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Revision of the genus *Porcellionides* Miers, 1877 (Isopoda: Porcellionidae) in the Ibero-Balearic region

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Abstract. Until now, the genus *Porcelliniodes* Miers, 1877 is represented in the Ibero-Balearic region by seven species. The study of 721 specimens from Portugal and Spain has led to the identification of 11 species, including poorly known species, and the description of a new species, *Porcellionides ibericus* sp. nov. This new species is characterized by the absence of transverse ridges on the pereonites, medium-sized lateral lobes on the cephalon, the pleon slightly retracted in relation to the pereon, pereopods without sexual differentiation, and a truncated posterior inner tip in the male pleopod I. We consider *P. glaber* (Koch, 1856), *P. hispanus* (Vandel, 1953), *P. lucasioides* (Vandel, 1953), *P. lusitanus* (Vandel, 1946), and *P. molleri* (Verhoeff, 1901) as valid species, while *P. buddelundi* (Verhoeff, 1901) and *P. rufocinctus* (Dollfus, 1892) are considered species inquirendae. Five species are recorded for the first time in some Portuguese districts and seven in some Spanish provinces.

Keywords. Distribution, Portugal, Spain, taxonomy, woodlice.

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Introduction

The family Porcellionidae Brandt, 1831 is one of the most diverse within Oniscidea Latreille 1802, with 331 species (Sfendourakis & Taiti 2015; Boyko *et al.* 2023). The genus *Porcellionides* Miers, 1877 is the second most diverse within this family, with 49 species, second only to the genus *Porcellio* Latreille, 1804, which has 191 species (Boyko *et al.* 2023). Identifying the species within this family poses a significant challenge, given the substantial variability observed and the lack of comprehensive descriptions for many species. Consequently, different authors have described the same species with

different names, along with many subspecies and varieties (Schmalfuss 2003; Boyko *et al.* 2023). Currently, the majority of the described species and subspecies within the family Porcellionidae are not accepted, as indicated in Boyko *et al.* (2023), where 331 species are accepted, while another 750 are not recognized for several reasons and the genus *Porcellionides* is not an exception to this pattern.

The Ibero-Balearic region is currently known to have seven species of *Porcellionides*: *P. buddelundi* (Verhoeff, 1901), *P. cingendus* (Kinahan, 1857), *P. elegans* (Pollo Zorita, 1982), *P. fuscomarmoratus* (Budde-Lund, 1885), *P. pruinosus* (Brandt, 1833), *P. rufocinctus* (Dollfus, 1892), and *P. sexfasciatus* (Budde-Lund, 1885), with the subspecies *P. sexfasciatus hispanus* (Vandel, 1953), *P. sexfasciatus lucasioides* (Vandel, 1953), *P. sexfasciatus lusitanus* (Vandel, 1945), and *P. sexfasciatus sexfasciatus* (Budde-Lund, 1885), while *P. sexfasciatus glaber* (Koch in Rosenhauer, 1856), which is currently considered nomen dubium (Boyko *et al.* 2023).

The study of numerous specimens of *Porcellionides* from Portugal and Spain allowed us to identify specimens belonging to poorly known species and species that have been mistaken for others or even considered subspecies. Furthermore, we describe a new species within this genus. Based on current knowledge, we provide distribution maps for all species, illustrations, and a dichotomous key. Therefore, this study aims to clarify the taxonomic status of certain species within the genus *Porcellionides* found in the Ibero-Balearic region.

Material and methods

We could not examine the existing types for the evaluated species, so the work is based on their bibliographic descriptions. The specimens studied in this work were mostly collected through direct searches and hand captures across Portugal, between December 2021 and June 2023. The specimens were preserved in 96° ethanol for potential molecular analysis. Some specimens from Spain were also studied, which were deposited in different public and private collections and stored in 70° ethanol.

Institutional abbreviations

CRBA = Centre de Recursos de Biodiversitat Animal de la Universitat de Barcelona, Spain
JC = Julio Cifuentes' private collection, Madrid, Spain
LPS = InBio Barcoding Initiative, Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Portugal
MNCN = Museo Nacional de Ciencias de Madrid, Spain
UGM = Departamento de Zoología de la Universidad de Granada, Spain

Coordinates were recorded in the field for the collected and studied Portuguese specimens. For the remaining studied specimens and for bibliographic records where coordinates were not provided, approximate coordinates were obtained using Google Maps (https://www.google.com/maps/), relying on the available information. Distribution maps for all studied species were created using QGIS ver. 3.10. The synonym list provided for each species is obtained by consulting the references mentioned for each species, as well as Schmalfuss (2003) and Boyko *et al.* (2023).

To facilitate the identification of the studied species, several figures were included. These figures were captured using a microscope and a stereo microscope (Gundlach), equipped with a 12 MP digital camera (C2CMOS), and prepared with the free graphic editor InKscape (https://inkscape.org/en/).

In many Oniscidea families, it is a common practice that, during species descriptions, the positioning of the noduli laterales on the different pereonites is specified. We used the coordinates suggested by Vandel (1953, 1960): b (distance from the nodule to the posterior edge of the tergite), c (pereonite width), and d (distance from the nodule to the lateral edge).

Results

Taxonomy

Class Malacostraca Latreille, 1802
Order Isopoda Latreille, 1817
Suborder Oniscidea Latreille, 1802
Family Porcellionidae Brandt, 1831
Genus *Porcellionides* Miers, 1877

Porcellionides buddelundi (Verhoeff, 1901)

Porcellio buddelundi Verhoeff, 1901: 406.
Porcellio atlanticus Arcangeli, 1935: 20.

Bibliographic references

Portugal: Coimbra (Verhoeff, 1901).

Remarks

Porcellionides buddelundi was briefly described by Verhoeff (1901) based on two females collected in Coimbra. In his description, the following features can be highlighted: body greyish-yellow and brown marbled, a light longitudinal stripe at the base of the epimera; back and head dull, robust, and fairly densely granulated; first segment of the antenna flagellum approximately one and half times as long as the second; cephalon with small, rounded lateral lobes on the sides; and tergites without transverse ridges. Based on these characteristics, this species closely resembles *P. cingendus* and *P. molleri*. However, since Verhoeff (1901) states that there are no transverse ridges on the tergites, it cannot be *P. cingendus*. The only features that distinguish *P. buddelundi* from *P. molleri* would be the coloration variations, observed by Vandel (1946) and indicated below, and the first segment of the flagellum being slightly longer than the second in *P. molleri*, whereas Verhoeff (1901) suggests that it is one and a half times longer in *P. buddelundi*. Despite sampling in numerous locations in Portugal, including Coimbra and nearby areas, we were unable to find specimens that perfectly match the short original species description, despite our best efforts. Considering the potential for misidentification with other species within the genus, particularly with *P. molleri*, we currently regard *P. buddelundi* as a species inquirenda.

Arcangeli (1936) proposed the name *Porcellio* (*Porcellionides*) *atlanticus* for this species, as he indicated that the name originally given by Verhoeff (1901), *Porcellio* (*Metoponorthus*) *buddelundi*, was already in use for another *Porcellio*. However, the current name still remains *P. buddelundi.*

Distribution

Coimbra district of Portugal (Verhoeff 1901) and in the Spanish provinces of Coruña, Granada, Orense, and Pontevedra (Schmölzer 1955a, 1971). However, these last records are considered doubtful because the author did not provide any information that would allow the association of his specimens from these citations with this largely unknown species.

Porcellionides cingendus (Kinahan, 1857)
Figs 1, 2A, 3A, 4A–D, 5, Table 1

Porcellio cingendus Kinahan, 1857: 279, figs 1–2, 4, 6, 8–9.
Metoponorthus simplex Budde-Lund, 1885: 188.
Porcellio lusitanorum Arcangeli, 1935: 21, figs 13–18.

Metoponorthus cingendus – Vandel 1946: 274, figs. 91–97.
Porcellionides simplex – Stebbing 1911: 188.

Material examined

PORTUGAL – **Aveiro** • 1 ♀; Barcouço; 40.3084° N, 8.4705° W; 27 Oct. 2022; L.P. Da Silva leg.; LPS472 • 1 ♀; Calvão; 40.4650° N, 8.7003° W; 24 Dec. 2021; L.P. Da Silva leg.; LPS11 • 1 ♂; Cruz Alta, Serra do Bussaco; 40.3691° N, 8.3607° W; 23 Dec. 2022; L.P. Da Silva leg.; LPS614 • 1 ♂; Cruz Alta, Serra do Bussaco; 40.3689° N, 8.3607° W; 23 Dec. 2022; L.P. Da Silva leg.; LPS616 • 1 ♀; Gafanha da Boa Hora; 40.5313° N, 8.7686° W; 26 Nov. 2022; L.P. Da Silva leg.; LPS512 • 1 ♀; Grada; 40.2974° N, 8.4736° W; 24 Dec. 2021; L.P. Da Silva leg.; LPS13. – **Braga** • 1 ♂; Fão, restinga do Cavado; 41.5334° N, 8.7903° W; 17 Dec. 2022; L.P. Da Silva leg.; LPS593a • 1♀; same collection data as for preceding; LPS593b. – **Bragança** • 1 ♀; Castrelos (Baceiro River); 41.8375° N, 6.8926° W; 26 Jun. 2022; L.P. Da Silva leg.; LPS405 • 1 ♀; Sendas; 41.6042° N, 6.8581° W; 15 Sep. 2022; L.P. Da Silva leg.; LPS446 • 1 ♀; Sernande (Rabaçal River); 41.9335° N, 7.1508° W; 25 Jun. 2022; L.P. Da Silva leg.; LPS396 • 1 ♀; Sernande (Rabaçal River); 41.9337° N, 7.1510° W; 25 Jun. 2022; L.P. Da Silva leg.; LPS401. – **Castelo Branco** • 1 ♂; Trigais; 40.2435° N, 7.7145° W; 18 Mar. 2023; L.P. Da Silva leg.; LPS749. – **Coimbra** • 1 ♂; Murraceira Island; 40.1390° N, 8.8445° W; 28 Dec. 2021; L.P. Da Silva leg.; LPS15 • 1 ♂; Murraceira Island; 40.1381° N, 8.8377° W; 6 Mar. 2022; P. Da Silva leg.; LPS124 • 2 ♂♂; Serra da Boa Viagem; 40.1891° N, 8.9023° W; 26 Dec.2022; L.P. Da Silva leg.; LPS632a • 1 ♀; same collection data as for preceding; LPS632b • 1 ♀; Vale Soeiro; 40.3121° N, 8.4041° W; 20 Feb. 2022; L.P. Da Silva leg.; LPS109. – **Leiria** • 1 ♂; A-dos-Negros; 39.3571° N, 8.0921° W; 19 Feb. 2022; L.P. Da Silva leg.; LPS94 • 1 ♂; A-da-Gorda; 39.3483° N, 8.1588° W; 8 Apr. 2022; L.P. Da Silva leg.; LPS215 • 1 ♂; Alvito; 40.006° N, 8.5651° W; 3 Jul. 2022; L.P. Da Silva leg.; LPS429 • 1 ♀; Casa da Moura; 39.3263° N, 9.2489° W; 19 Feb. 2022; L.P. Da Silva leg.; LPS97 • 1 ♀; Casa da Moura; 39.3262° N, 9.2489° W; 19 Feb. 2022; L.P. Da Silva leg.; LPS98 • 1 ♀; Casa da Moura; 39.3263° N, 9.2487° W; 19 Feb. 2022; L.P. Da Silva leg.; LPS99 • 1 ♀; Pia do Urso; 39.5985° N, 9.7172° W; 11 Mar. 2022; L.P. Da Silva leg.; LPS142. – **Portalegre** • 3 ♂♂; Sobral; 39.2777° N, 7.3086° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS537a • 3 ♀♀; same collection data as for preceding; LPS537b • 1 ♂; same collection data as for preceding; LPS539. – **Porto** • 1 ♀; Vairão; 41.3289° N, 8.6733° W; 30 Sep. 2022; L.P. Da Silva leg.; LPS458. – **Viana do Castelo** • 1 ♀; Portelinha; 42.0521° N, 8.1689° W; 24 Mar. 2022; L.P. Da Silva leg.; LPS181. – **Vila Real** • 1 ♂; Ribeira de Pena; 41.5111° N, 7.7960° W; 30 May 2022; L.P. Da Silva leg.; LPS475a • 1 ♀; same collection data as for preceding; LPS475b. – **Viseu** • 1 ♀; Curvaceira; 41.1447° N, 7.8120° W; 3 Sep. 2022; L.P. Da Silva leg.; LPS444.

SPAIN – **Álava** • 1 ♂; Izarra; 5 Feb. 1984; J. Cifuentes leg.; JC138 • 1 ♂; Izarra; 16 Feb. 1984; J. Cifuentes leg.; JC104. – **Asturias** • 2 ♂♂, 3 ♀♀; Llanes, Purón; 22 May 1982; E. Ortiz de Vega leg.; MNCN 20.04/11972 • 1 ♂; Pembes; 5 Aug. 1984; J. Cifuentes leg.; JC190. – **Cantabria** • 1 ♀; Pechón; 30 Oct. 1986; E. Ortiz de Vega leg.; MNCN 20.04/11999 • 1 ♀; Santander; 22 Jul. 1954; Fuentes leg.; MNCN 20.04/12110 • 1 ♂; Urdón; 31 Jul. 1954; S.V. Peris leg.; MNCN 20.04/11977 • 1 ♀; Villaverde de Pontones; 3 Jul. 1954; S.V. Peris leg.; MNCN 20.04/11982. – **Coruña** • 1 ♀; El Burgo; 10 Aug. 1892; MNCN 20.04/9515. – **Lugo** • 4 ♀♀; Cruz do Incio; Aug. 2022; A. Maceda leg.; JC809-JC812. – **Navarra** • 2 ♂♂, 3 ♀♀; Barañain; 20 Nov. 2019; J. Cifuentes leg.; JC410. – **Vizcaya** • 3 ♂♂, 4 ♀♀; Somorrostro, Punta de Musqués; Oct. 1979; A. Pollo leg.; MNCN 20.04/11859.

Remarks

As indicated by Vandel (1946), individuals of this species can exhibit various types of coloration, ranging from very dark to reddish, and even depigmented individuals, although the most common specimens are yellowish with brown pigmented areas (Fig. 1A–B). This species can be recognized by the weak and flat granulations on the dorsal side of the tergites (Table 1). The b/c coordinates stand out as one of

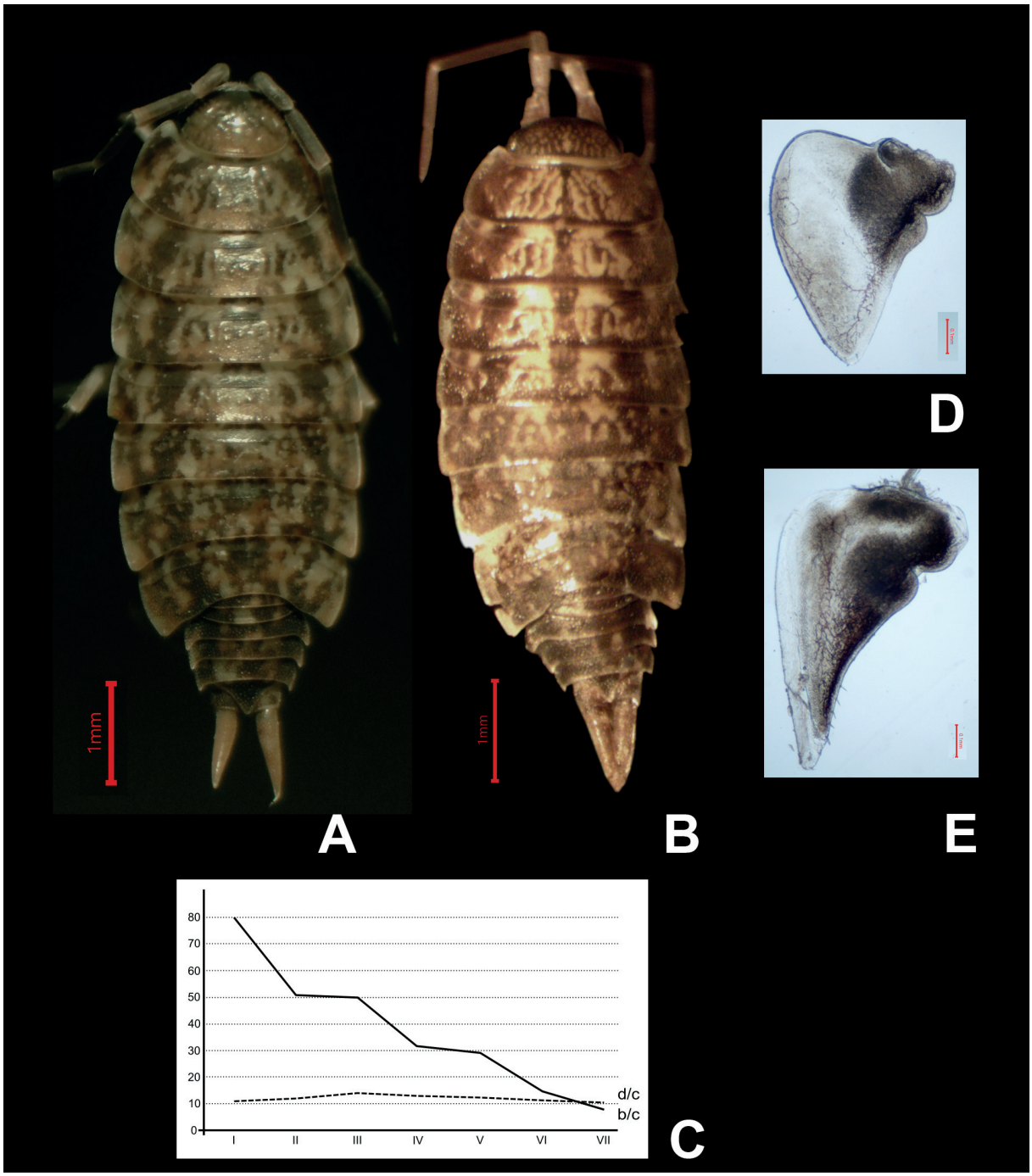

Fig. 1. *Porcellionides cingendus* (Kinahan, 1857). **A–B**. Habitus. **A**. ♀ (LPS11). **B**. ♂ (LPS215). **C**. Noduli laterales coordinates. **D–E**. ♂ (LPS215). **D**. Exopod I. **E**. Exopod II. Scale bars: A–B = 1 mm; D–E = 0.1 mm.

Table 1. Summary of comparative characters for species within the genus *Porcellionides* Miers, 1877 found in the Ibero-Balearic region.

	P. cingendus (Kinahan, 1857)	*P. elegans* (Pollo Zorita, 1982)	*P. fuscomarmoratus* (Budde-Lund, 1885)	*P. glaber* (Koch, 1856)	*P. hispanus* (Vandel, 1953)	*P. lucasioides* (Vandel, 1953)	*P. lusitanus* (Vandel, 1946)	*P. molleri* (Verhoeff, 1901)	*P. pruinosus* (Brandt, 1833)	*P. sexfasciatus* (Budde-Lund, 1885)	*P. ibericus* sp. nov.
body convexity	pronounced	slightly pronounced	pronounced	highly pronounced	slightly pronounced	slightly pronounced	slightly pronounced	slightly pronounced	pronounced	pronounced	slightly pronounced
granulations	faint	highly marked	smooth	smooth	marked	marked	highly marked	slightly marked	flat	thin	marked
glandular fields	ovoid or semi-ovoid	long	absent	long	long	small	long	long	very small	elongated	long
cephalon lateral lobes	very small	small	reduced to a protrusion	reduced to a protrusion	reduced to a protrusion	moderate	prominent	small	small	slightly marked	prominent
pereonintes with transverse ridges	II–VII	no	no	I–VII	no	II–VII	no	no	no	II–VII	no
pleon in relation to pereon	retracted	slightly retracted	slightly retracted	retracted	retracted	slightly retracted	slightly retracted	retracted	highly retracted	somewhat retracted	slightly retracted
1st antennal flagellum in relation to 2nd	slightly smaller	almost equal (1st > 2nd)	double	slightly longer	slightly longer	slightly smaller	much longer	(approximately) equal	double	slightly longer	almost equal (1st > 2nd)
sexual differentiation on pereopod 1	yes	yes	yes	no	no	yes	yes	yes	yes	no	no
sexual differentiation on pereopod 2	yes	no	no	no	no	yes	no	yes	no	no	no
sexual differentiation on pereopod 3	yes	no	no	no	no	no	no	no	no	no	no
sexual differentiation on pereopod 7	no	no	no	no	no	no	no	no	no	no	no
♂ exopod of pleopod I: posterior inner tip	long and triangular	large with a big notch	small and triangular	long and pointed	absent or weakly discernible	large and pointed	very small	slightly marked	large and triangular	long and triangular	large and truncated
notched exopods of pleopod I and II (♂ and ♀)	yes	no	no	no	no	no	no	yes	no	no	no

the highest among the studied species (Fig. 1C). This is primarily attributed to the anterior location of the noduli on the tergite. The d/c coordinates and its relation with b/c are the lowest among the studied species (Figs 1C, 2A), with the noduli situated very close to the lateral edge on all pereonites, showing little variation in d/c coordinates (Fig. 1C). On the dorsal side of the integument, there are triangular scales arranged in a circle and triangular scale-setae with a very long and sharp tip (Fig. 3A). The

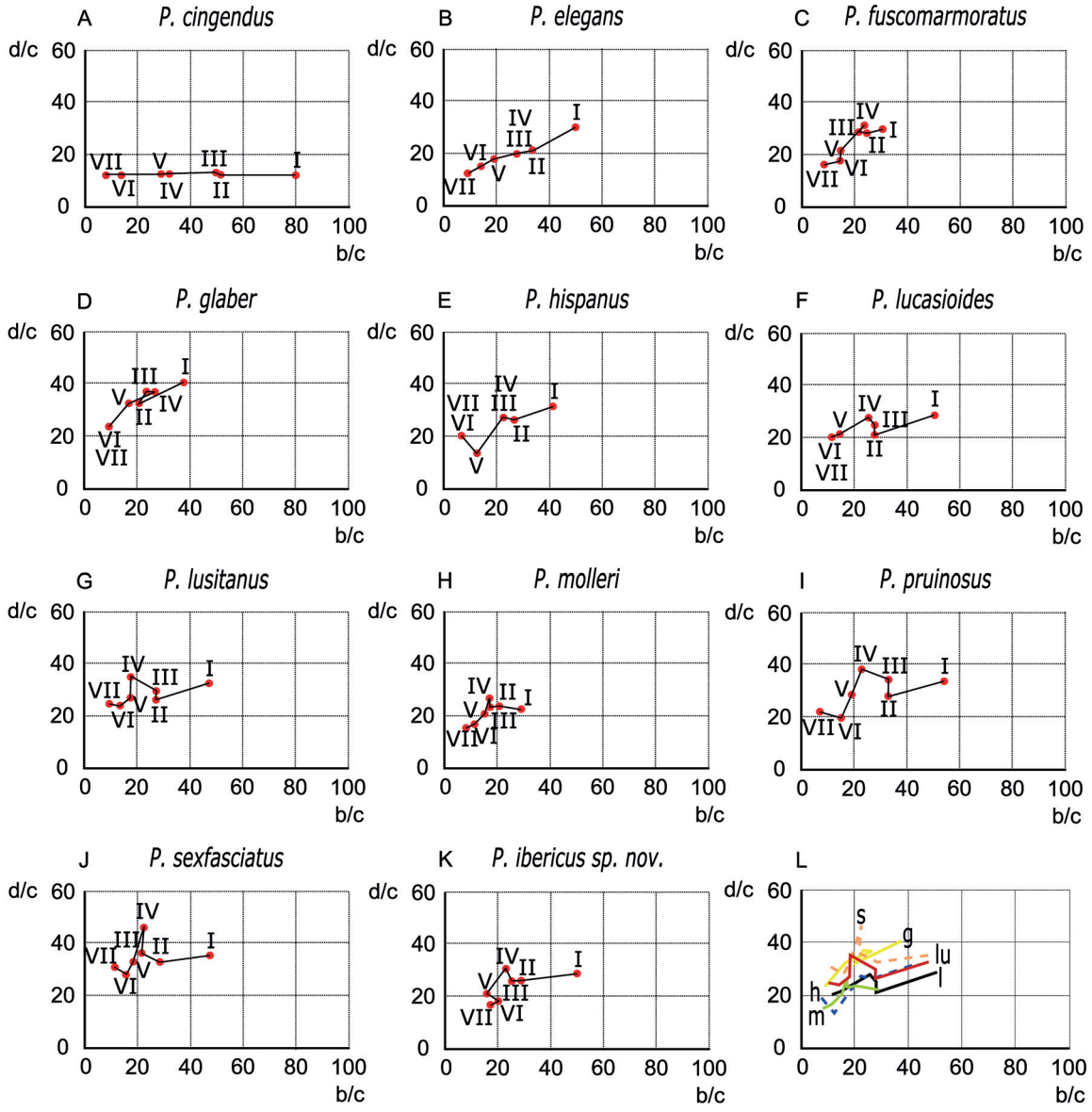

Fig. 2. Relation between noduli laterales coordinates (following Vandel 1960) d/c (y-axis) and b/c (x-axis) multiplied by 100 for all studied species. **A**. *Porcellionides cingendus* (Kinahan, 1857). **B**. *Porcellionides elegans* (Pollo Zorita, 1982). **C**. *Porcellionides fuscomarmoratus* (Budde-Lund, 1885). **D**. *Porcellionides glaber* (Koch, 1856). **E**. *Porcellionides hispanus* (Vandel, 1953). **F**. *Porcellionides lucasioides* (Vandel, 1953). **G**. *Porcellionides lusitanus* (Vandel, 1946). **H**. *Porcellionides molleri* (Verhoeff, 1901). **I.** *Porcellionides pruinosus* (Brandt, 1833). **J**. *Porcellionides sexfasciatus* (Budde-Lund, 1885). **K**. *Porcellionides ibericus* sp. nov. **L**. *P. sexfasciatus* and its previously considered subspecies: *P. glaber* (g), *P. hispanus* (h), *P. lucasioides* (l), *P. lusitanus* (lu), *P. molleri* (m) and *P. sexfasciatus* (s).

antennas are slender, with the first segment on the flagellum slightly smaller than the second. The pleon is highly retracted in relation to the pereon (Fig. 1A–B). The pereonites II to VII have a transverse ridge (Fig. 1A–B). The exopods of the pleopods I and II in both sexes have a notch (Figs 1D–E, 4A–D), and in males, the carpus of the pereopods 1 and 3 have a brush of setae, and the exopod I is triangular, with a large and rounded posterior inner tip (Figs 1D, 4A).

Distribution

Portuguese districts of **Braga**: Joane (Vandel 1946), Serra do Gerez (Vandel 1946, 1962); **Coimbra**: Luso (Arcangeli 1936, as *Porcellio lusitanorum* Arcangeli, 1936) and Mata do Buçaco (Vandel 1946); **Leiria**: Aljubarrota, Lagoa do Cão and Serra de Minde (Vandel 1946); **Lisboa**: Cavadal and Sintra (Vandel 1946); **Porto**: Regoa (Arcangeli 1936 as *Porcellio lusitanorum* Arcangeli, 1936), Boa Nova, Monte Pedral, Rio Tinto and São Pedro da Cova (Vandel 1946); **Viana do Castelo**: Britelo, Castanheira, central de Lindoso, Minho, Vascões and Vila Praia de Âncora (Gregory *et al.* 2012). It has been also reported from the Spanish provinces of **Asturias**: without locality (Vandel 1962); **Cantabria**: Potes (Dollfus 1892) and San Román (Vivar *et al.* 1984); **Coruña**: Finisterre (Cifuentes 2019) and Villa Rutis (Dollfus 1893); **Orense**: Avión, Beade, Beiro (Gregory *et al.* 2012), Los Peares (Schmölzer 1955a, 1971) and Sobradejo (Schmölzer 1955a, 1971); **Pontevedra**: Amorin, As Eiras, Bayona, Camposancos, Goján, Oia and Puerto de Moncelos (Gregory *et al.* 2012); **Vizcaya**: Larrabasterra, Lendoño de Arriba, Orduña, Plencia and Urduliz (Vivar *et al.* 1984).

It is recorded for the first time in the Portuguese districts of Aveiro, Bragança, Castelo Branco, Portalegre, Vila Real and Viseu, and the Spanish provinces of Álava, Lugo and Navarra (Fig. 5).

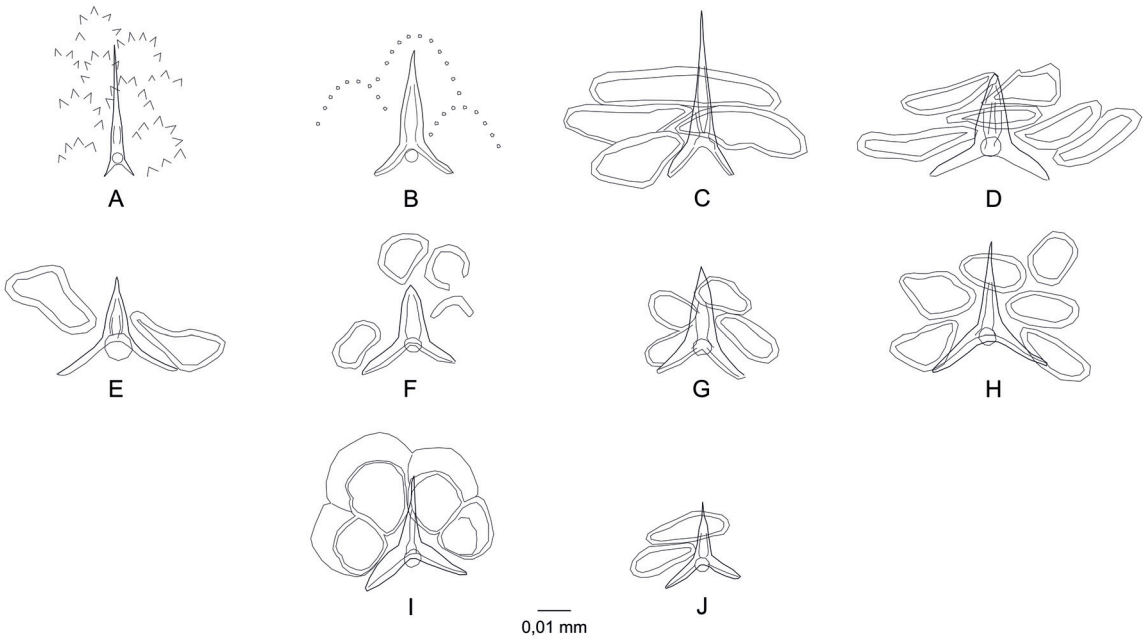

Fig. 3. Scale-setae. **A**. *Porcellionides cingendus* (Kinahan, 1857), ♂ (JC104). **B**. *Porcellionides elegans* (Pollo Zorita, 1982), ♂ (MNCN 20.04/7306). **C**. *Porcellionides fuscomarmoratus* (Budde-Lund, 1885), ♀ (MNCN 20.04/8129). **D**. *Porcellionides glaber* (Koch, 1856), ♀ (MNCN 20.04/11490). **E**. *Porcellionides hispanus* (Vandel, 1953), ♂ (MNCN 20.04/7163). **F**. *Porcellionides lucasioides* (Vandel, 1953), ♂ (JC352). **G**. *Porcellionides lusitanus* (Vandel, 1946), ♂ (LPS661). **H**. *Porcellionides molleri* (Verhoeff, 1901), ♀ (LPS135). **I**. *Porcellionides pruinosus* (Brandt, 1833), ♀ (JC318). **J**. *Porcellionides sexfasciatus* (Budde-Lund, 1885), ♂ (LPS455a). Scale bar = 0.01 mm.

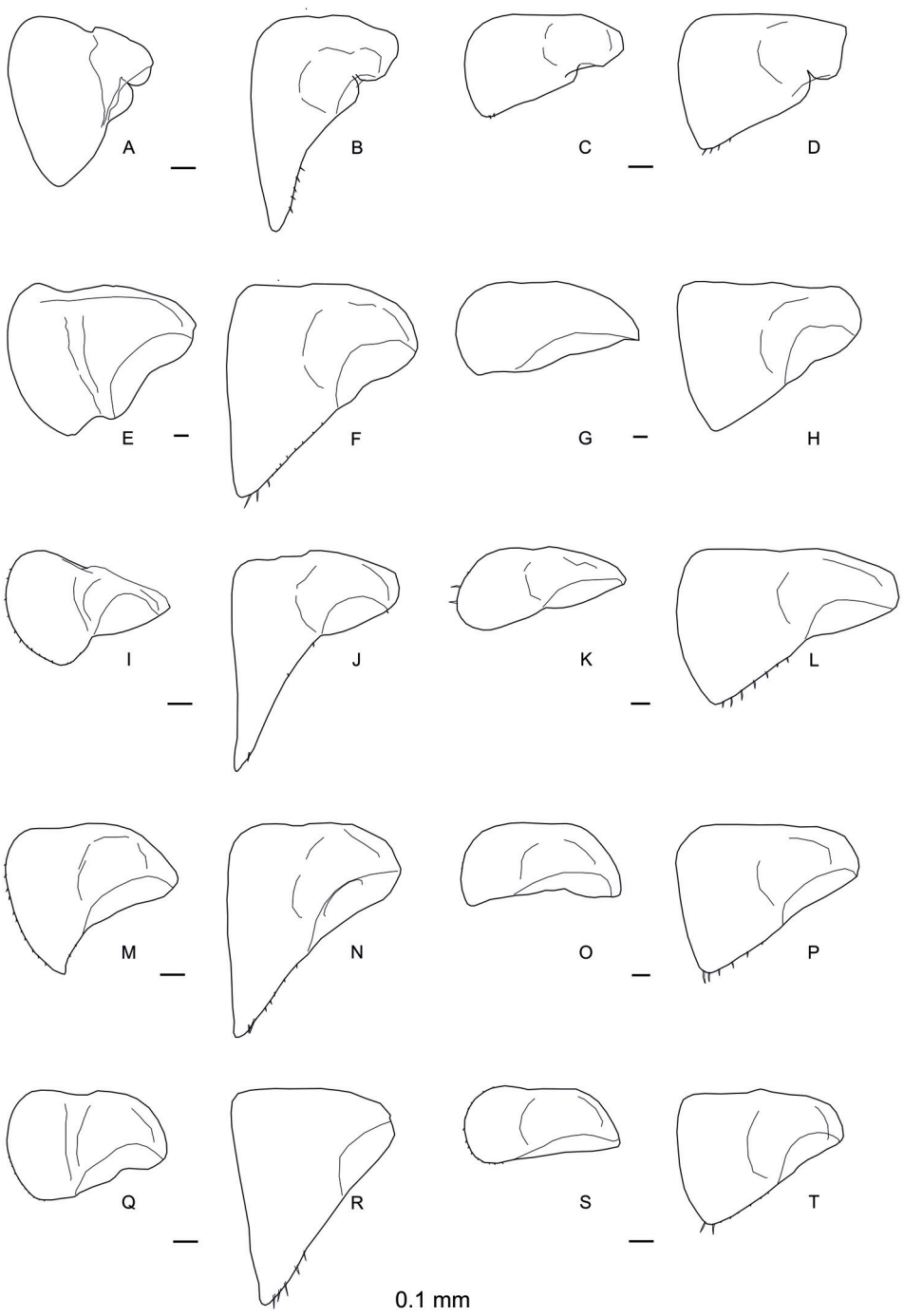

Fig. 4. Pleopods. **A–D**. *Porcellionides cingendus* (Kinahan, 1857). **A–B**. ♂ (LPS215). **A**. Exopod I. **B**. Exopod II. **C–D**. ♀ (MNCN 20.04/11972). **C**. Exopod I. **D**. Exopod II. **E–H**. *Porcellionides elegans* (Pollo Zorita, 1982). **E–F**. ♂ (JC490). **E**. Exopod I. **F**.Exopod II. **G–H**. ♀ (MNCN 20.04/9590). **G**. Exopod I. **H**. Exopod II. **I–L**. *Porcellionides fuscomarmoratus* (Budde-Lund, 1885). **I–J**. ♂ (UGMSS-2). **I**. Exopod I. **J**. Exopod II. **K–L**. ♀ (MNCN 20.04/8129. **K**. Exopod I. **L**. Exopod II. **M–P**. *Porcellionides glaber* (Koch, 1856). **M–L**. ♂ (MNCN 20.04/7886). **M**. Exopod I. **N**. Exopod II. **O**. ♀ (MNCN 20.04/11490), exopod I. **P**. ♀ (MNCN 20.04/11490), exopod II. **Q–T**. *Porcellionides hispanus* (Vandel, 1953). **Q–R**. ♂ (MNCN 20.04/7163). **Q**. Exopod I. **R**. Exopod II. **S–T**. ♀ (JC380). **S**. Exopod I. **T**. ♀ (JC380), exopod II. Scale bars = 0.1 mm.

Porcellionides elegans (Pollo Zorita, 1982)
Figs 2B, 3B, 4E–H, 6–7, Table 1

Metoponorthus elegans Pollo Zorita, 1982: 169, figs 1–2.

Material examined

PORTUGAL – **Évora** • 1 ♀; Alandroal; 38.7036° N, 7.3995° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS559 • 1 ♂; same collection data as for preceding; LPS560a • 2 ♀♀; same collection data as for preceding; LPS560b • 1 ♀; same collection data as for preceding; LPS562 • 1 ♂; Alandroal; 38.7036° N, 7.3998° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS565 • 1 ♂; Alandroal; 38.7037° N, 7.3997° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS566 • 2 ♀♀; Vila Viçosa; 38.7542° N, 7.4098° W; 3 Dec.2022; L.P. Da Silva leg.; LPS571 • 1 ♀; Vila Viçosa; 38.7555° N, 7.4105° W; 3 Dec. 2022; L.P. Da Silva leg.; LPS576. – **Portalegre** • 1 ♂; Anta de Valmor; 38.8408° N, 7.1882° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS555 • 1 ♂; Anta de Valmor; 38.8407° N, 7.1881° W; 2 Dec.2022; L.P. Da Silva leg.; LPS556 • 1 ♀; Anta de Valmor; 38.8405° N, 7.1882° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS557 • 1 ♂; Casa Branca; 38.9291° N, 7.8100° W; 3 Dec. 2022; L.P. Da Silva leg.; LPS586• 1 ♀; same collection data as for preceding; LPS587.

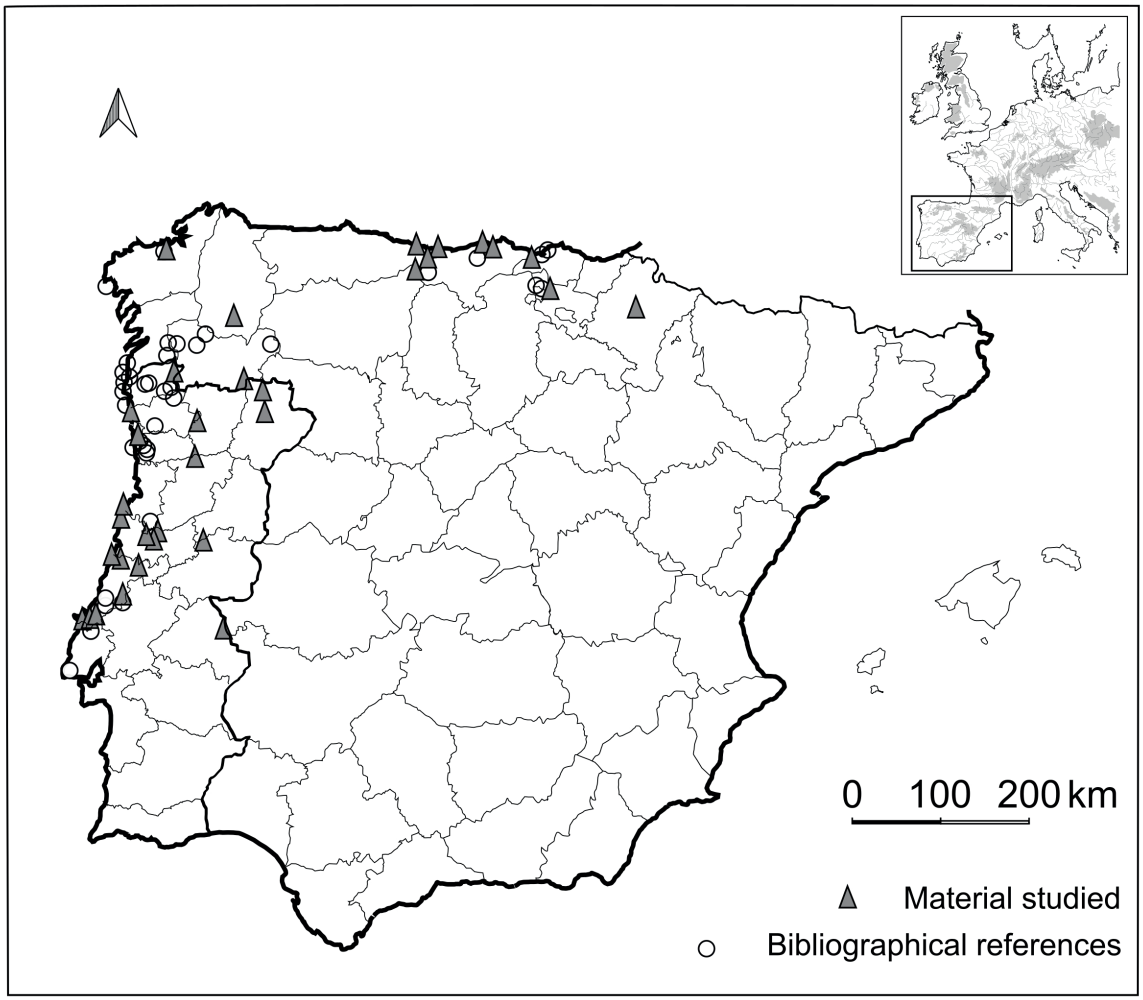

Fig. 5. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides cingendus* (Kinahan, 1857).

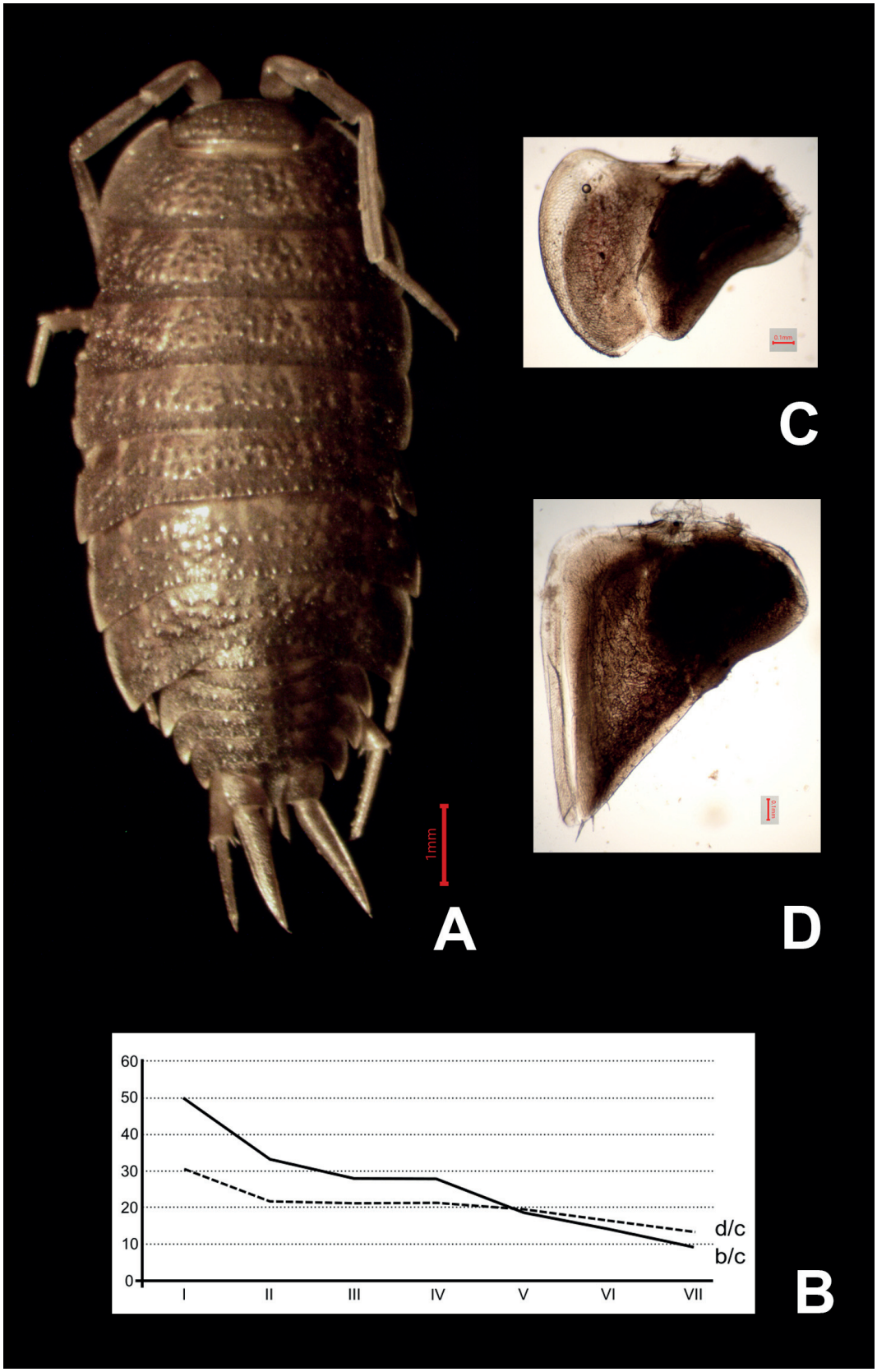

Fig. 6. *Porcellionides elegans* (Pollo Zorita, 1982), ♂ (JC490). **A**. Habitus. **B**. Noduli laterales coordinates. **C**. Exopod I. **D**. Exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

SPAIN – **Ávila** • 15 ♂♂, 12 ♀♀; La Adrada; 5 May 1982; A. Pollo leg.; MNCN 20.04/7274 • 3 ♂♂, 2 ♀♀; Piedralaves; 21 May 1982; A. Pollo leg.; MNCN 20.04/7190 • 3 ♂♂, 5 ♀♀; Piedralaves; 27 Nov. 1984; E. Ortiz de Vega leg.; MNCN 20.04/8150 • 5 ♂♂, 7 ♀♀; Piedralaves; 21 Oct. 1982; A. Pollo leg.; MNCN 20.04/7306. – **Cáceres** • 2 ♀♀; Almoharín; 14 Apr. 1979; C. Cabrerizo leg.; MNCN 20.04/9709 • 1 ♂; Guadalupe; 20 Mar. 1966; E. Ortiz de Vega leg.; MNCN 20.04/9874 • 1 ♀; Villar del Pedroso; 9 Oct. 2021; J. Cifuentes leg.; JC485 • 6 ♂♂, 3 ♀♀; Villar del Pedroso; 16 Oct. 2020; J. Cifuentes leg.; JC490. – **Madrid** • 6 ♂♂, 10 ♀♀; Aldea del Fresno; 1 Apr. 1953; E. Ortiz de Vega leg.; MNCN 20.04/9590.

Remarks

The illustration of the male exopod of the pleopod I in Arcangeli (1936), as part of his redescription of *Porcellio* (*Porcellionides*) *molleri*, allowed Pollo Zorita (1982, 1986a) to identify the specimens studied by Arcangeli (1936) as belonging to the species *Porcellionides elegans*, a species she described herself. To aid in the identification of this species, it can be noted that its integument shows pronounced granulations (Fig. 6, Table 1). The noduli laterales shift their location from the anterior region on the first pereonites towards the posterior region and edge, particularly in the last three pereonites (Figs 2B, 6B). The scale-setae are triangular with long tips (Fig. 3B). It lacks the transverse ridges on the pereonites

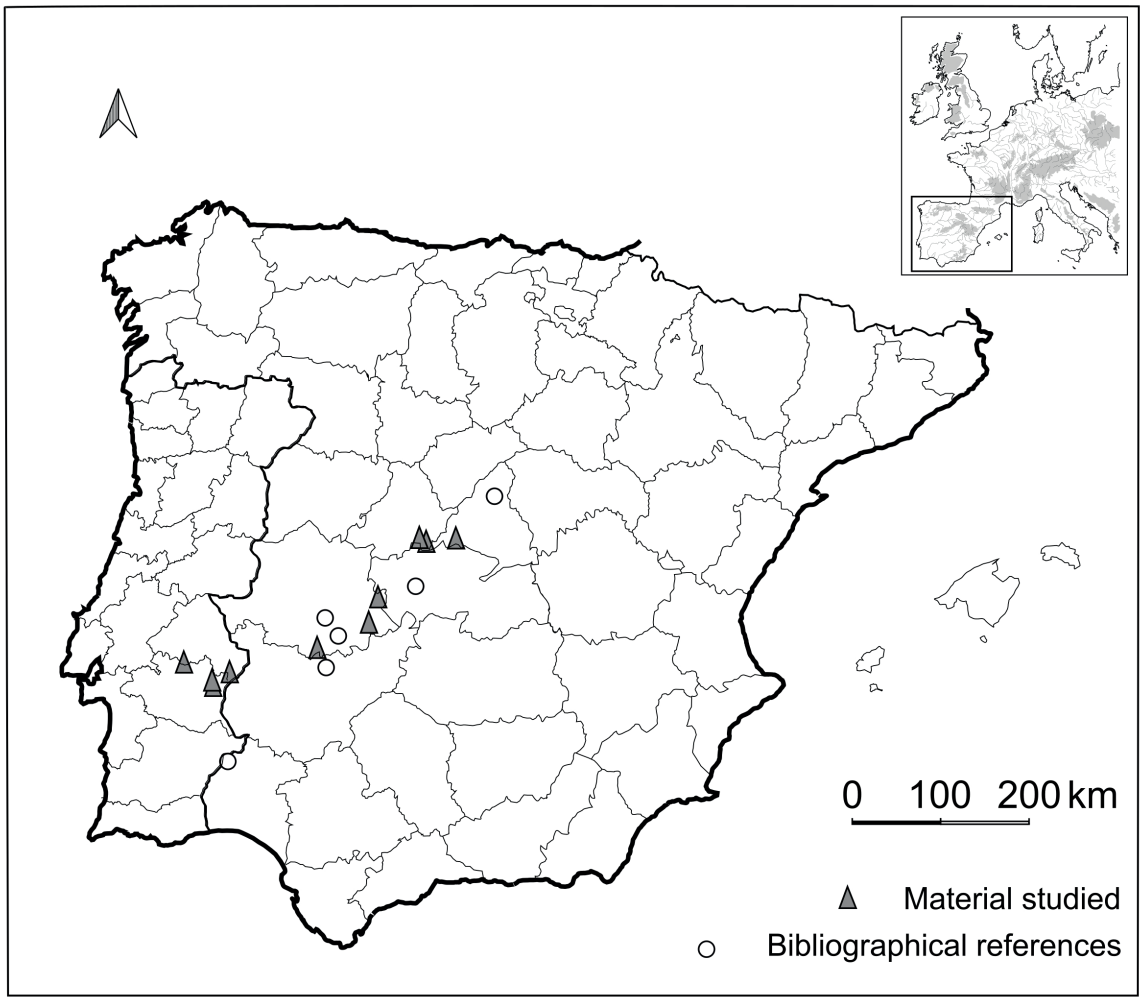

Fig. 7. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides elegans* (Pollo Zorita, 1982).

(Fig. 6, Table 1). In males, the carpus of the pereopod 1 has a brush of setae, and the exopod of the pleopod I has a large notch on the posterior inner tip (Figs 4E, 6C), while the exopod of the pleopod II is triangular, almost as wide as it is long (Figs 4F, 6D). In females, the pleopodal lungs of the exopods in the first two pairs lack notches (Fig. 4G–H), similar to the males.

Distribution

Only known from the Iberian Peninsula in the Portuguese districts of **Beja**: Beja (Arcangeli 1936; Pollo Zorita 1982, 1986a); and the Spanish provinces of **Badajoz**: Don Benito (Garcia *et al.* 2021); **Cáceres**: Trujillo and Zorita (Garcia *et al.* 2021); **Madrid**: Guadalix de la Sierra (Pollo Zorita 1982, 1986a, 2015); **Toledo**: San Bartolomé de las Abiertas (Pollo Zorita 1982, 1986a, 2015).

It is recorded for the first time in the Portuguese districts of Évora and Portalegre and the Spanish province of Ávila (Fig. 7).

Porcellionides fuscomarmoratus (Budde-Lund, 1885)
Figs 2C, 3C, 4I–L, 8–9, Table 1

Metoponorthus fuscomarmoratus Budde-Lund, 1885: 189.

Material examined

SPAIN – **Granada** • 2 ♀♀; Lanjarón; 25 Mar. 2023; J.D. Gilgado and V.M. Pillado leg.; JC758 • 3 ♂♂, 5 ♀♀; Tajos del Campanario, Sierra Nevada; 2973 m a.s.l.; Aug. 2013–Aug. 2014; A. Tinaut leg.; UGMSS-2 • 4 ♀♀; Sierra Nevada (Monte caballo); 4 Oct. 1965; MNCN 20.04/8129.

The latest specimens are cited by Cifuentes (2021a). Furthermore, 179 other specimens were previously studied, consisting of 38 males, 136 females and 5 immatures in earlier works (see Cifuentes 2021b; Cifuentes *et al.* 2021).

Remarks

This species is easily recognized by having a highly convex body (Table 1) and by its brown-yellowish coloration, with a distinct marbling pattern (Fig. 8A). It lacks granulations. The position of the noduli laterales shows little variation across tergites, although they follow the general pattern of being situated closer to the lateral and posterior edges in an anterior-posterior direction (Figs 2C, 8B). Scales-setae are triangular with very long and fine tips (Fig. 3C). The lateral lobes of the cephalon are reduced to protrusions. There is no transverse ridge on the pereon (Fig. 8A, Table 1). The pleon is more or less retracted in relation to the pereon. In males, the carpus of the pereopod 1 has a brush of setae, the exopod of the pleopod I has a short, triangular, and pointed posterior inner tip (Figs 4I, 8C), and the exopod of the pleopod II is triangular with a very long posterior inner tip (Figs 4J, 8D). In females, they are similar to those of other studied species within the genus (Fig. 4K–L).

Distribution

Only in the eastern part of the Ibero-Balearic region (Fig. 9). Spanish providences of **Almería:** Dalias (Vandel 1953), Felix, Fondón, María and Vélez Rubio (Cifuentes *et al.* 2021); **Córdoba:** Santa María de Trassierra (Garcia 2019); **Granada:** Sagra (Vandel 1953) and Sierra Nevada (Vandel 1953; Cifuentes 2021a); **Islas Baleares:** Cabrera (Garcia & Cruz 1993, 1996), Dragonera (Garcia 2008), Ibiza (Garcia & Cruz 1996) and Mallorca (Garcia & Cruz 1996; Garcia 2009); **Jaén:** Cazorla (Garcia 2013), Poblado de Vadillo-Castril, Quesada and Sierra de Cazorla (Cifuentes 2021a); **Málaga:** Antequera (Dollfus 1892); **Murcia:** Sierra de Espuña (Cifuentes 2021b) and Yecla (Garcia 2019).

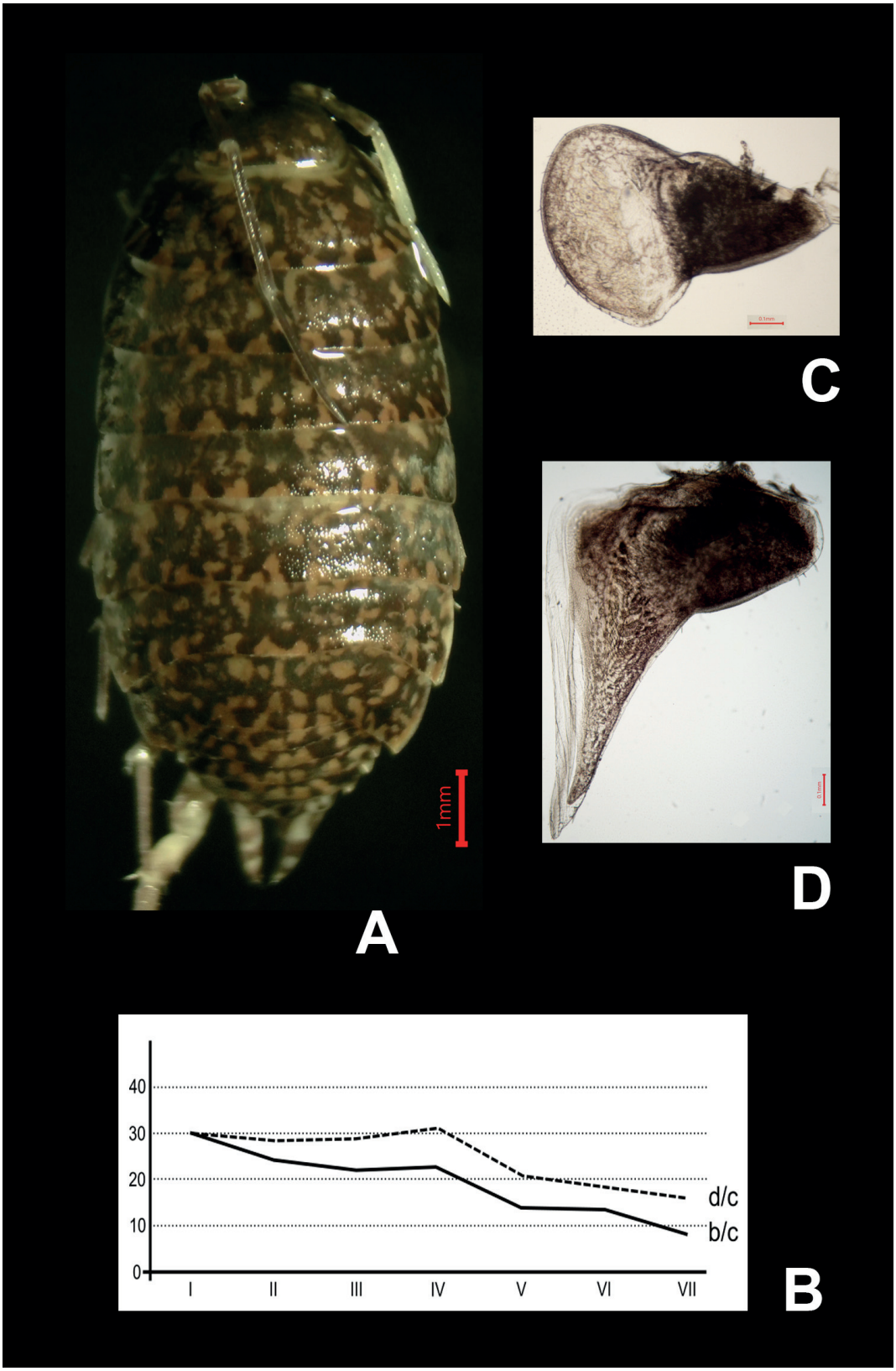

Fig. 8. *Porcellionides fuscomarmoratus* (Budde-Lund, 1885). **A**. ♀ (JC758), habitus. **B**. Noduli laterales coordinates. **C**. ♂ (UGMSS-2), exopod I. **D**. ♂ (UGMSS-2), exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

Porcellionides glaber (Koch, 1856)
Figs 2D, L, 3D, 4M–P, 10–11, Table 1

Porcellio glaber Koch, 1856: 420.
Metoponorthus sexfasciatus glaber Vandel, 1961: 257.

Metoponorthus glaber – Vandel 1953: 48, fig 1.

Material examined

SPAIN – **Cádiz** • 2 ♂♂, 1 ♀; Algeciras; 13 Jan. 1907; Arias leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/12308 • 2 ♂♂, 3 ♀♀; Arcos-Bornos; 25 Nov. 2004; M. García Paris leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/6120 • 1 ♀; Puerto Real, Las Canteras; 24 Nov. 2004; M. García Paris leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/12315 • 6 ♂♂, 19 ♀♀; Tarifa; 22 Feb. 1912; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/10003 • 4 ♂♂; Sierra de Cádiz; J. García leg., JC527. – **Gibraltar** • 1 ♂, 15 ♀♀; Gibraltar; 19 Feb. 1912, MNCN 20.04/12385. – **Huelva** • 1 ♂; Alájar; 23 Apr. 1980; E. Ortiz de Vega leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/9482 • 3 ♂♂, 10 ♀♀; Cala;

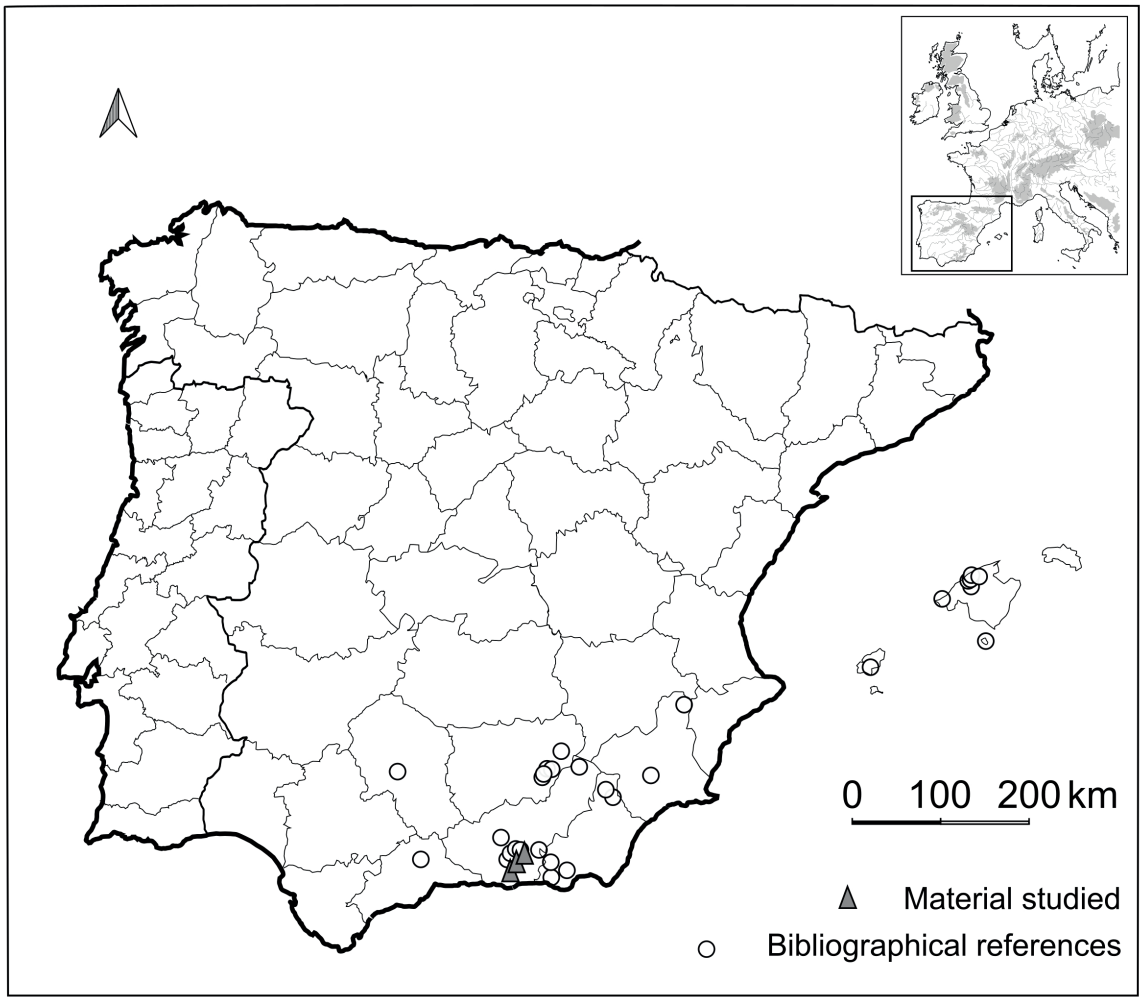

Fig. 9. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides fuscomarmoratus* (Budde-Lund, 1885).

Feb. 1915; C. Bolívar and J. Fernández Nonidez leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/8058 • 2 ♂♂, 13 ♀♀; Doñana; 14 May 1966; E. Ortiz de Vega leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/7886 • 6 ♂♂, 11 ♀♀; Doñana; 23 Apr. 1980; E. Ortiz de Vega leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/9919. – **Islas Baleares** • 5 ♂♂; Menorca, Ciutadella, Platja dels Algaiarens - La Vall; 23 Mar. 1989; A. Cruz leg.; A. Cruz coll., CRBA-86565 • 7 ♂♂; Maó, Es Grau; 21 Mar. 1989; A. Cruz leg.; A. Cruz coll., CRBA-86562. – **Málaga** • 4 ♂♂, 16 ♀♀; Benaoján; 6 May 1952; E. Ortiz de Vega leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); MNCN 20.04/11490 • 2 ♂♂; Serranía de Ronda, Puerto del Pozuelo, Sierra Nieves; 16 Apr. 1987; O. Escolà leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a); A. Cruz coll.; CRBA-86540.

Description

Coloration. Color varies among different specimens, ranging from dark brown to reddish, with well-defined muscle insertions (Fig. 10A–B). First two antenna segments, pleonite epimera, and tips of neopleurons display lighter color, sometimes whitish or intensely red.

Integumentary characters. Integument smooth and shiny (Fig. 10A–B) or with some very thin granulations (Table 1). Glandular fields at lateral edge of pereonites epimera with numerous pores. Noduli laterales located in small depigmented area, slightly separated from edge, with b/c and d/c coordinates as in Figs 2D, 10C. Scale-setae triangular, very small, but with wide tip (Fig. 3D).

Somatic characters. Body bulged (Fig. 10A–B). Cephalon with softly arched frontal line, lateral lobes reduced to protrusions, and supra-antennal line prominently marked. Pereon with nearly straight posterior edge for first three pereonites and all pereonites present highly noticeable transverse ridge curving over noduli laterales. Pleon retracted in relation to pereon. Telson with very small base and broadly triangular tip with pointed end.

Appendages. Antennae extend beyond posterior edge of pereonite III, first segment of flagellum longer than second. Uropods with protopod slightly longer than telson tip, featuring transversely oriented posterior edge. Endopods much longer than telson. Exopods elongated and conical in both sexes. Pereopods without sexual differentiation.

Male sexual characters. Exopod of pleopod I with inner lobe ending in curved tip (Figs 4M, 10D). Exopod of pleopod II triangular with long posterior inner tip (Figs 4N, 10E). In females (Fig. 4O–P), only first exhibits small tip, and second similar to those of other studied species.

Remarks

This species was initially described as *Porcellio glaber* by Koch (1856). It was subsequently placed within the genus *Metoponorthus* Budde-Lund, 1879 as *Metoponorthus glaber* by Budde-Lund (1885), and treated similarly by Vandel (1946). Later, Vandel (1953) considered the possibility that it might be a species with uncertain status, or alternatively, a form or subspecies of *P. sexfasciatus*. In later works, Vandel referred to it as a subspecies of *Porcellionides sexfasciatus* (Budde-Lund, 1885) in his studies from Menorca (Vandel 1961) and France (Vandel 1962). Currently, *P. glaber* is commonly regarded as nomen dubium (Boyko *et al.* 2023).

The original description of this species by Koch (1856), generally follows the common practices of its time, presenting few truly distinguishing characters for the species. Some important details from its description include: species exhibits a shiny, moderately convex and elongated body; antennae are long and slender, with the first segment of the antennal flagellum slightly longer than the second; lateral lobes are absent from the cephalon, replaced by a narrow crest; cephalon is grey, and the first antennal segments

are reddish-brown; and the dorsal surface of the tergites exhibits a transverse ridge. Lastly, Koch (1856) adds that it is not uncommon in Málaga. Budde-Lund (1885) provides several additional details, as follows: species possesses a convex, smooth, shiny appearance, lacking middle and lateral lobes; telson is triangular with slightly curved sides, and their coloration varies from black to brown. Additionally, he also mentions that this species is present in Málaga. While these descriptions suggest that this species shares similar characters with other species within the *Porcellionides* genus, including *P. sexfasciatus*, none of the previous authors mention the presence of more or less pronounced longitudinal lines. Such lines are highlighted by Budde-Lund (1885) for *P. sexfasciatus*, and they are distinctive enough to have earned the species its name.

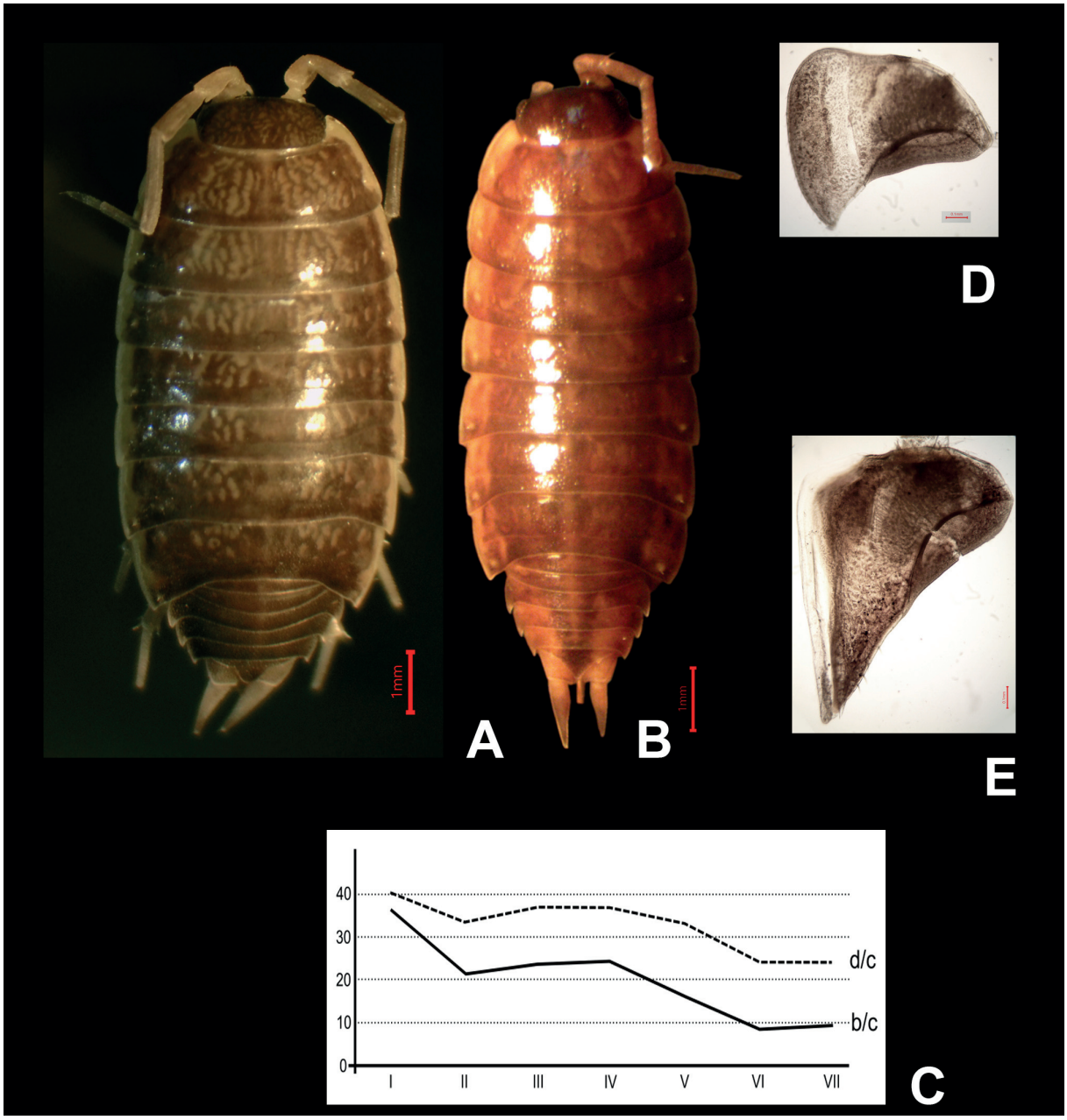

Fig. 10. *Porcellionides glaber* (Koch, 1856). **A–B**. ♂ (JC527), habitus. **C**. Noduli laterales coordinates. **D–E**. ♂ (MNCN 20.04/7886). **D**. Exopod I. **E**. Exopod II. Scale bars: A–B = 1 mm; D–E = 0.1 mm.

In his work on isopods of Portugal, Vandel (1946), describes three new subspecies for *P. sexfasciatus*: *P. sexfasciatus bernardi* (Vandel, 1946), *P. sexfasciatus lusitanus* (Vandel, 1946), and *P. sexfasciatus mamorensis* (Vandel, 1946). He justifies their inclusion within the same specific entity, *P. sexfasciatus*, based on the presence of transverse ridges on the tergites, scale-setae, scale structures, and glandular fields (Vandel 1946: 267). However, these characteristics are also found in other species of the genus, although the scale-setae are not identical across all of them (Fig. 3). Regarding *P. sexfasciatus mamorensis*, important characters highlighted by Vandel (1946: 263 and onwards) include the presence of granulations that are particularly challenging to discern. In males, the carpus and merus of the pereopod 1 exhibit a dense brush of setae, as well as a sharply curving posterior inner tip on the exopod of the pleopod I (Vandel 1946: 266, fig. 80e), which is set apart from the base by a small projection. Concerning its geographical range, this subspecies appears to be localized in a small region in Morocco.

We examined several specimens that align with the descriptions provided by Koch (1856) and Budde-Lund (1885) for their *Porcellio glaber*. These specimens also correspond to the descriptions provided by Vandel (1946) for *P. sexfasciatus lusitanus* and for *P. s. mamorensis*. Among these specimens, some originate from Benaojan (Málaga), located 37 km in a straight line from Casarabonela, which is the

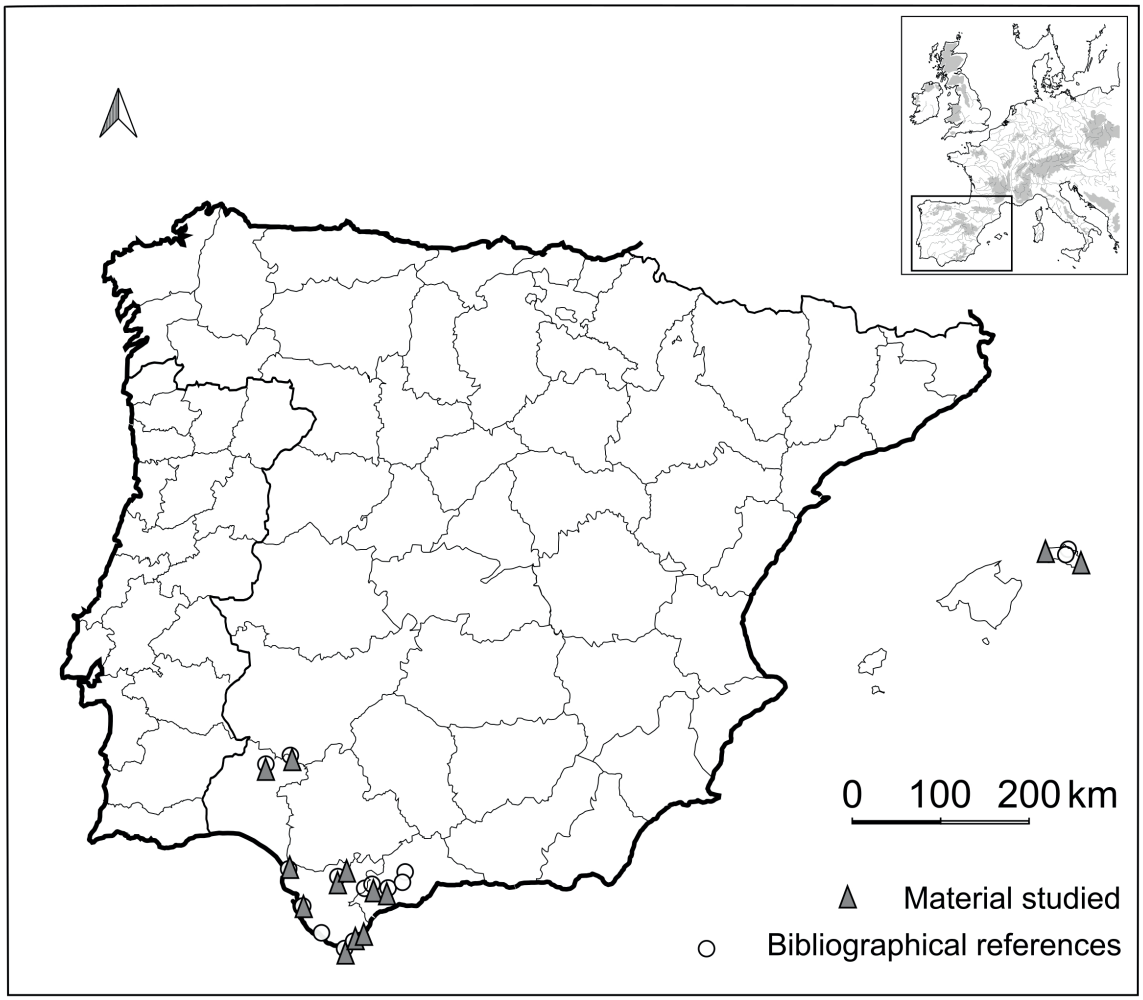

Fig. 11. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides glaber* (Koch, 1856).

type locality according to Koch, along with others from various locations in Andalusia. To aid the identification of *P. glaber*, we provide a brief species description above.

Porcellionides glaber can be distinguished from *P. sexfasciatus* by its highly convex body, smooth integument, the presence of transverse ridges on all tergites, the noduli laterales position, the broad-tipped scale-setae and in males, by the exopod of the pleopod I with a very fine and curved posterior inner tip. In contrast, the body of *P. sexfasciatus* body is elongated, with thin granulations on the integument, lacking transverse ridges on the first pereonite, scale-setae with a sharp tip, and, in males, the exopod of the pleopod I exhibits a very wide and elongated posterior inner tip. Based on the aforementioned characters, we validate the species described by Koch as *P. glaber* (Koch, 1856). Unfortunately, we were unable to analyse specimens of *P. s. mamorensis* from North Africa, but this subspecies differs from *P. glaber* in the carpus and merus of the pereopod 1, which possess a dense brush of setae, in contrast with their absence in *P. glaber*. Furthermore, as will be explained in detail below, some of the specimens identified by Vandel (1946) as *P. s. lusitanus*, based on the morphology of the male pleopod I and the absence of sexual differentiation in the pereopods, are likely to be *P. glaber*.

Distribution

Found in the southern part of Spain and in the northern region of Africa (Morocco), based on specimens identified by Vandel (1946) as *P. s. lusitanus* from Mamora. There is a record from Mont Estoril, Lisbon, Portugal, by Jackson (1926). However, this citation is highly likely to be an identification error, possibly resulting from confusion with other species due to its coloration. *Porcellionides glaber* is typically found in considerably drier environments compared to those found in Mont Estoril, as indicated by its established distribution range (Fig. 11).

In Spain, it has been reported from the provinces of **Cádiz**: Vejer de la Frontera and Villaluenga del Rosario by Cruz (1991), Algeciras, Arcos-Bornos, Puerto Real, Tarifa and Vejer de la Frontera by Cifuentes (2021a), in both references identified as *P. sexfasciatus lusitanus;* **Huelva**: Alájar, Cala and Doñana by Cifuentes (2021a) identified as *P. sexfasciatus lusitanus*; **Islas Baleares**: Menorca, as P. *sexfasciatus glaber* by Vandel (1961) and Cruz (1989); **Málaga**: Carratraca, Casarobonela (Budde-Lund 1885), Málaga (Koch 1856), Puerto del Pozuelo by Cruz (1991), Benaoján and Puerto del Pozuelo by Cifuentes (2021a), with the latter two references identifying it as *P. sexfasciatus lusitanus*.

It is recorded for the first time in the Spanish provinces of Cádiz and Huelva as well as for Gibraltar (Fig. 11).

Porcellionides hispanus (Vandel, 1953)
Figs 2E, L, 3E, 4Q–T, 12–13, Table 1

Metoponorthus sexfasciatus hispanus Vandel, 1953: 269, figs 80, 84–85.

Material examined

SPAIN – **Almeria** • 2 ♂♂; Almeria, Barranco de El Palmer carretera de Roquetas; 17 Feb. 1984; A. Pollo leg.; MNCN 20.04/7163 • 5 ♀♀; same collection data as for preceding; cited by Cifuentes (2021a); MNCN 20.04/7302. – **Granada** • 5 ♂♂, 6 ♀♀; Tocón de Quentar; 11 Apr. 2019; J. Cifuentes and A. Tinaut leg.; cited by Cifuentes (2021a); JC380. – **Huelva** • 1 ♂; Doñana; 2 May 1968; E. Ortiz de Vega leg.; MNCN 20.04/12320. – **Madrid** • 2 ♀♀; Madrid; 6 Apr. 1955; E. Ortiz de Vega leg.; MNCN 20.04/12389 • 2 ♂♂; Madrid; 21 Jun. 1978; A. Pollo leg.; MNCN 20.04/6929 • 3 ♀♀; same collection data as for preceding; MNCN 20.04/6934. – **Málaga** • 1 ♀; Ardales; 14 Apr. 2019; J. Cifuentes leg.;

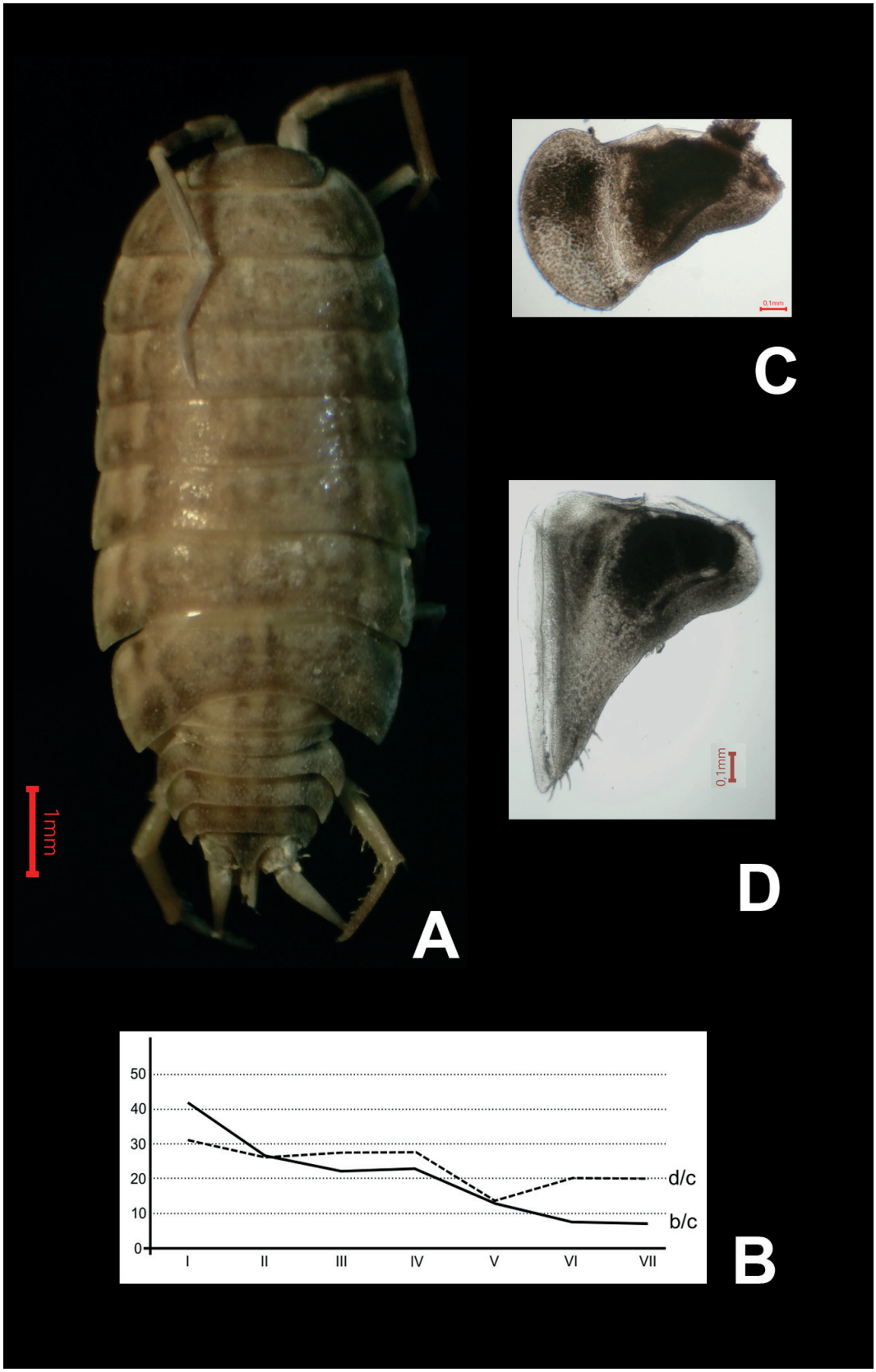

Fig. 12. *Porcellionides hispanus* (Vandel, 1953), ♂ (JC380). **A**. Habitus. **B**. Noduli laterales coordinates. **C.** Exopod I. **D**. Exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

cited by Cifuentes (2021a); JC390. – **Toledo** • 4 ♂♂, 3 ♀♀; Toledo; 23 Apr. 1967; E. Ortiz de Vega leg.; MNCN 20.04/12394.

Remarks

The original description of *Metoponorthus sexfasciatus hispanus*, by Vandel (1953) indicates that it is intermediate between *M. s. molleri* and *M. s. lusitanus*. Vandel identified several distinguishing characters, such as the overall well-marked granulations, a transverse ridge on the pereonite VII with a surrounding row of granulations, and, in males, the absence of a brush of setae on the carpus of the pereopod 1, along with the lack of an inner lobe on the exopod of the pleopod I.

While this species exhibits the closest morphological similarity to *P. sexfasciatus*, the characters highlighted by Vandel (1953) enable their differentiation. The overall coloration is light brown (Fig. 12A). The noduli laterales coordinates are notably lower than those in *P. sexfasciatus*, especially d/c (Figs 2E, L, 12B). The scale-setae are short (Fig. 3E), but larger than those in *P. sexfasciatus*. The cephalon lacks lateral lobes (Table 1), and no transverse ridge is present on any pereonite, though, as noted by Vandel (1953), a row of granulation is present in this region. The antennae are remarkably long and thin. In males, the exopod of the pleopod I lacks a posterior inner tip or is only faintly discernible (Figs 4Q, 12C). These characters differ from those observed in *P. sexfasciatus*. However, the male exopod of the pleopod II (Figs 4R, 12D), as well as the exopods of the females (Fig. 4S–T), resemble those of

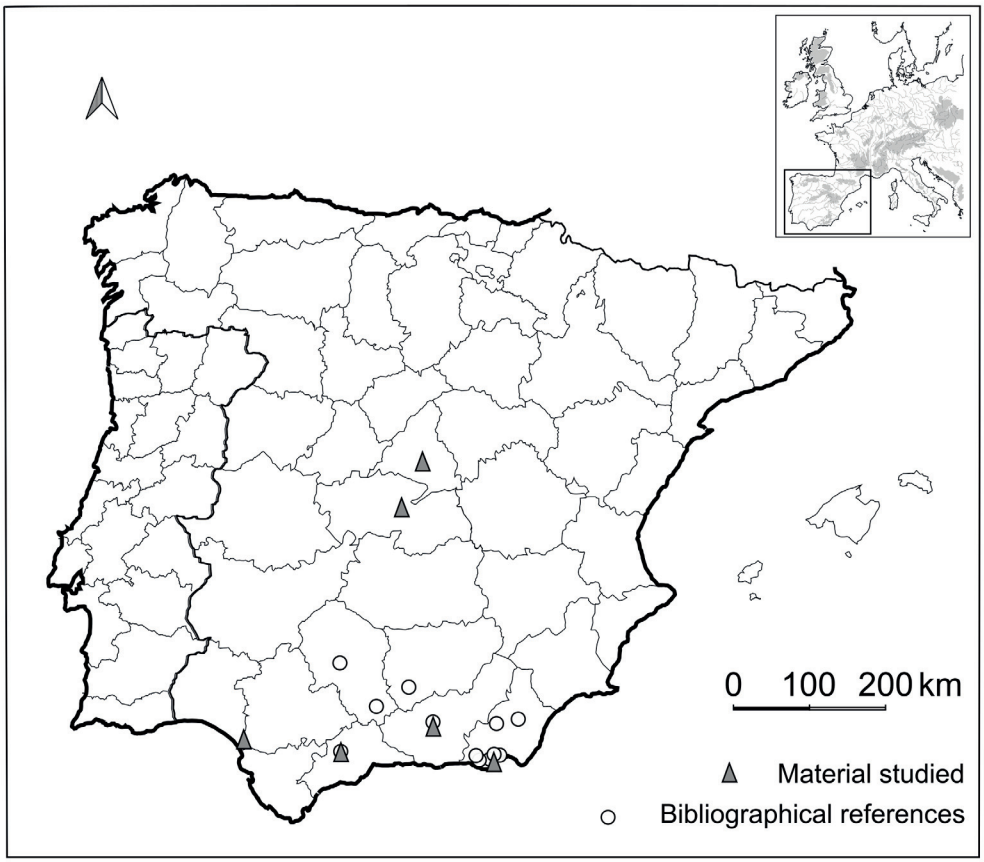

Fig. 13. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides hispanus* (Vandel, 1953).

P. sexfasciatus. Nevertheless, given the significant observed differences, we consider *P. hispanus* as a valid species.

Distribution

Spanish providences of **Almería**: Aguadulce, Albanchez, Dalias, El Alquian, El Egido (Vandel 1953), El Palmer (Vandel 1953; Cifuentes 2021a), La Garrofa and Sierra de los Filabres (Vandel 1953); **Córdoba**: Carcabuey and El Bejarano (Garcia 2019); **Granada**: Tocón de Quentar (Cifuentes 2021a); **Jaén**: Peñas (Garcia 2019); **Málaga**: Ardales (Cifuentes 2021a).

It is recorded for the first time in the Spanish provinces of Huelva and Madrid (Fig. 13).

Porcellionides lucasioides (Vandel, 1953)
Figs 2F, L, 3F, 14, 15A–D, 16, Table 1

Metoponorthus sexfasciatus lucasioides Vandel, 1953: 52, fig. 2.

Material examined

SPAIN – **Almeria** • 8 ♂♂, 5 ♀♀; Nijar, Cabo de Gata; 15 Feb. 1984; A. Pollo leg.; cited by Cifuentes (2021a); MNCN 20.04/7164. – **Córdoba** • 2 ♂♂; Venta del Charco; 3 Apr. 1985; J. Cifuentes leg.; cited by Cifuentes (2021a); JC352 • 17 ♀♀; same collection data as for preceding; cited by Cifuentes (2021a); JC216. – **Murcia** • 4 ♀♀; Cabo Tiñoso; 14 May 2022; I. Escarabajal Bernabé leg.; JC649 • 1 ♂; same collection data as for preceding; JC648.

Remarks

Vandel (1953: 52) originally classified this taxon as a subspecies of *P. sexfasciatus*. He indicated distinctive characters, including pronounced granulations (Fig. 14A), few pores in the glandular fields, cephalon with a small median lobe, and medium-sized lateral lobes. In males, the carpus of the pereopods 1 and 2 possess dense setae, and the exopod I has a widened inner lobe at the base, terminating in a fine, narrow point (Figs 14C, 15A). The b/c and d/c coordinates are relatively low (Figs 2F, L, 14B). Additionally, it is noteworthy that the scale-setae possess a broad tip (Fig. 3F). The male exopod of the pleopod II is triangular (Figs 14D, 15B). Females exhibit a minor incision in the tracheal field on exopods I and II (Fig. 15C–D). Considering the aforementioned, we consider that *P. lucasioides* (Vandel, 1953) possesses sufficient distinct characters to be considered a valid species (Table 1), rather than a subspecies of *P. sexfasciatus*.

In some specimens of both immature and adult *P. lucasioides*, the inner tip of the exopod I is occasionally underdeveloped, which increases the potential for misidentification with *P. glabe*r. However, distinguishing between these two species is feasible, as *P. lucasioides* has pronounced granulations and medium-sized lateral lobes on the cephalon, while *P. glabe*r either presents a smooth body or, in some specimens, may have sparse and very fine granulations on the cephalon, and lacks lateral lobes.

Distribution

Spanish providences of **Almería**: Fondón, Laujar de Andarax (Vandel 1953) and Níjar (Cifuentes 2021a); **Ávila**: Piedralaves (Pollo Zorita 1986b); **Córdoba**: Morrón Grande (Garcia 2019) and Venta del Charco (Cifuentes 2021a); **Cuenca**: Ruinas de Segóbriga (Pollo Zorita 1986a, 2015); **Jaén**: Peñas (Garcia 2019).

It is recorded for the first time in the Spanish province of Murcia (Fig. 16).

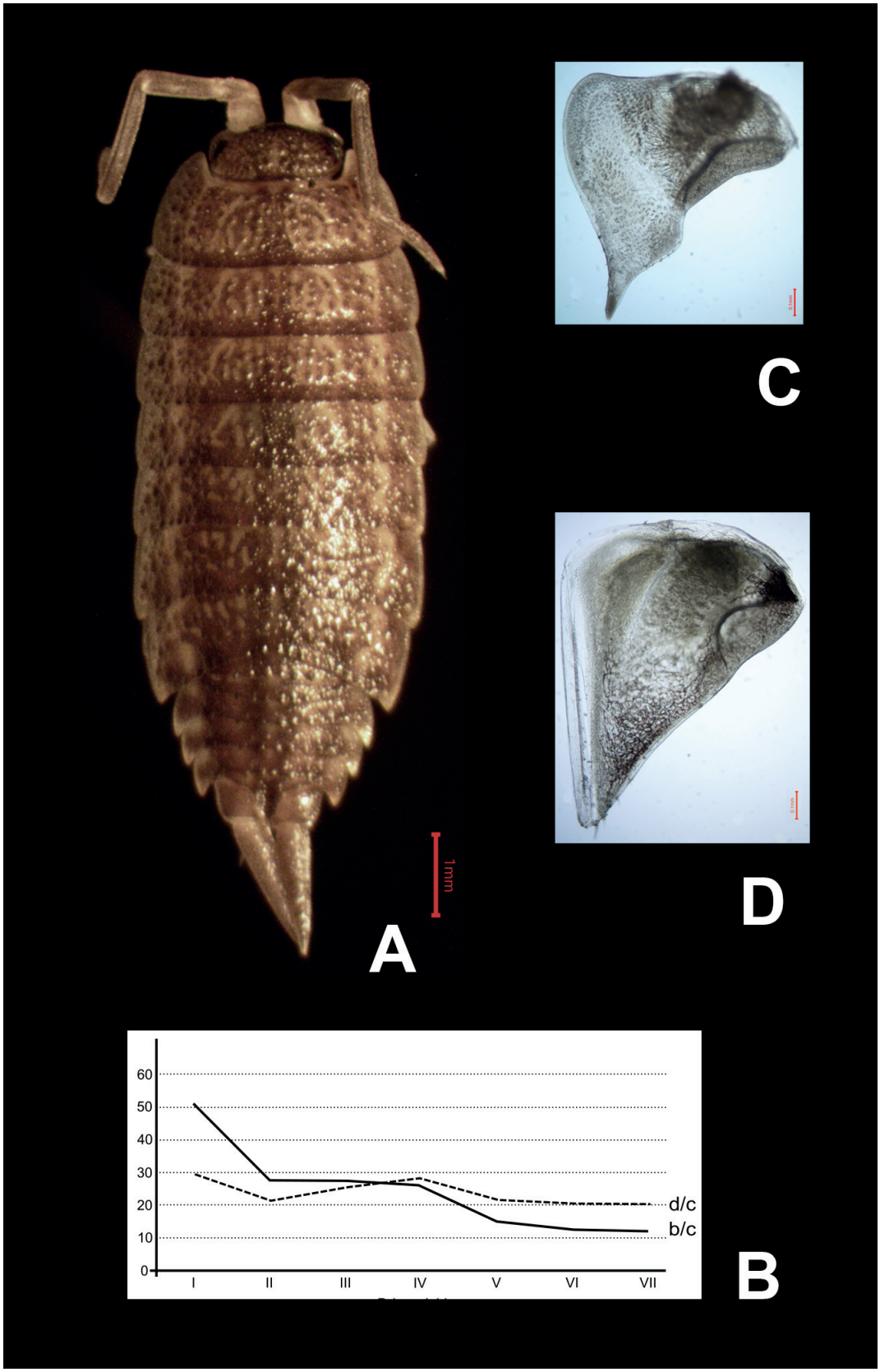

Fig. 14. *Porcellionides lucasioides* (Vandel, 1953), ♂ (JC648). **A**.Habitus. **B**. Noduli laterales coordinates. **C**. Exopod I. **D**. Exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

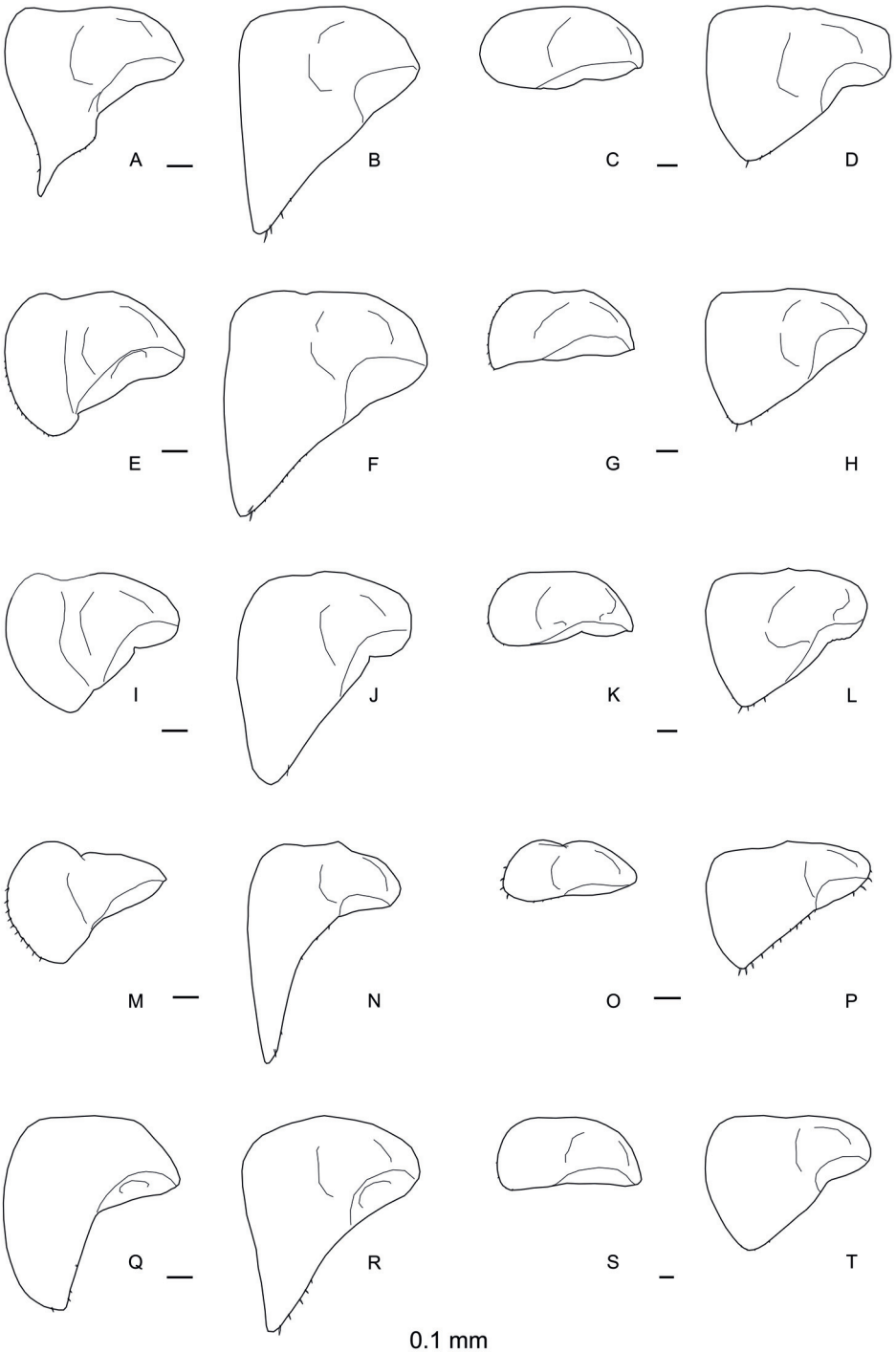

Fig. 15. Pleopods. **A–D**. *Porcellionides lucasioides* (Vandel, 1953). **A–B**. ♂ (JC648). **A**. Exopod I. **B**. Exopod II. **C–D**. ♀ (JC216). **C**. exopod I. **D**. Exopod II. **E–H**. *Porcellionides lusitanus* (Vandel, 1946). **E–F**. ♂ (LPS661). **E**. Exopod I. **F**. Exopod II. **G–H**. ♀ (LPS644). **G**. Exopod I. **H**. Exopod II. **I–L**. *Porcellionides molleri* (Verhoeff, 1901), ♂ (JC237). **I**. Exopod I. **J**. Exopod II. **K**. Exopod I. **L**. Exopod II. **M–P**. *Porcellionides pruinosus* (Brandt, 1833). **M–N**. ♂ (JC383). **M**. Exopod I. **N**. Exopod II. **O–P**. ♀ (JC42). **O**. Exopod I. **P**. Exopod II. **Q–T.** *Porcellionides sexfasciatus* (Budde-Lund, 1885). **Q–R**. ♂ (LPS455a). **Q**. Exopod I. **R**. Exopod II. **S–T**. ♀ (JC75). **S**. Exopod I. **T**. Exopod II. Scale bars = 0.1 mm.

Porcellionides lusitanus (Vandel, 1946)
Figs 2G, L, 3G,15E–H, 17–18, Table 1

Metoponorthus sexfasciatus lusitanus Vandel, 194: 269, figs 80, 84–85.

Material examined

PORTUGAL – **Faro** • 1 ♀; Cabo de São Vicente; 37.0245° N, 8.9935° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS644 • 1 ♂; Cabo de São Vicente; 37.0240° N, 8.9946° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS661 • 1 ♀; same collection data as for preceding; JC774 (ex. LPS664) • 1 ♂; Cabo de São Vicente; 37.0240° N, 8.9942° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS662 • 1 ♂; Cabo de São Vicente; 37.0241° N, 8.9944° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS663a • 1 ♀; same collection data as for preceding; LPS663b • 1 ♂; Cabo de São Vicente; 37.0241° N, 8.9945° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS665 • 1 ♀; Fonte da Benémola; 37.2041° N, 8.0037° W; 30 Dec. 2022; L.P. Da Silva leg.; LPS718 • 1 ♂; Faro, Gambelas; 37.0420° N, 7.9715° W; 29 Dec. 2022; L.P. Da Silva leg.; JC775 (ex. LPS694a) • 1 ♀; same collection data as for preceding; LPS694b.

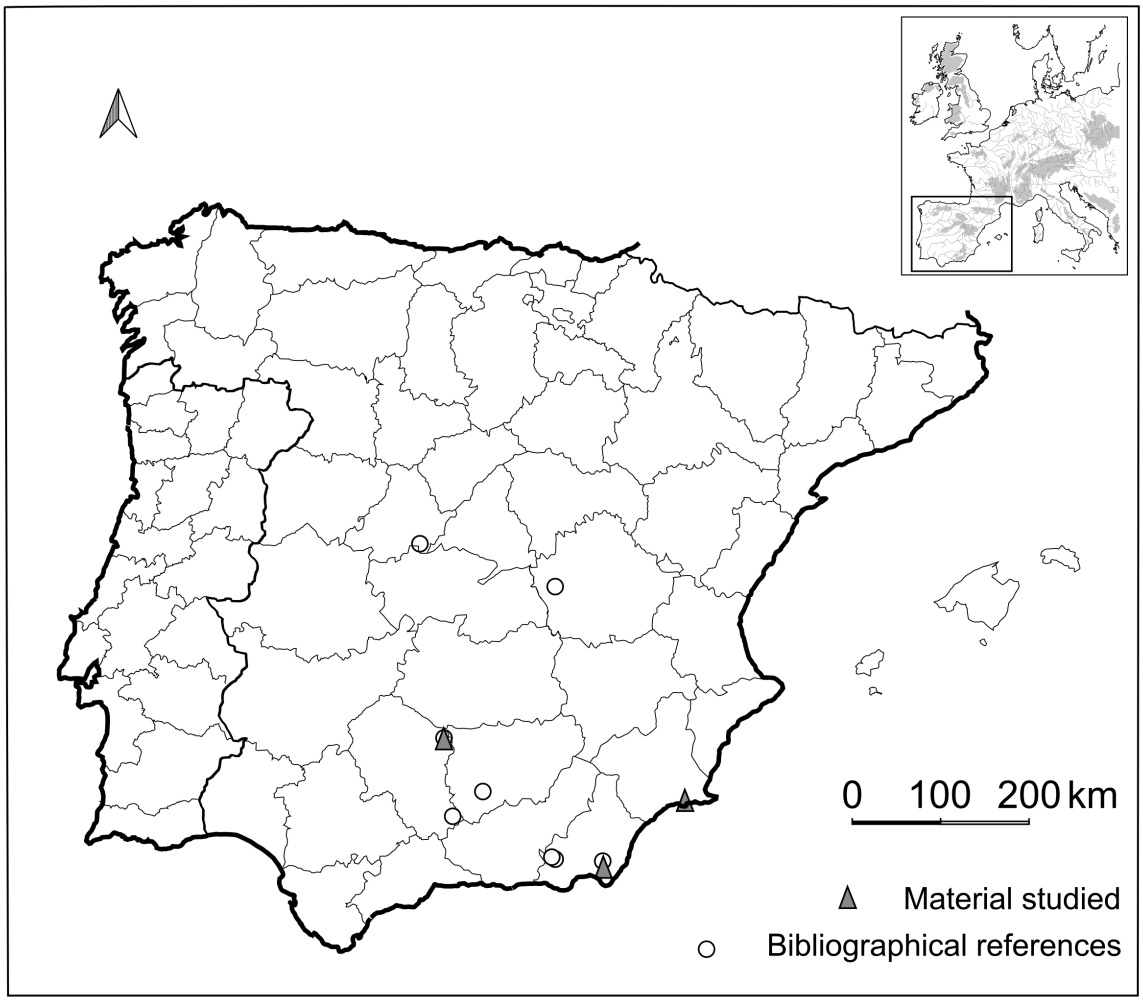

Fig. 16. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides lucasioides* (Vandel, 1953).

Remarks

In 1946, Vandel described a new subspecies of *P. sexfasciatus*, designating it *M. sexfasciatus lusitanus*, which is now recognized as *P. sexfasciatus lusitanus* (Vandel, 1946). This description was based on 2 males and 14 females collected from different locations throughout Portugal, in addition to 35 specimens obtained from the Mamora forest, in Morocco. Unfortunately, some of his illustrations lack a reference to the capture locations. He indicates that *P. lusitanus* is more variable than other subspecies. However, it differs from *P. sexfasciatus* in several characters, namely: its larger size, reaching 13 mm in females; much stronger granulations, including those located on the posterior edge of pereonites and pleonites;

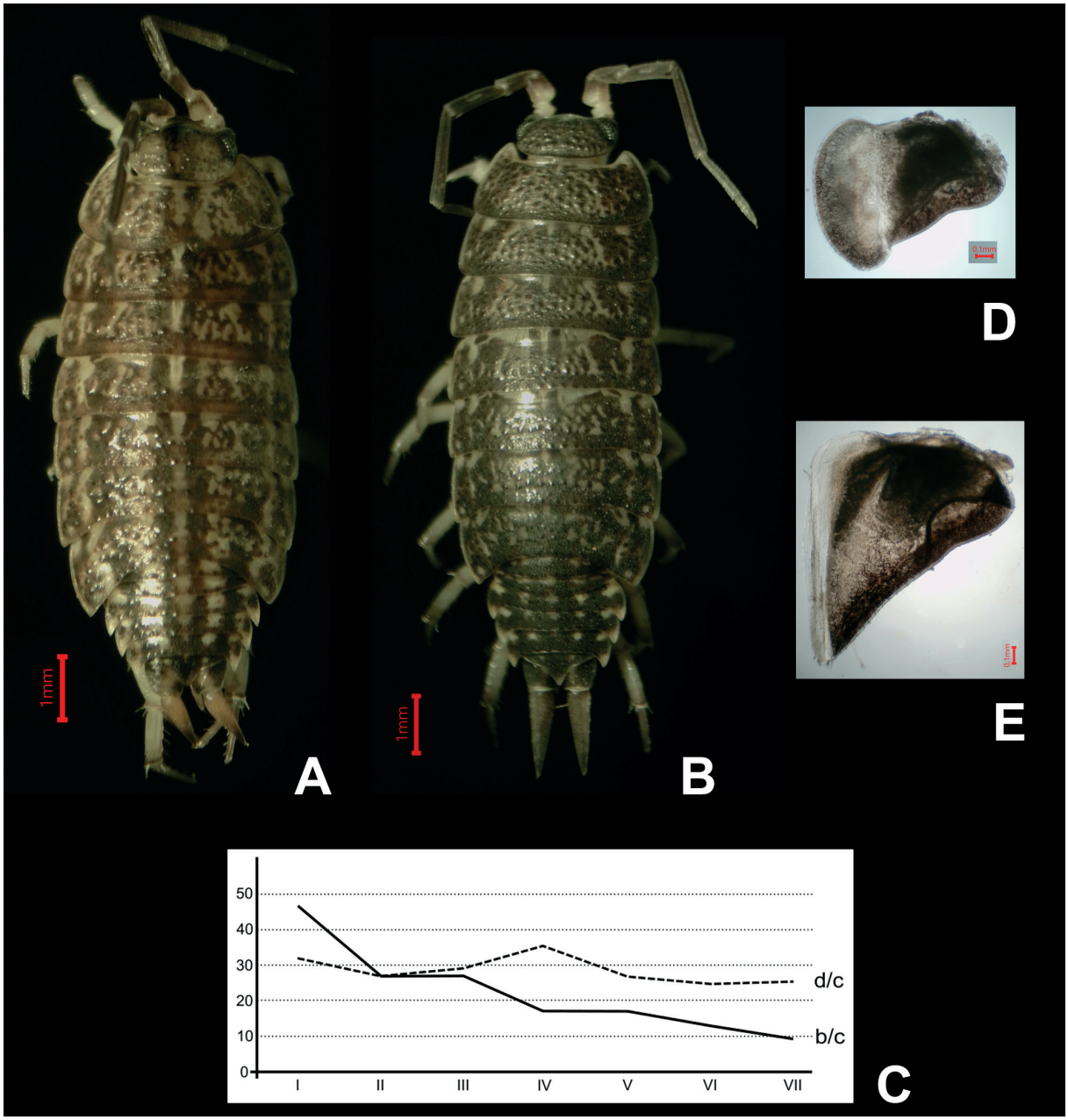

Fig. 17. *Porcellionides lusitanus* (Vandel, 1946). **A–B**. Habitus. **A**. ♂ (LPS661). **B**. ♀ (LPS644). **C**. Noduli laterales coordinates. **D–E**. ♂ (JC775). **D**. Exopod I. **E.** Exopod II. Scale bars: A–B = 1 mm; D–E = 0.1 mm.

elongated antennae, with the first segment of the flagellum much longer than the second; in males, the pereopod 1 lacks a brush of setae, except in large males from Morocco; the shape of the exopod is highly variable, as illustrated by various figures (Vandel 1946: 266, fig. 80b–d).

The specimens we analysed, measuring up to 12 mm in males (14 mm including uropods) and 13 mm in females (14.2 mm including uropods), closely align with Vandel's description, although showing some important nuances. The coloration is dark brown with lighter muscle insertions (Fig. 17A–B). On the cephalon, the frontal line forms a slight curve, while the lateral lobes are well defined (Table 1). The tergites lack transverse ridges; however, a line of granulations occupies the area where transverse ridges are typically found in other species. The b/c and d/c coordinates are consistently lower compared to those in *P. sexfasciatus* (Figs 2G, L, 17C). The scale-setae are triangular and wide (Fig. 3G). In males, the carpus of the pereopod I has a brush of setae, while the exopod of the pleopod I exhibits only a small, rounded posterior inner tip (Figs 15E, 17D) and a sinuous tracheal field. The male exopod of the pleopod II also exhibits a sinuous tracheal field (Figs 15F, 17E), similar to that of both female exopods (Fig. 15G–H).

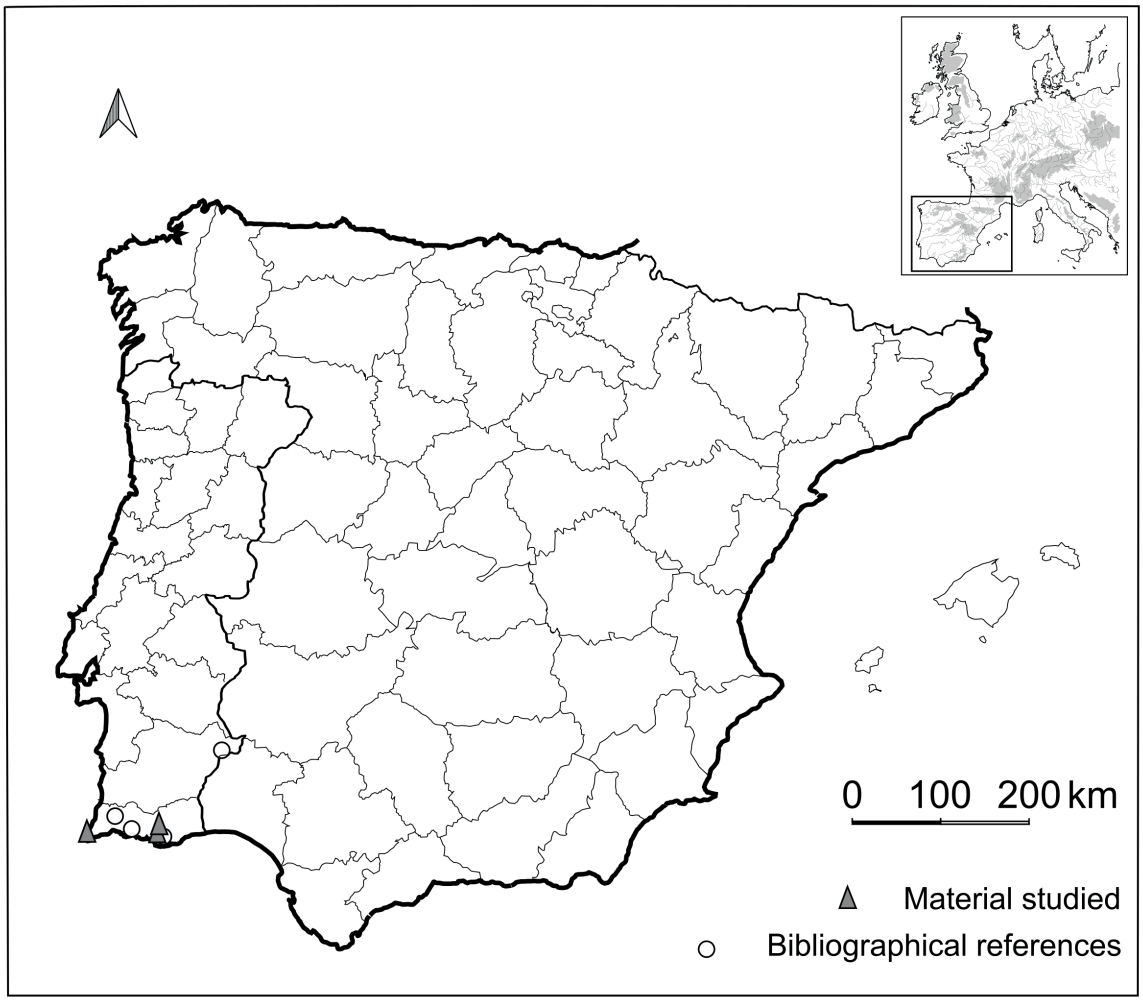

Fig. 18. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides lusitanus* (Vandel, 1946).

Therefore, *P. lusitanus* presents important distinguishing characters that differentiate it from *P. sexfasciatus*, thus confirming its status as a valid species. The variability mentioned by Vandel (1946) in *P. lusitanus* could be attributed to the inclusion of specimens from other species. For example, the specimens identified by Vandel (1946) as *P. s. lusitanus*, which lack sexual differentiation in the pereopods and exhibit a long and slender posterior inner tip on the exopod of the pleopod I in males, are likely *P. glaber*, while those specimens that do exhibit sexual differentiation in the pereopods and have a short and rounded posterior inner tip on the exopod of the pleopod I are *P. lusitanus*.

Distribution

The subsequent authors who have studied the isopod fauna of the Iberian-Balearic region, following Vandel (1946), have reported *P. sexfasciatus lusitanus* in various districts in Portugal and provinces in Spain. However, we observed this species exclusively within the Portuguese district of Faro (Fig. 18). Many of the occurrences in the northern Iberian Peninsula are likely to represent *P. molleri*, as discussed below. Similarly, some records from the southern region may also represent other species within the *Porcellionides* genus.

Vandel (1946) suggests that the *P. sexfasciatus* recorded by Preudhomme De Borre (1886) likely corresponds to *P. sexfasciatus lusitanus*. However, this suggestion remains doubtful because Preudhomme De Borre only made reference to a single specimen captured in Mafra. Cruz (1991) documented the presence of *P. sexfasciatus lusitanus* in Cádiz (Villaluenga del Rosario and Vejer de la Frontera) and Málaga (Pozuelo Montejaque). After conducting a thorough examination of the specimens within A. Cruz's collection deposited at the Centre de Recursos de Biodiversitat Animal de la Universitat de Barcelona (CRBA), we have confirmed they are indeed *P. glaber*. Similarly, the references provided by Cifuentes (2021a) for Cádiz (Algeciras, Arcos-Bornos, Puerto Real, Tarifa, Vejer de la Frontera), Huelva (Alájar, Cala, Doñana), and Málaga (Benaoján, Puerto del Pozuelo) also correspond to *P. glaber*. Vandel (1946) has reported occurrences in the districts of Faro (Algueiráo, Mexilhoerinha, Pic de Foia, Pic de Picota) and Beja (Sobral da Adiça), which we consider to be valid. However, we recommend reviewing the records of Vandel (1946) from Porto (Ermezinde, Sao Pedro da Cova), as well as those of Gregory *et al.* (2012) from Viana do Castelo (Vila Praia de Âncora). In Spain, the following records should also be revised: Schmölzer (1955a) from Madrid (El Escorial) and later (Schmölzer 1971) from Coruña (Bahía de Corme, Noia) and Pontevedra (Bayona, Gondomar, Cies Island, Ons Island, Lourido), records that are likely to be misidentifications; Gregory *et al.* (2012) recorded its occurrence in Pontevedra (Camposancos), and Garcia (2019) recorded its presence in Huelva (Huelva).

Porcellionides molleri (Verhoeff, 1901)
Figs 2H, L, 3H, 15I–L, 19–20, Table 1

Porcellio molleri Verhoeff, 1901: 406.
Porcellionides variabilis Jackson, 1926: 187, figs 23–43.
Porcellionides jacksoni Arcangeli, 1935: 21.

Metoponorthus molleri – Verhoeff 1901: 406.

Material examined

PORTUGAL – **Aveiro** • 1 ♀; Serra do Bussaco; 40.3619° N, 8.3550° W; 23 Dec. 2022; L.P. Da Silva leg.; LPS612. – **Bragança** • 1 ♀; Mirandela; 41.4758° N, 7.2184° W; 26 Jan. 2022; L.P. Da Silva leg.; LPS31. – **Coimbra** • 1 ♀; Serra da Boa Viagem; 40.1995° N, 8.9025° W; 26 Dec. 2022; L.P. Da Silva leg.; LPS634. – **Faro** • 1 ♂; Cabo de Sagres; 37.0010° N, 8.9475° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS668 • 3 ♀♀; Cabo de São Vicente; 37.0244° N, 8.9935° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS646

• 1 ♀; Cabo de São Vicente; 37.0245° N, 8.9936° W; 27 Dec. 2022; L.P. Da Silva leg.; LPS650 • 1 ♂; Pechão; 37.0598° N, 7.8705° W; 29 Dec. 2022; L.P. Da Silva leg.; LPS705. – **Guarda** • 1 ♂; Vila Nova de Foz Côa; 41.0802° N, 7.1112° W; 27 Mar. 2023; L.P. Da Silva leg.; LPS750. – **Leiria** • 1 ♀; Alvaiázere; 39.8228° N, 8.4149° W; 8 Mar. 2022; L.P. Da Silva leg.; LPS132 • 1 ♀; Alvaiázere; 39.8277° N, 8.4131° W; 8 Mar. 2022; L.P. Da Silva leg.; LPS133 • 1 ♂; Alvaiázere; 39.8278° N, 8.4130° W; 8 Mar. 2022; L.P. Da Silva leg.; JC608 (ex. LPS134) • 1 ♀; Alvaiázere; 39.8280° N, 8.4129° W; 8 Mar.

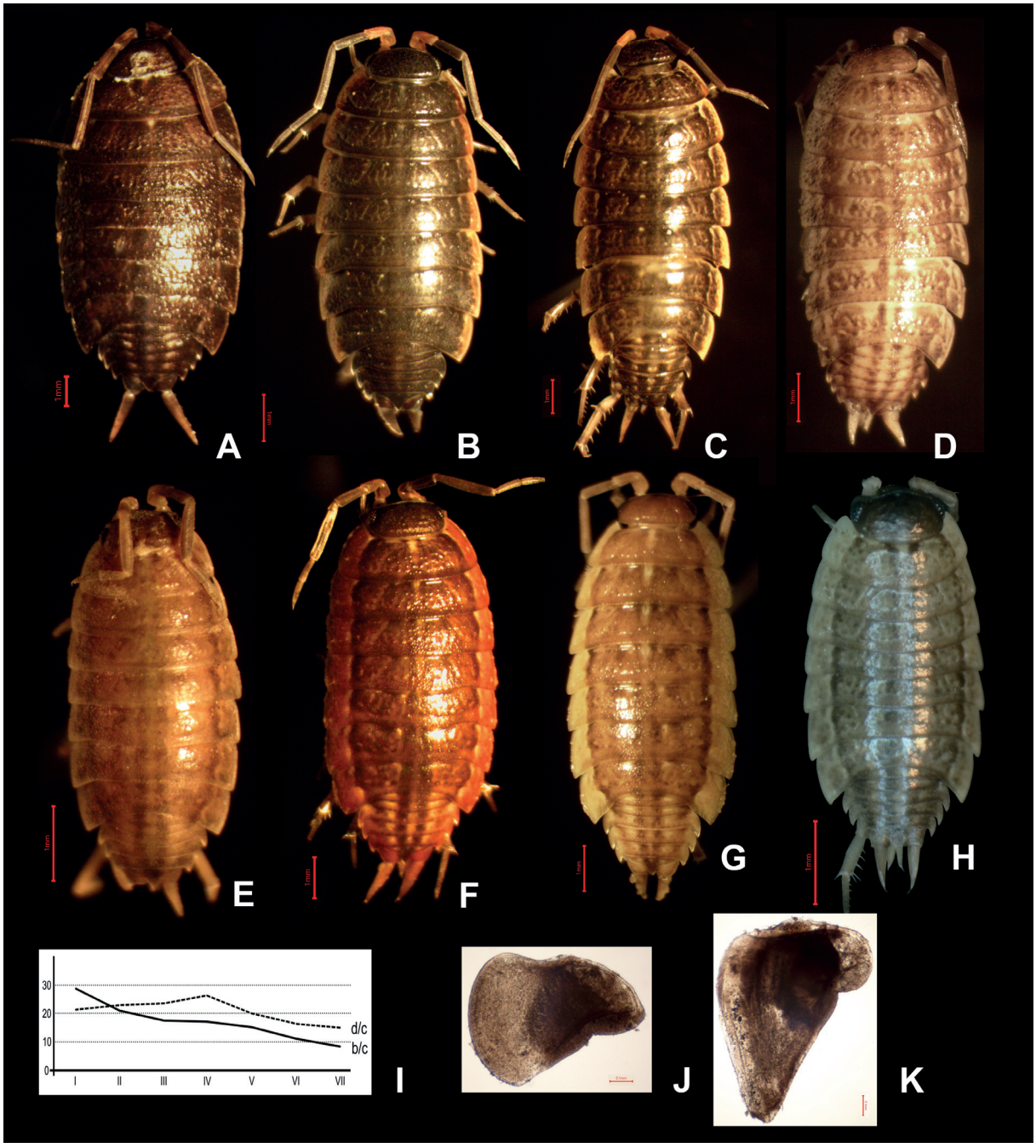

Fig. 19. *Porcellionides molleri* (Verhoeff, 1901). **A–H**. Habitus. **A**. ♀ (LPS132). **B**. ♂ (LPS306). **C.** ♀ (LPS307). **D**. ♀ (LPS31). **E**. ♂ (JC639). **F**. ♀ (LPS135). **G**. ♀ (LPS136). **H**. ♂ (LPS604). **I**. Noduli laterales coordinates. **J–K.** ♂ (JC237). **J**. Exopod I. **K**. Exopod II. Scale bars: A–H = 1 mm; J–K = 0.1 mm.

2022; L.P. Da Silva leg.; LPS135 • 1 ♀; Alvaiázere; 39.8352° N, 8.4114° W; 8 Mar. 2022; L.P. Da Silva leg.; LPS136 • 1 ♀; Alvaiázere; 39.8283° N, 8.4073° W; 10 Jun. 2023; L.P. Da Silva leg.; LPS766 • 1 ♀; Alvaiázere; 39.8298° N, 8.4127° W; 10 Jun. 2023; L.P. Da Silva leg.; LPS768 • 1 ♂; Alvaiázere; 39.8243° N, 8.4136° W; 10 Jun. 2023; L.P. Da Silva leg.; LPS767 • 1 ♀; Alvaiázere; 39.8229° N, 8.4148° W; 15 Mar. 2022; L.P. Da Silva leg.; LPS171 • 1 ♂; Arrimal; 39.5074° N, 8.8822° W; 13 Mar. 2023; L.P. Da Silva leg.; LPS164 • 1 ♀; Arrimal; 39.5074° N, 8.8821° W; 13 Mar. 2023; L.P. Da Silva leg.; LPS166 • 1 ♀; Arrimal; 39.5076° N, 8.8827° W; 13 Mar. 2023; L.P. Da Silva leg.; LPS169 • 1 ♂; Praia de Salir do Porto; 39.5068° N, 9.1485° W; 1 May 2022; L.P. Da Silva leg.; LPS306 • 1 ♀; Praia de Salir do Porto; 39.5068° N, 9.1484° W; 1 May 2022; L.P. Da Silva leg.; LPS307. – **Viana do Castelo** • 1 ♂; Castelo do Neiva; 41.6203° N, 8.8080° W; 17 Dec. 2022; L.P. Da Silva leg.; LPS603a • 2 ♀♀; same collection data as for preceding; LPS603b • 2 ♂♂; Castelo do Neiva; 41.6203° N, 8.8078° W; 17 Dec. 2022; L.P. Da Silva leg.; LPS604 • 2 ♂♂; Castelo do Neiva; 41.6203° N, 8.8077° W; 17 Dec. 2022; L.P. Da Silva leg.; LPS605a • 2 ♀♀; same collection data as for preceding; LPS605b • 1 ♀; Foz do Neiva; 41.6128° N, 8.8099° W; 17 Dec. 2022; L.P. Da Silva leg.; LPS602.

SPAIN – **Asturias** • 1 ♂; Oviedo; Barros leg.; MNCN 20.04/11853. – **Pontevedra** • 1 ♂♂, 1 ♀, 2 immatures; La Guardia; 3 Aug. 1985; J. Cifuentes leg.; JC237 • 1 ♂; same collection data as for preceding; JC637 • 1 ♂; same collection data as for preceding; JC638 • 1 ♂; same collection data as for preceding; JC639 • 17 ♂♂, 17 ♀♀; O Grove; 6 Aug. 1953; W. Steiner leg.; col. Schmölzer; MNCN 20.04/9661 • 1 ♂; O Grove; 18 Aug. 1953; W. Steiner leg.; coll. Schmölzer; MNCN 20.04/9631.

All the specimens from Pontevedra province are cited by Cifuentes (2019).

Description

Coloration. Highly variable coloration (Fig. 19A–H). Specimens range from nearly black to very light and even exhibit yellowish tones. Typically, darker cephalon than body. Pereon, in addition to mentioned color variations, with very marked muscular insertions and thin white-yellowish central line bordered by two dark lines. Pleonite epimera edge with elongated light patch bordered by two dark areas, more intense on insertion side and lighter on pleonite epimera side. Pleonite epimera more or less pigmented in anterior and posterior regions, but some individuals can be of yellowish-white color, intense red, or even dark brown. Pleon follows aforementioned color patterns, often with four dark lines, two central and two at neopleuron edges, which are variably pigmented. Pigmented telson with two light lateral spots. Light ventral side, with dark spot at basis of pereopods and pigmented pleopods. Antennae with dark segments, except second and third, which may be light brown, reddish, or whitish.

Integumentary characters. Very weak and flattened granulations (Fig. 19A–H). Glandular fields located at lateral edge of tergite, occupying almost its entire extent (Table I). Highly visible noduli laterales in small depigmented area, on first pereonites in posterior third and progressively closer to edge. Noduli laterales coordinates as in Figs 2H, L, 19I. Elliptical scales and scale-setae long and Y-shaped with sharp tip (Fig. 3H).

Somatic characters. Cephalon with prominently curved frontal line, creating projection extending beyond small lateral lobes. Supra-antennal line distinctly marked. Pereon with posterior edge on first three pereonites rounded, while on pereonites IV–VII, small posterior tip gradually emerges. Tergites lack transverse ridges. Pleon more or less continuous with pereon, varying among specimens, but sometimes notably retracted. Short telson, with very small base and broad, triangular tip that barely surpasses the basipod of uropods (Fig. 19A–H).

Appendages. Antennae barely reach posterior edge of third pereonite, although varies among specimens. Very small and rounded teeth on second and third segments, fourth segment lacks tooth. Carinated

fourth and fifth segments. First flagellum segment approximately same length as second. Uropods with long and conical exopods in both sexes.

Sexual characters. In males, carpus of pereopods 1 and 2 with a brush of long setae. Carpus of pereopod 1 with dense covering of scales on inner surface, in both sexes. Pereopod 7 without sexual differentiation. In males, endopod of pleopod I curves outward in posterior third, and triangular exopod with strongly curved inner edge and very small, pointed inner tip, with tracheal field with a notch (Figs 15I, 19J), also present in females (Fig. 15K). Male pleopod II with long and slender endopod and triangular exopod, very wide and long, with pronounced notch in tracheal field (Figs 15J, 19K). Less pronounced notch in females (Fig. 15L).

Remarks

Porcellionides molleri was described based on one male and three females collected from Coimbra. Later, Verhoeff (1918) improved the description and included an illustration of the male exopod of the pleopod I. Vandel (1962) and Schmalfuss (2003) classify it as a subspecies of *P. sexfasciatus*.

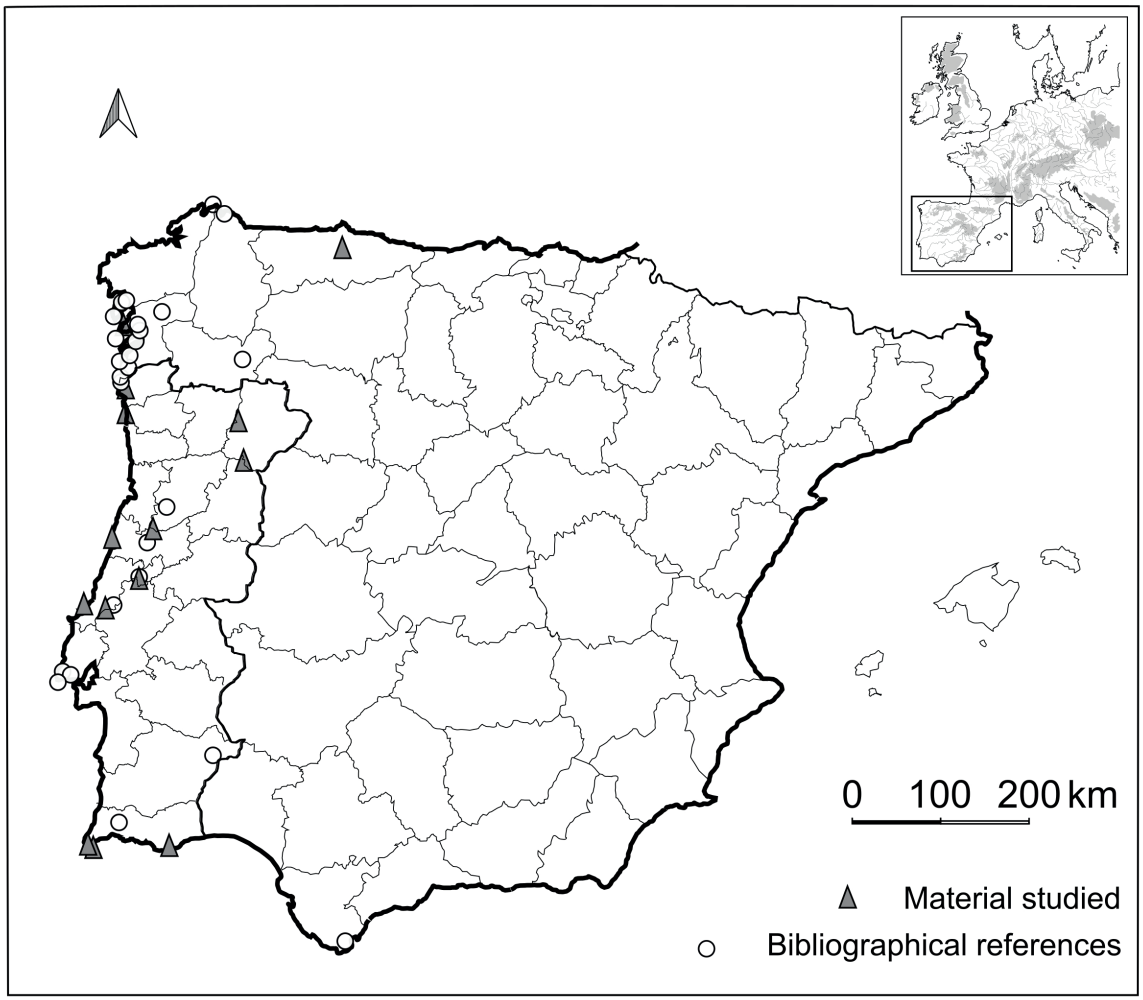

Fig. 20. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides molleri* (Verhoeff, 1901).

Arcangeli (1936), in his study on the isopods of Portugal, once again describes and illustrates what he refers to as *Porcellio* (*Porcellionides*) *molleri* (Arcangeli 1936: 20, figs 8–12). However, as highlighted by Pollo Zorita (1982, 1986a), the three specimens examined by the Italian author actually belong to the species *Porcellionides elegans*. This determination is supported by the illustration of the male exopod of the pleopod I (Arcangeli 1936: 20, fig. 11), which corresponds to the latter species (Figs 4E, 6C).

Vandel (1946), in his study of the isopods of Portugal, presents a redescription of *P. molleri*, along with several figures. However, since the specimens we have analysed do not fully correspond with certain aspects of Vandel's (1946) description, but do match the remaining characters of *P. molleri*, we believe it is beneficial to provide the above description of this species.

Porcellionides molleri can be distinguished from *P. sexfasciatus* by the granulations on its integument, the noduli laterales position, and the absence of a transverse ridge on the pereonites. In males, there is a brush of setae on the carpus of the pereopods I and II, while the exopod of the pleopod I lacks a posterior inner tip. Additionally, a tracheal field incision is present in this exopod, although it can be more or less pronounced. In the male exopod of the pleopod II, and female exopods of pleopods I and II, an incision is also present. These characters distinguish *P. molleri* from *P. sexfasciatus*, supporting our classification of *P. molleri* as a distinct and valid species.

Distribution

Only known from the westernmost area of the Iberian Peninsula, as records from the central part of Spain are likely to be identification errors (Fig. 20). In Portugal it has been reported from the districts of **Coimbra**: Coimbra (Verhoeff 1901); **Faro**: Serra de Monchique (Vandel 1946); **Leiria**: Porto do Mós and Serra de Alvaiazera (Vandel 1946); **Lisboa**: Monte Estoril by Jackson (1926), as *Porcellionides variabilis* Jackson, 1926 according to Vandel (1946) and by Arcangeli (1936) as *Porcellionides jacksoni* Arcangeli, 1936 according to Vandel (1946), and Sintra (Vandel 1946; Schmölzer 1971); **Setúbal**: Beja (Arcangeli 1936; Vandel 1946); **Viseu**: Serra do Caramulo (Vandel 1946). In Spain it has been reported from the provinces of **Cádiz**: Sierra de la Luna (Schmölzer 1955b); **Ciudad Real**: Venta de Cárdenas (Schmölzer 1955a, this citation is likely an identification error); **Coruña**: Corrubedo, Noia, Punta de la Estaca and Santiago (Schmölzer 1971); **Lugo**: Puente de Lozera (Schmölzer 1955a); **Orense**: Castineira (Schmölzer 1955a); **Pontevedra**: Bayona, Beluso (Schmölzer 1971), Bueu (Schmölzer 1955a), Cangas de Morrazo (Schmölzer 1971), Gondomar, Isla de Ons (Schmölzer 1971), La Guarda (Cifuentes 2019), La Lamosa, Marín (Schmölzer 1971), O Grove (Cifuentes 2019), Pontevedra (Schmölzer 1955a) and Ria de Vigo (Schmölzer 1971).

Porcellionides pruinosus (Brandt, 1833)
Figs 2I, 3I, 15M–P, 21–22, Table 1

Porcellio swammerdamii Audouin, 1826: 289, fig. 6.
Porcellio pruinosus Brandt, 1833: 178.
Porcellio punctatus Brandt, 1833: 180.
Porcellio maculicornis Koch, 1841: 34.
Porcellio uniformis Koch, 1841: 34.
Porcellio frontalis Lereboullet, 1853: 63, figs 17, 81–87.
Porcellio immaculatus Fitch, 1855: 120.
Porcellio zealandicus Miers, 1876: 226.
Porcellio flavovittatus Miers, 1878: 669, plate 68, fig. 4.
Porcellio jelskii Miers, 1878: 668, plate 68, fig. 3.
Metoponorthus meleagris Budde-Lund, 1885: 168.

Metoponorthus nigrobrunneus Budde-Lund, 1896: 47.
Metoponorthus schwencki Moreira, 1927: 195, figs 4–6.
Metoponorthus anatolicus Verhoeff, 1941: 235, fig. 16.
Porcellionides bagnalli Collinge, 1942: 648.
Porcellionides breviramus Shen, 1949: 50, fig. e.

Metoponorthus pruinosus – Budde-Lund 1885: 169.
Metoponorthus swammerdamii – Budde-Lund 1885: 172.
Porcellionides anatolicus – Stebbing 1911: 188.
Porcellionides meleagris – Stebbing 1911: 188.
Porcellionides nigrobrunneus – Stebbing 1911: 188.
Porcellionides schwencki – Stebbing 1911: 188.
Porcellionides swammerdamii – Stebbing 1911: 188.

Material examined

PORTUGAL – **Braga** • 1 ♀; Vila Nova de Famalicão; 41.4104° N, 8.5206° W; 28 Aug. 2022; L.P. Da Silva leg., LPS435. – **Beja** • 1 ♀; Mértola; 37.6391° N, 7.6623° W; 12 Apr. 2022; L.P. Da Silva leg.; LPS249. – **Coimbra** • 1 ♂; Coimbra, Jardim Botânico da Universidade de Coimbra; 41.2056° N, 8.4224° W; 17 Jun. 2022; L.P. Da Silva leg.; LPS370 • 1 ♀; Coimbra, Jardim Botânico da Universidade de Coimbra; 41.2071° N, 8.4214° W; 17 Jun. 2022; L.P. Da Silva leg.; LPS385 • 1 ♀; Praia de Mira; 41.4586° N, 8.8021° W; 21 May 2022; L.P. Da Silva leg.; LPS310. – **Guarda** • 1 ♂; Longroiva; 28 Mar. 2023; L.P. Da Silva leg.; LPS756. – **Porto** • 1 ♀; Vila do Conde; 41.3420° N, 8.7517° W; 23 Feb. 2022; L.P. Da Silva leg.; LPS111. – **Viana do Castelo** • 1 ♀; Vila Nova de Cerveira; 41.9370° N, 8.7498° W; 11 Jun. 2022; L.P. Da Silva leg.; LPS361. – **Vila Real** • 3 ♂♂; Alijó; 41.2783° N, 7.4764° W; 25 Jan. 2022; L.P. Da Silva leg., LPS30.

SPAIN – **Asturias** • 2 ♂♂; Gijón; E. Rioja leg.; MNCN 20.04/7394. – **Ávila** • 1 ♀; Arévalo; 12 Apr. 1979; M.T. Sanz leg.; MNCN 20.04/14239. – **Cuenca** • 2 ♂♂, 2 ♀♀; Albalate de las Nogueras; 24 Oct. 1980; A. Pollo leg.; MNCN 20.04/7166 • 7 ♂♂; Las Majadas; 23 Oct. 1980; A. Pollo leg.; MNCN 20.04/6360. – **Guadalajara** • 1 ♀; Sigüenza, 18 Jul. 1986; J. Cifuentes leg.; JC318. – **Madrid** • 1 ♀; Madrid; 12 Apr. 1979; R.M. Segovia del Rey leg.; MNCN 20.04/12378 • 2 ♀♀; Madrid; 22 Nov. 1953; E. Ortiz de Vega leg.; MNCN 20.04/14234. – **Málaga** • 1 ♂, 7 ♀♀; Málaga; Jan. 1917; O. de Buen y del Cos leg.; MNCN 20.04/9498 • 1 ♂; Maro Cueva Nerja; 27 Jan. 2018; J. Cifuentes leg.; JC340 • 1 ♂, 2 ♀♀; Maro Cueva Nerja; 11 Apr. 2019; J. Cifuentes leg.; JC383 • 2 ♀♀; same collection data as for preceding; JC385 • 2 ♂♂, 4 ♀♀; same collection data as for preceding; JC386. – **Murcia** • 1 ♀; Puerto de Mojantes; 10 Jun. 1986; A. Blasco leg.; CRBA-91169. – **Navarra** • 1 ♂, 2 ♀♀; Caparroso; 29 May 1983; J. Cifuentes leg.; cited by Cifuentes (1984); JC114 • 1 ♀; same collection data as for preceding; cited by Cifuentes (1984); JC141 • 5 ♀♀; Barañain; 13 Mar. 1981; JC leg., JC42. – **Soria** • 1 ♂, 2 ♀♀; Medinaceli; 11 Apr. 1985; J. Cifuentes leg.; JC153. – **Toledo** • 1 ♂, 1 ♀; Toledo; 12 Nov. 1986; MNCN 20.04/9923.

Remarks

This is a well-known species, so we provide only brief details. The dorsal side of the integument exhibits small, flat granulations (Fig. 21A). The d/c coordinates decrease from the first to the last pereonite, showing greater variation than the b/c coordinates (Figs 2I, 21B). The scale-setae are triangular, elongated, and sharply pointed surrounded by characteristic small scales that are arranged in a distinct pattern (Fig. 3I). The glandular fields are very small with very few pores (Table 1). On the cephalon, the lateral lobes are small. There is no transverse ridge on the pereonites. The first segment of the antenna flagellum is twice the size of the second. In males, the carpus of the pereopod 1 has a brush of setae, the exopod of the pleopod I has a short, wide, rounded, or slightly pointed posterior inner tip (Figs 15M,

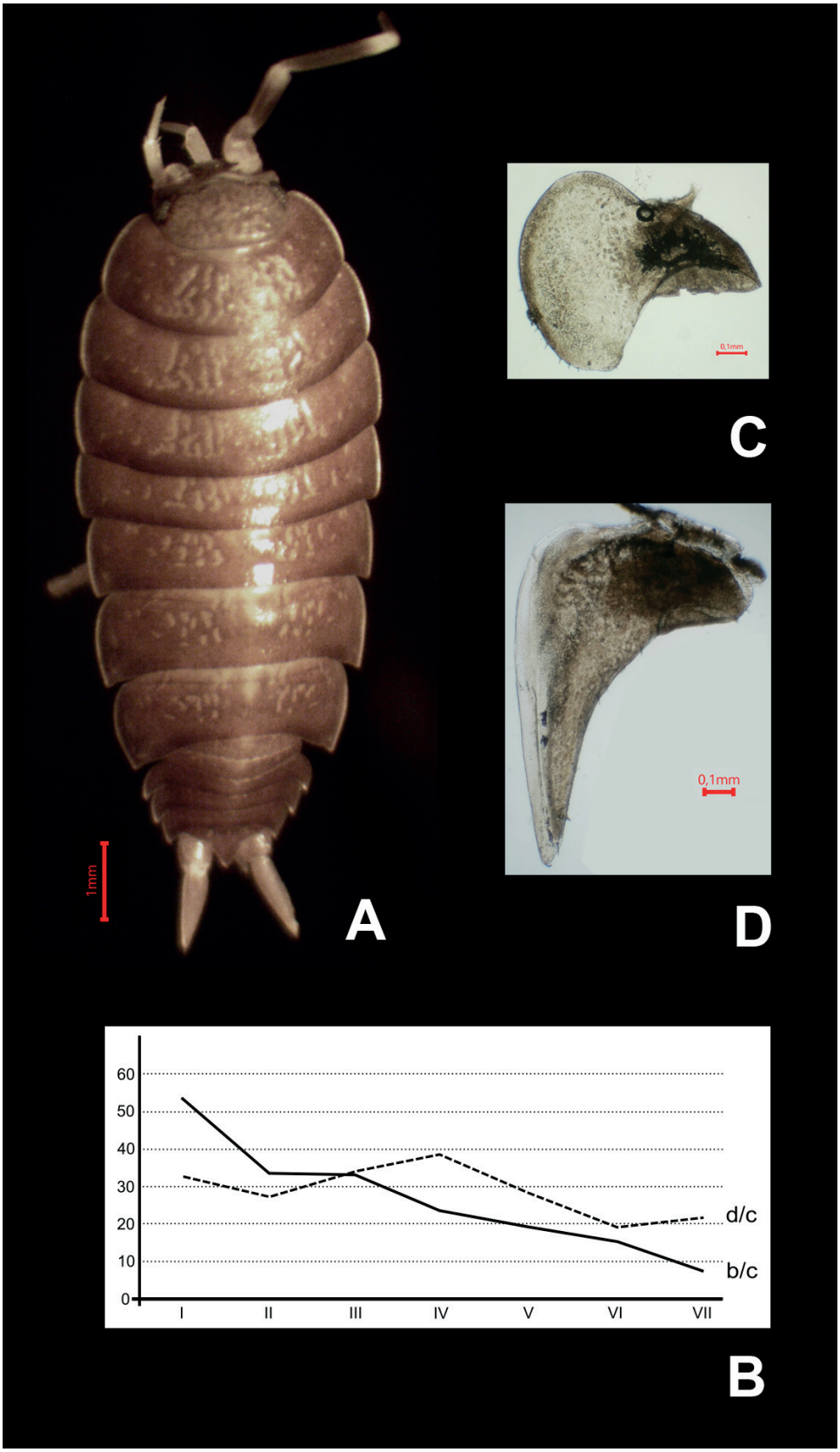

Fig. 21. *Porcellionides pruinosus* (Brandt, 1833). **A**. ♀ (LPS310), habitus. **B**. Noduli laterales coordinates. **C–D**. ♂ (JC383). **C**. Exopod I. **D**. Exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

21C), and the exopod of the pleopod II has a very long and slender posterior inner tip (Figs 15N, 21D). In females, the exopods of the pleopods I and II resemble those of other studied species (Fig. 15O–P).

Distribution

Originally from the Mediterranean, it has become cosmopolitan due to human activity (Vandel 1962; Schmalfuss 2003). Reported from the Portuguese districts of **Évora**: Estremoz-Cano Massif (Reboleira *et al.* 2015); **Faro**: Tavira (Vandel 1946). Given the high number of records from Spain, only the provinces are listed: **Almería** (Vandel 1953; Cifuentes 2021a); **Badajoz** (Garcia *et al.* 2021); **Barcelona** (Arcangeli 1924; Cruz, 1991); **Cádiz** (Schmölzer 1955a); **Castellón** (Schmölzer 1971); **Ciudad Real** (De Buen 1887); **Coruña** (Dollfus 1892); **Cuenca** (Pollo Zorita 1986a, 2015); **Gerona** (Arcangeli 1924; Cruz, 1991); **Granada** (Dollfus 1892, 1897; Vandel 1953; Schmölzer 1955a; Cifuentes 2021a); **Guadalajara** (Pollo Zorita 1986a, 2015); **Guipúzcoa** (Vivar *et al.* 1984); **Huelva** (De Buen 1887); **Islas Baleares** (Vandel 1961; Schmölzer 1971; Bellés *et al.* 1989; Cruz 1989; Garcia & Cruz 1996; Vadell 2003; Vadell & Zaragoza 2005; Garcia 2008, 2009); **Lérida** (Arcangeli 1925); **Madrid** (De Buen 1887; Pollo Zorita 1986a, 2015; Lefebvre & Marcadé 2005; Garcia & Cabanillas 2021); **Málaga** (Schmölzer 1971; Cifuentes 2021a; Castillo Martínez *et al.* 2022); **Murcia** (Garcia 2019; Cifuentes 2021b); **Navarra** (Fidalgo & Herrera 1980; Cifuentes 1984); **Pontevedra** (Gregory *et al.* 2012); **Sevilla**

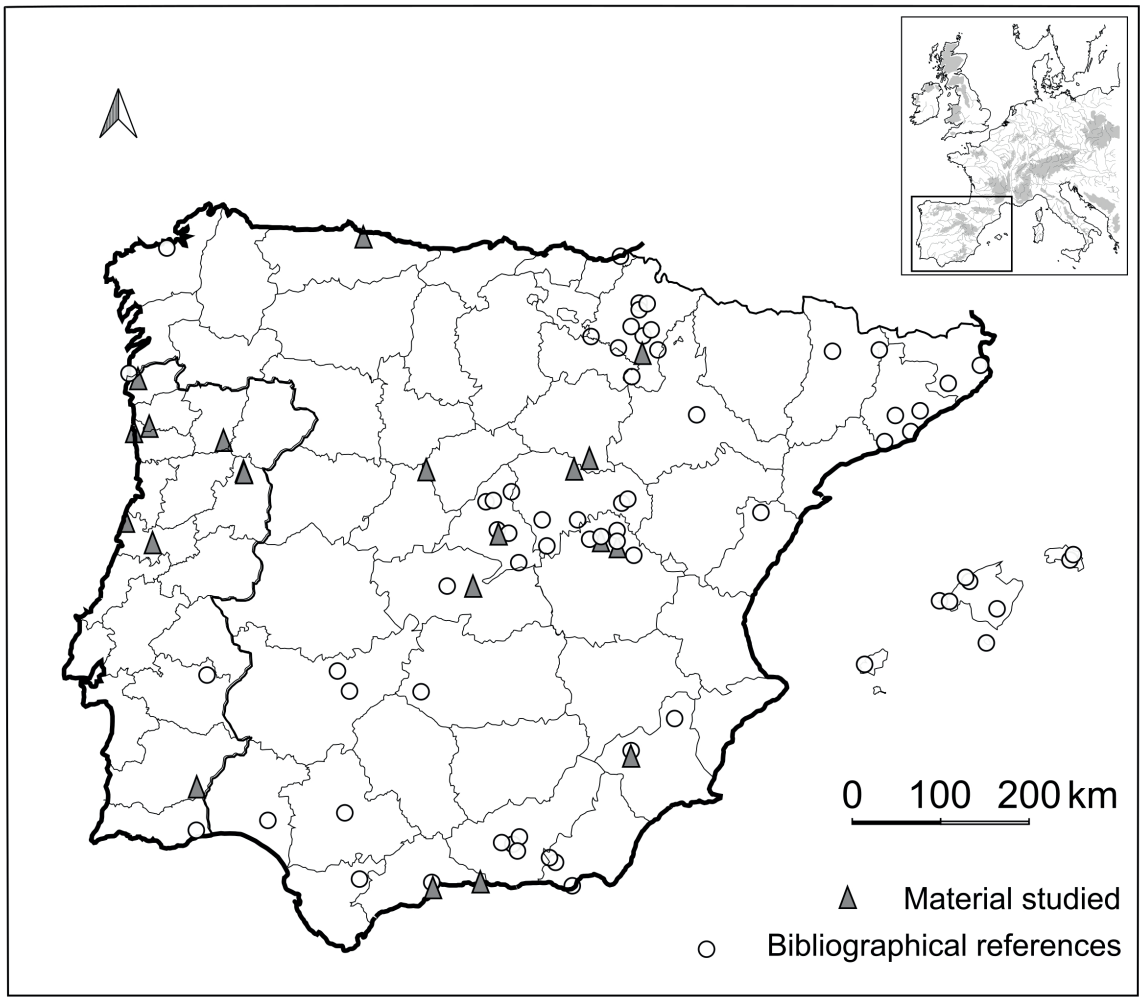

Fig. 22. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides pruinosus* (Brandt, 1833).

(Budde-Lund 1885; Dollfus 1892; Schmölzer 1971); **Toledo** (Pollo Zorita 1986a, 2015); **Zaragoza** (Dollfus 1897).

In Portugal, it appears to have a limited representation compared with its prevalence in the rest of the Ibero-Balearic region. It is recorded for the first time in the Portuguese districts of Beja, Braga, Coimbra, Guarda, Porto, Viana do Castelo and Vila Real, and the Spanish provinces of Asturias, Ávila and Soria (Fig. 22).

Porcellionides rufocinctus (Dollfus, 1892)

Metoponorthus rufocinctus Dollfus, 1892: 184.

Remarks

Porcellionides rufocinctus was described by Dollfus (1892) in his work on terrestrial isopods of Spain. The description was based on a male specimen deposited in the Museo Nacional de Ciencias de Madrid (MNCN), collected by Bolívar in Villa Rutis, officially known as Santa María de Rutis, belonging to the municipality of Culleredo in the province of Coruña. Later, the same author (1893) added another locality for the species, San Roque, situated close to the first location and within the municipality of Coruña in the same province. Within the MNCN collection, there is a specimen with the following data: "Coruña, Villa Rutis, 1893, 1 male, Bolívar, MNCN 20.04/11518". Although the date of this specimen does not match Dollfus's original description (1892), the remaining data is consistent. This specimen was stored with the code MNCN 20.04/7895, former number 86, alongside specimens of *Oniscus asellus* Linnaeus, 1758, *Porcellio dilatatus* Brandt, 1833, *P. herminiensis* Vandel, 1946, and *P. scaber* Latreille, 1804. Currently, the specimen has undergone discoloration due to its extended preservation period in alcohol. However, we identified it as *Porcellionides sexfasciatus* (Budde-Lund, 1885) based on the exopod of the pleopod I.

The original description of *P. rufocinctus* by Dollfus (1892) followed the common approach of the time, focusing on the coloration and morphology of the antennae, cephalon, pereon, pleon, telson, and uropods. In closely related species, these characters often prove insufficient for establishing specific identity. Absent are mentions of other now significant characters, such as pleopod and pereopod morphology, as well as certain integumentary characters like glandular fields or scale-setae. Nonetheless, Dollfus (1982) provided the following description: oval body, quite convex, pleon noticeably retracted (the body shape is exactly that of *Philoscia muscorum*); cephalon with a frontal line finely but distinctly bordered, lateral lobes very short and forehead almost flat; antennae reaching approximately half the body length, flagellum segments equal. Dollfus (1983) observed regarding the San Roque specimens that their coloration resembles that of *P. sexfasciatus* but *P. rufocinctus* is cleary distinguished by the flat forehead and the much shorter pleotelson. All these characters could also correspond to *P. molleri*, as mentioned in the description provided above, as well as other species within this genus, and even certain specimens of *P. sexfasciatus*. The latter aligns with our analysis of the specimen from Villa Rutis.

Therefore, at least for now, we classify this as species inquirenda, because it is not possible to definitively differentiate it from the other species of *Porcellionides*.

Porcellionides sexfasciatus (Budde-Lund, 1885)
Figs 2J, L, 3J, 15Q-T, 23–24, Table 1

Metoponorthus sexfasciatus Budde-Lund, 1885:167.

Material examined

PORTUGAL – **Aveiro** • 1 ♂; Vagueira; 40.5611° N, 8.7579° W; 24 Sep. 2022; L.P. Da Silva leg.; LPS453a • 1 ♀; same collection data as for preceding; LPS453b • 1 ♂; Vagueira; 40.5612° N, 8.7580° W; 24 Sep. 2022; L.P. Da Silva leg.; LPS455a • 1 ♀; same collection data as for preceding; LPS455b. – **Coimbra** • 1 ♂; Cabedelinho beach; 40.1410° N, 8.8652° W; 6 Mar. 2022; L.P. Da Silva leg.; LPS128 • 1 ♀; Coimbra, Jardim Botânico da Universidade de Coimbra; 40.2074° N, 8.4221° W; 17 Jun. 2022; L.P. Da Silva leg.; LPS381 • 2 ♂♂; same collection data as for preceding; LPS382a • 1 ♀; same collection data as for preceding; LPS382b • 2 ♀♀; same collection data as for preceding; LPS383 • 2 ♂♂; same collection data as for preceding; LPS384 • 1 ♂; Portunhos; 40.2943° N, 8.5473° W; 16 Jan. 2021; L.P. Da Silva leg.; LPS24 • 5 ♀♀; Praia de Mira; 40.4508° N, 8.8015° W; 16 Jun. 2022, L.P. Da Silva leg.; LPS368. – **Faro** • 2 ♀♀; Caminho da Rocha; 37.1406° N, 8.6086° W; 28 Dec. 2022; L.P. Da Silva leg.; LPS687 • 1 ♀; Praia de Faro; 37.0113° N, 8.0010° W; 29 Dec. 2022; L.P. Da Silva leg.; LPS696 • 1 ♀; Sagres; 37.0178° N, 8.9473° W; 28 Dec. 2022; L.P. Da Silva leg.; LPS674 • 1 ♂; Sagres; 37.0177° N, 8.9473° W; 28 Dec. 2022; L.P. Da Silva leg.; LPS677a • 1 ♀; same collection data as for preceding; LPS677b. – **Porto** • 1 ♂; Areia; 41.3290° N, 8.7383° W; 3 May 2022; L.P. Da Silva leg.; LPS335 • 1 ♀; Areia; 41.3292° N, 8.7384° W; 3 May 2022; L.P. Da Silva leg.; LPS336 • 1 ♂; Areia; 41.3305° N, 8.7378° W; 10 Dec. 2021; L.P. Da Silva leg.; LPS06 • 1 ♂; Areia; 41.3290° N, 8.7383° W; 14 Jun. 20221; L.P. Da Silva leg.; LPS367a • 1 ♀; same collection data as for preceding; LPS367b • 1 ♂; Azurara; 41.3401° N, 8.7457° W; 13 Nov. 2022; L.P. Da Silva leg.; LPS509. – **Setubal** • 1 ♀; Herdade da Ribeira Abaixo; 38.1072° N, 8.5700° W; 28 Apr. 2022; L.P. Da Silva leg.; LPS287.

SPAIN – **Barcelona** • 4 ♂♂, 2 ♀♀; Malgrat; 1 May 1981; J. Cifuentes leg.; JC351 • 7 ♂♂, 3 ♀♀; Malgrat; 5 May 1981; J. Cifuentes leg.; JC75. – **Guadalajara** • 1 ♂, 1 ♀; Sigüenza; 19 Apr. 2023; J.D. Gilgado leg.; JC748. – **Islas Baleares** • 1 ♂, 2 ♀♀; La Cabrera; 21 Apr. 1973; E. Ortiz de Vega leg.; MNCN 20.04/12158 • 12 ♂♂, 12 ♀♀; La Cabrera; 14. Jul. 1978; A. Pollo leg.; MNCN 20.04/7358 • 1 ♂, 1 ♀; La Cabrera; 23 Jul. 1978; A. Pollo leg.; MNCN 20.04/12140 • 2 ♂♂, 4 ♀♀; La Cabrera; 23 Jul. 1978; A. Pollo leg.; MNCN 20.04/12143 • 8 ♂♂, 4 ♀♀; La Cabrera; 23 Jul. 1978; A. Pollo leg.; MNCN 20.04/7359 • 7 ♂♂; Menorca, Maó, Es Grau; 21 Mar. 1989; A. Cruz leg.; A. Cruz coll., CRBA-86562 • 5 ♂♂; Menorca, Ciutadella, Platja dels Algaiarens, La Vall; 23 Mar. 1989; A. Cruz leg.; A. Cruz coll., CRBA-86565 • 7 ♂♂, 3 ♀♀; Palma de Mallorca; 1894; MNCN 20.04/12153 • 1 ♂; Palma de Mallorca; 10 Mar. 1954; A. Compte leg.; MNCN 20.04/7932 • 1 ♀; Palma de Mallorca; 8 Mar. 1959; A. Compte leg.; MNCN 20.04/7951. – **Madrid** • 2 ♂♂, 1 ♀; Colmenar de Oreja; 14 Mar. 1979; A. Pollo leg.; MNCN 20.04/6933 • 1 ♀; Madrid; 17 May 1950; J.L. Sampedro leg.; MNCN 20.04/12160 • 1 ♂; Madrid, Casa de Campo; 1 Jun. 1953; A. Martinez Castellote leg.; Schmölzer coll., MNCN 20.04/9651 • 1 ♀; Madrid; 1 Apr. 1979; G. Florez leg.; MNCN 20.04/12362.

Remarks

Vandel (1946) places the origin of this species in either Morocco or Portugal, asserting it to be highly abundant. However, both the captures conducted in Portugal and the bibliographic references from this country do not provide support for the claim made by this author. While it is a well-known species, for easier differentiation from the other species studied, we emphasize that the body is elongated, the dorsal side of the exoskeleton exhibits very fine granulations (Fig. 23A). The noduli laterales coordinates, particularly d/c, are among the highest of the studied species, exceeded only by that of *P. glaber* on some pereonites (Figs 2J, L, 23B). Scale-setae are triangular, short and pointed (Fig. 3J). On the cephalon, the lateral lobes are faintly marked (Table 1). The pereonites II to VII exhibit a transverse ridge. In males, the pereopods lack sexual differentiation, the exopod of the pleopod I has a very long, wide, and rounded posterior inner tip (Figs 15Q, 23C), and the exopod of the pleopod II is triangular (Figs 15R, 23D). In females, the exopods of the pleopods I and II resemble those of the other studied species (Fig. 15S–T).

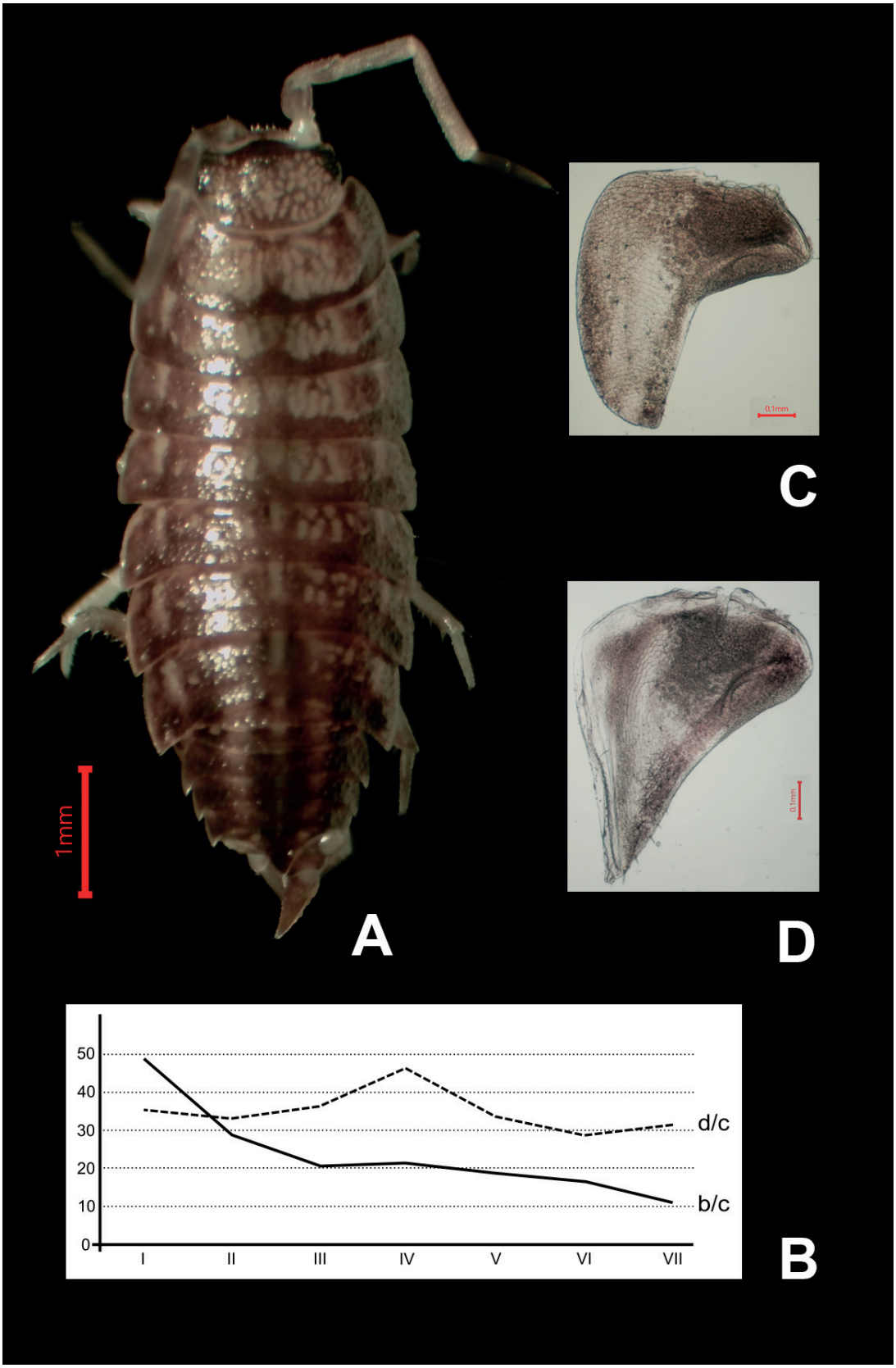

Fig. 23. *Porcellionides sexfasciatus* (Budde-Lund, 1885). **A**. ♂ (LPS455a), habitus. **B**. Noduli laterales coordinates. **C–D**. ♂ (LPS455a). **C**. Exopod I. **D**. Exopod II. Scale bars: A = 1 mm; C–D = 0.1 mm.

Distribution

The distribution range of this species includes the western Mediterranean, and due to its anthropophilic nature, it has been introduced to other regions across the world (Vandel 1946; Schmalfuss 2003). In the Ibero-Balearic region, it has been reported from the Portuguese districts of **Faro**: Serra de Malhão (Schmölzer 1971) and Serra de Monchique (Vandel 1962); **Leiria**: Serra de Alvaiazere and Serra de Minde (Vandel 1962); **Lisboa**: Mafra (Preudhomme De Borre 1886); **Viseu**: Serra do Caramulo (Vandel 1962). Given the high number of records from Spain, only the provinces are listed: **Alicante** (Vandel 1962; Cifuentes 2021b); **Almería** (Dollfus 1892; Vandel 1962; Cifuentes *et al.* 2021); **Badajoz** (Garcia *et al.* 2021); **Barcelona** (Schmölzer 1971; Cruz 1991); **Burgos** (the record by Agüera de Vivar *et al.* (1984) corresponds to this province); **Cáceres** (Garcia *et al.* 2021); **Cádiz** (Schmölzer 1955a, 1971; Cifuentes 2021a); **Castellón** (Español 1958); **Córdoba** (Budde-Lund 1885); **Coruña** (Cifuentes 2019); **Gerona** (Budde-Lund 1885; Pablos 1964; Schmölzer 1971); **Guipúzcoa** (Vandel 1962; Cifuentes *et al.* 2021); **Granada** (Dollfus 1892; Vandel 1962; Schmölzer 1971); **Huelva** (Dollfus 1892; Cifuentes 2021a); **Islas Baleares** (Dollfus 1892; Vandel 1961, 1962; Bellés *et al.* 1989; Cruz 1989; Garcia & Cruz 1993, 1996; Vadell 2003; Vadell & Zaragoza 2005; Vadell *et al.* 2006; Garcia 2008); **Jaén** (Schmölzer 1971); **Lugo** (Schmölzer 1955a); **Madrid** (Pollo Zorita 1986a, 2015; Garcia & Cabanillas 2021); **Málaga** (Budde-Lund 1885; Schmölzer 1955a, 1971; Vandel 1962; Wallace Moreno & Berrocal Pérez

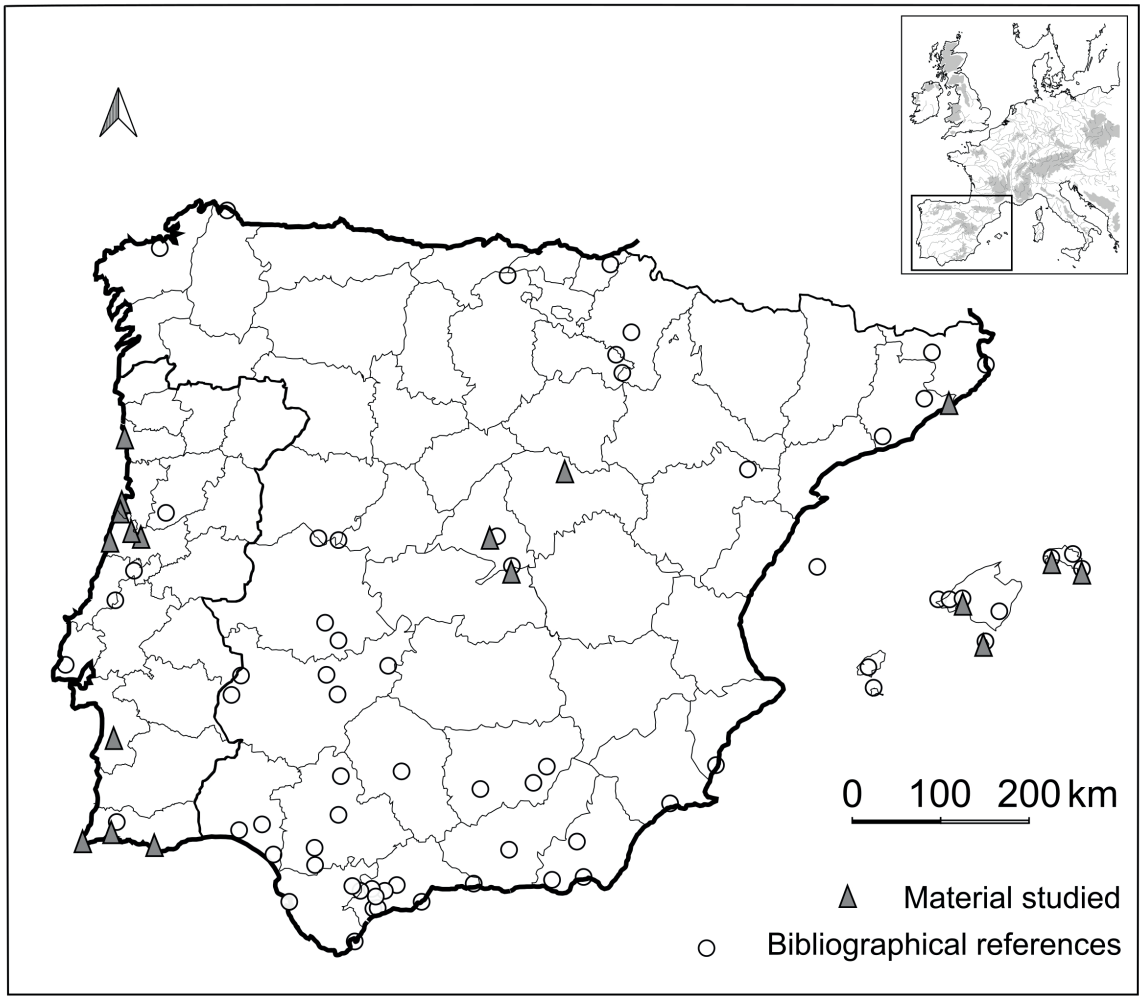

Fig. 24. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides sexfasciatus* (Budde-Lund, 1885).

2002; Del Rosal Padial *et al.* 2009; Cifuentes 2021a); **Murcia** (Cifuentes 2021b); **Navarra** (Cifuentes 1984); **Pontevedra** (Schmölzer 1955a; Cifuentes 2019; Marmaneu *et al.* 2019); **Sevilla** (Budde-Lund 1885; Dollfus 1892; Schmölzer 1971); **Teruel** (Barrientos 2005).

It is recorded for the first time in the Portuguese districts of Aveiro, Coimbra, Porto and Setubal, and the Spanish province of Guadalajara (Fig. 24).

Porcellionides ibericus sp. nov.
urn:lsid:zoobank.org:act:C921D848-D2E0-4FAB-B6A6-98F30D684DFF
Figs 2K, 25–27, Table 1

Diagnosis

Integument with small granulations. Glandular fields occupy substantial portion of tergite lateral edge and with numerous pores. Scale-setae very short arrowhead-shaped. Cephalon with broadly curved frontal line and well-defined lateral lobes. Pereon with rounded hind margins on first tergites, and without transverse ridges. Pleon slightly retracted from pereon. Pereopods without sexual differentiation. In males, truncated posterior inner tip in exopod of pleopod I, and short and triangular exopod of pleopod II.

Etymology

The specific epithet refers to '*IberiaI*', the term used by Herodotus (circa 484–425 B.C.) to designate the region now recognized as Iberian Peninsula, where *P. ibericus* occurs.

Type material

Holotype

PORTUGAL – **Faro** • ♂; Gambelas; 37.0400° N, 7.9736° W; 29 Dec. 2022; L.P. Da Silva leg.; MNCN 20.04/20810 (ex. LPS692a).

Paratypes

PORTUGAL – **Beja** • 1 ♂; Alves; 37.6091° N, 7.5644° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS246 • 1 ♀; same collection data as for preceding; LPS247 • 1 ♀; same collection data as for preceding; LPS248 • 1 ♂; Belmeque; 38.0423° N, 7.3874° W; 12 Apr. 2022; L.P. Da Silva leg.; LPS254 • 1 ♀; Belmeque; 38.0422° N, 7.3873° W; 12 Apr. 2022; L.P. Da Silva leg.; LPS256 • 1 ♂; Mértola; 37.6421° N, 7.6642° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS227 • 1 ♀; same collection data as for preceding; LPS226 • 2 ♀♀; Mértola; 37.6432° N, 7.6645° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS231 • 1 ♂; same collection data as for preceding; LPS232 • 1 ♀; Mértola; 37.6432° N, 7.6646° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS233 • 1 ♂; Mértola; 37.6413° N, 7.6693° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS235 • 1 ♀; Mértola; 37.6413° N, 7.6696° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS236 • 1 ♀; same collection data as for preceding; LPS237 • 1 ♀; Mértola; 37.6372° N, 7.6665° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS242 • 2 ♀♀; Mértola; 37.6406° N, 7.6685° W; 11 Apr. 2022; L.P. Da Silva leg.; LPS244 • 1 ♀; Pias; 38.0216° N, 7.4821° W; 12 Apr. 2022; L.P. Da Silva leg.; LPS250 • 1 ♀; Pias; 38.0221° N, 7.4817° W; 12 Apr. 2022; L.P. Da Silva leg.; LPS253 • 3 ♂♂; São Matias; 1. Apr. 1983; A. Serra leg.; A. Cruz coll.; CRBA-86572 • 1 ♀; Vale Perditos; 37.8228° N, 7.3799° W; 9 Apr. 2022; L.P. Da Silva leg.; LPS216 • 1 ♀; Vale Perditos; 37.8227° N, 7.3799° W; 9 Apr. 2022; L.P. Da Silva leg.; LPS217. – **Bragança** • 1 ♀; Frechas; 41.4059° N, 7.1562° W; 5 Jan. 2023; L.P. Da Silva leg.; LPS736. – **Castelo Branco** • 1 ♂; Perdigão; 39.6805° N, 7.7264° W; 1 Dec. 2022; L.P. Da Silva leg.; LPS523a • 1 ♀; same collection data as for preceding; LPS523b • 1 ♂; same collection data as for preceding; LPS524a • 1 ♀; same collection data as for preceding; LPS524b • 2 ♀♀; Vila Velha de Ródão; 39.6540° N, 7.6972° W; 1 Dec. 2022; L.P. Da Silva leg.; LPS526. – **Évora** • 1 ♀; Alandroal; 38.7036° N, 7.3996° W; 2 Dec. 2022; L.P. Da Silva leg.; LPS564 • 1 ♂; Terena, Santuário de Endovélico de Rocha da Mina; 38.6634° N, 7.4772° W;

3 Dec. 2022; L.P. Da Silva leg.; LPS580a • 1 ♀; same collection data as for preceding; LPS580b • 1 ♂; Terena, Santuário de Endovélico de Rocha da Mina; 38.6630° N, 7.4757° W; 3 Dec. 2022; L.P. Da Silva leg.; LPS582. – **Faro** • 1 ♀; Estômbar; 37.1562° N, 8.4993° W; 28 Dec. 2022; L.P. Da Silva leg.; LPS690 • 1 ♂; Faro, Gambelas; 37.0413° N, 7.9729° W; 29 Dec. 2022; L.P. Da Silva leg.; MNCN 20.04/20811 (ex. LPS691) • 1 ♂; same collection data as for holotype; LPS692a • 1 ♀; same collection data as for holotype; LPS692b • 1 ♀; same collection data as for holotype; JC770 (ex. LPS692b) • 1 ♀; Faro, Gambelas; 37.0422° N, 7.9714° W; 29 Dec. 2022; L.P. Da Silva Leg.; MNCN 20.04/20812 (ex. LPS693b) • 1 ♂; Faro, Gambelas; 37.0420° N, 7.9715° W; 29 Dec. 2022; L.P. Da Silva leg.; JC771 (ex. LPS694c) • 1 ♂; Pechão; 37.0597° N, 7.8707° W; 29 Dec. 2022; L.P. Da Silva leg.; LPS698a • 1 ♀; same collection data as for preceding; LPS698b. – **Portalegre** • 1 ♀; Fronteira de Marvão; 39.3537° N, 7.3074° W; 1 Dec. 2022; L.P. Da Silva leg.; LPS533 • 1 ♀; Santana; 39.6128° N, 7.6625° W; 1 Dec. 2022; L.P. Da Silva leg.; LPS530. – **Santarém** • 2 ♀♀; Água de Todo o Ano; 39.2874° N, 8.1149° W; 3 Dec. 2022; L.P. Da Silva leg.; LPS589 • 1 ♂; Aldeia do Mato; 39.5456° N, 8.2775° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS505a • 1 ♀; same collection data as for preceding; LPS505b • 1 ♀; same collection data as for preceding; MNCN 20.04/20813 (ex. LPS505b) • 1 ♀; same

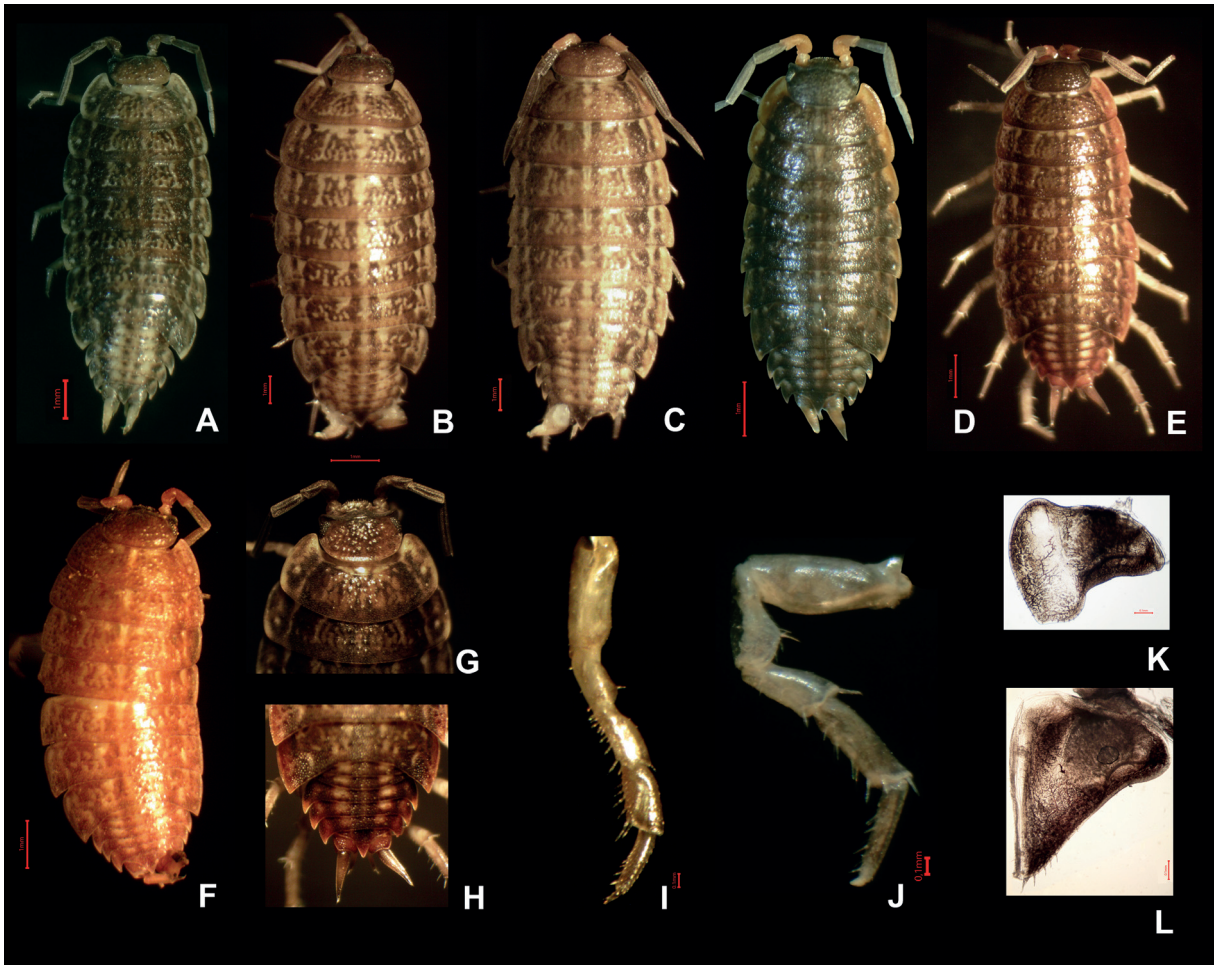

Fig. 25. *Porcellionides ibericus* sp. nov. **A–F**. Habitus. **A**. Paratype, ♀ (LPS226). **B**. Paratype, ♀ (LPS250). **C**. Paratype, ♀ (LPS247). **D**. Paratype, ♂ (LPS232). **E**. Paratype, ♂ (LPS254). **F**. ♀ (LPS217). **G**. Paratype, ♀ (LPS226), cephalon and first pereonites. **H**. Paratype, ♂ (LPS254), pleon, telson and uropods. **I–J**. Paratype, ♂ (LPS232). **I**. Pereopod 1. **J**. Pereopod 7. **K–L**. Paratype, ♂ (LPS254). **K**. Exopod I. **L**. Exopod II. Scale bars: A–H = 1 mm; I–L = 0.1 mm.

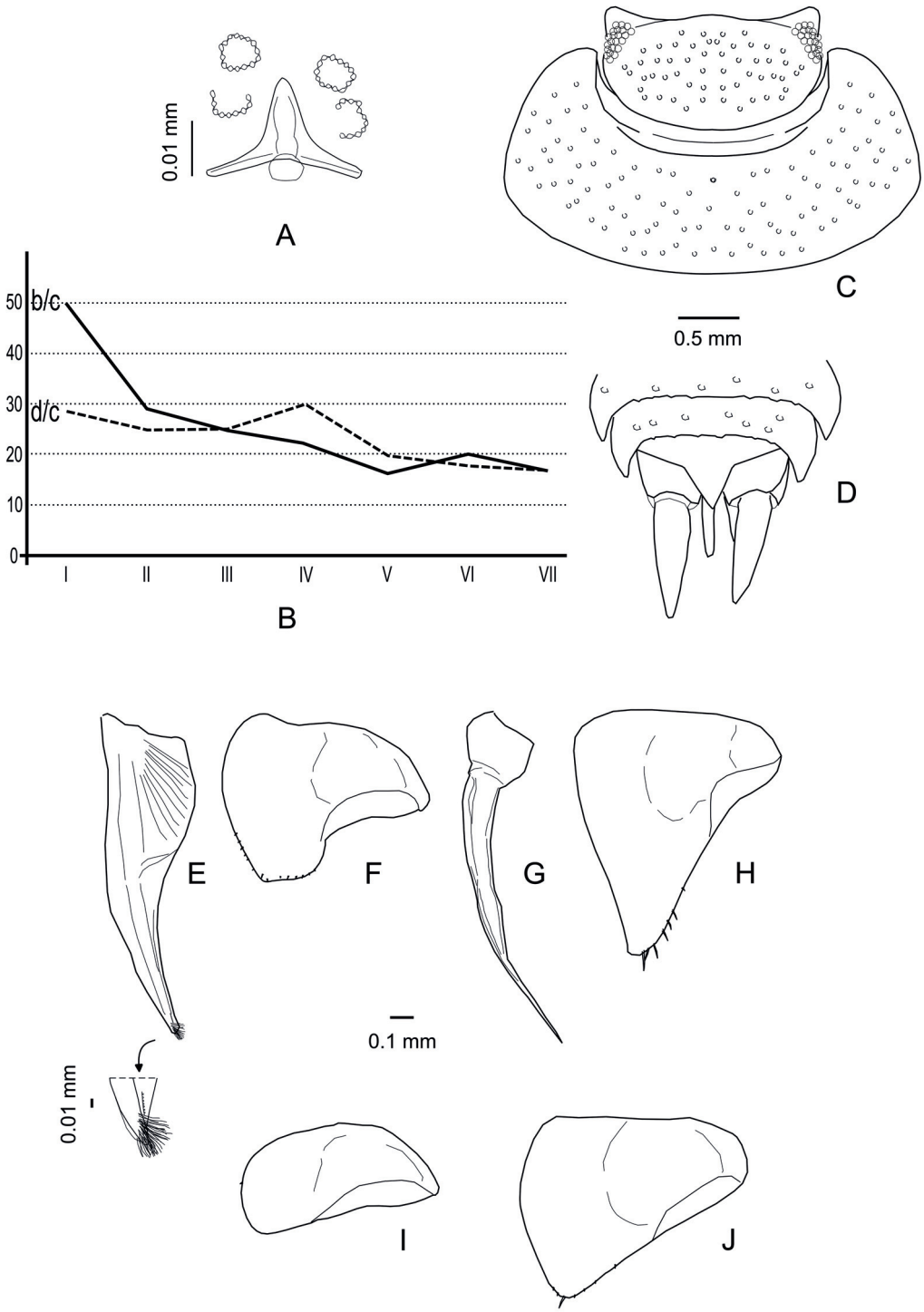

Fig. 26. *Porcellionides ibericus* sp. nov. **A**. Paratype, ♀ (LPS273), scale-setae. **B.** Noduli laterales coordinates. **C–D**. Paratype, ♀ (LPS226). **C**. Cephalon and pereonite I. **D**. Pleon, telson and uropods. **E–H**. Paratype, ♂ (LPS254). **E**. Endopod I. **F**. Exopod I. **G**. Endopod II. **H**. Exopod II. **I–J**. Paratype, ♀ (LPS273). **I**. Exopod I. **J**. Exopod II. Scale bars: A = 0.01 mm; C–D = 0,5 mm; E–J = 0.1 mm.

collection data as for preceding; JC773 (ex. LPS505b) • 1 ♂; Tancos; 39.4619° N, 8.3995° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS499 • 1 ♂; Tancos; 39.4620° N, 8.3996° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS501 • 2 ♀♀; Tancos; 39.4621° N, 8.3997° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS502 • 4 ♀♀; Tancos; 39.4645° N, 8.3980° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS503 • 1 ♂; Tancos; 39.4655° N, 8.3980° W; 5 Nov. 2022; L.P. Da Silva leg.; JC772 (ex. LPS504a) • 1 ♀; same collection data as for preceding; LPS504b • 1 ♀; Tancos; 39.4620° N, 8.3951° W; 5 Nov. 2022; L.P. Da Silva leg.; LPS508. – **Setubal** • 1 ♀; Herdade da Ribeira Abaixo; 38.1070° N, 8.5705° W; 28 Apr. 2022; L.P. Da Silva leg.; LPS273 • 1 ♀; Marateca; 38.5939° N, 8.6775° W; 24 May 2022; L.P. Da Silva leg.; LPS321.

SPAIN – **Cádiz** • 1 ♂; Véjer de la Frontera, La Janda, Cueva Quiñones; 17 Jan. 1971; Meseguer and Masot leg.; cited as *P. sexfasciatus lusitanus* by Cifuentes (2021a: fig. 27); A. Cruz coll.; CRBA-86542.

Description

Measurements. Maximum observed length: female 10,5 mm, male 9 mm.

Coloration. Highly variable coloration (Fig. 25A–F). Several patterns can be differentiated, which nevertheless establish all series of intermediates between them. First pattern: strongly pigmented specimens, dark brown in color; in pereon, muscle insertions, and central line poorly marked, very small spot at pleonite epimeron edge, pleonite epimera pigmented but with clear lateral edge; in pleon, faint central line, and two clear and wide lateral lines, small light spot at anterior edge, and clear lateral edge. Second pattern: specimens of more or less dark brown color, with middle area and muscle insertions highly pronounced, bordered by darker lines, with large white spots at pleonite epimera edge, and these lightly pigmented. Third pattern: poorly pigmented specimens, light brown in color, with muscle insertions and lines indicated above faintly marked. This coloration generally found in young specimens. Fourth pattern: regardless of coloration, granulations more pigmented, and in many specimens, gradual shift toward reddish tones occurs, starting in anterior pleonite epimeron and extending toward posterior ones, resulting in specimens displaying lateral edge more or less intense red, yellowish, or whitish. Sometimes, body with light reddish tone. Additionally, common for second and third antenna segments to be reddish, although, in some specimens, might be whitish, reddish-brown, or dark, in heavily pigmented individuals.

Integumentary characters. Integument with small granulations arranged in numerous rows (Figs 25A–H, 26B–C), more pronounced on cephalon and first pereonites and less distinct towards posterior region, although some specimens are nearly smooth. Glandular fields with high number of pores (Table I). Pereonite I bearing granulations on entire lateral edge, remaining pereonites, situated in middle region and extending to about two-thirds, or even more, of pereonite's edge. In some specimens, this field extended along entire edge of pereonite VII, although pores not reaching extremities. Noduli laterales, except pereonite I situated in middle region, located on posterior third of initial pereonites and gradually shift towards posterior edge in subsequent segments. In heavily pigmented specimens, highly noticeable due to their location in small depigmented region. b/c and d/c coordinates as in Figs 2K, 26B. Circular scales and setae-scales arrow-shaped, short, and rounded tip (Fig. 26A).

Somatic characters. Body slightly convex. Cephalon with broadly curved frontal line, distinct lateral lobes, and supra-antennal line generally well-marked (Figs 25G, 26C). Pereon with posterior edge of pereonite I highly rounded (Figs 26G, 27C), less rounded edges on second and third pereonites, and from fourth to seventh, posterior angle increases, forming pointed shape. Pereonites without transverse ridge. Pleon retracted in relation to pereon (Fig. 25A–H). Short telson, barely surpassing protopod of uropods, with very small base and broad, triangular, and pointed tip, separated from base by well-defined angles (Figs 25H, 26D).

Appendages. Thick antennae reaching posterior edge of pereonite III; lacking antennal teeth, with first segment of flagellum slightly longer than second. Uropods with transversely oriented posterior edge on protopods, endopods much longer than telson, exopods short and conical in both sexes (Figs 25H, 26D). Pereopods with no sexual differentiation (Fig. 25I–J). In both sexes, pereopod 1 with strong setae splitting into several tips at end, along with setae for antennal cleaning.

Sexual characters. In males, outwardly curved endopod of pleopod I (Fig. 26E), exopod wider than long, with well-defined and truncated posterior inner tip (Figs 25K, 26F), with sinuous tracheal field but no notch. In males, long and slender endopod of pleopod II (Fig. 26G) and short and triangular exopod (Figs 25L, 26H), devoid of notch. In females, rectangular exopod I with sinuous but non-notched posterior edge (Fig. 26I), and triangular exopod II without notch (Fig. 26J).

Ecology

This epigean species was mostly found beneath rocks, and occasionally under fallen wood, during the daytime. At night, some specimens were also found beneath rocks, while others were collected from above rocks and on walls. Several specimens were encountered alongside *Lucasius pallidus* (Budde-Lund, 1885), *Porcellio hoffmannseggii* Brandt, 1833, and *Porcellionides elegans*.

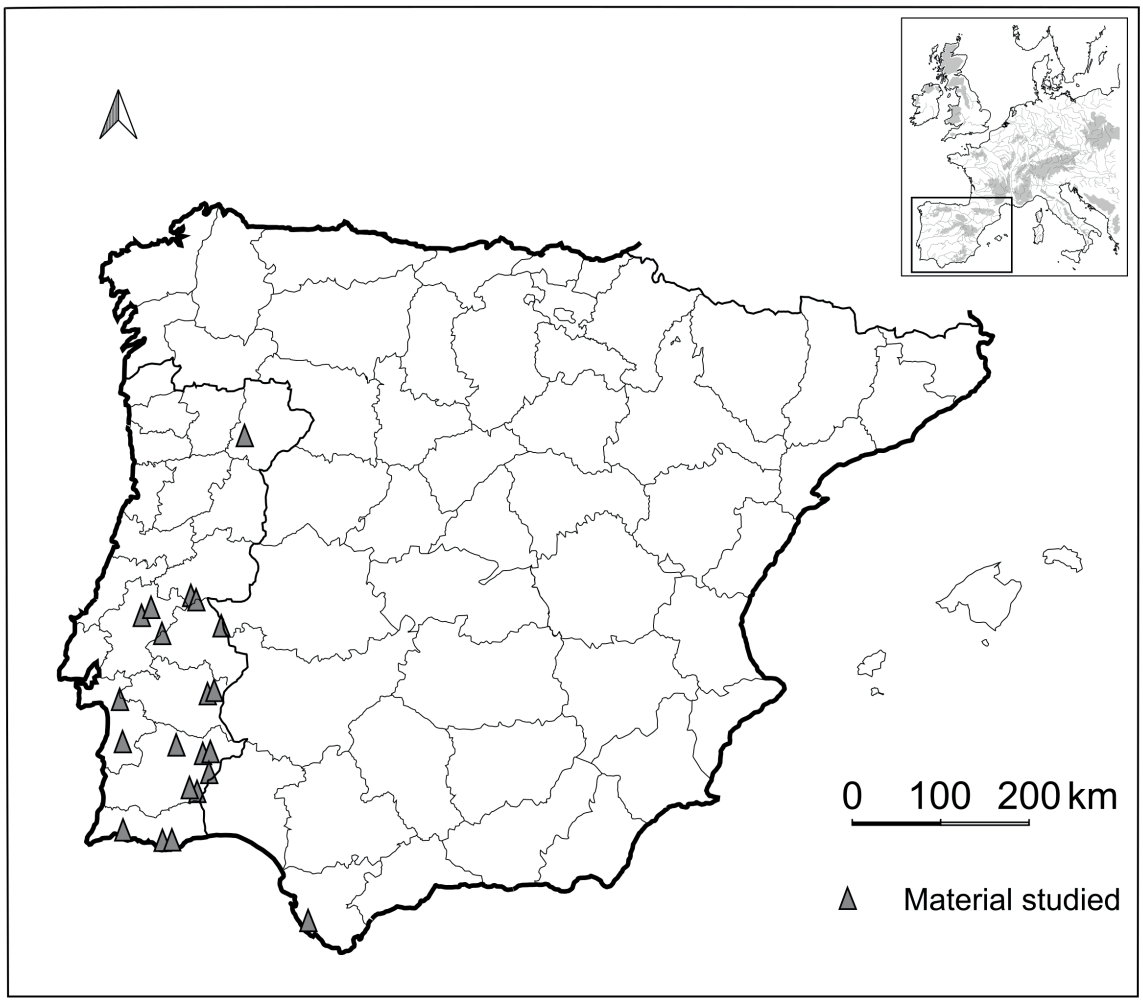

Fig. 27. Localization of the Ibero-Balearic region in Europe and the distribution of *Porcellionides ibericus* sp. nov.

Remarks

Porcellionides ibericus sp. nov. lacks the transverse ridges on the tergites, which distinguishes it from *P. cingendus*, *P. glaber*, *P. lucasioides* and *P. sexfasciatus*. In the males, the carpus of the pereopod 1 features a brush of setae in *P. fuscomarmoratus*, *P. elegans*, *P. pruinosus* and *P. lusitanus* whereas *P. ibericus* lacks sexual differentiation in the pereopods (Table 1). The cephalon of *P. ibericus* has moderate lateral lobes, the antennae are thick with flagellum segments of nearly equal size, and the male exopod of the pleopod I has a truncated posterior inner tip. In contrast, *P. hispanus* lacks lateral lobes on the cephalon, has long and slender antennae with the first segment of the flagellum larger than the second, and the male exopod of the pleopod I lacks a posterior inner tip. Due to the notable variations in coloration in *P. ibericus*. (Fig. 25A–F), some specimens could potentially be mistaken for *P. molleri* (Fig. 19A–H). However, there are specific characters that enable accurate identification. In *P. molleri* males, the carpus of the pereopods 1 and 2 have dense brushes of setae, the posterior inner tip of the exopod of the pleopod I is only slightly pronounced (Figs 15I, 19J), and the exopod of the pleopod II (Figs 15J, 19K) along with the female exopods of the pleopods I and II (Fig. 15K–L) are notched. On the other hand, in *P. ibericus*, pereopods lack sexual differentiation (Fig. 25I–J), the posterior inner tip of the male exopod of the pleopod I is highly pronounced and truncated (Figs 25K, 26F), and there are no notches on the exopods of the pleopods I and II in males (Figs 25K–L, 26F, H) or females (Fig. 26I–J).

Key to the species of the genus Porcellionides Miers, 1877 from the Ibero-Balearic region

1. Pereon with transverse ridges on the dorsal side of the tergites 2
– Pereon without transverse ridges on the dorsal side of the tergites 5

2. Carpus of the pereopod 1 in males lacks a brush of setae 3
– Carpus of the pereopod 1 in males with a brush of setae 4

3. Highly convex body, smooth integument, male exopod of the pleopod I with an inner lobe ending in a curved tip .....***P. glaber*** (Koch, 1856)
– Elongated body, integument with fine granulations, male exopod of the pleopod I with a long posterior inner tip ..... ***P. sexfasciatus*** (Budde-Lund, 1885)

4. Integument with weak and flat granulations, cephalon with very small lateral lobes, male exopod of the pleopod I and II with notches .....***P. cingendus*** (Kinahan, 1857)
– Integument with marked granulations, cephalon with moderate lateral lobes, male exopod of the pleopod I and II without notches ..... ***P. lucasioides*** (Vandel, 1953)

5. Carpus of the pereopod 1 in males lacks a brush of setae 6
– Carpus of the pereopod 1 in males with a brush of setae 7

6. Cephalon with moderate lateral lobes, male exopod of the pleopod I with a truncated posterior inner tip .....***P. ibericus*** sp. nov.
– Cephalon without lateral lobes, male exopod of the pleopod I without a posterior inner tip .....
.....***P. hispanus*** (Vandel, 1953)

7. Smooth integument, cephalon with almost absent lateral lobes .....
..... ***P. fuscomarmoratus*** (Budde-Lund, 1885)
– Integument with more or less pronounced granulations, cephalon with more or less marked lateral lobes 8

8. First and second segments of the antennal flagellum of equal or very similar size 9
– First segment of the antennal flagellum much longer than the second 10

9. Male exopod of the pleopod I with a deeply incised posterior inner tip and an unnotched tracheal field ..... ***P. elegans*** (Pollo Zorita, 1982)
– Male exopod of the pleopod I with a very small posterior inner tip and a notched tracheal field .... ***P. molleri*** (Verhoeff, 1901)

10. Integument with small and flat granulations, cephalon with small lateral lobes .... ***P. pruinosus*** (Brandt, 1833)
– Integument with strong granulations, cephalon with moderate lateral lobes .... ***P. lusitanus*** (Vandel, 1946)

This key is only applicable to males and does not include *P. buddelundi* (Verhoeff, 1901) or *P. rufocinctus* (Dollfus, 1892), which we regard as species inquirendae, based on currently available data.

Discussion

The descriptions of *Porcellionides buddelundi* given by Verhoeff (1901) and *Porcellionides rufocinctus* by Dollfus (1892, 1893) lack sufficient information to clearly distinguish them from other closely related species, such as *P. molleri*. Additionally, *P. molleri* is widely distributed in northern Portugal and the northwestern region of Spain, precisely the areas where these two species have been documented. The coloration, granulations, and the absence of transverse ridges on the pereonites in the description of *P. buddelundi* are features that resemble those of *P. molleri*. Regarding *P. rufocinctus*, its coloration, short lateral lobes, absence of transverse ridges on the tergites, significant pleon retraction in relation to pereon, and the uniform length of the flagellum segments also contribute to its resemblance to *P. molleri*. Therefore, at present, we classify these as species inquirendae, and as a result, we have not considered them for establishing distinctions among the species within this genus in the Ibero-Balearic region.

Vandel (1962) indicates that for the genus *Metoponorthus*, which is now referred to as *Porcellionides*, the cephalon lacks a middle lobe in the frontal line, the lateral lobes are either small or moderately sized, and the supra-antennal line forms a V on the forehead. In the pereon, the posterior edges of the pereonites I to III are rounded, and the pleon is retracted from the pereon. All these characters are present in *P. ibericus* sp. nov., confirming its classification within this genus. In the diagnosis of the genus *Porcellionides*, Schmalfuss & Ferrara (1978) described a "head without distinct lateral and median lobes." However, as mentioned above, in the Ibero-Balearic region, several species exhibit varying degrees of pronounced lateral lobes (Table 1), while simultaneously retaining the other defining characters of the genus.

Vandel (1946, 1953) observed a wide range of variations in several characters, including the morphology of male pleopods, within *P. sexfasciatus*. This led him to propose the establishment of several subspecies, namely *P. sexfasciatus hispanus* (Vandel, 1953), *P. sexfasciatus lucasioides* (Vandel, 1953), *P. sexfasciatus lusitanus* (Vandel, 1945) and *P. sexfasciatus sexfasciatus* (Budde-Lund, 1885). We agree with Vandel's perspective, as integumentary characters such as granulations, glandular fields, scale-setae, and the presence or absence of transverse ridges on tergites are consistent and important for distinguishing between different species. Vandel (1946, 1953) attributed a subspecific status to the observed variations in the specimens he studied. We believe that there are other additional important characters that should be considered, despite the fact that Vandel (1946, 1953) placed only a limited emphasis on them within this genus. These include the morphology of the cephalon, particularly the lateral lobes, the position of the noduli laterales on the various pereonites (Fig. 2), the consistent sexual differentiation in the first pairs of male pereopods across the numerous specimens of the studied species, and most importantly, the morphology of the first pair of male pleopods. Through the examination of the 721 specimens mentioned in this work (in addition to those examined in precious works by the same authors), we have confirmed that the variability in all these characters is comparable to that observed in the other major genus of the family, namely the genus *Porcellio*. This variability has facilitated the

establishment of well-defined distinct species, namely *P. hispanus*, *P. lucasioides*, and *P. lusitanus*, based on the distinguishing characters previously mentioned (see also Table 1).

Although *P. glaber* is currently considered a nomen dubium and *P. molleri* is considered a synonym of *P. sexfasciatus* (Boyko *et al.* 2023), we consider these to be valid species due to their distinctive characters (Table 1). Finally, while *P. buddelundi* and *P. rufocinctus* are currently acknowledged as valid species (Boyko *et al.* 2023), we here currently classify them as species inquirendae because it is not possible to unequivocally differentiate them from other species within the genus, at least with the specimens we had the opportunity to study and currently available data.

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