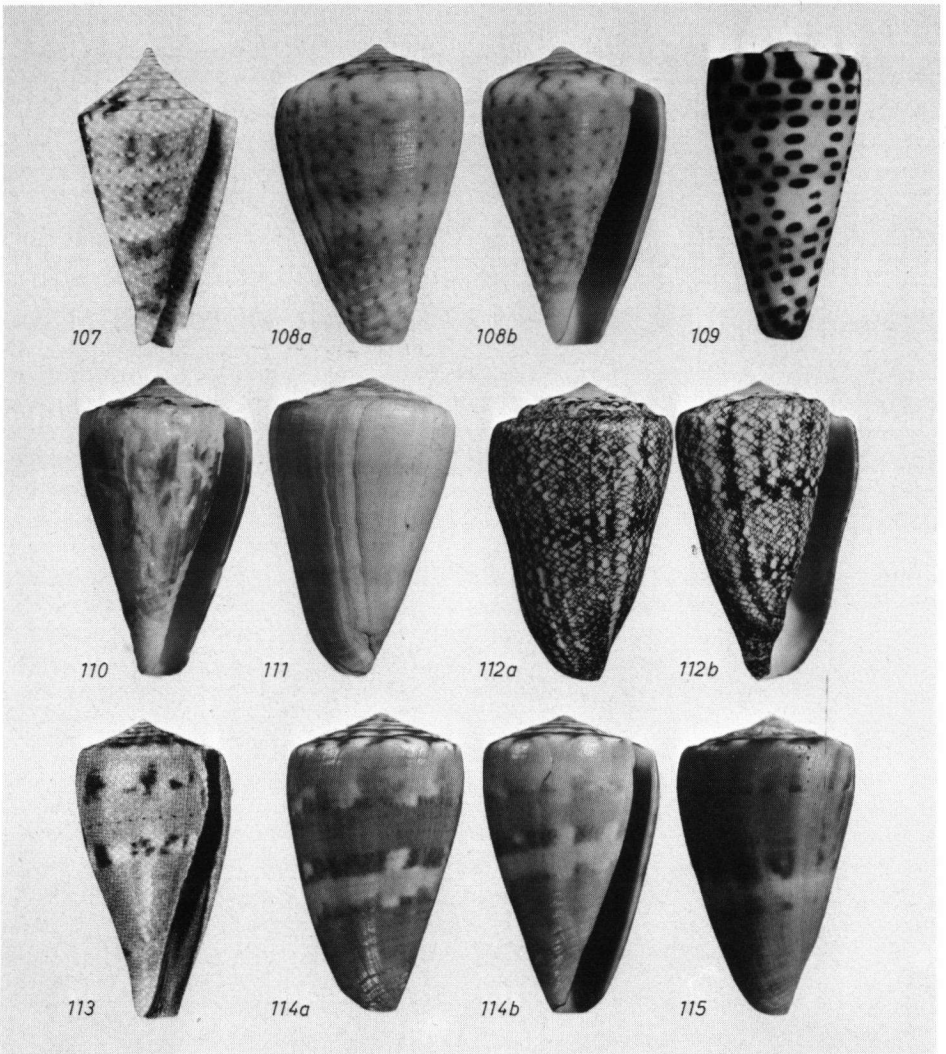
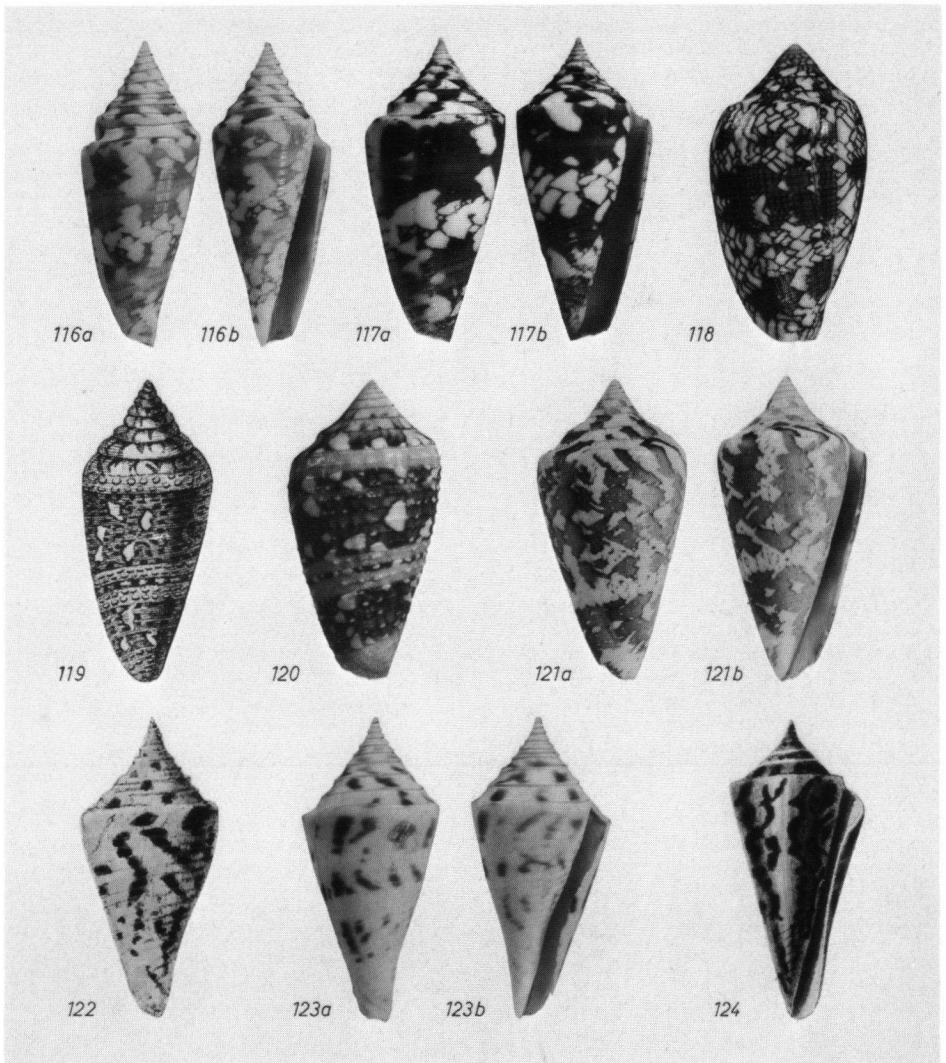
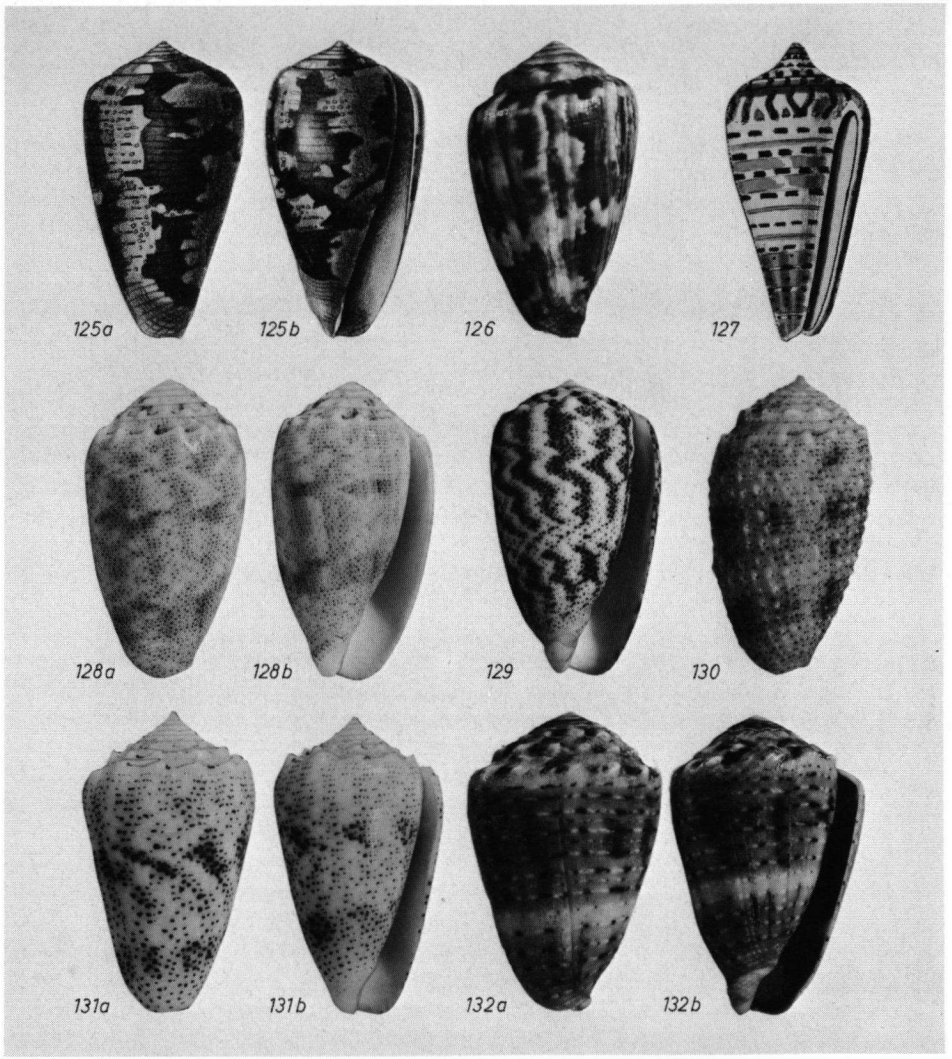


Fig. 107. *Conus aphrodite* Petuch, type figure (after Petuch), Bohol, Philippines, length 21 mm.
Fig. 108. *C. aplustre* Rve, New South Wales, length 21.5 mm.
Fig. 109. *C. litteratus* L., juvenile (=*arabicus* Lam.), E. Flores, Indonesia, length 39.6 mm.
Figs. 110-111. *C. princeps* fa. *apogrammatus* Dall. 110. Holotype, partly with periostracum, Panama, length 35.5 mm (USNM). 111. Panama, length 64.0 mm.
Fig. 112. *C. araneosus* Sol., Rameswaram, India, 84.2 mm.
Fig. 113. *C.* cf. *arangoi* Sarasúa, Bahamas, length 5 cm (after Abbott).
Figs. 114-115. *C. daucus* Hw. 114. Holotype of *C. archetypus* Crosse, length 24.9 mm (BMNH). 115. Curaçao, Piscadera Bay, length 42.6 mm.



Figs. 116-117. *Conus amadis castaneofasciatus* fa. *arbornatalis* Da Motta. 116. Off Ranong, Thailand, length 47.1 mm (Coll. Wils). 117. Intermediate specimen, Andaman Is., length 41.2 mm.
Fig. 118. *C. textile* fa. *archiepiscopus* Hw., Java, Tjilatjap, length 50.9 mm.
Figs. 119-120. *C. ammiralis* fa. *architalassus* Sol. 119. Type figure (after Argenville), length 37 mm. 120. Moluccas, length 33.7 mm.
Fig. 121. *C. archon* Brod., Guaymas, Mexico, length 58.6 mm.
Figs. 122-123. *C. arcuatus* Brod. & Sow. 122. Neotype (after Reeve), Mazatlan, length 43.5 mm. 123. Guaymas, Mexico, length 36.5 mm.
Fig. 124. *C. emarginatus* Rve, type figure of *C. arcuatus* Gray (after Gray), Eastern Pacific, length 50 mm.



Figs. 125-126. *Conus ardisiaceus* Kiener. 125. Type figure (after Kiener), length 35 mm. 126. Oman Masirah Id., length 34.6 mm.
Fig. 127. *C. argillaceus* Perry, type figure (after Perry), East Indies, length 46 mm.
Figs. 128-130. *C. a. arenatus* Hw. 128. Moluccas, length 42.1 mm. 129. forma *undata* Dtz., Moluccas, length 41.5 mm. 130. forma *granulosa* Dtz., Moluccas, length 21.7 mm.
Fig. 131. *C. arenatus bizona* nov. subsp., holotype, Malindi, Kenya, length 35.1 mm.
Fig. 132. *C. coronatus* fa. *aristophanes*. Lectotype of *C. aristophanes* Sow., length 35.3 mm (BMNH).

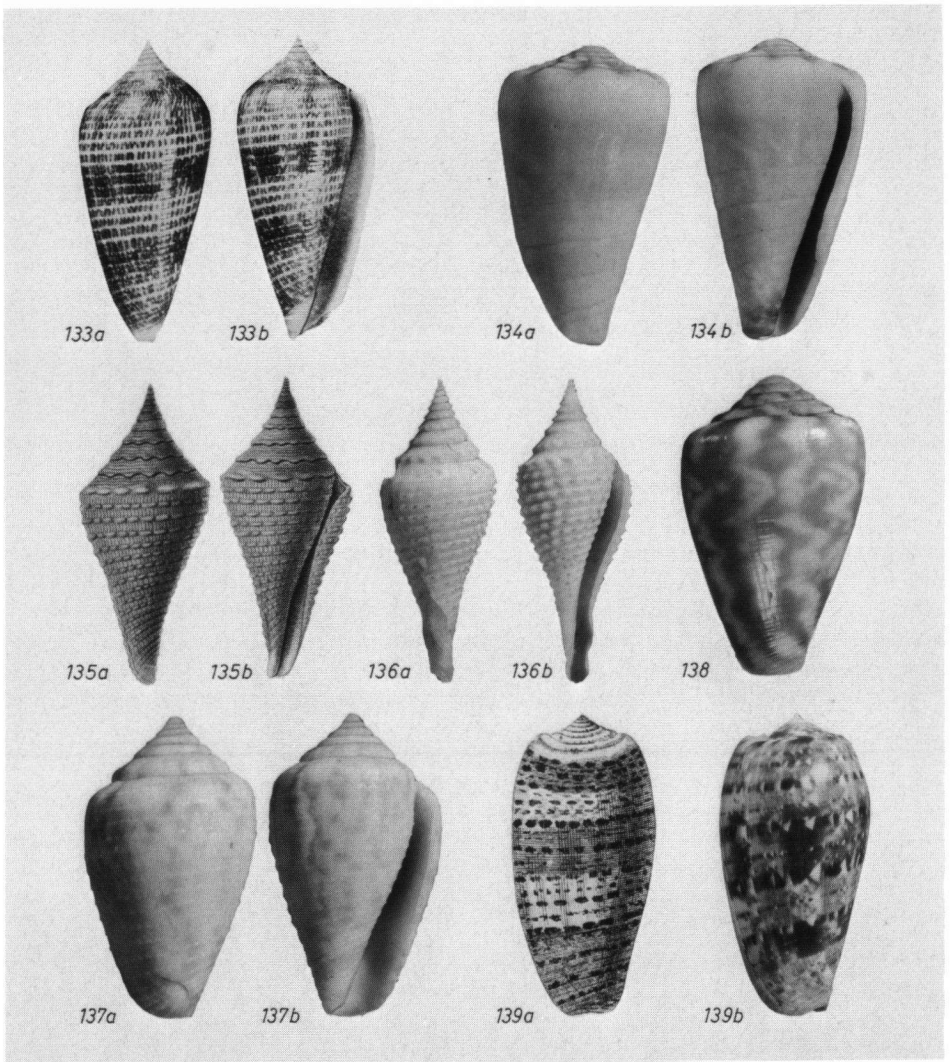
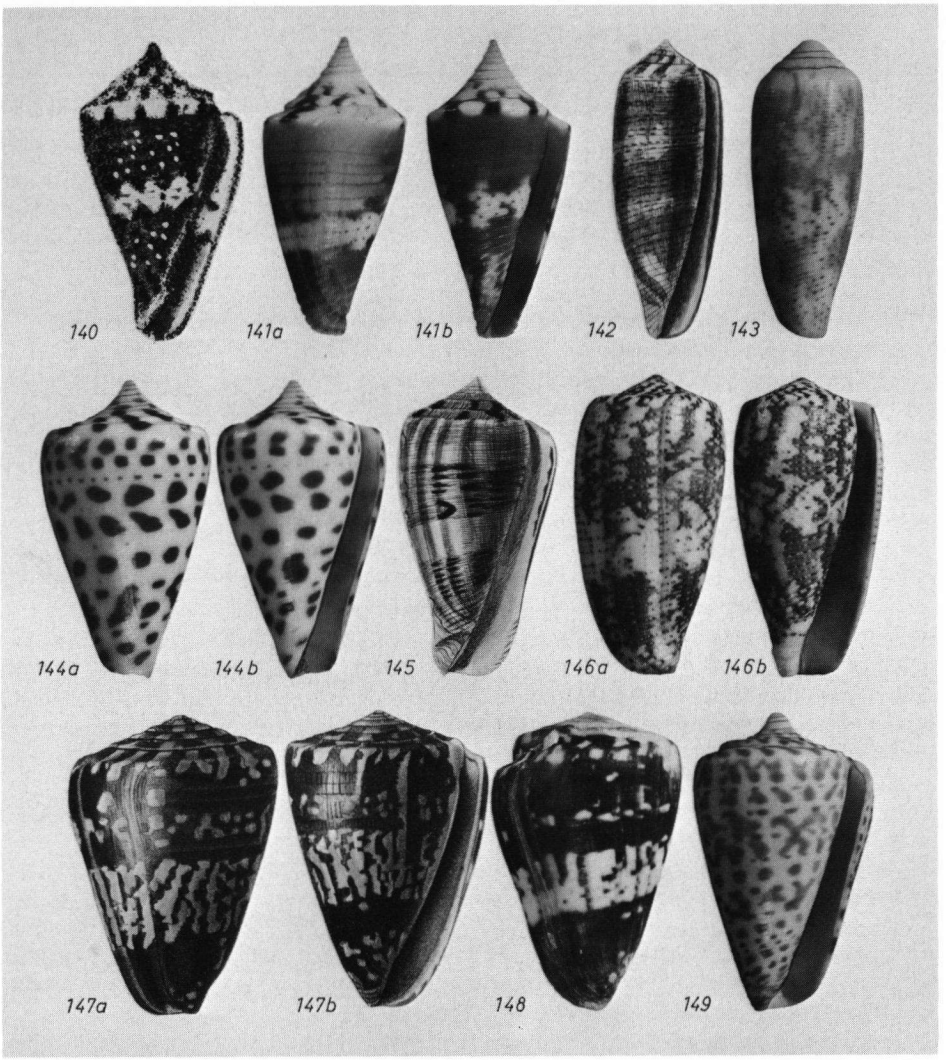


Fig. 133. *Conus armadillo* Shikama, type figure (after Shikama), Taiwan, length 73.0 mm.
Fig. 134. *C. distans* Hw., holotype of *C. kenyonae* var. *arrowsmithensis* Braz., Arrowsmith Id., Marshall Is., length 35.6 mm (SAM).
Figs. 135-136. *C. armiger* Crosse. 135. Type figure of *C. crenulatus* Kiener, length 30 mm (after Kiener). 136. Pensacola, Florida, length 36.1 mm.
Figs. 137-138. *C. hieroglyphus* fa. *armillatus*. 137. Holotype of *C. armillatus* C.B. Ads, Jamaica, length 14.1 mm (USNM). 138. Curaçao, length 14.3 mm.
Fig. 139. *C. bullatus* fa. *articulata* Dtz. 139a. Lectotype, length 57 mm (after Hwass). 139b. Sta Cruz, New Hebrides, length 43.2 mm (coll. Wils).



Figs. 140-141. *Conus articulatus* Sow. 140. Type figure (after Sowerby), 'Mauritius', length 18 mm. 141. Phuket, Thailand, length 21.0 mm (coll. Wils).
Figs. 142-143. *C. artoptus* Sow. 142. Type figure (after Sowerby), length 41.5 mm. 143. Biak, New Guinea, length 33.3 mm.
Fig. 144. *C. spurius* Gmel., holotype of *C. spurius arubaensis* Usticke, Aruba, length 38.6 mm (AMNH).
Fig. 145. *C. ermineus* Born. Type figure of *C. aspersus* Sow., St. Croix, length 94 mm (after Sowerby).
Fig. 146. *C. magus* fa. *assimilis* A. Ads, lectotype, Australia, length 53.0 mm (BMNH).
Figs. 147-148. *C. ateralbus* Kien. 147. Lectotype (after Kiener), length 45 mm. 148. Sal, Cape Verde Is., length 38.0 mm.
Fig. 149. *C. spurius* Gmel., *'atlanticus'* pattern, Florida, length 53.8 mm.

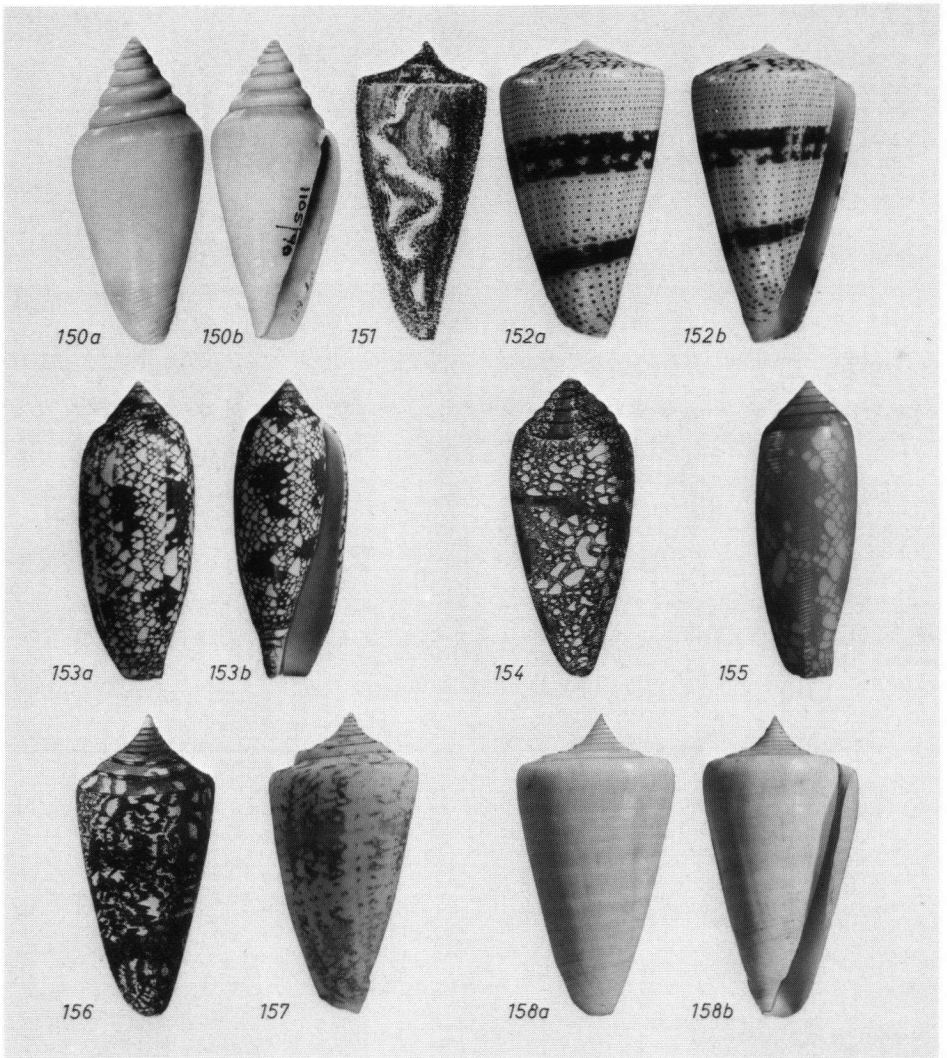
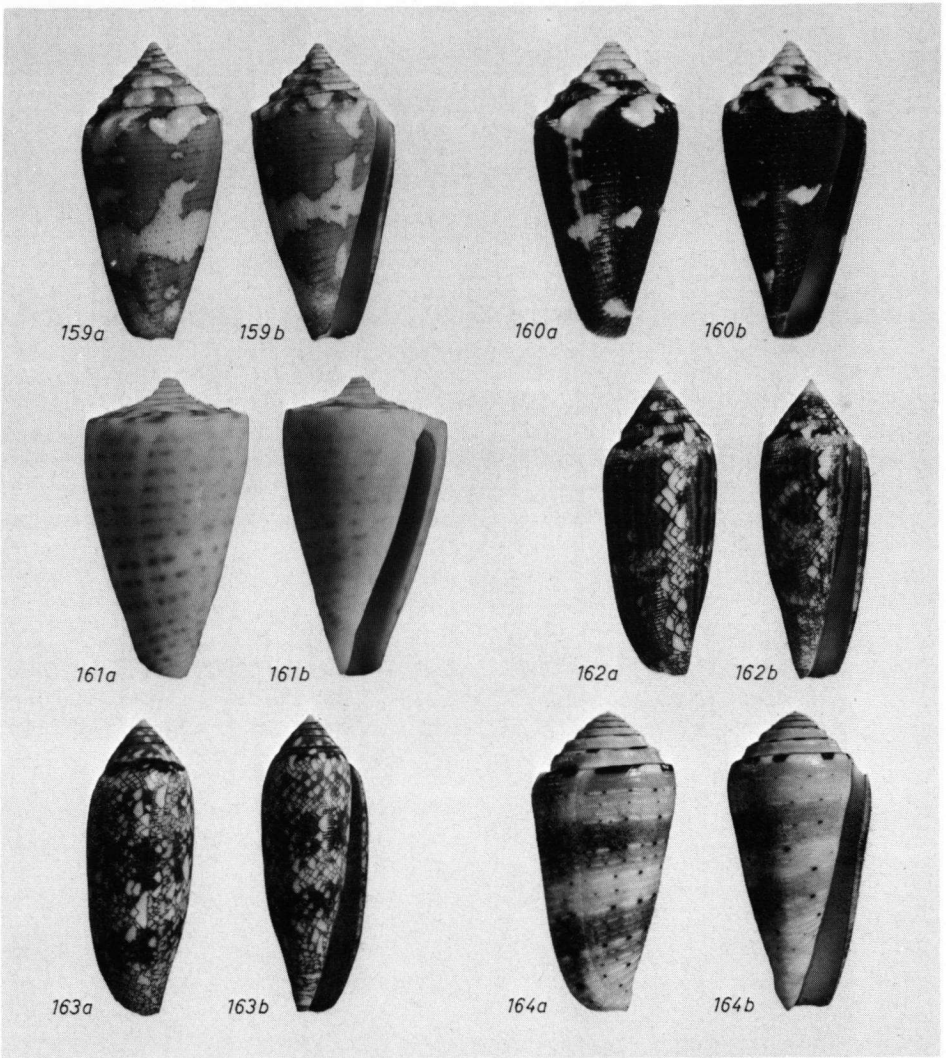
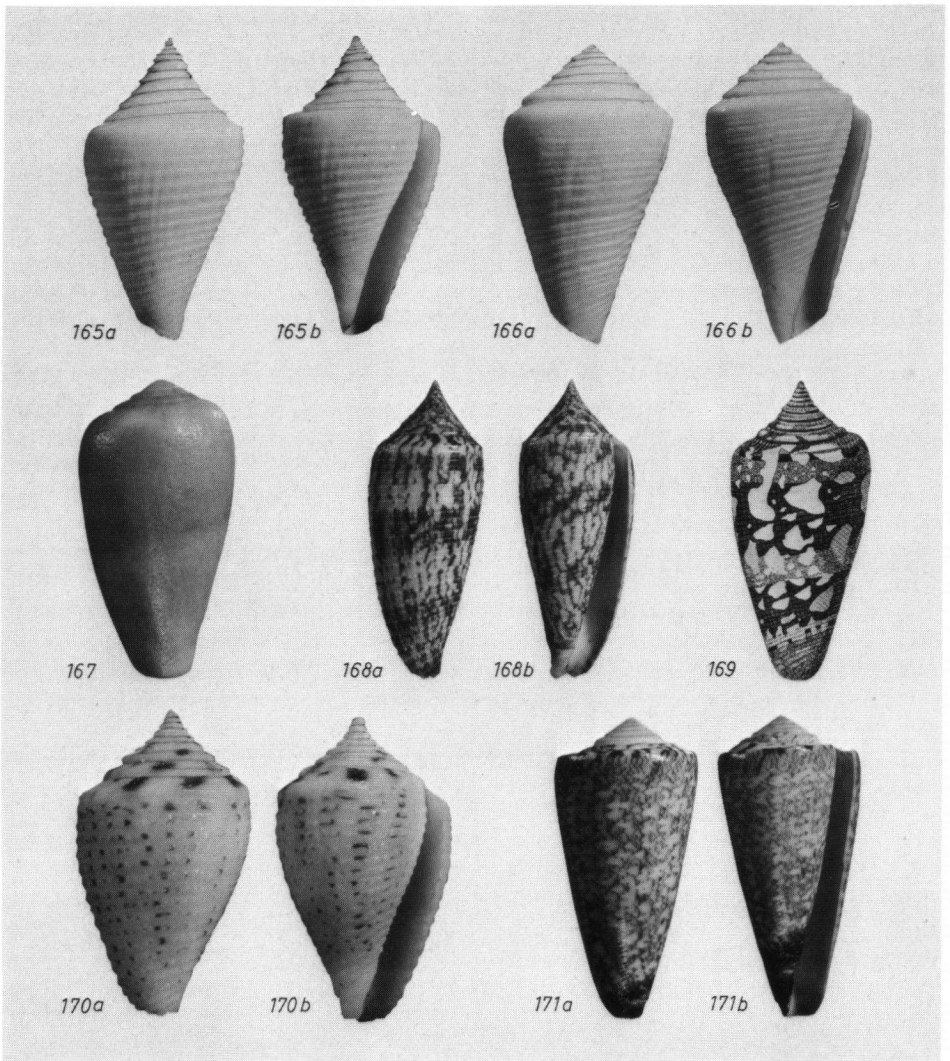


Fig. 150. *Conus anemone* fa. *compressus* Sow., holotype of *C. fusiformis* Lam. (=*C. atractus* Tomlin), length 48 mm (MHNG). Photo G. Dajoz, MHNG.
Fig. 151. *C. attenuatus* Rve, type figure, length 19 mm (after Reeve).
Fig. 152. *C. augur* Sol., Hikkaduwa, Ceylon, length 34.0 mm.
Figs. 153-155. *C. aulicus* L. 153. Moluccas, length 144.2 mm. 154. forma *aurantia* Dtz., lectotype (after Knorr), length 64 mm. 155. Juvenile (= '*C. auratus* var. *B*'), New Guinea, Jajapura, length 46.1 mm.
Figs. 156-157. *C. amadis* fa. *aurantia* Dtz. 156. Lectotype, length 71 mm (after Knorr). 157. Ceylon, length 74.2 mm.
Fig. 158. *C. spurius* fa. *aureofasciatus* Rehd. & Abb., holotype, Dry Tortugas, Florida, length 65.0 mm (USNM).



Figs. 159-160. *Conus aurantius* Hw. 159. Yellow, Malmok, Aruba, length 35.9 mm. 160. Dark brown, Curaçao, length 40.2 mm.
Fig. 161. *C. aureolus* Sow., holotype, length 19.1 mm (BMNH).
Fig. 162. *C. aureus* Hw., Moluccas, length 53.4 mm.
Fig. 163. *C. auricomus* Hw., Moluccas, length 59.1 mm.
Fig. 164. *C. aurisiacus* L., Moluccas, length 55.1 mm.



Figs. 165-166. *Conus austini* Rehd. & Abb. 165. Horn Id., Miss., Gulf of Mexico, length 32.6 mm
166. S. of Barbados, length 43.0 mm.
Fig. 167. *C. tinianus* fa. *aurora* Lam., Jeffreys Bay, S. Africa, length 31.8 mm.
Fig. 168. *C. australis* Holten, Kochi Pref., Japan, length 80.5 mm.
Fig. 169. *C. ammiralis* fa. *australis* Dtz., lectotype (after Hwass), Moluccas, length 66 mm.
Fig. 170. *C. axelrodi* Walls, paratype, Palawan, Philippines, length 13.8 mm (Natal Mus.).
Fig. 171. *C. thalassiarchus* fa. *azona* Wils, Siasi, Sulu Archipelago, length 51.6 mm.
Unless otherwise stated, specimens in ZMA.

ADDENDUM

amiralis

Conus cedonulli amiralis Hwass in Bruguière, 1792, Encycl. Méth.: 602-604, no. 1 A

Type. – Hwass mentioned one specimen in his collection, the shell is not present in MHNG at Geneva (Mermod, 1947: 172). From the references in Hwass we herewith designate the specimen figured in the Tableau Encyclopédique vol. 23, pl. 316 fig. 1 lectotype of *C. cedonulli amiralis* Hwass. The dimensions on the figure are 44 x 26 mm. The type figure will be reproduced in the next issue of this series.

Type locality. – 'les mers de l'amérique méridionale' (the seas of South America).

Remarks. – Hwass considered his *amiralis* (non *C. ammiralis* Linné, 1758) the typical 'variety' of *C. cedonulli* Linné, 1767. Next to this one he described eight more varieties of *C. cedonulli*. According to the I.C.Z.N. art. 45 they must be considered subspecific names (cf. Kohn, 1968: 450).

The type figure of *C. cedonulli amiralis* has the pattern of *C. cedonulli* specimens known from St. Vincent and Barbados, Lesser Antilles. The type figure of *C. cedonulli* Linné, in Seba (1759, vol. 3, pl. 48 fig. 8), also was compared to specimens from St. Vincent (Usticke, 1968: 20, figs. 1010; Dunn, 1971: 290-291, figs. 1-2; Vink, 1977: 85, pl. 1 fig. 1, pl. 2 figs. 1-2). Usticke changed the name into *Conus nulli-secundus*.

We consider *amiralis* Hwass a junior synonym of *Conus cedonulli* Linné, 1767. This is in accordance with the intention of Hwass, since he stated that *C. cedonulli amiralis* was 'Le vrai cédonulli' (the real *cedonulli*), described by Linné as *Conus ammiralis cedonulli*.

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SEBA, A., 1759. Locupletissimi rerum naturalium thesauri accurata descriptio, 3. Amsterdam.
VINK, D.L.N., 1977. The Conus cedonulli complex. Zool. Meded. Leiden 51: 79-93.