

# The Beach Fleas and Sandhoppers (Amphipoda; Talitridae) of Trinidad

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Amphipods are small to medium-sized crustaceans that occur abundantly in aquatic habitats world-wide. They are important chiefly because they convert basic plant and animal materials into a form of protein suitable as food for fishes and ultimately man (Bousfield, 1981, 1982, 1988). Members of one family of amphipods, the Talitridae, have become specialized for life in the tidal zone and on land. However, in contrast to their land-dwelling isopod crustacean cousins, the sow bugs and wood lice, the terrestrial adaptations of amphipods have not evolved very far. Thus, the talitrids are, by and large, restricted to warm (frost-free) seashore and rain forest habitats of oceanic islands and continental coasts of tropical and temperate regions of the world.

The terrestrial amphipods have been subdivided pragmatically into four main morphological-ecological groups (Bousfield, 1984). These encompass: (1) palustral talitrids - structurally primitive and relatively unmodified species that live in salt marshes, mangrove swamps and some freshwater habitats; (2) beach fleas - generalized but more advanced species that live mainly in the drift-wrack at the high water line along rocky shores and in estuaries; (3) sandhoppers - specialized for burrowing in sand and found almost exclusively at or near the drift line of sandy beaches; and (4) landhoppers - structurally and physiologically the most specialized and modified species that live in the leaf litter of rain forests, occasionally to altitudes of more than 3000 m, quite remote from the sea. At least three species are known from caves (in Hawaii, the Canary islands, and Jamaica).

The terrestrial amphipods of Trinidad include representatives of the first three subgroups. Although species of the fourth sub-group, especially those introduced with exotic plants, are anticipated, none has yet been discovered. Material of two seashore species, *Platorchestia platensis* (Kroyer) and *Talorchestia sulensoni* Stebbing, was collected by one of us (VCQ) in 1957; it provided the basis for a short note by the other (ELB) in this journal that same year. Over

the next six years, many more collections were made by VCQ in different parts of the country. The purpose of this short paper is to list the species obtained and to describe the localities and habitats where they were encountered.

By way of quick review, the Amphipoda is one of sixteen Orders within the crustacean subclass Malacostraca (see Schram, 1986). This subclass includes mostly large crustaceans such as crabs, lobsters and shrimps (Decapoda), but also includes small to medium-sized animals such as amphipods, isopods, and the tadpole shrimps (Cumacea). Amphipods differ from crabs and lobsters in lacking a carapace (hard shield over the thorax), in having eyes flat on the sides of the head (rather than on movable stalks), and having the abdominal legs divided into 3 pairs of swimmerets and 3 pairs of uropods (rather than a 5 and 1 arrangement). In amphipods, thrusting of the tail fan (formed by the uropods and telson) drives the animal forwards, whereas in lobsters and shrimps it provides a backwards escape reaction.

The basic features of a talitrid amphipod are shown in Fig. 1; greater detail of the general structure of amphipods is provided by Bousfield (1973). Members of family Talitridae differ from those of other amphipod families in having a very short first antenna and a much shortened urosome (last three abdominal segments); also the mandible lacks a palp.

In amphipods the sexes are separate. In primitive species, mating takes place freely in the water, and males are usually smaller than females. In more advanced types, as in the Talitridae, mating takes place mainly on the bottom, and males are usually larger than females. Such males usually possess very large and powerful gnathopods (peraeopods 1 & 2 of the thoracic region) by means of which they can hold (or carry) the female until she moults and is receptive for mating. During copulation, the male fertilizes the eggs as they are deposited in the thoracic brood pouch of the female. The reproductive behaviour of most species of amphipods is unknown, but it would make a challenging subject for further study.

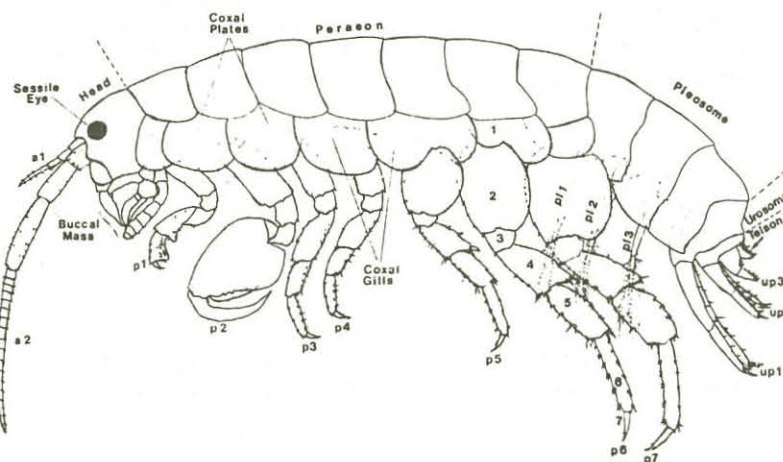


Fig. 1. Gross body parts and their nomenclature in male *Orchestia aestuarensis*. (from Wildish, 1988.) a1 - antenna 1, a2 - antenna 2, p1 - peraeopod 1, p2 - peraeopod 2, p3 - peraeopod 3, p4 - peraeopod 4, p5 - peraeopod 5, p6 - peraeopod 6, p7 - peraeopod 7, pl1 - pleopod 1, pl2 - pleopod 2, pl3 - pleopod 3, up1 - uropod 1, up2 - uropod 2, up3 - uropod 3. Peraeopod 6 parts: 1, coxa; 2, basis; 3, ischium; 4, merus; 5, carpus; 6, propodus; 7, dactylus.

## List of Talitroidean species and their occurrence in Trinidad

### 1. *Parhyale fascigera* Stebbing

Localities: Avalon, Monos I., protected stony beach, 26 Dec. 1957; Biscayen Bay, Monos I., surf-exposed sand and pebble beach beneath cliffs, 27 Dec. 1967; Perruquier Bay, Chacachacare I., protected stony beach near landing quay (Sites 4 of Darlington 1967), 7 Nov. 1958.

Remarks: All localities are off the northwest peninsula. Animals were found under wave-washed stones in the tidal zone.

### 2. *Parhyale hawaiiensis* (Dana)

Localities: Avalon, Monos I., protected stony beach, 26 Dec. 1957; Morris Bay, Monos I., protected sand, stone and coral beach near old landing jetty, 27 Dec. 1957.

Remarks: The genus *Parhyale* has recently been transferred to family Hyalidae which, with Talitridae and several other related families comprise the superfamily Talitroidea (Bousfield 1981, 1982).

### 3. *Chelorchestia mulleri* (Shoemaker)

Locality: Maracas Bay, brackish swamp behind outer beach.

Remarks: The Talitrids were collected at the mouth of a crab hole, under vegetation of *Montrichardia arborescens*.

### 4. *Platorchestia platensis* (Kroyer)

Localities: Morris Bay, Monos I., under pebbles, bits of coral, shell and debris, at high water mark on a protected beach, 27, Dec. 1957; Biscayen bay, Monos I., surf-exposed beach beneath cliffs, 27 Dec. 1957; Cocorite, 100 m west of Diego Martin River, under decaying mangrove leaves on sandy and muddy beach at high water mark; Bande du Sud, Chacachacare I., under debris on sandy and stony beach, 7 Nov. 1958; Perruquier Bay, Chacachacare I., as above under *P. fascigera*, 7 Nov. 1958.

Remarks: Animals occur mainly on protected beaches, at high water mark, usually below stones covered with sea wrack.

### 5. *Tethorchestia* (?) *tucurauna* (Muller)

Localities: Mucurapo, Port of Spain, protected sand and mud beach with shell debris, among mangrove leaves, seedlings and wood, 1 Dec. 1957; Rooks Bay, Mayaro, 3.75 km north of Plaisance Village, among shore debris of brackish water pond behind open sandy beach, 26 May 1958; "Shell House" Mayaro, 6.5 km south of Plaisance, in coconut debris 1 m from edge of brackish pond behind beach dunes, Sept. 1963.

Remarks: This species is provisionally placed within genus *Tethorchestia* Bousfield, 1984, even though it shows some characters of the genus *Platorchestia*.

### 6. *Tethorchestia* sp.

Localities: Mucurapo, Port of Spain, procted sand and mud beach, among mangrove leaves, seedlings and wood, 1 Dec. 1957; Cocorite, near mouth of Diego Martin River, in finely divided mangrove leaf debris; Cocos Bay, mouth of Ortoire River, under mangroves along river bank.

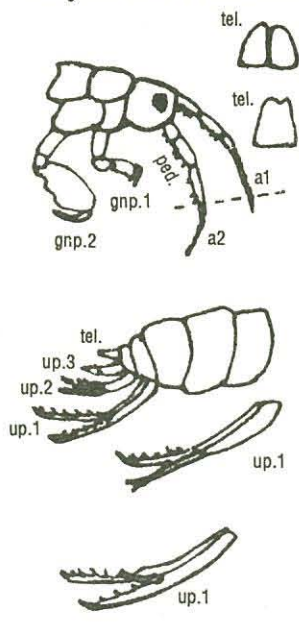
Remarks: This form is similar to a new species of *Tethorchestia* from Guadeloupe currently being described by Dr. G. Ciavatti (pers. comm.).

### 7. *Talorchestia sulensoni* Stebbing

Localities: Jean Baptiste Bay, Blanchisseuse, sandy beach, under seaweed and debris at high tide level, 22 Dec., 1956, (D. Lee collector); Maracas Bay, sandy beach, at high tide level, 12 Jan. 1958; Balandra Bay, exposed sandy beach, at high tide level; 26 Oct. 1958; Matura Bay, exposed, steeply sloping beach of coarse sand, at high tide level; Mouth of Yarra River, Blanchisseuse, exposed sandy beach at high tide level, 17 Feb. 1958; Rooks Bay, Mayaro, exposed sandy beach, at high tide level, 26 May 1958; "Shell House", Mayaro, under debris at extreme high tide level, Sept. 1963.

Remarks: The world genera of sandhoppers are currently being revised by Dr. H. Morino of Japan (pers. comm.). Species of the *sulensoni* group may be transferred from the genus *Talorchestia* to a new genus close to *Platorchestia* (see Morino, 1988). Tropical sandhoppers tend to be extremely agile, an adaptation for eluding their principal predator, the ghost crab *Ocypode*.

## Key to the Trinidad species of Talitridae

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1. Antenna 1 longer than peduncle of antenna 2; telson cleft to base; uropod 3 with minute inner ramus (tide pools)..... *Parhyale* 2  
 Antenna 1 shorter than peduncle of antenna 2; telson entire or notched at tip; uropod 3 uniramous (semi-terrestrial) ..... 3
2. Ant. 1 peduncle with ventral clusters of setae..... *P. fascigera* Stebbing  
 Ant. 1 peduncle ventrally smooth ..... *P. hawaiiensis* Dana.
3. Uropod 1 outer ramus with lateral spines (perhaps only 2 or 3) ..... 4  
 Uropod 1 outer ramus laterally smooth ..... 6
4. Uropod 1 with inter-ramal spine; in male, peduncle of ant. 2 slim ..... 5  
 Uropod 1 without inter-ramal spine; ant. 2 heavy and swollen (leaf mould) ..... *Tethorchestia tucurauna* Muller

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5. In both sexes, gnathopod 1 simple; gnathopod 2 mitten-like (rain forests).....*Talitriator*\*  
 Gnathopod 1 subchelate; gnathopod 2 of male, hand very large and powerful, palm smooth (rain forests, seashore) .....*Parorchestia*\*
6. In male, peduncle of ant. 2 slender; in gnathopod 1, segments 4, 5 & 6 each with a ventral swelling or tubercle.....7  
 Peduncle of ant. 2 heavy and swollen in mature males; gnathopod 1, only segments 5 & 6 with ventral tubercle .....8
7. Eyes large, covering front of head; gnathopod 2 of mature male chelate, finger closing forward on ventral projection of "hand" (leaf mould, crab burrows) .....*Chelorchestia mulleri* (Shoemaker)  
 Eyes normal; gnathopod 2 of mature male subchelate, finger long, sinuate, recurved, closing backward on sinuate palm (mangroveswamps).....*Tethorchestia* sp.  
 (This species somewhat similar to *O. uhleri* of Florida)
8. Gnathopod 1 of female simple; gnathopod 2 of male, palm and finger hollowed out near hinge (sand beaches) .....*Talorchestia sulensoni* Stebb.  
 Gnathopod 1 of female with weakly defined palm; gnathopod 2 of male, palm slightly notched distally, not hollowed out near hinge (seashores).....*Platorchestia platensis* Kroyer
- \* Not known from Trinidad but possibly present.

## References

- BOUSFIELD, E. L., 1957. Terrestrial Amphipod crustaceans from Trinidad. Jour. Trin. Field Nat. Club, 1957, pp. 33-34.
- BOUSFIELD, E. L., 1973. Shallow-water gammaridean Amphipoda of New England. Cornell Univ. Press, Ithaca, N.Y. 312 pp., illustr.
- BOUSFIELD, E. L., 1981. Evolution in North Pacific coastal marine amphipod crustaceans. In Evolution Today, Proc. 2nd Int. Congr. Syst. & Evol. Biol. Vancouver, B.C., Ed. by G.G.E. Scudder & J.L. Reveal: 69-89.
- BOUSFIELD, E. L., 1982. Amphipoda: Gammaridea. In Synopsis and Classification of Living Organisms. Ed. S. P. Parker. McGraw-Hill, New York. 2: 254-285.
- BOUSFIELD, E. L., 1984. Recent Advances in the systematics and biogeography of landhoppers (Amphipoda: Talitridae) of

- the Indo-Pacific region. In Biogeography of the Tropical Pacific (proceedings of a symposium). Ed. by F.J. Radovsky, P.H. Raven, and S. H. Sohmer. Bishop Mus. Spec. Publ. 72: 171-210.
- BOUSFIELD, E. L., 1988. Amphipod crustaceans of Tropical Seas. Sea Wind 2(3): 13-16.
- DARLINGTON, J., 1967. The vegetation of Chacachacare Island. Jour. Trin. Field Nat. Club 1967, pp. 29-40.
- MORINO, H., 1988. Redefinition of *Talorchestia* (Amphipoda: Talitridae) with description of a new species from the tropical west Pacific. Jour. Crust. Biol. 8(1): 91-98.
- SCHRAM, F.R., 1986. Crustacea. Oxford University Press. New York, Oxford. 606 pp., illustr.
- WILDISH, D.J., 1988. Ecology and natural history of aquatic Talitroidea. Can. Jour. Zool. 66: 2340-2359.