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THE GENUS RHYNCHOTHORAX (PYCNOGONIDA) IN THE MEDITERRANEAN SEA

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ABSTRACT

Of the five species of *Rhynchothorax* recorded from the Mediterranean, the description of *Rh. alcicornis* is completed with new material, and *Rh. anophthalmus* is synonymized with *Rh. philopsammum*.

Created by Costa (1861) for a species collected on the Northern African coast (Tunisia or Eastern Algeria) that he named *Rhynchothorax mediterraneus*, this genus comprises only minute-sized species which were long overlooked after Dohrn's record of the above species from Capri (Italy). In 1966 Stock (1966) described *Rh. voxorinum* from the vicinity of Banyuls-sur-Mer. Arnaud (1972) rediscovered *Rh. mediterraneus* in the Marseille area and described *Rh. anophthalmus*. Krapp (1973) found *Rh. alcicornis* near Ischia (Italy). Finally, *Rh. monnioti* Arnaud, 1974, described from the Azores Is. (North Atlantic Ocean) was recorded west of Marseille (Arnaud, 1987).

Up to now, 15 species have been recorded from the World oceans and the present paper, in honour of our friend Jan H. Stock who has devoted a large part of his intensive scientific activity to study the taxonomy of Pycnogonida sampled all over the world, intends to revise the

five representatives of this genus so far known from the Mediterranean.

Rhynchothorax alcicornis Krapp, 1973

Rhynchothorax alcicornis Krapp, 1973: 120, fig. 1; Child 1979: 67; Arnaud 1987: 47, 54; Arnaud & Bamber 1987: 32.

New material examined: 2 ♂, NW Corsica, Ile Rousse, in calcareous algal concretions, 3.04.1978, 1 to 1,5 m, (H. Zibrowius coll., diving). 1 ♂, Gulf of Fos-sur-Mer (about 30 km W of Marseille), 11 m, 2.11.1982, in *Posidonia oceanica* altered grounds; 4 ♂, same place, 20.05.1983 (A. Willsie coll., diving); 1 ♂ from Ischia, near the Institute, August-September 1972, sponges, hydroids with sand (U. Schiecke coll.).

Male. Tegument finely granulated. Trunk completely segmented. Presence of middorsal tubercles: two on somites 1, 2, 3, one on 4th

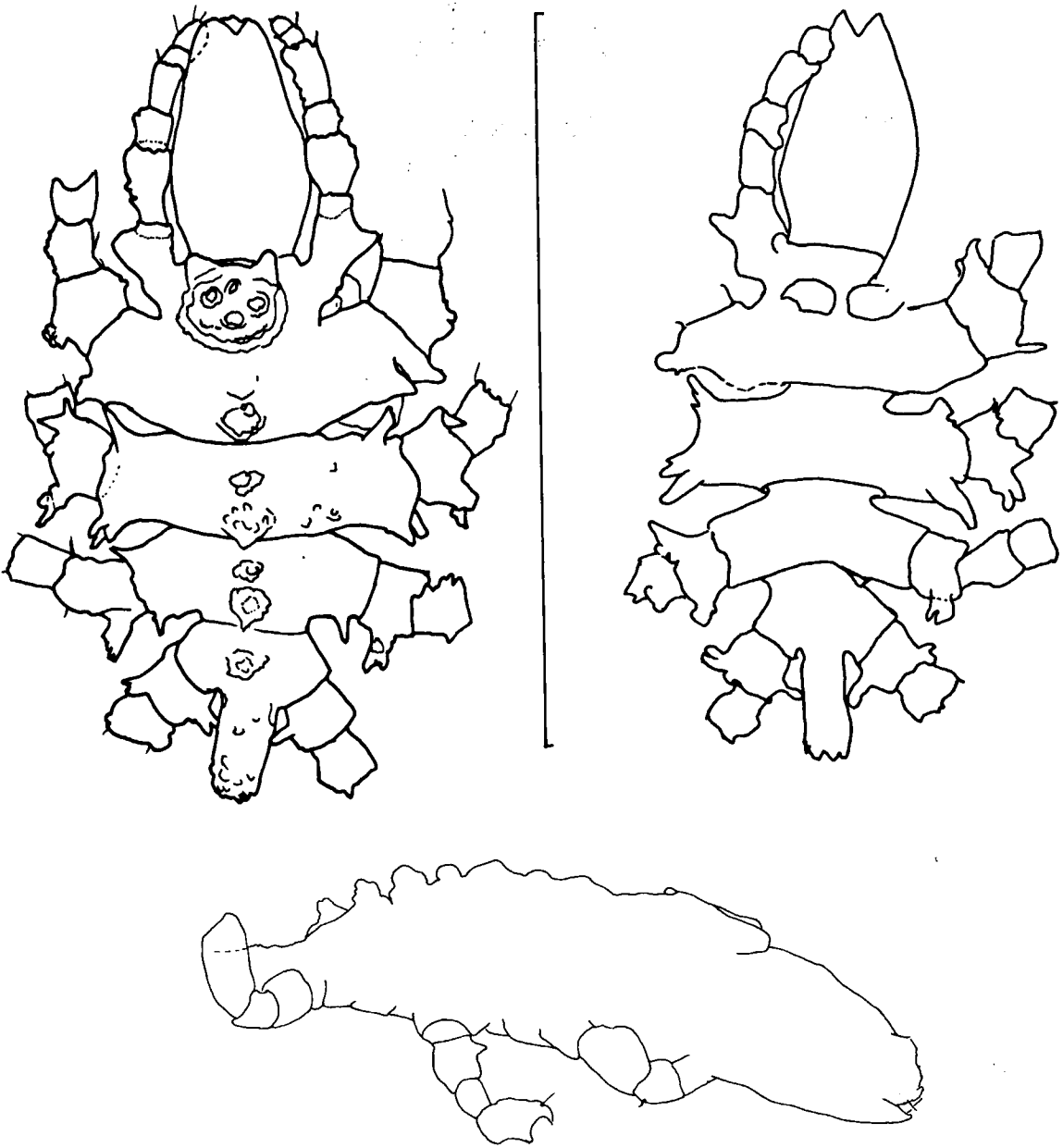


Fig. 1: *Rhynchothorax alaicornis*, ♂ from Ischia, topotypical material: A dorsal view, B ventral view, C dorsal contour
Scale in all 1 mm.

somite. Lateral processes separated by less than their diameter, with three multiple apophyses on the distal distal extremities of processes 1 to 3. No individualized ocular tubercle, but two cephalic extensions (which are not to be considered as cheliphores) pointing forwards, with two clear spots behind them. Proboscis without

dorsal ornamentation, barrel-shaped, with dorsal antimere well developed and with triradiate mouth. Palps 5-segmented with the very typical 4th and 5th segments (fig. xxx). Cheliphores absent, contrary to the assertion in the original description, in which the two cephalic extensions were misinterpreted as such organs. Child

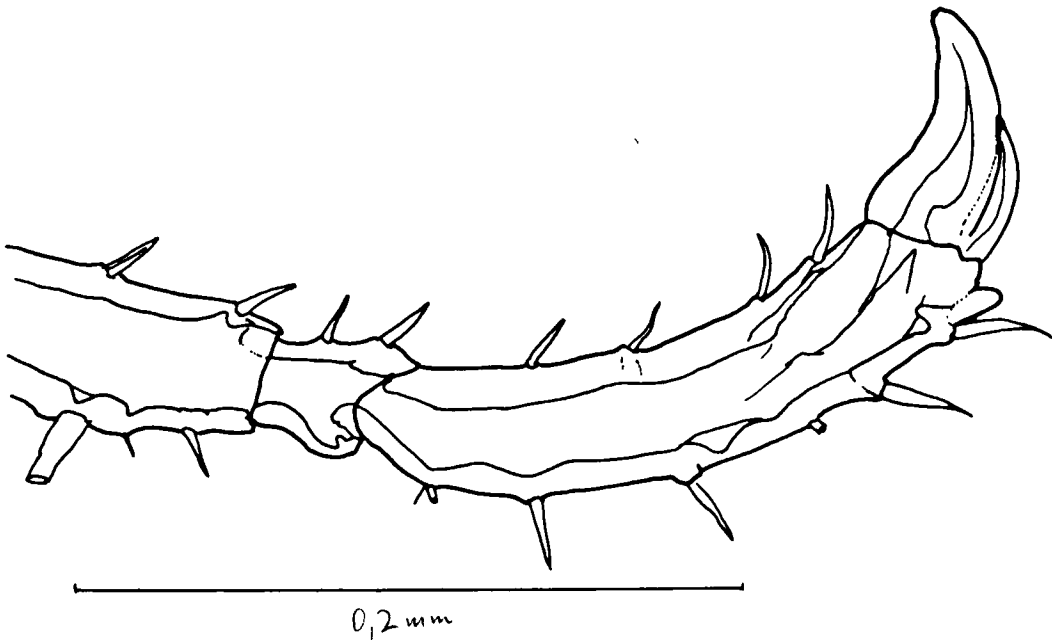
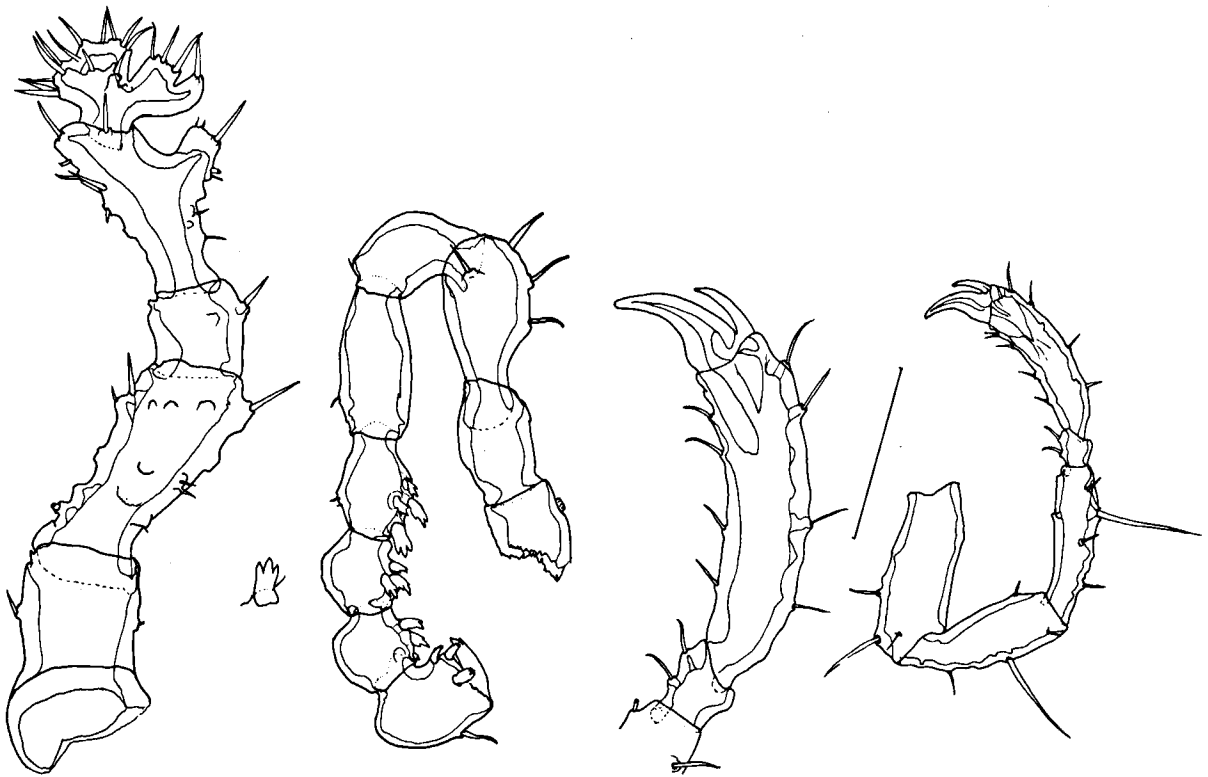


Fig. 2: *Rhynchothorax alcicornis*, same specimen as in fig. 1: A palp, B oviger, C distal articles of third leg (scale 0,1 mm); D a single special spine (scale 0,05 mm). (enlarged doubly)

(1979) clearly recognized this error and we agree that no adult *Rhynchothorax* has cheliphores. The legs are robust, with a short conical point directed forwards on each first coxa. The male sexual orifice is situated on the large posterior dilatation of the second coxae of fourth legs. The femoral gland is a rather inconspicuous ventral bulge bearing a small spine of the third legs only. Abdomen square-tipped, with two small distal corners individualized, and two round tubercles at midlength, dorsally.

Female. Unknown.

Geographical distribution. The holotype found at Ischia (near Naples, Italy) by diving at 12 m on "coarse sand with rather much detritus" was accidentally partly damaged, but another was discovered later in the same locality. Two other locations should be added: The first is the SE zone of Fos-sur-Mer (30 km NW of Marseille) at Pointe Donnelle, 11 m, in *Posidonia oceanica* beds. There, one ♂ was taken in the four uppermost cm of a core made among roots of *Posidonia*. 4 more ♂ were collected between 4 and 8 cm under the surface of the sediment (sand accumulated among the scales of basal *P. oceanica* leaves). The second is from the NW coast of Corsica (Ile Rousse area), among calcareous algal concretions, at 1 to 1.50 m, in a sciaphilous habitat.

Rh. alcornis seems to be strictly infested to sand, as it has never been collected mixed with other species of pycnogonids. Like *Rh. philosammum*, it is devoid of burrowing organs and we must think that the size of sand particles and its porosity are two essential factors for finding these two species buried several cm below the surface. So far it is recorded from depths of 11 and 12 m.

***Rhynchothorax mediterraneus* Costa, 1861**

Rhynchothorax mediterraneus Costa 1861: 8-9, pl. 1; Dohrn 1881: 211-215; pl. 17, figs. 1-9; Thompson 1909: 535, fig. 284; Arnaud 1972: 408 (key), 409; Krapp 1973: 121 (key); Arnaud 1976: 70; Arnaud 1987: 47-48; Arnaud & Bamber 1987: 32, 57, 69; Child 1988: 56.

After Costa (1861) who found *Rh. mediterraneus* on the Northern African coast (probably Tunisia or Eastern Algeria, where Italian fishermen of these days had the monopoly of red coral collecting) "sulle rocce coralligene, tra fuchi, vermeti e serpole", Dohrn (1881) was the second author to record it from Capri at 90 m. It was considered a rare species until Arnaud (1972) discovered two specimens in a depth of 35 m among the infauna of a coralligenous algal habitat 20 km NW of Marseille. After that no less than 49 individuals of both sexes have been counted in 18 samples taken between the Gulf of Marseille and Cannes (French Riviera), Hyères Is., and NW Corsica (Bay of Calvi), mainly on detritic substrates. One record exists from the oriental Mediterranean Basin (Aegean Sea, Antipsara I.) at "Calypso" station 801 (38°31'N-25°31'E, dredging 120-130 m, 25.09.1955. On the Atlantic coast of Morocco (35°43'30"N-06°21'W, 200 m, 21.07.1969) one ♂ was identified on dead branches of the Stylasteridae *Errina aspera*.

This species was also recorded from tropical localities as different as South Brasil, NW Madagascar and Aldabra Atoll (Seychelles Is.) in the Indian Ocean, from 1 to 200 m. In the Mediterranean it occurs mainly on detritic bottoms (coralligenous algae*, substrates with small echinids or brachiopods, rock covered with Laminarians) in relatively clean waters, from 35 to 120 m.

***Rhynchothorax monnioti* Arnaud, 1974**

Rhynchothorax monnioti Arnaud 1974: 171-172, figs. 1-5; Arnaud 1987: 48; Sanchez & Munilla 1987: 179-187, fig. 4; Child 1988: 56. Only one new ♀ specimen has been recorded in the Mediterranean Sea, in the vicinity of Marseille (Gulf of Fos-sur-Mer) at 15 m from coralligenous algae, from a rather sciaphilous habitat. The ♀ holotype came from the Azores

* In Arnaud & Bamber (1987: 32), at the end of chapter "Tropism", instead of "*R. alcornis* from coralligenous algae in the same area" should be read "*R. mediterraneus* from coralligenous..."

Table 1. Tabular key for differentiating the five mediterranean species of *Rhynchothorax*

	Oculated species			Blind species	
	<i>mediterraneus</i>	<i>monnioti</i>	<i>voxorinum</i>	<i>alcicornis</i>	<i>philopsammum</i>
Proboscis type*	C' 2 E''	C' 2	B 2 E''	C 1	B 1
dorsal antimere	absent	absent	present	present	present
dorsal ornamentation	absent	1 median horn at the proximal third	1 tubercle anterior to midlength	absent	light bosses present
Ocular tubercle	with anterior horizontal projection	large, conical, anteriorly bent	low, rounded	absent	absent
Eyes	4 pigmented	4 pigmented	4 pigmented	2 round spots	absent
Post ocular tubercles	2 small	2 small	2 small	2 small	2 small
Palp segments	5 (3rd with a spur)	6 (1, 3 & 4 with a spur)	6 (1st with a lateral strong spur)	5 (5th bifid distally)	4 (3rd with a strong dorsal tubercle)
Lateral cephalic spurs	absent	absent	present	absent	absent
Trunk sutures	2	3	2	3	3
Middorsal tubercles	3 columnar	3 conical	3 strong, granular	5 low, rounded	absent
Spurs on lat. processes	1 dorsal, posteriorly	1 strong posterior, with short setae	long, multi-tuberculated	1 anterior and 1 posterior, short	strong on 1st and 2nd lateral processes
Tegument	shagreened	with small granulations	with small granulations	with numerous granules	shagreened
Legs	slender with some granulations	slender, smooth	slender with some setae	strong with numerous granules	relatively strong, with few setae
Auxiliary claws	absent	absent	about half the main claw	half of the main claw	two thirds of the main claw
Sexual orifice in ♂	long spur on 3rd coxae of 3rd legs	unknown	small ventral swelling on 2nd coxae of 3rd legs	small spur on 2nd coxae of 4th legs	large posterior swelling on 2nd coxae of 3rd legs
Segments of the ♂ oviger	10	unknown	10	10	10
♂ oviger spines	simple	unknown	denticulated	denticulated	denticulated
Segments of the ♀ oviger	10	reduced to a small cone	unknown	unknown	10 (with simple spines)

+ as defined by Fry & Hedgpeth (1969).

Is. (Atlantic Ocean) at 37°16'54"N-24°47'W, 130-169 m, "Jean Charcot" station 207, on gravel, shells and stones. Sanchez & Munilla (1987) have identified another ♀ from the SE of Tenerife (Canary Is.) at 62 m on calcareous algal bottom, and Child (1988) recognized Zilberberg's Brazilian specimen no. 2 as a juvenile of *Rh. monnioti*. So the male sex remains unknown to date.

Rhynchothorax voxorinum Stock, 1966

Rhynchothorax voxorinum Stock 1966: 412-415, fig. 3; Arnaud 1987: 48.

No other specimen having been discovered since its description, despite our careful searches, nothing could be added to its life

peculiarities. Only the ♂ sex is known from the surface of a sponge encrusting the inferior face of a stone at Cape Creus (NE Spain), 10-18 m deep. It is a very tiny pycnogonid measuring 1.1 mm in total length.

This species confirms the negative phototropism also exhibited by the four other Mediterranean relatives, which have cryptic tendencies, living in crevices or being endoposammic as *Rh. alcicornis* and *philopsammum*, and even lacking any burrowing organ. We have tabulated the main characters permitting the easy identification of the five Mediterranean representatives so far recorded, hoping that the lack of informations about one sex of a few species will be filled in the coming years (table 1).

Rhynchothorax philopsammum Hedgpeth, 1951

Rhynchothorax philopsammum Hedgpeth 1951: 111-115, 3; Stock 1966: 415 (key). Zago 1970: 3 (key); Arnaud 1972: 408 (key); Krapp 1973: 121 (key); Clark 1976: 295 (key); Child 1979: 67, 72, fig. 24h; Stock 1986: 700.

Rhynchothorax anophthalmus Arnaud 1972: 405-409, figs 1-7; Arnaud 1974: 172-173, figs 6-7; Child 1979: 67, fig. 24i; Arnaud 1987: 47, 54; Arnaud & Bamber 1987: 8, 32, 69.

Already in the original description the strong morphological similarities of *Rh. anophthalmus* with *philopsammum* were pointed out. Eleven new individuals from the Azores Is. dredged at a depth of 77 m on a bottom composed of gravel, shelly sand with calcareous algae on 14.10.1971 (38°34'N-28°32.5'W) and three more Mediterranean examples lead us to re-examine the two species comparatively.

The integument is finely granulated. Absence of dorsal ornamentation, of an ocular tubercle, and of cheliphores—which have been misinterpreted until Child (1979) demonstrated that these organs were in fact cephalic extensions—as for *alcicornis*. The palps are only 4-segmented. The males exhibit stronger lateral apophyses and the 2nd coxae of the 3rd legs bear a posterior conical sexual gland with sexual orifice.

The Mediterranean specimens were found among the invertebrates settled after 6 and 12 months on immersed artificial reefs in the Gulf of Marseille at 34 m on coralligenous bottom, and in the dark central part of these reefs. The 4 ♀ from California were collected “from coarse sand some five or six inches below the surface” (Hedgpeth 1951). We have no doubt that *Rh. anophthalmus* is a junior synonym of *Rh. philopsammum*.

The geographical distribution includes now the Pacific Ocean (coastal California, shores of the Gulf of Tehuantepec and Bora Bora I.), Atlantic Ocean (Azores Is.), and the NW part of the Mediterranean (Marseille area).

RE-DEFINITION OF THE FAMILY RHYNCHOTHORACIDAE THOMPSON, 1909

The familial affiliation of the genus *Rhynchothorax* has long been uncertain, being variously placed among the Ammotheidae or the Colossendeidae. Thompson (1909) created the family Rhynchothoracidae for the single genus *Rhynchothorax*, at a time when only two species were known: *Rh. mediterraneus* Costa, 1861 from the Mediterranean Sea and *Rh. australis* Hodgson, 1902 from the Antarctic. Child (1979) discussed the opportunity of removing this genus from the “old” families and was tempted to adopt Rhynchothoracidae, as it was already accepted by Arnaud & Bamber (1987).

We propose the following characters for this family: minute-sized body (total length usually less than 2 mm), trunk with 2 or 3 sutures, very short legs, absence of cheliphores in adults (vestigial in juvenile stages of a few species), palps 4- to 6-segmented. Ovigera 10-segmented (♂) or 9-segmented (♀). Strigilis with simple or denticulated spines, the distal segment being typically enlarged with a terminal claw forming a subchela.

This very distinctive family of tiny pycnogonids lives cryptic in biodetritic or psammophilous habitats, including even endopsammic forms. It possesses representatives in temperate, tropical and cold Antarctic waters.

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