

# New data on the distribution of some species of Iberian *Hydrochus* LEACH, with notes on their ecology

(Coleoptera: Hydrochidae)

D. MIGUÉLEZ & L.F. VALLADARES

## Abstract

New data on the distribution of seven species of *Hydrochus* LEACH (Coleoptera: Hydrochidae) in northern Spain are given. These records extend the known distribution area of these species, the record for *Hydrochus ibericus* VALLADARES, DÍAZ & DELGADO, 1999 in the northern Iberian Peninsula being of particular interest. Detailed maps for the four Iberian endemic species of this genus are provided, including both bibliographic and unpublished data. A complete study of the altitudinal range of the Iberian endemic species of *Hydrochus* shows that, except for *Hydrochus angusi* VALLADARES, 1988, their presence is linked to mountainous areas, usually above 1000 m.

**Key words:** Coleoptera, Hydrochidae, *Hydrochus*, distribution, Iberian Peninsula, endemic species, altitudinal level.

## Introduction

*Hydrochus* LEACH is the only genus of the family Hydrochidae, a well differentiated group within Hydrophiloidea (BERNHARD et al. 2009). The adults live in shallow parts of standing or flowing water bodies almost always associated with macrophytic vegetation.

Of the 20 species in this genus known in the western Palearctic, 11 inhabit the Iberian Peninsula. Six of them can be considered endemic to the Ibero-Maghrebian area (HIDALGO-GALIANA & RIBERA 2011), and four are endemic to the Iberian Peninsula (*Hydrochus angusi* VALLADARES, 1988, *H. ibericus* VALLADARES, DÍAZ & DELGADO, 1999, *H. interruptus* HEYDEN, 1870 and *H. nooreinus* BERGE HENEGOUWEN & SÁINZ-CANTERO, 1992). The validity and phylogeny of all these species was recently verified by HIDALGO-GALIANA & RIBERA (2011). The distribution of *Hydrochus* species in the Iberian Peninsula and Balearic Islands has been included in the catalogue by VALLADARES & RIBERA (1999), though new provincial data or extended distribution areas have since been published.

New data on the distribution and ecology of some species of *Hydrochus* in northern Spain are provided in this study. The data include a review of material previously recorded as *Hydrochus nitidicollis* in León province (VALLADARES 1995), current knowledge of which demonstrates that it belongs to three different species (*Hydrochus grandicollis*, *H. nitidicollis* or *H. interruptus*). The study also includes distribution maps of the Iberian endemic species of this genus and a complete study of their altitudinal ranges.

## Material and methods

Our study was carried out on 419 adults of *Hydrochus* spp. collected from different Spanish localities in the provinces of Asturias (1), Ávila (6), Burgos (19), Cantabria (1), León (63), Salamanca (4), Soria (2) and Zamora (1). All specimens are deposited in the collection of the second author (Coll. Valladares, León University, Spain: CVL). Data about locality and collector are shown in Table 2.

Table 1: Published records of the Iberian endemic species of *Hydrochus*.

Species	Literature records
<i>H. angusi</i>	VALLADARES 1988; VALLADARES et al. 1999; GARRIDO & MUNILLA 2008; SÁNCHEZ-FERNÁNDEZ et al. 2008; PÉREZ-BILBAO et al. 2009; VALLADARES et al. 2010; HIDALGO-GALIANA & RIBERA 2011
<i>H. ibericus</i>	DELGADO 1995; VALLADARES et al. 1999; MILLÁN & AGUILERA 2000; MILLÁN et al. 2001a; MILLÁN et al. 2001b; MILLAN et al. 2002; SÁNCHEZ-FERNÁNDEZ et al. 2003, 2008; HIDALGO-GALIANA & RIBERA 2011
<i>H. interruptus</i>	HEYDEN 1870; CORRÊA DE BARROS 1926; ORCHYMONT 1929; ANGUS 1976; MAKHAN 1996; RIBERA et al. 1999b; VALLADARES et al. 2000; GAYOSO & RIBERA 2001; MILLÁN et al. 2002; SÁNCHEZ-FERNÁNDEZ et al. 2008; HIDALGO-GALIANA & RIBERA 2011
<i>H. nooreinus</i>	BERGE HENEGOUWEN & SÁINZ-CANTERO 1992; DELGADO 1995; SÁINZ-CANTERO & ACEITUNO-CASTRO 1997; CASTRO 1998; CASTRO & DELGADO 1998; JÄCH et al. 1999; RIBERA et al. 1999a; MILLÁN & AGUILERA 2000; MILLAN et al. 2002; SÁNCHEZ-FERNÁNDEZ et al. 2003, 2008; HIDALGO-GALIANA & RIBERA 2011; MILLÁN et al. 2013; ESTEBAN & TOLOSA 2014

The distribution maps of the Iberian endemic species (Fig. 1) include an exhaustive bibliographic review and the data base of Iberian water beetle records (ESACIB ‘EScarabajos ACuáticos IBéricos’) mentioned by SÁNCHEZ-FERNÁNDEZ et al. (2008). The references of the records used to draw up the maps for the four species are included in Table 1. Each map shows the localities where the species was previously recorded (blue spots) and present records (red spots). If more than one presence was recorded within a  $10 \times 10 \text{ km}^2$  area, only one spot is shown on the map corresponding to the central spot of this area.

Data on locality altitude published in the same bibliography and ESACIB data base (Table 1) were used for the analysis of the altitudinal range of the four species. In cases where altitude was not expressly indicated, it was obtained from published maps (National Topographic Map of Spain. IGN Scale 1:25.000). Altitude data were excluded in two cases: when two different records were made in the same sampling site or when the position of the localities was not accurate enough. The SPSS 15.0 program was used to carry out the analysis and the box plot.

## Results

Seven species of the genus *Hydrochus* were identified, and the most significant aspects of their distribution and ecology indicated.

### *Hydrochus angusi* VALLADARES, 1988

*Hydrochus angusi* VALLADARES, 1988: 84.

#### MATERIAL EXAMINED:

León Province: Soto de Valdeón-1, 1 ♂, 1 ♀; Soto de Valdeón-2, 1 ♀; Torneros de Jamuz, 2 ♂♂.

DISTRIBUTION (Fig. 1a): Northwestern Iberian endemic recently recorded in the Sistema Central Mountains (HIDALGO-GALIANA & RIBERA 2011). Current capture records are limited to León province, and its presence has been confirmed in Picos de Europa (Valdeón Valley).

ECOLOGY: The species is found in a wide variety of aquatic environments. Inland, it lives in clean standing water bodies such as ponds, watering holes and mountain streams (VALLADARES

1988). On the coast of Galicia, it lives in coastal lagoons with a high salt content (GARRIDO & MUNILLA 2008, PÉREZ-BILBAO et al. 2009). It has a wide altitudinal range, from sea level on the Atlantic coast to 1609 m in the Cantabrian Mts. (Fig. 2). Mean altitude: 801 m a.s.l. (n = 26).

### *Hydrochus angustatus* GERMAR, 1824

*Hydrochus angustatus* GERMAR, 1824: 90.

#### MATERIAL EXAMINED:

**Asturias** Province (Principality): Puerto de Leitariegos, 5 ♂♂, 5 ♀♀.

**Ávila** Province: Mesegar de Corneja, 2 ♂♂, 2 ♀♀; San Miguel de Corneja, 4 ♂♂, 8 ♀♀; Vallehondo, 1 ♂.

**Burgos** Province: Agüera, 1 ♂; Ahedo de Butrón, 10 ♂♂, 18 ♀♀; Barbadillo de Herreros, 1 ♂; La Piedra, 1 ♂; Vilviestre del Pinar, 1 ♂, 3 ♀♀.

**Cantabria** Province: Soto, 3 ♂♂, 6 ♀♀.

**León** Province: Soto de Valdeón-3, 1 ♀; Torneros de Jamuz, 23 ♂♂, 20 ♀♀; Villamanín, 1 ♂, 3 ♀♀; Villasimpliz, 1 ♂.

**Salamanca** Province: Navamorales, 1 ♂, 2 ♀♀.

**Soria** Province: Oteruelos, 1 ♂.

**DISTRIBUTION:** This European species inhabits most of the Iberian Peninsula. It is relatively common. It is here recorded for the first time from Asturias, Ávila, Cantabria, Salamanca and Soria Provinces.

**ECOLOGY:** This species occurs more frequently in valleys and lowlands than in mountainous areas. It can be found in shores with a fine substrate (gravel, clay, silt), ponds and slow-flowing streams with macrophytic vegetation (FERRO 1979, VALLADARES 1995). It is also present in coastal lagoons (PÉREZ-BILBAO et al. 2009) and occasionally in artificial environments (watering holes and irrigation canals). Many of the records in our study are from mountain streams, as high as 1680 m in a glacier lagoon in the Leitariegos Pass.

### *Hydrochus flavipennis* KÜSTER, 1852

*Hydrochus flavipennis* KÜSTER, 1852: no. 55.

#### MATERIAL EXAMINED:

**Ávila** Province: Mesegar de Corneja, 3 ♂♂; Navalperal de Tormes, 1 ♀; San Bartolomé de Corneja, 1 ♂, 1 ♀; San Miguel de Corneja, 5 ♂♂, 4 ♀♀.

**León** Province: Torneros de Jamuz, 1 ♂; Villamanín, 1 ♂.

**Salamanca** Province: Navamorales, 1 ♂.

**Soria** Province: Oteruelos, 1 ♂.

**DISTRIBUTION:** This Mediterranean species is distributed throughout the Iberian Peninsula. According to HIDALGO-GALIANA & RIBERA (2011) *Hydrochus flavipennis* is a complex with at least two species present in the Iberian Peninsula. Recorded from Ávila, Salamanca and Soria Provinces for the first time.

**ECOLOGY:** This species occurs more frequently in flat areas and rarely in mountainous regions. It is found in permanent ponds with submerged vegetation (VALLADARES 1995). It is less frequent in slow-flowing streams, also recorded from coastal lagoons (PÉREZ-BILBAO et al. 2009). As a species complex (HIDALGO-GALIANA & RIBERA 2011) their ecology could be also different.

### *Hydrochus grandicollis* KIESENWETTER, 1870

*Hydrochus grandicollis* KIESENWETTER, 1870: 73.

#### MATERIAL EXAMINED:

**Burgos** Province: Barcenillas de Rivero, 1 ♂; Dobro, 1 ♀; Palazuelo de Cuesta-Uría, 1 ♀; Pomar, 2 ♂♂, 2 ♀♀; Valujera, 3 ♂♂, 1 ♀.

**León** Province: Jiménez de Jamuz, 1 ♂.

**DISTRIBUTION:** Western Mediterranean and Canary Islands. Present in the Balearic Islands, it is distributed mostly in the south of the Iberian Peninsula and in both plateaus, as far as the Cantabrian coast. Recorded from Burgos and León provinces for the first time. The specimen from León province was incorrectly identified as *Hydrochus nitidicollis* by VALLADARES (1995).

**ECOLOGY:** It occurs mainly in vegetated margins of clean water streams, though also in pools with varying levels of eutrophication (CASTRO & DELGADO 1998). Most of the Iberian records are for average altitudes (450–1000 m), but it can generally be found between sea level and 2023 m altitude in the Sierra Nevada (MILLÁN et al. 2013).

### ***Hydrochus ibericus* VALLADARES, DÍAZ & DELGADO, 1999**

*Hydrochus ibericus* VALLADARES, DÍAZ & DELGADO, 1999: 82.

**MATERIAL EXAMINED:**

**Burgos** Province: Amaya, 7 ♂♂, 1 ♀.

**DISTRIBUTION** (Fig. 1b): Iberian endemic present in the Iberian and Baetic Mountains and isolated records in Prepyrenean and Portuguese mountains. The new record of this species on the eastern slopes of the Cantabrian Mountains, in a small stream near Peña Amaya in the Northwest of Burgos province, is unexpected and interesting.

**ECOLOGY:** The species was collected in vegetated margins of small mountain streams (VALLADARES et al. 1999) at altitudes ranging between 565 and 1600 m (Fig. 2). Average altitude: 1118 m a.s.l. (n = 24).

### ***Hydrochus interruptus* HEYDEN, 1870**

*Hydrochus interruptus* HEYDEN, 1870: 72.

**MATERIAL EXAMINED:**

**Ávila** Province: San Miguel de Corneja, 1 ♂, 4 ♀♀.

**Burgos** Province: Barbadillo del Pez, 1 ♂; Piedrahitia de Muñó, 1 ♀; Valle de Valdelaguna, 2 ♂♂.

**León** Province: Arlanza, 1 ♀; Bárcena de la Abadía, 2 ♂♂, 2 ♀♀; Barniedo de la Reina, 3 ♀♀; Besande, 2 ♀♀; Brañuelas, 1 ♂, 5 ♀♀; Burón, 1 ♂; Guímara-1, 1 ♂; Guímara-2, 4 ♀♀; Labaniego, 1 ♀; La Baña-1, 1 ♀; La Baña-2, 1 ♂; La Baña-3, 1 ♂; La Mata de la Riba, 2 ♂♂; La Omañuela, 1 ♀; La Uña-1, 2 ♂♂; Las Omañas, 1 ♀; Llamas de Rueda, 2 ♂♂; Murias de Paredes, 1 ♀; Paradaseca, 1 ♀; Portilla de la Reina, 1 ♂; Puerto de Monteviejo, 2 ♂♂; Priaranza, 1 ♀; Retuerto-1, 1 ♂, 1 ♀; Retuerto-2, 1 ♂; Retuerto-3, 1 ♂; San Pedro de Olleros, 1 ♀; Siero de la Reina, 1 ♂; Soto de Valdeón-3, 2 ♂♂, 4 ♀♀; Torneros de Jamuz, 1 ♂, 3 ♀♀; Velilla de la Valduerna, 1 ♀; Villafranca del Bierzo, 2 ♀♀; Villar de Acero, 1 ♂; Villaverde de la Sierra, 1 ♀.

**DISTRIBUTION** (Fig. 1c): This Iberian endemic mainly occupies the mountainous strip surrounding the northern Iberian Plateau. Numerous records for León province correspond partly with the material previously recorded as *Hydrochus nitidicollis* by VALLADARES (1995).

**ECOLOGY:** Particularly on the banks of rivers and mountain streams. Less common in mountain ponds. These environments are located in mountainous areas at altitudes between 504 and 2121 m (Fig. 2). Mean altitude: 1101 m a.s.l. (n = 57).

### ***Hydrochus nitidicollis* MULSANT, 1844**

*Hydrochus nitidicollis* MULSANT, 1844: 49.

**MATERIAL EXAMINED:**

**Ávila** Province: San Bartolomé de Corneja, 1 ♂, 3 ♀♀; Navamoriscia, 2 ♂♂, 4 ♀♀.

**Burgos** Province: Barbadillo del Mercado, 1 ♂; Loma de Montija, 1 ♂; Pineda de la Sierra, 1 ♂; Riocavado de la Sierra, 1 ♂; Ura, 1 ♀.

**León** Province: Burón, 1 ♂, 2 ♀♀; Cacabelos-1, 2 ♂♂, 3 ♀♀; Cacabelos-2, 2 ♂♂, 1 ♀; Cabornera, 1 ♂; Castrocontrigo, 1 ♂, 2 ♀♀; Cuénabres, 2 ♂♂, 2 ♀♀; El Villar de Santiago, 2 ♂♂, 4 ♀♀; Espejos de la Reina,

3 ♂♂, 1 ♀; Folgoso de la Ribera, 1 ♂; Isoba, 1 ♂; La Cándana de Curueño, 1 ♂; La Uña-2, 1 ♂, 1 ♀; La Uña-3, 1 ♀; Palacios de Jamuz, 1 ♂; Posada de Valdeón, 1 ♀; Puerto de Leitariegos, 10 ♂♂, 8 ♀♀; Retuerto-3, 30 ♂♂, 23 ♀♀; Riaño, 2 ♂♂; San Justo de la Vega, 1 ♂; Soto de Valdeón-3, 1 ♂, 4 ♀♀; Sueros de Cepeda, 1 ♂, 4 ♀♀; Torneros de la Valdería, 1 ♀; Truchas, 1 ♂, 1 ♀; Turienzo de los Caballeros, 1 ♂, 1 ♀; Val de San Román, 1 ♂, 1 ♀; Vegacerneja, 1 ♂, 1 ♀; Villanueva de la Tercia, 11 ♂♂, 11 ♀♀; Villar del Monte, 2 ♂♂, 4 ♀♀.

**Salamanca** Province: La Casilla, 2 ♀♀; Puente del Congosto, 1 ♂, 3 ♀♀.

**Soria** Province: Santa Inés, 1 ♀.

**Zamora** Province: Porto, 1 ♂.

**DISTRIBUTION:** Palearctic species with an extensive range in the Iberian Mountains. Recorded from Salamanca and Zamora provinces for the first time.

**ECOLOGY:** In running and standing water bodies (VALLADARES 1995, PÉREZ-BILBAO et al. 2009). In inland Iberian areas, *H. nitidicollis* occurs more frequently near the banks and in marginal ponds of mountain streams and rivers. It can reach 1999 m altitude (Laguna Helada in Santa Inés, Soria Province).

Table 2: Localities by province, sampling sites (indicating habitat: stream, river, lake or pond), coordinates ED50 (“European Datum 1950”), altitude (m a.s.l.), date and collector (DM: David Miguélez; FG: Francisco García-Criado; LV: Luis F. Valladares).

Sampling site	UTM	Altitude	Date (collector)
Asturias			
Puerto de Leitariegos: Arbás Lake	29T 709882 4763195	1680	02.VI.1986 (LV)
Ávila			
Mesegar de Corneja: Corneja River	30T 305792 4485576	1014	14.VI.2011 (DM)
Navalperal de Tormes: Cervunal Lake	30T 305395 4462907	1820	17.VII.2007 (FG)
Navamorisma: Tormes River	30T 286218 4472118	988	16.VI.2011 (DM)
San Bartolomé de Corneja: Corneja River	30T 296813 4484460	988	14.VI.2011 (DM)
San Miguel de Corneja: Corneja River	30T 307413 4485737	1028	12.VI.2012 (DM)
Vallehondo: Tormes River	30T 286137 4474916	977	16.VI.2011 (DM)
Burgos			
Agüera: Cerneja River	30T 462968 4773792	790	20.III.2006 (DM)
Abedo del Butrón: pond	30T 444162 4743070	870	24.VII.2001 (LV)
Amaya: Hongarrera Stream	30T 404808 4720733	950	12.VI.1994 (LV)
Barbadillo de Herreros: Umbría Stream	30T 486409 4667714	1140	14.VII.2010 (DM)
Barbadillo del Mercado: Pedroso River	30T 468971 4654944	930	13.VII.2010 (DM)
Barbadillo del Pez: Pedroso River	30T 482248 4664344	1080	15.VII.2010 (DM)
Barcenillas de Rivero: Trueba River	30T 460530 4763652	655	21.III.2006 (DM)
Dobro: pond	30T 448268 4739664	1000	15.VI.2001 (LV)
La Piedra: Úbel River	30T 428358 4720632	934	21.VII.2009 (DM)
Loma de Montija: Trueba River	30T 459766 4766951	679	20.III.2006 (DM)
Palazuelo de Cuesta-Uría: Jerea River	30T 470505 4737557	532	24.III.2006 (DM)
Piedrahita de Muñó: Pedroso River	30T 475512 4659039	990	15.VII.2010 (DM)
Pineda de la Sierra: Arlanzón River	30T 474510 4675508	1160	17.VII.2009 (DM)
Pomar: Trueba River	30T 461230 4754571	594	22.III.2006 (DM)

Riocavado de la Sierra: Valdorcas River	30T 483540 4666615	1120	15.VII.2010 (DM)
Ura: Mataviejas River	30T 453506 4652085	885	22.VII.2010 (DM)
Valle de Valdelaguna: Tejedo River	30T 487330 4663013	1110	15.VII.2010 (DM)
Valujera: Jerea River	30T 472744 4746579	587	24.III.2006 (DM)
Vilviestre del Pinar: Arlanza River	30T 493575 4646567	1080	13.VII.2010 (DM)
Cantabria			
Soto: de los Coteruelos Stream	30T 400626 4766059	980	24.6.1998 (LV)
León			
Arlanza: Noceda River	29T 712073 4726941	708	24.VI.1984 (LV)
Bárcena de la Abadía: Cúa River	29T 693986 4740028	710	30.VI.1983 (LV)
Barniedo de la Reina: Guspíada Stream	30T 346159 4763919	1165	18.V.2007 (DM)
Besande: Grande River	30T 347378 4753257	1310	29.V.2007 (DM)
Brañuelas: pond	29T 729113 4724225	1060	23.VI.1984 (LV)
Burón: Mirva Stream	30T 332314 4766382	1105	09.V.2007 (DM)
Cabornera: Casares River	30T 277957 4750649	1090	28.IX.1984 (LV)
Cacabelos-1: Cúa River	29T 686120 4720314	475	18.X.2007 (DM)
Cacabelos-2: pond	29T 686432 4719960	680	01.VII.1983 (LV)
Castrocontrigo: Eria River	29T 731980 4674475	920	17.VII.1984 (LV)
Cuénabres: Orza River	30T 339276 4769191	1170	10.V.2007 (DM)
El Villar de Santiago: La Miranda Lake	29T 726803 4756072	1380	27.VI.2006 (FG)
Espejos de la Reina: Yuso River	30T 345363 4761689	1137	16.V.2007 (DM)
Folgoso de la Ribera: Boeza River	29T 719760 4725818	775	23.VI.1984 (LV)
Guímara-1: Cúa River	29T 686254 4752954	1361	23.X.2007 (DM)
Guímara-2: Cúa River	29T 686163 4752266	1080	30.VI.1983 (LV)
Isoba: Isoba Lake	30T 311603 4768655	1402	29.VIII.1983 (LV)
Jiménez de Jamuz: Jamuz River	30T 256047 4683805	793	18.IV.1984 (LV)
La Baña-1: La Baña Lake	29T 685613 4680910	1380	19.VII.1984 (LV)
La Baña-2: Cabrera River	29T 689805 4682818	1105	08.VI.2005 (DM)
La Baña-3: Cabrera River	29T 692424 4682116	1040	19.VII.1984 (LV)
La Cándana de Curueño: Curueño River	30T 303199 4744114	980	19.VII.1983 (LV)
La Mata de la Riba: de Foces Stream	30T 309228 4747198	970	19.VII.1983 (LV)
La Omañuela: Omaña River	30T 255721 4740496	1025	05.XI.2007 (DM)
La Uña-1: Carcedo Stream	30T 326578 4771005	1220	09.V.2007 (DM)
La Uña-2: Riosol Stream	30T 322644 4770852	1200	08.V.2007 (DM)
La Uña-3: Riosol Stream	30T 324410 4771327	1230	08.V.2007 (DM)
Labaniego: Noceda River	29T 712511 4727239	810	24.VI.1984 (LV)
Las Omañas: Omaña River	30T 264800 4729286	930	31.X.2007 (DM)
Llamas de Rueda: Corcos Stream	30T 325183 4724045	940	10.VI.1984 (LV)
Murias de Paredes: Omaña River	29T 729085 4747871	1250	06.XI.2007 (DM)
Palacios de Jamuz: Jamuz River	29T 742396 4682252	822	10.X.2007 (DM)
Paradaseca: Burbia River	29T 681396 4727711	615	28.V.2008 (DM)
Portilla de la Reina: Salceda River	30T 348256 4766830	1225	14.V.2007 (DM)
Posada de Valdeón: de la Magdalena Stream	30T 344292 4779249	940	21.VI.1981 (LV)

Priaranza: Duerna River	29T 731971 4691123	940	20.V.2008 (DM)
Puerto de Leitariegos: de la Cabaña Stream	29T 711292 4763426	1521	01.VII.1985 (LV)
Puerto de Monte Viejo: Valdicueva Stream	30T 343110 4752015	1433	29.VIII.1984 (LV)
Retuerto-1: Tuerto Stream	30T 335693 4769854	1150	10.V.2007 (DM)
Retuerto-2: Tuerto Stream	30T 335642 4771597	1180	10.V.2007 (DM)
Retuerto-3: Tuerto Stream	30T 335598 4771111	1180	28.VIII.1984 (LV)
Riaño: Esla River	30T 336206 4759560	1048	28.VIII.1984 (LV)
San Justo de la Vega: Tuerto River	29T 745104 4704439	832	18.VI.1983 (LV)
San Pedro de Olleros: Ancares River	29T 687735 4730691	587	22.X.2007 (DM)
Siero de la Reina: Siero River	30T 344008 4755895	1105	29.V.2007 (DM)
Soto de Valdeón-1: de Cable Stream	30T 341022 4776666	1080	02.VIII.2012 (LV)
Soto de Valdeón-2: de la Iglesia Stream	30T 338440 4774512	1250	21.VIII.2012 (LV)
Soto de Valdeón-3: Las Brañas Stream	30T 340288 4777608	890	02.VIII.2012 (LV)
Sueros de la Cepeda: Tuerto River	29T 743188 4722442	940	12.X.1983 (LV)
Torneros de Jamuz: Jamuz River	29T 737869 4682465	860	10.X.2007 (DM)
Torneros de la Valdería: Eria River	29T 427864 4677271	962	17.VII.1984 (LV)
Truchas: Eria River	29T 712264 4682025	1090	17.VII.1984 (LV)
Turienzo de los Caballeros: Turienzo River	29T 724776 4703744	1018	18.VI.1983 (LV)
Val de San Román: Turienzo River	29T 735048 4701415	985	13.V.1984 (LV)
Vegacerneja: Tuerto Stream	30T 336373 4768295	1120	10.X.2007 (DM)
Velilla de la Valduerna: Duerna River	29T 734731 4690159	920	20.X.2008 (DM)
Villafranca del Bierzo: Burbia River	29T 679255 4719623	504	01.VII.1983 (LV)
Villamanín: Bernesga River	30T 283158 4756937	1202	11.VIII.2011 (DM)
Villanueva de la Tercia: Bernesga River	30T 282517 4760525	1180	12.VII.1984 (LV)
Villar de Acero: Porcarizas River	29T 680146 4732748	722	28.V.2008 (DM)
Villar del Monte: Eria River	29T 721226 4679151	1065	17.VII.1984 (LV)
Villasimpliz: Bernesga River	30T 283591 4754616	1098	11.VIII.2011 (DM)
Villaverde de la Sierra: Grande River	30T 350599 4756091	1400	29.V.2007 (DM)
<hr/>			
Salamanca			
La Casilla: Tormes River	30T 286844 4481454	929	15.VI.2011 (DM)
Navamorales: Corneja River	30T 288054 4481689	942	14.VI.2011 (DM)
Puente del Congosto: Tormes River	30T 285988 4486115	917	15.VI.2011 (DM)
<hr/>			
Soria			
Oteruelos: Duero River	30T 533042 4633325	1030	28.X.2009 (DM)
Santa Inés: Helada Lake	30T 511635 4649217	1999	25.VI.2004 (FG)
<hr/>			
Zamora			
Porto: Camposagrado Lake	29T 679415 4666233	1660	26.VI.2007 (FG)

### Discussion

The records of this study increase our knowledge of the distribution of the genus *Hydrochus* in the Iberian Peninsula, and in particular of some of its endemic species. The record for *Hydrochus ibericus* in Burgos (Fig. 1b) extends the distribution area of this endemic species towards the north, to the western foothills of the Cantabrian Mountains. This new location is of great interest as it brings the distribution area of *Hydrochus ibericus* closer to that of *H. angusi* which occurs in the Hesperian Massif and the Cantabrian Mountains (Fig. 1a). They are sister species of relatively recent origin (1.5 million years according to HIDALGO-GALIANA & RIBERA 2011). Their distribution is disjunct taking into account current data. Although there are no great geographical barriers separating these two species, both historical and ecological factors (for instance different preferences for substrate, *H. angusi* perhaps more silicicolous and *H. ibericus* more calcicolous) probably determine their spatial separation, which seems to be in the Pisuerga river basin (northern limit of *H. ibericus*).

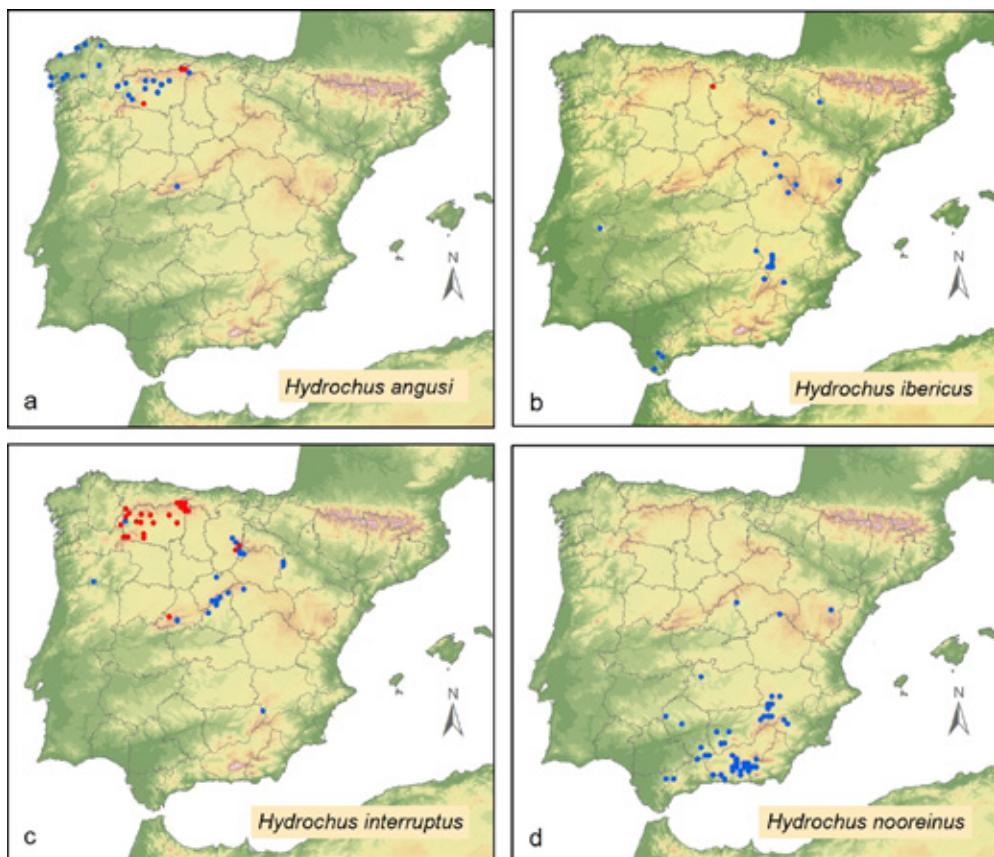


Fig. 1: Distribution maps of Iberian endemic species: a) *Hydrochus angusi*, b) *H. ibericus*, c) *H. interruptus*, and d) *H. nooreinus*. Blue spots: published records, red spots: new records.

*Hydrochus interruptus* is an Iberian endemic of earlier origin (HIDALGO-GALIANA & RIBERA 2011) and has a wider distribution (Fig. 1c). *H. interruptus* mostly inhabits mountainous areas in the north and centre of the Iberian Peninsula. There is a notable lack of records for this species in

Galicia, where all of the specimens studied in this group belong to *H. nitidicollis*. *Hydrochus interruptus*, *H. nitidicollis* and *H. grandicollis* form a phylogenetically close group of species (HIDALGO-GALIANA & RIBERA 2011). Whereas *H. interruptus* has an exclusively Iberian distribution that does not reach the east and very rarely reaches the south of the Peninsula, *H. nitidicollis* and *H. grandicollis* have wider distribution areas (including western Europe and north Africa). Although both species share some areas, *H. nitidicollis* is more mountainous and common in the northern half of the Iberian Peninsula, and *H. grandicollis* is mainly found in regions with a more Mediterranean influence.

*Hydrochus interruptus* and *H. nitidicollis* were collected together at three sampling sites, specifically in the Mirva, Tuerto and Las Brañas streams, all three of which are located in the central area of the Cantabrian Mountains. Also belonging to an Ibero-Maghrebian lineage, but characteristic of southern mountains, *H. nooreinus*, is an Iberian endemic distributed throughout the Baetic Mountain Ranges and their foothills with some scattered records from the Iberian and Central Mountains (Fig. 1d). The altitudinal ranges of the strictly Iberian endemic species of *Hydrochus* (Fig. 2) indicate that their presence is linked to mid and high altitude mountainous regions, usually concentrating in areas above 1000 m. Only *Hydrochus angusi* is found also at lower altitudes (mean altitude: 740 m), occurring at sea level in wetlands at the north-western Iberian Atlantic coast (PÉREZ-BILBAO et al. 2009). If we exclude coastal records, the remaining captures correspond to mountainous regions. With regard to the other three endemic species, the altitudinal ranges are narrower for species in the north and the centre of the Iberian Peninsula (*H. ibericus* and *H. interruptus*), and wider for *H. nooreinus*. The latter is plastic enough to reach one of the highest altitudes for the genus in the Iberian Peninsula (2058 m in the Sierra Nevada, MILLÁN et al. 2013). The mean height in the case of *H. nooreinus* is the highest for all the Iberian endemic species (1214 m a.s.l., n = 58).

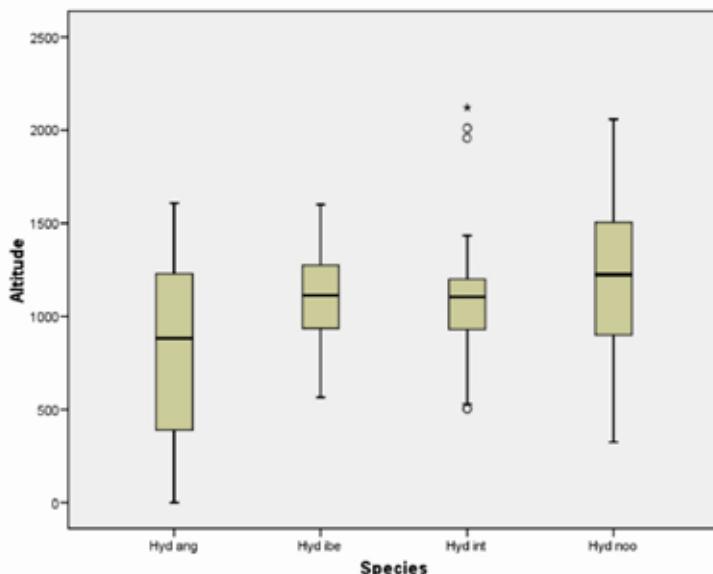


Fig. 2: Distribution of the altitude values for the four Iberian endemic species of *Hydrochus*: *H. angusi*, *H. ibericus*, *H. interruptus*, *H. nooreinus*. The box plots show the medians (horizontal line inside boxes), 25 and 75 percentiles (edges of the boxes), outliers (circles), and one extreme value (asterisk).

### Acknowledgements

Many thanks to Josefina Garrido and Amaia Pérez-Bilbao (Universidad de Vigo) for supplying us with material from Galicia, and to Carlos Martínez-Sanz and Francisco García-Criado (Universidad de León) for material from mountain lakes. We are indebted to the Institut de Biología Evolutiva (UPF-CSIC) and Ecología Acuática Group (Universidad de Murcia) for access to ESACIB data. We also thank Javier García for his help in drawing the maps and Susana Blanco, Gustavo González and David Pérez for their help during field sampling.

### References

- ANGUS, R.B. 1976: A re-evaluation of the taxonomy and distribution of some European species of *Hydrochus* Leach (Col., Hydrophilidae). – Entomologist's monthly magazine 112: 177– 201.
- BERGE HENEGOUWEN, A.L. van & SÁNZ-CANTERO, C.E. 1992: *Hydrochus nooreinus*, a new species from Spain (Coleoptera, Hydrochidae). – Storkia 1: 26–28.
- BERNHARD, D., RIBERA, I., KOMAREK, A. & BEUTEL, R. 2009: Phylogenetic analysis of Hydrophiloidea (Coleoptera: Polyphaga) based on molecular data and morphological characters of adults and immature stages. – Insect Systematic & Evolution 40: 3–41.
- CASTRO, A. 1998: Coleópteros acuáticos del sur de Córdoba (España) (Haliplidae, Gyrinidae, Noteridae, Dytiscidae, Hydraenidae, Hydrochidae, Helophoridae, Hydrophilidae, Dryopidae y Elmidae). – Zoologica Baetica 8: 49–64.
- CASTRO, A. & DELGADO, J.A. 1998: Notas sobre la presencia de *Hydrochus grandicollis* Kiesenwetter, 1870 en la Península Ibérica (Coleoptera, Hydrochidae). – Boletín de la Asociación española de Entomología 22 (1–2): 145–149.
- CORRÊA DE BARROS, J.M. 1926: Notas entomológicas. – Memórias e estudos do Museo Zoológico da Universidade de Coimbra, ser. I (6): 1–10.
- DELGADO, J.A. 1995: Los Hydraenidae e Hydrophilidae acuáticos (Coleoptera) de la cuenca del río Segura (SE de la Península Ibérica). Propuesta para el estudio de sus ciclos vitales. – PhD thesis, Universidad de Murcia, 503 pp.
- ESTEBAN, I. & TOLOSA, L. 2014: Nuevas citas y aportaciones al conocimiento de los coleópteros acuáticos en Aragón (España) (Coleoptera: Gyrinidae, Dytiscidae, Hydrochidae, Hydraenidae). – Boletín de la Sociedad Entomológica Aragonesa 54: 359–369.
- FERRO, G. 1979: Ricerche coleotterologiche sul litorale Jonico della Puglia, Lucania e Calabria. Campagne 1956-1957-1958. XVIII: Coleoptera Palpicornia. – Bollettino Societá entomologica Italiana 111 (1–3): 26–33.
- GARRIDO, J. & MUNILLA, I. 2008: Aquatic Coleoptera and Hemiptera assemblages in three coastal lagoons of the NW Iberian Peninsula: assessment of conservation value and response to environmental factors. – Aquatic Conservation: Marine and Freshwater Ecosystems 18: 557–559.
- GAYOSO, A. & RIBERA, I. 2001: *Hydrochus martiniae* Makhan revisited. – Latissimus 13: 19.
- HEYDEN, L. von 1870: Entomologische Reise nach dem südlichen Spanien, der Sierra Guadarrama und Sierra Morena, Portugal und den Cantabrischen Gebirgen. – Berlin: G. Kraatz, 176 pp., plt. II.
- HIDALGO-GALIANA, A. & RIBERA, I. 2011: Late Miocene diversification of the genus *Hydrochus* (Coleoptera, Hydrochidae) in the west Mediterranean area. – Molecular Phylogenetics and Evolution 59: 377–385.
- JÁCH, M.A., DÍAZ, J.A. & GAYOSO, A. 1999: “Acciones Integradas”: Excursion to Andalucía (Spain: Málaga, Cádiz), October 1998. – Koleopterologische Rundschau 69: 171–181.

- MAKHAN, D. 1996: Descriptions of three new species of *Hydrochus* (Coleoptera: Hydrochidae). – *Phegea* 24 (4): 183–185.
- MILLÁN, A. & AGUILERA, P. 2000: A new species of *Hydraena* Kugelann from the spring of Fuenfría (Segura basin, SE Spain), a site of special conservation interest (Coleoptera: Hydraenidae). – *Koleopterologische Rundschau* 70: 61–64.
- MILLÁN, A., MORENO J.L. & VELASCO, J. 2001a: Estudio faunístico y ecológico de los Coleópteros y Heterópteros acuáticos de las lagunas de Albacete (Alboraj, Los Patos, Ojos de Villaverde, Ontalafía y Pétrola). – *Sabuco, Revista de Estudios Albacetenses* 1: 43–94.
- MILLÁN, A., MORENO J.L. & VELASCO, J. 2001b: Estudio faunístico y ecológico de los Coleópteros y Heterópteros acuáticos de las lagunas de Albacete (Lagunas de Ruidera, Salinas de Pinilla, Laguna del Saladar, Laguna del Salobrante, Lagunas de Corral Rubio, Fuente de Isso y Fuente de Agua Ramos). – *Sabuco, Revista de Estudios Albacetenses* 2: 167–214.
- MILLÁN, A., MORENO J.L. & VELASCO, J. 2002: Los Coleópteros y Heterópteros acuáticos y semiacuáticos de la provincia de Albacete. Catálogo faunístico y estudio ecológico. – Instituto de Estudios Albacetenses “Don Juan Manuel” de la Excma. Diputación Provincial de Albacete, Albacete, 180 pp.
- MILLÁN, A., PICAZO, F., SÁNCHEZ-FERNÁNDEZ, D., ABELLÁN, P. & RIBERA, I. 2013: Los Coleópteros acuáticos amenazados, pp. 442–456. – In Ruano, F., Tierno de Figueroa, J.M. & Tinaut, A. (eds.): Los insectos de Sierra Nevada. 200 años de historia. Vol. 2. – Granada: Asociación española de Entomología.
- ORCHYMONT, A. d' 1929: Contribution à l'étude des Palpicornia. VII. – *Bulletin et Annales de la Société Entomologique de Belgique* 69: 79–96.
- PÉREZ-BILBAO, A., BENETTI, C.J. & GARRIDO, J. 2009: Nuevas aportaciones al conocimiento de la familia Hydrochidae (Coleoptera) en Galicia (noroeste de España). – *Boletín Sociedad Entomológica Aragonesa* 45: 241–244.
- RIBERA, I., HERNANDO, C. & AGUILERA, P. 1999a: *Hydrochus tariqi* sp.n. from south Spain (Coleoptera: Hydrochidae). – *Koleopterologische Rundschau* 69: 99–102.
- RIBERA, I., HERNANDO, C. & AGUILERA, P. 1999b: Notes on the status of *H. interruptus* Heyden and *H. martinae* Makh. – *Latissimus* 11: 22–23.
- SÁINZ-CANTERO, C.E. & ACEITUNO-CASTRO, E. 1997: Coleopterofauna acuática de las sierras de Tejeda y Almijara (Sur de España). II. Polyphaga (Coleoptera, Dryopidae, Elmidae, Hydraenidae, Hydrochidae, Hydrophilidae). – *Nouvelle Revue d'Entomologie* (N.S.), 14 (2): 115–133.
- SÁNCHEZ-FERNÁNDEZ, D., ABELLÁN, P., VELASCO, J. & MILLÁN, A., 2003: Los coleópteros acuáticos de la Región de Murcia. Catálogo faunístico y áreas prioritarias de conservación. – *Monografías S.E.A.* 10: 71 pp.
- SÁNCHEZ-FERNÁNDEZ, D., LOBO, J.M., ABELLÁN, P., RIBERA, I. & MILLÁN, A. 2008: Bias in freshwater biodiversity sampling: the case of Iberian water beetles. – *Diversity and Distributions* 14: 754–762.
- VALLADARES, L.F. 1988: Descripción de *Hydrochus angusi* n. sp. del norte de España (Coleoptera, Hydrophilidae). – *Nouvelle revue d'entomologie* (N.S.) 5 (1): 83–87.
- VALLADARES, L.F. 1995: Los Palpicornia acuáticos de la provincia de León. III. Helophoridae, Hydrochidae e Hydrophilidae (Coleoptera). – *Boletín de la Asociación española de Entomología* 19 (1–2): 281–308.
- VALLADARES, L.F., BASELGA, A. & GARRIDO, J. 2010: Diversity of water beetles in the Picos de Europa National Park, Spain: Inventory completeness and conservation assessment. – *The Coleopterists Bulletin* 64 (3): 201–219.

- VALLADARES, L.F., DÍAZ, J.A. & DELGADO, J.A. 1999: *Hydrochus ibericus* sp. n. (Coleoptera, Hydrochidae) from the Iberian Peninsula. – *Aquatic Insects* 21 (2): 81–87.
- VALLADARES, L.F., DÍAZ, J.A. & GARRIDO, J. 2000: Coleópteros acuáticos del Sistema Ibérico Septentrional (Coleoptera: Haliplidae, Gyrinidae, Dytiscidae, Hydraenidae, Helophoridae, Hydrochidae, Hydrophilidae). – *Boletín de la Asociación española de Entomología* 24 (3–4): 59–84.
- VALLADARES, L.F. & RIBERA, I. 1999: Lista Faunística y Bibliográfica de los Hydrophiloidea acuáticos (Coleoptera) de la Península Ibérica e Islas Baleares. *Asociación Española de Limnología*. – *Listas de la Flora y Fauna de las Aguas Continentales de la Península Ibérica* 15: 1–114.

David MIGUÉLEZ

Departamento de Biodiversidad y Gestión Ambiental (Zoología), Facultad de Ciencias Biológicas y Ambientales,  
Universidad de León, E – 24071 León, Spain  
Ichthos Gestión Ambiental, S.L. C/Pablo Ruiz Picasso, 38. E-24009 León, Spain ([biodavid@hotmail.com](mailto:biodavid@hotmail.com))

Dr. Luis F. VALLADARES

Departamento de Biodiversidad y Gestión Ambiental (Zoología), Facultad de Ciencias Biológicas y Ambientales,  
Universidad de León, E – 24071 León, Spain ([lfvald@unileon.es](mailto:lfvald@unileon.es))

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Koleopterologische Rundschau](#)

Jahr/Year: 2014

Band/Volume: [84\\_2014](#)

Autor(en)/Author(s): Miguelez David, Valladares Luis F.

Artikel/Article: [New data on the distribution of Soma species of Iberian Hydrochus Leach, with notes on their ecology. 221-232](#)