AMPHIPODA (CRUSTACEA, PERACARIDA) OF GUAMBLÍN ISLAND NATIONAL PARK, CHILEAN ARCHIPELAGOES

Jorge Pérez–Schultheiss1,*, Aldo Arriagada1,2,3 & Luisa Baessolo1,3

Abstract: The composition of the amphipod fauna of the Guamblín Island National Park, Aysén Patagonia, Chile, is analyzed. A total of 15 species are studied, all of them new records for this area. Two species (Parapherusa crassipes and Aora cf. maculata) are reported for first time from Chile, one (Orchestoidea sp.) corresponds to an undescribed species and six (Phoxocephalopsis mehuinensis, Melita sp., Protolyhae rubra, Parhyalella penai, Orchestoidea tuberculata and Tryphosella paramoi) extend their known distributional range to Guamblín Island. This is the first information about the amphipod fauna of a remote and little known area of the Chilean Patagonia.

Key words: Crustacea, Amphipoda, new records, distribution range, taxonomic comments, Aysén, Chile.

Introduction

In Chile, the marine area between Chiloe and Cape Horn (40° to 56° S) is one of the least studied from the viewpoint of its biodiversity (Arntz, 1999; Escribano et al., 2003) due to restricted access to study sites and difficult climatic conditions. This area, comprising a broad insular system with profusion of bays, fjords and channels (Camus, 2001), shows a remarkable habitat diversity (Ward et al., 1999) and high number of invertebrate species in relation to other areas of the country (Fernandez et al., 2000; Lancellotti & Vásquez, 2000)

Guamblín Island is the most oceanic component of the Chonos Archipelago, in the Aysén Region, located approximately 30 km to southwest of Ipúñ. This island was declared National Park in 1976, but the knowledge of its biodiversity is still scarce and limited to publications on the flora (Ramirz et al., 2004), nudibranch mollusks (Schrödl & Grau, 2006), decapod crustaceans (Xu et al., 2009), mammals (Valenzuela & Grau, 2005), birds (Castro et al., 2009), and coleopteran insects (Pérez-Schultheiss et al., 2009). In addition, there are some unpublished reports by the National Forestry Corporation (CONAF) and the Scientific Expedition to the Chonos Archipelago conducted by the Universidad Austral de Chile. These reports give general information about flora and fauna, the latter restricted to some species of annelid worms, mollusks, arthropods and vertebrates. Currently there is few published information regarding the composition of the crustacean fauna, but some data recorded by Grau (unpublished report) indicate the presence of six decapod species. Nothing is currently known about the Amphipoda species present on Guamblín Island.

The Magellan Amphipoda has been studied on several occasions (Schellenberg, 1931; Lowry & Bullock, 1976; González, 1991b; De Broyer & Jadzewska, 1993; De Broyer & Rauschert, 1999), but the northern area of this biogeographic sub-region, where Guamblín Island National Park is located, has been considerably less studied (Chieza et al., 2007). Herewith, in this paper, we study for the first time the amphipod crustaceans present on Guamblín Island National Park, providing new distributional records, some information of species not previously cited in Chile and the presence of an undescribed species.

Material and methods

During January 2008, the Universidad de Los Lagos and the Centro de Investigación en Ecosistemas de la Patagonia (CIEP) conducted a scientific expedition to Isla Guamblín, Aysén District, Chile. Samples of amphipod crustaceans were obtained from the East coast of the island, between Punta Piedra and Punta Arenas (Figure 1), from 11 stations representing diverse intertidal and freshwater adjacent aquatic habitats (Table I). The specimens were collect with hand nets and were immediately fixed and preserved in alcohol 70%.
The material was classified at family level and subsequently, some specimens were dissected in alcohol and mounted in glycerine for detailed observation in microscope. All material is deposited in the Biological Collections of the Centro de Estudios en Biodiversidad (CEBCh), Osorno, Chile.

Results

The material includes a total of 10 families and 15 species, 14 of them belonging to the suborder Gammaridea and only one to the suborder Corophiidea (Table II). The superfamily Talitroidea was represented by six species, including some semiterrestrial (Talitridae) and freshwater (Hyalella sp.) forms.

Melita sp.

The material studied could correspond to *Melita gayi* (Nicolet, 1849), the only species of the genus previously cited in Chile from Herradura Bay and Coquimbo (González, 1991b), but this melitid was poorly described and cannot be recognized with precision. The only character that can be useful in the recognition of the species is the large lobe on coxa 6 (Stebbing, 1906), although this is a feature present also on females of several species of the genus.

The specimens studied are very close to *M. inaequistyli*is (Dana, 1852), especially in dorsal urosomite armaments, coxa 1 and male gnathopods; but differs in the shape of lateral cephalic lobes and prebuccal mass, the 4-articulate accessory flagellum, non-serrate dactyls of pereiopods, posterior margin of epimeron 3 slightly concave, article 2 of uropod 3 longer and distal margin of inner ramus obtusely pointed. The condition of female coxa 6 is unknown because there are not adult females among the Guamblín island material. A complete study of numerous samples from more Chilean localities is needed in order to confirm the validity of and rediagnose *M. gayi*.

Parapherusa sp.

The melitids of the genus *Parapherusa* are defined by the accessory multiarticulate flagellum (7-9 articles), coxa 4 not excavated, uropod 1 with developed interramal spine, rami of uropod 3 shorter than peduncle, with ornamented spines at apex, and telson entire. The only known species of the genus, *Parapherusa crassipes* (Haswell), is known from Australia, New Zealand and Tristan da Cunha (Barnard, 1972b; Chilton, 1920; Lowry & Fenwick, 1983; Stephens, 1949), where it is a common inhabitant of the lower intertidal zone to about 20 m depth, mostly among seaweed (Lowry & Fenwick, 1983). This is the first record of the genus in South American waters. The single specimen collected in Guamblín Island has a gnathopod 2 similar to that reported by Chilton (1916) and Stephens (1949) in males of *P. crassipes*, but our specimen does not display male genital papillae nor oostegites. Additionally we have at hand other single specimen found in a sample from Pucatrihue (Región de Los Lagos), but this is an ovigerous female, strangely with a large gnathopod 2, as a male and longer spines on the telson. It is needed a more numerous collection of this genus to know the specific status of the Chilean material.
Currently the genus Paramoera Miers, 1875 includes more than 40 species (Staude, 1995), but the inadequate description of the first taxa known (e.g. australis (Bate), fissicauda (Dana), capensis (Dana), australis Miers and gregaria (Pfeffer)) has resulted in a great confusion and profusion of synonyms (Schellenberg, 1931), that difficult the recognition of some taxa (Thurston, 1974; De Broyer & Jazdzews-ki, 1993). In Chile there are reports of Paramoera cf. fissicauda (Dana, 1852), P. pfefferi Schellenberg, 1931, especially in the rounded anteroventral corner of the head, second segment of peduncle of antenna 1, shape of coxa 1, setae arrangement on epimeron and dorsal structure of pleosomite 3 and urosomite 2-3. However, there are some remarkable differences such as the slightly more marked upper portion of the lateral cephalic lobe, the absence of posterodorsal teeth in the seventh pereionite and pleosomites, and the absence of a concavity in the dorsal carina of the urosomite 3. As noticed by Barnard (1932) in A. villosus (Bate), it is possible that our specimens represent an indeterminate form of A. dentatus although several character are unknown for this species. The slight differences with the original description of the species reported herewith makes compulsory a detailed study and comparison with the type material of Schellenberg.

**Paramoera sp.**

It was not possible to determine this material. However, some taxonomic characters are in agreement with the genus Paramoera, such as an oblique row of setae on the inner plate of the maxilla 2, the medial margin of the inner plate of maxilla 1 with setae on the most part, and the cleft telson, with only one strong seta at the apex of each lobe. It will be necessary to collect new material, because the specimens studied are two small damaged juveniles.

**Nototropis cf. dentatus (Schellenberg, 1931)**

The specimens are very similar to N. dentatus (Schellenberg, 1931), especially in the rounded anteroventral corner of the head, second segment of peduncle of antenna 1, shape of coxa 1, setae arrangement on epimeron and dorsal structure of pleosomite 3 and urosomite 2-3. Nevertheless, there are some distinct differences such as the more marked upper portion of the lateral cephalic lobe, the absence of posterodorsal teeth in the seventh pereionite and pleosomites, and the absence of a concavity in the dorsal carina of the urosomite 3. As noted by Barnard (1932) in A. villosus (Bate), it is possible that our specimens represent an indeterminate form of A. dentatus although several characters are unknown for this species. The slight differences with the original description of the species reported herewith make compulsory a detailed study and comparison with the type material of Schellenberg.

**Phoxocephalopsidae mehuinensis Varela, 1983**


P. mehuinensis can be recognized by the convex-rounded posterior margin of the epimeron 3, peduncle of uropod 2 setose, and article 2 of outer ramus of uropod 3 short (attaining 20% length of article 1) (Thurston 1989). The species is a common inhabitant of some sandy beaches of the

### Table I. Collecting stations of Amphipoda on Isla Guamblín National Park.

<table>
<thead>
<tr>
<th>Station</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22-JAN-2008</td>
<td>Supratidal: filtration area in brackish water from nearby wetland. Under rocks</td>
</tr>
<tr>
<td>2</td>
<td>23-JAN-2008</td>
<td>Rocky intertidal: floating algae debris</td>
</tr>
<tr>
<td>3</td>
<td>23-JAN-2008</td>
<td>Sandy intertidal: infauna</td>
</tr>
<tr>
<td>4</td>
<td>23-JAN-2008</td>
<td>Rocky intertidal: gravel accumulated in tidal pool</td>
</tr>
<tr>
<td>5</td>
<td>23-JAN-2008</td>
<td>Rocky intertidal: between coralline algae in tidal pools</td>
</tr>
<tr>
<td>6</td>
<td>23-JAN-2008</td>
<td>Rocky intertidal: infauna of sand accumulated in rockeries</td>
</tr>
<tr>
<td>7</td>
<td>25-JAN-2008</td>
<td>Wetland with about 10 cm of freshwater between reeds</td>
</tr>
<tr>
<td>8</td>
<td>26-JAN-2008</td>
<td>Sand supratidal: 30 cm deep hole dug out in the sand</td>
</tr>
<tr>
<td>9</td>
<td>26-JAN-2008</td>
<td>Sandy intertidal mid-inferior infauna</td>
</tr>
<tr>
<td>10</td>
<td>26-JAN-2008</td>
<td>Posterior dunes on sandy beach: buried in a mound surrounded by grasses</td>
</tr>
<tr>
<td>11</td>
<td>28-JAN-2008</td>
<td>Stream: Sandy sediment sample including plant debris</td>
</tr>
</tbody>
</table>

### Table II. Species, number of specimens and collection stations of amphipods in Isla Guamblín Nacional Park.

<table>
<thead>
<tr>
<th>Order Amphipoda</th>
<th>Species</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suborder Gammaridea</td>
<td>Melita sp.</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Pontogeneiidae</td>
<td>Paramoera cf. fissicauda</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Pontogeneiidae</td>
<td>Paramoera sp.</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Atyidae</td>
<td>Nototropis cf. dentatus</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Phoxocephalopsidae</td>
<td>Phoxocephalopsis mehuinensis</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Cheiidae</td>
<td>Cheius annae</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Lysianassidae</td>
<td>Tryphosella paramoi</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Hyalidae</td>
<td>Protohyale rubra</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Dogielinotidae</td>
<td>Parhyalella penai</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Talitridae</td>
<td>Transorcheata chilensis</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Talitridae</td>
<td>Orchestoidea tuberculata</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Talitridae</td>
<td>Orchestoidea sp.</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Suborder Corophiidea</td>
<td>Aoracea</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
</tbody>
</table>

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Región de Los Lagos (~41° S). This is a new record that marks the southern limit of its distribution.

**Cheus annae** Thurston, 1982


This species, originally described from sandy beaches of the Falkland Islands (Thurston, 1982), has been cited several times in estuaries of the Chilean coast from the Biobío River to Guamblín Island (Turner, 1984; Bravo, 1984; Bertran et al., 2001). The species has also been reported from the Magellan Sub-region in Chile by De Broyer and Rauschert (1999), however these authors do not indicate precise localities.

The species is rare in Chilean marine environments. Seemingly, Thurston (1982) points out that this species is "not very common" in the type locality, a marine beach. Probably, the prospect of estuaries in the Falklands could confirm their status as predominantly estuarine, as observed in Chile.

**Tryphosella? paramoi** (Schellenberg, 1931)

*Trynotyx paramoi* Schellenberg, 1931: 41-43, Fig. 20-21; Barnard, 1938: 100.

*Tryphosa paramoi* Barnard, 1962: 30 (in key).


*Tryphosella* is distinguished from other genera in the Tryphosinae group principally by the display of a reduced and tapering first coxa, and the proximally setose and distally triturative molar (Lowry & Stoddart, 1995). Our specimens have a non-reduced coxa and consequently their generic assignment remains unresolved (Barnard & Karaman, 1991). The specimens have the posterior margin of epimeron 3 with fewer and more rectangular denticles than Schellenberg (1931) illustration, thus approaching to *Tryphosella castellata* (K. H. Barnard, 1932) but differing from this species in the posteriorly widened epimeron 1, the deep dorsal notch present on urosomite 1 and the sharper lateral cephalic lobe. The species has been cited previously only from the Magellan Strait (González, 1991b), although De Broyer and Rauschert (1999) reported it from the Chilean part of the Magellan sub-region, but without indication of precise localities. The two specimens found in Guamblín Island extends the northern limit of the distribution of the species.

**Protohyale (Boreohyale) rubra** (Thompson, 1879)

*Nicea rubra* Thompson, 1879: 236, Pl. 10b, Fig. 3; Thompson and Chilton, 1886: 144.


*Protohyale (Boreohyale) rubra* Bousfield and Hendricks, 2002: 61 (cited).

This widely distributed species is known from Australia, New Zealand, Japan, Hawaii, and Juan Fernandez Islands, continental Chile, and Peru (Barnard, 1979; González, 1991a, 1991b). It can be recognized based on the strong distolateral spine displayed on the first uropod, the small or absent inner marginal dactyl setae, the coxa 1 without posterior cusp, the subrectangular propodus of the first gnathopod provided with an oblique palm, the maxillipodal dactyl with long distal setae surpassing the distal nail, and the slightly crenulate posterior margin of pereiopod 7. In Chile, *P. rubra* has been recorded only in the north, from Iquique to Coquimbo (González, 1991b). The specimens of Guamblín Island represent a significant expansion of the range for the species to the south of the country.

**Parhyalella penai** Pérez-Schultheiss and Crespo, 2008


The males of this species can be characterized by the following features: eyes medium-sized, oval, dark; antenna 2 peduncle very strong, flagellum article 1-4-conjointed; anterior margin of gnathopod 1 segment 5 with or without single medial seta, palm transverse, gently concave, dactyl bifurcate; gnathopod 2 segment 6 with rounded posterior margin; margin of inner ramus of uropod 2 with a single row of spines.

This species is common among subtidal floating macroalgae that temporarily reach the intertidal fringe (e.g. Rodriguez, 2000). The material studied allows to extend the known distribution for the species, which had previously been recorded from Coquimbo to Maicolpué in continental Chile (Perez-Schultheiss & Crespo, 2008).

**Hyalella chiloensis** González & Watling, 2001

*Hyalella chiloensis* González and Watling, 2001: 177-183, Figs. 1-4, González, 2003: 625-627, Fig. 2; Jara et al. 2006: 42, 43, 44 (cited).

The species can be recognized by the following combination of characters: medium, ovoid eyes. Propodus of male gnathopod 1 not subtriangular, inner side with nine papose setae and 10-16 small triangular setae. Palm margin of male gnathopod 2 convex, as long as posterior margin of propodus. Telson longer than wide, apically truncated, with more than two long and short simple setae (there may be additional smaller ones). Uropod 3 rami not shorter than peduncle. Sternal gills present on segments 3-7 (González & Watling, 2001).

This species is distributed from Laguna Redonda in Concepción, to Nirepan River, Coyhaique (González, 2003). Its range overlaps with *Hyalella costera* González and Watling, 2001 from Valdivia to the north, but can be differentiated from this species by the foregoing diagnosis.

**Transorchestia chilensis** (Milne Edwards, 1840)

*Orchestia chilensis* Milne Edwards, 1840: 18; Stebbing, 1906: 537; Schellenberg, 1931: 224; Ruffo, 1949: 53, Fig. 18; Varela, 1983: 43-47, Figs. 11-13 (not *Orchestia chilensis* Hurley, 1957).

*Transorchestia chilensis* Bousfield, 1982: 20-21, Fig. 9; González, 1991b: 64; González, 1991c: 103, Fig. 8; Carvacho and Saavedra, 1994: 173.

This species can be differentiated from other Chilean talitrids by the 4-dentate left lacinia mobilis, maxillipodal palp obscurely 4-segmented, antenna 2 and pereiopods 6-7 sexually dimorphic, dactyl 1 of the female barely or not exceeding palm, anterior margin of posterior lobe of coxa 6 vertical, telson elongated and distally narrow, with rows of
dorsal margin of epimera. Other characters probably significant are the presence of transversal rows of small outgrowths in the hyperadult dorsal surface of pleonites 5-7 and pleosomites 1-2. This character needs confirmation because has not been observed in female or subadult specimens, including additional material from Bahia Metri and Carelmapu in Lakes Region (that do not include hyperadults), where this species has been found also.

Conclusions

This report is a first approximation to the amphipod fauna of a poorly studied geographic area in terms of its biodiversity. The material allowed to expand the known distribution on Chile for several species. Phoxocephalopsis mehainensis, Melita sp., Protohyale rubra, Parhyalella penai and Orchestoidea tuberculata, extend their range to the south, and Tryphosella paramoi expands its range to the north. Besides, we confirm the presence of Paramoera cf. fissa cuda, Cheus annae, Hyallela chiloensis and Transorchestia chilienis, species whose occurrence was expected by their known longitudinal geographic range in Chile.

Some taxonomic problems have arisen during this study. It is necessary to get more material to undertake a detailed analysis of Nototropis cf. dentattes, Aora cf. maculata and Melita sp. in order to determine their specific identity (they are probable new species). It is necessary also to confirm the possible validity of M. gayi and the generic position of Tryphosella paramoi. New collections should be made in the study area to determine the specific identity of Parapherusa sp., Paramoera sp. and to complete the amphipod inventory of Guanbín Island.

Acknowledgements

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