

## APSEUDES BERMUDEUS N. SP. FROM CAVES AROUND BERMUDE ISLANDS

APSEUDES BERMUDEUS N. SP. IZ PEĆINA OKO BERMUDSKIH OTOKA

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By studying a Tanaidacean and Cumacean material from a grotta linked to the sea, in the Bermude Islands, the author describes the *Apseudes bermudeus* n. sp. from the hermaphrodite groupe of *A. intermedius* Hansen.

Even though the present paper is not directly concerned with the Mediterranean fauna has, however, two direct links with the space of this sea: first, it has been completed on the basis of a material collected from the Bermuda waters by a Yugoslavian scientist; and, second, the newly described Tanaid is allied with a Mediterranean species, both probably coming from a common ancestor which had lived in the Tethys sea.

Upon the request of Professor Boris Sket (Institute of biological University of Ljubljana, Yugoslavia), I studied 7 samples with Tanaiids collected by him and Dr. Thomas Iliffe over the December 1978 — January 1979 period. I noted beside the presence of some representatives of the genus *Leptochelia*, *Tanais* and *Anatanaïs* the presence of a new species of *Apseudes* namely:

*Apseudes bermudeus* n. sp.

(fig. A-N)

**Diagnosis.** Small-size forms (2—2,3 mm), with integument smooth, slightly hairy; species hermaphrodite with strong cheliped of male type in females with marsupial laminae; without ventral spines of thorax and abdomen. First two thoracopods with exopodites. Propodus of peraeopod II 2,5 as long as wide; carpus of chela carries a single tubercle-spine at the proximal inferior edge; 4 denticles on the inner proximal part of basal segment of Antennule.

**Material, occurrence.** Over 40 specimens, 11 of them with marsupial laminae, and 5 juveniles (no ♂ ♂) found in 3 of the 7 stations with Tanaiids from the collection of Dr. B. Sket, all from the Bermude Islands, loc. Walsingham III. *Apseudes bermudeus* was captured in three Stations, at different intervals, in a cave near the seacoast, filled by a lake of marine water inhabi-

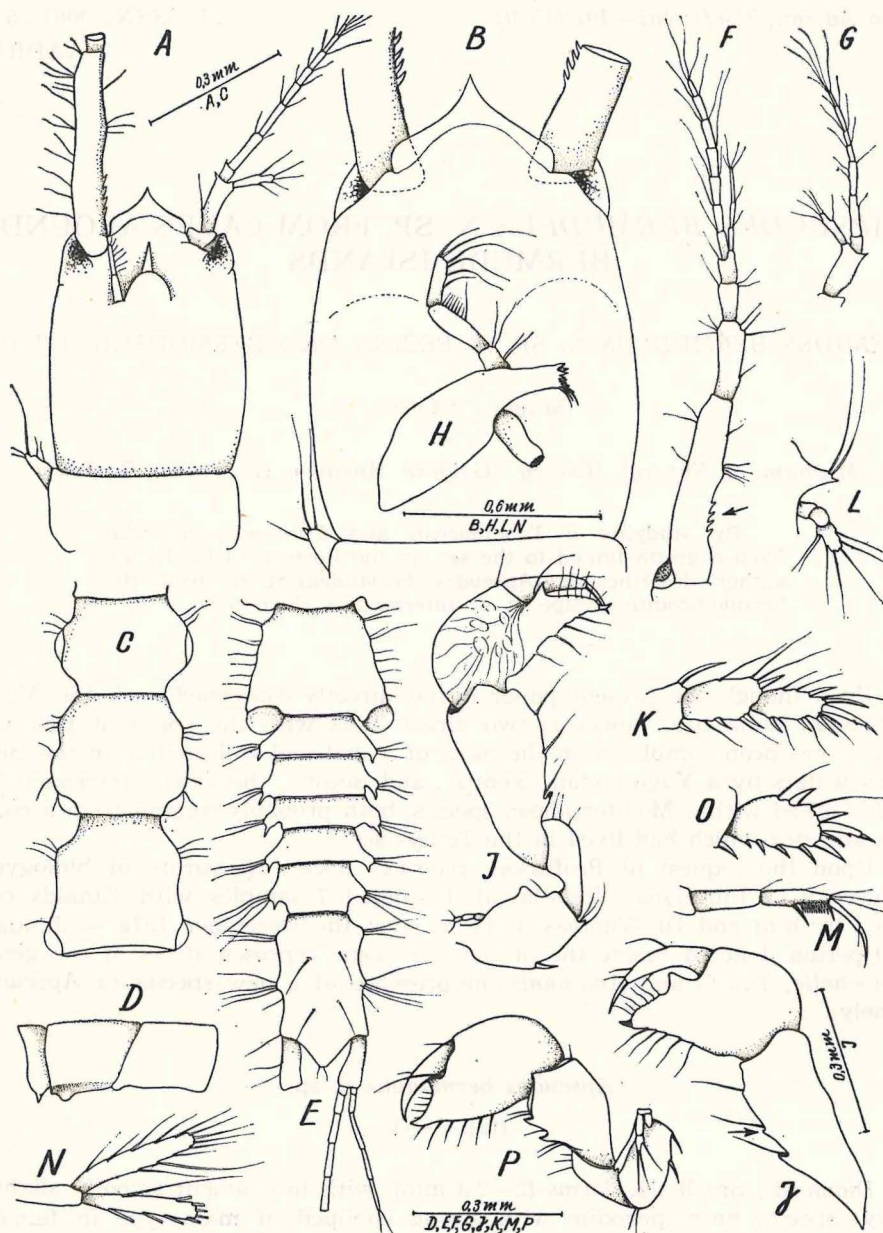


Fig. A—N = *Apseudes bermudeus* n. sp. ♀ with small marsupial laminae. A, anterior portion, seen from below; B, ditto, seen from above; C, thoracomers 4—6; D, thoracomers 6—7, the last one with genital tubercle amorphous; E, posterior portion; F, A<sub>1</sub>, G, arrow showing the 4 denticles characteristic of the species; H, mandible; I, cheliped; J, cheliped of another specimen, with the outline of a second tubercle (arrow); K, last 3 segments of pereopod II; L, its coxal apophysis and exopodite; M, last 3 segment of pereopod VI; N, pleopod 3 (all 5 almost similar).

O, propodus of a specimen of *Apseudes intermedius mediterraneus* n. ssp. (after Băcescu, 1961) much thicker (compare with K); P, chela of *Aps. intermedius* type (according to Hansen, 1908), compare with fig. I.



ted by some marine animals; bottom covered by fine clay, walls rocky, ever in the company of a *Nannastacus* sp. The 29. X. 78 one is by far the richest (41 specimens), almost all of them with marsupial laminae (only 5, the sex of which could not be defined, lack them) and 1 juv. without pleopods, in the 12. XII. 1978 one, only one ♀ with marsupial laminae was found; the 1. I. 1979 one contained 3 juv. (2 without pleopods) and 1 adult with not defined sex, but with a feeble chela.

*Description of individuals with marsupial laminae.* Body very slender (ratio between its standard length and maximum width at first thoracomere level = 6) with procelain-like white integument, weakly calcified, but hard enough to show fissures when pressed, transparent enough to allow the sight of the whole digestive tube, filled with yellowish-fine mud. Despite its structure reminiscent of a granules mosaic — especially on the ventral face, which makes it seem dirty — the integument is shiny with a dorsal pilosity reduced to a few short hairs; only the edges of the segments carry long hairs and the telson bears dorsally 2 long hairs on either side. At any age, no ventral spines on thorax or abdomen; only among the pereopods of last pair, a medio-posterior protuberance reminiscent of the genital tubercle of the non-hermaphrodite species of the genus (fig. D).

Carapace oval with such weak ornamentation that practically it is smooth, glabrous (fig. A); no cardio-pleural sulcus distinct; 1,4—1,6 as long as large and somewhat longer than first free thoracomeres. The oval aspect is more pronounced by the lack of serration or spines, as well as by the weak limitation of eyes lobes (fig. B).

Rostrum well defined by two short »shoulders« without lobes, suddenly terminating in a strong, pointed spine, slightly tilted ventrally (fig. A and B); no antero-lateral angles; eyes lobes show a slight lateral depression, which does not alter the oval shape of carapace; they are conical in shape, located rather low and separated from the rest, by an oblique obvious soulder rising from the base rostrum. These eyes show a few shiny omatidia resting in a mass of brown pigment (fig. A).

Thoracomeres occupy only a little more than  $\frac{1}{2}$  the body length and do not show any ornamentation; no lateral spines, solely a few hairs on the lateral pleural prominences. Peraeonite I is the shortest of all, 2,2 as wide as long; the others get thinner than wide (ratio = 1,1 : 1,3 in the latter). The coxal plate short with a posterior spiniform tip bearing 2 setae in its antero-terminal excavation and a posterior hair (fig. A and L). Peraeomers carry antero-lateral tubercles, weakly distant, more weakly in the posterior portion, bearing an abundant pilosity (fig. C, E).

*Pleonites* (fig. E) similar, carrying a latero-posterior spine each bearing 3—4 setae almost as long as their diameter.

*Pleotelson* cylindrical 1,7—1,8 as long as wide with two pairs of lateral protuberances also provided with hairs longer than the diameter of the cylinder and 2 pairs of long latero-dorsal hairs (fig. E).

*Appendages.*  $A_1$  (fig E.) almost twice as long as carapace; proximal segment usually with 4 denticles at the inner face of basal third (arrow); flagella 7 and 3-segmented respectively (+ one segment each, if we count the basal one



common to both flagella). Base of  $A_2$  with an elongate squama and the entero inner angle projected in a pointed spine. Flagellum 7-segmented (fig. A, G).

*Labrum* oval, smooth, bearing an anterior strong spine obvious when seen from below and from profile.

*Mandible* with a short palp, 3-segmented, 6 golden teeth and 2 laminae (fig. H).

*Maxilla* I with palp bearing 3 setae; maxilliped I with a retinacula.

*Chelipeds* in adults of the  $\sigma$  type; juveniles, the pleopods of which are not completely developed, bear a fine chela reminiscent of  $\text{♀♀}$  of other *Apseudes* species. Cheliped with a 3-segmented exopodite (fig. L). A basipodite with outer spine, a large carpus carrying a single short apophysis with spiniform tip towards proximal portion of ventral edge. The palm of the chela transparent allowing to see the integument and the insertion of muscles (fig. I); claws sharp. Finger of propodus with a triangular dentiform apophysis in the third posterior portion. The juveniles do not bear spines, but only setae on the edge of carpus; the older specimens bear sometimes (5%) a second spiniform tubercle, more smaller also at the proximal portion, near the first one (fig. J. arrow).

Peraeopod II fine, with elongate segments; propodus 2,5—2,6 as long as deep, with dactylus elongate and 3 inner spines (fig. K); exopodite 3-segmented and the already mentioned coxal apophysis (fig. L). Propodus, carpus and meros of equal length; basis as long as two of these combined.

The other peraeopods common, with dactylus and dactylic claws very long and thin, and basis feeble; only the penultimate peraeopod bears on the inferior of propodus a «comb» consisting of 10—12 spinules, bounded by 2 normal spines (fig. M). Hairs scarce; carpus and propodus equal in length; 5 pairs of biramous pleopods; rami unisegmented; endopodite somewhat larger (fig. N). Folding of legs is posterior in peraeopod II and III; anterior in the remaining ones, between meros and ischium.

*Uropod* with a short base, hardly exceeding the apical tip of telsonal triangle; exopodite always 5-segmented (also in juveniles) and endopodite 14—18-segmented in both flagella, also counting the short proximal segment; very seldom 3 segments at exopodite and 17—18 at endopodite. Exopodite distinctly longer than the whole abdomen and last peraeonite.

In juveniles, pleopods absent, chela without spine on carpus, only with 1 hair on the edges of their pleonites and uropodal endopodite only 12-segmented.

*Size*: 2—2,3 mm, Species-type, 1  $\text{♀}$  with marsupial laminae, in the collection of «Gr. Antipa» Museum; no 503; 5 paratypes: 3 specimens with marsupial laminae, 2 juveniles (sex non-identified) ditto, no 504.

*Remarks*: *A. bermudeus* rises at 6 the number of sure or supposed proterandrie hermaphrodite species within the genus.

*Apseudes bermudeus* n. sp. belongs to the group of *Apseudes intermedius* Hansen, also hermaphrodite, taking into account that all adult specimens show maletype chela and over 90 per cent of these bear marsupial laminae, keeping the penial prominence of youth on the sternum of last thoracomere. Only in

juveniles the chelae are thin, with palm less inflated and more shorter than carpus (in aduult they are equal in length).

Unfortunately the description of *A. intermedius* requests a revision because f. ex. what Da Silva Brum (1960) described from Brasil is at least a subspecies *A. intermedius brasiliensis* (n. ssp.), characterized by only 7 segments at uropodal endopodite, by a much larger size (4,5 mm) and a spinless carpus at the cheliped the one described from the eastern Mediterranean (Larwood, 1932; Băcescu, 1961) is also a subspecies differing from the type by another structure of pleomers, a different shape of the propodus of pereopod II, of the base of  $A_1$  and of pleonal sternites (*A. intermedius mediterraneus* n. ssp.).

The new species belongs to the smallest *Apseudes* among the 70 species known of the genus; only *Apseudes garthi* from the Mexican Pacific and the South African *A. browni* (n. n. for *A. minutus* Brown 1930, nec Claus 1876), have a smaller size, viz. 1,9 and 1,6 mm respectively. From the species type from the Green Cape waters and from what was afterwards described as such, *A. bermudeus* differs by: — integument shiny, without ornamentation and abundant pilosity; — by a shorter rostrum; — by the absence of the 2 spines on the anterior portion of the inferior edge of carpus of cheliped (to compare (fig. P—a copy of fig. 10, Pl. V. Hansen) with fig. J).

In our species, the carpus — equal in length with propodus of chela, or even shorter and not 1,5 times (as in the Mediterranean population) or 1,4 (as in the type), is armed with only a very typical tubercle, spiniform, detached at the posterior and of same segment (fig. I); it also differs by the slenderness of pereopod II reflected in the propodus which is 2,5 as long as wide (compare fig. K with O); by the proximal segment of the  $A_1$  base which bears 4 distinct denticles and not a »serration«.

These differences, as well as others less important (telson, size) are given in the table below (no 1).

*A. bermudeus* raises at 6 units the number of hermaphrodite species of the genus *Apseudes*.



Table 1. Some morphological features of the *Apseudes* species allied with *A. Bermudeus*

	Size in mm	Segments at uropodal exopodite	Segments at uropodal endopodite	Segments at large flagellum A <sub>1</sub>	Segments at small flagellum A <sub>1</sub>	Segments at flagellum A <sub>2</sub>	Spines on carpus of cheliped	Ratio length/width propodus Prp II	Spines on inferior edge of propodus Prp II	Ratio length/width I
<i>Apseudes bermudeus</i>	2—2,3	4—5	15—18	7	3	7	1 spiny tubercle at the basis 2 tubercles at	2,4—2,6	3	1,7
<i>Apseudes intermedius</i> <i>typ</i> (Is. Green Head)	2—3	4—5	—	6	3	7	the terminal portion	1,4	—	1,18
<i>Apseudes interm.</i> <i>brasiliensis</i> n. ssp.	4—5	3	7	6	3	9	without spines	1,2	—	1,7
<i>Apseudes i. mediterraneus</i> n. ssp. (d. B. Israel)	2—3,3	5	17—18	8	4	8	2 anteriors	1,85	5	1,26
<i>Apseudes i. Egypt</i> (Larwood)	3,3	4	15	6	3	7	ditto	2	—	1,1
<i>Apseudes garthi</i> Menzies	1,9	4	12	6	2	8	ditto	1,6	—	1,44

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## KRATKI SADRŽAJ

Studijem faune tanaidacea i kumacea iz špilja oko Bermudskih otoka zabilježena je, osim nekih predstavnika rodova *Leptochelia*, *Tanais* i *Anatanais*, i pojava nove vrste *Apseudes bermudeus* iz hermafroditske skupine *A. intermedius* Hansen. U radu je dat opis vrste.

