

NOMENCLATURAL NOTES ON EIGHTEENTH CENTURY STOMATOPODA (HOPLOCARIDA)

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A B S T R A C T

Four stomatopod species described in the 18th century, the names of which have not or not consistently been used in modern literature, are now identified. The name *Astacus vitreus* Fabricius, 1775 (fam. Lysiosquillidae), is a senior synonym of the well-known and widely used name *Lysiosquilla scabricauda* (Lamarck, 1818). As the reintroduction of the specific name *vitreus* will cause an undesirable confusion, it is advised to have this specific name suppressed by the International Commission on Zoological Nomenclature in order to save the name *scabricauda*. The other three names *Squilla phalangium* Fabricius, 1798 (fam. Nannosquillidae), *S. ichneumon* Fabricius, 1798, and *Cancer neptuni* Linnaeus, 1768 (both fam. Squillidae), are senior synonyms of respectively *Acanthosquilla acanthocarpus* (Claus, 1871), *Cloridina microphthalma* (H. Milne Edwards, 1837) and *Alima alba* (Bigelow, 1893). As neither of the three species is common or well known, there is no reason not to follow the International Code strictly here. For each of the three a neotype has been selected.

Our present knowledge of the taxonomy of the Stomatopoda, thanks to the excellent studies by Raymond B. Manning, is quite well stabilized. Manning's (1995) monograph can be considered the basis for any study of the group. Notwithstanding this, there are still some awkward nomenclatural problems within the group. As usual in systematics, these problems are caused mainly by generic and specific nomina dubia, which in Stomatopoda not infrequently are based on larval forms. Such nomina dubia often are very old and have been neglected by most authors as the original descriptions in the early times were considered insufficient for the recognition of the species. These old descriptions, however, sometimes describe characters (e.g., color, behavior, habitat, and locality), that to the next generations of zoologists seemed not important, but that may enable modern carcinologists to recognize the species. An example are several of Forskål's (1775) descriptions of Red Sea species. These were made in the field and gave good color descriptions, but relatively few morphological details. The color meant nothing to the next generations of carcinologists, who mostly studied dead material, that had lost all traces of color. But when it became possible to examine the various species alive, Forskål's color descriptions clearly proved the identity of such "species incertae." When the identity of these species is ascertained, their

names may threaten well-established names that at present are widely used, but in other cases a change of name will not cause much difficulty. The problems caused by Stomatopod names proposed in the 18th century will be discussed here.

The following abbreviations have been used here: USNM = National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.; and RMNH = National Museum of Natural History, Leiden, the Netherlands.

Linnaeus (1758: 633) in the 10th edition of his *Systema Naturae* mentioned only two species of Stomatopoda. The description of the first of these, *Cancer scyllarus*, is based exclusively on the account of that species by Rumphius (1705). Rumphius' description and figure are so clear that there has never been any doubt about the identity of the species, which at present is universally known as *Odontodactylus scyllarus* (L., 1758). Linnaeus' (1758) second stomatopod species, *Cancer mantis*, however, is composite. Linnaeus, namely, based it on at least three different species, viz., *Lysiosquillina maculata* (Fabricius, 1798), *Lysiosquilla scabricauda* (Lamarck, 1818), and the species at present generally known as *Squilla mantis*. A neotype selection (by Holthuis, 1969) for Linnaeus' *Cancer mantis* tied the name definitely to the largest of the Mediterranean Stomatopoda, which has been indicated with the specific

name *mantis* by practically all authors dealing with it. Throughout the 20th century the name *Squilla mantis* has been universally adopted.

When at the end of the 18th century Fabricius (1798) gave a review of all the stomatopod species known to him, his list included 9 species which all were placed in the genus *Squilla* Fabricius, 1787. Seven of these species had been described before, viz., *S. maculata* (= *Lysiosquillina maculata* (Fabricius, 1793)), *S. mantis* (= *Squilla mantis* (L., 1758)), *S. raphidea* (= *Harpiosquilla raphidea* (Fabricius, 1793)), *S. scyllarus* (= *Odontodactylus scyllarus* (L., 1758)), *S. ciliata* (= *Pseudosquilla ciliata* (Fabricius, 1793)), *S. chiragra* (= *Gonodactylus chiragra* (Fabricius, 1793)), and *S. vitrea* Fabricius, 1775. In addition two new species were described by him: *Squilla phalangium* and *Squilla ichneumon*. The first six of these species are well understood and there are no nomenclatural difficulties with them. This is quite different with the last three species. Their names provide nomenclatural problems, which so far have not been satisfactorily solved. These three are the following:

Fam. Lysiosquillidae Giesbrecht, 1910
Astacus vitreus Fabricius, 1775

Astacus vitreus Fabricius, 1775: 417.

Squilla vitreus.—Fabricius, 1781: 515.

Squilla vitrea.—Fabricius, 1787: 334; 1793: 513; 1798: 417; Bosc, 1802: 123; Latreille, 1803: 281; Kemp, 1913: 205.

Cancer (Mantis) vitreus.—Herbst, 1793: 102.

Erichthus vitreus.—Bosc, 1830: 85; H. Milne Edwards, 1837: 501.

Lysiosquilla vitrea.—Hansen, 1895: 73.

Lysierichthus vitreus.—Hansen, 1895; 77; Gurney, 1946: 167; Manning, 1977: 156.

The original description (Fabricius, 1775: 417–418) is as follows:

“*vitreus*. 18. A.[stacus] antennis posticis trifidis, thorace laevi, carinato: angulis subulatis, manibus falcato subulatis, integris.

Habitat in Oceano atlantico. Mus. Banks.

[p. 418:] Corpus parvum, pellucidum, limpidissimum, membranaceum. Thorax oblongo-quadratus, angulis subulato-spinosis. Rostrum elongatum, subulatum, acutum. Abdomen elongatum, subclavatum, cauda magna, ovata, sexdentata, utrinque foliolis tribus parvis, oblongis, intermedio truncato, biseto, suffulta. Pedes quinque parium, 1. cap-

illare simplex, longitudine thoracis: 2. crassius, thorace longius, articulo penultimo compresso, intus carinato pro receptione digiti subulato-falcati apice inflexi, simplicis. Reliqua similia, at multo breviora.”

This species has usually been considered to be based on the larva of *Lysiosquilla scabricauda* (Lamarck, 1818), e.g., by Hansen (1895: 77) and Gurney (1946: 168). Hansen (1895: 77) declared positively that his specimens of *Lysierichthus vitreus* (Fabr.) belonged to *Lysiosquilla scabricauda*, but when citing *Squilla vitrea* in the synonymy of that species he stated, “nur nach der Tradition aufgenommen, da eine Identifizierung ganz unmöglich ist.” Gurney (1946:168) under *Lysiosquilla scabricauda* refers to Hansen and says, “*Lysierichthus vitreus* is its larva.” Holthuis (1967: 21) placed *Squilla vitrea* with a question mark in the synonymy of *Lysiosquilla scabricauda*. Manning (1977: 156) remarked, “Although this species [*Lysierichthus vitreus*] is generally considered to be the larva of the western Atlantic *Lysiosquilla scabricauda* (Lamarck) . . . , the occurrence of the larva outside the range of the adult . . . suggests that it should be identified with another taxon (or taxa).” Of course it is quite well possible that the larvae found outside the area of *L. scabricauda* and identified as *Squilla vitrea* do not actually belong to *Lysiosquilla scabricauda*. However, it is only the identity of the type specimens of Fabricius’ *Squilla vitrea* that counts. These types were reported from the Atlantic Ocean and formed part of the collection of Sir Joseph Banks. So far as I know Banks made one voyage that passed through the southern Atlantic, namely the first circumnavigation by James Cook in the *Endeavour* (26 August 1768–15 July 1771). The Atlantic leg of the outward journey went from Plymouth to Madeira (where the ship stayed from 13 to 19 September 1768). From there the expedition went to Rio de Janeiro, a voyage of two months. Rio was left on 7 December 1767, and the *Endeavour* sailed past the east coast of South America to Cape Horn, which was rounded on 27 January 1769. On the home voyage the *Endeavour* joined the British East India fleet in crossing the Atlantic from Capetown (10 April 1771) via St. Helena to England, where she arrived on 15 July 1771. If Banks collected *Squilla vitrea*

himself during this expedition, it must have been either on high seas or near Rio de Janeiro, which was the only place in tropical South America where he did collect (his next collecting site was Staten Island in the Magellan region). I could find no indication that Banks collected during the home voyage in the Atlantic; his health was not very good then, and traveling in convoy may have been not favorable for collecting. If the type material of *Squilla vitrea* originated from the Rio de Janeiro area, it was taken well within the range inhabited by *Lysiosquilla scabricauda*, which affords one more argument to support the likelihood that these larvae indeed could be those of that species. However, we cannot be certain of this. Banks could also have received the material from a different collector.

According to Zimsen (1964: 9), "Fabricius spent the winters of the following years (= after 1769) in Copenhagen and the summers in London where he worked on Banks', Hunter's and Drury's collections", and evidently he was there in July 1771 when Banks returned from his journey. The description of *Squilla vitrea* is not sufficient for a definite identification, and the type locality cannot with certainty be placed within the range of *Lysiosquilla scabricauda*, but there is nothing to make the generally accepted identification of *Astacus vitreus* Fabricius, 1775, with *Squilla scabricauda* Lamarck, 1818, impossible. The collection of Banks was given by him some time before 1815 to the Linnean Society of London, which in 1863 passed it on to the British Museum. The type material of *Squilla vitrea* no longer exists, as has also been reported by Zimsen (1964: 645).

As the specific name *vitrea* is the oldest for any species of lysiosquillid (it is much older than the oldest specific name (*maculata* Fabricius, 1793) given to an adult lysiosquillid), it forms a threat to the stability of the nomenclature within this family. The name *vitrea* has been used in stomatopods exclusively for larvae (usually as *Lysioerichthus vitrea*) and has never replaced the name of an adult. Only Hansen (1895: 73) pointed out that as a consequence of the Law of Priority, "da *Erichthus vitreus* (F.) zu der *Lysiosquilla scabricauda* (Lam.) gehört, müsste diese *Lysiosquilla vitrea* (F.) heissen." However, Hansen rejected this combination and remarked, "Derartige mögliche Aenderungen

würden eine grenzenlose Verwirrung mit sich führen." He suggested that the larvae and adult animals each should have a separate nomenclature, both with its own Law of Priority. Although Hansen's suggestion was never accepted by the International Code of Zoological Nomenclature or considered by the International Commission, no subsequent author on Stomatopoda has ever used the name *vitrea* for an adult *Lysiosquilla*.

The general consensus is that *Squilla vitrea* is a senior synonym of *Squilla scabricauda*, and there seem to be no valid arguments disproving this. The selection of a neotype for Fabricius' *Squilla vitrea*, regardless of the specific identity of that specimen, would indeed cause considerable confusion in lysiosquillid nomenclature, and such an action should better be avoided. *Lysiosquilla scabricauda*, namely, is a well-known species and has almost exclusively been indicated with that name. Therefore it seems that the best way out of this muddle is to submit this case to the International Commission on Zoological Nomenclature, requesting the suppression of the specific name *vitrea* Fabricius, 1775, for the purposes of the Law of Priority but not for those of the Law of Homonymy.

Fam. Nannosquillidae Manning, 1980
Squilla phalangium Fabricius, 1798
 Figs. 1, 2

Squilla phalangium Fabricius, 1798: 416; Bosc, 1802: 122; Latreille, 1803: 280; Bosc, 1830: 95 (*Phalangium*); H. Milne Edwards, 1837: 525; Miers, 1880: 14; Kemp, 1913: 205.

The second of Fabricius' problem species is his *Squilla phalangium*. Fabricius' (1798) description of this species is as follows: "*phalangium*. 4. S [quilla] pollice falcato quinque-dentato: dente tertio quintoque longioribus, corpore laevi.

Habitat in India orientali Dom. Daldorff.

Corpus S. Mantis paullo minor, laeue, glabrum ultime segmento spinoso serratum."

Bosc (1802, 1830) and Latreille (1803) in their handbooks listed *Squilla phalangium* in the genus *Squilla*, citing Fabricius' description but not adding any new information. All subsequent authors rejected the name *phalangium* as they thought Fabricius' description insufficient for recognition of the species. H. Milne Edwards (1837: 525) remarked, "La *Squilla phalangium* de Fabricius paraît appartenir à cette subdivision [= the section with

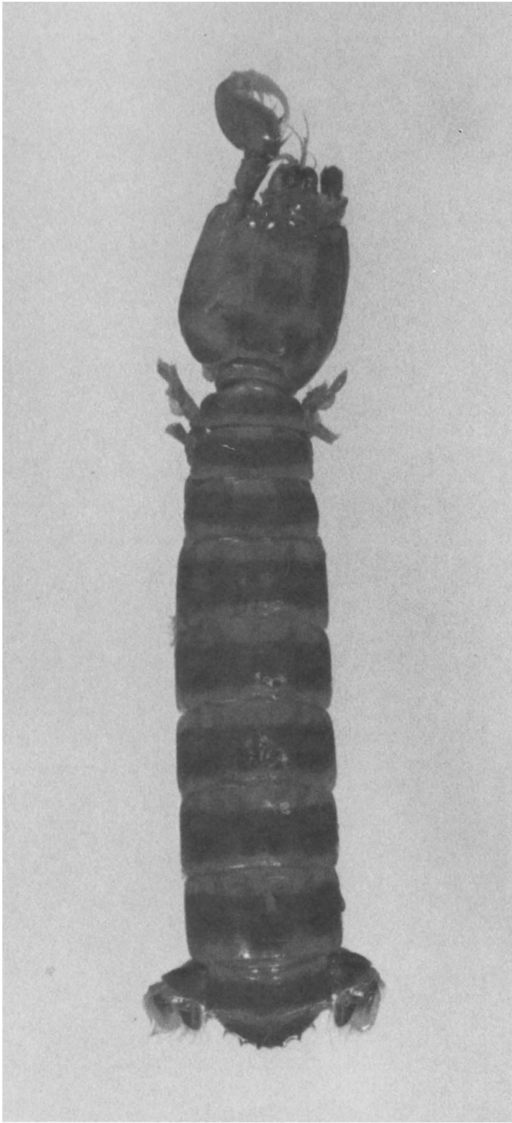


Fig. 1. *Acanthosquilla phalangium* (Fabricius, 1798), neotype of *Squilla phalangium* Fabricius, 1798, male, total length 78 mm. RMNH, no. S 1163. Animal in dorsal view.

Parasquilla ferussaci (Roux)] mais n'est que très-imparfaitement connue." Miers (1880: 14) stated, "The *Squilla phalangium* of [Fabricius] is so briefly described that it is impossible to say whether it belongs to this genus [i.e., *Chloridella*], *Lysiosquilla*, or *Pseudosquilla*; in the five-spined dactylus of the raptorial limbs, which has the third and fifth spine longest, it appears to resemble *Lysiosquilla acanthocarpus*; and that species may prove to be identical with it." Kemp

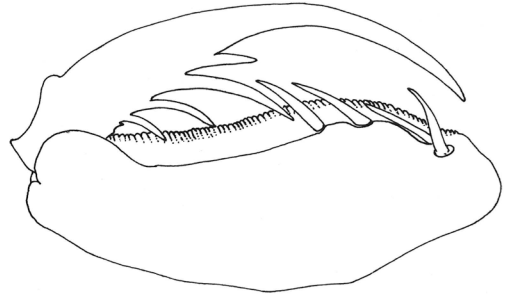


Fig. 2. *Acanthosquilla phalangium* (Fabricius, 1798), neotype of *Squilla phalangium* Fabricius, 1798. Raptorial claw. (5.6x)

(1913: 205) ranged *Squilla phalangium* among the doubtful species and said, "Perhaps belonging to the *acanthocarpus* section of the genus *Lysiosquilla*." After that the species seems to have been conveniently forgotten by stomatopodologists.

The most important statement in Fabricius' description is the description of the raptorial claw with the third and fifth tooth longer than the fourth. This shows that the species (as already surmised by previous authors) belongs to *Acanthosquilla*, in several species of which the penultimate tooth of the raptorial dactylus is remarkably small, smaller than the previous and the following tooth. Also it shows that this dactylus has five teeth (the tip of the dactylus included). Fabricius' description of the telson as having spines and teeth, also agrees with the situation found in *Acanthosquilla*. *Squilla phalangium* clearly is either *Acanthosquilla acanthocarpus* (Claus, 1871) or *A. multifasciata* (Wood-Mason, 1895), both of these have frequently been reported from India and fit Fabricius' description. The oldest specific name in the genus *Acanthosquilla* is *Coronis acanthocarpus* Claus, 1871. *Squilla phalangium* Fabricius thus is older than any of the specific names in *Acanthosquilla* now in use, and forms a threat to all. No type material of *Squilla phalangium* is extant anymore (vid. Zimsen, 1964: 653).

In order to solve this complicated problem, it might be best to select a specimen of *Coronis acanthocarpus* to be the neotype of *Squilla phalangium*. By this action the specific name *phalangium* will replace its junior synonym *acanthocarpus*. The name *acanthocarpus*, as used in modern literature, belongs

to a species that is known only to taxonomists; it has no commercial, medical, or other general value, and its replacement will not cause any major confusion. If it later should prove that the Australian and Indian forms of *Acanthosquilla phalangium* are different species, the name *acanthocarpus* could be used again for the Australian species, as the type locality of *A. acanthocarpus* is Port Essington, Northern Territory, Australia.

Another possibility to solve the problem would be to request the International Commission on Zoological Nomenclature to suppress the specific name *phalangium* Fabricius, 1798, as published in the binomen *Squilla phalangium*, for the purposes of the Law of Priority but not for those of the Law of Homonymy. For the reasons given in the previous paragraph, I believe that the first option is to be preferred, and therefore a neotype for *Squilla phalangium* is selected here. The specimen selected is a male with a total length of 78 mm in the collection of the National Museum of Natural History in Leiden, registered under RMNH no. S 1163. The neotype locality is Bombay, India (1964, leg. S. R. Sane). It very well agrees with Kemp's (1913: 120–122) description of the species. The color pattern, which still is clearly visible also agrees with Kemp's description.

Acanthosquilla phalangium (Fabricius, 1798) has a rather wide distribution in the Indo-West Pacific region. It has been reported from Mozambique, the Persian Gulf, Pakistan, both coasts of India, Sri Lanka, both coasts of Thailand, Japan, Taiwan, Viet Nam, Malaysia, the Philippines, Indonesia, and northern Australia.

Fam. Squillidae Latreille, 1803
Squilla ichneumon Fabricius, 1798
Fig. 3

Squilla ichneumon Fabricius, 1798: 416; Bosc, 1802: 122; Latreille, 1803: 280; Bosc, 1830: 96 (*Ichneumon*); H. Milne Edwards, 1837: 523; Miers, 1880: 14; Kemp, 1913: 205.

This species was described by Fabricius (1798: 416) as follows:

"*ichneumon*. 5. S.[quilla] pollice falcato quadridentato cauda margine nodoso spinoso.

Habitat in India orientali D. Daldorff.

Praecedente [= *S. phalangium*] adhuc minor, Corpus utrinque lineis tribus eleuatis. Cauda rotundata spinis crassis nodosis ciliata."

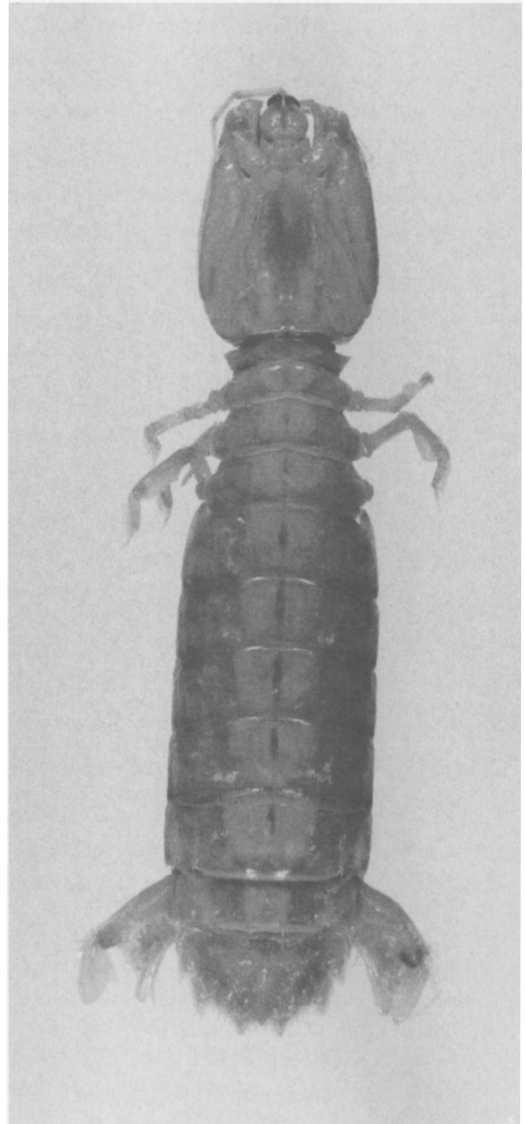


Fig. 3. *Cloridina ichneumon* (Fabricius, 1798), neotype of *Squilla ichneumon* Fabricius, 1798, male, total length 45 mm, RMNH, no. S.1164. Animal in dorsal view.

Like the previous species (*S. phalangium*), *Squilla ichneumon* is listed in the handbooks by Bosc (1802: 122, 1830: 96) and Latreille (1803: 280) but without the addition of any new information. Later authors had difficulty in placing the species. So, H. Milne Edwards (1837: 523) remarked that "La *Squilla ichneumon* de Fabricius paraît être semblable à l'espèce précédente [= *Squilla microphthalma* H. Milne Edwards, 1837]." Miers (1880: 14) stated, "The *Squilla ichneumon* of Fabricius . . . may belong either to this genus [= *Chlo-*

ridella Miers] or to a species of the first section of the genus *Squilla*." Kemp (1913: 205), who placed *Squilla ichneumon* among his "Doubtful species", thought it to be "Possibly a species of *Squilla* of the '*Chloridella*' group." Like the previous species, this species since then has been generally ignored.

At present (cf. Manning, 1995: 180–195) Miers' (1880) *Chloridella* (an unnecessary substitute name for *Clorida* Eydoux and Souleyet, 1842) has been split into two genera: *Clorida* Eydoux and Souleyet, 1842, and *Cloridina* Manning, 1995. The most common Indian species of these two genera are *Clorida latreillii* Eydoux and Souleyet, 1842, and *Cloridina microphthalma* (H. Milne Edwards, 1837), and it seems most likely, but by no means certain, that *Squilla ichneumon* is one of these two species. The fact that Fabricius described the abdomen with three carinae on either side ("Corpus utrinque lineis tribus elevatis"), evidently the marginal, lateral, and intermediate carinae, shows that his species cannot be *C. latreillii*, as that species has four such carinae, the just mentioned ones and the submedian, while in *C. microphthalma* the submedian carinae are absent. The possibility that *Squilla ichneumon* is identical with *Cloridina microphthalma* (already suggested by H. Milne Edwards, 1837) is quite great, but not certain. Fabricius may have had one of the rarer Indian species, or he may not have counted the marginal carinae when he described the carinae of the abdomen.

As the specific name *ichneumon* is older than any of those used at present in *Clorida* and *Cloridina*, it remains a threat to the nomenclature of the species of these two genera, and it would be good to eliminate this threat. One could either select a neotype for *Squilla ichneumon* Fabricius, 1798 (a specimen of *Cloridina microphthalma* is the most acceptable) and so definitely make the valid name for that species *Cloridina ichneumon* (Fabricius, 1798), or one could ask the International Commission on Zoological Nomenclature for the suppression of the name *ichneumon* for purposes of the Law of Priority but not for those of the Law of Homonymy. As the specific name *microphthalma* is well known only to specialists in the taxonomy of the group and is neither of commercial nor of medical importance, and also is not frequently found in the popular literature, the

reasons for its suppression are not overwhelming. Therefore, a neotype is here selected for the species, viz., a male specimen of *Cloridina microphthalma* in the collection of the National Museum of Natural History in Leiden (RMNH no. S 1164). The specimen is 45-mm long and was collected in Bombay, India, in 1964, leg. S. R. Sane. The specimen agrees perfectly with the description of *Squilla microphthalma* by Kemp (1913: 31, 32). The only trace of the original color pattern still visible is the dark spot at the end of the basal segment of the uropodal exopod (Fig. 3).

Cloridina ichneumon (Fabricius, 1798) has a wide distribution in the Indo-West Pacific region. It is known from E. Africa (Zanzibar), the Persian Gulf, Pakistan, both coasts of India, Taiwan, Viet Nam, Thailand, Malaysia, Indonesia, N. and W. Australia, and New Caledonia.

Cancer neptuni L., 1768

Cancer neptuni Linnaeus, 1768: 226; 1769: 506.

(*Cancer*) *Astacus neptuni*.—Herbst, 1793: 91.

Alima neptuni.—Manning and Lewinsohn, 1986: 13.

Alima alba.—Schotte and Manning, 1993: 577.

A tenth species of stomatopod was described in the 18th century, viz., *Cancer neptuni* Linnaeus, 1768. Its description is rather hidden, namely in an appendix to vol. 3 (the mineralogical Regnum Lapideum volume) of the 12th edition of Linnaeus' *Systema Naturae*. Even Gmelin in the 13th edition overlooked this record and did not list the species. The name is based on material collected by Linnaeus' pupil Anders Sparrman (1748–1820) on 27 May 1767 during his home voyage from China; it was taken between Ascension and Fayal (see Linnaeus, 1769: 506). Manning and Lewinsohn (1986: 13, 14) were the first to extensively discuss the species. They reproduced both Linnaeus' 1768 and 1769 accounts of *Cancer neptuni* and fully discussed his (1769) rather lengthy description of it. They reached the conclusion, "There can be little doubt therefore that *Cancer neptuni* is based on a specimen of *Alima hyalina* or a very closely related species." They took the wise step to replace the specific name *hyalina* Leach, 1817, with *neptuni* Linnaeus, 1768. Unfortunately Schotte and Manning (1993: 577) were of a different opinion. They stated, "We question the wisdom of using names based on larval forms for

adult species unless the adult can be raised from larvae from a known parent, especially in stomatopods in which there are so many larval forms." They were not certain whether both *Cancer neptuni* L., 1768, and *Alima hyalina* Leach, 1817, were the larvae of *Alima alba* or of *Alima hieroglyphica* (Kemp, 1913), and they reverted to the name *Alima alba* for the first species. With the type of *Cancer neptuni* lost, and the description of it probably insufficient for ever positively deciding whether the specimen belonged to *Alima hieroglyphica* or *A. alba* (although the latter is far more likely), it seems best to decide this question once and for all by selecting a neotype for *Cancer neptuni*. To this end I now select the lectotype specimen of *Squilla alba* Bigelow, 1893, to be the neotype of *Cancer neptuni*. This specimen is a female of 41.2-mm length found burrowing in the coral sand at Bimini Harbor, Bimini Islands, Straits of Florida, between 16 June and the end of July 1892, leg. R. P. Bigelow (USNM no. 18495). An account of Bigelow's Bimini trip can be found in Andrews *et al.* (1945: 333–344; *Squilla alba* on p. 340, fig. 5). The advantage of this neotype selection is that the name of the species is now definitely decided and that the name is older than any name proposed for the species or its larva (see Manning, 1969: 128, 129, for the complicated synonymy of the species). Also the specific name *neptuni* has recently been used several times for the species (Manning and Lewinsohn, 1986; Reaka and Manning, 1989; Manning, 1990), while the nomenclature of the species has never been stable—both the specific names *alba* and *hyalina*, as well as *neptuni* having been used for it in recent years.

An eleventh species of stomatopod was described in the 18th century, viz., *Cancer falcatus* Forskål, 1775. This is a well-known species, at present known as *Gonodactylaceus falcatus* (Forskål, 1775). There are no nomenclatural problems with it, certainly not after a neotype has recently been selected for it (Manning and Lewinsohn, 1981: 314–316, fig. 1).

In summary, I recommend that the specific name *vitrea* Fabricius, 1775, be suppressed, and that those of *phalangium* Fabricius, 1798, *ichneumon* Fabricius, 1798, and *neptuni* Linnaeus, 1768, be removed from their status of nomina dubia by the selection of a neotype. In my opinion these actions will be stabiliz-

ing factors in the nomenclature of Stomatopoda. Not to deal with them one way (suppression) or another (neotype selection) will serve only to put off the problems until later, when they will be still more difficult to solve.

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