

CHAPTER 10

THE ALCYONARIAN AND BLACK CORALS (ANTHOZOA; OCTOCORALLIA AND ANTIPATHARIA)

described and figured by G. E. Rumphius

by

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It is perhaps a hopeless task to identify the zoophytes which Rumphius knew and wrote about with any of the established species of the present day, largely because their important taxonomic characters (mostly microscopic) were unknown to such early investigators. Indeed, it was more than a century after the publication of the "Herbarium Amboinense" until the appearance of Kölliker's "Icones histiologicae, oder Atlas der vergleichenden Gewebelehre" (1865: zweite Abtheilung, erstes Heft) which put the systematics of the alcyonarian corals on a scientific basis through the use of their minute calcareous spicules. It was still later that zooidal anatomy came to be used in the study of the black corals, and I think it is safe to say that still today many of the older antipatharian species are not sufficiently known in this regard to be precisely definable. However, the skilfully executed illustrations in the "Herbarium", together with Rumphius's often penetrating observations, make it possible in many cases to determine what species he had. Thus we can assign the Rumphian species, chiefly the illustrated ones, to species later named in the Linnean system. Unfortunately, the immediately post-Linnean authors often differed in their opinions as to what names should be applied to the various Rumphian species, and were moreover careless in citing references and commonly transcribed the errors

of others. In this way, several binominals have frequently become associated with a single species of the "Herbarium". Since the specimens which Rumphius described and figured are no longer extant, at least no longer available for study, we are left with the unhappy alternative of finding known species from the areas where Rumphius collected which agree both with Rumphius and with the first Linnean descriptions applied to his species. In this direction von Martens (1902) has already broken ground, as has also van Pesch (1914).

The following account of the Rumphian octocorals and black corals takes up the species in the order of their appearance in the "Herbarium Amboinense"; the last two appear also in the "Rariteitkamer". The species are listed under their correct binominal names insofar as these can be ascertained. Under each of these there appears a list containing the Rumphian Latin and vernacular names, other pertinent pre-Linnean polynominals, and the binominals applied to them by various early authors. The authors cited in these lists refer to the Rumphian species under discussion, but further synonymy of all citations is not necessarily implied. The references are only those which actually refer to Rumphius, which Rumphius himself refers to, or which are closely related to his work.

I have tried to make the nomenclature of the Octocorallia as modern and reliable as possible; for the Antipatharia, however, I have essentially followed van Pesch, although certain of his nomenclatural practices seem to me to be open to question. The sponges are discussed only when they have become involved with accepted coelenterate names.

In the present endeavor, I am greatly indebted to Dr L. B. Holthuis, of the Rijksmuseum van Natuurlijke Historie at Leiden; to Prof. Dr H. C. D. de Wit, of the Laboratory for Plant Taxonomy and -Geography at Wageningen and to Dr W. Vervoort, of the Zoölogisch Laboratorium, at Leiden.

Moreover, the authorities of the Library of Congress of the United States have been so kind as to make available volume 6 of the "Herbarium Amboinense", at the request of Mrs. E. H. Gazin of the National Museum Library. Mrs. Gazin has further been of invaluable assistance in tracking down and obtaining many of the ancient volumes required during the preparation of this chapter of the Rumphius Memorial Volume.

Most especially I am grateful to Mr. L. B. Isham, of the U.S. National Museum, who has skilfully executed plate 3 in antique style.

Rumphella antipathes (Linnaeus) — (Plate 1)

- Corallium nigrum ramosum*, Rumphius Corall. 1685, p. 77, pl. 3.
"Zwarte Acarbahaar", Valentyn, 1726, p. 544, pl. 51, AA.
Corallium nigrum, et *Accarbarium ramosum*, Rumphius Herb. VI, 1750,
p. 196, pl. 77; "Accarbaar", "Kalbahaar".
Gorgonia Antipathes Pallas, 1766, p. 193.
Gorgonia Antipathes Linnaeus, 1767, p. 1291.
Gorgonia Antipathes Burman, 1769, p. (8).
Gorgonia Antipathes Esper, II, 1791, p. 90.
Gorgonia Antipathes Gmelin, 1791, p. 3804.
Gorgonia Antipathes Bosc, III, 1802, p. 33.
Eunicea Antipathes Lamouroux, 1816, p. 435.
Gorgonia Antipathes Oken, 1833, p. 110.
Euplexaura Antipathes Hiles, 1899, p. 51, pl. 4.

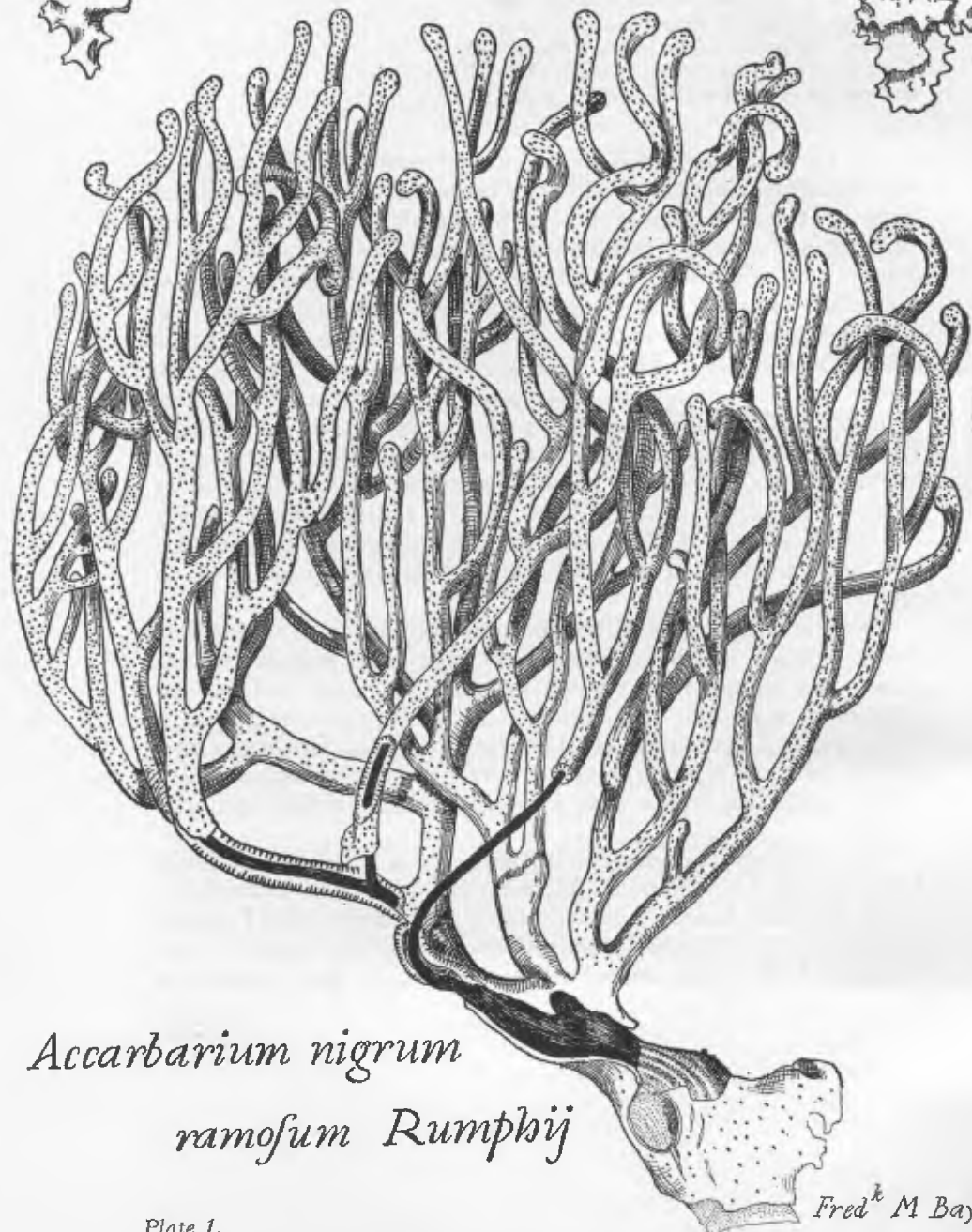
The Linnean binominals applied to this coral have been remarkably consistent; that those authors who had specimens all had the same species is certainly not demonstrable. The plate in the "Herbarium" could represent any number of plexaurids in a decorticated condition; but certain points in the description lead me to believe that it actually does depict the common, widespread, shallow-water species usually known under the name *Plexaura antipathes* (Linnaeus). The most striking characteristic of this species is the densely calcareous basal enlargement, which Rumphius mentions and Esper (*Gorgonian* plate 24) figures well. Although Hiles states that the same kind of a dense basal enlargement is likewise found in *Plexaura principalis* and *P. suffruticosa*, it is at most only weakly developed in Dana's *P. suffruticosa*, which further differs from *P. antipathes* in both appearance and spiculation; unfortunately, "*Plexaura principalis*" is entirely unknown to me.

Gorgonia antipathes is quite similar in spiculation to some other Pacific species of *Plexauridae* which have been referred to the genus *Psammogorgia* by various authors, but none of these are congeneric with true *Psammogorgia* of the Panamic region. In a recent paper (Bayer, 1955, p. 212) I have proposed for them a new generic name, *Rumphella*, given in honor of that remarkable 17th century naturalist whose work forms the subject of this memorial volume.

Hiles records *Rumphella antipathes* (as a *Euplexaura*) from Funafuti, the U.S. National Museum has specimens from Arno in the Marshall Islands and Onotoa in the Gilberts, and I myself have seen it growing and obtained specimens from native divers at Ifaluk Atoll in the central Caroline Islands. I give herewith a



Spicula corticis Accarbarij



Accarbarium nigrum
ramosum Rumphij

new figure of *Rumphella antipathes* (Linnaeus) n. comb. based upon material from the Gilbert Islands.

Cirrhopathes rumphii van Pesch

Palmijuncus vulgaris, Rumphius Herb. VI, 1750, p. 202, pl. 78, fig. A; "tali aros", "rottang laut".

Antipathes spiralis var. *B.* Lamouroux, 1816, p. 373.

Cirrhopathes (Eucirripathes) Rumphii van Pesch, 1914, p. 170.

Van Pesch considers it possible that certain specimens taken by the "Siboga" and described by him as *C. (Eucirripathes) Rumphii* are identical with the material described and figured by Rumphius. For a diagnostic account of the species, see van Pesch's Siboga-Monograph, p. 170 sqq.

Cirrhopathes anguinus (Dana)

Palmijuncus striatus, Rumphius Herb. VI, 1750, p. 202, pl. 78, fig. B; "Accarbaar lacki lacki".

Antipathes anguina Dana, 1846, p. 576, pl. 56, figs. la-d.

Cirripathes (Eucirripathes) anguinus van Pesch, 1914, p. 149.

The "Siboga" took at Saleyer some specimens which van Pesch thinks are likely the same as Rumphius's "*Palmijuncus striatus*". The Siboga-Monograph must be consulted for a full description (p. 149). There has been some confusion of the unbranched, sinuous or spiral antipatharians, which van Pesch explains in his discussions of the species involved.

Cirrhopathes spiralis (Linnaeus)

Acarbarium anguinum, Rumphius Corall. 1685, p. 78, pl. 4.

"Tali aros", Valentyn, 1726, p. 545, pl. 51, fig. BB.

Palmijuncus anguinus, Rumphius Herb. VI, 1750, p. 202, pl. 78, fig. C; "Accarbaar oelar".

Gorgonia spiralis Linnaeus, 1758, p. 800.

Antipathes spiralis Pallas, 1766, p. 217.

Gorgonia Abies (var.), *spiralis* Linnaeus, 1767, p. 1290.

Antipathes spiralis Burman, 1769, p. (17).

Gorgonia spiralis Houttuyn, 1772, p. 319.

Antipathes spiralis Gmelin, 1791, p. 3795.

Antipathes spiralis Esper, II, 1792, p. 154.

Antipathes spiralis Bosc, III, 1802, p. 41.

Antipathes spiralis Lamouroux, 1816, p. 373.

Antipathes spiralis Oken, 1833, p. 117.

Cirrhopathes spiralis Milne Edwards & Haime, 1857, p. 313.

Cirripathes (Eucirripathes) spiralis van Pesch, 1914, p. 158.

This species forms the first entry under Linnaeus's original genus *Gorgonia*, and was removed to *Antipathes* by Pallas in 1766. For a complete history and description of the species, consult van Pesch, p. 158.

Heterogorgia magna Nutting

Flabellum marinum planum, Rumphius Herb. VI, 1750, p. 205, pl. 79; "Accarbaar kipas".

Gorgonia Flabellum Linnaeus, 1758, p. 801.

Gorgonia Ventalina Linnaeus, 1767, p. 1293.

Gorgonia ventilabrum Burman, 1769, p. (9).

Gorgonia Ventalina Houttuyn, 1772, p. 352.

Gorgonia ventalina Esper, II, 1791, p. 20.

Gorgonia ventalina sive ventilabrum Oken, 1833, p. 117.

Rhipidipathes flabellum Milne Edwards & Haime, 1857, p. 321.

G(orgonia) umbella von Martens, 1902, p. 133.

There has been considerable confusion regarding the reticulate, flabellate "sea-fans" of early authors; some are sponges, others are antipatharians, and a few are gorgonians. Rumphius's plate 79 in the 6th volume of the "Herbarium Amboinense" without doubt shows a gorgonian, but its exact identity will probably forever remain a mystery. Linnaeus (1758) cited page 205, plate 79 under his *Gorgonia flabellum*, along with the figures of Clusius (1605) and Olearius (1666) which undoubtedly represent the West Indian sea-fan that still bears the Linnean name. Linnaeus's *Gorgonia ventalina* of 1758 referred to the same page of the "Herbarium", but to plate 89, figure 1; plate 89 depicts a flabellate, reticulate structure, but has only a single figure which, furthermore, is not designated as "figure 1", and refers to page 245. The Linnean citation may be an error for plate 80, which does have a figure 1 that is a flabellate organism, though its textpage is 208. In the 12th edition of the *Systema*, Linnaeus shifted the citation of plate 79 to *Gorgonia ventalina* and plate 89 (no "fig. 1") with a question-mark to *Spongia ventilabra*, and refers to plate 80, figure 1 under *Spongia flabelliformis*. Although this jumble of references has only an historical interest, I discuss it here because Rumphius's figure is mentioned by Linnaeus under both *Gorgonia flabellum* and *G. ventalina*. The latter has remained a dubious species in spite of some reasonably good modern descriptions, inasmuch as they probably do not at all refer to the species Linnaeus had in mind. There may be some justification for retaining the name *Gorgonia ventalina* for certain West Indian specimens, on the basis of Linnaeus's statement "Differt haec a G. flabello solum ramis non

versus ramulos, sed a lateribus exterioribus compressis, . . ." which deals with a feature that may be correlatable with constant spicular differences. I do not agree with von Martens (1902, p. 133) that *Gorgonia umbella* Esper may be Rumphius's species, mainly because the branching of Esper's sea-fan is entirely at variance with that shown in Rumphius's figure. Von Martens may actually have had the species figured by Rumphius, but it almost certainly is not *Gorgonella umbella* (Esper). Gorgonellids commonly have a heavily calcified axis, usually round and often rather brittle, whereas Rumphius says of his "Zeewajer": ". . . de takjes zijn niet rond, maar hoekig, en scherpkantig. Hunne substantie is ook zeer houtagtig, ligt, taai, en buigzaam". These remarks, as well as "bekleed met een donkere rosse, zomtyds ook roode schorsse" fit much more satisfactorily some muriceid, possibly *Echinogorgia pseudosassapo* K lliker as described but unfortunately not figured by Nutting, 1910a, p. 64.

Nutting's *Heterogorgia magna*, as shown on plate 16 of his Siboga-Monograph (1910a, p. 92, pl. 16), is very much like the "Flabellum marinum" depicted on plate 79 of the "Herbarium", but is dull, sandy brown in color; Rumphius does not specifically state what color his illustrated example was. Since he recognized three forms of "Flabellum marinum planum", the third of which he described as "van buiten bekleed met een witte of grauwe kalkagtige korste", and says that the seventy-ninth plate "Flabellum exhibit marinum, quod est Keratophyton maximum cinereum elegantissime reticulatum, Boerh. Ind. pag. 6", I think that at least "Flabellum marinum planum, tertia forma", and plate 79 may reasonably be referred to *H. magna* Nutting.

According to Stiasny (1942), Nutting's species belongs in the genus *Echinomuricea*; but I have not seen Nutting's type. The original figures of the spicules of *H. magna* are very poor but tend to support Stiasny's conclusion.

? *Verrucella* sp.

Flabellum multiplex, Rumphius Herb. VI, 1750, p. 205.

Gorgonia reticulum Pallas, 1766, p. 167.

Gorgonia reticulum Gmelin, 1791, p. 3808.

Gorgonia reticulum Esper, Fortsetz. II, 1796, p. 161.

Gorgonia Reticulum Lamouroux, 1816, p. 405.

Rhipidigorgia reticulum Milne Edwards & Haime, 1857, p. 174.

It is impossible to say what Rumphius may have had in hand; the post-Linnean citations are certainly unreliable. The *Gorgonia*

reticulum of the various authors as listed above probably deals with several species. Rumphius's description suggests some gorgonellid of moderate size, but the only possibility of reidentifying it now would lie in collecting at Rumphius's localities in the hope of finding specimens reasonably like his description.

? *Ianthella* sp.

Flabellum marinum Aruense, Rumphius Herb. VI, 1750, pp. 206, 208, pl. 80, fig. 1.

Spongia flabelliformis Pallas, 1766, p. 380.

Spongia flabelliformis Linnaeus, 1767, p. 1296.

Spongia flabelliformis Gmelin, 1791, p. 3817.

Spongia flabelliformis Esper, II, 1793, p. 213.

Ianthella flabelliformis von Lendenfeld, 1889, p. 696, pl. 47, figs. 4, 6, &c.

This particular kind of "*Flabellum marinum*", described in the last paragraph of chapter 4 of the 12th book of the "*Herbarium*", seems never to have become directly involved nomenclaturally with any coelenterates. It was retained in the genus *Ianthella* by von Lendenfeld (1889); de Laubenfels (1948) on one page (p. 19) seems to accept the generic transfer to *Verongia* proposed by Ehlers (1870), but on another (p. 154, & *sqq.*) lists the species under *Ianthella*.

Antipathes ericoides Pallas

Cupressus marina prima, Rumphius Herb. VI, 1750, p. 207.

Antipathes ericoides Pallas, 1766, p. 208.

Antipathes ericoides Burman, 1769, p. (9).

Antipathes ericoides Gmelin, 1791, p. 3797.

Antipathes Ericoides Lamouroux, 1816, p. 381.

Antipathes ericoides of Pallas has been recognized and redescribed in detail by van Pesch (1914, p. 82) under the name *Antipathes (Euantipathes) ericoides*. He does not suggest that the zoophyte named by Pallas is identical with that of Rumphius's description, but a closer determination hardly seems possible at this time.

Antipathes abies (Linnaeus)

Cupressus marina altera, Rumphius Herb. VI, 1750, p. 207, pl. 80, fig. 2.

Gorgonia Aenea Linnaeus, 1758, p. 802. (The citation here is to plate "30", fig. 2, in error for plate 80, fig. 2).

Antipathes cupressina Pallas, 1766, p. 213.

Gorgonia Abies (var.) *a, recta* Linnaeus, 1767, p. 1290. (Cited here is page 207, plate 80, fig. 2; "*Cupressus marina*" R.; but see next entry, below).

Gorgonia aenea Linnaeus, 1767, p. 1290. (Under this name is cited p. 227, pl. 80, fig. 2; page 227 has nothing to do with "*Cupressus marina*" R.).

Antipathes Cupressina Burman, 1769, p. (9).

Gorgonia Abies Houttuyn, 1772, p. 317.

Antipathes Cupressus Gmelin, 1791, p. 3796. (*Gorgonia aenea* of the 10th edition and *G. abies recta* of the 12th edition are listed in synonymy; the page reference in the "Herbarium" is 207).

Antipathes orichalcea Gmelin, 1791, p. 3796. (Under this name, *G. aenea* of the 12th edition is listed in synonymy; the page reference is "227" and the figure is cited still as pl. 80, fig. 2, as for *A. cupressus*).

Antipathes cupressus Shaw & Nodder, 1798, no 320.

Antipathes cupressina Bosc, III, 1802, p. 40.

Antipathes aenea Bosc, III, 1802, p. 41 (Obviously, Bosc was led astray by the confusion of references in the "Systema").

Antipathes Cupressus var. B. Lamouroux, 1816, p. 380.

Antipathes cupressus Milne Edwards & Haime, 1857, p. 316.

Van Pesch (1914, p. 39) describes some specimens of black corals from Macassar, Solor Strait, and Sapeh Strait under this name, and accepts the synonymy of Brook (1889, p. 170), which cites the Rumphian figure. Brook (*op. cit.* p. 5) thinks that *G. abies* Linnaeus and *G. aenea* Linnaeus may be identical; why he does not use the name *aenea*, under which Rumphius's figure is cited, instead of *abies*, which has only a brief description, is a point that I cannot clarify at the present moment.

Antipathes dichotoma Pallas

Fœnum marinum, Rumphius Herb. VI, 1750, p. 208, pl. 80, fig. 3; "Accarbaar rompot", "Daun casuari laut".

Antipathes foeniculacea Pallas, 1766, p. 207.

Antipathes fœniculacea Burman, 1769, p. (10).

Antipathes foeniculacea Gmelin, 1791, p. 3797.

Antipathes foeniculacea Esper, II, 1792, p. 152.

Antipathes foeniculacea Bosc, III, 1802, p. 39.

Antipathes Fœniculacea Lamouroux, 1816, p. 379.

Antipathes fœniculum Milne Edwards & Haime, 1857, p. 318.

Antipathes (Euantipathes) dichotoma van Pesch, 1914, p. 52.

This species seems to have received a large number of names over the years, and van Pesch (1914) gives an extensive synonymy. He does not consider Esper's *A. foeniculacea* as belonging here. Van Pesch describes the abundant "Siboga" material at length and gives numerous figures. For some remarks about Rumphius's "Fœnum marinum", see page 70 of the Siboga-Monograph.

? *Antipathes myriophylla* Pallas

Erica marina tenuis, Rumphius Herb., VI, 1750, p. 209; "Accarbaar ruttu ruttu".

Antipathes myriophylla Pallas, 1766, p. 210.

Antipathes myriophylla Gmelin, 1791, p. 3795.

Antipathes myriophylla Esper, II, 1792, p. 150.

Antipathes nyriophylla Esper, Fortsetz. I, 1797, p. 180.

Antipathes myriophylla Shaw & Nodder 10, 1799, no 352.

Antipathes Myriophylla Lamouroux, 1816, p. 378.

Neither Brook (1889, p. 166) nor van Pesch (1914, p. 42) cites Rumphius, who gave no figure. While the identity of Pallas's species seems pretty soundly established by van Pesch and others, it cannot definitely be equated with Rumphius's "*Erica marina tenuis*".

Antipathes (Aphanipathes) pennacea Pallas

Erica (marina) crassa, Rumphius Herb. VI, 1750, p. 209.

Antipathes pennacea Pallas, 1766, p. 209.

Antipathes Flabellum + *Antipathes pennacea* Burman, 1769, p. (9).

Antipathes pennacea Gmelin, 1791, 3797.

Antipathes Pennacea Lamouroux, 1816, p. 379.

Antipathes pennacea Milne Edwards & Haime, 1857, p. 318.

Again Rumphius offers no illustration, and neither Brook (1889, p. 129) nor van Pesch (1914, p. 92) suggests that Pallas's species is identical with that of Rumphius.

? *Tylopathes flabellum* (Pallas)

Erica marina altera, Rumphius Herb. VI, 1750, p. 209.

Antipathes flabellum Pallas, 1766, p. 211.

Antipathes flabellum Gmelin, 1791, p. 3797.

For a description of Brook's idea of Pallas's species, see the "Challenger" Report, 1889, p. 137. The specific identity of *Antipathes flabellum* Pallas with Rumphius's "*Erica marina altera*" must be regarded as uncertain.

Toeplitzella regia (Nutting)

Accarbarium cinereum ramosum Rumphius Herb. VI, 1750, p. 221; "Accarbaar poeti", "Calbahaar poeti".

I can find no Linnean references to this description in the

"Herbarium". From Rumphius's remarks, I judge the specimen before him to have been some large gorgonellid. It had long, whip-like branches, three or four feet tall, with few side-branches. The main stem was as thick as the little finger, and the axis, light grey to yellowish or brownish in color, was covered with a granular red cortex. All considered, it was probably a large, handsome *Junceella*-like gorgonian. Rumphius says that it did not grow in Amboina, but came from the Papuan islands. A specimen described by Nutting (1910b, p. 26, pl. 8, figs. 1, 1a) as *Scirpearella regia* (which Kükenthal, 1924, p. 367, considers the same as *Scirpearia andamanensis* Simpson 1910 = *Toeplitzella andamanensis*) fits Rumphius's description in most respects and could well be the species he had.

Various aspects of the complex nomenclatural tangle involving *Toeplitzella* and related genera may be found in Bayer, 1955, p. 214, and 1956, p. 214; Deichmann, 1936, p. 205; and Toeplitz, 1929, p. 286.

? *Subergorgia*

"Accarbaar gabba gabba, & Accarbaar boa zagu", Rumphius Herb. VI, 1750, p. 222.

Alcyonium arboreum Pallas, 1766, p. 347.

Alcyonium arboreum Burman, 1769, p. (3).

"Pyagtige" Houttuyn, 1772, p. 398.

Alcyonium arboreum Gmelin, 1791, p. 3810.

Alcyonium arboreum Esper, III, 1805, p. 10.

Alcyonium Arboreum Lamouroux, 1816, p. 335.

Whatever this coral may be, it certainly is not the *Paragorgia arborea* (L.) as we know it today, which is strictly a cold-water inhabitant. Linnaeus did not refer to Rumphius in his description of it (1758), and the connection dates, I believe, from Pallas. The description, (there is no figure), definitely suggests a scleraxonian, possibly a *Subergorgia*,

? *Verrucella stellata* Nutting

Virgae sanguineae, Rumphius Herb. VI, 1750, p. 223, pl. 83; "Accarbaar sassapo".

Gorgonia ceratophyta Linnaeus, 1758, p. 801.

Gorgonia sasappo Pallas, 1766, p. 188.

Gorgonia Sasappo Gmelin, 1791, p. 3801.

Gorgonia Sasappo Esper, II, 1791, p. 46.

Gorgonia savappo (sic) Bosc, III, 1802, p. 31.

Gorgonia elongata Esper, Fortsetz. II, 1806, p. 35.
Gorgonia Sasappo Lamouroux, 1816, p. 402.

The gorgonian represented on plate 83 of the "Herbarium" is certainly not the same as that on Esper's *Gorgonia* plates 9 (1791) or 55 (1806). Both description and figure suggest another gorgonellid; Nutting's *Verrucella stellata* (1910b, p. 13) shows branching essentially like Rumphius's specimen, though not so dense. Kükenthal (1924, p. 367) considers *V. stellata* to be the same as *Toeplitzella andamanensis* (Simpson) (and thus the same as *Toeplitzella regia* Nutting, already referred to on p. 000, although in my opinion this is open to question.

Antipatharian

Accarbarium Ericae forma, prima et altera, Rumphius Herb. VI, 1750, pp. 223, 224; "Accarbaar caju alus".

Antipathes orichalcea Pallas, 1766, p. 215.

Antipathes orichalcea Burman, 1769, p. (3).

Antipathes Aenea Lamouroux, 1816, p. 376.

I have been unable to locate more than the few unrelated references listed above to Rumphius's "Accarbaar in de gedaante van Heide", and these are apparently not reconcilable. Rumphius gave no figure.

Subergorgia mollis (Nutting) — (Plates 2 and 3)

Flabellum marinum cinereum, major et minor, Rumphius Herb. VI, 1750, p. 224; "Accarbaar abu abu".

Gorgonia flabellum Pallas, 1766, p. 169.

Gorgonia Flabellum Ellis, 1767, p. 68.

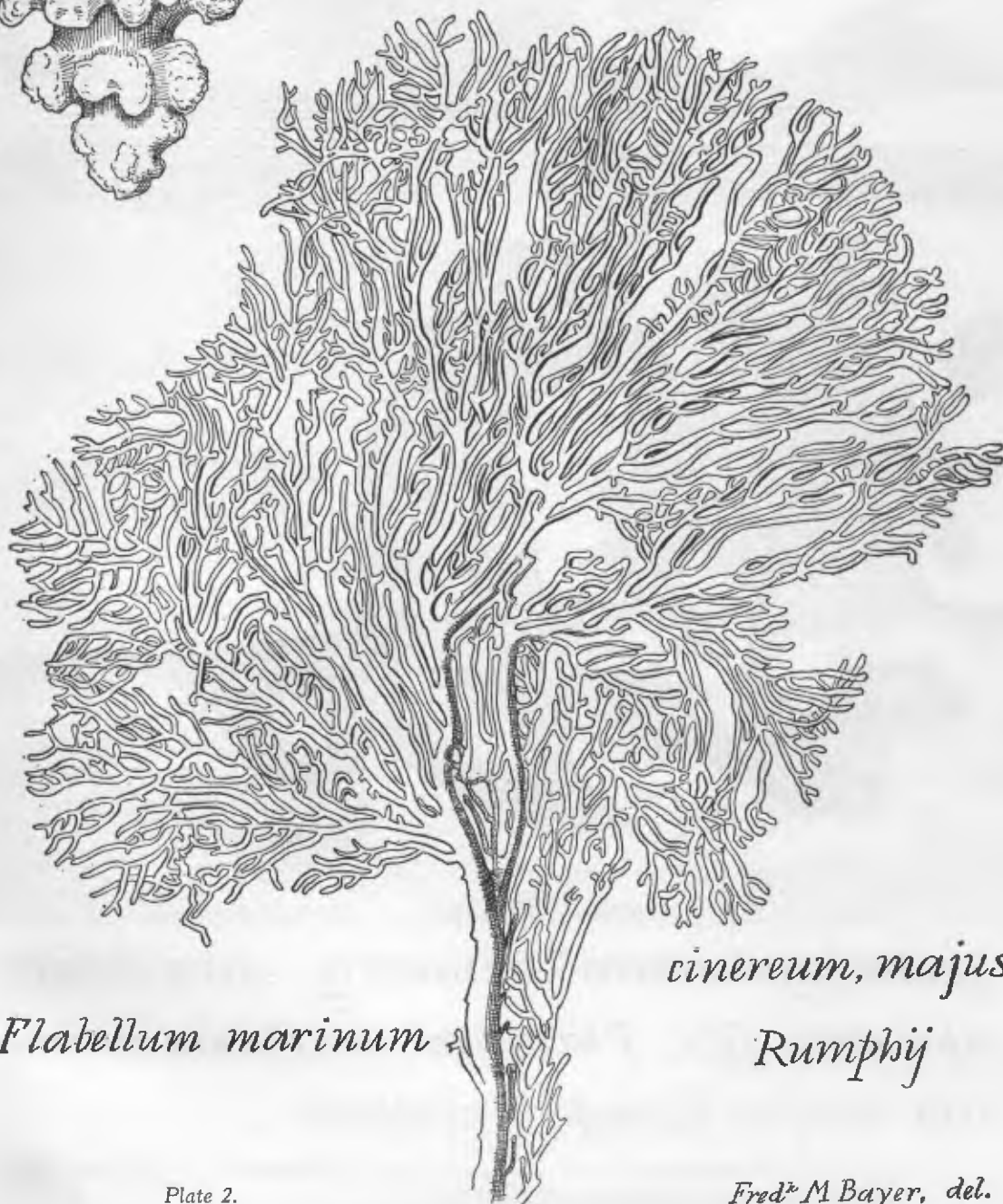
Gorgonia Flabellum Esper, II, 1791, p. 23.

Gorgonia Flabellum Lamouroux, 1816, p. 403.

The five authors cited above have listed the Rumphian reference under their synonymies of *Gorgonia flabellum* L. Exactly what Rumphius's "grauwe Zee-wayer" was is now impossible to tell, but it almost certainly was not the West Indian *Gorgonia flabellum*. There are some huge (Rumphius says "flabellum satis magnum, quator & quinque pedes altum, pauloque latius") fan-like Subergorgias in the East Indies, which could fit the Rumphian description except possibly for the woody axis mentioned, but about this Rumphius says "Vera ejus substantia est obscure cinerea, levis &

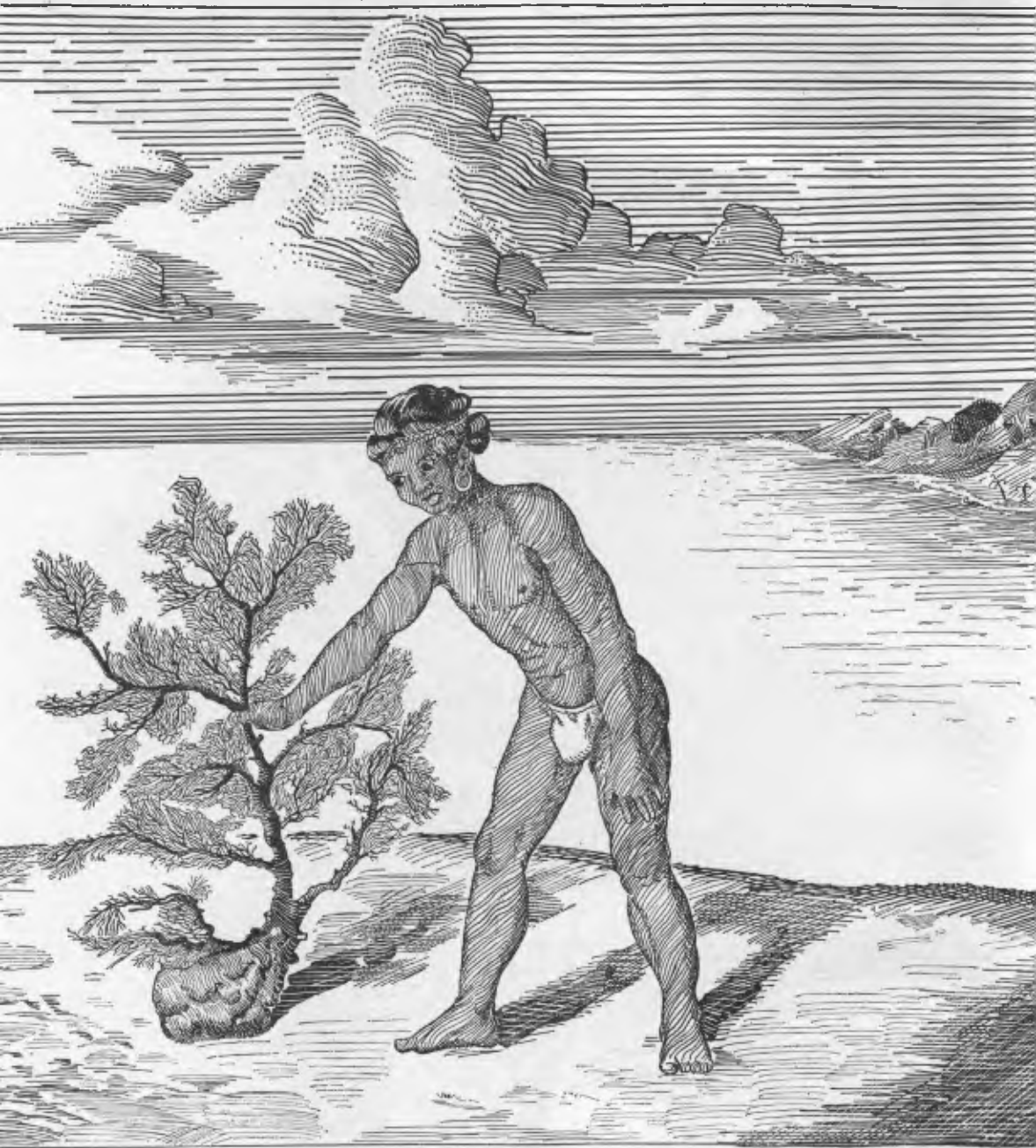


Spicula corticis Flabelli cinerei



Flabellum marinum

cinereum, majus
Rumphij



*Incola Insularum Urinatorq₃ Accarbaar
abu abu sive Flabellum marinum cinere-
um majus Rumphij exhibens.*

lignosa, ac facile dissecari potest, interne gerens cor solidum, sine volvulis, sed tenues rami fragiles sunt, nec sine fractura ac vix tractari possunt, sique sibi mutuo adterantur, corneum fundunt odorem, sed debiliorem quam in primis speciebus (i.e., Heterogorgia magna, which see)". One should keep in mind that Rumphius considered the true coral to be only the axial cylinder, which was covered with a friable, easily removed bar,.

One of the largest sea-fans in the Indo-Pacific is *Subergorgia mollis* (Nutting), the axis of which is sufficiently solid to have led Nutting to place the species in the holaxonian genus *Euplexaura*; see Stiasny, 1937, p. 98, pl. 7, fig. 47; or Bayer, 1949, p. 196, pl. 4, fig. 1. It is entirely possible that it is *S. mollis* or a closely related species that Rumphius describes.

I have no suggestions regarding "Flabellum marinum cinereum, minor", which seems not to have been mentioned again in the literature.

Junceella juncea (Pallas)

Palmijuncus marinus albus Rumphius Herb. VI, 1750, p. 226; "Kalbahaar puti lacki lacki".

Gorgonia juncea Pallas, 1766, p. 180. (The page reference is incorrectly cited 126 for 226).

Gorgonia Juncea Burman, 1769, p. (17).

Gorgonia Juncea Houttuyn, 1772, p. 322.

Gorgonia juncea Gmelin, 1791, p. 3801.

Gorgonia juncea Esper, Fortsetz. II, 1806, p. 26.

Gorgonia Juncea Lamouroux, 1816, p. 419.

Junceella juncea Simpson, 1910, p. 284.

The identity of Rumphius's "witte Zee-Palmbies" with Pallas's *Gorgonia juncea* has been generally accepted, and appears to be almost indisputable. For a modern description, see either the paper by Simpson cited above, or Kükenthal 1924, p. 363. On the other hand, it is surely not clear that this actually is the species that Pliny calls "Junci lapidei", which Simpson lists in his historical synonymy of *Junceella juncea*. Pliny says only: "Qui nauigauere in indos Alexandri milites . . . tradidere . . . Iuncos quoque lapideos perquam similes veris per littora: . . ." ¹⁾ (1516. Hist. Nat. bk. 13, cap. 23 (25 in most later eds.), folio XLV).

¹⁾ "The officers of Alexander who navigated the Indian Seas . . . have spoken also of bulrushes of stone bearing a strong resemblance to real ones, which grew along the sea-shore . . .".

Isis hippuris Linnaeus

- Hippuris saxea*, Clusius Exot., 1605, p. 124.
Corallium album littoreum, Rumphius, Corall., 1685, p. 78, pl. 3.
"De Witte Acarbahâr", Valentyn, 1726, p. 545, pl. 51, fig. AAA.
Accarbarium album litoreum, Rumphius Herb. VI, 1750, p. 228, pl. 84, fig. A. "Calbahaar puti".
Isis Hippuris Linnaeus, 1758, p. 799.
Isis Hippuris Pallas, 1766, p. 233.
Isis Hippuris Linnaeus, 1767, p. 1287.
Corallium geniculatum Burman, 1769, p. (3).
Isis Hippuris Houttuyn, 1772, p. 234, pl. 131, fig. 1.
Isis Hippuris Esper, I, 1788, p. 33, pls. 1—3 (*Isis*).
Isis Hippuris Esper, I, 1790, p. 279, pl. 3A (*Isis*).
Isis Hippuris Gmelin, 1791, p. 3792.
Isis Hippuris Shaw & Nodder 3, 1792, no 106.
Isis Hippuris Lamouroux, 1816, p. 475.

This well-known species was figured and discussed by a number of early authors. Valentyn's figure was very obviously engraved from the same original drawing as was Rumphius's in the "Herbarium". Esper's first three plates, and that of Ellis & Solander (who do not mention Rumphius), appear to be originals, but Esper's plate 3A is mostly copied from Ellis & Solander, and Shaw & Nodder's figure looks suspiciously like a modified redrawing after Ellis & Solander. For references and a short description, see Kükenthal 1924, p. 443. Whether Rumphius's other "species" are also *Isis hippuris* I am unable to say; I have found no references to them in the 18th century binominal literature.

Burman's use of *Corallium* for this coral antedates by several years Cuvier's use of it for the precious red coral and would submerge the name *Corallium* as a junior synonym of *Isis* should it prove to be nomenclaturally available.

Melitnaea ocracea (Linnaeus) — (Pl. 85, fig. 1)

- Accarbarium rubrum*, Rumphius Herb. VI, 1750, p. 234, pl. 85, fig. 1, "Accarbaar mera".
Isis ocracea Linnaeus, 1758, p. 799.
Isis ocracea Pallas, 1766, p. 230.
Isis ochracea Linnaeus, 1767, p. 1287.
Isis ocracea Ellis, 1767, p. 125, pl. 40.
Isis oeracea (sic) Burman, 1769, p. (3).
Isis ochracea Houttuyn, 1772, p. 247.
Isis ochracea Esper, I, 1788, p. 38, pls. 4, 4a (*Isis*).
Isis ochracea Gmelin, 1791, p. 3793.
Melitea Ochracea Lamouroux, 1816, p. 462.
Melitodes ochracea Hickson, 1937, p. 97.

Rumphius distinguishes three kinds of "Accarbarium rubrum"; the first seems certainly to be the common *Melitnaea ocracea* (Linnaeus); the other two are less readily identifiable. The second kind, from Ceram, called "Accarbaar djinka" (oranje-roode Kalbahaar) may be just a paler example of the first; but von Martens (1902) suggests that the third, which is "buiten met een rood-geel brosse en zandige schorsse bekleedt" may be *Mopsella aurantia* (Esper).

Hickson (1937) describes *M. ocracea* (p. 97), and discusses *Mopsella aurantia* (p. 142); Kükenthal (1924) also describes them.

Tubipora musica Linnaeus

Halcyonium rubrum indicum, Rumphius Herb. VI, 1750, p. 236, pl. 85, fig. 2; "Batu swangi".

Tubipora musica Linnaeus, 1758, p. 789.

Tubipora musica Pallas, 1766, p. 339.

Tubipora musica Linnaeus, 1767, p. 1270.

Tubularia purpurea Burman, 1769, p. (12).

Tubipora musica Esper, I, 1789, p. 163.

Tubipora musica Gmelin, 1791, p. 3753.

Tubipora musica Bosc. II, 1802, p. 297.

Tubipora musica Oken, 1833, p. 131.

Tubipora musica Milne Edwards & Haime, 1857, p. 132.

This widespread species, one of the best known of all alcyonarians is unmistakably described and figured by Rumphius.

Ianthella basta (Pallas)

Basta marina, Rumphius Herb. VI, 1750, p. 253, pl. 89; "Basta laut".

Gorgonia Ventalina Linnaeus, 1758, p. 801.

Gorgonia Ventilabrum Pallas, 1766, p. 165.

Spongia Basta Pallas, 1766, p. 379.

Spongia Ventilabra Linnaeus, 1767, p. 1296. (In "Systema ed. 10, plate 89 was referred to *Gorgonia ventalina*. Pallas's *Spongia strigosa*, p. 397, is cited under synonymy of *Sp. ventilabra* in "Systema" ed. 12).

Gorgonia Ventalina Gmelin, 1791, p. 3808. (Herb. VI, p. 205, pl. 89 is cited here).

Spongia Ventilabra Gmelin, 1791, p. 3817. (Herb. VI, p. 253, pl. 89, cited here with a question mark).

Spongia Basta Esper, II, 1799, p. 244, pl. 25 (Spong.).

Gorgonia ventalina Bosc, III, 1802, p. 34.

Gorgonia Ventalina Lamouroux, 1816, p. 404.

Antipathes Flabellum Lamouroux, 1816, p. 382.

Spongia Basta Lamouroux, 1816, p. 57.

Rhipidigorgia flabellum Milne Edwards & Haime, 1857, p. 173.

Ianthella basta von Lendenfeld, 1889, p. 695.

Plate 89 of the "Herbarium" has been referred to a variety of genera, largely through error. It is certainly not a gorgonian. I find that von Lendenfeld (1889, p. 695) refers it (with the usual error: "plate 89, fig. 1") to *Ianthella basta* (Pallas), a sponge; his plate 47, fig. 5 is convincingly suggestive of Rumphius's figure. Oken's genus *Basta* has as its tautonymous genotype Pallas's species, which is based on Rumphius's "*Basta marina*"; de Laubenfels (1948, p. 125; cf. also p. 159) disposes of *Basta* by the astounding nomenclatural tactic of establishing as neotype of *Spongia basta* Pallas a specimen of *Spongia officinalis* (which hardly corresponds with either Pallas's description, short though it may be, or with plate 89 of the "Herbarium Amboinense"). Fortunately, the International Commission on Zoological Nomenclature has imposed stringent requirements governing the establishing of neotypes, which in this case may not have been satisfied.

Virgularia juncea (Pallas)

Sagitta marina alba, Rumphius Rarit. 1741, p. 43; "Zee-pylen".

Sagitta marina alba, Rumphius Herb. VI, 1750, p. 256.

Pennatula juncea Pallas, 1766, p. 371.

Pennatula juncea Gmelin, 1791, p. 3866.

Pennatula juncea Esper, III, post 1805, p. 87, pl. 4 (Pennat.).

The three authors listed above refer to both the "Herbarium" (p. 256) and the "Rariteitkamer" (p. 43). Von Martens (1902, p. 133) considers the animal to be *Virgularia rumphii* Kölliker; see the synonymies given by Kükenthal (1915, pp. 76, 77) under both *V. juncea* and *V. rumphii*.

It is interesting to note how accurately Rumphius anticipated modern accounts of the habits of pennatulids. In the "Rariteitkamer" he says (keep in mind that the soft parts are referred to as the "worm" and the axial rod as the "arrow"): "These worms grow on flat, sandy beaches, and the arrows always stand straight up, at high tide mostly with the arrows above the bottom but covered with sea-water; but when the tide falls, the arrows descend into the soil, and remain projecting not more than 3 or 4 fingers above the bottom. Therefore, if one wishes to collect them, one must do so at high tide, seizing the upper part of the worm where the arrow projects, and pulling it out with one jerk; for if one begins to wiggle it, the worm withdraws more and more". "They are found on such beaches which at high tide are covered by not more than one ell of water, but at low tide are always covered with some water". Compare MacGinitie & MacGinitie, 1949, p. 78.

? Sponge

- Nidus vesparum marinus*, Rumphius Herb. VI, 1750, p. 256; "Roema miri".
Alcyonium cotoneum Pallas, 1766, p. 359.
Alcyonium Cydonium Linnaeus, 1767, p. 1295.
Alcyonium cotoneum Burman, 1769, p. (22).
Alcyonium Cydonium Houttuyn, 1772, p. 409.
Alcyonium cydonium Gmelin, 1791, p. 3813.
Alcyonium cydonium Esper, III, 1805, p. 72.
Alcyonium Cydonium Lamouroux, 1816, pp. 337—338.
Alcyonium Vesparium Lamouroux, 1816, p. 339.

Although Rumphius's unillustrated description has frequently been thought to deal with an alcyoniid, the object in question seems more likely to be a sponge. See von Martens, 1902, p. 135.

Pteroeides grandis (Pallas)

- Sagitta marina nigra*, Rumphius Rarit. 1741, p. 43.
Pennatula grandis Pallas, 1766, p. 366.
Pennatula grandis Gmelin, 1791, p. 3867.

Hickson (1916, pp. 148, 157, 170) has very ably and convincingly discussed the identity of "Sagitta marina nigra"; von Martens (1902, p. 133) had already suggested the identity of *Pennatula argentea* Ellis & Solander with Rumphius's second kind of sea-pen. Hickson lists *Pennatula grandis* Pallas under the synonymy of *P. argentea* E. & S., but it seems to me that the earlier name should be employed.

Rumphius describes the habits and luminescence of this species, as well as the virulence of its nematocysts: "When one carelessly touches these spines (on the polyp-leaves) one feels a burning and the hand becomes red, followed by an unpleasant itching, after which small blisters appear, as if one had been touched by nettles, continuing for three days: but if one seizes them from below upwards, one does not feel the burning in the hand, so one should always seize them this way, first having made the hands rough with sand. At night they give off a fiery and greenish slime . . . They do not retract farther into the sand than to the combs (the polyp-leaves); and they occur on the beach in front of the Victoria Castle, close to the edge of the lowest water, where the shore begins to drop off". He also gives a remedy for the stings, consisting of lemon juice and warm ashes, followed by a poultice made of gorgonian cortex ground up with water.

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EXPLANATION OF THE PLATES

Plate 1.

Psammogorgia antipathes (Linnaeus). Spicules of the cortex of this coral; and an entire specimen. Drawn from material in the U.S. National Museum, collected at Onotoa, Gilbert Islands, by P. E. Cloud.

Plate 2.

Subergorgia mollis (Nutting). Spicules of the cortex of this sea-fan; and a branch of the fan, drawn from a specimen in the U.S. National Museum, collected at Bikini, Marshall Islands, by Robert W. Hiatt.

Plate 3.

Subergorgia mollis (Nutting). A native of the islands, and diver, displaying the "Accarbaar abu abu" or larger grey sea-fan of Rumphius. Drawn by Mr. L. B. Isham from photographs of a specimen in the U.S. National Museum and engravings of native figures published by F. Valentyn (1726).