

Original watercolours donated by Cornelius Sittardus to Conrad Gesner, and published by Gesner in his (1558 - 1670) works on aquatic animals

L.B. Holthuis

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L.B. Holthuis, c/o National Museum of Natural History, Leiden, P.O. Box 9517, 2300 RA Leiden, the Netherlands.

Key words: Conrad Gesner; Cornelius Sittardus; Gysbertus Horstius; Cetacea; Pisces; Tunicata; Coelenterata; Mollusca; Echinodermata; Insecta; Crustacea Decapoda; Fungi; original 16th century illustrations. Some original watercolours, that were donated by the sixteenth century physician Cornelius Sittardus, to Conrad Gesner, who published them in his "Historia Animalium Liber IV"(1558), at present are kept in the National Museum of Natural History of Leiden. These watercolours are discussed here, as well as the other figures of the Sittardus collection published by Gesner.

In the division of Crustacea of the National Museum of Natural History, Leiden, the Netherlands, a collection of drawings, watercolours and prints dealing with Crustacea is kept. This collection is owned by myself, but is on permanent loan in the Crustacea Division, and after my death will become the property of the Division. A few of the original watercolours are of special interest; one set of these will be dealt with here. It contains watercolours donated by Cornelius Sittardus to Conrad Gesner, who published the larger part in his 1558 *Historia Animalium Liber IV*. As Dr Urs Leu of the Zentralbibliothek in Zürich, Switzerland, and foremost specialist on Gesner, informed me, original watercolours of Gesner's woodcuts are quite rare; the few known so far are kept by the University libraries of Tartu (Estonia), Erlangen (Germany), Basel and Zürich (Switzerland), and now by the Leiden Museum.

In the fourth volume of his *Historia Animalium*, subtitled "qui est de Piscium & Aquatiliū Animantium natura", Gesner (1558) dealt with fishes, crustaceans and other aquatic animals. The volume is copiously illustrated with woodcuts made after illustrations that Gesner obtained from different sources. These sources are usually meticulously indicated by him.

The greater part of Gesner's illustrations are reproductions of the figures published in the works by Guillaume Rondelet (= Gulielmus Rondeletius) (1554) and Pierre Belon (= Petrus Bellonius) (1553). Of the rest, a great percentage are those made under the supervision of Gesner himself, when in 1544 he spent the summer in Venice, where he "untersuchte die Fische und liess sie abmalen" (H. Fischer, 1966: 26); also at other occasions Gesner had drawings of fishes made. A number of illustrations were received by him from anonymous friends in Italy and elsewhere. Several other persons who contributed figures to Gesner's book are mentioned there by name, like Io Caius (= the Englishman John Caius, 1510-1573), Georgius Fabricius, Io Kentmanus (= Johann Kentmann of Dresden), Stephanus Lauraeus, Geryon Seilerus, Cornelius Sittardus, Petrus Stuibius and others. Most of these are also listed in his

introductory chapter "Enumeratio Authorum", which follows the chapter "Praefatio" of his 1558 book; these introductory chapters are unpaginated. Of the helpers who are mentioned by name, Cornelius Sittardus is cited most frequently as the provider of drawings published in this work. The same figures by Sittardus can also be found in Gesner's (1560) "Nomenclator Aquatiliū Animantium", in which even a few additional ones are published. In the second (1604) edition of Gesner's "Historia Animalium Liber IV", the same figures as in the first edition are found; to these are added three more of Sittardus' figures, namely those of "Pastinaca" (published by him also in 1560), "Penna marina" (also found in his 1560 and 1670 works), and "Raiae uterus", which was there published for the first time. This second edition of the "Historia Animalium Liber IV" has a separately paginated addendum, the first 30 pages of which are named "Paralipomena", while pp. 31-38 bear the title "De Aquatilibus". Finally, in Gesner's (1670) "Fischbuch", the abridged German edition of his 1558 work, published as two separately paginated parts, a great percentage of Sittardus' illustrations (but not all) are reproduced; in the first part of the "Fischbuch" Sittardus is often acknowledged as the source of the illustrations, but not in the second part, where at the most the remark "in Italia conterfeitet" is given. The Sittardus figures that I could find in the four books mentioned above, are discussed here, and reproductions of Gesner's wood cuts are given; for convenience sake, the figures are mostly copied from Gesner (1650). The species are the following:

Vertebrata Mammalia

Cetacea

1. "Delphinus" (1558: 1276; 1560: 161; 1604 (Paralipomena): 17). A habitus figure of a dolphin, possibly *Steno bredanensis* Lesson, 1828. (fig. 1a).
2. "Delphini cranium". Gesner (1558: 381; 1604: 321) reproduced the figure of the skull of a dolphin that was first published by Belon (1553: 14) and stated that he had received a similar figure from Sittardus. In 1560 (: 162) he published a different figure of the skull of a dolphin and gave as legend: "Delphini Calvaria è libro Bellonij". This is an error as Belon's figure is the same as that figured by Gesner in 1558 (and 1604); it seems logical to conclude that the figure published in 1560 is the one received from Sittardus; this figure also was used by Gesner (1670 (1): 131). The specific identity of the dolphin cannot be made out with certainty. (fig. 1b).

Pisces

Osteichthyes

3. "Sargus" (1558: 996; 1560: 44; 1604: 827), front view of the skull. In the second (1604) edition of *Historia Animalium IV*, the pages numbered 809-828 occur twice, the first page 829 was misprinted 809 and the text continued with this false pagination; p. 827 with the figure of "Sargus" here is the second 827. The figure represents the skull of a *Diplodus* species. (fig. 2).
4. "Fiatola" (1558: 1110; 1560: 60; 1604: 926; 1670 (1): 44). The 1558, 1560 and 1604 figures are good, that of 1670 is a very poor copy. This species is *Stromateus fiatola* L., 1758. (fig. 3a).

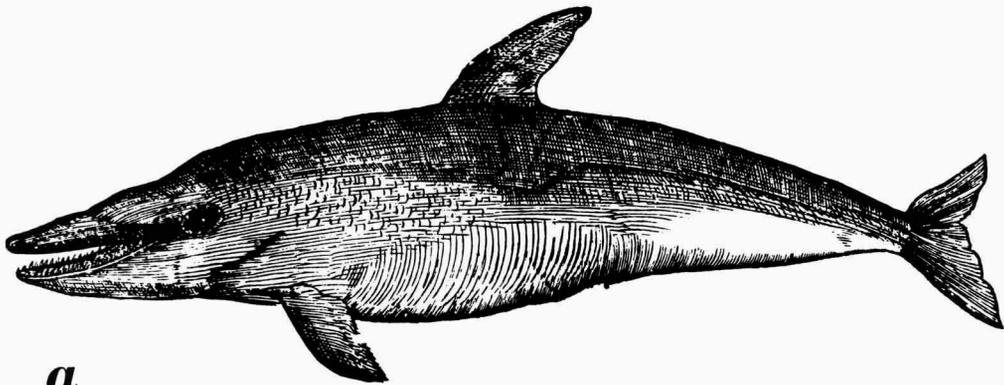
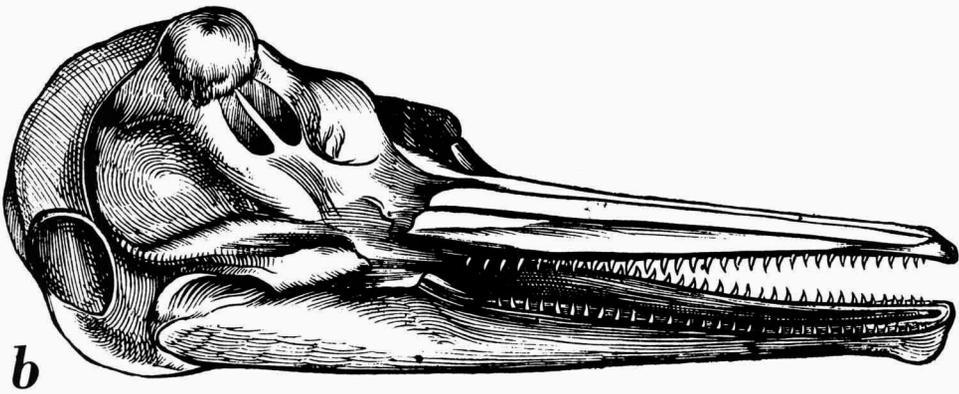
*a**b*

Fig. 1a. *Steno bredanensis* Lesson, 1828 ("Delphinus" Gesner, 1560: 161); b, Skull of a dolphin ("Delphini Calvaria" Gesner, 1560: 162).

5. "Acus" (1558: 1225; 1560: 92; 1604: 1025). Figures of two pipefish, *Syngnathus typhle* L., 1758, both of the Sittardus collection. The original watercolour of one is discussed on p. 190 below. (fig. 3b; pl. 2).

6. "Corvulus" (1558: 1273; 1560: 57; 1604 (Paralipomena): 15; 1670 (1): 42). The species represented is *Umbrina cirrhosa* (L., 1758). (fig. 3c).

7. "Novacula, Pesce Pettine" (1558: 1283; 1560: 62; 1604 (Paralipomena): 24). A good figure of *Xyrichtys novacula* (L., 1758). (fig. 4a).

8. "Passer, Passerinus" (1558: 1288; 1560: 104; 1604 (Paralipomena): 28). The figure probably is that of a Labrid. (fig. 4b).

9. "Rhomboides pecten" (1560: 97; 1670 (1): 78). This figure represents *Citharus macrolepidotus* (Bloch, 1787). (fig. 4c).

Chondrichthyes

Batoidea, Rays

Myliobatidae, Eagle Rays

10. "Aquila" (1558: 88; 1560: 123; 1604: 77; 1670 (1): 94). Showing the tail of the Eagle Ray, *Myliobatis aquila* (L., 1758). (fig. 5a).

11. "Aquila" (1560: 122; 1604 (Paralipomena): 38). Complete figure of an Eagle Ray, *Myliobatis aquila* (L., 1758). (fig. 5b).

Rajidae, Rays

12. "Raia oculata" (1558: 945 (misprinted 545), not figured; 1560: 133; 1604 (Paralipomena): 32; 1670 (1): 98). Figure of the whole animal of *Raja miraletus* L., 1758, in dorsal view. In 1558 the species and Sittardus' figure were mentioned in Gesner's text, but the figure was not shown there; however, in 1560, 1604 and 1670 the figure was published. (fig. 6a).

13. "Raiae uterus" (1604 (Paralipomena): 35). This egg case of a ray is not figured in Gesner's 1558, 1560 or 1670 books, but is shown in the (1604) second edition of his *Historia Animalium IV*. It was published in the addendum "De Aquatilibus" of the "Paralipomena". No explanation is given with the figure except for the legend "Raiae uterus". In the printed figure the long horns of the case are shown somewhat shorter than in the original. The figure is only included here as its original was found among the original Sittardus figures discussed below (p. 190). This egg case is of *Raja (Rostroraja) alba* Lacépède, 1803. (fig. 6b; pl. 2).

Torpedinidae, Electric Rays

14. "Torpedo" (1558: 1188; 1560: 126; 1604: 993; 1670(1): 103). This is a quite good figure of *Torpedo (Torpedo) marmorata* Risso, 1810. (fig. 7a).

Selachoidea, Sharks

Oxynotidae, Humantins

15. "Galeus centrinus" (1558: 1250; 1560: 147; 1604: 1047; 1670 (1): 109). A figure of *Oxynotus centrina* (L., 1758). (fig. 7b).

Sphyrnidae, Hammerhead sharks

16. "Zygaena" (1558: 1256; 1560: 150; 1604: 1051). The figure shows only the head of a hammerhead shark, *Sphyrna zygaena* (L., 1758). (fig. 7c).

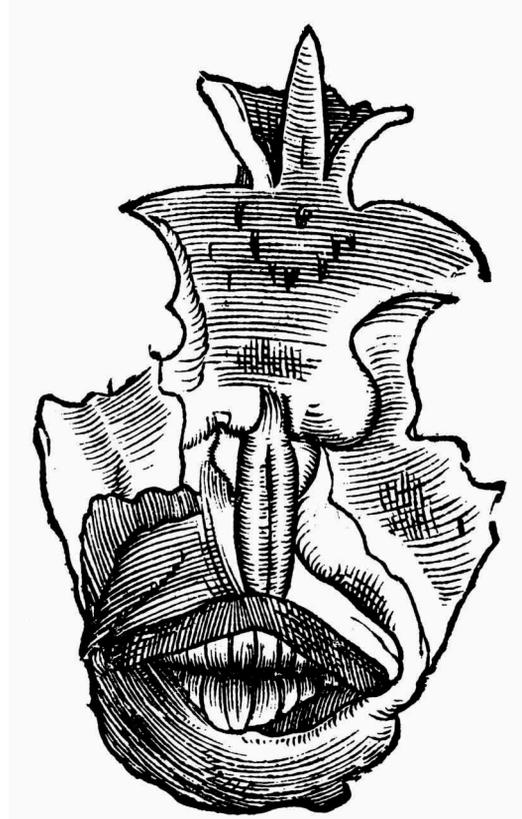


Fig. 2. *Diplodus* spec. ("Sargus" Gesner, 1560: 44).

Invertebrata
Tunicata

17. "Tethya" (1558: 1144, lower two figures; 1560: 263, lower two figures; 1604: 955, lower two figures; 1670 (2): 83, lower two figures of "Meersprützen"). Aldrovandus (1606: 584) copied these figures and named them (together with those of no. 30, "Fungus marinus") "Tethyorum icones Zoographo [= Gesner, see pp. 193, 194 below] à Cornelio Sittardo missae". Possibly the Ascidian *Microcosmus* is meant and perhaps

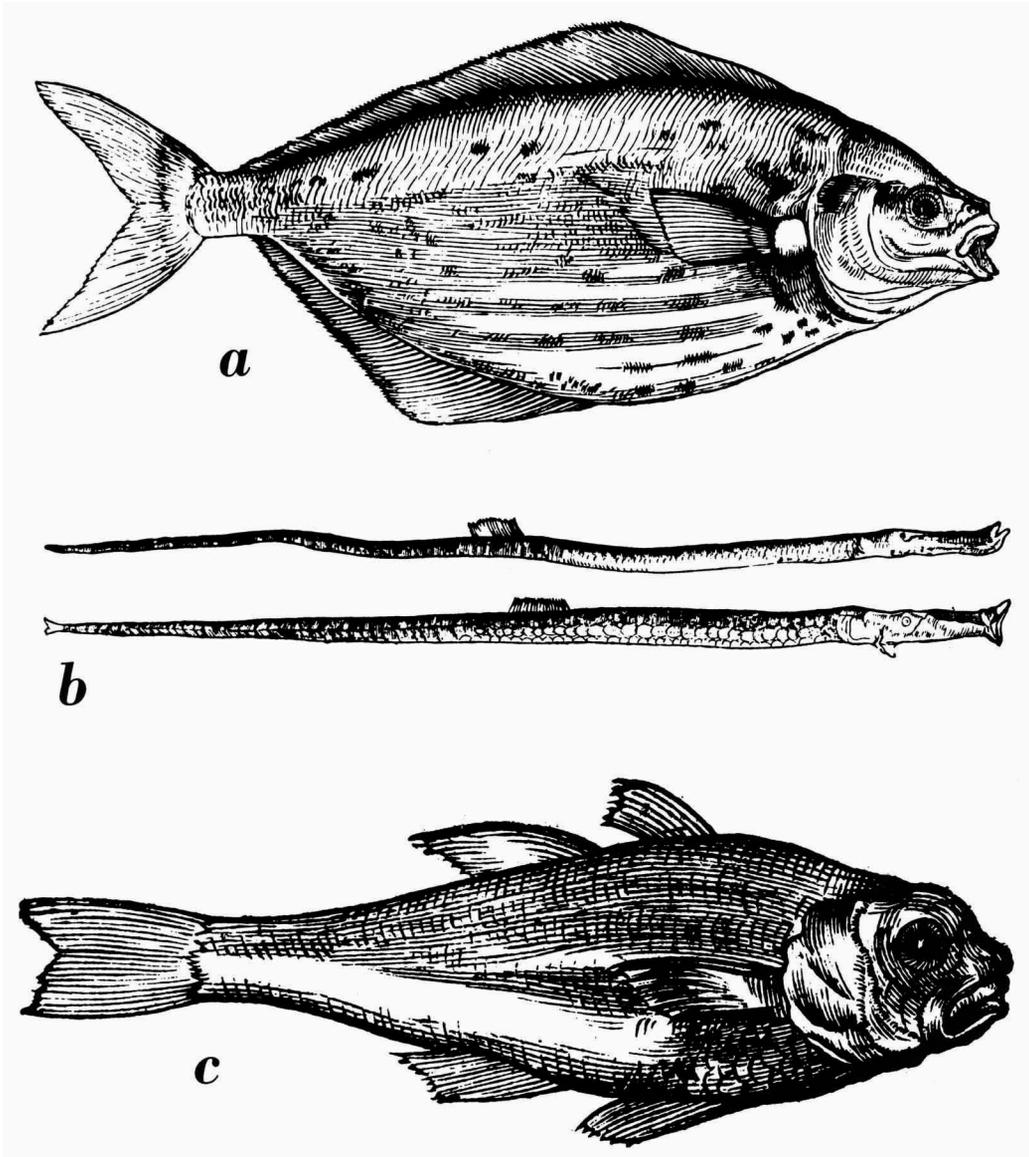


Fig. 3a. *Stromateus fiatola* L., 1758 ("Stromateus" Gesner, 1560: 60); b, *Syngnathus typhle* L., 1758 ("Acus" Gesner, 1560: 92); c, *Umbrina cirrhosa* (L., 1758) ("Corvulus" Gesner, 1560: 57).

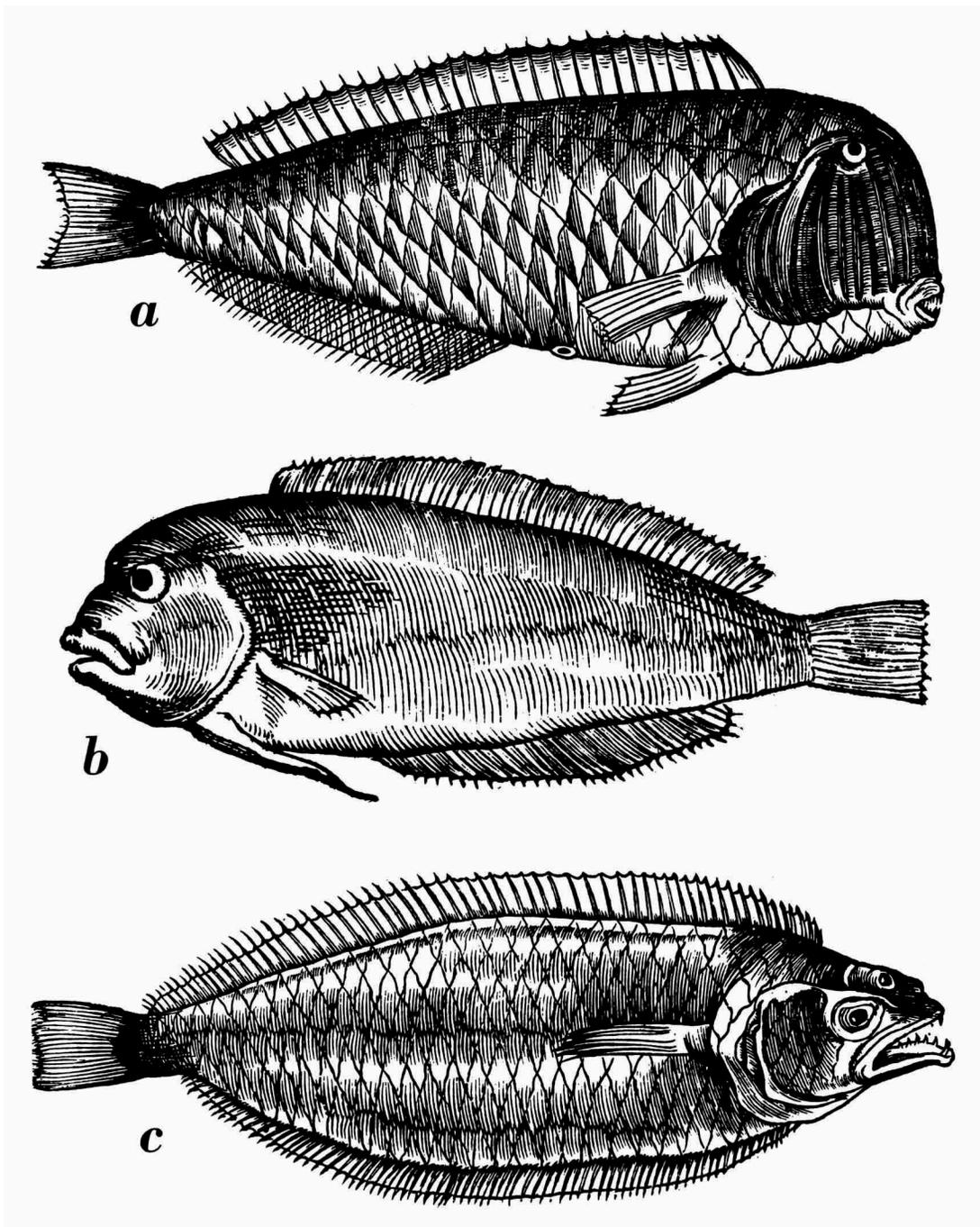


Fig. 4a. *Xyrichtys novacula* (L., 1758) ("Novacula" Gesner, 1560: 62); b. ? Labrid ("Passerini" Gesner, 1560: 104); c. *Citharus macrolepidotus* (Bloch, 1787) ("Pecten" Gesner, 1560: 97).

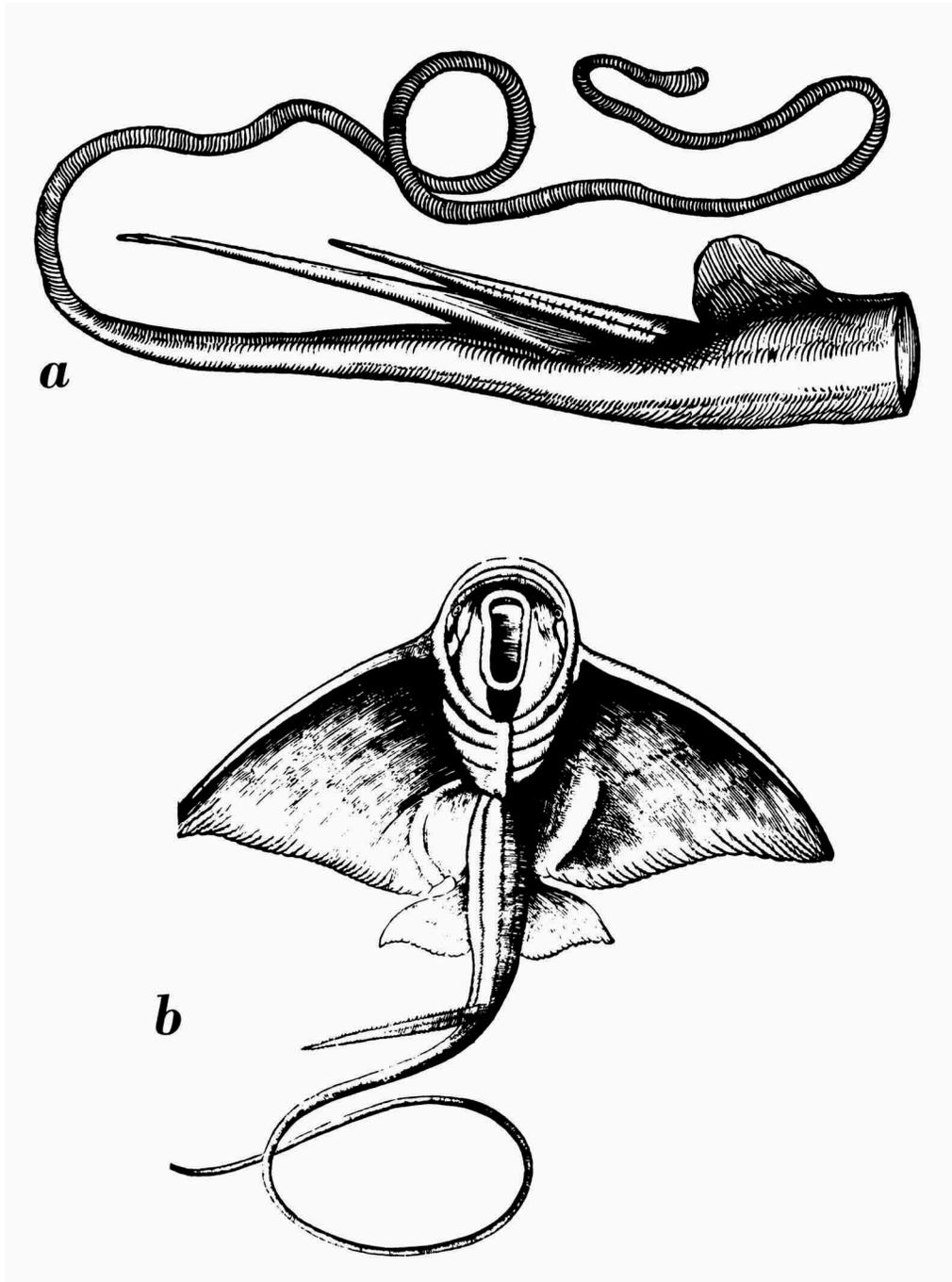


Fig. 5a. *Myliobatis aquila* (L., 1758), tail end ("Aquila" Gesner, 1560: 123); b, *Myliobatis aquila* (L., 1758), whole animal ("Aquila" Gesner, 1560: 122).

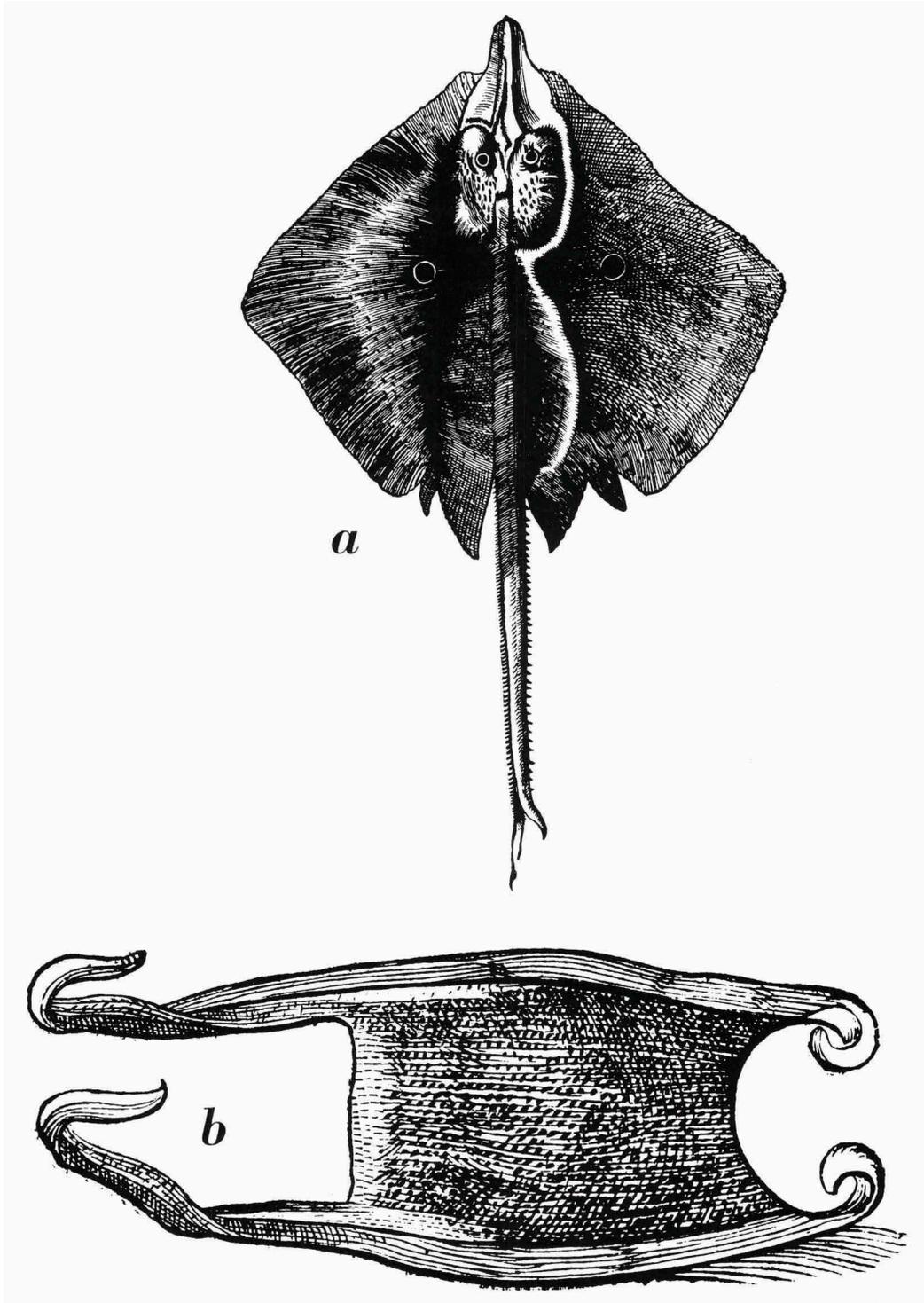


Fig. 6a. *Raja miraletus* L., 1758 ("Raia oculata" Gesner, 1560: 133); b, *Raja alba* Lacépède, 1803 ("Raiae uterus" Gesner, 1604 (Paralipomena: 35)).

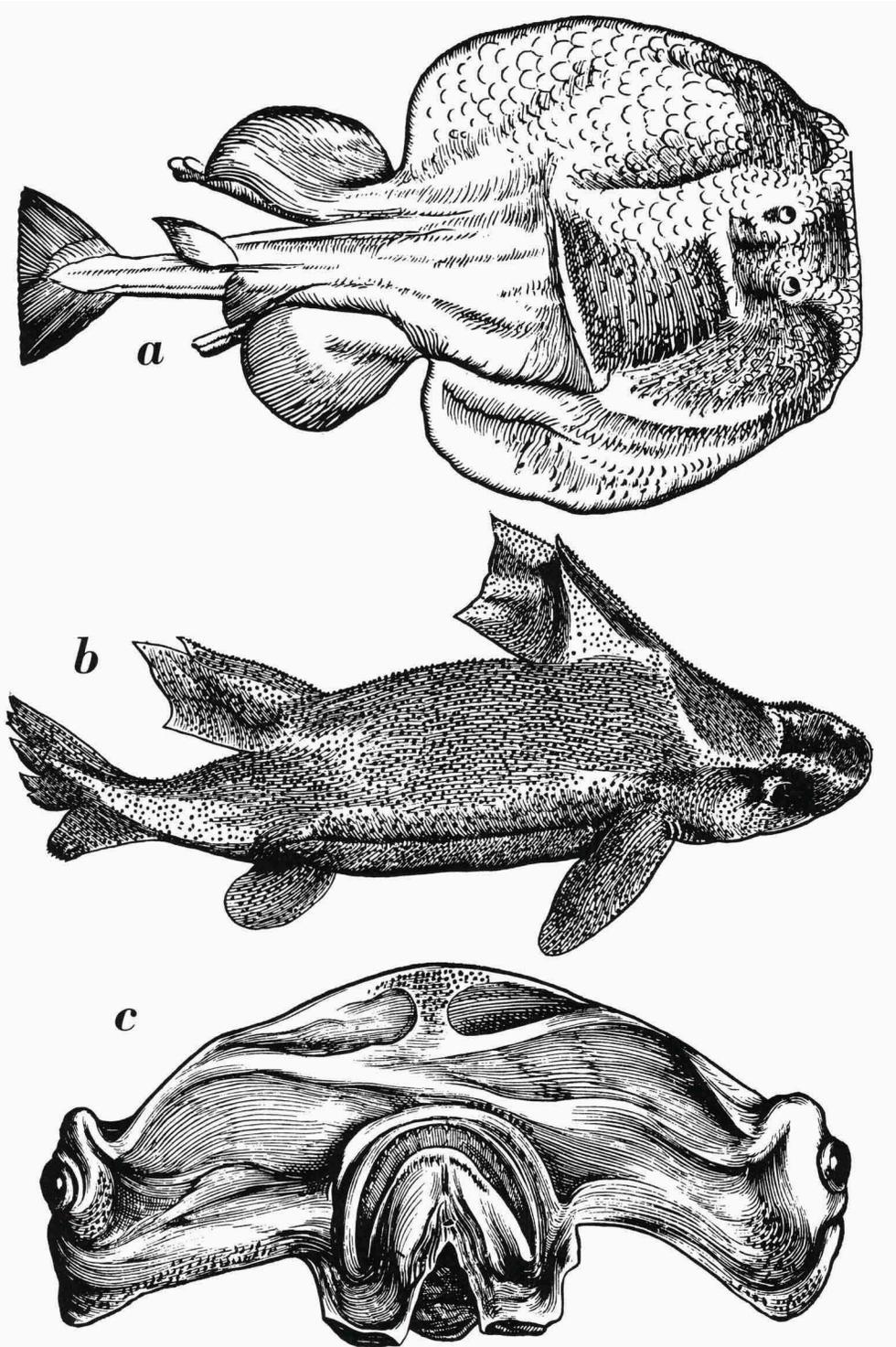


Fig. 7a. *Torpedo marmorata* Risso, 1810 ("Torpedo" Gesner, 1560: 126); b, *Oxymotus centrina* (L., 1758) ("Galeus" Gesner, 1560: 147); c, *Sphyrna zygaena* (L., 1758) ("Zygaena" Gesner, 1560: 150).

Microcosmus sulcatus (Coquebert, 1797). The original figure is discussed below on p. 190. (fig. 8a; pl. 2).

18. "Pudendum marinum" (1558: 894, no figure; 1560: 266; 1604: 759 and (Paralipomena): 35; 1670 (2): 84). In the first edition of *Historia Animalium Liber IV*, Gesner discussed a species of which he had received a figure from Cornelius Sittardus, but he did not publish that figure. In 1560 he did publish the figure, repeating the earlier description. The figure was also published in the 1604 edition, namely in the section "De Aquatilibus" of the "Paralipomena" addendum; here it carries only the legend "Pudendum marinum" and there is no reference to the description of this figure found on p.759. According to Leuckart (1875: 95, first footnote) and Seeliger (1893: 15), this organism belongs to *Salpa maxima* Forskål, 1775. (fig. 8b).

Coelenterata

19. "Manus marina" (1558: 619; 1560: 273; 1604: 524; 1670 (2): 85). Aldrovandus (1606: 593) copied this figure under the same name. This is *Alcyonium palmatum* Pallas, 1766, as already indicated by Leuckart (1875: 98). (fig. 9a).

20. "Urtica marina" (1558: 1243; 1560: 199; 1604: 1041; 1670 (2): 13). Aldrovandus (1606: 569) copied Gesner's figures and gave them the legend "Urticae species duae quas in Italia pictas Zoographus [= Gesner, see pp. 193, 194] accepit à Cornelio Sittardo". Judging by the shape, the colour, and the vertical lines on the body, this is *Calliactis parasitica* (Couch, 1842). There are two figures of the animal, one shows it in lateral view with the tentacles contracted, the other figure shows the animal from above with extended tentacles. See below (p. 191) for a discussion of the original water colour of the first figure. (fig. 9b, c; pl. 2).

21. "Penna marina" (1558: 818, not figured; 1560: 273; 1604 (Paralipomena): 32; 1670 (2): 86). Aldrovandus (1606: 591) copied this figure from Gesner and published it under the name "Penna marina sanguinei coloris". The figure shows clearly a *Pennatula*. It was identified as *Pennatula phosphorea* Linnaeus, 1758 by Leuckart (1875: 98). In 1558 Gesner mentioned that Cornelius Sittardus had given him a figure of this species, but only in his 1560, 1604, and 1670 works he published that figure. (fig. 9d).

Mollusca

22. "Pinna" (1558: 1287; 1560: 240; 1604 (Paralipomena): 27; 1670 (2): 54). The figure shows *Pinna nobilis* L., 1758. Aldrovandus (1606: 533) published a rather poor copy of this figure, which he named "Pinna Zoographi" (= Gesner's Pinna). (fig. 10a).

Echinodermata Holothurioidea

23. "Epipetrum" (1558: 1287; 1560: 272; 1604 (Paralipomena): 27; 1670 (2): 85). In 1558 Gesner did not mention that the figure he published was received from Cornelius Sittardus, but did so in 1560. A (not quite exact) copy of this figure was published by Aldrovandus (1606: 590). Leuckart (1875: 96, first footnote) identified the figure as a Holothurian, and was followed in this by Seeliger (1893: 17). Gmelin (1792: 3138-3139), when establishing *Holothuria tubulosa*, cited both Gesner's and Adrovandus'

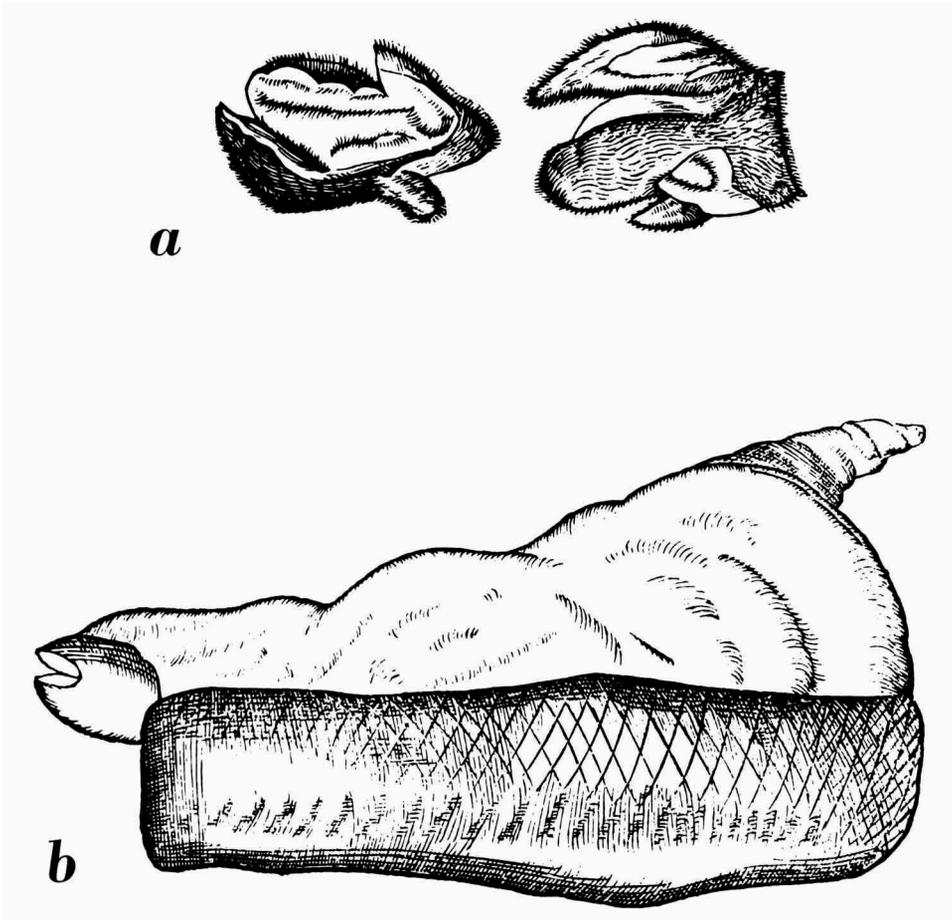


Fig. 8a. ? *Microcosmus sulcatus* (Coquebert, 1797) ("Tethya" Gesner, 1560: 263); b, *Salpa maxima* Forskål, 1775 ("Pudendum marinum" Gesner, 1560: 266).

figures of "Epipetrum" in the synonymy of this species; therefore Sittardus' specimen is a syntype of Gmelin's species. (fig. 10b).

Insecta

24. "*Pediculus marinus*" (1558: 817; 1560: 268; 1604: 695; 1670 (2): 88). Gesner was rather dubious about the identity of the species figured here, stating "si *Pediculi mar. species non est, quo referam dubito*" (1560: 268). This is not surprising as the figure is that of a lepidopteran chrysalis, and certainly is not a marine animal. (fig. 10c).

Crustacea

Penaeidae

25. "*Squilla Crange*" (1558: 1099; 1560: 218; 1604: 916). A reasonably good figure

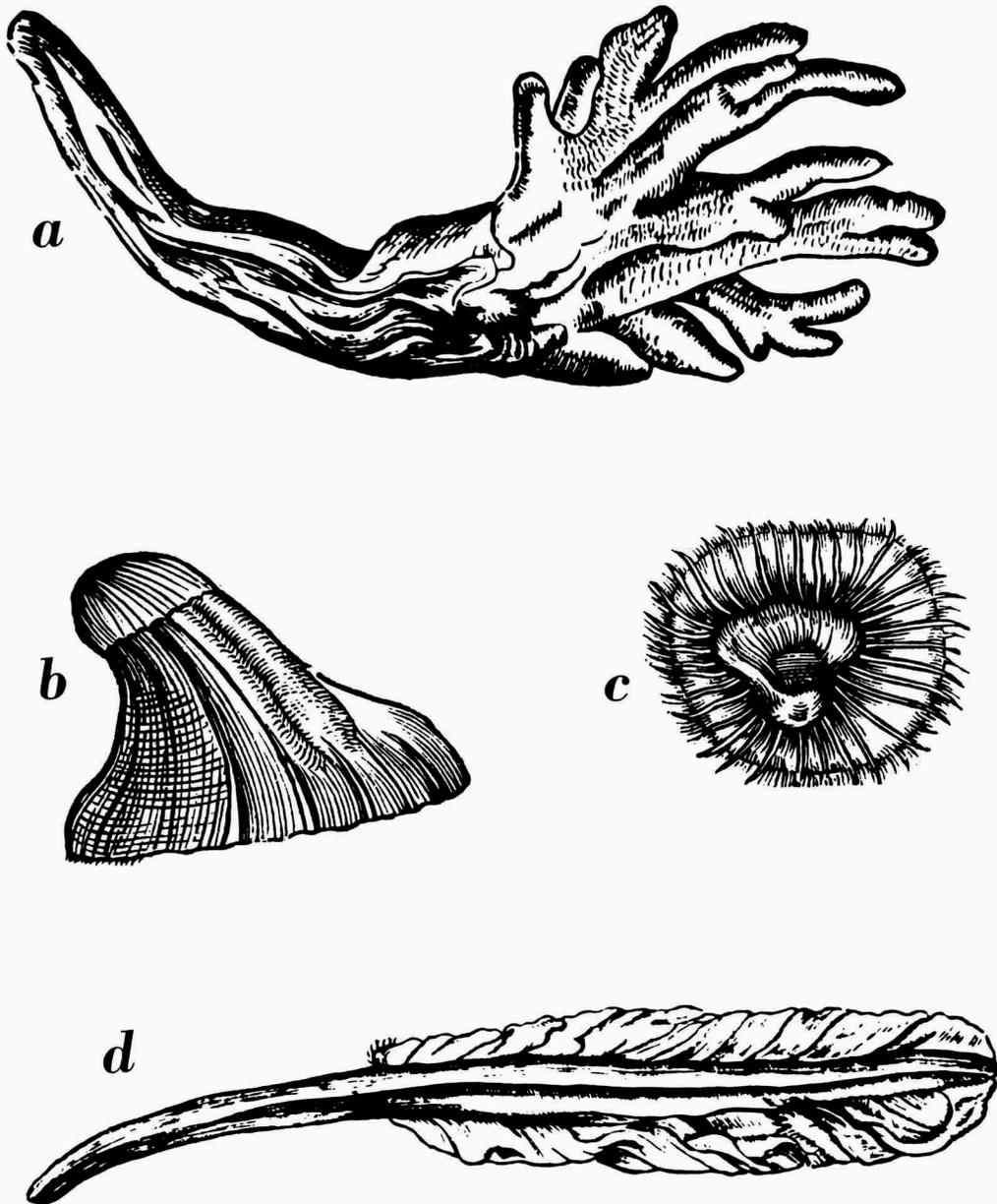


Fig. 9a. *Alcyonium palmatum* Pallas, 1766 ("Manus marina" Gesner, 1560: 273); b, c, *Calliactis parasitica* (Couch, 1842) ("Urtica marina" Gesner, 1560: 199); d, *Pennatulula phosphorea* L., 1758 ("Penna marina" Gesner, 1560: 273).

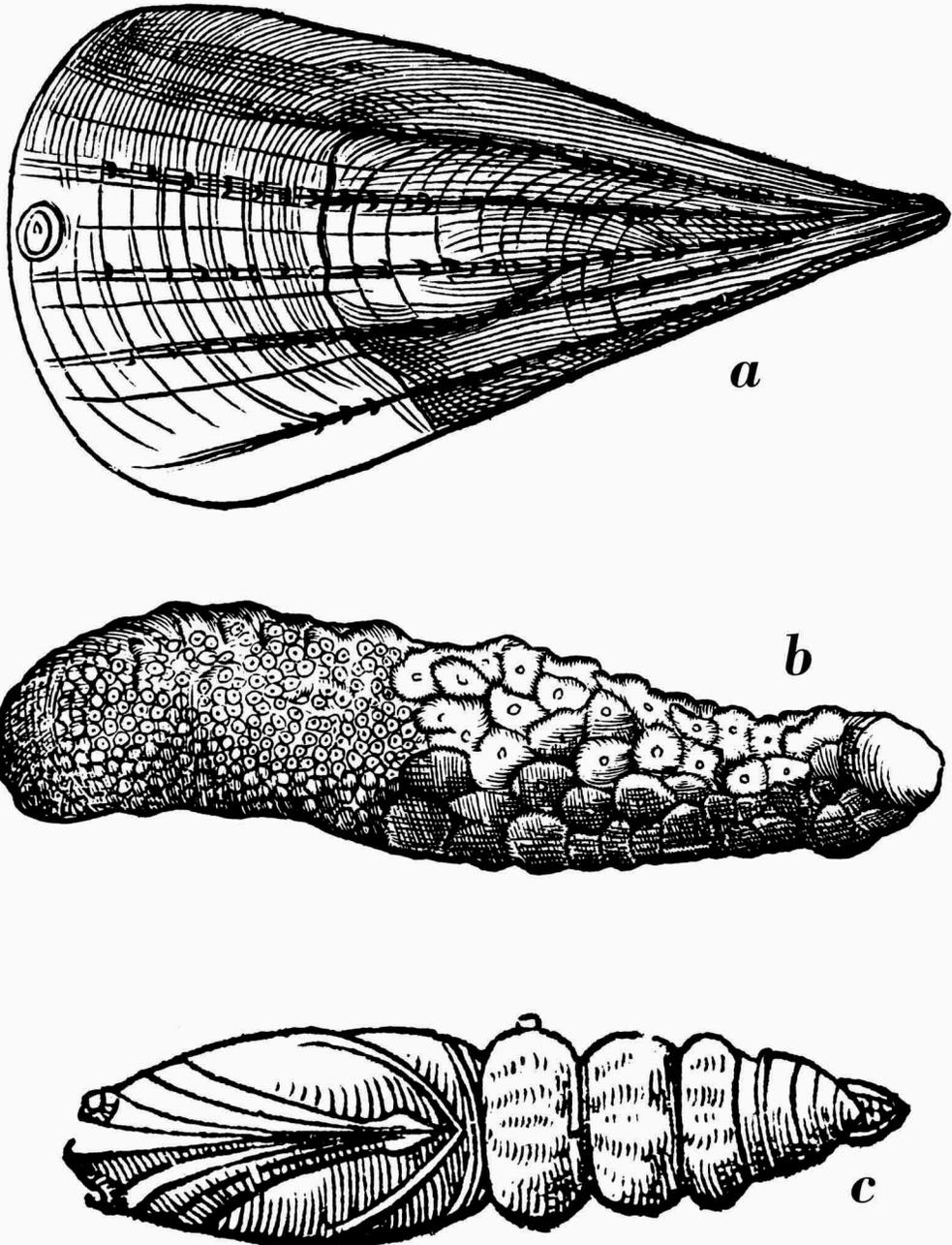


Fig. 10a. *Pinna nobilis* L., 1758 ("Pinna" Gesner, 1560: 240); b, Holothurian ("Epipetrum" Gesner, 1560: 272); c, Lepidopteran chrysalis ("Pediculus marinus" Gesner, 1560: 268).

of *Penaeus kerathurus* (Forskål, 1775). See discussion of the original water colour below (p. 191). (fig. 11a; pl.2).

Scyllaridae

26. "Squilla lata" (1558: 1097; 1560: 216; 1604: 915; 1670 (2): 38). An excellent figure of *Scyllarides latus* (Latreille, 1803). See discussion of the original water colour below (pp. 187, 188). (fig. 11b; pl. 1).

Paguridae

27. "Cancellus" (1558: 193; 1560: 209; 1604: 164; 1670 (2): 27). Gesner (1558) gave here three figures of "Cancellus" placed in a triangle. The top figure (the larger of the three), and the much smaller right bottom figure were ascribed to Cornelius Sittardus. The top figure is quite good and shows *Dardanus arrosor* (Herbst, 1796) in a shell of *Galeodea echinophora* (L., 1758). In the 1558 figure, the hermit crab is shown with the legs smooth and without sculpturation. The characteristic striae on the legs of *Dardanus arrosor* are not visible (fig. 12a). But in Gesner's later (1560, 1604, 1670) figures of the animal these striae are added (fig. 12b), unmistakably showing the identity of the species as *Dardanus arrosor*. Gesner remarked about this species that Sittardus wrote him that he observed the animals in great numbers in the Ligurian Sea near the harbour of Livorno (= Liburnum, = Leghorn). Gesner's (1558: 193) lower right hand figure of Cancellus is very poor, it is the least satisfactory of Sittardus' illustrations. I have placed it here among the Pagurids, because Gesner did so; actually, however, the shape of the abdomen is not Paguroid at all. The illustration shows more resemblance to a primitive picture of a lobster or crayfish, be it of one with chelate 4th and 5th pereopods. Aldrovandus (1606: 221) published a copy of this poor figure and indicated it (like Gesner did himself) as "Cancellus alius oblongus astaco fluviatili similis". The identity of the species is unknown. If Gesner had not definitely said so, it would be difficult to believe that the figure indeed belongs to the Sittardus collection (fig. 12c).

Calappidae

28. "Gallus marinus, Cancer Heracleoticus" (1558: 1265; 1560: 202; 1604 (Paralipomena): 8; 1670 (2): 20). A very good figure of *Calappa granulata* (L., 1758). (fig. 13a).

Dromiidae

29. "Cancer hirsutus" (1558: 187; 1560: 207; 1604: 158, lowest figure). Sittardus' figure is rather crude and differs greatly from the "Cancer hirsutus" of Rondelet (which is *Eriphia verrucosa* (Forskål, 1775)), to which species Gesner assigned Sittardus' figure. The figure is not very clear, but might well purport to show *Dromia personata* (Linnaeus, 1758). The smooth appearance of the carapace may well be caused by that the velvety hairs form a smooth cover, in contrast to *Eriphia* where there are many scattered long hairs. The fact that the species is called "hirsutus" by Gesner may be caused by the hair cover of the animal. Also in agreement with the supposition that this is a *Dromia* is the fact that the last two pairs of legs are much shorter and narrower than the other walking legs. The short and thick segments of the walking legs, the median incision of the front, the indistinct anterolateral teeth all point in the direction of *Dromia*, even the chelipeds could be those of *Dromia*, drawn rather superficially. At first I thought that it might be a Xanthid (e.g., *Eriphia*) that had been eaten by a fish and had become swollen and with its teeth etc. reduced and eroded by the action of the digestive juices. But on second thoughts its identity with *Dromia person-*

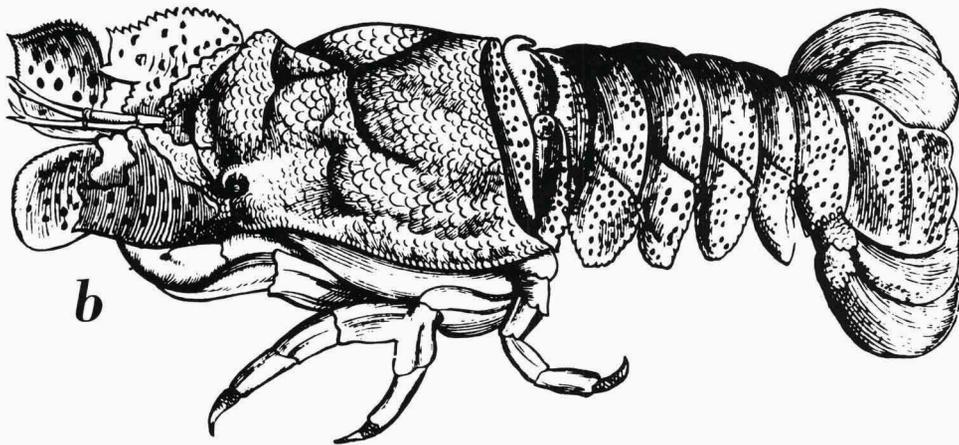
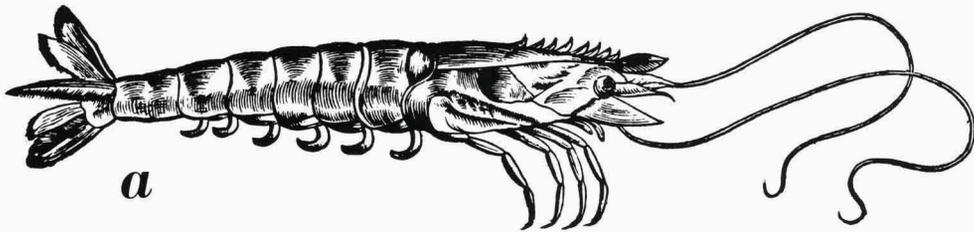


Fig. 11a. *Penaeus kerathurus* (Forskål, 1775) ("Squilla Crange" Gesner, 1560: 218); b, *Scyllarides latus* (Latreille, 1803) ("Squilla lata" Gesner, 1560: 216).

ata seems more likely, even though the figure is quite poor and not immediately recognisable as a Dromiid. Aldrovandus (1606: 192, 193) published two figures, both evidently copies of the present one; the first figure (on p. 192) he named "Cancer hirsutus Zoographi, Somniolo dictus". As Aldrovandus used the name Zoographus for Gesner (see below, pp. 193, 194) this first figure is definitely meant to be that of Gesner's, but the second (on p. 193) undoubtedly is likewise a copy of the same figure. Aldrovandus also seemed to think the species a *Dromia* as he used the for it the name "Somniolo" (the sleepy), which matches Linnaeus' *Cancer dormia* for a species of this genus and also vernacular names for the Mediterranean species (like Granchio dormiglione in Italy, vid. Falciai & Minervini (1992: 188), and the (respectively French, English, and Spanish) FAO names Crabe dormeur, Sleepy crab and Cangrejo

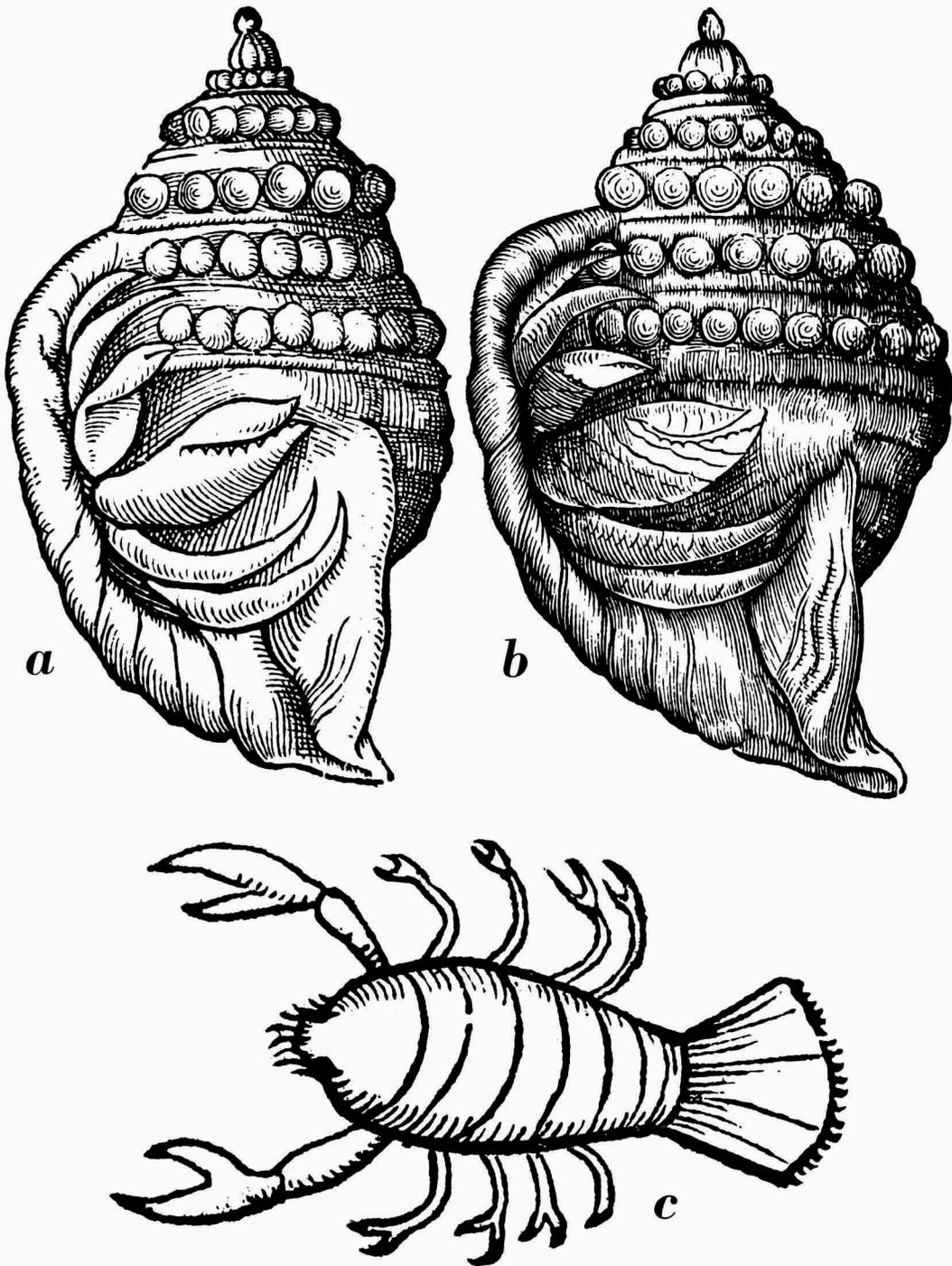


Fig. 12a, b. *Dardanus arrosor* (Herbst, 1796) in *Galeodea echinophora* (L., 1758); a, ("Cancellus" Gesner, 1558: 193); b, ("Cancellus" Gesner, 1560: 209); c, Lobster ("Cancellus" Gesner, 1560: 209).

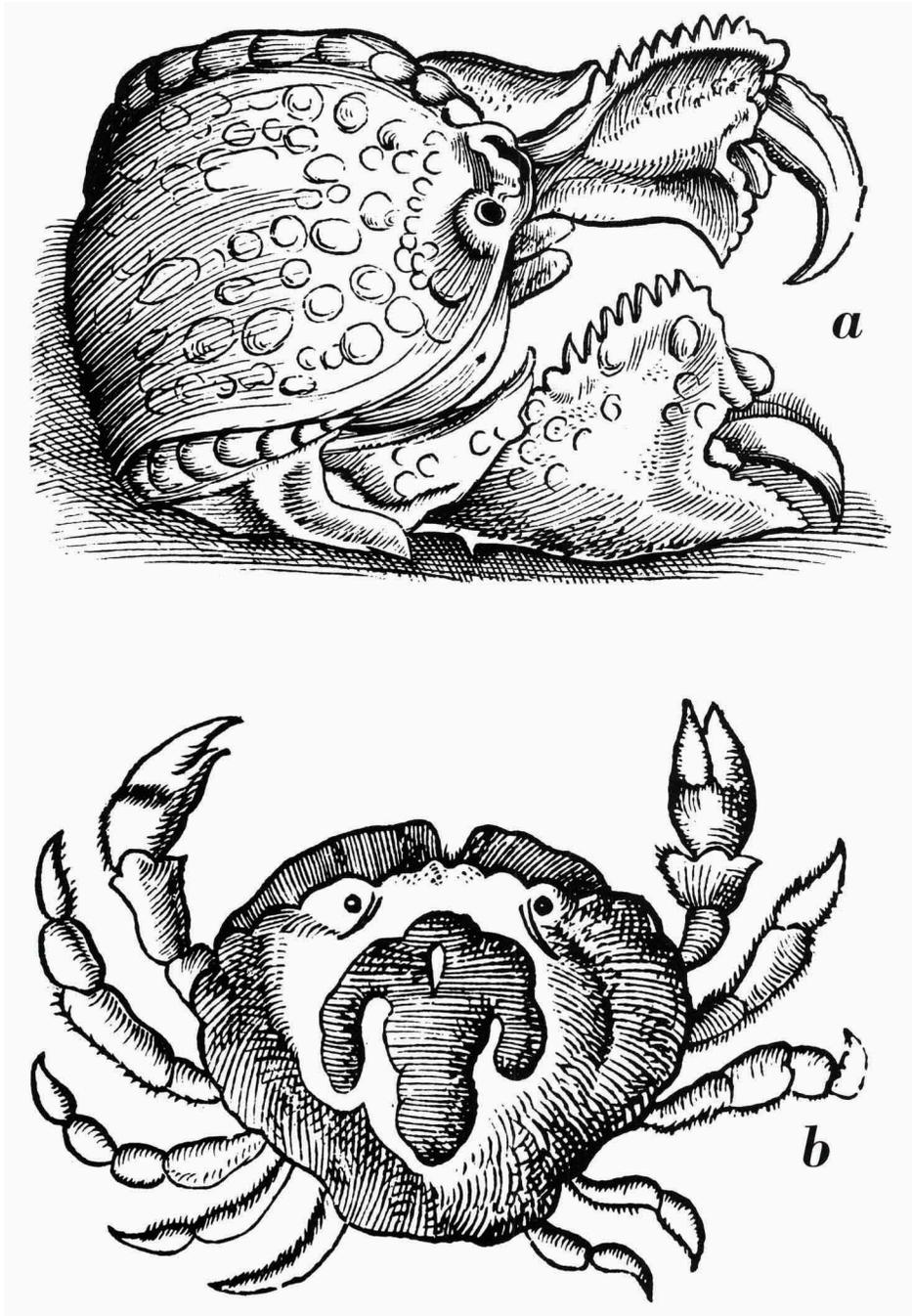


Fig. 13a. *Calappa granulata* (L., 1758) ("Gallus marinus" Gesner, 1560: 202); b, *Dromia personata* (L., 1758)? ("Cancer hirsutus" Gesner, 1560: 207).

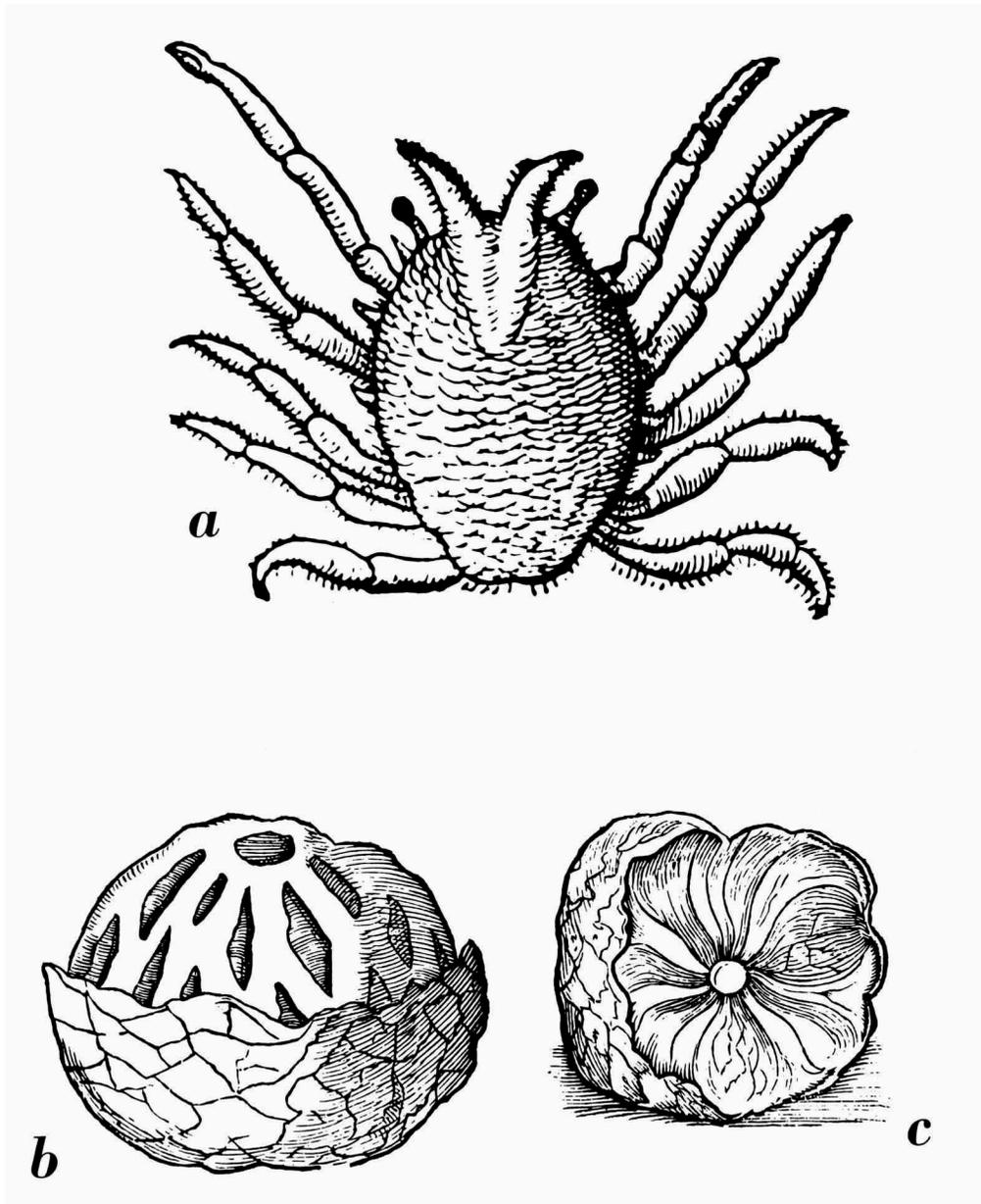


Fig. 14a. *Maja crispata* Risso, 1827 ? ("Folia vel Folca" Gesner, 1560: 208); b, *Clathrus ruber* Micheli: Pers. ("Fungos marinos" Gesner, 1560: 263).

dormilón (see Holthuis, 1987: 336). (fig. 13b).

30. "Folia vel Folca" (1558: 180; 1560: 208; 1604: 153; 1670(2): 21). This figure clearly is of a Majid crab, but the identity of the species is rather dubious. Gesner's figure is copied on fol. 146 (verso) of the manuscript "De Animantium Naturis" by Petrus Candidus. Candidus' book is at present reproduced facsimile and published with a volume of comments by Pyle (1984). Pyle identified the species as *Maja squinado*

(Herbst, 1788), and it may be well a juvenile of that species, or more likely of *Maja crispata* Risso, 1827. However, the narrow shape of the body resembles somewhat some species of *Pisa*; like *P. tetraodon* (Pennant, 1777), but the front is far more like that of *Maja*. The Italian names Folia or Folca are not of too great help. Palombi & Santarelli (1961: 381), gave "Faolo" and "Faulo" as Italian names used in Liguria for *Maja*, but those names may also be given there to other majids. Aldrovandus (1606: 185, lower figure) published a crude copy of Gesner's figure and also some later authors (e.g., Jonstonus, 1650: pl. 7 fig. 15) copied it, but no additional information on the species was produced. (fig. 14a).

Botany (Fungi)

31. "Fungos marinos" (1558: 1144; 1560: 263; 1604: 955; 1670 (2): 83). This figure shows not a sea organism, but a terrestrial fungus, unmistakably the species *Clathrus ruber* Micheli: Pers. Like with the insect (p. 179 above), a terrestrial species was mistaken for a marine form, probably because all of Sittardus' other figures depicted marine species. The figures of *Clathrus* were copied by Aldrovandus (1606: 584) and indicated as "Tethyrorum icones Zoographo à Cornelio Sittardo missae" (together with "Tethya" (no. 17) of pp. 173 & 178 above). (fig. 14b, c).

Original watercolours of the Cornelius Sittardus collection

Of several of Sittardus' above listed figures, the original watercolours by chance were obtained by me. In 1966 Dr. John C. Yaldwyn of Wellington, New Zealand, drew my attention to a drawing of *Scyllarides latus* (Latreille) which was offered for sale in a print catalogue of Mr. Alistair Mathews, Poole, Dorset, England. A black-and-white figure of the watercolour was reproduced in the catalogue; it was listed as "144. Italian or French, circa 1600. Pen & ink & watercolour, a large Crayfish. $7\frac{1}{4} \times 15$ inches, 182×380 mm. ". The figure at first view seemed familiar to me and after searching through several old volumes dealing with Crustacea, I found that it showed a mirror image of "Squilla lata" as depicted by Gesner (1558). I contacted Mr. Mathews and obtained the watercolour from him. A few years later Mr. Mathews wrote me and sent a photograph of another sheet with water colours of Crustacea and other aquatic animals, which I also acquired. The drawings on the second sheet are 7 in number and all but one proved also to have been published by Gesner, who gave the source of five of them to be Cornelius Sittardus, as he had done also for the figure of "Squilla lata". The sixth figure was published by Gesner in the second edition of his "Historia Animalium Liber IV" (1604), while the seventh, as far as I have been able to ascertain, remained unpublished. A close study of the figures, the paper on which they were designed, etc., showed that these watercolours must have been the originals used by Gesner. They are discussed in the following text.

Scyllarides latus (Latreille, 1803) (fig. 11b; pl. 1)

The first of the two sheets measures, as already stated above, 182 by 380 mm. It contains only the figure of *Scyllarides latus*. In the figure, the length of the animal

itself, measured from the posterior margin of the uropodal endopods to the tip of the antennular flagella, is 371 mm, the carapace length is 120 mm. The figure is excellent. It is very detailed and clearly shows this species. Also the colour does not leave much to be desired. The body is plain brown, here and there slightly spotted (e.g., larger spots on the antennae and smaller on the telson), and darker in some areas than in others; a reddish tinge is visible on the soft parts of the uropods and on part of the first abdominal somite. The characteristic blue antennulae are well represented, as well as the grey dactyli of the last three pereopods, the colour of the eye and the characteristic yellowish central spot on the first abdominal somite. As stated in Mr. Mathew's catalogue there is an inscription in ink in a contemporary hand (but not that of Gesner) above the figure. This inscription says "Dormitioso αρκτου πuto esse Ursam, vidi Bellonij descriptionem". The word αρκτου also appears in the lower right hand corner, but in a vertical position. Above the extreme right hand part of the lower margin an English inscription is vaguely visible; it consists of three words, the first unmistakably is "The" and the last "Lobster"; the middle word cannot be deciphered with certainty, it could be "Mother", but that is not certain at all. The name Mother lobster was used by Browne (1789: 424) for *Scyllarides aequinoctialis* (Lund, 1792), a species belonging to the same genus as Gesner's lobster. In the above list (p. 182) of Gesner's woodcuts of Sittardus' drawings, the present figure is cited under no. 26 as "Squilla lata".

Gesner's woodcut (fig.11b) is a faithful representation of this original figure; only the tear in the posterior margin of the telson shown in the original has been retouched in Gesner's figure, while the narrow white spot on the left half of the first abdominal somite in the original, shows as an incision in the posterolateral margin of the somite in the woodcut. The high quality of Gesner's figure was also recognized by Latreille (1803: 182), who in the original description of *Scyllarus latus* remarked (in footnote (2)): "La meilleure figure est dans Gesner, tom III [error pro IV], p.1097". For this reason Cornelius Sittardus' syntype specimen, on which this figure is based, has been selected by Holthuis (1991: 191) to be the lectotype of Latreille's species. As to the type locality, Gesner in the original 1558 publication gave no locality, but in that of 1670 he stated that the specimen was "von Rom". We know that Sittardus acquired the drawing from Gijsbert van der Horst (Gysbertus Horstius) in Rome, and the specimen after which the watercolour was made may have been obtained either from a fish market in Rome or at the coast of the Tyrrhenian Sea near Rome, which also would have been the place where material offered on the fishmarkets would most likely have been caught. There can be no doubt that the water colour was made after a living or quite fresh specimen.

The second sheet with original Sittardus watercolours shows 7 separate figures. The sheet bears, in black ink, the number 49 in the upper right hand corner, and evidently formed part of a set of plates, this is supported by the fact that the sheet shows paired needle holes along both the right and left hand margins, most likely indicating that at one time it has been sewn together with other plates. The size of this sheet is 275 × 410 mm; the actual plate, which is 22.9-23.4 × 39.8-40.3 mm, is pasted on the sheet and contains all the figures. The following species are represented on this plate:

Syngnathus typhle Linnaeus, 1758 (fig. 3b; pl. 2)

This figure of a pipefish is the original of the right hand figure of the two pipefishes, of the Sittardus collection, that Gesner published (no. 5 of the list cited on p. 171 under "Acus", and the lower of the two pipefishes of fig. 3b). The figure of the animal is 250 mm long, but the tip of the tail is missing as the plate was cropped too short. The watercolour shows a pale grey animal with the posterior half of the head lighter, almost whitish, and the lower part of the body somewhat pale yellowish. Above the drawing is the legend "Acus." in pale ink in an old handwriting. The figure is of very good quality.

Raja alba Lacépède, 1803 (fig. 6b; pl. 2)

This figure of the egg case of a ray measures 292 × 103 mm, but like in the pipefish, due to cropping of the plate a very small part of either of the long arms of the egg case is lost. The figure is excellent with the surface structure and consistency of the specimen well indicated. In a modern handwriting the legend "La Seche" is added. The intended meaning of the word is unknown to me; the French noun "la sèche" is given to sand banks that fall dry at low tide, while "la seiche" is a cephalopod. I did not find this figure in any of Gesner's 1558, 1560 or 1670 books, but in the 1604 second edition of *Historia Animalium Liber IV* it is given in the addendum "De Aquatilibus", which (with the same pagination) is a continuation of the addendum "Paralipomena". No explanation is given with the figure but for the legend "Raiae uterus", and there is no printed indication that the figure was made by Sittardus. However, the addendum contains more Sittardus figures, like "Raia oculata", "Penna marina", and "Aquila marina", of which the artist is not indicated there either. The figure is listed above on p. 172 under no. 13 "Raiae uterus". In the printed figure the long arms of the egg case are shown somewhat shorter than in the original.

Invertebrata
Tunicata*Microcosmus sulcatus* (Coquebert, 1797) ? (fig. 8a; pl. 2)

The two figures, that clearly belong together, are about 50 × 35 mm each. The legend, in a rather modern hand says "Tethya species". What probably is the outer surface of the figured specimens is dark brown with a dense cover of hairs or bristles. The smooth inside is bright carmine red, which agrees perfectly with Gesner's (1558) description of the material. These might be cut open specimens of the Ascidian *Microcosmus sulcatus* (Coquebert, 1797), the "Ovo di Mare" of the Italian fishermen. The outside of this species always is heavily overgrown, with algae or other epibionts (hence the generic name), and the siphon's are bright red. The printed figures have been dealt with above (pp. 173, 178) under no. 17 "Tethya" and Gesner's figure is reproduced as fig. 8a.

Coelenterata

Calliactis parasitica (Couch, 1842) (fig. 9b; pl. 2)

The single original water colour of this species measures 52 × 70 mm. It is provided with the legend "Urtica marina species" in the same hand and with the same dark ink as "Tethya" (see above under *Microcosmus*). It shows the sea-anemone with the tentacles contracted and of a whitish colour. The peduncle is purple with longitudinal light stripes. Judging by the shape and colour this undoubtedly is *Calliactis parasitica* (Couch). The printed version of this figure have been dealt with above on p. 178 under 20 "Urticarum species". The woodcut of the upper view of an expanded specimen of this species (fig. 9c) has no equivalent among the water colours.

Crustacea

Penaeus kerathurus (Forskål, 1775) (fig. 11a; pl. 2)

The water colour of "Squilla Crange" is about 45 × 254 mm. It shows without any shade of doubt a specimen of *Penaeus kerathurus* (Forskål, 1775). The whole body is pink, including the appendages. This shows that the animal possibly was cooked, as living specimens are pale brownish yellow with dark rather broad transverse bands on the abdominal somites, one on somites 1 to 5, two on somite 6; traces of his banded pattern, in darker pink, are still visible in Sittardus' water colour. This figure shows the corneae of the eyes black with a grey ring. Dark spots are scattered over the carapace, some of the grooves are indicated by a dark line. A row of dark median spots extends over the middle of abdominal somites 1 to 5 inclusive. There are dark spots on the exopod and protopod of the uropods. This figure has been copied in the 1558, 1560 and 1604 editions of Gesner's book mentioned above. Also several later authors, like Jonstonus (1650 and several later editions: pl. 4 fig. 10) and Bontius (1658: 81) used Gesner's figure. Gesner's printed versions are listed above on pp. 179, 182 under no. 25 "Squilla Crange" and one is figured in fig 11a.

Scyllarus arctus (Linnaeus, 1758) (pl. 2)

The water colour with the legend "Astaci species" measures about 64 × 105 mm. It shows undoubtedly *Scyllarus arctus* (L., 1758). The animal is painted in several shades of grey. The antennae, carapace and abdomen are dark purplish grey with lighter areas. The legs are rather uniformly pale grey and do not, or not clearly, show any dark rings. The tailfan is brownish grey except at the base. This figure, although recognisable as to the species is of a lower quality than the others on the sheet; the characteristic sculpturation of carapace and abdomen is not shown at all. The figure is accompanied by the legend "Astaci species" in the same hand and with the same ink as the legends of the other non-ichthyological figures of this sheet. Evidently Gesner considered this figure of insufficient quality to be used, and I have been unable to find it reproduced in any of Gesner's works, being the only one of Sittardus' originals of the present collection to have been so rejected. Rondelet's figure of this species that Gesner did publish indeed is of a better quality.



Pl. 1. *Scyllarides latus* (Latreille, 1803). Original water colour of "Squilla lata" (Gesner, 1558: 1097).

We know very little of the person of Cornelius Sittardus. Gesner (1558) on the fourth page of his above mentioned introductory chapter "Enumeratio Authorum" lists him as follows:

Cornelius Sittardus felicis memoriae, medicus ante paucos annos Norimbergae excellentissimus: qui tamen pro plurimis illis quae contulit, à Gysberto Horstio medico Romae nuper (ut audio) defuncto, accepisse se omnia confessus, in illum potiùs quàm sese omnem honoris gratiam conferri voluit". Sittardus, as just said, was a physician in the German town of Nürnberg (=Nuremberg), and came to Italy where he stayed in Rome, and there came in contact with the physician Gysbertus Horstius, who gave him the drawings which he sent to Gesner (see also Leuckart, 1875: 98, first footnote). Although Sittardus asked Gesner that the drawings should be attributed to Horstius, Gesner consistently, gave Sittardus all the honour for them. Gijsbert van der Horst (or Gysbertus Horstius) was a Dutch physician, who was born in Amsterdam around 1500. He went to Italy and had a general practice in Rome. He treated his patients in the hospital Santa Maria della Consolazione. He was very well known, and Dutch physicians, who visited Rome always went to see him. He died in Rome in 1555 or 1556 (Lindeboom, 1984: 912). At the time that Gesner published his book, Horstius thus had already died. It is possible that Cornelius Sittardus, if one judges by his name (Sittard is a town in the Netherlands province of Limburg and inhabitants often adopted the name Sittardus, or Van Sittard), was likewise of Dutch descent, and thus one of those who visited their fellow countryman Horstius in Rome.

Sittardus went to Italy in the company of Valerius Cordus. About Cordus much more is known than about Sittardus; Cordus was born 18 February 1515 in Erfurt, Germany, and died 25 September 1544 in Rome. He graduated in medicine and botany and wrote a fundamental pharmacological handbook "Dispensatorium pharmacorum". This was published in Nürnberg in 1535 when Cordus stayed in that town. During this time he probably met Sittardus, whom he invited to join him on a visit to Italy. They started in 1542, visiting Venezia (Venice), Padova (Padua), Ferrara, Bologna, Firenze (Florence), Pisa, Livorno (Leghorn) and finally Rome where Cordus died in 1544, 29 years old. Several of his works were published posthumously. Of one of these, viz. "Annotationes in Pedacii Dioscoridis Anazarbei de Medica Materia libros V" (1561), Gesner was the editor. On the second page of his "Praefatio" to this posthumous work, Gesner mentioned that Sittardus, with whom he (Gesner) corresponded, accompanied Cordus on his travels. Also in his own "Opera botanica" (1754: 15) Gesner mentioned that Sittardus had joined Cordus on his Italian trip, and on p. xii of the same work he confirmed that Sittardus sent him material and illustrations (of plants) from Italy. After his stay in Rome, Sittardus left with Joachim Moller for Naples, joining a convoy for greater security against highwaymen (Gesner, 1754: 16). Leuckart (1875: 98, first footnote) remarked that Sittardus sent drawings to Aldrovandus, Gesner and "einem mehrfach von Aldrovandi citirten, mir sonst aber unbekanntem Zoographus". Leuckart is mistaken here: all the figures of which Aldrovandus cites Sittardus as the source, were copied by him from Gesner. And Aldrovandus' Zoographus is nobody else but Gesner himself. There is therefore no proof that Sittardus sent material to anyone but Gesner. As Pyle (1994: 276) pointed out, the works of the Protestant Gesner were placed on the Index of forbidden works

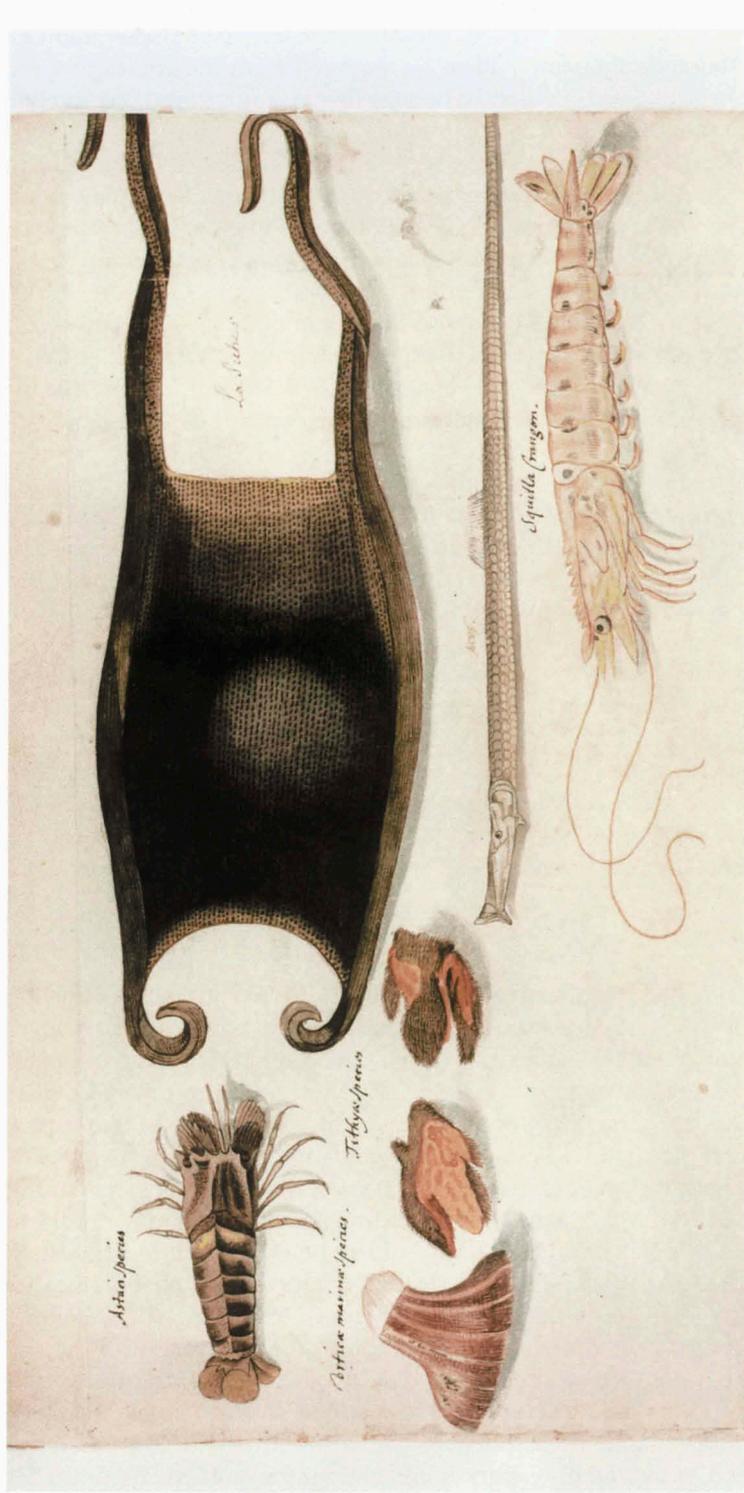
by the Vatican, and Aldrovandus needed, and obtained, a special dispensation to use them. However, the author's name had to be removed from the copies of Gesner's books that Aldrovandus used. Evidently he was likewise not permitted to cite that author by name, and used the word "Zoographus" to indicate him. That this was not a unique case is shown by my copy of the second (1604) edition of Gesner's *Historia Animalium Liber IV* (formerly owned by the "Conventus Sancti Dominis de Neapolis"), where likewise the name Conradus Gesnerus on the title page and elsewhere in the volume was struck out with ink after which a strip of paper was pasted over it.

It is clear that Sittardus made important contributions to Gesner's work and therefore it is to be regretted that we know so little about him. He died between 1544 (when he was in Rome) and 1558 (when Gesner's book was published, and he was indicated there as the late C. Sittardus). Leuckart's (1875: 98) supposition that Sittardus "gegen Ende des 16. Jahrhunderts starb" cannot be correct. It is possible that he died when in Italy.

Judging by Sittardus' contributions to Gesner's *Historia Animalium Liber IV*, the drawings that he sent varied greatly in quality. The watercolours of *Scyllarides*, *Penaeus*, the egg case of *Raia alba* and the pipefish are excellent; also difficult objects like *Calliactis* and "Tethya" are drawn as well as was possible at that time. Most of Sittardus' figures of Vertebrates of which we know only the woodcuts are usually of a high quality. His figures of "Cancer hirsutus" (no.29) and "Fiola" (no.30) are less satisfactory. But it is very strange to meet among his products an extremely poor specimen like the smaller "Cancellus", and one wonders if Gesner was not mistaken in assigning this low quality drawing to Sittardus. This highly heterogeneous quality of the Sittardus drawings makes it likely that they were not all made by the same artist. Gesner indicates on several occasions that he received the paintings from Sittardus and that these had obtained them from Horstius. At some places of his text Gesner seems to indicate that at least some of these illustrations were made by Horstius.

Acknowledgements

For one who, like me, did not have a classical education, and knows very little of groups other than Crustacea, it would have been impossible to write this note without the help of numerous colleagues and friends, who often had to spend much of their time in answering my requests for help. Dr C. Smeenk, curator of Mammals of the Leiden National Museum of Natural History greatly helped me in translating the often very difficult latin of Gesner and his contemporaries; he also discussed Gesner's Cetacea with me and suggested their names. My ichthyological colleagues Dr M. Boeseman and Dr M.J.P. van Oijen gave considerable aid in the identification of Sittardus' fishes. Mr J.C. den Hartog, also of the Leiden Museum suggested the Actinian name. Mr H. Adema and Mrs W. de Ligny helped with the identification of the fungus *Clathrus*. I am most thankful to Dr John C. Yaldwyn, of the Wellington Museum, New Zealand, for drawing my attention to the watercolour of *Scyllarides latus*, and so make it possible to unravel the history of these important illustrations. To Mr Alistair Mathews I am most indebted for making me acquainted with the second sheet of water colours discussed here. Dr Urs Leu of the Zentralbibliothek Zürich, Switzerland, provided his expert opinion about the authenticity of the Sittar-



Pl. 2. Original watercolours of the Cornelius Sittardus collection showing in the upper row, on the left *Scyllarus arctus* (L. 1758) ("Astaxi species", not published by Gesner), and on the right an egg case of *Raja alba* Lacépède, 1803 ("Raiae uterus" Gesner, 1604 (Paralipomena): 35). On the second row from left to right: *Callinectes parasitica* (Couch, 1842) in lateral view ("Urtica marina" Gesner, 1558: 1243); two figures of ? *Microcosmus sulcatus* (Coquebert, 1797) ("Tethya" Gesner, 1558: 1144); and *Syngnathus typhle* L., 1758 ("Acus" Gesner, 1558: 1225). The single figure on the lowest (third) row is *Penaeus kerathurus* (Forskål, 1775) ("Squilla Crange" Gesner, 1558: 1099).

us watercolours, and provided me with the very scarce information on *C. Sittardus*, which he kindly translated. I am also thankful to Prof. Dr P.F.J. Obbema of the Leiden University Library, who saw the importance of these watercolours and had one exhibited at the occasion of the 400th anniversary of the library (see Obbema & Holthuis, 1987). And last but not least, I am much indebted to Dr Cynthia M. Pyle of City University, New York, who provided me with much interesting information about Aldrovandus and Gesner and greatly encouraged me to write the present paper.

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