

# The genus *Platorchestia* (Crustacea, Amphipoda) on the Mid-Atlantic islands, with description of a new species from Saint Helena

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*The genus Platorchestia (Crustacea, Amphipoda) on the Mid-Atlantic islands, with description of a new species from Saint Helena.*— Landhoppers (Crustacea, Amphipoda, Talitridae) of the genus *Platorchestia* from various Mid-Atlantic islands (Azores, Madeira, Ascension, Saint Helena) and from continental Europe have been compared. They belong to three sibling species: *P. platensis* (Krøyer, 1845) from temperate, near-shore areas, *P. monodi* (Mateus et al., 1986) from warm-temperate and (sub)tropical, often inland, places, and *P. ashmoleorum* n. sp. from the low-altitude zones of St. Helena. The subtle differences between the sibling species are described and illustrated.

Key words: *Platorchestia*, Atlantic sibling species, Ecology.

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## Introduction

The genus *Platorchestia* was split off from *Orchestia* by BOUSFIELD, 1982. It belongs to the cuspidactylate land-hoppers, mainly characterized by a 5-dentate or 6-dentate left lacinia mobilis, an incrassate male

antenna 2, and a dorsally unarmed exopodite of uropod 1.

Members of the genus *Platorchestia* BOUSFIELD, 1982 are found in semi-terrestrial habitats, not only on or near the sea-shore («beach fleas») but also in moist places at altitudes over 850 m. a. s. l. From the Mid-

Atlantic islands (Azores, Madeira, and Ascension island), two closely related taxa are known, *P. platensis* (Krøyer, 1845) and *P. monodi* (Mateus et al., 1986), the latter also considered as forma *monodi* of *P. platensis*.

Earlier records are discussed by Stock & BIERNBAUM (1994), who re-examined the material of *Orchestia platensis* reported by BENOIT (1977) from St. Helena. Benoit's material proved to belong to the genus *Talitriator* Methuen, 1913, not yet recorded outside St. Helena and Ascension, and described as *T. insularis* Stock & Biernbaum, 1994. Nineteenth century records in St. Helena of *Orchestia platensis* (MELLISS, 1875) lack illustrations, but the text leaves little doubt that *Talitriator* and not *Platorchestia* is concerned. This opinion is based on two points in MELLISS' 8-line remark (1875: 204): «These little black, hopping creatures inhabit the land as far away from the sea as they possibly can. They keep to the central mountain parts...». Both the black colour and the high-altitude habitat fit *Talitriator insularis* on St. Helena perfectly.

The observations on this island showed it to be abundant everywhere in the green belt between 540 and 700 m of altitude, but absent in lower zones. Contrary to the dark colour (blackish green or -brown) of *T. insularis*, *Platorchestia* from St. Helena is pale grey or straw-coloured, and is found in the arid zone below 100 m. *Platorchestia* from Ascension, belonging to a different species, is found only in a narrow belt of the humid altitudinal zone, between 762 and 792 m. *Talitriator insularis* was found between 335 and 853 m in Ascension island.

The landhoppers (Amphipoda, Talitridae) from Ascension and St. Helena have been studied by Stock & BIERNBAUM (1994).

During April and May 1995, 76 stations were sampled from Ascension and St. Helena and two talitrid species were encountered, one of the genus *Platorchestia*, the other of *Talitriator*.

The aim of this work is to report the characteristics of the specimens of *Platorchestia* found.

## 1. Ascension Island

### *Platorchestia monodi* Mateus et al., 1986

Previous sampling in Ascension (Stock & BIERNBAUM, 1994) yielded only 45 specimens of *Platorchestia*. However, during the 1995 programme, 555 additional specimens were obtained, from a locality named The Piggery, UTM coordinates ES 57170 912103, altitude c. 760 m, 11 V 1995. The Ascension population differs from European *P. platensis* (Krøyer, 1845) principally in two characters: (1) the palma of gnathopod 2 { is slightly sinuous (with 2 semi-circular notches in Europe; compare figs. 1a and 1e in Stock & BIERNBAUM, 1994); (2) the merus and carpus of pereopod 7 { are never dilated (dilated in terminal males from Europe; compare fig. 1d in Stock & BIERNBAUM, 1994 with fig. 514 in RUFFO, 1993 or with fig. 8a in Jo, 1988).

Merus and carpus of pereopod 7 ♂ are dilated in terminal («old» or «senile») males of *P. platensis* only, and not in females or in younger, though apparently mature, males. The morphology of the palmar margin is likewise age-dependent. For these reasons, Stock & BIERNBAUM (1994) downgraded the status of the Ascension material to the forma *monodi* of *P. platensis*. A *monodi* morphology is encountered in several other localities in warm-temperate to tropical parts of the Atlantic, viz. the island of São Miquel in the Azores (MATEUS et al., 1986), the islands of Madeira and Guadeloupe (West Indies), West Florida (U.S.A.), and Charleston (South Carolina, U.S.A.) (see Stock & BIERNBAUM, 1994). MATEUS et al. (1986) based their *P. monodi* on specimens from the Azores. Recently, MORINO & ORTAL (1995) recorded *P. monodi* from Israel and provided a set of new illustrations.

The 555 additional specimens from Ascension, including males and mature females, carrying setose oostegites and eggs or juveniles, show that all males have a *monodi* morphology, that is with non-dilated seventh pereopods and non-ex-

cavated second gnathopod palmae. Two other characters have been discovered, which in spite of being of very refined nature, they discriminate *monodi* from *platensis*. These characters are: (1) gnathopod 1 (♂, ♀) is cuspidactylate in both taxa, but the cusp is strong and triangular in *platensis* (fig. 2 G1 A for *monodi* G1 D for *platensis*); (2) coxal gill of gnathopod 2 (♀) is at least as long as the basis in *platensis*, and much shorter than it in *monodi*.

The Ascension specimens have been compared with those from Madeira and proved to be morphologically identical.

*P. monodi* may thus be retained as full species for tropical to warm-temperate populations, often living far from the sea, whereas its sibling *P. platensis* occurs in cooler, temperate climates close to the seashore. Without immuno-genetic studies, the status of the two taxa cannot be determined further.

## 2. Saint Helena Island

Previous sampling has not yielded any *Platorchestia* from this island. During the 1995 programme, 41 specimens were obtained, which differed sufficiently (albeit subtly) from *P. platensis* and *P. monodi* to be considered a representative of an undescribed species.

### *Platorchestia ashmoleorum* n. sp.

#### Material

One ♂ (holotype), one ♀ (allotype), four ♂♂ and five ♀♀ (paratypes). St. Helena Stn. 95-49: Broad Gut, near junction with Gates of Chaos; UTM grid coordinates 30L 20845 822960; in coarse sand and gravel; stream disappears underground at this point; electric conductivity (Ec) 8.3 mS/cm; salinity (S) 4.8 ppt; temperature (t) 25.2 °C; altitude 40 m; c. 700 m from the sea; 29 IV 1995.

Other paratypes, all from St. Helena: nine ♂♂, ten ♀♀. Stns. 95-27 and 95-51:

small spring in bank of Sandy Bay Gut, S. of former Experimental Garden; UTM grid coordinates 30L 20881 822955; in clay and gravel; Ec 2.1 mS/cm; S 0.5 ppt, t 24.3 °C; altitude 15-20 m; c. 200 m from the sea; 25 IV 1995.

One ♂, four ♀♀. Stns. 95-37 and 95-48; c. 50 m upstream of Stn. 95-49 (see above), UTM grid co-ordinates 30L 20825 822968; upwelling water in dry stream bed; Ec 7.5 mS/cm; S 5 ppt; t 27.7 °C; altitude 40 m; c. 750 m from the sea; 27-29 IV 1995.

One ♂, one ♀. Stn. 95-50; Sandy Bay Valley, near bridge closest to the sea; UTM co-ordinates 30L 20871 822985; in gravel and loam; Ec 1.2 mS/cm; S c. 1 ppt; t 23.8 °C; altitude c. 15 m; distance to the sea 700 m; 30 IV 1995.

One ♂, four ♀♀. Stn. 95-59; Jamestown, mouth of The Run; UTM grid co-ordinates 30L 20840 823805; discharge of small gut into the sea, just above the surf zone; gravel and plant debris; Ec 1.1 mS/cm; S 1.8 ppt; t 24.8 °C; altitude 1 m; 2 V 1995.

All type material deposited in the collections of the Zoölogisch Museum Amsterdam.

#### Description

Length of male holotype 9.2 mm, of female allotype 8.5 mm. General appearance very similar to *P. monodi* (see MORINO & ORTAL, 1995, fig. 1), i.e. pereopod 7 ♂ not dilated and palma of gnathopod 2 ♂ slightly sinuous, but without two deep emarginations. Live colour pale brown to straw-coloured, eye black, rather large (fig. 1C).

Antenna 1 (fig. 1 A1) just reaching to implantation of segment 5 of antenna 2, often (but not always) upcurved; peduncle 3-segmented, flagellum 6- to 7-segmented. Antenna 2 (fig. 1 A2) slightly incrassate in male; flagellum 11- to 12-segmented.

*Lacinia mobilis* of left mandible 5-dentate. Mouthparts as in *P. monodi*. Maxilliped palp segment 2 without «medial spine»; this spine is also lacking in *P. monodi* from Ascension and Madeira, but present in some specimens from Israel,

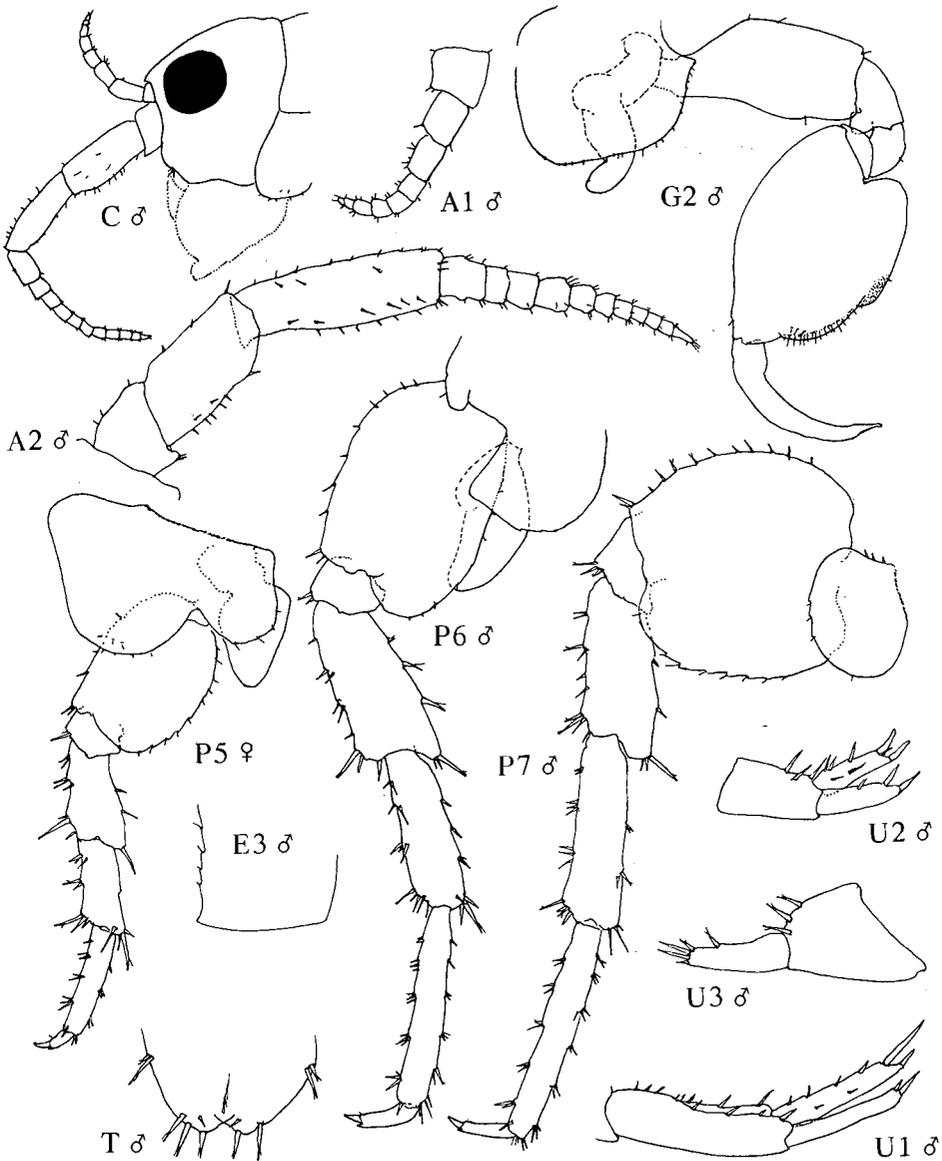


Fig. 1. *Platorchestia ashmoleorum* n. sp. (paratypes from Broad Gut, St. Helena): A1. Antenna 1; A2. Antenna 2; C. Head; E3. Third epimeral plate; G1 to G2. Gnathopods 1 to 2; O. Oostegite; P3 to P7. Pereiopods 3 to 7; PI2. Pleopod 2; T. Telson; U1 to U3. Uropods 1 to 3. (Scales: T and U3, scale 1; remaining figures, scale 2, see figure 3.)

*Platorchestia ashmoleorum* sp. n. (paratipos de Broad Gut, Sta. Helena): A1. Antena 1; A2. Antena 2; C. Cabeza; E3. Tercera placa epimeral; G1, G2. Gnatópodos 1 y 2; O. Oosteguito; P3 a P7. Pereiópodos 3 a 7; PI2. Pleópodo 2; T. Telson; U1 a U3. Urópodos 1 a 3. (Escala: T y U3, escala 1; el resto, escala 2, ver figura 3.)

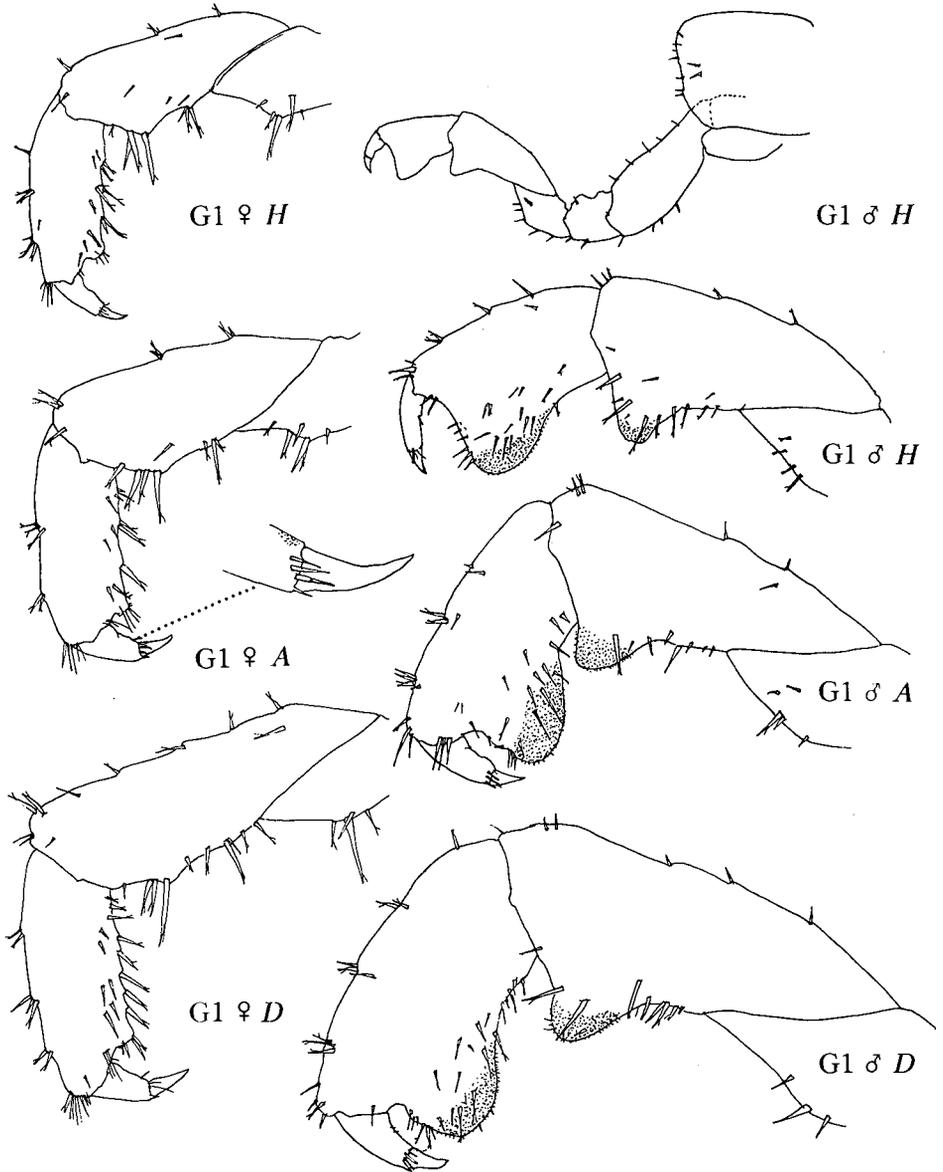


Fig. 2. *Platorchestia* div. sp. First gnathopod of males and females: A. *P. monodi* from Ascension; D. *P. platensis* from Møns Klint, Denmark; H. *P. ashmoleorum* from St. Helena. (G1 ♂ H: scale 2; remaining figures: scale 1, see figure 3.) (For abbreviations see figure 1.)

*Platorchestia* sp. div. Primer gnatópodo de machos y hembras: A. *P. monodi* de Ascensión; D. *P. platensis* de Møns Klint, Dinamarca; H. *P. ashmoleorum* de Sta. Helena. (G1 ♂ H: escala 2; el resto de figuras, escala 1, ver figura 3.) (Para las abreviaturas ver figura 1.)

according to MORINO & ORTAL (1995: 829, fig. 3K).

Gnathopod 1 ♂ (fig. 1 G1♂) with well-defined posterior swelling on carpus. Propodus with strong posterior swelling; ratio length propodus (measured along anterior margin) / greatest width propodus (measured from anterior margin across the swelling) = 1.43 [in *P. platensis* and *P. monodi* this ratio fluctuates between 1.55 and 1.75]. Distal edge of dactylus on articulation with unguis, with two or three setules, but no anterior spine-like or scale-like process (so-called simplidactylate condition); total claw (= dactylus + unguis) distinctly shorter than palmar margin.

Gnathopod 1 ♀ (fig. 2 G1♀) similar to that of related species, except for the narrower claw: basal diameter of dactylus less than length of palmar margin [against wider than length palmar margin in *P. platensis* and *P. monodi*].

Coxal gills present on gnathopod 2 and pereopods 3 through 6; broadly V-shaped, ribbon-like, on gnathopod 2, somewhat comma-shaped on remaining pereopods; always much shorter than basis [this situation is similar in *P. monodi*, but in *P. platensis* gill reaches to end of basis].

Gnathopod 2 ♂ (fig. 1 G2♂) very similar to that of *P. monodi* (i.e. palmar margin, near palmar angle, with small dent; and without two semi-circular emarginations, of which one mid-palmar, as in *P. platensis*).

Gnathopod 2 ♀ (fig. 3 G2♀) with characteristic carpus: posterior margin showing crescent-shaped swelling («blister») in proximal part, constricting abruptly into narrow, straight distal part [in related

species entire posterior margin occupied by evenly convex «blister» without constricted distal portion].

Pereiopod 3 (fig. 3 P3): carpus more elongated than that of pereopod 4; claw normal. Pereiopod 4 (fig. 3 P4): carpus shortened (length / width ratio 1.62-1.90); claw fattish, pinched. Dactyli cuspidate.

Pereiopod 5 (fig. 1 P5) much shorter than pereopod 6; coxal plate anterolobate. Pereiopod 6 (fig. 1 P6) with posterolobate coxal plate; distal part of posterior lobe slightly attenuate; posterodistal lobe of basis wider than in *P. monodi*; dactyli cuspidate.

Pereiopod 7 (fig. 1 P7) with non-lobate coxal plate; posterodistal lobe of basis very wide; merus and carpus of male not dilated; cuspidactylate.

Oostegites elongate, on gnathopod 2 ♀♀ (fig. 3 G2(O)) and pereopods 3 (fig. 3 P3) through 5, with some 14 or 15 marginal, straight (not curled-tipped), smooth setae.

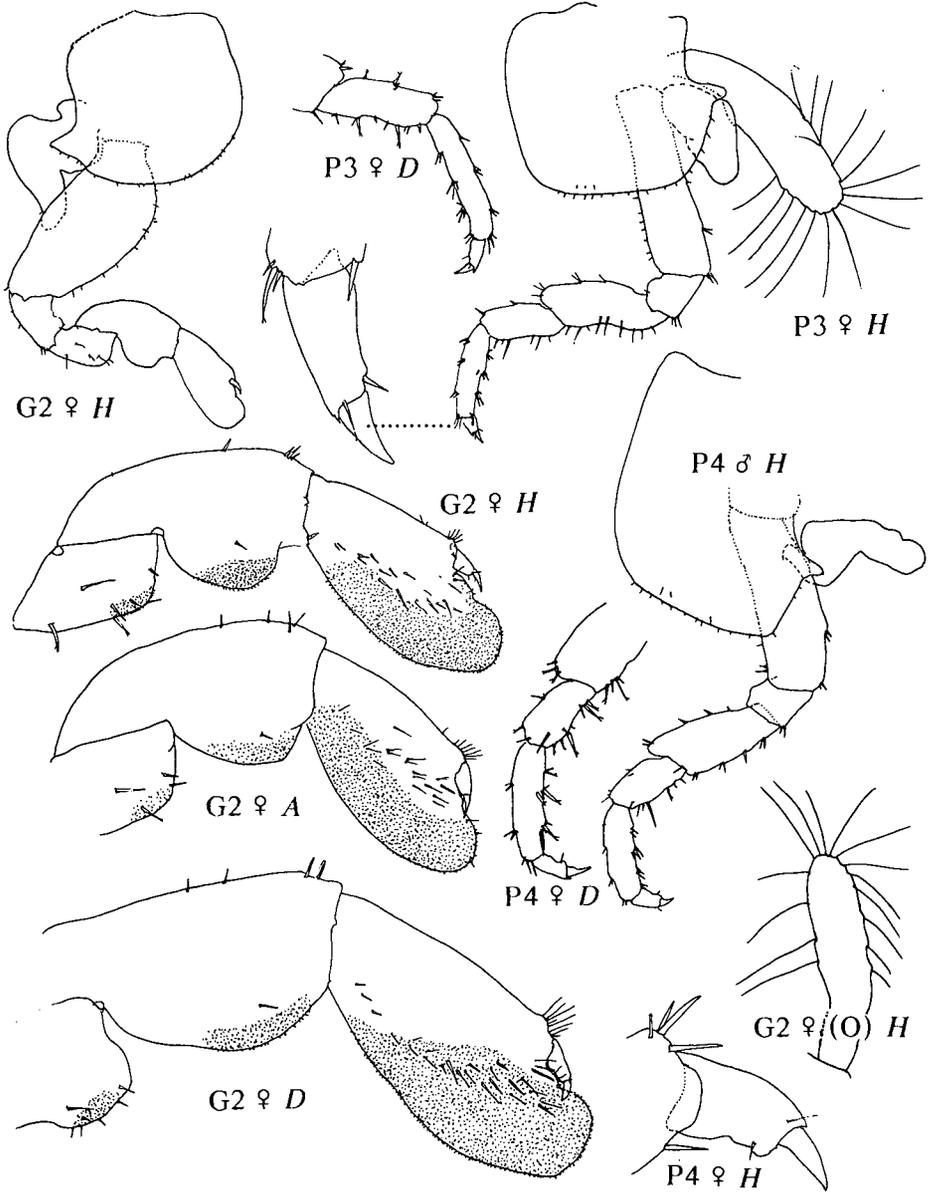
Epimeral plates (fig. 1 E3) as in *P. monodi*. Pleopods 1 to 3 biramous, rami slightly shorter than peduncle. Outer margin of peduncle of pleopod 1 unadorned; of pleopod 2 (fig. 3) with one proximal spinule and row of setules in distal part; of pleopod 3 with some spinules [in *P. platensis* and *P. monodi* the outer margin of peduncle of pleopod 2 bears spinules instead of setules].

Uropod 1 (fig. 1 U1) with unarmed dorsal exopodal margin, as usual in genus *Platorchestia*. Exopodite of uropod 2 (fig. 1 U2) with 1 dorsal spine, endopodite with two or three dorsal and two lateral spines. Uropod 3 as illustrated (fig. 1 U3).

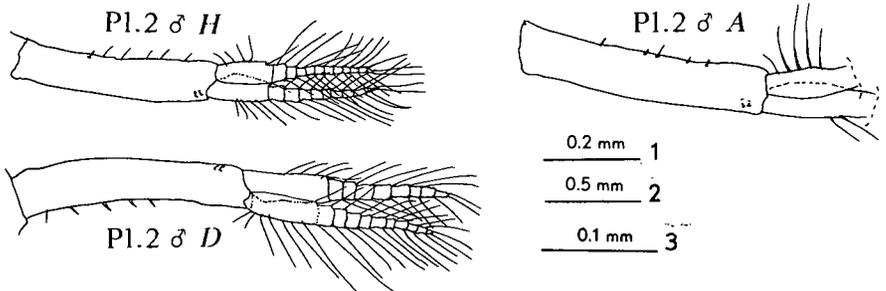
**Figs. 3-4. *Platorchestia* div. sp., various appendages: 3. Propodi of G2 ♂, (A, D and H scale 1; claw of P3 ♀ and P4 ♂, scale 3; remaining figures, scale 2.) 4. Pleopod 2 of ♂ (scale 2). (For abbreviations see fig. 1.)**

***Platorchestia* div. sp., varios apéndices: 3. Propodio de G2 ♂ (A, D y H, escala 1; uña de P3 ♀ y P4 ♂, escala 3; resto de figuras, escala 2.) 4. Pleopodo 2 de ♂ (escala 2). (Para abreviaturas ver figura 1.)**

3



4



Telson (fig. 1 T) with medioterminal notch; each telson lobe with two or three distal, one subdistal, and two lateral spines.

#### Derivatio nominis

This species is dedicated to Dr. Philip Ashmole and his wife Myrtle, in recognition of their contributions to the natural history of the Mid-Atlantic islands.

#### Discussion

The new species from St. Helena is a sibling species of the other two Atlantic species of *Platorchestia*, *P. platensis* and *P. monodi*. The main differences between the three species are: (1) the claw of gnathopod 1 (♂, ♀), is simplidactylate in *P. ashmoleorum*, cuspidactylate in *P. platensis* and *P. monodi* (the cusp is strong, triangular, in the former, and fine, needle-like in the latter); (2) the presence of a distal constriction of the «blister» on the carpus of gnathopod 2 ♀ of *P. ashmoleorum*; (3) the shortness of the claw of gnathopod 1 ♂ of *P. ashmoleorum* (claw only slightly shorter than the palmar margin in the other two siblings); (4) the basal diameter of the claw of gnathopod 1 ♀ (see description); (5) the setulate outer peduncular margin of pleopod 2 (♂, ♀) in *P. ashmoleorum* (see description). The new species from St. Helena differs from *P. platensis* (but not from *P. monodi*), in the shorter coxal gills, the lack of dilatation of merus and carpus of pereopod 7 ♂, and in the absence of a mid-palmar emargination in gnathopod 2 ♂. Moreover, *P. platensis* can reach 1.5 times the size of *P. monodi* and *P. ashmoleorum*.

There is also some resemblance to species recently attributed to *Platorchestia* from eastern Asia and the Pacific, such as *P. japonica* (Tattersall, 1922) (MORINO & DAI, 1990) and *P. lanipo* Richardson, 1991, *P. pickeringi* (Dana, 1853), and *P. kaalensis* (Barnard, 1955) (RICHARDSON, 1991), but these species lack an incrassate antenna 2 ♂ and do not have a strongly «pinched» dactylus on pereopod 4.

*Platorchestia joi* Stock & Biernbaum, 1994 (= *P. crassicornis* (Derzhavin, 1937),

preocc.) has, like *P. ashmoleorum*, a simplidactylate male gnathopod 1, but differs in the spinulose pedunculus of pleopods 1 and 2, and in the strong mid-palmar emargination of gnathopod 2 in male.

#### Ecology

The two inland Talitridae of St. Helena, *Talitriator insularis* and *Platorchestia ashmoleorum*, inhabit different habitats. *Talitriator* lives in the «green belt», the cool, humid zone with luxurious vegetation, and was encountered between elevations of 540 and 700 m. The observations confirm those of BENOIT (1977: 466): «cette espèce est rigoureusement absente des régions sèches de la périphérie», and «sur la crête de l'île ...(elle) est certes présente mais de façon plutôt sporadique».

*Platorchestia* on the contrary has been encountered only along small guts (=streams) in the dry and hot lowland zone (altitudes 1-40 m) and close to the sea (at 300-750 m in direct line). The gut water in these areas is often slightly salty, not so much through marine influence, as by salts dissolved after rains from the volcanic rocks and sediments. The two talitrid species were never found together.

#### Resumen

*El género Platorchestia (Crustacea, Amphipoda) en las islas del Atlántico medio, con descripción de una nueva especie de Santa Helena*

Se comparan diversos *Platorchestia* (Crustacea, Amphipoda, Talitridae) procedentes de varias islas del Atlántico medio (Azores, Madeira, Ascensión, Santa Helena) y de la Europa continental (figs. 1-4). Pertenecen a tres especies gemelas: *P. platensis* (Krøyer, 1845) procedente de zonas templadas cercanas a la costa, *P. monodi* (Mateus et al., 1986) de lugares cálidos-templados y (sub)tropicales a menudo de interior y *P. ashmoleorum* sp. n. de zonas de poca altitud de Santa

Helena. Se describen e il·lustren las diferències sutiles existents entre estas espècies.

### Acknowledgements

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