

LITERATURE CITED

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ARE THERE POISONOUS CRABS?

BY

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Balss (1956: 1489) in his chapter on harmful Decapoda stated that "abgesehen davon, dass manche Menschen nach dem Genuss von Krebsen von einer Urticaria (Nesselsucht) befallen werden, sind eigentliche Krankheiten nach dem Genuss von frischen Krebsen nicht zu befürchten". He continued by saying that the consumption of Decapoda which had just eaten toxic plants might cause symptoms of poisoning in human beings and he cited for this *Ucides cordatus* (L.) from the West Indies, which species is toxic after it has eaten leaves or fruit of the poisonous Manzanilla Tree (*Hippomanes mancinella* L.). In this connection Balss also mentioned some Samoan crabs, while he stated that at the island of Yap in the Carolines, the natives first leave the robber crab, *Birgus*, for a few days without food before eating it, so that the toxic substances by then have left its intestinal tract. However, truly poisonous crabs were evidently not positively known to him.

Halstead (1965: 907-909) listed all the reports on poisonous crabs that had come to his knowledge. These reports pertain to West Indian land crabs, a number of unidentified crabs from Japan, China, and India, and a few identified species that will be discussed below.

The most recent and complete discussion of the subject is that by Guinot (1967: 16, 17), who listed a number of Xanthidae and other crabs that had been reported as poisonous.

A few additional records of poisonous crabs were found by me and it seemed useful to give here a list of the known species of crabs that have been reported as toxic, in the hope that this may contribute to the solution of the question whether truly poisonous crabs actually do exist.

One of the oldest sources on edible and harmful crabs from extra-european waters is Rumphius's (1705) "Amboinsche Rariteitkamer", which evidently has not been consulted by the above authorities; the fact that this delightful and scientifically most important book was written in Dutch makes it not easily accessible. Rumphius, who lived for almost half a century (1653-1702) at the island of Amboina in the Moluccas, collected a wealth of information on marine animals of the island, which was published in his 1705 book. As a true child of his time, Rumphius was most interested in the usefulness for mankind of the animals that

he studied. In starting his account of the crabs of Amboina he stated (p. 9): "Myn voorneemen noch vermoogen is niet om alle de soorten van dit slag te beschryven, dewylze zoo menigvuldig zyn, maar alleen de meest bekendste, die my voorgekomen zyn; en die ik verdeele in eetbare, en schadelyke". (It is not my intention, nor is it in my power to describe all the species of this kind, because they are so numerous, but I will only deal with the best known that I have encountered and which I divide in edible and harmful). Among the edible crabs he listed *Scylla serrata* (Forskål) (p. 9), *Charybdis* spp. (p. 10), *Portunus pelagicus* (L.) (p. 11), *Matuta lunaris* (Forskål) (p. 11), *Cardisoma* sp. (p. 12), *Uca vocans* (L.) (p. 14, edible, but too small to be of much value), *Micippa cristata* (L.) (p. 15, 16, edible, but with so little meat that it is not eaten), *Carpilius maculatus* (L.) (p. 18, see also below), *Dromidiopsis dormia* (L.) (p. 19, see also below), *Galappa calappa* (L.) (p. 21, not eaten because they contain so little meat), *Pseudograpsus setosus* (Fabr.) (p. 26).

In Rumphius's treatment of the harmful crabs his remarkable scientific accuracy and objectivity is clearly shown. Time and again he warns that one has to be very careful before stating a species to be harmful. So when dealing with the edible portunids he remarked (p. 10): "Doch is 't waar, dat de Ervarenheit ons heeft geleeraart, dat'er, onder alle deeze eetbaare Krabben ook, zoodanige zyn, waar van de Eters zich quaalyk bevoelt hebben. Dit gebrek moet men geenzins 't geheele geslagte toeschryven, maar de eene of andere Krabbe, in 't byzonder, die, by geval, van eenig schadelyk hout of vrucht gegeten heeft, gelyk onder anderen verdagt zyn de vrugten van den *Arbor excoecars*..." (But it is true that experience has taught us that among all these edible crabs there are some that made people who ate them feel ill. For this, however, one cannot blame the whole species, but only some particular individual crab, which by chance had eaten harmful wood or fruit, like that of the *Arbor excoecars*, = *Excoecaria agallocha* L.). Rumphius also made it repeatedly clear that most of his information actually is hearsay evidence and he also indicated when his different informants differed in their opinion concerning the harmfulness of a species.

In a little known book by Curtiss (1938) a poisonous crab is mentioned from Tahiti (see below under *Eriphia sebana*). This record is not cited by either Halstead or Guinot, and it is very likely that similar records are scattered in the literature but so far have escaped notice.

The following enumeration lists the species of crab that to my knowledge have been reported as poisonous or harmful.

XANTHIDAE

Rumphius (1705: 17) gave the interesting observation that at Amboina crabs with black fingers are considered harmful, "dat alle Krabben, wier schaeren aan de nypers zwart of bruin zyn, tot de kost niet deugen, als of ze van Natuuren getekent waaren" (that all crabs, the pincers of which have the fingers black or brown, are not fit for consumption, as if they are marked as such by Nature),

and on p. 19 he even cites a latin saying "Hic niger est hunc tu Romane caveto" for this purpose. Now, black or dark brown fingered crabs are especially numerous among the Xanthidae and rarely found among other brachyuran families. The fact that the Amboinese evidently distrust all black fingered crabs coincides curiously with the unusual preponderance of species of Xanthidae over those of other families, among the forms that have been cited as poisonous, also outside the Moluccas.

Atergatis floridus (L.)

Rumphius (1705: 17) stated that this species, which he named *Cancer Floridus*, is not eaten by the natives of Amboina because these crabs have black fingers.

Carpilius maculatus (L.)

Cancer ruber as Rumphius (1705: 18) named this species is considered suspect by the natives of Amboina because of the presence of the red spots. Rumphius cited an instance in which it was stated that some people of the village of Hucconalo had had bad effects from eating specimens of this species from the Bay of Amboina. He immediately added, however, that other people, namely those from the villages Caybobbo and Bonoa, considered this species "voor de beste ..., zynde vol geel vet, en vol vleesch" (the best for eating, being full of yellow fat and full of meat). Guinot (1967: 17, 90) noted that this species is considered poisonous by some inhabitants of Mauritius (but not by all), while on the other hand it elsewhere (e.g., in Madagascar) is highly esteemed as food. Also Ward (1937: 213) indicated that *Carpilius maculatus* by some natives is considered poisonous, while it was thought a delicacy by others; it is not clear whether he cited Rumphius here or relied upon other information.

Carpilius convexus (Forskål)

According to Guinot (1967: 17, 91) *Carpilius convexus* is considered unfit for consumption at Cocos-Keeling Islands (Tweedie, 1950: 110), Micronesia, and Reao, Tuamotu Islands, while it is eaten, be it that it is not very highly esteemed, at Madagascar, Mauritius, Samoa, and at Raroia Atoll, Tuamotu Islands.

Eriphia sebana (Shaw & Nodder)

Rumphius (1705: 14, 17) considered this a harmful crab and used the latin name *Cancer Noxius* for it, although at the same time he cited it under the name *Cancer Rubris Oculis*. Also the native names that he cited indicated the crab as forbidden to be eaten, unlucky, poisonous, and harmful. He stated that when the amboinese fishermen find a specimen of it in their nets "word ze straks weg geworpen, om dat ze voor schadelyk, ja doodelyk gehouden word" (immediately throw it back as they consider it harmful, even deadly). Nevertheless he indicated

that the animals are sometimes eaten “'t welk dikwils mislukt” (which often goes wrong), and gave the following story: “het is in mynen tyd gebeurt op *Hitoelamma*, dat zekere Vrouw van een Krabbe, maar de eene schaer op koolen gebraden eetende, vermits ze deze Krab niet kende, by het vuur zittende, in slaap gevallen is, wordende daar ter steede dood gevonden, gelyk ook haar dogtertje, dat mede daar van at, en kort daar na ook storf, doch alvorens aanwees de Krabbe waar van ze gegeten hadden” (it has happened in my time at Hitoelamma, that a certain woman was found dead sitting next to her fire, after having eaten only a claw of this crab, which she evidently did not know. She had roasted the claw on the hot coals of her fire and fell asleep after eating it. Her little daughter, who also ate from the crab, died soon after, but not before having indicated the crab that they ate). Furthermore Rumphius remarked philosophically that Nature had very wisely arranged that this harmful animal only occurs on the bottom of the sea and is not found on the beaches and therefore cannot harm the many people, who search there for food at ebb tide. Ward (1937: 213) identified Rumphius's species as being perhaps *Carpilius convexus*, but Rumphius's description, and especially his mention of the red colour of the eyes, shows that he actually meant *Eriphia sebana*.

Curtiss (1938: 176, 177) described under the new name *Cancer tearlachi* a crab from Tahiti which he indicated as “papaá taéro (poison crab)” and which from his description cannot be anything but *Eriphia sebana*. His statement that the natives call it poisonous and do not eat it, supports Rumphius's story.

Ward (1937: 214) mentioned this species to be taboo as food in parts of the Solomon Islands.

Banner (1952: 31), on the other hand, discussed a “red-eyed crab” which at Onotoa Atoll, Gilbert Islands is caught for food. Guinot (1967: 94) identified this as probably belonging to *E. sebana*, which is the more likely as Dr. Banner's collection from Onotoa indeed did contain that species (see Holthuis, 1953: 20).

***Eriphia norfolcensis* Grant & McCulloch**

As also indicated by Halstead & Courville (1965: 907, pl. 19 fig. 2) and Guinot (1967: 17, 94), *Eriphia norfolcensis* Grant & McCulloch from Norfolk Island, is called there “Poison Crab” (see Grant & McCulloch, 1907: 152).

***Lophozozymus pictor* (Fabricius)**

This species was described by Rumphius (1705: 18) under the name *Cancer Aeneus*. He stated that according to the natives of Amboina the species is “volkomen schadelyk” (completely harmful). Guinot (1967: 91) cited Gruvel (1925: 105) who ranged this species among the edible crabs of Indochina.

***Pilumnus vespertilio* (Fabricius)**

Rumphius (1705: 14) described this species as not edible and said that it was considered by the natives to be a form of the large harmful one, *Eriphia sebana*.

Xantho reynaudii H. Milne Edwards

André (1931: 649), Halstead & Courville (1965: 907, pl. 19 fig. 3) and Guinot (1967: 17) reported that this species is considered poisonous in the Gulf of Tonkin.

Zosimus aeneus (L.)

This species was named by Rumphius (1705: 19) *Cancer Nigris Chelis*, the smaller species. The amboinese fishermen throw these crabs immediately out, when they find them in their nets, and consider them harmful. Demandt (1913: 107; 1914: 110) mentioned that the intestines of this species are considered poisonous in Samoa. Banner (1952: 32) stated that at the Onotoa Atoll, Gilbert Islands this species is considered extremely poisonous, causing rapid death when eaten. But Morrison (1954: 16) reported that the species is caught and used for food at Raroia, Tuamotu Islands (see also Guinot, 1967: 17, 94). Under the name "Angatea" Gill (1876: 273) cited a crab, which at Hervey Id., Cook Islands is considered extremely poisonous. The figure of this "white shelled crab", which has also been reproduced by Halstead & Courville (1965: 907, pl. 19 fig. 1) is very crude, but it might represent *Zosimus aeneus* if a great number of errors in proportions, etc. is accepted for this drawing. It probably will never be possible to identify the species with certainty. Gill stated that some natives commit suicide by eating this crab, while there seem to have been instances in which it did no harm at all.

GECARCINIDAE

Ward (1937: 214) cited *Cardisoma carnifex* (Herbst) as being taboo or possibly considered poisonous on Murray Island, Torres Straits. On the other hand the species is used for human consumption almost throughout its range. The toxicity of *Ucides cordatus* (L.) after having eaten leaves or fruit of the poisonous Manzanilla Tree has already been mentioned above.

MAJIDAE

Micippa philyra (Herbst)

Demandt (1913: 109) reported that at Samoa this species was considered to be unedible and poisonous ("soll giftig sein").

PARTHENOPIDAE

Parthenope longimanus (L.)

According to Rumphius (1705: 15, 16) amboinese fishermen detest "Cancer Spinosus Longimanus" as an ugly sea monster, for which reason they throw it again overboard, considering it a useless animal, and even dangerous to eat ("de Visschers hebben een afschouw daar van, als voor een leelyk Zeegedrogt, weshalven zy hem gemeenlyk weder over boord smyten, houdende hem voor onnut, ja schadelijk om te eeten").

Daldorfia horrida (L.)

Rumphius (1705: 16) indicated this as the third species of *Cancer spinosus* and stated that "d'Ambonezen zyn 'er zoo bang voor, dat ze haar met de fuik of vishoek ophalende, straks weder in zee smyten, want ze houden haar voor schadelyk tot de kost, hoewelze geen exempel kunnen aanwyzen, dat ze in 't eeten leed heeft gedaan. Op Celebes Oostkust ... alwaar ze meede voor schadelyk gehouden worden" (the Amboinese are so afraid of it that when they catch one in their fish pots or on the line, they throw it right away back into the sea, because they consider it harmful to eat them, although they can not give any concrete examples that eating them has ever caused harm. At the east coast of Celebes ... they are also thought to be harmful).

RANINIDAE

Ranina ranina (L.)

Rumphius (1705: 13) remarked about this species: "of zy tot het eeten bequaam is, kan ik niet zeggen; immers d'Inlanders zyn schroomagtig haar te nuttigen" (I do not know whether they are edible, as the natives are reluctant to eat them). As Guinot (1967: 122) indicated the species is considered to be good eating in many parts of the Indo-West Pacific.

DROMIIDAE

Dromidiopsis dormia (L.)

Cancer lanosus as Rumphius (1705: 19, 20) indicated this species was considered by both the Christian and Moslim Amboinese to be harmful, and the animals were thrown away when caught, "doch zoo my dunkt komt dezen afkeer meer wegens haare leelyke gedaante, dan uit ervaring. Want daar zyn Natien die haar zonder schroom op koolen braaden en eeten, al het vleesch van 't zwarte bloed afzonderende" (but I believe that this antipathy is rather caused by the ugly appearance of the crab than by experience. There are, namely, people who without reluctance roast the animals on hot coals and eat them, separating the meat from the black blood), and he cited for this the inhabitants of Bonoa and Serua. He continued that like with the poisonous puffer fishes one has to know which parts of the animal are poisonous and should be removed before eating. Tinker (1965: 66) and Guinot (1967: 17, 123) indicated that in Hawaii the species is considered to be poisonous by many people, but that others eat it.

Summarizing we may state that it still is doubtful whether there are any truly poisonous species of crabs. Many of the species that are considered poisonous in one area are eaten in another (*Carpilius maculatus*, *C. convexus*, *Eriphia sebana*, *Zosimus aeneus*, *Cardisoma carnifex*, *Ranina ranina*, *Dromidiopsis dormia*) and among these are exactly those species which are most often said to be harmful. On the other hand it is remarkable that among the species that at one time or

another have been considered poisonous, there is such a high percentage of xanthids, and not a single portunid. It is possible as Rumphius stated that the ugly shape or peculiar markings (black fingers, red spots) of some species caused the reluctance of some people to eat them. Also it is possible that xanthids spoil easier or are more likely to eat poisonous food than e.g. Portunidae, but this of course is pure conjecture.

Rumphius (1705: 20) may be right when he stated: "Men hebbe wel aan te merken, dat als men in dit Boek zegt eenige Krabben venynig te zyn, zulks geschied naar de gemeene, hoewel dolende manier van spreken, want ze zyn niet vergiftig eigentlyk genomen" (one has to take into consideration that where in this book it is said that some crabs are poisonous, this is said in the common, but actually incorrect way of speaking, because they are not truly toxic).

Most of the records of toxic crabs can be explained by (1) tradition: ugly looking crabs are supposed to be harmful and this stigma sticks to them through generations, even if it is not verified; this probably is true for *Dromidiopsis* as Rumphius pointed out, (2) that some species do not taste too good and for that reason are not eaten, this will lead to have them finally classed as harmful; this may be the case with *Carpilius convexus*, (3) toxic food ingested by the crab, causing poisoning when the animal is eaten; there are several concrete examples of this and the possibility has been pointed out by several authors, including Rumphius, (4) an allergy of some people for crustacean proteins, which manifests itself in often very violent reactions after eating Crustacea, (5) that finally, some crabs are not consumed fresh, and toxins are formed in the decomposing tissues. It is possible that all the records of poisonous crabs listed above can be explained under one of these five headings, but a closer examination of this interesting problem remains desirable.

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A DEFORMED CHELIPED IN THE RED CRAB (*GERYON QUINQUEDENS*)¹)

BY

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Malformed crustacean appendages have always been of keen interest to both the casual and scientific observer due to their bizarre appearance. These pereopodal anomalies are particularly evident in the larger crustaceans and this paper reports the occurrence of such an appendage deformation in the deep sea red crab, *Geryon quinquedens* Smith, 1879.

The afflicted animal, a male, measured 95 mm from the notch in the rostrum

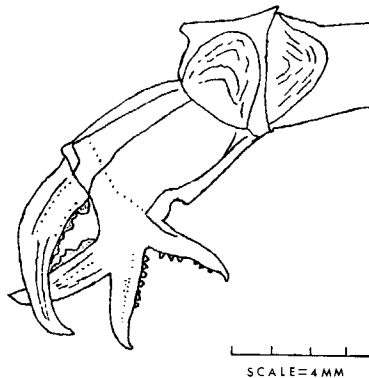


Fig. 1. *Geryon quinquedens* Smith, deformed chela.

¹) This paper is based on work performed under the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309) — Investigation of the Basic Life History of the Red Crab (3-46-R-1).