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# Notes on the genus *Pterygosquilla* Hilgendorf, 1890 (Stomatopoda: Squillidae) in Chile

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## Abstract

**Background:** *Pterygosquilla* is a large-size genus of the stomatopod family Squillidae. It contains four species of which two, *P. armata* (Milne Edwards H, Histoire naturelle des crustacés, comprenant l'anatomie, la physiologie et la classification de ces animaux 2, 1837) and *P. gracilipes* Miers, 1881, have been recorded in the Americas. Three subspecies of *P. armata* (*P. armata armata*, *P. armata gracilipes*, and *P. armata capensis* Manning, 1969) were recognised by Manning (Stomatopod Crustacea of the western Atlantic, 1969) but Ah Yong (The Marine Fauna of New Zealand: Mantis shrimps (Crustacea: Stomatopoda); 125: 1-111, 2012) showed they should be separate species.

**Methods:** New material of *Pterygosquilla armata* was collected off the coast of Chile, in the eastern Pacific and was compared with previous descriptions available in the literature for *P. armata*, to the type material of *Squilla gracilipes* and to additional museum specimens of this species. Special attention was given to the lateral processes of the abdominal somites in both species.

**Results:** Four males and one female of *P. armata* collected off Quellón, Punta Lapa, Chile, were studied. They share several diagnostic characters with typical *P. armata* and also feature a previously unknown character: a remarkable, wing-like, thin lateral extension of abdominal pleura representing up to 50 % of the specimens total width. These extensions had been previously reported for the other American species, *P. gracilipes*, by Parisi (Elenco degli stomatopodi del Museo di Milano; 61:91-114, 1922). The type material of *Squilla gracilipes*, held at the Natural History Museum in London, however, lacks these lateral extensions, probably because it is a much smaller specimen.

**Conclusions:** The material reported from off Chile represents a wing-like form of *P. armata* in which the lateral processes of the abdominal pleura are strongly expanded.

**Keywords:** Stomatopods, Chile, *Pterygosquilla*

## Background

The genus *Pterygosquilla* Hilgendorf, 1890 contains four nominal species (Ah Yong 2012) and is represented in America by two species, both distributed in the southern cold-temperate water of the continent (Manning, 1969a). *Pterygosquilla armata* (H. Milne Edwards, 1837) is known from 44°S in Argentina (Atlantic Ocean) to Chile, while *P. gracilipes* (Miers, 1881) has so far been reported only off the coast of Chile (Manning 1969b). Both species were

originally described within the genus *Squilla* Fabricius, 1787, and later transferred to *Pterygosquilla* Hilgendorf, 1890 (see Manning 1966, 1969, and Ah Yong 2012 for further details related to recognition of *Pterygosquilla*).

*Pterygosquilla armata* was described for Argentina, south of 44°S, without illustrations, and was later reported from the eastern Pacific (coast of Chile as far north as Valparaiso) (see Manning 1969a). *Pterygosquilla gracilipes* was described on the basis of a young male specimen collected "... from the west coast of Patagonia ..." (sic). A short description was provided together with an illustration of the telson and the last abdominal somite (Miers 1881: 75, plate VII, 8).

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A specimen collected from an unknown locality was reported by Hilgendorf (1890) as *Pterygosquilla laticauda* Hilgendorf, 1890, and recognized later (Hansen 1895) as a subjective junior synonym of *S. gracilipes* (see Manning 1969a: 123). Hilgendorf was also responsible for the description of *Pterygosquilla*, of which *P. laticauda* is the type-species, and in which he included *S. gracilipes*. Subsequent material of *P. gracilipes* was recorded in 1922, when Bruno Parisi reported on five large males (TL 80 to 144 mm) in the collection of the Milano Museum, Italia, collected off Valparaiso, Chile (Parisi 1922).

In his report on stomatopods of the west coast of America, Schmitt (1940: 150, 151) included both species of *Pterygosquilla* (within the genus *Squilla*, thus ignoring Hilgendorf assignment to *Pterygosquilla*), but did not report on additional material. Schmitt (loc. cit.) did not refer to any other records of *P. gracilipes* after Parisi's note published in 1922. Bahamonde (1968) noted the presence of *P.*

*armata armata* and *P. gracilipes* along the coast of Chile, provided distinctive features with *P. armata* for the latter, but did not report on new material examined either. Later, Manning (1971) proposed an identification key to species of Stomatopoda of the eastern Pacific, including a couplet for both species of *Pterygosquilla*.

New material belonging to *Pterygosquilla* was recently collected in southern Chile and is treated in this contribution.

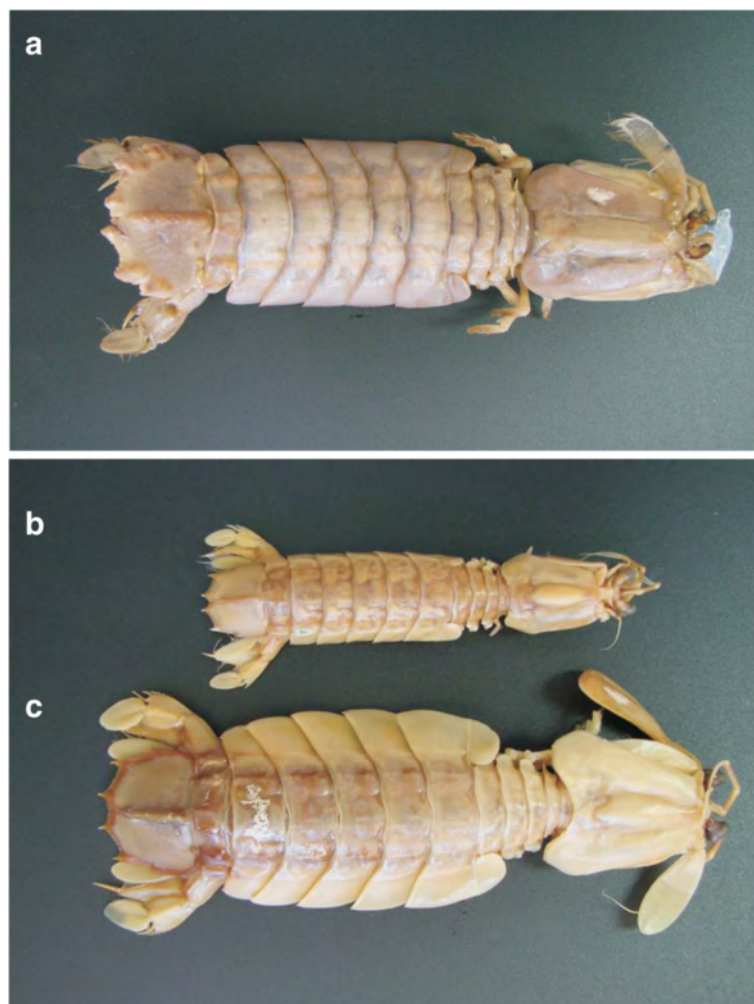
## Results and discussion

Order STOMATOPODA Latreille, 1817

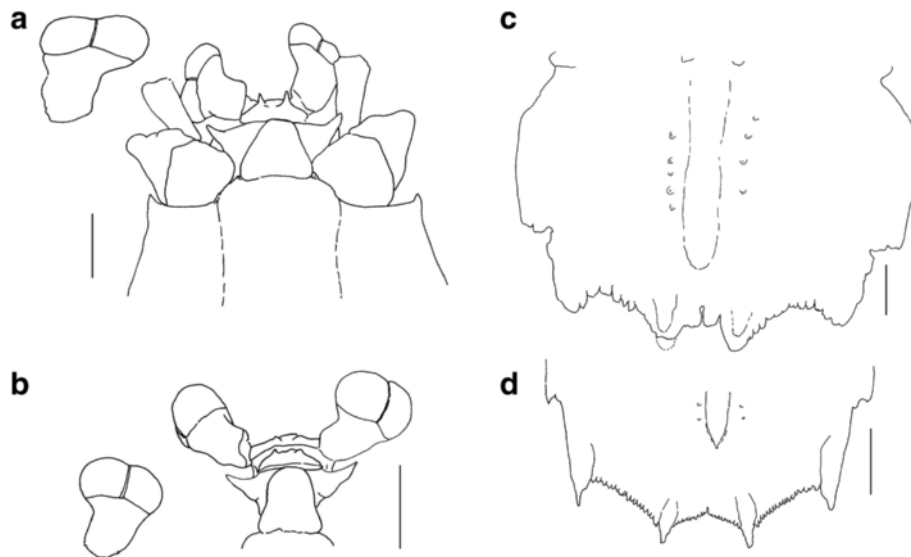
Family SQUILLIDAE Latreille, 1802

Genus *Pterygosquilla* Hilgendorf, 1860

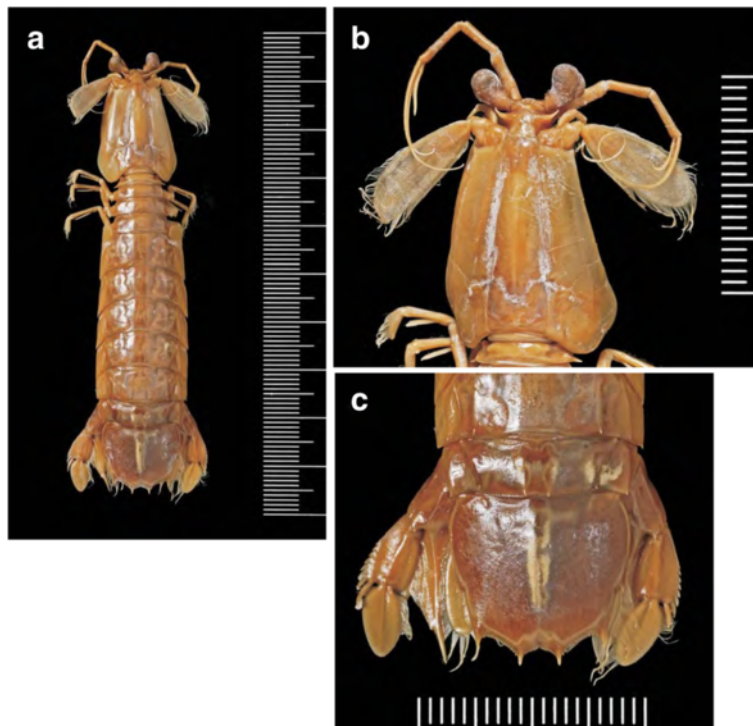
*Pterygosquilla armata* (H. Milne Edwards, 1837)  
(Figs. 1, 2, 3)



**Fig. 1** **a** *Pterygosquilla armata* (H. Milne Edwards, 1837), male (148 mm TL), dorsal view (ICML-EMU-7578). **b-c** *Pterygosquilla gracilipes* (Miers, 1881), male (80.5 mm TL) **b** and male (121.0 mm TL) **c**, dorsal view (MCSNM 2324). Scale in mm



**Fig. 2** *Pterygosquilla armata* (H. Milne Edwards, 1837), male (148 mm TL) (ICML-EMU-7578) (**a, c**) and *Pterygosquilla gracilipes* (Miers, 1881), male (80.5 mm TL) (MCSNM 2324) (**b, d**). **a, b** Anterior region of carapace and eye (magnified) in dorsal view. **c, d** Dorsal view of posterior half of telson



**Fig. 3** *Squilla gracilipes* Miers, 1881. Holotype male (NHM 80.30). **a**. Dorsal view of body. **b**. Dorsal view of carapace. **c**. Dorsal view of telson. Scale in mm

**Restricted synonymy**

*Squilla armata* H. Milne Edwards, 1837: 521; Bigelow, 1891: 94; 1894: 515, figures 9–10; A. Milne-Edwards, 1891: 53, plate 7; Parisi, 1922: 93; Schmitt, 1940: 150, figure 4; Manning, 1968: 123 (as a species included in *Pterygosquilla*).

*Pterygosquilla armata*.- Manning, 1969a: 123, figure 36; Bahamonde, 1968: 114, figure 5; Ahyong, 2012: 93 (key), 98–99 (passim).

*Pterygosquilla armata armata*.- Manning, 1971, 101 (key).

**Material examined**

Three males (TL 129–135 mm) and one female (TL 110 mm), off Quellón, Punta Lapa (43°08'22"S; 73°36'29"W), Chile, 15/July/2005, 50 m, bottom trawl (coll. Marco Retamal) (MZUC 33510); one male (TL 165 mm), same date and locality (EMU-7578) (Fig. 1a).

**Remarks**

The material examined herein shares several diagnostic characters with typical *P. armata*: the abdominal submedian carinae are still visible as lighter marks, although very much more fainted (absent in *P. gracilipes*); the ventral side of the telson features a strong postanal keel (absent in *P. gracilipes*); strong, sharp spines are present on ocular scales (Fig. 2a) (reduced or obtuse in *P. gracilipes*; Fig. 2b); 1 (2) submedian denticles are present on the posterior margin of the telson (Fig. 2c) (vs. up to 26 in *P. gracilipes*; Fig. 2d). In addition, the cornea is less globulose, the eye more asymmetric in dorsal view in *P. armata* than in *P. gracilipes*, and the rostral plate is relatively wider at its base in *P. armata* (Fig. 2).

Specimens examined feature a remarkable lateral expansion of the abdominal pleura (Fig. 1). Manning (1969a, 1969b) noted that adult males of *P. armata* show secondary sexual characteristics that include inflated (swollen) margins of the telson and of the abdominal pleura between the intermediate and lateral carinae (also see Manning 1969b, Fig. 3c). In the case of our material, however, in addition to inflated margins of telson, the lateral expansions of all abdominal somites represent up to 50 % of the specimens total width and are wing-like, very thin extensions (Fig. 1; Table 1). Initially, these characteristics were quite puzzling and lead us to believe that this new material from Chile might belong to an undescribed species.

We were not able to find a description of wing-like extensions of abdominal somites in *P. armata*. This feature has been reported for *P. gracilipes* (Miers, 1881) by Parisi (1922: 93) for three of the five males from off Valparaiso, Chile, he examined (called “forma larga”, or wide form, by Parisi by contrast to “forma estreta o normale”, normal or slender form presented by the two other specimens). Examination of a series of photographs of the holotype of *Squilla gracilipes*, held in very good condition at the Natural History Museum in London (NHM 80.30) (Fig. 3) (a male of TL ca 89 mm), allowed us to conclude that the wing-like lateral extension was not a feature of the type material. Two of the five specimens of *P. gracilipes* originally reported by Parisi (1922), still available at the Milano Museum (MCSNM 2324), were examined in August 2006 (Fig. 1). One of these two obviously belongs to the “forma larga”, or wide form, reported by Parisi (1922: 93, Fig. 1) and features remarkable wing-like expansion of the abdominal somites (see Fig. 1c). The jar containing Parisi’s material contains a note by the later Raymond Manning,

**Table 1** Measurements of specimens of *Pterygosquilla armata armata* (H. Milne Edwards, 1837) collected off southern Chile during this study and of *P. gracilipes* (Miers, 1881) type and material kept in the Milano Museum

Spec.	Ref.	Sex	TL	CL	Telson W - L (W/L)	Abd. width (somite 2) Total-IC (ratio)	Teeth on dactylus L/R
<i>Pterygosquilla armata armata</i>							
1	MZUC 33510	M	108	21	23.8-14.4 (1.65)	26.3-14.5 (1.81)	8/8
2	MZUC 33510	F	117	29	27.1-16.1 (1.68)	27.4-16.3 (1.68)	8/6
3	MZUC 33510	M	126	35	31.6-20.0 (1.58)	33.4-21.1 (1.58)	-/8
4	MZUC 33510	M	130	30	31.3-23.3 (1.34)	31.5-23.0 (1.37)	8/8
5	EMU-7578	M	148	33	37.9-29.4 (1.29)	45.4-21.8 (2.08)	8/9
<i>Pterygosquilla gracilipes</i>							
6	Milano (Wide form)	M	121	25	25.5-22.3 (1.14)	40.7-16.1 (2.53)	10/10
7	Milano (Slender form)	M	80.5	17	14.8-14.6 (1.01)	17.4-10.3 (1.69)	9/9
8	Type <sup>a</sup>	M	89	18	16.0-15.0 (1.10)	17.9-11.1 (1.61)	10/10 <sup>b</sup>

All measurements in mm. <sup>a</sup>Measured from photographs. <sup>b</sup>From Miers (1881). IC, measured between intermediate carinae. L/R, left/right



indicating that he examined it and identified it as *Pterygosquilla gracilipes*. A search in Ray Manning's notes at the Smithsonian museum indicates that he only examined two specimens (presumably the same we examined) when he visited the Milano Museum, but we were unable to find any reference to this fact in Manning's contributions.

## Conclusions

For the reasons described above, particularly all the diagnostic characters included in the "Remarks" section, we conclude that the material reported herein from off Chile represents a wing-like form of *P. armata armata* in which the lateral processes of abdominal pleura are strongly expanded in large males, in a way similar to what has been reported for *P. gracilipes* by Manning (1969a, 1969b) and for *P. schizodontia* (Richardson, 1953) by Ah Yong (2012).

## Methods

During an exploratory cruise along the coast of southern Chile, one of us (MRR) collected a small series of large specimens that proved to belong to the genus *Pterygosquilla*. This material is reported herein and compared with the previous descriptions and reports of species of this genus, and compared with photographs of the type of *P. gracilipes* deposited in the Natural History Museum, London, Great Britain, and with specimens of this species still available at the Museo Civico di Storia Naturale, Milano, Italy. Ethics, consent and permissions have been followed in the manuscript. The material examined herein was collected within the frame of the Chilean Navy project CIMAR-FIORDOS, with the permission of the "Comité Oceanográfico Nacional", Chile.

## Abbreviations

Abd., abdomen; CL, carapace length; ICML-EMU, Regional Collection of Invertebrates, Mazatlán, Mexico; L, length; MCSNM, Museo Civico di Storia Naturale di Milano; MZUC, Museo de Zoología, Universidad Católica, Chile; NHM, Natural History Museum; TL, total length; W, width.

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## Authors' contributions

MEH elaborated the first draft of the manuscript, reviewed the literature on the subject and examined the material held at the Museo Civico di Storia Naturale, Milano. MRR collected the material, made morphometric observations and measurements, and participate in the final edition of the manuscript. Both authors read and approved the final manuscript.

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## Competing interests

The authors declare that they have no competing interests.

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