

RED SEA MOLLUSCA

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**Contribution to the knowledge of
Conus (Pionoconus) nigropunctatus G.B. Sowerby II, 1858**

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Abbreviations:

BMNH The Natural History Museum, London, UK.

DZB Dautzenberg Collection in KBIN, Reg. no. IG 10591.

EW E. Wils, Belgium.

GV G. Verbinnen, Belgium.

ICZN International Commission on Zoological Nomenclature.

JB J.A. Buijse, The Netherlands.

KBIN Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, Belgium.

MHNG Muséum d'histoire naturelle de la Ville de Genève, Switzerland.

ZMA Zoölogisch Museum, University of Amsterdam, The Netherlands.

Abstract: In the opinion of several authors (Wils et al., 1969; Bosch et al., 1995: 162; Rusmore-Villaume, 2008) *Conus nigropunctatus* Sowerby II, 1858 is a valid species. Others consider it a form (Röckel et al, 1995: 103) or a synonym (Hori, 2000: 593) of *C. catus* Hwass in Bruguière, 1792. To clarify the situation, a summary of evidence for

the first opinion from literature will be repeated. On top of this, every hue in the paint-box of the first species will be depicted, and compared with the most similar species.

Translation into Dutch: Sommige auteurs (Wils et al., 1969; Bosch et al., 1995: 162; Rusmore-Villaume, 2008) zijn van mening dat *Conus nigropunctatus* Sowerby II, 1858 een valide soort is. Anderen beschouwen dit als een vorm (Röckel et al, 1995: 103) of als een synoniem (Hori, 2000: 593) van *C. catus* Hwass in Bruguière, 1792. Om e.e.a te verduidelijken zal hier een samenvatting van het bewijs voor de eerste mening worden herhaald en zal de kleurvariëteit van eerstgenoemde soort worden afgebeeld en vergeleken met de meest gelijkende soorten.

Introduction: When looking for *Conus nigropunctatus* Sowerby II, 1858 at the OBIS site "<http://clade.ansp.org/obis/search.php/45803>" it appears that this species is put in synonymy with *C. catus* Hwass in Bruguière, 1792. Moreover, at Alan Kohn's "The *Conus* Biodiversity website "<http://biology.burke.washington.edu/conus/>" – with the verbatim reproductions of the accounts of *C. catus* from *Manual of the Living Conidae* (Röckel, Korn and Kohn, 1995), *C. nigropunctatus* is only regarded a form of *C. catus*. This is also the case in "An illustrated checklist of recent Conidae", which one can consult at "<http://www.schnr-specimen-shells.com/ConidaeChecklist.html>". At the "World register of marine species' website" we read *Conus nigropunctatus* G. B. Sowerby II, 1858 and its variety *pedi* Wils, 1971 to be synonymous with *C. catus* Hwass in Bruguière, 1792, while *Conus nigropunctatus elatensis* Wils, 1971 is regarded to be *Conus striolatus* Kiener, 1845.

Wils (1986) already explained that in the absence of a type in the BMNH and by the confusion Sowerby II created, it took a long time until the species was recognized as such.

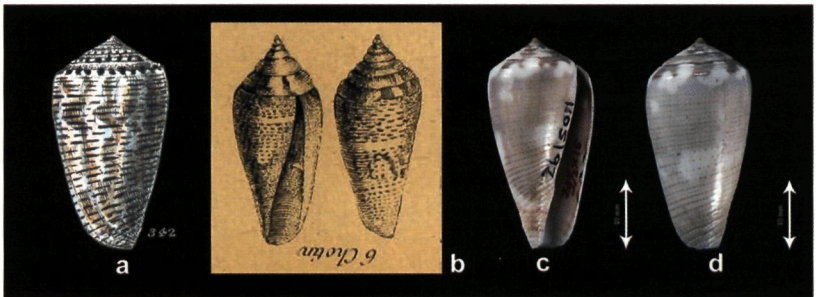


Fig. 1. a: Lectotype of *C. nigropunctatus* G.B. Sowerby II, 1858; b: Adanson's *Chotin*, lectotype of *C. adansonii* Lamarck, 1810; c-d: probable [syn]type of *C. adansonii* Lamarck, 1810 (MHNG inv. no. 52543, old no. 1105/92), 29.4x14.6 mm, type locality Senegal.

Sowerby II under no. 331 gave a description of “*Conus Adansoni* Lamk.” He probably based his use of the name on Reeve (1844, pl. 43, fig. 193), who depicted under the name *Conus Adansoni* from the Red Sea a shell which definitely is a true *C. nigropunctatus*; but his reference to Lamarck and to Adanson’s *Chotin* (Fig. 1 b) is wrong, because that refers to a West African species.



Fig.2. *Conus Adansoni* Lamarck – Reeve

Lamarck, according to the handwritten annotations by Lamarck’s daughter in the MHNG volumes of *Animaux sans Vertèbres* possessed two specimens of *C. adansonii* from Senegal, of which the whereabouts of only one is known [Fig. 1 c-d]. In his description Lamarck refers to the *Chotin* (Lamarck, 1845: 94, no. 133). But, the likeness to the *Chotin* is not speaking, and it is not 100% certain it is the original specimen figured in the *Encyclopedie Methodique* (Hwass, 1792: pl. 343, fig. 7), hence the status of a probable [syn]type only (Y. Finet, pers. comm., 4-II-2010). It must be this reason why Coomans et al. (1979: 21) chose to designate Adanson’s figure as the lectotype. This designation fixed the status of the specimen as the sole name-bearing type of *Conus adansonii* Lamarck, 1810, and a designation of the specimen MHNG inv. no. 52543 as lectotype would be invalid (ICZN 74.1.1). Therefore we consider it, as well as Hwass’ figure in the *Encyclopédie Méthodique* (pl. 343, fig. 7) to be possible paralectotypes. Kiener’s figure (1849, pl. 61, fig. 4), who by the way used a wrong name, was elucidated by Coomans et al. (1979: 21) and they concluded *adansonii* to be a form of *C. guinaicus* Hwass in Bruguière, 1792.

When Sowerby figured “*Conus Adansoni* Lamk” at pl. 199 figs. 286-289 he used 4 specimens from the Red Sea, which are *C. nigropunctatus*. He described no. 332 as *Conus nigropunctatus* and remarked: “More cylindrical than *C. adansonii*, and characterized by well defined square spots on the angle of the whorls”, nevertheless a feature that only seldom occurs. He depicts *Conus nigropunctatus* as such at pl. 201 fig. 342 [Fig. 1 a]. *C. adansonii* Lamarck, 1810 is a West African species and Sowerby’s use of the name is a misidentification. After describing *Conus catus* he added: “*C. adansoni* stands halfway between this species and *C. nigropunctatus*.”

Issel (1869: 142.143) did not mention the name *C. nigropunctatus*, but presented no. 325 *Conus catus* Bruguière as a rare species from the Gulf of Aqaba, and no. 332 as *Conus adansonii* Lamarck. Wils (1971:59) cast about for the explanation that Issel used Hwass’ work with disregard of Sowerby’s. Subsequent authors (Tryon, 1884;

Sturany, 1903) regarded *C. nigropunctatus* as a Red Sea variety [= subspecific cf. ICZN 45.6.4] of *C. catus*.

Weinkauff (1874) probably confused *C. nigropunctatus* with *C. striolatus* Kiener, 1845 by wrongly extending the former's range to the Central Pacific. So did others after him: Jickeli (1875), Dautzenberg (1937), Walls (1979), Wils (1971) and Oliver (1975). This of course added to the confusion. Hence, Wils (1971:61) presumed the nominal species *C. nigropunctatus nigropunctatus* to occur in the Pacific when he described *C. nigropunctatus elatensis* as a new subspecies from the Red Sea. Later he came back to the subject (Wils, 1986: 185,186). Coomans et al. (1986: 101) considered the latter a junior synonym of *C. nigropunctatus*.

Systematics:

- Superfamily: Conoidea Fleming, 1822
- Family: Conidae Fleming, 1822
- Subfamily: Coninae Fleming, 1822
- Genus: *Conus* Linnaeus, 1758
- Subgenus: *Pionoconus* Mörch, 1852
- Type species: *Conus marmoreus* Linnaeus, 1758

Conus (Pionoconus) nigropunctatus G.B. Sowerby II, 1858

- 1817 ... Savigny: Coquilles pl. 6 figs 161,162
- 1844 *Conus Adansoni* Lamarck – Reeve: *Conus* pl. 43 fig. 190,193 (not Lamarck, 1810)
- 1858 *Conus nigropunctatus* Sowerby, II: 38-332, pl. 201 fig. 342
[fig. 342 = designated lectotype with type locality Elat, Gulf of Aqaba, Red Sea by Wils (1986: 184)]
- 1858 *Conus Adansoni* Lamk. – Sowerby II: pl. 199 figs 286-289 (not Lamarck, 1810)
- 1869 *Conus catus* Bruguière – Issel: 142, nr. 325
- 1869 *Conus adansonii* Lamarck – Issel: 143, nr. 332 (not Lamarck, 1810)
- 1888 *Conus catus* Brug. – Paetel: 293
- 1888 *Conus catus* Brug. var. *nigropunctatus* Sow.– Paetel: 293
- 1888 *Conus nigropunctatus* Sow.– Paetel: 302
- 1873 *Conus Adansoni* auct. – Weinkauff: 220, pl. 34, figs 11,12 (not Lamarck, 1810)
- 1874 *Conus nigropunctatus* Sow. – Weinkauff (a): 250
- 1874 *Conus nigropunctatus* Sow. – Weinkauff (b): 30 (218)
- 1875 *Conus nigropunctatus* Sowb. – Jickeli: 57
- 1884 *Conus catus* Hwass var. *nigropunctatus*, Sowb. – Tryon: 64, pl. 20 figs 8,9

- 1903 *Conus catus* Hwass var. *nigropunctatus* Sow. – Sturany: 250, 274
 1926 *Conus catus* Hwass var. *nigropunctatus* Sowerby – Pallary: 91, pl. 10 figs 161,162
 1938 *Conus magus* Linné – Lamy: 43
 1938 *Conus catus* Hwass – Lamy: 43
 1969 *Conus nigropunctatus* Sowerby, 1857 – Wils et al: 59/90, pl. 10 fig. 6
 1971 *Conus nigropunctatus elatensis* Wils et al, 1971 – Wils et al: 61
 1975 *Conus nigropunctatus* Sowerby, 1857 – Oliver: 270
 1978 *Conus achatinus* – Mastaller: 122; 135
 1979 *Conus achatinus* Hwass, 1792 – Mastaller: 103
 1979 *Conus catus* Hwass, 1792 – Mastaller: 104
 1979 *Conus magus* L., 1758 – Mastaller: 106
 1982 *Conus nigropunctatus* Sowerby, 1857 – Abbott & Dance: 256/1.3
 1984 *Conus monachus* Linnaeus – Taylor & Reid: 205
 1984 *Conus nigropunctatus* Sowerby, 1857-1858 – Sharabati: 76, pl. 31, figs. 2,2a
 1984 *Conus catus* Hwass in Bruguière, 1792 – Sharabati: 76, pl. 31, figs. 3,3a
 1986 *Conus nigropunctatus elatensis* Wils et al, 1971 – Coomans et al: 100, 101, fig. 698 – lectotype
 1986 *Conus nigropunctatus* Sowerby, 1857 – Coomans et al: 101
 1986 *Conus nigropunctatus* Sowerby, II 1857 – Wils: 184, figs. 61,63,64,66
 1992 *Conus nigropunctatus* Sowerby, 1857 – Fainzilber et al.: 7
 1994 *Conus catus* Hwass in Bruguière, 1792 – Coulombel: 97, figs
 1995 *Conus nigropunctatus* Sowerby, 1857 – Bosch et al.: 162, pl. 713
 1995 *Conus catus* Hwass in Bruguière, 1792 forma *nigropunctatus* – Röckel: 103, pl. 15, figs. 24-27
 1997 *Conus nigropunctatus* Sowerby II, 1857 – Verbinnen: 52, pl. 2/4 (a,b)
 2000 *Conus nigropunctatus* Sowerby, 1857 – Dekker & Orlin: 31
 2002 *Conus nigropunctatus* Sowerby, 1857 – Heiman: 21 (T1) 13
 2007 *Conus nigropunctatus* Sowerby II, 1857 – Verbinnen & Wils: 151, pl.2 fig. 25
 2008 *Conus nigropunctatus* – Rusmore-Villaume: 126, 127 figs
 2008 *Conus nigropunctatus* Sowerby II, 1857 – Dekker & Van Gemert: 131
 2008 *Conus nigropunctatus* Sowerby II, 1858 – Van Gemert: 147
 2010 *Conus nigropunctatus elatensis* Wils, 1971 – Bozzetti: 11-12

Not:

- 1884 *Conus catus* Hwass var. *nigropunctatus*, Sowb. – Tryon: 64, pl. 20 fig. 9
 [= *Conus catus* Hwass in Bruguière, 1792]
 1894 *Conus nigropunctatus* Sowerby. – Horst & Schepman: 27 [= probably *C. striolatus*]
 1913 *Conus (Achatini) nigropunctatus* Sowerby – Schepman: 390 [= probably *C. striolatus*]
 1925 *Conus (Achatini) nigropunctatus* Sowerby as synonym of *Conus (Dendroconus) achatinus* Hwass – Oostingh: 207 [= probably *C. striolatus*]

- 1979 *Conus nigropunctatus* Sowerby II, 1857-1858 – Walls: 763-764, pl. 497 [= *C. striolatus* Kiener, 1845]
- 1981 *Conus nigropunctatus* Sow. – Eisenberg: 142, figs. 2, 2a-b-c [= *C. striolatus*]
- 2000 *Conus (Chelyconus) catus* Hwass in Bruguière, 1792 – Hori: 591, pl. 294 fig. 30 with *C. nigropunctatus* Sowerby, 1857 as synonym [= *C. catus*]
- 2007 *Conus (Chelyconus) catus* forma *nigropunctatus* Sowerby, 1857 – Thach: 136, pl. 673 [= *C. striolatus*]

Original description by Sowerby: *C. oblongus*, subcylindricus, obtusus, solidus, caeruleus, castaneo sparsim maculatus, lineus nigris albo interruptis cinctus; spira obtusâ, ad angulum seriatim nigropunctatâ, anfractibus depressis. [*C.* longish, not quite cylindrical, blunt, solid, bluish, speckled with chestnut brown, black lining interrupted by white girdles, spire blunt, ad the shoulder a row of dark spots, bent low.]

Types:

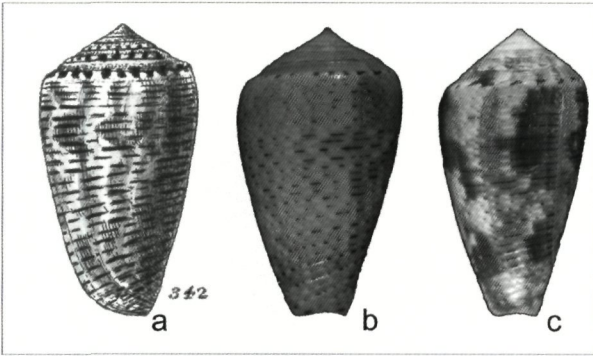


Fig. 3. a: Lectotype *C. nigropunctatus* G.B. Sowerby II, 1858; b: Paralectotype *C. n. elatensis* Wils et al., 1971 [ZMA 139787, 25.9x15.4 mm]; c: Lectotype *C. n. elatensis* [ZMA 136999, 28.1x15.2 mm]

The original shell used by Sowerby for his description of *C. nigropunctatus* [habitat unknown] has not been traced in BMNH and was considered to be lost (Wils, 1986: 184). Wils then appointed Sowerby's fig. 343 as the lectotype and Eilat, Gulf of Aqaba, Red Sea as the type locality. *C. nigropunctatus elatensis* Wils et al., 1971 is a synonym. Its lectotype, designated by Coomans et al. (1986: 101), is in ZMA 136999 (old nr.371001), type locality: northern part of the Gulf of Aqaba.

General description of *C. nigropunctatus*: Average size 30 mm, the largest shell depicted herein measures 58 mm. Spire of moderate height, straight to slightly convex.

Shoulders rounded. Body whorl with straight sides, slightly convex adapical. Ground colour off-white with purple-bluish or light bluish grey underground. Protoconch multispiral. Teleoconch and first whorls pink with tiny dark spots in between tubercles, hence the name. The sutural ramp slightly concave with 3-4 spiral ridges. Surface of body whorl with continuous axial striae. At the anterior third of the shell a few low, wavy spiral ridges. Some specimens show dark spots on the shoulder. Many specimens show irregularly formed dark brown or orange patches on the body whorl. The adapical part of the lower half of the last whorl with a lighter coloured band. The whole surface of the last whorl shows fine, interrupted brown spiral lining at regular intervals. The interruptions are caused by white dashes. The aperture is bluish white. The operculum is small; the smooth periostracum is yellowish brown. The form '*peledi*' [an unavailable name acc. ICZN: art. 45.5] (Wils, 1971: 64) is uniformly banded with light and dark orange-brown.

Habitat: The species is piscivorous and has been collected from the low tide zone until depths of 35 m, hiding during daytime under coral rubble. Fainzilber et al. (1992: 7,15) reported it in sandy lagoons near seaweed and on the sandy outer slopes of fringing reefs, feeding on blennies during the night.

Distribution: *C. nigropunctatus* is known from the Red Sea including the Gulf of Aqaba and the Gulf of Suez, Gulf of Aden, Yemen until the Gulf of Oman; and Somalia (pers. comm. L. Bozzetti 17.III.2010).

Comparison:

Conus achatinus Gmelin, 1791 [up to 80 mm]. Teleoconch and first whorls not tubercular, beige coloured. The wavy sutural ramp is slightly concave with 4-6 spiral ridges increasing when adult, body whorl more convex; with variably spaced spiral ribs at the lower half, sometimes extending adapically. Ground colour white. Surface with spiral rows of dark spots, sometimes fusing into brown lines. Colour variable. Specimens from eastern Indonesia sometimes granulated. Distribution: Gulf of Oman, Central Indo-Pacific [including Australia, Solomon Islands, New Caledonia, Vanuatu (source OBIS)].

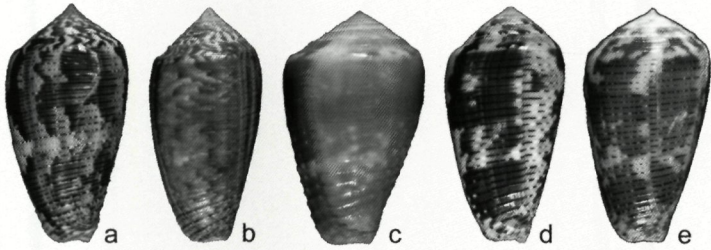


Fig. 4. a. *Conus achatinus*; b. *C. monachus*; c. *C. catus*; d. *C. nigropunctatus*; e. *C. striolatus*.

C. monachus Linnaeus, 1758 [up to 70 mm]. Teleoconch and first whorls not tubercular, beige coloured. The sutural ramp is slightly concave with 4-8 fine spiral ridges. Shoulder angulated. Last whorl slightly convex, surface smoother. Deep, widely set spiral grooves at anterior 1/4 of the last whorl. Ground colour bluish grey. Patches olive green, darker in adult specimens, alternated with white clouds. Specimens from southwestern Pacific sometimes granulated. Distribution: Central West Pacific [Philippines, Indonesia, Solomon Isl., New Caledonia, Vanuatu (source OBIS)].

C. catus Hwass in Bruguière, 1792 [up to 45 mm] is less slender, mostly squat. Teleoconch and first whorls tubercular, pink to purple. Shoulder angulated. The sutural ramp is slightly concave with 4-6 spiral ridges increasing when adult. Spiral ridges at the lower half of the body whorl often pronounced and tubercular. Distribution: Indo-Pacific except the Red Sea.

C. striolatus Kiener, 1845 [up to 40 mm]. More solid. Teleoconch and first whorls slightly tubercular, pink coloured. The sutural ramp is slightly convex with 4-5 fine spiral ridges. Last whorl ovate. Ground colour off white, light grey or beige. Dautzenberg (1910: 26) described: “*Conus magus* var. *decurtata* nov. var. [= *Conus adansoni* Sowerby, non Lamarck ...] Cette forme présente le même dessin et la même coloration que le *C. magus*; mais elle est plus petite et beaucoup plus trapue.» *C. magus* var. *decurtatus* Dautzenberg, 1910 is a synonym [lectotype designated by Coomans et al., (1985: 158), measuring 28.5x16.7 mm, collection DZB] Distribution: Indo-Malaysia, Western central Pacific to Vanuatu.

Remarks: In the past the discussed species were placed within the subgenus *Chelyconus* Mörch, 1852. Research on chemistry of cone venoms (Olivera, 2006; Imperial et al., 2007) resulted in a cladistic analysis [Fig. 5]. Based hereupon *C. nigropunctatus* belongs to the subgenus *Pionoconus* Mörch, 1852. We agree.

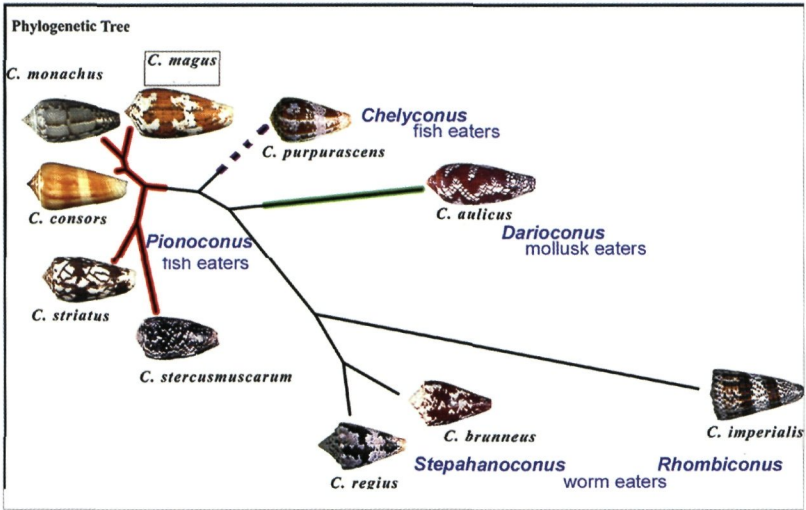


Fig. 5.. Phylogenetic tree, based on Imperial et al. (2007). [*C. nigropunctatus* within the branch of *C. monachus*.]

Tucker & Tenorio (2009:10) worked out a new classification in which *Pionoconus* is a genus itself. In their work they propose 89 genera divided over 5 families within the Conoidea: Conidae; Conorbiidae; Conolithidae; Hemiconidae and Taranteconidae. They based their views on radular morphology research and using modern statistical methods, which enabled them to establish the foundations of their proposed classification. We have chosen not to follow their views and regard *Pionoconus* as a subgenus of *Conus*.

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Literature:

- Abbott, R.T. & S. C. Dance.** 1982. *Compendium of Seashells*: 1-411. New York.
- Bosch, D., S. C. Dance, R.G. Moolenbeek & C. Graham Oliver.** 1995. *Seashells of eastern Arabia*: 1- 296. Dubai.
- Bozzetti, L.** 2010. *Conus simonis* (Gastropoda: Prosobranchia: Conidae) a new species from South Eastern Madagascar. *Malacologia* (Cupra Marittima) 66).
- Coomans, H.E., R.G. Moolenbeek & E. Wils.** 1985. Alphabetical revision of the (sub)species in recent Conidae 8. *Basteria* 49: 145-196.
- Coomans, H.E., R.G. Moolenbeek & E. Wils.** 1986. Alphabetical revision of the (sub)species in recent Conidae 9. *Basteria* 50: 93-150.
- Coulombel, A.,** 1994. *Coquillages de Djibouti*. Edisud.: 1-143. Aix-en-Provence.
- Dance, S.C.** [Ed.] 1974. *The Encyclopedia of Shells*: 1-288. London.
- Dautzenberg, Ph.** 1910. Liste de coquilles recueillies par le R.C. Aubin dans l'île de Rua Sura (Archipel Salomon) en 1909. *J. Conchyl.* 58: 24-33.
- Dautzenberg, Ph.** 1937. Observations sur le genre Cône et descriptions de trois espèces nouvelles, avec une catalogue alphabétique des Cônes actuellement connus. *Revue Mag. Zool.* (2) 10:113-127.
- Dautzenberg, Ph.** 1937. Gastéropodes marins. 3. Famille Conidae.- *Mém, Mus, R. Hist. Nat. Belg.* Hors série 2 (18): 1-280.
- Dekker H. and Orlin Z.** 2000. Check list of Red Sea Mollusca. *Spirula*, 47(suppl.): 1-46.
- Dekker H. & L.J. van Gemert.** 2008. A new list with corrections to the shells pictured in "Red Sea Shells" (1984) by Doreen Sharabati. *De Kreukel* 44 (7-8): 123-136.
- Duda T.F. Jr., A.J. Kohn, S. R. Palumbi.** 2001. Origins of diverse feeding ecologies within *Conus*, a genus of venomous marine gastropods. *Biological Journal of the Linnean Society*, 73: 391-409.
- Eisenberg, J.M.** 1981. *Seashells of the World*: 1-239. New York, London.
- Fainzilber, M., H.K. Mienis, and J. Heller.** 1992. The Conidae (Mollusca, Gastropoda) of the shallow waters of the east coast of Sinai, Gulf of Elat, Northern Red Sea. *Argamon, Israel Journal of Malacology*, 14: 1-16.
- Fischer-Piette, E.** 1942. Les mollusques d'Adanson. *J. Conchyl.*, Paris 85: 101-366.
- Gemert, L.J. van.** 2008. A new book on shells from the Red Sea by Mary Lyn Rusmore-Villaume. *De Kreukel* 44 (7-8): 143-150.
- Gmelin, J.F.** 1791. *Systema Naturae per regna Tria Naturae* / 13 ed., (1)6. Leipzig.
- Heiman, E.L.** 2002. Shells of East Sinai, an illustrated list. Conidae. *Triton*, 5: 19-23.
- Hori, S.** 2000. Conidae. In: **T. Okutani** (ed.). *Marine Mollusks in Japan*: 1-1173. Tokyo.
- Horst, R. & M.M. Schepman.** 1894. *Catalogue systématique des mollusques. – Première partie.* Muséum d'Histoire Naturelle des Pays-Bas, 13: 1-176. Leiden.
- Hwass, C. H.** 1792. Cone. In: **Bruguière, J. -G.** *Encyclopédie Méthodique ou par ordre de matières. Histoire Naturelle des Vers*, 1: 586-757. Paris.
- Imperial J. S., N. Silvertown, B. M. Olivera, C. K. Bandyopadhyay, A. Sporning, M. Ferber & H.Terlau.** 2007. Using chemistry to reconstruct evolution: On the origins of fish-hunting in venomous cone snails. *Proceedings Of The American Philosophical Society*, 151 (2): 185-200.
- Issel, A.** 1869. *Malacologia del Mare Rosso*. 1/387. Pisa.
- Jickeli, C.F.** 1874. Studien über die Conchylien des Rothen Meeres, 2, Die Gattung *Conus*. *Jahrbuch Deutsch. Malakozool. Gesl.*, 2: 43-71.
- Kiener, L.C.** 1845-1850. *Spécies général et iconographie des coquilles vivante*, 2: 1-379. Paris.
- Kohn, A.J.** 1965. *Conus* (Mollusca, Gastropoda) collected by the Israel South Red Sea

- expedition 1962, with notes on collections from the Gulf of Akaba and the Sinai Peninsula. *Sea Fisch. Res. Stat. Haifa Bull.* (38): 54-59.
- Lamarck, J.B.P.A. de.** 1810. Sur la détermination des espèces. *Annls. Mus. Hist. nat. Paris* 15: 20-4-, 263-286, 422-442.
- Lamarck, J.B.P.A. de.** 1845. *Histoire naturelle des animaux sans vertèbres*, 2, tome 11, 1-665. Paris
- Mastaller, M.** 1978. The Marine molluscan assemblages of Port Sudan, Red Sea. *Zoologische Mededelingen* 53 (13): 118-144.
- Mastaller, M.** 1979. *Beiträge zur Faunistik und Ökologie der Mollusken und Echinodermen in den Korallenriffen bei Aqaba, Rotes Meer*. Ruhr-Universität Bochum. Dissertation. 1-344.
- Oliver, A.P.H.** 1975. *The Hamlyn guide to shells of the world*: 1-320. London.
- Olivera, B.M.** 2006. *Conus peptides*: Biodiversity-based discovery and exogenomics. *The Journal of Biological Chemistry*, 281, 31173-31177.
- Oostingh, C.H.** 1925. Report on a collection of recent shells from Obi and Halmahera, Molluccas. *Mededeelingen van de Landbouwhoogeschool te Wageningen* 29 (1): 1-362
- Paetel, F.** 1888. *Catalog der Conchylien. Sammlung von Fr. Paetel*: [i] 1-271. Berlin.
- Pallary, P.** 1926. Explication des planches de J.C. Savigny. — *Mémoires de l'Institut d'Égypte* 11: 1-138, pls. 1-18.
- Petit, R. E.** 2009. George Brettingham Sowerby, I, II & III: their conchological publications and molluscan taxa. — *Zootaxa* 2189: 1-218.
- Reeve, L. A.** 1843-1844. *Monograph of the genus Conus. Conchologia Iconica I.* London. pls 1-47
- Regenfuss, R.M.** 1758. *Sammlung von Muscheln, Schnecken und anderen Schaaltieren*, 1-193, pls 1-12, figs 1-78. København.
- Richard, G.** 1990. *Revision des Conidae du Muséum national d'histoire naturelle de Paris*: 1-231. Ecole Pratique des Hautes Etudes. Perpignan Cedex.
- Röckel, D., W. Korn & A.J. Kohn.** 1995. *Manual of the living Conidae*. 1-517. Hong Kong.
- Rusmore-Villaume, M.L.** 2008. *Seashells of the Egyptian Red Sea*. i-xii, 1-307. Cairo.
- Savigny, J-C.** 1817. *Description de l'Égypte, ou recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française, publiée par ordre du gouvernement. Histoire naturelle*. Planches, vol. 2. Paris.
- Schepman, M.M.** 1913. *The Prosobranchia of the Siboga Expedition - Part V Toxoglossa. Siboga-Expeditie Monographie*, 49 1e: 365-452, pls 25-30, 1 textfig.
- Sharabati, D.** 1984. *Red Sea shells*: 1-128; pls. 1-49. London.
- Sowerby, G.B. II,** 1858. *Thesaurus Conchyliorum*, Vol. 3 (*Conus*) 1-323; pl. 1-36. London.
- Sturany, R.** 1903. Expedition S.M. Schiff "Pola" in das Rote Meer, nördliche und südliche Hälfte. 1895/96 und 1897/98. Zoologische Ergebnisse. XXIII. Gastropoden des Roten Meeres. — *Denkschriften der Mathematisch-Naturwissenschaftlichen Classe der Kaiserlichen Akademie der Wissenschaften*, Wien 74: 209-283, pls. 1-7.
- Taylor, J.D. & D.G. Reid.** 1984. The abundance and trophic classification of molluscs upon coral reefs in Sudanese Red Sea. *Journal of Natural History* 18: 175-209.
- Thach, N.N.** 2007. *Recently collected shells of Vietnam*: 1-384. Cupra Marittima.
- Tomlin, J.R.** le B. Catalogue of recent and fossil cones. *Proc. Malac. Society London* 22: 205-330.
- Tucker, J.K. & M.J. Tenorio.** 2009. *Systematic Classification of Recent and Fossil Conoidean Gastropods*. Hackenheim.
- Verbinnen, G.** 1997. Red Sea Malacology XII. Conidae of the Raised Reefs. *Gloria Maris*

Verbinnen, G. & E. Wils. 2007. Red Sea Mollusca Part 24: Conidae. *Gloria Maris* 45(6): 142- 164.

Walls, J.G. 1979. *Cone Shells. A synopsis of the living Conidae*: 1-1021. Neptune City (N.J.).

Weinkauff, H.C. 1873-1875. *Die Gattung Conus. System. Concycl. Cab. Von Martini und Chemnitz* 4 (2): 125-413. Nürnberg.

Weinkauff, H.C. 1874. Catalog der Gattung *Conus* L. *Jahrb. der malak. Gesch.* 1: 236-305

Wils, E. & werkgroep "Xenophora" Gloria Maris. 1969-1974. *Familie Conidae*: 1-108.

Wils E. 1986. Red Sea Malacology, III, Revisie: De Conidae van de Rode Zee. *Gloria Maris* 25: 161-206.

Fig. 6. The white rather straight outline of *C. nigropunctatus* against the more convex silhouette of *C. catus*, with the wavy outline due to the spiral cords.



Plate 1 (sizes not in proportion to each other)

1. Lectotype *Conus nigropunctatus* Sowerby, 1858
2. Israel, Elat, paralectotype of *C. n. elatensis* Wils et al., 1971, 25.8 mm, coll. ZMA 136999
3. *C. nigropunctatus*: Egypt, Hurghada, 38.8 mm, coll. GV - 3a. Idem
4. *C. nigropunctatus*: Egypt, Hurghada, 39.9 mm, coll. JB 4350
5. Lectotype of *Conus catus* Hwass in Bruguière, 40.0 mm, MHNG inv. no. 52604 (ex MHNG 1106/53) - 5a. Idem
6. *C. catus*: Sri Lanka, Hikkaduwa, 34.8 mm, ZMA 039359
7. *C. catus*: Philippines, Samar, 32.9 mm, coll. JB 12375
8. Lectotype of *Conus achatinus* Gmelin, 1791, 68.7 mm, MHNG inv. no. 52583 (ex MHNG 1106/32), type locality "Indes Orientales" - 8a. Idem
9. *C. achatinus*, "Ocean Asiatuique", 61.0 mm, MHNG inv. no.52512 (ex MHNG 1105/61-1)
10. *C. achatinus*, "Ocean Asiatuique", 65.7 mm, MHNG inv. no.52584 (ex MHNG 1106/33) - 10a. Idem
11. Lectotype of *Conus monachus* Linnaeus, 1758 (Regenfuss, pl. 12, fig. 68)
12. *C. monachus*: Indonesia, Maluku, 44.5 mm, ZMA 063054
13. *C. monachus*: Indonesia, Maluku, 49.1 mm, ZMA 063066
14. *C. monachus*: Indonesia, Maluku, 35.2 mm, ZMA 063098
15. *Conus striolatus* Kiener, 1845, 28 mm
16. Lectotype of *Conus magus* var. *decurtata* Dautzenberg, 1910 28,5 mm, coll. KBIN
17. *C. striolatus* Philippines, Samar, 27.9 mm, coll. ZMA 100579
18. *C. striolatus* Philippines, Cebu, 34.6 mm, coll. JB 12381
19. *C. striolatus* Papua New Guinea, New Britain, 30.6 mm, coll. ZMA 084833



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3 & 2



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3a



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8a



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10a



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Plate 2: All *C. nigropunctatus* Sowerby, 1858 (sizes in proportion to each other)

1. Egypt, Safaga, Lotus Bay (26°50'N 33°57'E), 19.5 mm, coll. EW - 2 figs
2. Egypt, Port Ghalib (25°31'N 34°38'E), 23.5 mm, coll. GV - 2 figs
3. Port Ghalib, 24.5 mm, coll. GV - 2 figs
4. Port Ghalib, 27.6 mm, coll. GV - 2 figs
5. Egypt, Hurghada, 22.6 mm, coll. JB 4350 - 2 figs
6. Hurghada, 22.6 mm, coll. GV - 2 figs
7. Hurghada, 29.6 mm, coll. GV - 1 fig.
8. Egypt, Berima (27°18'N 33°45'E), 25.2 mm, coll. GV - 2 figs
9. Berima, 27.2 mm, coll. GV - 1 fig.
10. Berima, 28.6 mm, coll. GV - 2 figs
11. Berima, 29.9 mm, coll. GV - 2 figs
12. Berima, 29.9 mm, coll. GV - 1 fig.
13. Israel, Elat (29°31'N 34°56'E), lectotype *C. nigropunctatus elatensis* Wils, 1971, 28.1 mm, ZMA 136999 - 2 figs
14. Elat, paralectotype *C. nigropunctatus elatensis*, 38.8 mm, ZMA 136999 - 1 fig.
15. Lotus Bay, 31.0 mm, coll. GV - 2 figs
16. Port Ghalib, 28.0 mm, coll. GV - 2 figs
17. Port Ghalib, 36.7 mm, coll. GV - 1 fig.
18. Port Ghalib, 34.8 mm, coll. JB 10903 - 2 figs
19. Lotus Bay, 31.6 mm, coll. GV - 2 figs
20. Lotus Bay, 31.9 mm, coll. GV - 2 figs
21. Lotus Bay, 32.4 mm, coll. GV - 1 fig.
22. Lotus Bay, 33.2 mm, coll. GV - 1 fig.
23. Egypt, Dahab (28°28'N 34°30'E), 36.4 mm, coll. GV - 1 fig.
24. Egypt, Gebel Ish (27°19'N 33°43'E) 35.7 mm, coll. GV - 2 figs
25. Port Ghalib, 35.4 mm, coll. GV - 1 fig.

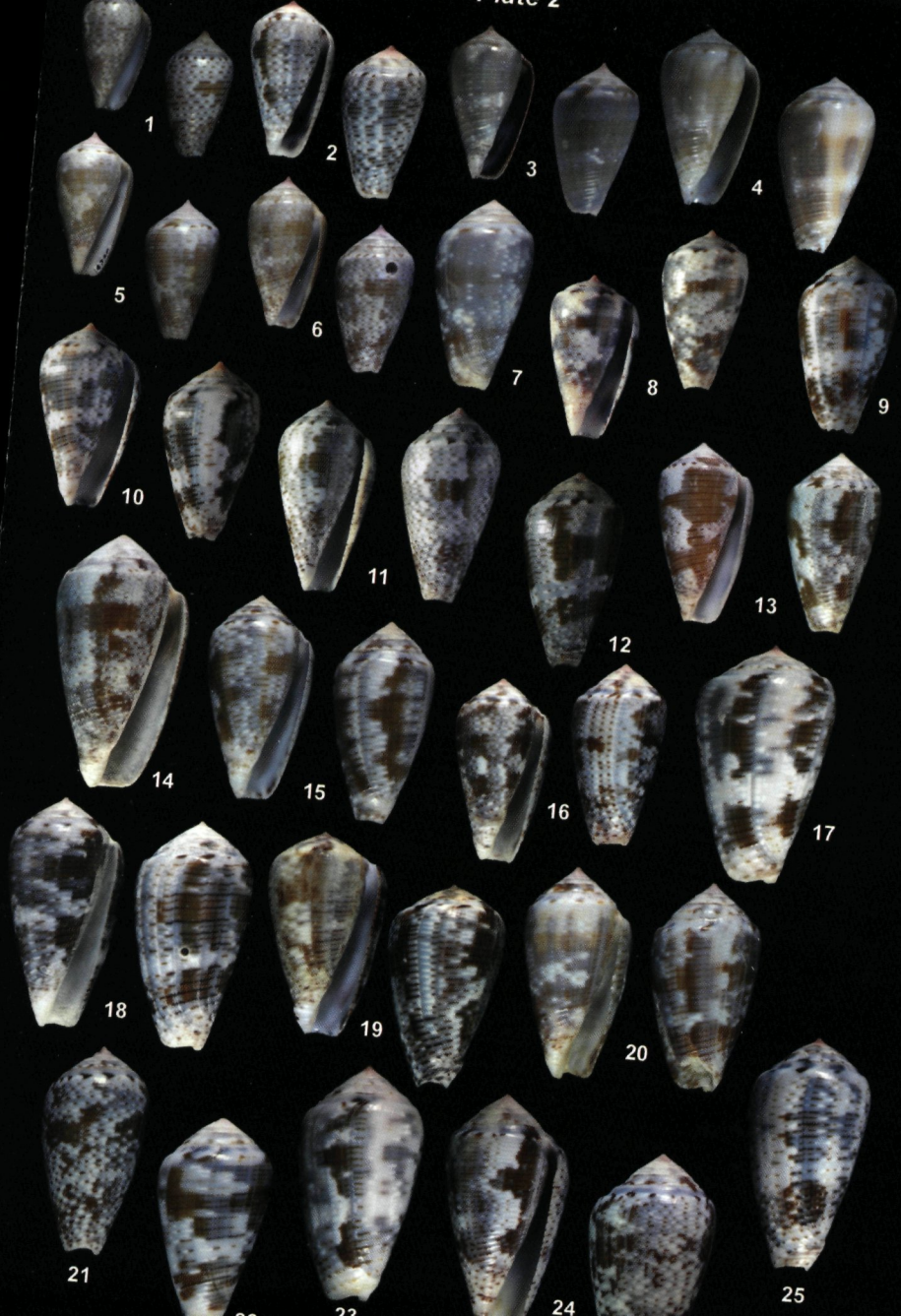
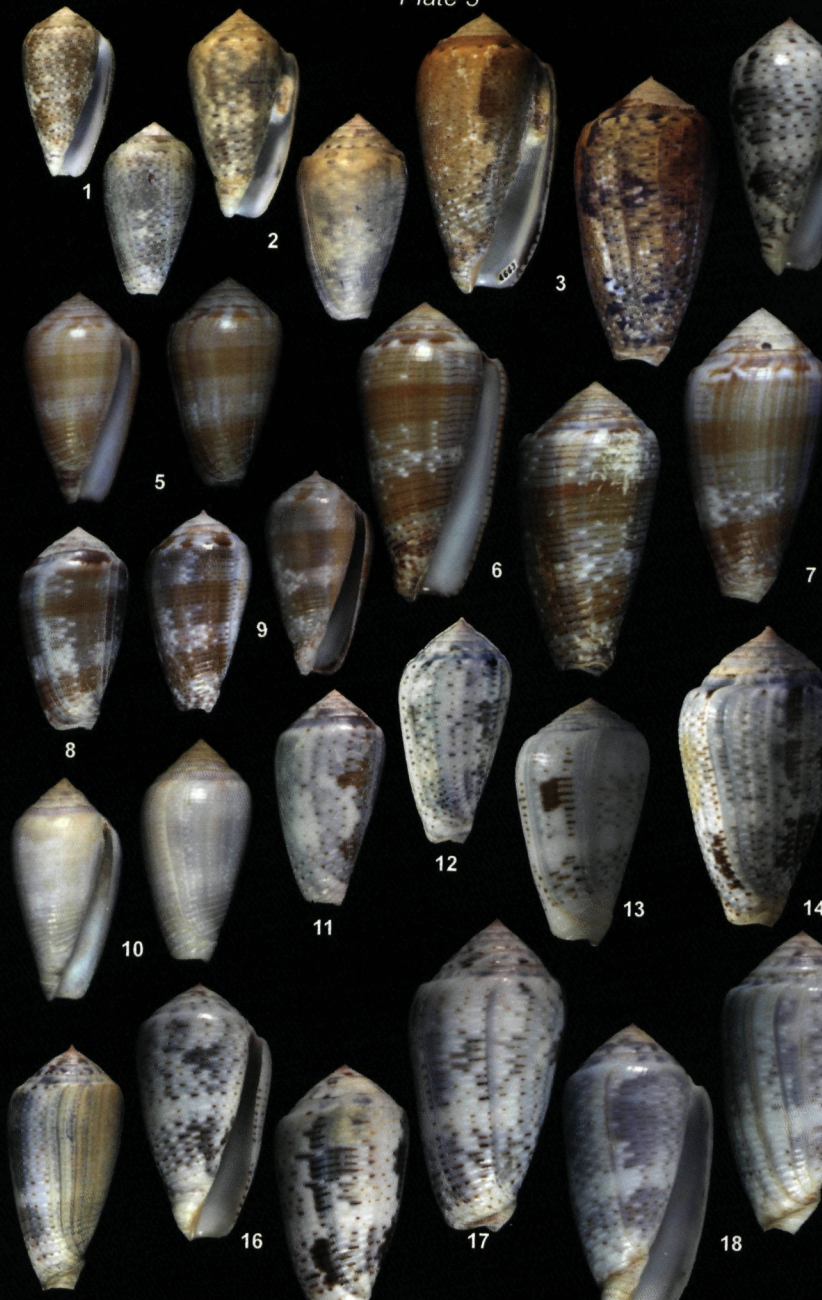


Plate 3: All *C. nigropunctatus* Sowerby, 1858 (sizes in proportion to each other)

1. Port Ghalib, 27.5 mm, coll. JB 10329 (with periostracum) - 2 figs
2. Hurghada, 32.8 mm, coll. JB 4663 (with periostracum) - 2 figs
3. Hurghada, 44.6 mm, coll. JB 4663 (with periostracum) - 2 figs
4. Hurghada, 39.9 mm, coll. JB 4350 - 1 fig.
5. Elat, 33.5 mm coll. EW (forma *peledi*) - 2 figs
6. Hurghada, 46.8 mm, coll. EW - 2 figs
7. Egypt, Sharm el Sheikh, Ras Nusrani (27°58'N 34°25'E), 46.2 mm, coll. EW - 1 fig.
8. Hurghada, 29.6 mm, coll. GV - 1 fig.
9. Port Ghalib, 32.0 mm, coll. GV - 2 figs
10. Lotus Bay, 31.0 mm, coll. EW - 2 figs
11. Berima, 33.8 mm, coll. GV - 1 fig.
12. Berima, 34.7 mm, coll. GV - 1 fig.
13. Berima, 38.9 mm, coll. GV - 1 fig.
14. Berima, 46.9 mm, coll. GV - 1 fig.
15. Port Ghalib, 38.5 mm, coll. JB 10903 - 1 fig.
16. Port Ghalib, 41.4 mm, coll. GV - 2 figs
17. Dahab, 48.5 mm, coll. GV - 1 fig.
18. Gebel Ish, 47.4 mm, coll. GV - 2 figs



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Plate 4: All *C. nigropunctatus* Sowerby, 1858 (sizes in proportion to each other)

1. Berima, 30.9 mm, coll. GV - 2 figs
2. Berima, 33.6 mm, coll. GV - 2 figs
3. Hurghada, 33.6 mm, coll. GV - 1 fig.
4. Port Ghalib, 32.9 mm, coll. GV - 2 figs
5. Port Ghalib, 34.8 mm, coll. JB 10903 - 2 figs
6. Port Ghalib, 40.9 mm, coll. JB 10903 - 2 figs
7. Gebel Ish, 42.9 mm coll. GV - 2 figs
8. Gebel Ish, 43.9 mm coll. GV - 2 figs
9. Lotus Bay, 43.3 mm, coll. GV - 2 figs
10. Egypt, Sharm el Sheikh, Milton Bay (27°52'N 34°17'E) coll. EW - 2 figs
11. Hurghada, Pleistocene, 40.6 mm, GV - 2 figs
12. Hurghada, Pleistocene, 49.7 mm, GV - 2 figs

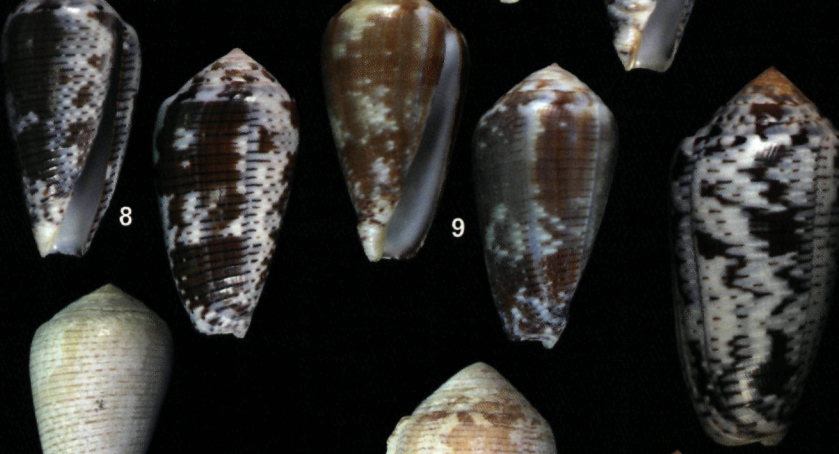


Plate 5 (sizes not in proportion to each other)

a = *C. achatinus*

m = *C. monachus*

c = *C. catus*

n = *C. nigropunctatus*

s = *C. striolatus*

