



## Scientific Note

# New records of the brachyuran crabs *Hepatus pudibundus* (Aethridae) and *Persephona mediterranea* (Leucosiidae) in their southernmost Western Atlantic distribution

GASTÓN MARTÍNEZ<sup>1</sup>, FABRIZIO SCARABINO<sup>1,2</sup> & ESTELA DELGADO<sup>3</sup>

<sup>1</sup>Dirección Nacional de Recursos Acuáticos, Constituyente 1497, P.O. Box 11200, Montevideo, URUGUAY. Email: gmartinez@dinara.gub.uy

<sup>2</sup>Museo Nacional de Historia Natural y Antropología, C. C. 399, P.O. Box 11.000, Montevideo, URUGUAY. Email: fscara@gmail.com

<sup>3</sup>Instituto de Investigaciones Pesqueras, Facultad de Veterinaria, Tomás Basañez 1160, P.O. Box 11300, Montevideo, URUGUAY. Email: estela@fcien.edu.uy

**Abstract.** New findings as well as biological data on the presence of the brachyurans *Hepatus pudibundus* and *Persephona mediterranea* in the Uruguayan shelf are recorded and discussed. Both species have their southernmost limits there, where their occurrences have increased in the last 10 years.

**Keywords:** Uruguayan shelf, subtropical species, Decapoda, Brachyura.

**Resumen.** Nuevos registros de los cangrejos braquiuros *Hepatus pudibundus* (Aethridae) y *Persephona mediterranea* (Leucosiidae) en el extremo sur de su distribución en el Atlántico Occidental. Se registran y discuten nuevos hallazgos así como información biológica sobre la presencia de los cangrejos braquiuros *Hepatus pudibundus* y *Persephona mediterranea* en la plataforma uruguaya. Ambas especies tienen su límite sur de distribución aquí, donde su ocurrencia ha aumentado en los últimos 10 años.

**Palabras clave:** Plataforma uruguaya, especies subtropicales, Decapoda, Brachyura.

Living mostly in tropical waters, the brachyuran crabs of the families Aethridae and Leucosiidae are very scarcely represented south of Santa Catarina State, Brazil (28°S) (Zolessi & Philippi 1995, Melo 1996, Spivak 1997, Boschi 2000).

*Hepatus pudibundus* (Dana, 1851) (Brachyura, Aethridae) (see Ng *et al.* 2008) is found from Guinea to southern Africa in the East Atlantic Ocean; and from Georgia (USA) to Rio Grande do Sul (Brazil) in the West Atlantic Ocean (Melo 1996). Juanicó (1978) registered the first and yet only detailed record for Uruguayan waters. The geographic distribution range for *Persephona mediterranea* (Herbst, 1794) (Brachyura, Leucosiidae) is from New Jersey (USA) to Uruguay (Coelho & Torres 1980, Bordin 1987, Melo 1996).

However, these reports did not provide detailed data about the material collected in Uruguayan waters.

For both species there is no other available information on their southernmost Western Atlantic distribution. Here we report and discuss new findings of these species in Uruguayan waters based on several sources, including benthic surveys and occasionally collected material washed ashore. The first source includes a) fishing trip (June 2003) using a clam dredge, b) scientific survey using a beam trawl (November 2006) and a Spatangue dredge (April 2007) and c) fishing (October 2006) and scientific survey (January 2007) using a shrimp trawl. Incidentally captured specimens during the fisheries monitoring program of DINARA (Dirección Nacional de Recursos Acuáticos) (December 2002 and April 2007) using an Engel

trawl were also considered (Table I). Bathymetric and sediment information was taken from scientific surveys.

**Table I.** Number of crabs analyzed (collected) for *H. pudibundus* and *P. mediterranea*, washed ashore (dead) and by each sampling procedure.

|               | <i>H. pudibundus</i> | <i>P. mediterranea</i> |
|---------------|----------------------|------------------------|
| Washed ashore | 8                    | 3                      |
| Beam Trawl    | 9                    | 13                     |
| Shrimp trawl  | 6                    | 2                      |
| Engel Trawl   | 12                   | 25                     |
| Clam Trawl    | 27                   | 22                     |
| <b>Total</b>  | <b>62</b>            | <b>65</b>              |

Individual morphometric data (0.01 mm) and wet weight (0.001 g) were registered. Measures of carapace width (CW: greatest width), abdomen width (AW: width of fifth abdominal somite), and chela length (CHL: propodus length) were taken. All captured crabs in the fishing trip (June 2003) of *H. pudibundus* were dissected in order to assess their

gonad development stage according to Reigada & Negreiros-Fransozo (2000). For *H. pudibundus*, juveniles were considered after Mantelatto & Fransozo (1994) who established the morphologic sexual maturity at 32 - 34 mm of CW.

Total samples or voucher specimens were deposited in the Museo Nacional de Historia Natural y Antropología (MNHNM, Montevideo, Uruguay).

*Hepatus pudibundus*, including adults and juveniles (Table II), was found washed ashore (8 dead specimens) and between 5 and 31 m depth (Fig. 1), and mainly occurring in fine sands. From 12 females dissected, one was immature, two has rudimentary gonads, three were in intermediary stage and six presented developed gonads; one ovigerous female was found (September). From 12 males dissected, one resulted immature, five presented rudimentary gonads, two had developing gonads and two presented already developed gonads. Two specimens (a male and a female) were found immature despite being larger than 34 mm. Morphometric and weight data registered here were in accordance with Mantelatto & Fransozo (1992, 1994) for Brazilian specimens.

**Table II.** Ranges of individual morphometric data (mm) (CW: carapace width, AW: abdomen width and CWL: chela length) and wet weight (g) (WW), discriminated by sex for *H. pudibundus* and *P. mediterranea* and by state of maturity for *H. pudibundus*. The number of specimens is between parentheses. NA means not available.

|            | <i>Hepatus pudibundus</i> |               |                |               | <i>Persephona mediterranea</i> |                |
|------------|---------------------------|---------------|----------------|---------------|--------------------------------|----------------|
|            | Females (22)              |               | Males (35)     |               | Females (26)                   | Males (38)     |
|            | Juveniles (2)             | Adults (20)   | Juveniles (12) | Adults (23)   |                                |                |
| <b>CW</b>  | 29.68 – 34.21             | 40.35 – 60.72 | 6.08 – 33.98   | 47.50 – 73.68 | 27.59 – 38.76                  | 4.30 – 42.83   |
| <b>AW</b>  | 5.68 – 9.36               | 11.27 – 18.51 | 0.50 – 4.30    | 6.41 – 11.13  | 17.81 – 28.84                  | 0.80 – 8.87    |
| <b>CWL</b> | 11.84 – 13.74             | 17.30 – 26.15 | 2.60 – 14.42   | 21.53 – 39.13 | 20.87 – 30.02                  | 1.10 – 38.72   |
| <b>WW</b>  | 7.24 – 9.27               | 17.05 – 44.16 | NA – 7.65      | 25.03 – 68.23 | 9.38 – 26.39                   | < 1.00 – 30.01 |

*Persephona mediterranea* was found washed ashore (3 dead specimens) and between 5 and 28 m depth (Fig. 1), including a wide range of sizes (Table II) and occurred in fine sands. Two ovigerous females were found (January). The morphology of this species makes difficult the macroscopic assessment of the gonad development stage of the individuals, which should be carried out based on histological studies.

The bathymetric range and sediment preferences of *H. pudibundus* and *P. mediterranea* registered in the Uruguayan waters fits within the already known for these species (see Mantelatto *et al.* 1995, Melo 1996, Bertini *et al.* 2001).

*Hepatus pudibundus* and *P. mediterranea* are very distinctive species, having singular

morphological and chromatic features among the Uruguayan carcinofauna that diminishes the possibilities of being overlooked and enhances interest of occasional collections. In this sense, although being aware of the different effort of sampling, we detected a progressive colonization of both species into the Uruguayan coast. In fact, these were not cited by Barattini & Ureta (1961), which includes all distinctive brachyurans known to be washed ashore there, as are present cases. Furthermore, none were recorded by Itusarry (1984), who considered the decapod fauna of the zone inhabited by these species. Finally, no specimen was brought to the collections and/or researchers along the 80' and 90'. Since a few years (2000-2001) *H. pudibundus* and *P. mediterranea* started to be

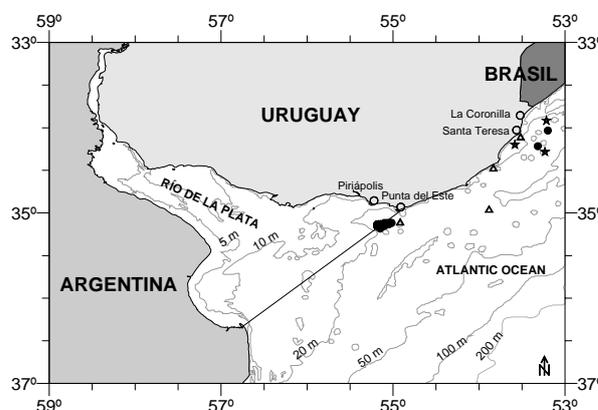
usually collected in the Uruguayan coast, and even known by local fishermen whom already refer to these crabs using common names. In this sense, *H. pudibundus* and *P. mediterranea* are called “cofresito” (little coffer) and “San Antonio” (leaf beetle – Coleoptera-Chrysomellidae) respectively, given the most remarkable morphological and chromatic features of each one. Furthermore, both species (especially *H. pudibundus*) has been brought to our attention in recent years during stomach content analysis of the Patagonian smoothhound (*Mustelus schmitti*) and loggerhead turtles (*Caretta caretta*) from the Uruguayan inner shelf (Karumbé and Gatuzo Projects, pers. comm.).

Mañé-Garzón (1968) and Milstein *et al.* (1976) reported *Persephona punctata* (Linnaeus, 1758) for the Uruguayan coast based on two specimens collected in the inner shelf. This species was otherwise cited as having the coast of Rio Grande do Sul (Brazil) as its southern limit of distribution (Bordin 1987, Melo 1996). We examined those two specimens (MNHNM 409 and 1222, respectively), which are juveniles (CL: 11.63 and 11.83 mm) without traces of chromatic design of *P. mediterranea*. The distinguishing characters between *P. punctata* and *P. mediterranea* (see Melo 1996) are difficult to assess in juvenile fixed specimens. In fact, some of the juveniles we collected and positively identified alive as *P. mediterranea*, had their marmorations vanished only few weeks after being fixed in formaline and preserved in alcohol. However, Mañé-Garzón (1968) mentioned orange symmetrical spots for his specimen, which must therefore be referred to *P. mediterranea*. The identity of the specimen listed by Milstein *et al.* (1976) remains uncertain, as the presence of *P. punctata* in Uruguayan coast.

The reidentification of Mañé-Garzón's specimen as *Persephona mediterranea* indicates the finding of this species in Uruguayan coast in 1963. The previous record of *H. pudibundus* is based on one specimen (MNHNM 1530) collected in 1976 (Juanicó 1978) and an additional specimen (MNHNM 1627) was found as being collected in the same opportunity; both are adult specimens. These findings indicate the presence, at least intermittently, of both species since that time. However, the material here reported confirms these species as established in the Uruguayan coast. Although we found ovigerous females, it is unknown if this finally implies successful recruitment for the local population. Given the ingression of subtropical water mixed with coastal waters it is not unlikely that a larvae supply of slightly northern locations in

southern Brazil coast may account for at least part of the Uruguayan populations, which in turn is responsible for the colonization of these warm water species.

Further research need to be done concerning abundance, life history and reproductive biology of these crabs at the edge of their southern distribution. Our findings further highlight the importance of monitoring the Uruguayan coast, which is the southernmost limit for many warm water species in accordance to the influence of Subtropical Waters (see e.g. Ortega & Martínez 2007). This is of particular interest here in a Global Warming scenario, where extreme oceanographic events (see e.g. Demicheli *et al.* 2006) may contribute not only to eventual colonization but to definitive establishment of a given species.



**Figure 1.** Sampling areas: (△) for *P. mediterranea*, (★) for *H. pudibundus*, (●) for both species and (○) localities where carapaces and dead crabs were found washed ashore.

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