

A new forest-hopper (Amphipoda, Talitridae) from La Palma, Canary Islands

J. H. Stock

Institute of Taxonomic Zoology, University of Amsterdam, P. O. Box 20125, 1000 HC Amsterdam, The Netherlands & Dep. de Zoología. Universidad de La Laguna, Tenerife, Spain.

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ABSTRACT: Description of *Palmorchestia epigaea* n. sp., from the humid forest zone (altitudes 600-700 m) of La Palma (Canary Islands). This is the second species of *Palmorchestia*, a genus of Talitridae endemic to La Palma (the first species, *P. hypogaea*, being subterranean). It is supposed that *P. epigaea* evolved from coastal *Orchestia*-like ancestors after the emergence of La Palma, whereas *P. hypogaea* originated, during periods of drought, from *P. epigaea*.
Key words: Terrestrial Talitridae, *Palmorchestia*, La Palma (Canary Islands).

RESUMEN: Descripción de *Palmorchestia epigaea* n. sp., de la zona de bosque húmedo (altitud 600-700 m) de La Palma (Islas Canarias). Esta es la segunda especie conocida de *Palmorchestia*, género de Talitridae endémico de La Palma (la primera, *P. hypogaea*, es una especie subterránea). Se supone que *P. epigaea* evolucionó a partir de ancestros costeros de tipo *Orchestia* después de la emergencia de La Palma, mientras que *P. hypogaea* se originó a partir de *P. epigaea* durante periodos de sequía.
Palabras clave: Talitridae terrestres, *Palmorchestia*, La Palma (Islas Canarias).

INTRODUCTION

The genus *Palmorchestia* was created recently (Stock & Martín, in press) for a talitrid, *P. hypogaea*, discovered in several lava caves of the island of La Palma. This island also harbours an epigeal representative of the same genus, which is described in the present paper.

Palmorchestia epigaea n. sp.

1 male holotype, 1 female allotype, 28 paratypes. Isla de la Palma (Canary Islands), Cubo de la Galga, a couple of hundred metres below the great cascade (UTM coordinates BS 2284x31844); very humid Laurisilva forest, under stones, fallen branches and decaying leaves; altitude 600-700 m; 20 Nov. 1986 and 10 May 1987. (Zoölogisch Museum, Amsterdam, ZMA Amph. 108.266).

Comparative description.- The new species is compared with the generotype (and unique species) of *Palmorchestia*, *P. hypogaea* (when a character is not mentioned, it is similar in both species). Length of adult specimens 10-12.5 mm. Body (fig. 1) dark grey, pale grey or reddish brown. Eye (fig. 2) rather large, more or less circular, black; all ocelli pigmented.

Antenna 1 (fig. 2): Flagellum 6-segmented, segments 1 to 4 each with 1 aesthetask, segment 5 with 2 aesthetasks, segment 6 devoid of any.

Antenna 2 (fig. 3): Peduncle segment 5 not very slender, 5 to 6 times as long as wide; flagellum 19- to 24-segmented.

Mandibles (fig. 4) similar to those of *P. hypogaea*.

Maxilla 1: Outer lobe with 9 distal spines, the medial margin of which with 3, 5, 2, 3, 4, 5, 3, and 3 teeth, from lateral to medial, respectively.

Maxilla 2 as in *P. hypogaea*.

Maxilliped (fig. 5) fundamentally as in *P. hypogaea* (palp segment 2 with strong medial lobe; palp segments 3 and 4 fused; armature of outer lobe non-marginal). Inner lobe with 3 triangular distal spines and a contiguous row of plumose medial setae.

Gnathopod 1 (fig. 10): Carpus less elongate than in *P. hypogaea*. Palmar margin of female (fig. 11) shorter than basal diameter of claw, that of male (fig. 12) longer.

Gnathopod 2 (fig. 16) without marked sexual dimorphism; coxal gill not strongly convoluted.

Pereiopods 3 (fig. 13) and 4 (fig. 14): Coxal gill not convoluted. Carpus, propodus, and claw less elongate than in *P. hypogaea*. Dactyl of P4 (fig. 15) unlike that of P3 (posterior margin "pinched").

Pereiopod 5 (figs. 22-23): Coxal gill bilobed, in particular in larger specimens; distal segments, especially propodus, somewhat less slender than in *P. hypogaea*.

Pereiopods 6 (figs. 24-25) and 7 (figs. 28-29) somewhat less slender than in *P. hypogaea*. Coxal gill of P6 long, ribbon-like, up-curved (fig. 26). Number of spinules on posterior margin of basis increasing with size (fig. 27).

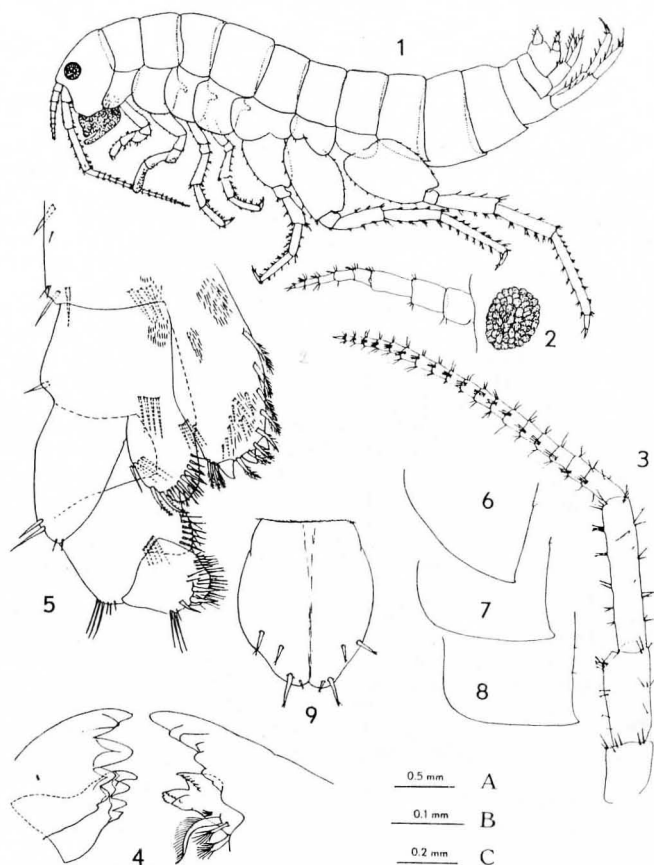
Epimeral plates (figs. 6-8) with 1 or 2 setules on posterior margin.

Pleopods (figs. 30-32) decreasing in size from anterior to posterior. Rami completely vanished. Retinacula subterminal.

Uropods 1 (fig. 19) and 2 (fig. 20) slightly less slender than in *P. hypogaea*. Uropod 3 (fig. 21): Ramus sometimes with, sometimes without dorsal spine.

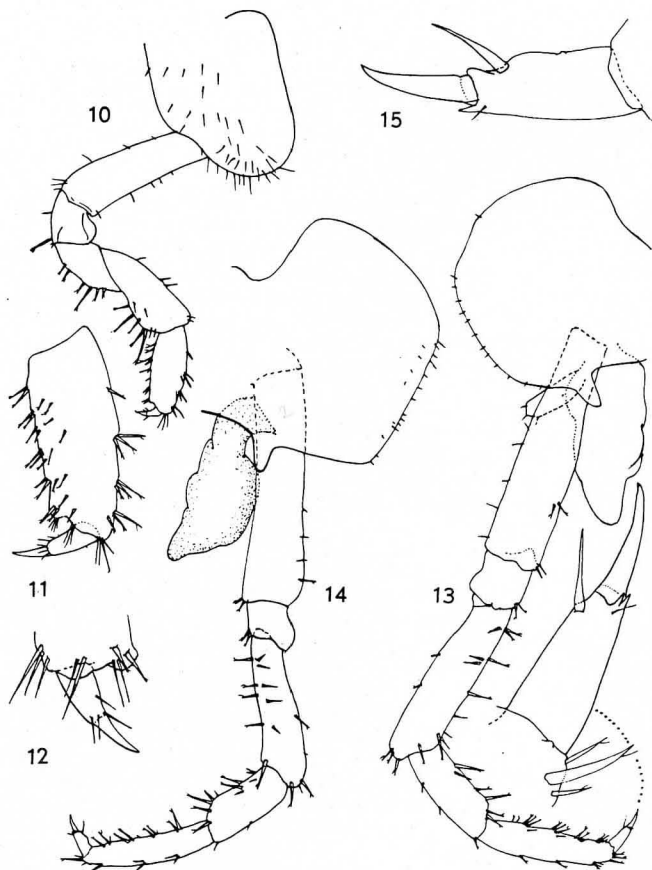
Telson (fig. 9): Lateral margins rounded.

Remarks.- *P. epigaea* lacks the typical cave adaptations found in *P. hypogaea* (the latter shows strongly reduced eyes, absence of body pigment, and very elongate appendages). Other differences between the two species reside in the slightly different number of teeth on the distal spines of the outer lobe of maxilla 1, and in the less convoluted state of the coxal gills. The most fundamental difference is that the dactyls of pereiopods 3 and 4



Figs. 1-9. *Palmorchestia epigaea* n.sp., female.

1, Entire animal (length 11 mm), from the left; 2, eye and first antenna (scale A); 3, second antenna (A); 4, left mandible (left) and right mandible (right) (B); 5, maxilliped (B); 6-8, epimeral plates 1 to 3 (A); 9, telson (C).



Figs. 10-15. *Palmorchestia epigaea* n. sp. (12 = male; remaining figures = female).

10, first gnathopod (scale D); 11, distal segments of first gnathopod (E); 12, palma of first gnathopod (F); 13, third pereiopod (D), claw more strongly enlarged (F); 14, fourth pereiopod (D); 15, claw of fourth pereiopod (F). Scales on next figure.

are alike in *P. hypogaea*, whereas they are dissimilar in *P. epigaea*. The "pinched" nature of the dactyl of P4 in the latter species proves in my opinion that this taxon is not just an epigean morph of *P. hypogaea*, but that it is distinct at specific level.

EVOLUTIONARY SCENARIO

The forest-dwelling *P. epigaea* shows in certain characters (pinched dactyl of P4, relative size of coxal gills) a somewhat closer affinity to the predominantly marine/supralittoral genus *Orchestia*, than the more apomorphic *P. hypogaea*. It is attractive to think that when La Palma arose above sea-level *) it harboured first littoral *Orchestia* species [*O. gammarellus* (Pallas, 1766) is still common on the island]. Through evolutionary processes, like neoteny, *P. epigaea* developed in humid forests. General Holocene/Recent desiccation of the Canary Islands depopulated the lower terrestrial zones of the islands of indigenous land-hoppers **). These land-hoppers show nowadays a relict-like type of distribution correlated with pockets of humid Laurisilva-forest, at altitudes around 500 to 700 m.

The droughts likewise formed the selection pressure for the evolution of the subterranean species, *P. hypogaea*, which lives exclusively in deep crevices and caves, where humidity is between 80 and 100%

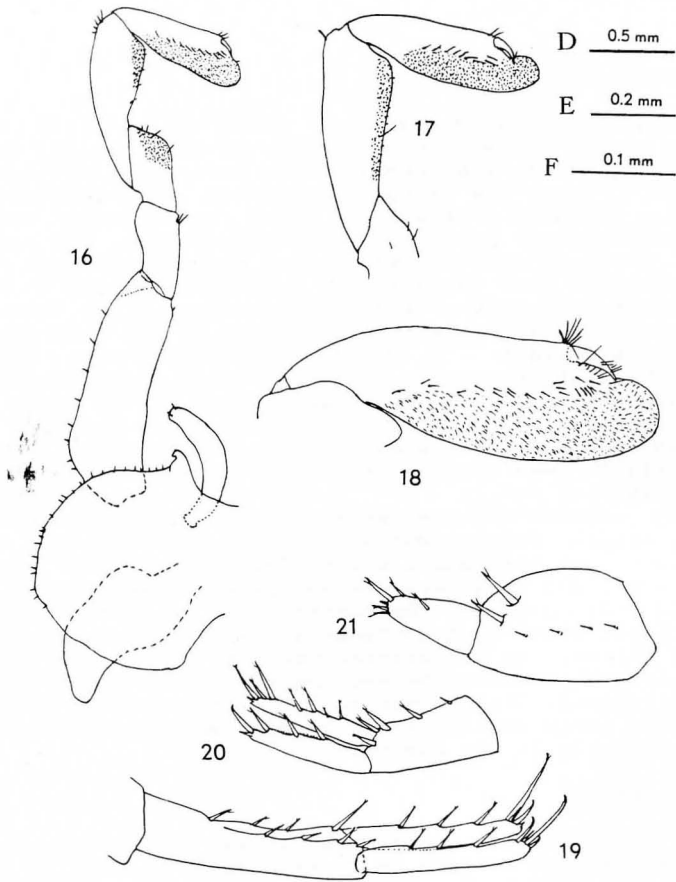
It is unclear why the terrestrial talitrids evolved into a separate genus, *Palmorchestia*, only on La Palma, and not on the other islands of the Canary group. The humid forests of Tenerife, Gran Canaria, and La Gomera are populated by members of the genus *Orchestia* (*O. chevreuxi* De Guerne, 1888 on Tenerife, *O. canariensis* Dahl, 1949 on Gran Canaria, and *O. spec.* on La Gomera). From El Hierro, in the western Canaries, and from the very dry eastern islands, Lanzarote and Fuerteventura, no landhoppers are known at present. Stock & Martin (in press) noticed that La Palma has several other peculiarities in its faunal composition, which are inexplicable at the moment.

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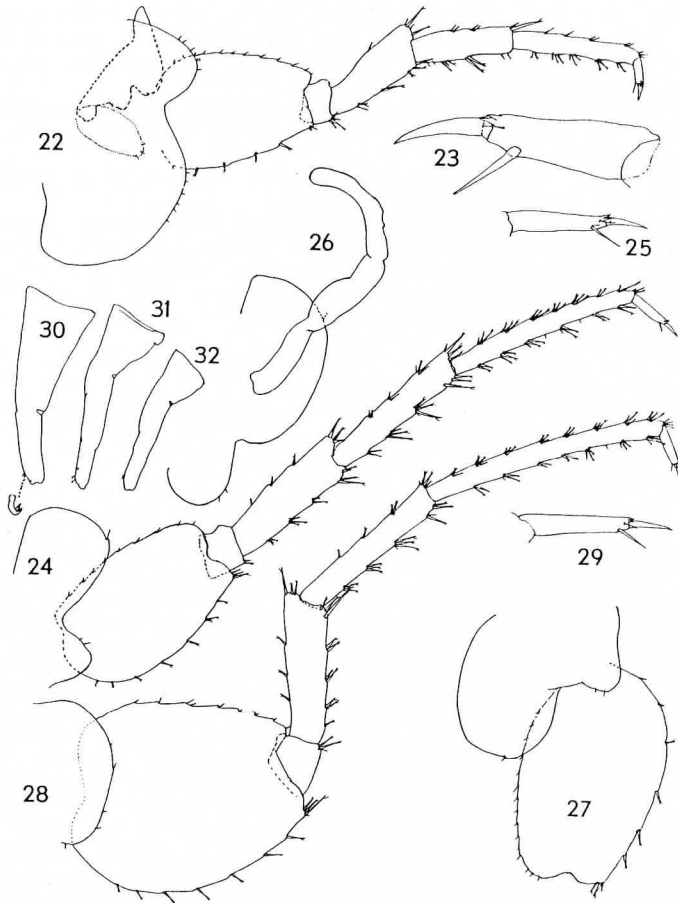
*) The oldest subaerial lavas have been K/Ar dated 1.6 mY B.P. (Abdel-Monem et al., 1972); this fits with the estimate of Schmincke, 1979 (Pliocene/Quaternary), and to a lesser degree with that of Mitchell-Thomé, 1982 (Pliocene).

***) The lower altitudes of the western Canary Islands are now inhabited by an introduced tropical species, *Talitroides alluaudi* (Chevreux, 1901), which is mainly restricted to cultivated areas (gardens, banana plantations).



Figs. 16-21. *Palmorchestia epigaea* n. sp. (17 = male; remaining figures = female).

16, second gnathopod (scale D); 17, distal segments of second gnathopod (F); 18, propodus of second gnathopod (E); 19, first uropod (D); 20 second uropod (D); 21, third uropod (E).



Figs. 22-33. *Palmorchestia epigaea* n. sp., female.
 22, fifth pereopod (scale A); 23, claw of same (B); 24, sixth pereopod (A); 25, claw of same (C); 26, coxal gill of sixth pereopod (A); 27 proximal segments of sixth pereopod (large specimen) (A); 28, seventh pereopod (A); 29, claw of same (C); 30-32, first to third pleopods. Scales on first figure.

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