

Graellsia, 59(1): 63-78 (2003)

AN OVERVIEW OF THE DISTRIBUTION OF THE PARABATHYNELLIDAE (CRUSTACEA, SYNCARIDA BATHYNELLACEA) ON THE IBERIAN PENINSULA AND BALEARIC ISLANDS

A. I. Camacho*

ABSTRACT

This paper reviews all the knowledge on the presence and distribution of 26 species of the family Parabathynellidae Noodt, 1964 (Crustacea, Syncarida, Bathynellacea) on the Iberian Peninsula and Balearic Islands. The different genera, subgenera and species distributions are subjected to a basic analysis. The presence of these taxa in different subterranean aquatic habitats (caves, springs, wells and interstitial environment) is also discussed. The most sampled habitat was the interstitial environment (45%); the least sampled habitat was springs (5%). The most commonly found genus was *Iberobathynella* Schminke, 1973 (54%) and the rarest was *Guadalopebathynella* Camacho & Serban, 1998 (0.7%)

All the knowledge on these taxa in the study area, in Europe and in the world is compared and evaluated. More species of the Parabathynellidae live on the Iberian Peninsula and Balearic Islands than in any other part of the world (26 species). *Iberobathynella* is a highly diversified genus endemic to the Iberian peninsula. Its diversity is comparable to another genus in the order, *Hexabathynella* Schminke, 1972, which also has 18 described species. However, *Hexabathynella* has a cosmopolitan distribution.

Key words: Crustacea, Syncarida, Parabathynellidae, Distribution, Faunistics, subterranean water, Spain, Portugal.

RESUMEN

Distribución de la familia Parabathynellidae (Crustacea, Syncarida, Bathynellacea) en la Península Ibérica e Islas Baleares

En este trabajo se reúne y actualiza el conocimiento acerca de la presencia y distribución de 26 especies de batinelas de la familia Parabathynellidae (Crustacea, Syncarida, Bathynellacea) en la Península Ibérica y las Islas Baleares. Se analiza de forma crítica la distribución de los diferentes géneros, subgéneros y especies y se discute acerca de la presencia de los mismos en diferentes hábitats acuáticos subterráneos (cuevas, fuentes o surgencias, pozos y medio intersticial asociado a ríos epigeos). El mayor número de puntos de muestreo corresponde al medio intersticial (45% del total) y en él se encuentran los cinco géneros presentes en el área de estudio; las surgencias constituyen el conjunto con menos puntos de muestreo (5%) y en ellas sólo se encuentran los géneros *Iberobathynella* (86%) y *Hexaiberobathynella* Camacho & Serban, 1998 (14%). El género *Iberobathynella* es el más común (54% de las muestras) y vive en todos los medios. El género *Guadalopebathynella* sólo se ha encontrado en el medio intersticial de un río.

Se valora comparativamente el conocimiento de estos taxa en el área estudiada, en Europa y en el mundo. En la Península Ibérica y las Islas Baleares vive el mayor porcentaje de especies de todo el mundo (24%) y todas ellas son endémicas de esta zona. El género *Iberobathynella*, endémico de la Península Ibérica, cuenta con 18 especies conocidas y tal diversificación sólo se da, en todo el orden, dentro del género *Hexabathynella* (18 especies) que es el único género cosmopolita de Bathynellacea.

Palabras clave: Crustacea, Syncarida, Parabathynellidae, Distribución, Faunística, agua subterránea, España, Portugal.

* Museo Nacional de Ciencias Naturales, C/José Gutiérrez Abascal 2, 28006- Madrid (Spain). e-mail: mcnac22@mncn.csic.es

Introduction

The Order Bathynellacea Chappuis, 1915, is widely distributed on the Iberian Peninsula and the Balearic Islands. This is the area of the World where most species of this crustacean group are known. The two families described in the order, Parabathynellidae Noodt, 1964 and Bathynellidae Grobben, 1905, are highly diversified in Portugal and Spain. In the rest of Europe only the Bathynellidae has a similar number of known species.

Twenty-six species of Parabathynellidae are known and a similar number of Bathynellidae to date on the Iberian Peninsula and Balearic Islands, but most of the latter have not yet been described. The Parabathynellidae comprises 18 species of *Iberobathynella*; one species of *Guadalopebathynella*; two species of *Hexaiberobathynella*; two species of *Paraiberobathynella* Camacho & Serban, 1998; and three species of *Hexabathynella* Schminke, 1972 (the only cosmopolitan genus in the order Bathynellacea).

The distribution of the Parabathynellidae family in this area is very extensive and covers the whole of the Peninsula and the islands of Mallorca and menorca (Pretus, 1991). Some of the species are found in many different sites, often placed considerably apart, while other species inhabit very limited areas, some even being known from a single location only. Subterranean water sensu lato (i.e. caves: gours, pools, lakes, subterranean rivers and springs; and in unconsolidated sediments: wells and the hyporheic and interstitial realms) is the only habitat where bathynells live. This environment is poorly known on the Iberian Peninsula as well as in Europe and the world. But, despite this, we consider that the current knowledge on the distribution of 26 species in 139 different places, in four habitats, is such that it constitutes a body of data that is of considerable importance and now is the time that it should be revised, updated and compared critically from a faunistic point of view.

It is important to bear in mind that in Europe, apart from the Iberian Peninsula, only two genera of the Parabathynellidae family have been found. One of these, *Parabathynella* Chappuis, 1926, has only two species, which are widely distributed in France and Central Europe. The other genus, *Hexabathynella*, which is the only cosmopolitan genus in the order, has five species in Bulgaria and one in Corsica. Given that *Parabathynella* never crossed the Pyrenees, *Hexabathynella* has three different species on the Iberian Peninsula, and that as much as four endemic genera are known from this

Table 1.— Recognized names of taxa and corresponding taxonomic authorities for all members of the Family Parabathynellidae of the Iberian Peninsula and Balearic Islands.

Tabla 1.— Nombres y autorías taxonómicas de todos los taxa de la familia Parabathynellidae encontrados en la Península Ibérica e Islas Baleares.

Subclass Eumalacostraca Packard, 1892
Superorder Syncarida Packard, 1885
Order Bathynellacea Chappuis, 1915
Family Parabathynellidae Noodt, 1964
Tribe Iberobathynellini Camacho & Serban, 1998
Subtribe Iberobathynellina Camacho & Serban, 1998
Genus <i>Iberobathynella</i> Schminke, 1973
Subgenus <i>I. (Iberobathynella)</i> Schminke, 1973
<i>I. (I.) lusitanica</i> (Braga, 1949). Portugal. <i>Pub. Inst. Zool. "Dr. Augusto Nobre"</i> , 40: 1-15.
<i>I. (I.) gracilipes</i> (Braga, 1960). Portugal. <i>Pub. Inst. Zool. "Dr. Augusto Nobre"</i> , 75: 9-22.
<i>I. (I.) paragracilipes</i> Camacho & Serban, 1998. Spain.
<i>I. (I.) barcelensis</i> (Galhano, 1970). Portugal. <i>Publ. Inst. Zool. "Dr. Augusto Nobre"</i> , 107: 41-65.
<i>I. (I.) valbonensis</i> (Noodt & Galhano, 1969). Spain & Portugal. <i>Pub. Inst. Zool. "Dr. Augusto Nobre"</i> : 77-82 & 148-153.
Subgenus <i>I. (Espanobathynella)</i> Camacho & Serban, 1998
<i>I. (E.) cantabriensis</i> Camacho & Serban, 1998. Spain.
<i>I. (E.) magna</i> Camacho & Serban, 1998. Spain.
<i>I. (E.) espaniensis</i> Serban & Comas, 1978. Spain. <i>Trav. Inst. Spéol. "Emile Racovitza"</i> , XVII: 13-37.
Subgenus <i>I. (Asturibathynella)</i> Camacho & Serban, 1998
<i>I. (A.) asturiensis</i> Serban & Comas, 1978. Spain. <i>Trav. Inst. Spéol. "Emile Racovitza"</i> , XVII: 13-37.
<i>I. (A.) parasturiensis</i> Camacho & Serban, 1998. Spain.
<i>I. (A.) cavadoensis</i> (Noodt & Galhano, 1969). Spain & Portugal. <i>Pub. Inst. Zool. "Dr. Augusto Nobre"</i> , 107: 41-65.
<i>I. (A.) imuniensis</i> Camacho, 1987. Spain.
<i>I. (A.) rouchi</i> Camacho & Coineau 1987. Spain. <i>Stylogologia</i> , 3(2): 125-137.
<i>I. (A.) ortizi</i> Camacho, 1989. Spain.
<i>I. (A.) guarenensis</i> Camacho, in press c. Spain.
<i>I. (A.) celiana</i> Camacho, in press c. Spain.
<i>I. (A.) serbani</i> Camacho, in press c. Portugal.
<i>I. pedroi</i> Camacho, in press c. Portugal.
Genus <i>Guadalopebathynella</i> Camacho & Serban, 1998
<i>Guadalopebathynella puchi</i> Camacho & Serban, 1998. Spain.
Subtribe Paraiberobathynellina Camacho & Serban, 1998
Genus <i>Paraiberobathynella</i> Camacho & Serban 1998
Subgenus <i>Pi. (Paraiberobathynella)</i> Camacho & Serban, 1998
<i>Pi. (Pi.) fagei</i> (Delamare & Angelier, 1950). Spain & France. <i>C. R. Acad. Sci., Paris</i> , 231: 175-176.
Subgenus <i>Pi. (Orihuelabathynella)</i> Camacho & Serban, 1998
<i>Pi. (O.) notenboomi</i> (Camacho, 1989). Spain.
Subtribe Hexaiberobathynellina Camacho & Serban, 1998
Genus <i>Hexaiberobathynella</i> Camacho & Serban, 1998
<i>Hi. hortezielensis</i> Camacho & Serban, 1998. Spain.
<i>Hi. mateusi</i> (Galhano, 1967). Portugal & Spain. <i>Publ. Inst. Zool. "Dr. Augusto Nobre"</i> , 98: 9-18.
Genus <i>Hexabathynella</i> Schminke, 1972
<i>H. minuta</i> (Noodt & Galhano, 1969). Portugal & Spain. <i>Publ. Inst. Zool. "Dr. Augusto Nobre"</i> , 107: 41-65.
<i>H. nicoleiana</i> Camacho, 1986. Spain.
<i>H. valdecasasi</i> Camacho, in press b. Spain.

Table 2.— World distribution of the Parabathynellidae.

Tabla 2.— Distribución mundial del número de géneros y especies de la familia Parabathynellidae.

	Family Parabathynellidae			
	number of genera	% of total	number of species	% of total
EUROPE	6	(17)	34	(31,2)
France	3	(8,6)	3	(2,7)
Spain	5	(14,3)	26	(23,8)
AMERICA	13	(37,1)	23	(21,1)
North America	3	(8,6)	6	(5,5)
South America	11	(31,4)	17	(15,6)
ASIA	7	(20)	20	(18,4)
AFRICA	14	(40)	23	(21,1)
AUSTRALIA & N. ZEALAND	5	(14,3)	14	(12,8)
TOTAL	35		109	

region, a comparative assessment of the knowledge on these taxa in the study area, in Europe and in the world is necessary.

Material and Methods

Data source derive from the literature (record appeared until 1980) and from our own surveys (Camacho 1986, 1987a & b, 1988, 1989a, b and c, 1998, 2000, 2003a, b & c; Camacho & Coineau, 1989; Camacho *et al.*, 1997 and 2000; Camacho & Serban, 1998, 2000; and personal observations). The paper by Guil & Camacho (2001) mentions the presence of the species *I. (E.) espaniensis* Serban & Comas, 1978 in the localities following: Torca Treslajorá (10), Fuente del Carnero (11), Torcón de Pelacristo (21) and Torca de la Grañaja (20), but in a later revision we found that these records correspond to the sister species *I. (E.) cantabriensis* Camacho & Serban, 1998, and to *I. (E.) magna* Camacho & Serban, 1998 (see Appendix).

Since 2001 four new species of *Iberobathynella* and one of *Hexabathynella* have been published (Camacho, in press b; Camacho, in press c).

Table 1 shows the recognized names of taxa and the taxonomic authorities for the Parabathynellidae in the study area. There are 18 species of *Iberobathynella* (belonging to three subgenera), one species of *Guadalopebathynella*, two species of *Paraiberobathynella* Camacho & Serban, 1998, two species of the *Hexaiberobathynella* genus, and three species of *Hexabathynella*.

Table 2 shows the world distribution, by continent, of the species of the Parabathynellidae.

Appendix lists the sites where the 26 species of the Parabathynellidae and eleven *Iberobathynella* sp., one *Paraiberobathynella* sp. and one *Hexabathynella* sp. have been found. For each site (139 places in Spain and Portugal) the following data are provided: an identification number, used also in Figures 1 to 4; the province; the country and the UTM coordinates. We also specify the habitat type (cave, spring, well and rivers -interstitial water associated with epigeic rivers or streams).

Distribution

The distribution of the 26 species of Parabathynellidae on the Iberian Peninsula & Balearic Islands is shown in detail in Figures 1 to 4.

Each map shows the distribution of a particular genus. The numbers indicate the different places, and the different symbols indicate the different subgenera or species.

Figure 1 shows the 74 localities where the 18 species of *Iberobathynella* have been found (plus 10 *I.* sp. localities). Taxa have been divided into 5 groups (Fig 1A): the *Iberobathynella (Iberobathynella)* subgenus in the western part of the Iberian Peninsula; the *Iberobathynella (Espanobathynella)* subgenus in a small area in the North of Spain (Picos de Europa); the *Iberobathynella (Asturibathynella)* subgenus in the North of the Iberian Peninsula above the Duero basin, plus one species found in Sevilla; *Iberobathynella pedroi* Camacho (in press c), species

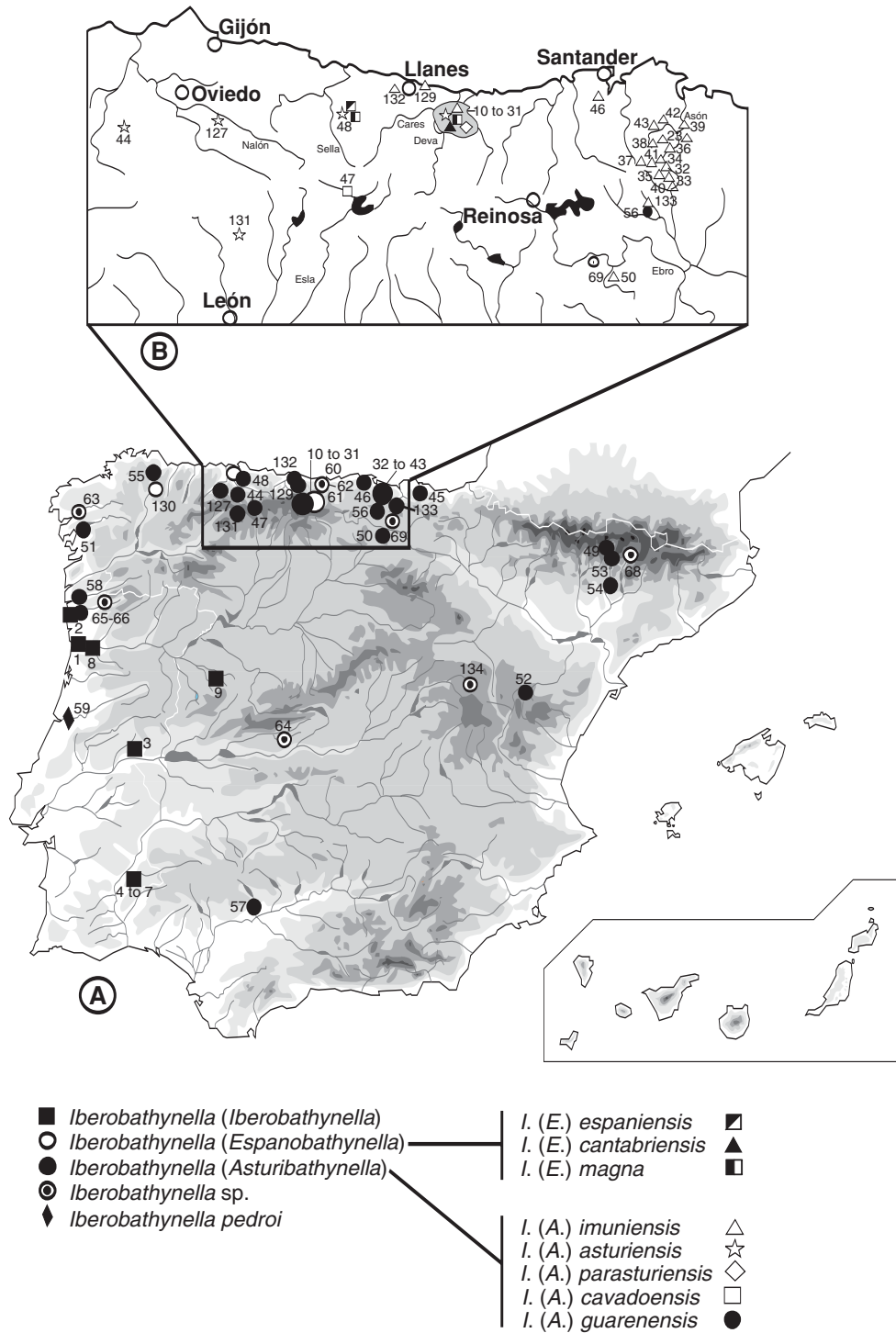


Fig. 1— Distribution of the genus *Iberobathynella* on the Iberian Peninsula. a) Iberian Peninsula and b) detail of Cantabrian region, the area with the highest density of sampling points. Each number corresponds to a sampling site (see Appendix).

Fig. 1— Distribución del género *Iberobathynella* en la Península Ibérica. a) Península Ibérica completa y b) detalle de la region Cantábrica, donde se da la mayor densidad de puntos de muestra. Los números corresponden a las localidades del Apéndice.

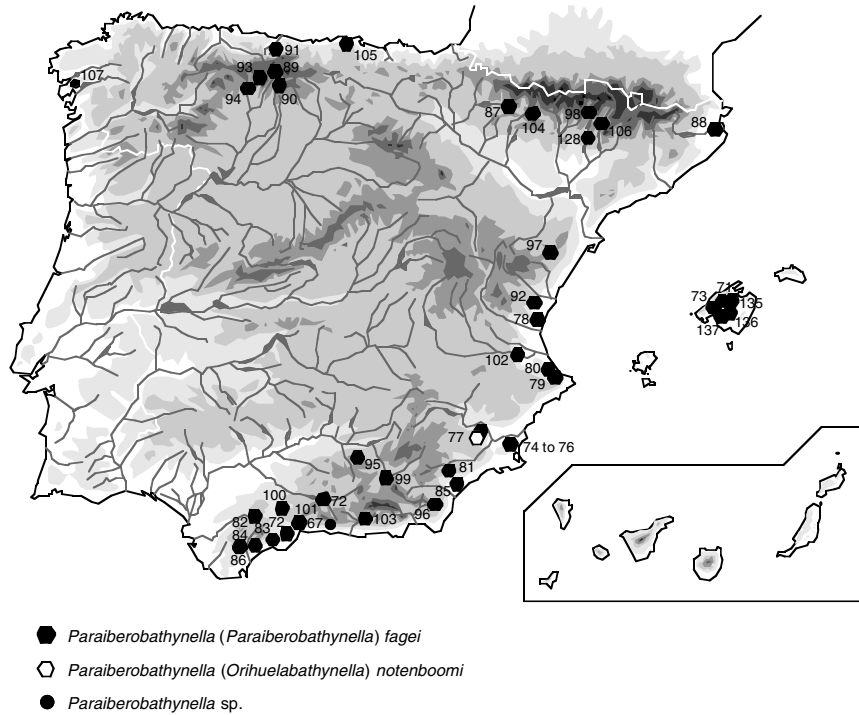


Fig. 2.— Distribution of the species of the genus *Paraiberobathynella* of the Iberian Peninsula and the Balearic Islands. Each number corresponds to a sampling site (see Appendix).

Fig. 2.— Distribución de las especies del género *Paraiberobathynella* en la Península Ibérica e Islas Baleares. Los números corresponden a las localidades del Apéndice.

limited to the western-central region of Portugal; and a fifth group composed of 10 *Iberobathynella* sp. distributed in the north, northeast, northwest and center of the Iberian Peninsula.

Figure 2 details the 43 localities where the 2 species of the genus *Paraiberobathynella* have been found. All places are situated on the edge of the Peninsula, from Cantabria to Cádiz, and on the Island of Mallorca. This genus also lives in North Africa (*Paraiberobathynella maghrebensis* Boutin & Coineau, 1987).

Figure 3 shows the 19 localities of *Hexaiberobathynella*. Another genus, the monotypic *Guadalopebathynella* is found in a single locality (70).

Figure 4 shows the distribution of the genus *Hexabathynella*, with two localities in the North of Portugal (124 and 65), one in the south of Spain (123) and three more in Central Spain.

There are 109 species of Parabathynellidae known in the world (Table 2). Europe is the continent which has been most sampled. This sampling

effort has been very unequal over the years and very different in each country. However it can still be said that the some sampling effort has been devoted in France, Spain, Portugal, Slovenia, Italy, Bulgaria, Rumania, Belgium and Germany during the last 70 years. America, both North and South, has been hardly sampled. Few species have been found there, and most new species described are only known from the type locality. The same holds for Asia, Africa, Australia and New Zealand. Most of the genera described worldwide (35) have only been found, to date, in a single country.

Results

Table 2 shows the world distribution of the genera and species of the Parabathynellidae by continent. It can be seen that almost one quarter of all the species known in the world live on the Iberian Peninsula and that of all the genera described, 14% come from Iberian Peninsula.

Table 3.— Number of localities and habitat types where the different taxa of Parabathynellidae family are found on the Iberian Peninsula and Balearic Islands. P= Portugal and S= Spain

Tabla 3.— Resumen del número de localidades y del número de habitat en que aparecen los diferentes taxa de la familia Parabathynellidae en la Península Ibérica y las Islas Baleares. *: P= Portugal and S= España.

Taxa	Number of localities	Number of wells	Number of caves	Number of streams	Number of springs
<i>Iberobathynella</i>	74	7	41	20	6
<i>Iberobathynella</i> (I.)	9	7	0	2	0
<i>I. (I.) lusitanica</i>	2	1	0	1	0
<i>I. (I.) gracilipes</i>	1	1	0	0	0
<i>I. (I.) paragracilipes</i>	4	4	0	0	0
<i>I. (I.) barcelensis</i>	1	0	0	1	0
<i>I. (I.) valbonensis</i>	2	1	0	1	0
<i>Iberobathynella</i> (E.)	15	0	15	0	0
<i>I. (E.) cantabriensis</i>	11	0	11	0	0
<i>I. (E.) magna</i>	11	0	11	0	0
<i>I. (E.) espaniensis</i>	1	0	1	0	0
<i>Iberobathynella</i> (A.)	45	0	29	12	4
<i>I. (A.) asturiensis</i>	5	0	5	0	0
<i>I. (A.) parasturiensis</i>	4	0	4	0	0
<i>I. (A.) cavadoensis</i>	3	0	0	3	0
<i>I. (A.) imuniensis</i>	26	0	19	3	4
<i>I. (A.) rouchi</i>	3	0	0	3	0
<i>I. (A.) ortizi</i>	1	0	1	0	0
<i>I. (A.) guarenensis</i>	1	0	1	0	0
<i>I. (A.) celiana</i>	1	0	0	1	0
<i>I. (A.) serbani</i>	1	0	0	1	0
<i>I. pedroi</i>	1	0	0	1	0
<i>Guadalopebathynella puchi</i>	1	0	0	1	0
<i>Paraiberobathynella</i>	43	12	6	25	0
<i>Pi. fagei</i>	42	12	6	24	0
<i>Pi. notenboomi</i>	1	1	0	0	0
<i>Hexaiberobathynella</i>	21	2	1	17	1
<i>Hi. hortezuelensis</i>	1	1	0	0	0
<i>Hi. mateusi</i>	20	1	1	17	1
<i>Hexabathynella</i>	6	0	0	6	0
<i>H. minuta</i>	3	0	0	3	0
<i>H. nicoleiana</i>	1	0	0	1	0
<i>H. valdecasasi</i>	1	0	0	1	0
TOTAL	139	21	49	62	7

Half of the world genera are African, but the number of African makes up only 25% of the total. In France, only 3 species of this family are known: *Paraiberobathynella* (*Pi.*) *fagei*, which lives in 3 localities close to Perpignan; *Parabathynella motasi* or *stygia*, known only from a single locality; in 10 French localities there are specimens as yet unidentified (under study by the author) but which could correspond to *Parabathynella*; and *Hexabathynella knoepfflery*, found in Corsica.

If we take into account that the sampling effort in neighbouring France has been similar or even greater in the past than that carried out in Spain in the last 18 years, we can conclude that the diversity, in the number of species, is far superior in the Iberian Peninsula.

In the rest of Europe, which has also been well sampled, only 2 species of *Parabathynella*, and 5 more, all Bulgarian, of *Hexabathynella* have been found.

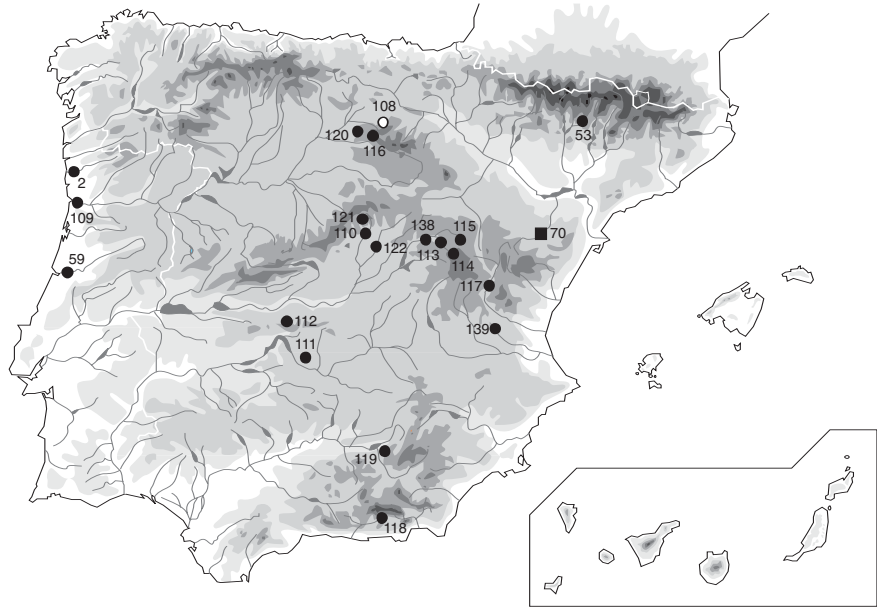


Fig. 3— Distribution of the *Hexaiberobathynella* and *Guadalopebathynella* species of the Iberian Peninsula. Each number corresponds to a sampling site (see Appendix).

Fig. 3— Distribución de las especies de los géneros *Hexaiberobathynella* y *Guadalopebathynella* en la Península Ibérica. Los números corresponden a las localidades del Apéndice.

- *Hexaiberobathynella hortezuelensis*
- *Hexaiberobathynella mateusi*
- *Guadalopebathynella puchi*

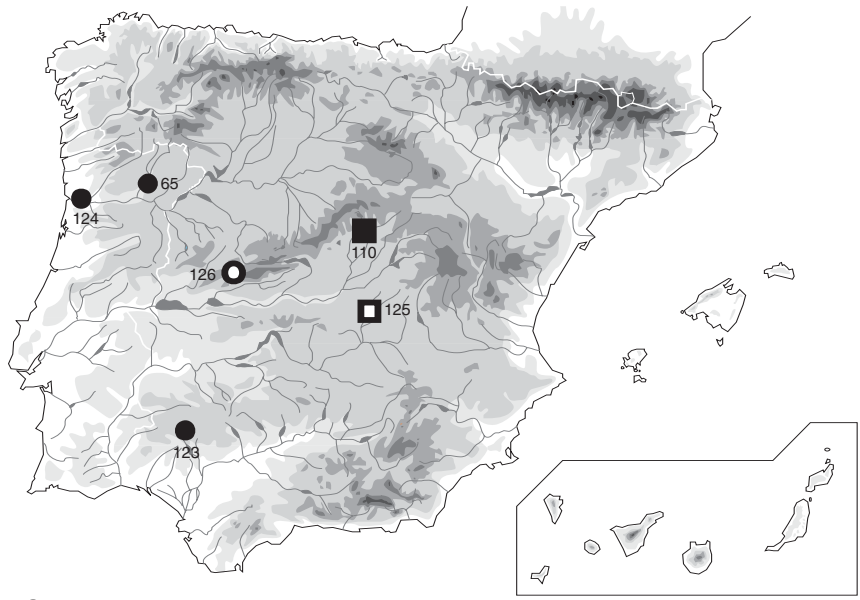


Fig. 4.— Distribution of the species of the genus *Hexabathynella* of the Iberian Peninsula. Each number corresponds to a sampling site (see Appendix).

Fig. 4.— Distribución de las especies del género *Hexabathynella* en la Península Ibérica. Los números corresponden a las localidades del Apéndice.

- *Hexabathynella minuta*
- *Hexabathynella nicoleiana*
- *Hexabathynella valdecasasi*
- *Hexabathynella* sp.

Table 4.— Coexistence of species of Parabathynellidae in the Iberian Peninsula. 1.- *Iberobathynella (I.) lusitanica*; 4.- *I. (I.) barcelensis*; 6.-*I. (E.) cantabriensis*; 7.-*I. (E.) magna*; 8.-*I. (E.) espaniensis*; 9.-*I. (A.) asturiensis*; 10.-*I. (A.) parasturiensis*; 11.-*I. (A.) cavadoensis*; 12.-*I. (A.) imuniensis*; 13.-*I. (A.) rouchi*; 18.-*I. pedroi*; 20.-*Paraiberobathynella fagei*; 21.-*Paraiberobathynella notenboomii*; 23.-*Hexaiberobathynella mateusi*; 24.-*Hexabathynella minuta*; 25.-*Hexabathynella nicoleiana*; 27.- *Iberobathynella* sp.; 28.- *Paraiberobathynella* sp. Localities with more than one species: 2.- Cavado river (interstitial); 10.- Torca Treslajorá (cave); 11.- Fuente del Carnero (cave); 12.- Torca Divisada (cave); 13.- Torcón de los Lobos (cave); 14.- Torco de los Lobos (cave); 20.- Torca de la Grañaja (cave); 21.- Torcón de Pelacristo (cave); 29.- Torca del Tejo (cave); 48.- Cova del Infierno (cave); 53.- Cinca river (interstitial); 59.- Mondego river (interstitial); 65.- Pinhao river (interstitial); 67.- Vélez river (interstitial); 77.- Los Picos (well) and 110.- Jarama river (interstitial).

Tabla 4.— Coexistencia entre especies de la familia Parabathynellidae presentes en la Péninsula Ibérica. 1.- *Iberobathynella (I.) lusitanica*; 4.- *I. (I.) barcelensis*; 6.-*I. (E.) cantabriensis*; 7.-*I. (E.) magna*; 8.-*I. (E.) espaniensis*; 9.-*I. (A.) asturiensis*; 10.-*I. (A.) parasturiensis*; 11.-*I. (A.) cavadoensis*; 12.-*I. (A.) imuniensis*; 13.-*I. (A.) rouchi*; 18.-*I. pedroi*; 20.-*Paraiberobathynella fagei*; 21.- *Paraiberobathynella notenboomii*; 23.-*Hexaiberobathynella mateusi*; 24.-*Hexabathynella minuta*; 25.-*Hexabathynella nicoleiana*; 27.- *Iberobathynella* sp.; 28.- *Paraiberobathynella* sp. Localidades en que se ha encontrado más de una especie: 2.- Río Cavado (interstitial); 10.- Torca de Treslajorá (cueva); 11.- Fuente del Carnero (cueva); 12.- Torca Divisada (cueva); 13.- Torcón de los Lobos (cueva); 14.- Torco de los Lobos (cueva); 20.- Torca de la Grañaja (cueva); 21.- Torcón de Pelacristo (cueva); 29.- Torca del Tejo (cueva); 48.- Cova del Infierno (cueva); 53.- Río Cinca (interstitial); 59.- Río Mondego (interstitial); 65.- Río Pinhao (interstitial); 67.- Río Vélez (interstitial); 77.- Los Picos (pozo) y 110.- Río Jarama (interstitial).

Species	Sampling points															
	2	10	11	12	13	14	20	21	29	48	53	59	65	67	77	110
1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	+	+	+	+	+	-	+	+	-	-	-	-	-	-	-
7	-	+	+	+	+	+	-	+	+	+	+	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
10	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-
11	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
23	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+
24	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
27	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-

None of the other 4 continents can equal the Iberian Peninsula in the number of known species. Africa, which is far bigger than the Iberian Peninsula harbours only 23 known species and the same holds for America (23 species). But the sampling effort in these continents cannot be compared with that carried out in the Iberian Peninsula in the last few years and it is to be expected that when more intensive sampling takes place the figures will go up significantly.

Table 3 and Appendix it show that the genus *Iberobathynella* is the most common in the study area, being present in 74 sites (Fig. 1). The 18 species belong to three subgenera: *Iberobathynella* (*Iberobathynella*) (9 localities, four in Portugal and

five in Spain), containing five species, three being unique to Portugal, one which only lives in Spain, and another found in both countries; the *Iberobathynella* (*Espanobathynella*) subgenus inhabits 15 localities, with one species in a single locality, the other two species coexisting in 7 localities and each inhabiting 4 additional localities separately; the *Iberobathynella* (*Asturibathynella*) subgenus is found in 45 localities, has the greatest number of species of all the subgenera (nine); four of its species are only found in a single site, one in Portugal, and the other three in Spain; another five species only appear in Spain in 5, 4, 3, 3 and 26 localities respectively; *Iberobathynella pedroi* (subgenus unknown) has only been found in a single locality in Portugal.

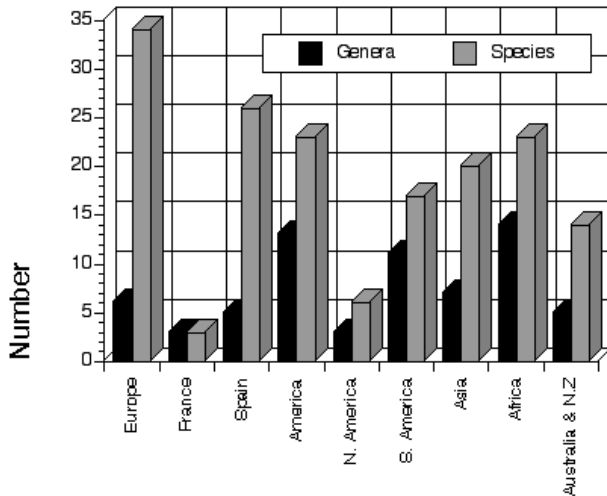


Fig. 5.— Number of genera and species of the world Parabathynellidae.

Fig. 5.— Histograma del número de géneros y especies de la familia Parabathynellidae en el mundo.

The genus *Paraiberobathynella* occurs in 43 localities (Fig. 2; Table 3): *Pi. (Paraiberobathynella) fagei* (42 localities), and *Pi. (Orihuelabathynella) notenboomi* (single locality, number 77), and *Pi. sp.* found in a single locality (67).

Hexaiberobathynella has been found in 21 localities (Fig. 3; Table 3); one species, *Hi. mateusi* was found in 20 sites, while the other species, *Hi. hortzuelensis* is known from a single site only (108).

Another genus with a reduced distribution (a single locality, 70) is the monotypic *Guadalopebathynella* (Fig. 3; Table 3).

Hexabathynella has been found in 6 localities (Fig. 4; Table 3); one species, *H. minuta*, lives in three sites, two in the North of Portugal, and one in the south of Spain. The other two species, *H. nicoleiana* and *H. valdecasasi*, are only found in Central Spain, each in a single place. An additional species, *H. sp.*, lives also in Central Spain.

Table 3 shows also the habitat types occupied by the 5 genera and 26 species: rivers (interstitial environment), caves, wells and springs.

Figure 6A shows of the percentage of sampling points per habitat type: 45%- the biggest- for rivers and 5% for springs- the smallest. In these habitats the representation of genera is very unequal, as can be seen in Fig. 6B. In rivers all 5 genera are present, with *Paraiberobathynella* being the most common, found in 40% of the sampling points) although

Iberobathynella is also very common (32%); *Guadalopebathynella* has only been found once and does not appear in any other habitat.

In caves only 3 genera have been found (neither *Guadalopebathynella* nor *Hexabathynella* occur) and here it is the genus *Iberobathynella* which occurs most frequently (84%); *Paraiberobathynella* only appears in 13% of the sampling points, and *Hexaiberobathynella* in 3%.

In wells the same subgenera as in caves are found, but again and as for rivers *Paraiberobathynella* is most common (57%), whereas the least common is *Hexaiberobathynella* (10%).

In springs we only found *Iberobathynella* (86%) and *Hexaiberobathynella* (14%).

Figure 6C shows the percentage of sampling points where each of the 5 genera have been found. *Iberobathynella* is most common (54% of the total), followed by *Paraiberobathynella* (31%), whereas the rarest is *Guadalopebathynella* (0.9%). Figure 6D shows the habitat preference for each genus. *Iberobathynella* occurs in all habitats, although it is more common in caves (55%). *Paraiberobathynella* is most common in rivers (53%) and is never found in springs. *Hexaiberobathynella* appears in all habitats, but most commonly in rivers (80%). *Guadalopebathynella* and *Hexabathynella* only live in rivers.

The most common species is *Paraiberobathynella fagei* (42 sampling points, covering all habitats except springs), followed by *Iberobathynella (A.) imuniensis* (26 sites, all habitats except wells) and *Hexaiberobathynella mateusi* (20 localities). The only species that appears in all habitats is *Hexaiberobathynella mateusi* (Table 3).

The different species of the genus *Iberobathynella* frequently coexist (*I. (E.) magna* and *I. (E.) cantabriensis* in 7 caves; e.g. see Table 4) while they rarely coexist with species from other genera. Species from the other genera show also little propensity to coexist with other species of their own genus or of other genera.

Discussion and Conclusion

The subterranean waters of the Iberian Peninsula and the Balearic Islands have been sampled very unequally. There are areas (e.g. the North of Spain) where a great deal of sampling has been carried out, whereas in other (e.g. the karsts of Cuenca and Andalucía) the invested sampling effort has been minimal. There is still a lot of virgin territory remaining to be explored. As the interstitial waters associated with rivers is

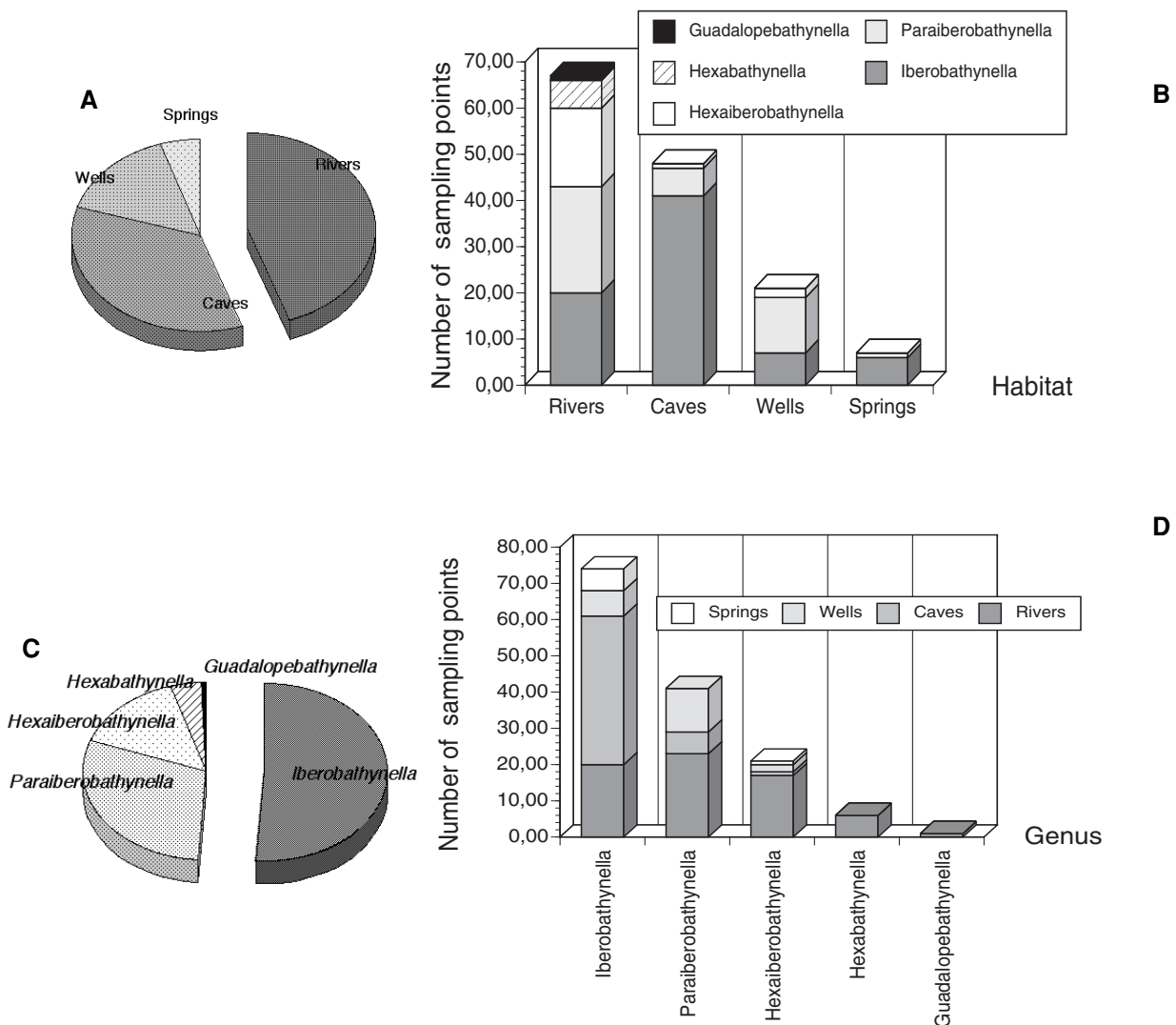


Fig. 6.— A) Number of locations sampled per habitat type as a percentage of the total. B) Number of samples per habitat rendering each genus. C) Number of points sampled rendering each genus as a percentage of the total. D) Number of samples containing each genus per habitat.

Fig. 6.— A) Distribucion del número de puntos de muestreo en los medios acuáticos subterráneos considerados, en %. B) Reparto de géneros por medios. C) Número de puntos de muestreo en que se ha encontrado cada género, en % y D) reparto de medios por géneros.

the most easily accessible habitat, it has been the most “intensively” sampled. However the very big subterranean systems are practically unknown from a faunistic viewpoint, especially those reaching great depth (in Spain there are 14 sinkholes more than 1000 m depth, see Puch, 1998) and length (many caves are more than 30 km long).

Nevertheless, and in spite of the big gap of knowledge that still remain on this habitat, batineles have been found in almost all places sampled, and the number of species known to date (26, see Table 4) is the biggest the world around.

The most abundant genus in the study area, *Iberobathynella* (18 species), is the world most

diversified of the Parabathynellidae (only the cosmopolitan genus *Hexabathynella* embraces a similar number of species). *Iberobathynella* is found in all habitat types studied, although it is more common in cave waters.

As sampling is intensified and sampling areas are expanded the number of new species found is growing up. This trend affects not only the family Parabathynellidae, but also the Bathynellidae, which also appears in almost every subterranean habitat sampled (data still unpublished).

ACKNOWLEDGEMENTS

We are very grateful to all people who kindly supplied us with material (Notenboom & Meijers; Rouch et col.; Ortiz; G.E.Edelweiss). We gratefully acknowledge C. Puch, F. Molinero, J. Robador, A. De Juan, A. G.-Valdecasas and J. Bedoya, who helped us in different ways. We thank Mark Creb who helped us with the English translations. This work was supported by projects REN2000-2040 GLO, EVK2-CT-2001-00121 (PASCALIS) and Convenio Junta de Castilla y León-CSIC (2002-2004).

References

- BOUTIN, C. & COINEAU, N., 1987. *Iberobathynella maghrebensis* (Crustacea, Syncarida, Bathynellacea) sur le continent Africain. Implications paléogéographiques. *Comptes Rendues de l'Académie des Sciences*, Paris, vol. 304, III(13): 355-358.
- CAMACHO, A. I., 1986. A new species of the genus *Hexabathynella* (Syncarida, Bathynellacea, Parabathynellidae) from Spain. *Bijdragen tot de Dierkunde*, 56(1): 123-131.
- CAMACHO, A. I., 1987a. *La familia Parabathynellidae (Crustacea, Syncarida, Bathynellacea) en la Península Ibérica. Taxonomía, filogenia y biogeografía*. Unpublished Ph.D. Thesis. Universidad Autónoma de Madrid. 889 pp.
- CAMACHO, A. I., 1987b. A new subterranean syncarid (Crustacea) from Spain: *Iberobathynella imuniensis* n. sp. (Bathynellacea, Parabathynellidae). *Archiv für Hydrobiologie*, 111(1): 137-149.
- CAMACHO, A. I., 1988. Historia y Clave de Determinación y Distribución del Género *Iberobathynella* (Crustacea, Syncarida, Parabathynellidae) en la Península Ibérica. *Actas del III Congreso Ibérico de Entomología*: 43-56.
- CAMACHO, A. I., 1989a. A new species of the "mateusi" group: *Iberobathynella ortizi* sp. n. (Crustacea, Syncarida, Parabathynellidae). *Zoologica Scripta*, 18(3): 405-410.
- CAMACHO, A. I., 1989b. Los Parabathynellidae (Crustacea, Syncarida, Bathynellacea) recogidos en la Península Ibérica. *Boletín de la Asociación Española de Entomología*, 13: 71-90.
- CAMACHO, A. I., 1989c. *Iberobathynella notenboomi* n. sp. (Syncarida, Parabathynellidae) from a well in Alicante, South-East Spain. *Spixiana*, 12(2):105-113.
- CAMACHO, A. I., 1998. *La Vida Animal en el Mundo Subterráneo: Habitantes de las Grandes Cuevas y Simas de España*. In: C. Puch (ed.). *Grandes Cuevas y Simas de España*. Exploracions, Monográfico Espeleo Club de Gracia. Barcelona: 19-46.
- CAMACHO, A. I., 2000. La fauna acuática subterránea de Lamasón y Peñamellera Baja (Cantabria): 15 años de investigaciones Bioespeleológicas. *Boletín Cántabro de Espeleología*, 14: 153-164.
- CAMACHO, A. I., 2003a. Historical biogeography of *Hexabathynella*, a cosmopolitan genus of groundwater Syncarida (Crustacea, Bathynellacea, Parabathynellidae). *Biological Journal of the Linnean society*, 78: 457-466.
- CAMACHO, A. I., in press b. An overview of *Hexabathynella* genus (Crustacea, Syncarida, Parabathynellidae) with the description of a new species. *Journal of Natural History* (in press).
- CAMACHO, A. I., in press c. Four new species of the groundwater crustaceans (Syncarida, Bathynellacea, Parabathynellidae) endemic to the Iberian Peninsula (Portugal and Spain). *Journal of Natural History* (in press).
- CAMACHO, A. I., BELLO, E. & ESTABROOK, G. F., 1997. A statistical approach to the evaluation of characters to estimate evolutionary relationships among the species of the aquatic subterranean genus *Iberobathynella* (Crustacea, Syncarida). *Biological Journal of the Linnean Society*, 60: 221-241.
- CAMACHO, A. I. & COINEAU, N., 1989. Les Parabathynellidae (Crustacés syncarides) de la Péninsule Ibérique, répartition et paléobiogéographie. *Mémoires de Biospéologie*, 16: 111-124.
- CAMACHO, A. I. & SERBAN, E., 1998. Tribu des Iberobathynellini nov., diagnoses des taxa nouveaux (Parabathynellidae, Bathynellacea, Podophallocarida). *Travaux de l'Institut de Spéologie "Emile Racovitza"*, 34: 15-75.
- CAMACHO, A. I. & SERBAN, E., 2000. Revisión del grupo *Iberobathynella (Iberobathynella)* Schminke, 1973 (Crustacea, Syncarida, Parabathynellidae) endémico de la Península Ibérica. *Graellsia*, 56: 35-48.
- CAMACHO, A. I., SERBAN, E. & GUIL, N., 2000. Phylogenetical review and biogeographic remarks on the interstitial and subterranean freshwater iberobathynellids (Crustacea, Syncarida, Parabathynellidae). *Journal of Natural History*, 34: 563-585.
- CHAPPUIS, P. A., 1926. *Parabathynella stygia* n. g. n. sp., nouveau crustacé cavernicole de la Serbie Orientale. *Buletinul Societății de Științe din Cluj*, 3(1): 7-10.

- GUIL, N. & CAMACHO, A. I., 2001. Historical biogeography of *Iberobathylla* (Crustacea, Syncarida, Bathynellacea), an aquatic subterranean genus of Parabathynellids, endemic to the Iberian Peninsula. *Global Ecology & Biogeography*, 10: 487-501.
- PRETUS, J. L., 1991. *Estudio Taxonómico, Biogeográfico y Ecológico de los Crustáceos epigeos e hipogeos de las Baleares (Branchiopoda, Copepoda, Mystacocarida y Malacostraca)*. Unpublished Ph. D. Thesis. Universidad Autónoma de Barcelona. 513 pp.
- PUCH, C., 1998. *Grandes Cuevas y Simas de España*. Espeleo Club De Gracia. Barcelona. 816 pp.
- SCHMINKE, H. K., 1972. *Hexabathynella halophila* gen. n., sp. n. und die Frage nach der marinen Abkunft der Bathynellacea (Crustacea: Malacostraca). *Marine Biology*, 15: 282-287.
- SCHMINKE, H. K., 1973. Evolution, system und verbreitungsgeschichte der Familie Parabathynellidae (Bathynellacea, Malacostraca). *Akademie der Wissenschaften und der Literatur zu Mainz, Mathematisch-Naturwissenschaftliche Klasse, Mikrofauna des Meeresboden* 24: 1-192.

Recibido, 13-VI-2003
Aceptado, 6-XI-2003
Publicado, 15-XII-2003

Appendix.— Sites that have rendered species of Parabathynellidae in the Iberian Peninsula and Balearic Islands.

Apéndice.— Localidades donde han sido encontradas las diferentes especies de la familia Parabathynellidae en la Península Ibérica e Islas Baleares.

Taxon	Sites	Province	Country	Habitat	UTM
<i>Iberobathynella (Iberobathynella) lusitanica</i> (Braga, 1949).	(1) Leça de Palmeira (Type Locality)	Oporto	Portugal	Well	29TNF2360
<i>I. (I.) gracilipes</i> (Braga, 1960).	(2) Río Cavado	Barcelos	Portugal	River	29TNF3198
<i>I. (I.) paragracilipes</i> Camacho & Serban, 1998.	(3) Idanha-a-Nova (Type Locality)	Beira-Baixa	Portugal	Well	29TPE5020
	(4) El Quejigo, Jabugo	Huelva	Spain	Well	29SPB992972
	(5) Fuente Aroche, Gibraleón	Huelva	Spain	Well	29SPB764412
	(6) La Hermita de San Isidro, Gibraleón	Huelva	Spain	Well	29SPB751428
	(7) Las Mesas, Gibraleón	Huelva	Spain	Well	29SPB752468
<i>I. (I.) barcelensis</i> (Galhano, 1970).	(2) Río Cavado (Type Locality)	Barcelos	Portugal	River	29TNF3198
<i>I. (I.) valbonensis</i> (Noodt & Galhano, 1969).	(8) Areinho de Valbom, near Rio Tua (Type Locality), Oporto	Oporto	Portugal	Well	29TNF3455
	(9) Río Yeltes road Tamames- La Alberca	Salamanca	Spain	River	30TQE4299
<i>I. (Espanobathynella) cantabriensis</i> Camacho & Serban, 1998.	(10) Torca Treslajorá, CO.209, Ptº de las Llaves	Cantabria	Spain	Cave	30TUN709919
	(11) Fuente del Carnero, CO.220, Venta Fresnedo	Cantabria	Spain	Cave	30TUN804939
	(12) Torca Divisada, CO.275, Panes	Asturias	Spain	Cave	30TUN739951
	(13) Torcón de los Lobos, CO.277, Herrerías	Cantabria	Spain	Cave	30TUN777939
	(14) Torco de los Lobos, CO.276, Herrerías	Cantabria	Spain	Cave	30TUN776940
	(15) Cabaña del Indiano, CO.170, Panes	Asturias	Spain	Cave	30TUN742949
	(16) El Calderón, CO.099, La Venta (Type Locality)	Cantabria	Spain	Cave	30TUN784922
	(17) Las Torcas, CO.121, Lamasón	Cantabria	Spain	Cave	30TUN786929
	(18) Los Sotombos, CO.180, Lamasón	Cantabria	Spain	Cave	30TUN788923
	(29) Torca del Tejo, CO.246, Herrerías	Cantabria	Spain	Cave	30TUN793943
	(21) Torcón de Pelacristo, CO.261, Merodio	Asturias	Spain	Cave	30TUN743947
<i>I. (E.) magna</i> Camacho & Serban, 1998.	(48) Cova del Infierno, Covadonga (Type Locality)	Asturias	Spain	Cave	30TUN3397
	(10) Torca Treslajorá, CO.209, Ptº de las Llaves	Cantabria	Spain	Cave	30TUN709919
	(20) Torca de La Grañaja, CO.150, Suarías, Panes	Asturias	Spain	Cave	30TUN728945
	(11) Fuente del Carnero, CO.220, Venta Fresnedo	Cantabria	Spain	Cave	30TUN804939
	(21) Torcón de Pelacristo, CO. 261, Merodio	Asturias	Spain	Cave	30TUN743947
	(22) La Helechosa, CO.084, Peñarubia	Cantabria	Spain	Cave	30TUN725926
	(12) Torca Divisada, CO.275, Panes	Asturias	Spain	Cave	30TUN739951
	(13) Torcón de los Lobos, CO.277, Herrerías	Cantabria	Spain	Cave	30TUN777939
	(14) Torco de los Lobos, CO.276, Herrerías	Cantabria	Spain	Cave	30TUN776940
	(29) Torca del Tejo, CO.246, Herrerías	Cantabria	Spain	Cave	30TUN793943
	(130) Río Arbon, Villayón	Asturias	Spain	Lake	29TPJ8815
<i>I. (E) espaniensis</i> Serban & Comas, 1978.	(48) Cova del Infierno, Covadonga (Type Locality)	Asturias	Spain	Cave	30TUN3397
<i>I. (Asturibathynella) asturiensis</i> Serban & Comas, 1978.	(48) Cova del Infierno, Covadonga (Type Locality)	Asturias	Spain	Cave	30TUN3397
	(23) Cueva Tresavarillas, CO.044 ,Ptº de las Llaves	Cantabria	Spain	Cave	30TUN732929
	(127) Cueva de la Pruneda, Bobia de Abajo	Asturias	Spain	Cave	30TTN8992
	(44) Cueva Menor, Bermiego	Asturias	Spain	Cave	30TTN581875
	(131) Cueva de Valporquero, Valporquero de Torio	León	Spain	Cave	30TTN910538

Taxon	Sites	Province	Country	Habitat	UTM
<i>I. (A.) parasturiensis</i> Camacho & Serban, 1998.	(10) Torca Treslajorá, CO.209, P ^o de las Llavies	Cantabria	Spain	Cave	30TUN709919
	(26) Cueva de la Nava, CO.034, Lafuente	Cantabria	Spain	Cave/sprir	30TUN783909
	(20) Torca de La Grañaja, CO.150, Suartias, Panes	Asturias	Spain	Cave	30TUN728944
	(12) Torca Divisada, CO.275, Panes	Asturias	Spain	Cave	30TUN739951
	(2) Río Cavado	Barcelos	Portugal	River	29TNF3198
<i>I. (A.) cavadoensis</i> (Noodt & Galhano, 1969).	(47) Río Esia Vegacereja	León	Spain	River	30TUN337673
	(51) Río Carballa o Tamuxo, near of La Guardia	Pontevedra	Spain	Stream	29TNG1037
	(41) Torca de los Morteros, P ^o de la Sia	Burgos	Spain	Cave	30TVN516775
<i>I. (A.) imuniensis</i> Camacho, 1987.	(42) Río Asón, Arredondo	Cantabria	Spain	River	30TVN518912
	(43) Río Asón, Rivas-Ramales de la Victoria	Cantabria	Spain	River	30TVN5492
	(32) Cueva de Imunía, P ^o . de La Sia	Burgos	Spain	Cave	30TVN515774
	(50) Pozo Azul, Covanera	Burgos	Spain	Spring	30TVN490644
	(34) Sima L-31, Soba, Peña de los Trillos	Cantabria	Spain	Cave	30TVN511792
	(24) Pozo del Agua CO.069, Venta Fresnedo	Asturias	Spain	Cave	30TUN765936
	(25) Cueva Huerta, CO.053, Venta Fresnedo	Asturias	Spain	Cave	30TUN761937
	(19) Cincho Agua, CO.070, Venta Fresnedo	Asturias	Spain	Cave	30TUN779935
	(35) Cuvio de Beroluncho, Las Machorras	Burgos	Spain	Cave	30TVN7451
	(36) Mortero de Astrana, Astrana	Cantabria	Spain	Cave	30TVN5383
	(49) Sima B-15, Escuin	Huesca	Spain	Cave	31TBG637234
	(37) Cueva Las Bernias, P ^o de Lunada	Burgos	Spain	Cave	30TVN477799
	(129) Cueva del Pindal, Pimiango	Asturias	Spain	Cave	30TUP759062
	(132) Cueva del Purón, Purón	Asturias	Spain	Cave	30TUP615044
	(38) Sistema Cueto-Coventosa-Cubera, Asón	Cantabria	Spain	Cave	30TVN511895
	(45) Cueva de Iguarán, Andoin	Alava	Spain	Cave	30TWN54
	(46) Los Covachos del Peñajorao, Camargo	Cantabria	Spain	Cave	30TVP259045
	(27) Seguedal, CO.054	Asturias	Spain	Spring	30TUN758935
	(39) Sistema Río Silencio, Ramales de la Victoria	Cantabria	Spain	Spring	30TVN529827
	(40) Cueva del Río Chico, La Gándara	Cantabria	Spain	Cave	30TVN535829
	(33) Nacimiento Gándara river, La Gándara	Cantabria	Spain	Spring	30TVN533826
	(28) Hoyo las Muñecas, CO.001, El Seguedal	Asturias	Spain	Cave	30TUN755940
	(10) Torca Treslajorá, CO.209, P ^o de las Llavies	Cantabria	Spain	Cave	30TUN709919
	(31) Cueva del Toyu, CO.073, Venta Fresnedo	Cantabria	Spain	Cave	30TUN794932
	(133) Río Trema, Cornejo	Burgos	Spain	River	30TVN490644
<i>I. (A.) rouchi</i> Camacho & Coineau 1987.	(52) Río Guadaloipe, Más de las Matas	Teruel	Spain	River	30TYL3324.
	(53) Río Cinca, Desfiladero de la Estada	Huesca	Spain	River	31TBG7161
	(54) Río Aragón, S ^o Cillia de Jaca	Huesca	Spain	River	30TYN878148
	(55) Cova do Rey Cintolo, Mondoñedo.	Lugo	Spain	Cave	29TPJ323058
	(56) Cueva Ojo Guareña	Burgos	Spain	Cave	30TVN457657
	(57) Río Torrecilla, Lora del Río	Sevilla	Spain	River	30STG686677
	(58) Río Lima, Ponte de Lima	Oporto	Portugal	River	29TNG3425
	(59) Río Mondego	Coimbra	Portugal	River	29TNE45
	(60) Cueva Cotera, Perelada	Asturias	Spain	Cave	30TUP965007
	(61) Fuentona de Ruente, Ruente	Cantabria	Spain	Spring	30TUN975903
	(62) Fuente de Quintana, La Pereda	Asturias	Spain	Spring	30TUP566071
	(63) Río Berdoyas, Ponto do Puerto, Vimianzo	Coruña	Spain	Stream	29TNH0073
	(64) Río Gévalo, Alcaudete de la Jara	Toledo	Spain	Stream	30SUK3908

Taxon	Sites	Province	Country	Habitat	UTM
<i>Iberobathynella</i> sp. 6	(65) Río Pinhao, Balsa	Balsa	Portugal	Stream	29TFE2262
<i>Iberobathynella</i> sp. 7	(66) Río Cavado, Entre-os-Pontes	Oporto	Portugal	River	29TNG4505
<i>Iberobathynella</i> sp. 8	(68) Río Veros, Barbastró	Huesca	Spain	Stream	31TBG5473
<i>Iberobathynella</i> sp. 9	(69) Cueva de Piscarciano, Soncillo	Burgos	Spain	Cave	30TVN368551
<i>Iberobathynella</i> sp. 10	(134) Río Tejadillos, Cañete	Cuenca	Spain	Stream	30TXK1643
<i>Guadalopebathynella puchi</i> Camacho & Serban, 1998.	(70) Río Guadaloipe, Más de las Matas	Teruel	Spain	River	30TYL3324.
<i>Paratberobathynella (Pi.) fagei</i> (Delamare & Angellier, 1950).	(71) Cueva Son Berenguer, Santa Maria del Cami	Mallorca	Spain	Cave	31SDD7281
	(72) Cueva de la Pileta, Benaoján.	Málaga	Spain	Cave	30STF9866
	(73) Cueva de Génova, Palma de Mallorca	Mallorca	Spain	Cave	31SDD6777
	(74) Las Tarregas, San Pedro del Pinatar	Murcia	Spain	Well	30SXG934909.
	(75) Los Piñacos, San Pedro del Pinatar	Murcia	Spain	Well	30SXG954895
	(76) 0,4 Km of Girena river, Campo de Orba	Alicante	Spain	Well	30SYH565993
	(77) Los Picos, Pilar de la Horadada	Alicante	Spain	Well	30SXG932943
	(78) Playa, Canet de Berenguer	Valencia	Spain	Well	30SYJ397962
	(79) Carr. Ondara-Benidoleig, Benidoleig	Alicante	Spain	Well	30SYJ600007
	(80) Carr. Benidoleig-Orba, Benidoleig	Alicante	Spain	Well	30SYH572981
	(81) German, 100m of Arboleas railway	Almeria	Spain	Well	30SWG812338
	(82) Marchenilla, Jimena de la Frontera	Cádiz	Spain	Well	30STF825305
	(83) Punta Pinillos, Estepona	Málaga	Spain	Well	30SUF098343
	(84) Road from Ronda to Jimena, Faraón	Málaga	Spain	Well	30SUF0362
	(85) Almazora, Railway of Albox, Cantoria	Almeria	Spain	Well	30SWH762337
	(86) Small stream on Descansadero, Grazalema	Cádiz	Spain	Stream	30STF805709
	(87) Río Areta, Puente a Lumpier, Ripodas	Navarra	Spain	River	30TXN391274
	(88) Río Ter, Torroella de Montgrí	Gerona	Spain	River	30TEG103538.
	(67) Río Velez, 2 Km de Viñuela	Málaga	Spain	River	30SUF9979
	(89) Río Esla, Huelde, Riaño	León	Spain	River	30TUN308563
	(90) Tributary río Esla, Vegacerneja	León	Spain	River	30TUN337673
	(91) Río Sella river, Vega de Sella, Arnieva	Asturias	Spain	River	30TUN293906
	(92) Río Pequeño, Puente de Onda, Espadilla	Castellón	Spain	Stream	30TYK259349
	(93) Río Aller, Casomería, Aller	Asturias	Spain	Stream	30TTN906745
	(94) Río Torio, Felmin-Los Carmenes	León	Spain	Stream	30TTN926546
	(95) Río Guadalbullón, Carchalejo	Jaen	Spain	Stream	30SVG471625
	(96) Río Lucámena, Cherín	Granada	Spain	Stream	30SVF991913
	(97) Río Alfambra, Aguilar de Alfambra	Teruel	Spain	Stream	30TXK8695
	(98) Río Alcanadre, Angüés/ Ponzano (N-240)	Huesca	Spain	Stream	30TYM4261
	(99) Río Frio, Piscifactoria Riofrío/Loja	Granada	Spain	Stream	30SUG9313
	(100) Río Turón, El Burgo	Málaga	Spain	Stream	30SUF2866
	(101) Río Guadalhorce, Alora/Vado de Alamo	Málaga	Spain	River	30SUF3672
	(102) Río Turia, C-3322, Villamarhante	Valencia	Spain	River	30SYJ0482
	(103) Río Guadaifeo, Ptº Camacho, Orgiva	Granada	Spain	Stream	30SVF6284
	(104) Río Majones, Villareal de la Canal	Huesca	Spain	Stream	30TXN734236
	(105) Río Deva, San Pelayo, Camaleño	Asturias	Spain	River	30TUN635794
	(106) Río Noguera Ribagorzana, Arén	Lérida	Spain	River	31TCG1281
	(107) Río Arnoia, Celanova	Orense	Spain	Stream	29TNG9075
	(135) Cova de Can Sion, Palma de Mallorca	Mallorca	Spain	Cave	31SDD997098
	(136) Cova de Ses Rodes, Palma de Mallorca	Mallorca	Spain	Cave	31SDD6777

Taxon	Sites	Province	Country	Habitat	UTM
		Huesca	Spain	River	30TYM4182
	(128) Río Alcanadre, near Bierge	Mallorca	Spain	Cave	31SDD6777
<i>Paraiberobathynella</i> (O.) <i>notenboomi</i> (Camacho, 1989).	(137) Cova de Sa Bassa Blanca, Alcudia	Alicante	Spain	Well	30SXG932943
<i>Paraiberobathynella</i> sp.	(77) Los Picos, Pilar de la Horadada	Málaga	Spain	Stream	30SUF9979
<i>Hexaiberobathynella hortezuelensis</i> Camacho & Serban, 1998.	(67) Río Vélez, 2 Km Viñuela	Soria	Spain	Well	30TWL1093
<i>Hexaiberobathynella mateusi</i> (Galhano, 1967).	(108) Hortezuela	Oporto	Portugal	River	29TNF2755
	(109) Río Duero	Barcelona	Portugal	River	29TNF3198
	(2) Río Cavado	Coimbra	Portugal	River	29TNE45
	(59) Río Mondego	Madrid	Spain	River	30TVL5908
	(110) Río Jarama, Talamanca del Jarama	Madrid	Spain	River	30TVL5219
	(110) Río Jarama, Torrelaguna	Madrid	Spain	River	30TVL5219
	(111) Río Pusa, Santa Ana de Pusa	Toledo	Spain	Stream	30SUJ5078
	(112) Río Valdehomos, Montes de Toledo	Toledo	Spain	Stream	30TVK6689
	(113) Río Tajo, Perales de las Truchas	Guadalajara	Spain	River	30TWK9294
	(138) Río Tajo, Peñalen	Guadalajara	Spain	River	30TWK8299
	(114) Río Hoz Seca, Perales de las Truchas	Guadalajara	Spain	Stream	30TWK9294
	(115) Río Tajo, Zaorejas	Guadalajara	Spain	River	30TWL6712
	(116) Río Unero, Unero	Soria	Spain	Stream	30TVM9518
	(117) Río De los Santos, Sierra de Javalón	Teruel	Spain	Stream	30TXK53
	(118) Río Fardes, Lanteira-Jerez del Marquesado	Granada	Spain	Stream	30SYG8614
	(119) Fuente el Baillo, Quesada	Jaen	Spain	Spring	30SVG979809
	(120) Berlanga de Duero	Soria	Spain	Well	30TWL1190
	(121) Cueva del Reguerillo, Patones	Madrid	Spain	Cave	30TVL5824
	(122) Río Sorbe	Guadalajara	Spain	Stream	30TVK8898
	(539) Río Cinca, Desfiladero de la Estada	Huesca	Spain	River	31TBG7161
	(139) Río Mijares, Montanejos	Castellón	Spain	River	30TYK1138
<i>Hexabathynella minuta</i> (Noodt & Galhano, 1969).	(123) Río Rivera de Huelva, Embalse de la Minilla	Sevilla	Spain	Stream	29SQB47
	(65) Río Pinhao, Balsa	Balsa	Portugal	Stream	29TPF2262
	(124) Río Duero, Zebreiros	Zebreiros	Portugal	River	29TNF4545
<i>H. nicoleiana</i> Camacho, 1986.	(110) RíoJarama, Torrelaguna & Talamanca	Madrid	Spain	River	30TVL5908
<i>H. valdecasasi</i> n. sp. Camacho 2003.	(125) Torcón stream, San Martín de Montalbán	Toledo	Spain	Stream	30SUJ8093
<i>Hexabathynella</i> sp.	(126) Río Astillas, Gredos	Avila	Spain	Stream	30TTK8570