

Indo-Pacific Chamidae – Part I

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Introduction: Although named “jewelbox” in the 19th century and found “*scarcely inferior in beauty and variety to the Spondyli*” by Reeve (1846), the nowadays undervaluation of the family **Chamidae** in the world of shell collectors and conchologists is striking. The author published “Revision of the Chamidae of the Red Sea” in 1986. In this article and the following ones he will not only try to give more scientific information, but also to show the beauty of the species.

CHAMIDAE

L.R. Cox (NHMUK) proposed the addition of the generic name “*Chama*” Linnaeus, 1758 to the “Official List of Generic Names in Zoology” in 1955. He also proposed the addition of the family name **Chamidae** (correction of **Camacea** Blainville, 1825) to the “Official List of Family-group Names in Zoology”. It was published in the *Bulletin of Zoological Nomenclature* 11 (11):327-329 on 9.5.1956. Affirmative votes: 23, negative votes none. Consequently “Opinion 484” followed in 1957:

Family CHAMIDAE (correction of CAMACEA) Blainville, 1825 — first published in correct form as CHAMIDAE by Broderip W.J., 1839.

Type genus of CHAMIDAE is *Chama* Linnaeus, 1758. The type species of the genus *Chama* is *Chama lazarus* Linnaeus, 1758 (selected by Children J.G., 1823).

Six genera are generally accepted within **Chamidae**:

Chama Linnaeus, 1758
Arcinella Schumacher, 1817
Pseudochama Odhner, 1917
Eopseuma Odhner, 1919
Amphichama Habe, 1964
Carditochama Matuskuma, 1996

An extensive study of the hinge structure and the anatomy of **Chamidae** was published by Odhner (1919), Yonge (1967) and Matsukuma (1996). These publications are basic literature.

I. Genus *Chama* Linnaeus, 1758

Species of *Chama* are predominantly attached to substrate by their left valve and grow counterclockwise. More information will be found when the Indo-Pacific species of *Pseudochama* will be discussed.

Matsukuma (1996:29) mentioned the distribution of the cosmopolitan genus *Chama* “in tropical and temperate waters, intertidal to 500m”.

1. *Chama lazarus* Linnaeus, 1758

Linnaeus, 1758. Syst. Nat. X: 691, no. 129.

The collection “Museum Ludovicae Ulricaе” was examined and described by Linnaeus, but the publication of the “Catalogue” followed much later than him finishing the manuscript. This is the reason why we often find the reference “M. L. U.” in the tenth edition of his *Systema Naturae*, which means: based on specimens in the Museum of the Swedish Queen Lovisa Ulrika, but this reference is not included in the description of *Chama lazarus*.

The original description of *Chama lazarus* by Linnaeus (1758): “C. testa imbricata lamellis laceris, nate oblique subspiralis” [translated: shell imbricated with cloven lamellae, with a somewhat obliquely spiral umbo].

His references to figures:

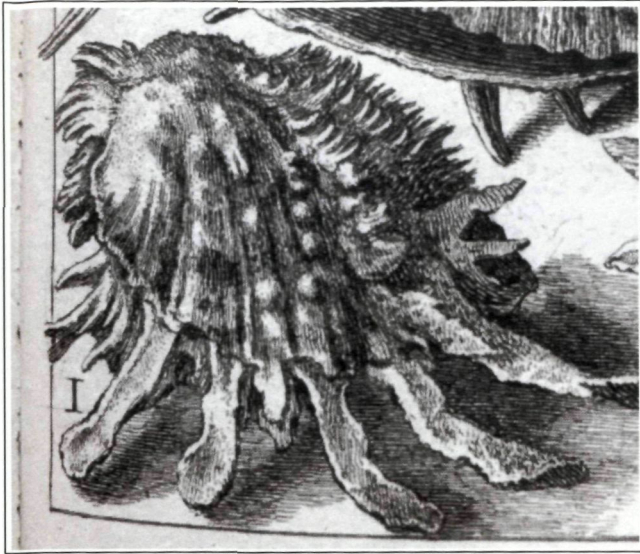
Rumph. mus. t. 48, f. 3.

Argenv. conch. t. 23, f. F.I.

Brown. jam. t. 40. f. 9.

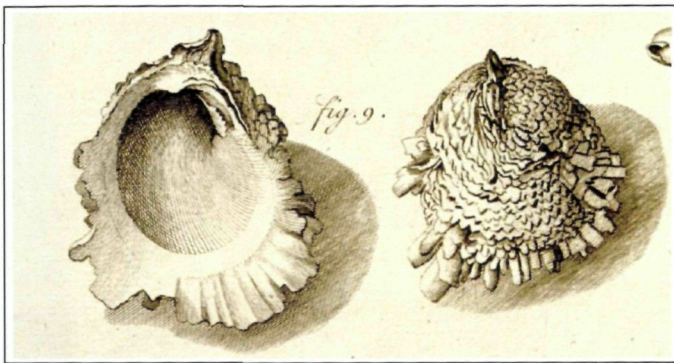
Habitat in M. Mediterraneo, Americano.

The specimen excellently figured by Rumphius (1705, 1711, 1741; redrawn in the edition 1766: pl. 48, fig. 3) is well-recognisable. Also no doubt concerning the specimen figured in D’Argenville (1742: pl. 23, fig. F), but the other specimen (pl. 23, fig. I) must be a species of *Spondylus*.



D'Argenville (pl. 23, fig. I)

Browne (1756: pl. 40, fig. 9) figured a specimen which in fact represents *Ch. macerophylla* Gmelin, 1791. Browne's work treated species from Jamaica, which is within the distribution of *Ch. macerophylla*.



Browne (1756: pl. 40, fig. 9)

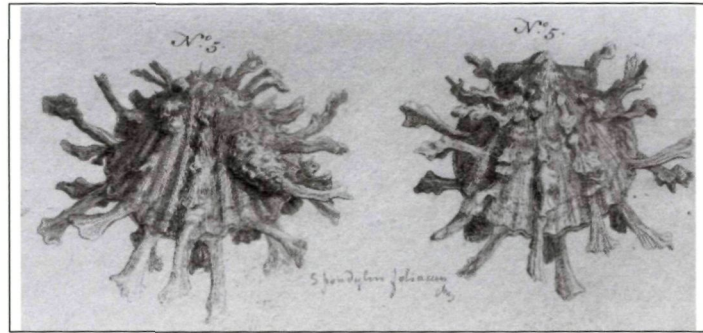
In the edition of Browne (1789) *complete Linnean indexes* were added. Identifications are given at the bottom of the plates. The figured specimen (pl. 40, fig. 9) is misidentified as *Ch. lazarus*. The plate is printed with all species flipped (all dextral species became sinistral).

Linnaeus, 1764. *Mus. Lud. Ulricae*: 513, no. 83.

The original description is repeated with a reference to the *Systema Naturae* (1758). Again, Linnaeus referred to the same figures in Rumphius and D'Argenville; Browne is not mentioned anymore, but a new reference is added: Seb. mus. 3. t. 89, f. 5, 6, 9, 11. Hereafter a much more extensive description is added:

“Testa admodum squarrosa ex lamellis elevatis patentibus, imbricatis, laceris, longitudine testae colore albidis flavis aut rufis. Intus glabra; subrotunda, concava; postice fornicata; altera productiore oblique fornicata, instar auris. Cardo constans callo obtuso, crenato intra fossam, qui inferitur alterius fossulae obliquae.”

The excellent figures in Seba (1758: pl.89, figs. 6, 9, 11) represent *Ch. lazarus* very well. Linnaeus (1764) also referred to figs. 5 on the same plate of Seba, but these represent *Spondylus foliaceus* Schreibers, 1793.



Seba (pl. 89, figs. 5)

Linnaeus, 1767. *Syst. Nat.* XII: 1139, no. 164.

The same short original description, but now followed by the reference to *Mus. Lud. Ulricae*. The same references to Rumphius, D'Argenville, Browne and Seba (including the figured *Spondylis*). Again “*Habitat in M. Mediterraneo, Americano*”. Linnaeus was probably convinced by the figured specimen in Browne to mention the habitat “in Mare Americano”. It must be remarked that the valve drawn on its inner side resembles *Ch. lazarus* well.

Type material: Specimens are kept in the Uppsala University's Zoological Museum (labelled “Museum Gustavi Adolphi”) from the *Museum Ludovicae Ulricae*. *Ch. lazarus* is also represented by a single specimen in the collection of the Linnean Society of London. This specimen is unmarked, but associated with a marked box, which is historically regarded as indicative of Linnaeus' own collection.



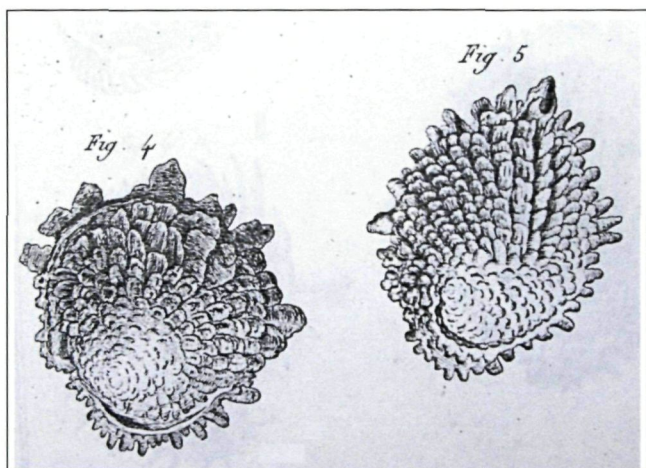
Syntype of *Chama lazarus* Linnaeus, 1758 kept by the Linnean Society of London. (photo S. Morris, NHMUK, 1986)

Note concerning Linnean type material: In 1741, Carl von Linné was appointed professor of medicine at Uppsala University. He built a museum for the university, but he also kept a private collection. After his father's death (1778), Carl von Linné jr. succeeded him as a professor of Medicine and botany, but he already died in 1783. His widow sold the private collection to England. It is now kept by the Linnean Society in Burlington House (London). A part of the Linnean private collection remained in Sweden and was included in the Linnean Collection at Uppsala University. The collection of Queen Lovisa Ulrika was partially donated to Uppsala University by her grandson King Gustav IV Adolf and also partially by his successor Karl XIII. It appears that no labels written by Linné himself exist (he probably did not write any label), which of course gives rise to problems.

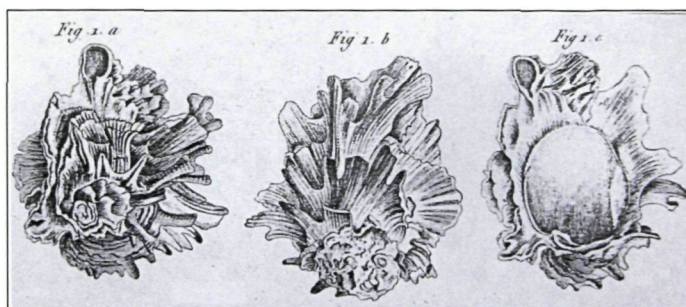
Chama damaecornis Lamarck, 1819

Lamarck (1801: 131) treated the Linnean *Chama lazarus*, with correct references to d'Argenville (pl. 20, fig. F) and Rumphius (pl. 48, fig. 3) and to Chemnitz (7., pl. 51, figs. 507-509), "le gâteau feuilleté des Indes". He distinguished *Chama imbricata*, with reference to Browne (pl. 40, fig. 9) and Chemnitz (7., pl. 52, figs. 514-515), "le gâteau feuilleté commun, ou d'Amérique" [= *Chama macerophylla* Gmelin, 1791].

Yet, Lamarck (1819: 93) curiously described "Came cornes-de-daim. *Chama damaecornis*" with reference a.o. to his *Tableau Encyclopédique et Méthodique* (pl. 197, figs. 1abc), which excellently represents the Linnean *Ch. lazarus*. Moreover, Lamarck mentioned the locality "l' Océan des Grandes Indes". The species depicted by Browne was identified as *Chama lazarus* by Lamarck (1819: 93), with reference to his *Tableau* (pl. 196: figs 4-5) and locality "L'Océan américaine". It is very easily recognisable as *Ch. macerophylla*.



Chama lazarus Lamarck in *Tableau* (pl. 196)



Chama damaecornis Lamarck in *Tableau* (pl. 197)

On the superb plates of Chenu (1842) we find *Chama lazarus* Lamarck (pl. 1, figs. 1, 1a-d) [= *Ch. macerophylla*] and *Chama damaecornis* Lamarck (pl. 2, figs. 1, 1a-c, 2) [= *Ch. lazarus* Linnaeus].

The confusion by Lamarck was already remarked by Deshayes (1835: 579-580) and confirmed by Hanley (1855: 89) and Lamy (1917: 201). Lamarck's type material in MHNG and in MNHN was examined by the present author in the eighties of the previous century. There is absolutely no doubt that *Ch. damaecornis* Lamarck, 1819 is a junior synonym of *Ch. lazarus* Linnaeus, 1758.

"*Chama lizardensis* Crosse"

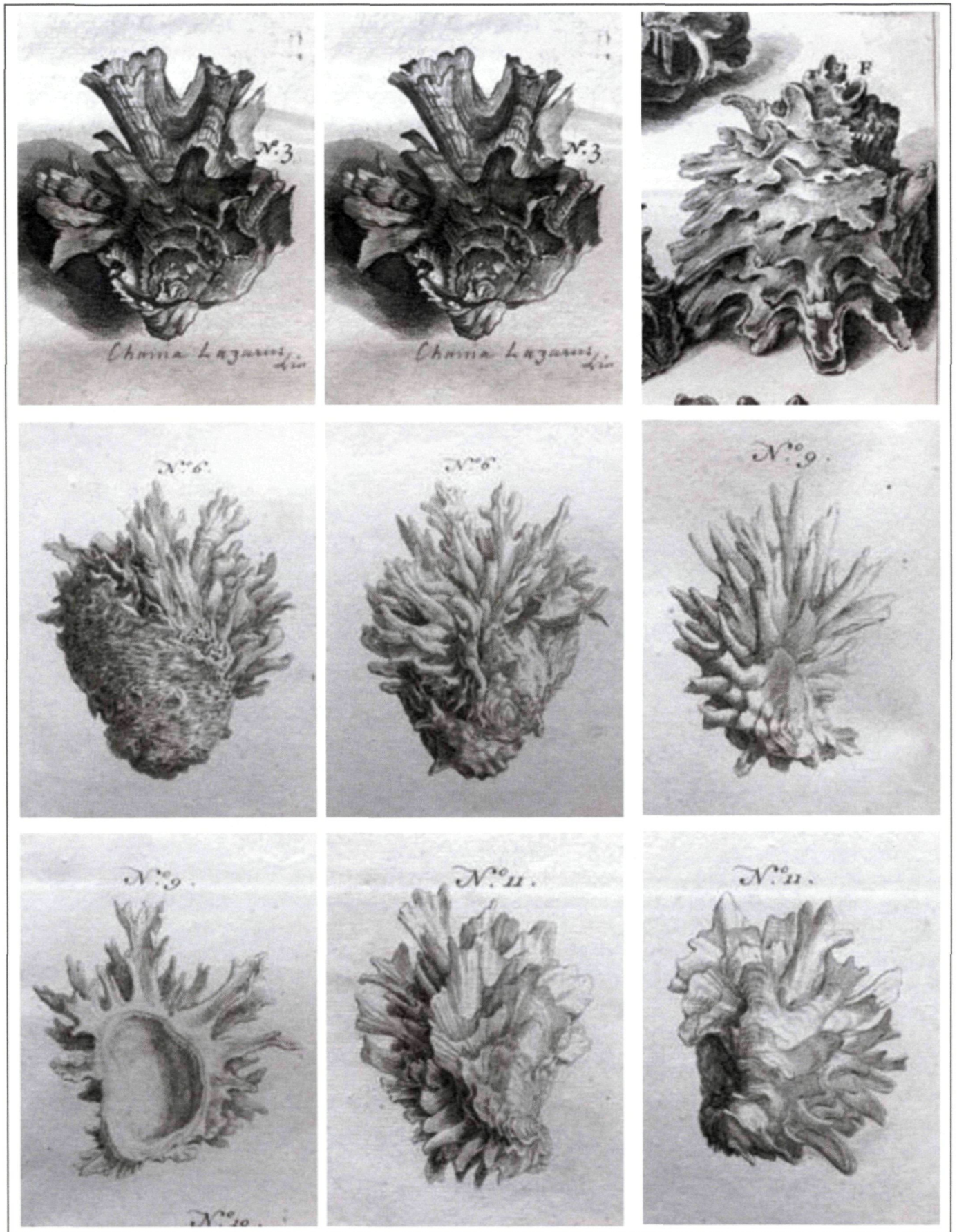
In the first edition of the *Kawamura Collection* (pl. XLVI, fig. 2) a beautiful subadult yellow specimen of *Ch. lazarus* is depicted. The index of the plate mentions: "*Chama lizardensis* Crosse; Red Sea". No other information could be found concerning *Ch. lizardensis* nor *Ch. lizardensis* Crosse. It may be a printing error.

Distribution: From the Red Sea to the Western Pacific. The species seems to be absent in Hawaiian waters (not mentioned by Moretzsohn & Kay, 1995) and in Polynesia (not mentioned by Salvat & Rive, 1983).

Acknowledgements: Thanks are due to S. Morris (NHMUK) for photos and information concerning the syntype and to Th. Backeljau (RBINS) who facilitated the study of (pre)Linnean literature.

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Rumphius (1705: pl. 48, fig. 3)	Rumphius (1766: pl. 48, fig. 3)	D'Argenville (1742: pl. 23, fig. F)
Seba (1758: pl. 89, fig. 6 left)	Seba (1758: pl. 89, fig. 6 right)	Seba (1758: pl. 89, fig. 9 left)
Seba (1758: pl. 89, fig. 9 right)	Seba (1758: pl. 89, fig. 11 left)	Seba (1758: pl. 89, fig. 11 right)

PLATE I *Chama lazarus* Linnaeus, 1758

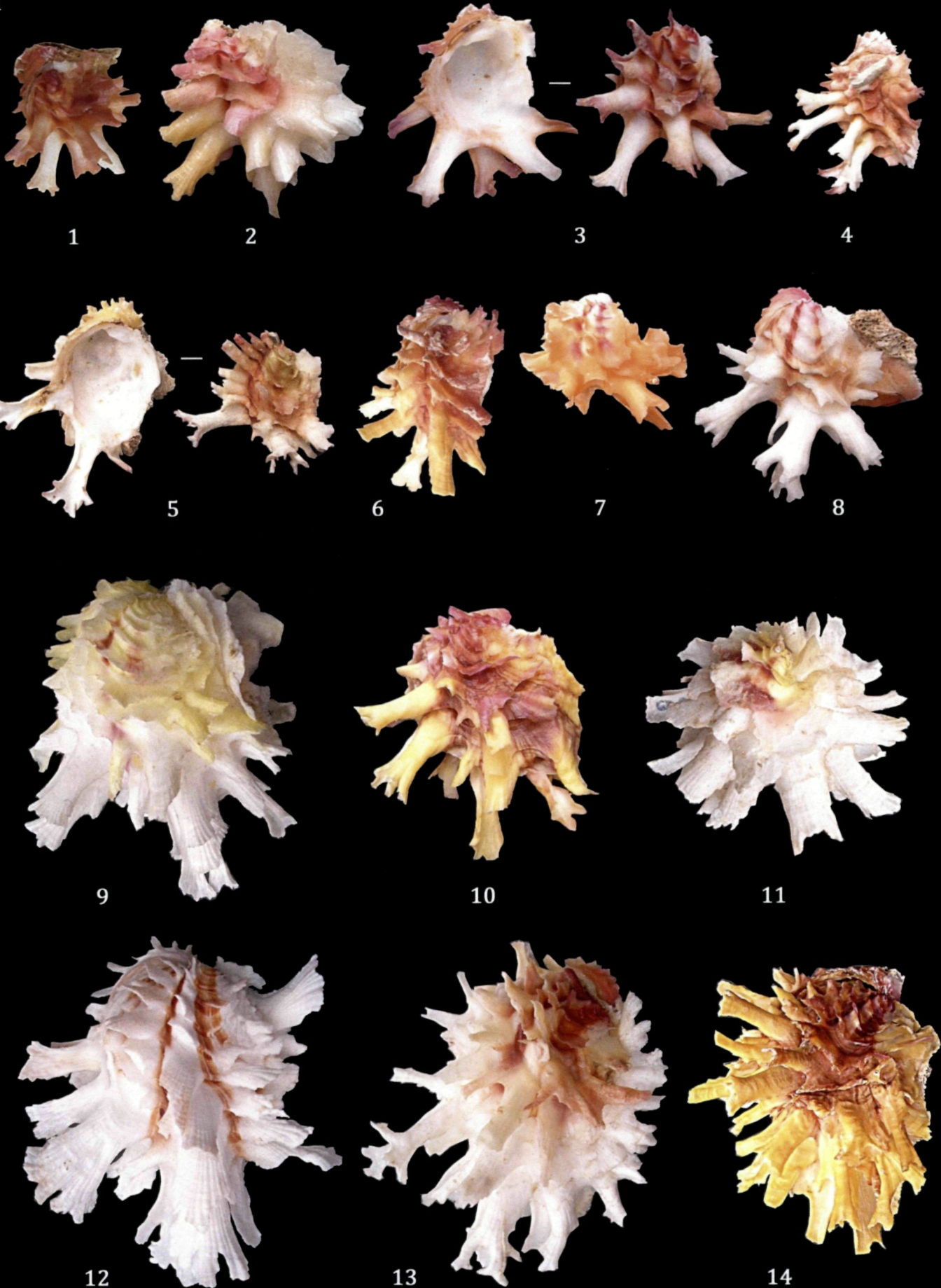
1.	31.2 x 32.9 mm	Cebu, Philippines.	[Ch.96] *
2.	38.0 x 38.0 mm	Cebu, Philippines.	[Ch.96]
3.	41.7 x 38.6 mm	Cebu, Philippines.	[Ch.96]
4.	43.6 x 35.5 mm	Cebu, Philippines.	[Ch.96]
5.	46.6 x 33.0 mm	Cebu, Philippines.	[Ch.96]
6.	40.6 x 29.4 mm	Cebu, Philippines.	[Ch.96]
7.	26.7 x 34.9 mm	Cebu, Philippines.	[Ch.96]
8.	42.4 x 44.7 mm	Cebu, Philippines.	[Ch.96]
9.	62.8 x 58.8 mm	Phuket, Thailand.	[Ch.333]
10.	47.3 x 41.5 mm	Nocnacan Isl., Bohol, Philippines.	[Ch.385]
11.	47.8 x 63.0 mm	Gulf of Eilat, Red Sea.	[Ch.6]
12.	67.2 x 61.7 mm	North coast of Bohol, Philippines.	[Ch.328]
13.	70.9 x 55.7 mm	Bohol, Philippines.	[Ch.378]
14.	60.0 x 47.5 mm	Olango Isl., Philippines.	[Ch.455]

* [...] = no. in register of Coll.author.

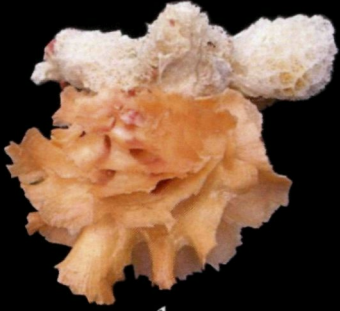
PLATE II *Chama lazarus* Linnaeus, 1758

1.	49.8 x 55.5 mm	In front of Tambuli resort, Mactan Isl., Philippines.	[Ch.330]
2.	63.8 x 89.5 mm	Bohol, Philippinen.	[Ch.328]
3.	82.0 x 82.0 mm	Mai Thon Isl., near Phuket, Thailand. Attached: <i>Chama asperella</i> Lamarck, 1819.	[Ch.473]
4.	84.0 x 90.0 mm	From wreck at Bonegi-2, W of Honiara, Guadalcanal Solomon Islands. Leg Colin Munday. The outside of the living specimen was blood-red by algae.	[02136]
5.	88.0 x 10.0 mm	From wreck of Hatsutake, -ca. 30m, 2 miles offshore, Malaysia. 4°50'N — 103°27'E.	[Ch.440]
6.	52.5 x 49.0 mm	Olango Isl., Philippines.	[Ch.455]
7.	56.0 x 98.0 mm	From wreck at Bonegi-2, W of Honiara, Guadalcanal, Solomon Islands. 9°25'S — 159°57'E.	[02136]
8.	115 x 105 mm	Linacapan Isl., Calaman Group, Palawan, Philippines. Attached to the old valves of <i>Chama lazarus</i> which is attached to the old valve of a <i>Spondylus</i> species.	[Ch.104]
9.	87.0 x 82.5 mm	Coron Isl., Palawan, Philippines. Attached: juveniles of <i>Chama pacifica</i> Broderip, 1835.	[Ch.210]

I



II



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3



4



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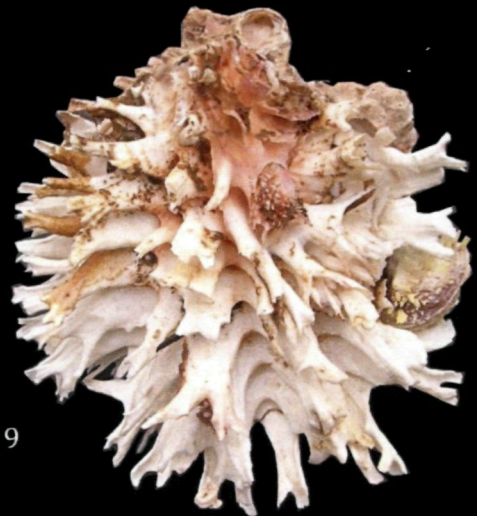
6



7



8



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