

## SECOND ANNOTATED LIST OF SELECTED SPIDER FAMILIES (ARACHNIDA: ARANEAE) HELD AT THE UNIVERSITY OF LEÓN (SPAIN)\*

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**Abstract:** The diversity and distribution of spiders in the Iberian Peninsula are poorly known. However, the institutional arthropod collections that remain unexplored can provide a considerable amount of taxonomical and biogeographical data. Here we analyze the samples of the families Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae and Pholcidae stored at the University of León (Spain). The 30 species that have been identified are here commented upon, and the male and female genitalia of *Holocnemus caudatus*, *Holocnemus hispanicus* and *Holocnemus pluchei* are presented. Also, a predictive distribution map of *Nemesia ungoliant* is provided. The review of the CaULE collection has proved to be a very efficient way to access previously untapped biodiversity information.

**Key words:** Collection, taxonomy, biogeography, Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae, Pholcidae, Iberian Peninsula.

### Segunda lista comentada de varias familias de arañas (Arachnida: Araneae) depositadas en la Universidad de León (España)

**Resumen:** El conocimiento sobre la diversidad y distribución de las arañas Ibéricas está lejos de ser completo. Sin embargo, una gran cantidad de colecciones de artrópodos mantenidas en las diferentes instituciones que permanecen inexploradas en la actualidad pueden ser una valiosa fuente de datos taxonómicos y biogeográficos. En este trabajo analizamos las muestras de las familias Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae y Pholcidae, conservadas en la Universidad de León (España). En total se identificaron 30 especies. Se aportan comentarios faunísticos y el dibujo de la estructura genital de ambos sexos de *Holocnemus caudatus*, *Holocnemus hispanicus* y *Holocnemus pluchei*. Además se proporciona un mapa de distribución potencial de *Nemesia ungoliant*. La revisión de la colección CaULE ha demostrado ser un medio muy eficaz para acceder a información de biodiversidad sin explotar.

**Palabras clave:** Colección, taxonomía, biogeografía, Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae, Pholcidae, península Ibérica.

\* Nota editorial: En este volumen se publica otro manuscrito relativo a la aracnofauna de León y Asturias: Arácnidos (Arachnida: Araneae y Opiliones) recogidos durante las XI Jornadas del GIA en Somiedo (Asturias), septiembre 2010. Marcos Méndez Iglesias, Eduardo Morano y Carlos E. Prieto: pág. 131–135.

## Introduction

Studies on the Iberian spider fauna have considerably increased in the last decade, with crucial data being compiled on the known species and their distribution (Morano & Cardoso, 2011). This ground work has allowed easier access to the previously published information, but large data sets remain unavailable to the scientific community, held in unidentified material in museums and university collections.

Even in well studied groups such as plants, it is predicted that 50% of undescribed species have already been collected and are just waiting in herbaria to be analyzed: therefore, it becomes clear that research resources should be focused as much on examining museum material as on collecting new material in the field (Bebber *et al.*, 2010).

As the collecting effort has clearly been not as intense with spiders as it is with plants, we cannot accurately assess the informative value of museum collection for arachnids, but Spain provides a good example of a territory in which a considerable amount of taxonomical and biogeographical data has been obtained from institution holdings (Barrientos, 1978; Barrientos, 1979; Barrientos *et al.*, 1983; Barrientos &

Ferrández, 1982; Barrientos & Urones, 1985; Hidalgo, 1983; Morano & Benhadi-Marín, 2012).

In a time of increasingly limited funding resources, to review collections scattered in decentralised institutions has proven to be a very efficient way to access previously untapped biodiversity information (e.g. Morano & Benhadi-Marín, 2012). This data may be particularly valuable in poorly studied groups distributed across biodiversity hotspots, such as the case study of Iberian spiders, where the number of new species described has consistently increased in the last years. In addition, the asymptote still seems far to reach, a high level of endemism of 236 species has been recorded and a fifth of the known species are only recorded from a single locality, with 50% of the species records coming from five localities or fewer (Morano & Cardoso, 2011).

The aim of the present paper is to contribute to the taxonomical and biogeographical knowledge of the Spanish spider fauna by analyzing previously undetermined samples from the families Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae and Pholcidae, held at the University of

León, located in one of the least studied provinces in the Iberian Peninsula.

## Material and methods

Specimens were mainly collected by *ad hoc* sampling performed by students and were deposited at the spider collection of the Zoology Area of the Department for Biodiversity and Environmental Management of the University of León (Spain). The studied material consists of those mature specimens belonging to the families Agelenidae, Dysderidae, Eresidae, Lycosidae, Nemesiidae and Pholcidae that were accompanied by data on their phenology and capture site. All this material was deposited in the Spider collection of the University of León (CaULE).

The characters used for their analysis follow those proposed by Nentwig *et al.* (2013), Roberts (1985 & 1996) and Simon (1914-1937); the systematics and nomenclature used follow Platnick (2012). New distribution reports follow the data compiled and made available by Morano & Cardoso (2011).

Each species listed includes data on the number of specimens analyzed, sex, phenology, locality and collector. Geographical locations are also registered (standard coordinates and altitude) and presented in the Appendix.

A predictive distribution map was made using the DOMAIN method (Carpenter *et al.*, 1993), applied to a 1km<sup>2</sup> precision map of the entire Iberian Peninsula, where all the areas of species potential distribution with estimate values above 80% were represented, not dismissing any isolated distribution patches. 19 bioclimatic variables were used as provided by the Worldclim database (see Hijmans *et al.*, 2005) derived from temperature and rainfall values, with a spatial resolution of ca. one square kilometre: annual mean temperature, mean monthly temperature range, isothermality, temperature seasonality, maximum temperature of warmest month, minimum temperature of coldest month, annual range temperature, mean temperature of wettest quarter, mean temperature of driest quarter, mean temperature of warmest quarter, mean temperature of coldest quarter, annual precipitation, precipitation of wettest month, precipitation of driest month, precipitation seasonality, precipitation of wettest quarter, precipitation of driest quarter, precipitation of warmest quarter and precipitation of coldest quarter.

## Results and discussion

A total of 161 specimens were identified, 36 belonging to Agelenidae, 21 to Dysderidae, one to Eresidae, 65 to Lycosidae, one to Nemesiidae and 37 to Pholcidae (Table I), gathered from 80 localities from 16 Spanish provinces (Appendix).

Lycosidae was the most abundant and diverse family, with 6 genera and 16 species, followed by Agelenidae with two genera and five species (Table I). On the other hand, the families Eresidae and Nemesiidae were only represented by a single specimen each (Table I). Such rarity is also common in other collections, which explains why both records proved to be particularly interesting biogeographically. In terms of sex ratio, both the Nemesiidae and Eresidae specimens were males; for Lycosidae the percentage of females was 70.49%, 56.25% for Agelenidae, 52.63% for Dysderidae and 51.35% for Pholcidae (Table I). The lack of females in Nemesiidae

and Eresidae is probably due to the highly cryptic nature of their nests and burrows, while males are exposed, even for small periods of time, when actively searching for females.

Among the Dysderidae specimens analyzed, two new species were found in *Dysdera* and *Harpactocrates* respectively. In the family Pholcidae, *Holocnemus hispanicus* proved to be more abundant in the analyzed samples than *H. pluchei*, only represented by three specimens (Table I).

In the potential distribution map (Fig. 1), we decided not to use a conservative cut-off approach to isolated patches, because our knowledge on the distribution and biology of this species is so incomplete and new records may prove to occur between them. Furthermore, the connectivity between suitable areas that has now been lost, might have existed once, a hypothesis which could only be validated through paleoclimatic analyses of such intermediate areas, which is considered to be beyond the scope of this work, although it should be the focus of future research.

## Agelenidae C. L. Koch, 1837

### *Tegenaria atrica* C.L. Koch, 1843

CANTABRIA: Bárcena, 10/7/1989, 1♀ (Marta F.). Soto de la Marina 1♀ (Ángel H. C.). Torrelavega, 15/7/1989, 1♀ 1 juv. (A. Gascón). LA RIOJA: Nájera, 20/8/2003, 2♂. LEÓN: Azadinos, 23/8/1987, 1♀ (Ana Bajo). Castrocontrigo, 22/7/1994, 1♂ (A. C. Lafuente). Congosto, 15/8/2002, 1♂. Fresno del Camino, 28/5/1988, 1♀ (R. Olivera). Grajal de Campos, 1/9/1984, 1♀. León, 1/6/1984, 1♀. León, 15/6/1985, 1♀ (Negral F.). León, 19/5/1985, 1♀ (J. Vaamonde). León, 15/10/1988, 1♀ (R. Olivera). León, 3/4/1990, 1♀ (Aurora G.). León, 10/11/1992, 1♂ (G. Mendoza). León, 5/1993, 1♂ (C. Cimadevilla). San Justo de la Vega, 7/2003, 1♂ (Marta V.). San Miguel de las Dueñas, 7/4/1995, 1♀ (Álvaro del P.). San Pedro de Trones, 7/1992, 1♀ (M. G.). Santa María del Páramo, 12/10/1989, 1 juv. (S. Cabrerós). Villacelama, 24/4/1988, 1♀ (A. Llorente). Villaquilambre, 19/7/1994, 1♀ (F. Sandoval). Villabispo de las Regueras, 8/9/1995, 1♀ (J. F. G.; S.G.R.S.). Villasanta, 7/7/1983, 1♂ (F. Bayón). PALENCIA: Gigondo, 17/7/1993, 1♀ (A. Herrero). VALLADOLID: Boecillo, 27/7/1994, 1♂ 1 juv. (F. Alonso). Boecillo, 20/7/1994, 1♂ (F. Alonso).

### *Tegenaria inermis* Simon, 1870

LEÓN: Villablino, 12/7/1986, 1♂ (G. Cordero).

### *Tegenaria domestica* (Clerck, 1757)

LEÓN: San Ciprián, 26/5/1986, 1♀. VALLADOLID: Sardón de Duero, 3/3/1987, 1♂.

### *Tegenaria feminea* Simon, 1870

LEÓN: San Ciprián, 26/5/1986, 1♂.

### *Malthonica parietina* (Fourcroy, 1785)

LA CORUÑA: Carral, 20/7/1993, 1 juv. (M. Regueiro). GUIPÚZCOA: Placencia de las Armas, 14/7/1983, 1♀ (Ausola G. G.).

## Comments on the family Agelenidae:

The data provided show an obvious bias towards domestic and peri-domestic environments. It will be necessary to complete this information in the future with samples from urban to forested environments, away from immediate human influence, in order to have a more balanced picture of the diversity of this group of spiders. The identification of the samples was

carried out with the help of the general works (Simon, 1914-1937; Heimer & Nentwig, 1991; Roberts, 1985 & 1996) as well as some more recent reviews (Barrientos, 1980; Barrientos & Ribera, 1988; Guseinov *et al.*, 2005).

Probably the most abundant and the most striking species to the human perception is *Tegenaria atrica*, which is, consequently, overrepresented in this small collection. Apart from *T. atrica*, there are two more species also linked to domestic environments, *Tegenaria domestica* and *Malthonica parietina*. However, the available data are not sufficient to better refine their distinctive features in relation to their biology, although, from the morphological perspective, they are well-known and clearly separated species. In addition, it must be said here that the samples analyzed and identified as *T. atrica* are homogeneous and conform precisely to the type of this species (*sensu stricto*). In addition to these, in the CaULE collection were registered two species of *Tegenaria* that appear in rugged environments and clearly unrelated to human presence, *Tegenaria inermis* and *Tegenaria feminea*. *Tegenaria feminea* is a widely distributed species in the Iberian area, usually dominant in open environments with little or extremely low vegetation; on the contrary, *T. inermis* is a species linked to the Cantabrian coast. Both are endemic to the Iberian Peninsula.

#### Dysderidae C. L. Koch, 1837

##### *Dysdera crocata* C.L. Koch, 1838

LEÓN: Cabrerros del Río, 20/3/2010, 1♀ (E. García). Carbajal de la Legua, 1/5/1994, 2♀ (J. Alberto). Fresno del camino, 7/7/1988, 1♂ (Rodríguez Olivera). Fresno del camino, 7/9/1988, 1♀ (Rodríguez Olivera). León, 17/4/1984, 2♂. León, 1/5/1984, 1♂ (Abad V.). León, 8/6/1984, 1♀. León, 25/10/1985, 2♂1♀ (J. García Calleja). Valderas, 24/3/1990, 1 juv. (A. Mañanes). Villaobispo de las Regueras, 25/10/1984, 1♀ (R. Delibes). Villaobispo de las Regueras, 24/11/1984, 1♂ (A. J. Pérez). PALENCIA: Gigondo, 4/7/1993, 1♀ (A. Herrero). VALLADOLID: Mucientes, 28/8/1990, 1♀ (Aurora G.).

##### *Dysdera fuscipes* Simon, 1882

LEÓN: San Pedro de Trones, 7/1992, 1 juv.

##### *Dysdera* sp. ined.

LEÓN: Villalfeide, 17/10/1989, 1♂1♀ (M. C. González).

##### *Harpactocrates* sp. ined.

LEÓN: Mansilla de las Mulas, 23/4/1992, 1♂ (Ponge Riaño F.).

#### Comments on the family Dysderidae:

*Dysdera crocata* is a cosmopolitan species, always associated with humanized habitats. In Spain it is known from most of the territory, although our data significantly complement the information available about its presence in the northern half of Castilla y León. *Dysdera fuscipes* is distributed in Atlantic areas of France and the Iberian Peninsula. In Iberia it occurs from southern Portugal to the Pyrenees, including the western part of the Sistema Central mountains. The record presented here, along with the one provided by Barrientos & Ferrández (1982), somehow connects the species distribution linked to the Atlantic coast in Portugal with all records from north-western Spain (Ferrández, 1987; Morano & Cardoso, 2011). In addition, one specimen of *Dysdera* studied here does not match any of the known species of the Iberian fauna: thus, we consider it as an undescribed species.

**Table I.** List of species studied indicating the number of individuals by sex and stage (individuals inside the male or female categories correspond to mature individuals).

Family/species	♂♂	♀♀	Immature	Total
<b>Agelenidae</b>				
<i>Tegenaria atrica</i> C.L. Koch, 1843	11	16	3	30
<i>Tegenaria inermis</i> Simon, 1870	1	0	0	1
<i>Tegenaria domestica</i> (Clerck, 1757)	1	1	0	2
<i>Tegenaria feminea</i> Simon, 1870	1	0	0	1
<i>Malthonica parietina</i> (Fourcroy, 1785)	0	1	1	2
Total Agelenidae	14	18	4	36
<b>Dysderidae</b>				
<i>Dysdera crocata</i> C.L. Koch, 1838	7	9	1	17
<i>Dysdera fuscipes</i> Simon, 1882	0	0	1	1
<i>Dysdera</i> sp. ined.	1	1	0	2
<i>Harpactocrates</i> sp. ined.	1	0	0	1
Total Dysderidae	9	10	2	21
<b>Eresidae</b>				
<i>Eresus kollari</i> Rossi, 1846	1	0	0	1
Total Eresidae	1	0	0	1
<b>Lycosidae</b>				
<i>Alopecosa accentuata</i> (Latreille, 1817)	1	2	0	3
<i>Alopecosa albofasciata</i> (Brulle, 1832)	5	2	0	7
<i>Alopecosa pulverulenta</i> (Clerck, 1757)	1	2	0	3
<i>Alopecosa simoni</i> (Thorell, 1872)	0	1	0	1
<i>Arctosa leopardus</i> (Sundevall, 1833)	0	1	0	1
<i>Arctosa similis</i> Schenkel, 1938	1	0	0	1
<i>Arctosa villica</i> (Lucas, 1846)	0	3	0	3
<i>Hogna radiata</i> (Latreille, 1817)	2	10	1	13
<i>Lycosa tarantula</i> (Linnaeus, 1758)	2	2	2	6
<i>Pardosa amentata</i> (Clerck, 1757)	0	1	0	1
<i>Pardosa hortensis</i> (Thorell, 1872)	0	2	0	2
<i>Pardosa monticola</i> (Clerck, 1757)	2	1	0	3
<i>Pardosa proxima</i> (C.L. Koch, 1847)	2	8	0	10
<i>Pardosa pullata</i> (Clerck, 1757)	0	2	1	3
<i>Trochosa ruricola</i> (De Geer, 1778)	2	5	0	7
<i>Trochosa terricola</i> Thorell 1856	0	1	0	1
Total Lycosidae	18	43	4	65
<b>Nemesiidae</b>				
<i>Nemesia ungodiant</i> Decae et al, 2007	1	0	0	1
Total Nemesiidae	1	0	0	1
<b>Pholcidae</b>				
<i>Holocnemus hispanicus</i> (Wiehle, 1933)	8	10	0	18
<i>Holocnemus plucheii</i> (Scopoli, 1763)	1	2	0	3
<i>Pholcus phalangioides</i> (Fuesslin, 1775)	9	7	0	16
Total Pholcidae	18	19	0	37
<b>Total</b>				<b>161</b>

The genus *Harpactocrates* is represented today in the Iberian Peninsula by six species. Interestingly, the only available specimen in the CaULE collection belongs to a species in the process of being described. This species occurs throughout much of the Cantabrian region (unpublished data). It is worth mentioning here the total absence of records of any *Harpactocrates* species from the whole of the north-western half of Castilla y León, Asturias and Galicia (Ferrández, 1987; Morano & Cardoso, 2011), which once again highlights the need and usefulness of this kind of publications in order to obtain a catalog of Iberian spiders as complete as possible.

#### Eresidae C. L. Koch, 1850

##### *Eresus kollari* Rossi, 1846

LEÓN: Fabero, 13/7/1984, 1♂ (Iglesias F.).

#### Comments on the family Eresidae:

*Eresus kollari* is a widespread species in several European countries but with few scattered records from the Iberian Peninsula, mostly recorded before 1975 (Morano & Cardoso,

2011). The identification of the specimens of these records probably was based only on morphological characters which were considered intra-specifically stable in that period but are now known to be shared by several different species (Miller *et al.*, 2012). Therefore, many Iberian records might belong to different species, even undescribed ones. This is the first record of this family from the province of León in north-western Spain (Morano & Cardoso, 2011).

### Lycosidae Sundevall, 1833

#### *Alopecosa accentuata* (Latreille, 1817)

LEÓN: León, 19/5/1986, 1♂ (Aparicio Nogales M.). León, 4/5/1993, 1♀ (C. Rodríguez). León, 12/5/1995, 1♀ (Peral G. R.).

#### *Alopecosa albofasciata* (Brulle, 1832)

LEÓN: León, 10/10/1982, 1♀ (Montes E.). León, 5/8/1984, 1♂ (J. M. Marcos). León, 1/5/1993, 1♂ (Ana M. Vega). León, 6/5/1984, 1♀. León, 5/6/1984, 1♂. Vega de Infanzones, 5/5/1985, 1♂ (J. García Calleja). Villabuena, 17/8/1994, 1♂ (Mónica Castelo).

#### *Alopecosa pulverulenta* (Clerck, 1757)

LEÓN: Boñar, 7/10/1984, 1♂. La Robla, 2/6/1993, 1♀. Valencia de Don Juan, 20/10/1984, 1♀ (E. Cimas).

#### *Alopecosa simoni* (Thorell, 1872)

VALLADOLID: Sardón de Duero, 3/11/1987, 1♀.

#### *Arctosa leopardus* (Sundevall, 1833)

PALENCIA: Terradillos de los Templarios, 10/5/1985, 1♀ (M. L. del Amo).

#### *Arctosa similis* Schenkel, 1938

CÓRDOBA: Peñarroya-Pueblo Nuevo, 15/4/1987, 1♂.

#### *Arctosa villica* (Lucas, 1846)

ÁVILA: Candeleda, 28/7/1984, 1♀ (I. Iglesias). LEÓN: Albares de la Ribera, 2/6/1989, 1♀ (J. Robles). Matadeón de los Oteros, 12/10/1989, 1♀ (Paniagua Pardo M. A.).

#### *Hogna radiata* (Latreille, 1817)

LEÓN: Bárcena del Bierzo, 13/7/1984, 1♀ (Iglesias Fernández). León, 19/5/1986, 1♀ (Aparicio Nogales M.). León, 21/7/1992, 1♂ (R. Revilla). León, 10/6/1995, 1♀ (D. C. Peña). Matallana de Torío, 10/7/1984, 1♀ (Bayón Darkistade - F. Bayón). Matallana de Torío, 19/7/1984, 1♀ (Bayón Darkistade - F. Bayón). Pallide, 28/8/1995, 1♀. San Cristóbal de Valdueza, 19/8/1984, 1♀ (Aparicio Nogales M.). Villaobispo de las Regueras, 9/5/1985, 1juv. (E. Cimas). SALAMANCA: Sobradillo, 10/8/1983, 2♀ (A. González G.). SEGOVIA: Cuéllar, 3/7/1995, 1♀ (Pilar Cuéllar M. F.). ZAMORA: Villadepera, 2/10/1992, 1♂ (A. Iglesias).

#### *Lycosa tarantula* (Linnaeus, 1758)

LEÓN: León, 18/7/1992, 1 juv. (E. García). Luyego de Somoza, 2/7/1990, 1♂. Matallana de Torío, 12/8/1985, 1♀ (A. García Barreda). Ribaseca, 17/10/1984, 1 juv. (García P.). Santa María del Páramo, 10/10/1988, 1♀ (S. Cabreros).

#### *Pardosa amentata* (Clerck, 1757)

LEÓN: Riaño, 25/5/1995, 1♀ (M. L. del Amo).

#### *Pardosa hortensis* (Thorell, 1872)

LEÓN: Puente de Domingo Flórez, 12/5/1985, 2♀ (San Juan I.).

#### *Pardosa monticola* (Clerck, 1757)

LEÓN: León, 15/6/1993, 1♂ 1♀ (F. García). León, 8/7/1993, 1♂ (C. Rodríguez).

#### *Pardosa proxima* (C.L. Koch, 1847)

LEÓN: La Virgen del Camino, 27/4/1994, 2♀ (M. Miguélez). León, 23/4/1984, 1♂ (Pilar Requeta). León, 25/4/1984, 1♀. León, 9/7/1984, 1♂. León, 8/6/1998, 1♀ (C. Rodríguez). Matallana de Torío, 10/8/1984, 1♀. Valencia de Don Juan, 20/10/1984, 1♀ (E. Cimas).

#### *Pardosa pullata* (Clerck, 1757)

LEÓN: Armunia, 15/5/1979, 1♀ 1 juv. (G. Soto). Vega de Infanzones, 26/5/1989, 1♀ (García Calleja).

#### *Trochosa ruricola* (De Geer, 1778)

LEÓN: La Virgen del Camino, 27/4/1994, 1♂ (L. Núñez). León, 12/8/1986, 2♀ (M. F. Diéguez). Mansilla de las Mulas, 23/4/1992, 1♀ (P. R. F.). Quintanilla de Somoza, 15/7/1994, 1♂ (J.F.G. and S.G.R.S.). Val de San Román, 12/8/2011, 1♀ (Nicolás Pérez). Villalfeide, 25/3/1990, 1♀ (M. C. González).

#### *Trochosa terricola* Thorell 1856

ASTURIAS: Gijón, 10/7/1993, 1♀ (Susana R. G.).

### Comments on the family Lycosidae:

This is a homogeneous but considerably diverse group, with 75 species known to date. For identification we have followed both general works (Simon, 1914-1937; Fuhn & Niculescu-Burlacu, 1971; Heimer & Nentwig, 1991; Roberts, 1985 & 1996) and some recent reviews (Lugetti & Tongiorgi, 1965; Lugetti & Tongiorgi, 1969; Tongiorgi, 1966; Barrientos, 1982; Buchar *et al.*, 2006). Most are ruderal forms whose populations are abundant but not very stable. Its individuals roam endlessly in open spaces, where they are most striking. However, in the CaULE collection larger forms are better represented, as they are samples that have been obtained by direct capture, thus obtaining a generous representation of the two larger species, *Hogna radiata* and *Lycosa tarantula*.

There is a considerable degree of confusion in relation to the Iberian tarantulas, which have been listed and cataloged under many different names, giving artificial consistency to non-existent differences at the genus level. In our opinion, the species described as *Allocosa dufouri* (Simon, 1876), *Allocosa fasciventris* (Dufour, 1835), *Hogna hispanica* (Walckenaer, 1837), *Hogna dufouri hispanica* (Strand, 1916), etc., constitute just one biological entity, clearly distributed throughout the western Mediterranean. In any case, and outside this discussion, the specimens which we have identified as *Lycosa tarantula* clearly belong to the same species, with *L. tarantula* (in the absence of a more accurate and compelling study about it) being their most plausible morphological identity.

Species belonging to the genus *Alopecosa* Simon, 1885 have a smaller size, but are still relatively large spiders. In the CaULE collection are represented two banal species, *Alopecosa albofasciata* and *Alopecosa pulverulenta*, which are much more abundant and widespread than it appears from these data. *Alopecosa simoni* and *Alopecosa accentuata* are also common, but less frequent. Something similar happens with the *Arctosa* C.L. Koch, 1847 species. Undoubtedly the most common and abundant species is *Arctosa villica*, usually protected under rocks and present throughout the reference area. *Arctosa similis* becomes large and is often found in



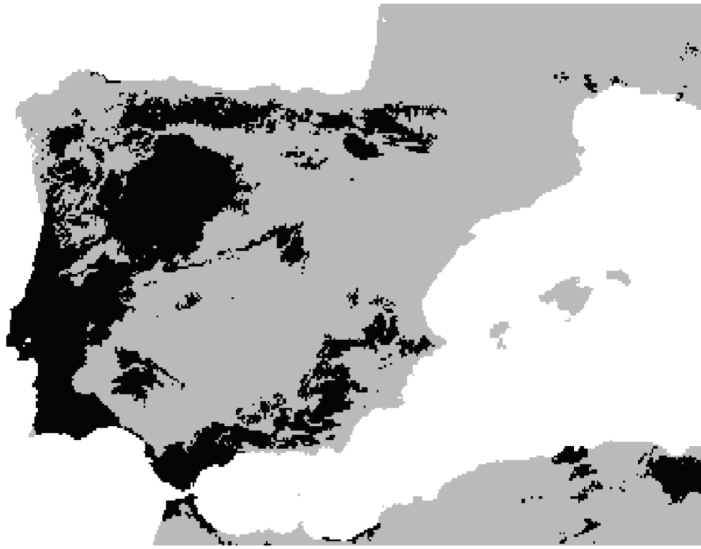


Fig. 1. Potential distribution map of *Nemesia ungoliant*.

damp places with water, especially if boulders abound. *Arctosa leopardus* is also associated with ruderal environments, sheltering under stones, but its presence is much less common.

*Trochosa* C.L. Koch, 1847 individuals are stout, medium sized spiders. The two species of *Trochosa* found here, *Trochosa ruricola* and *Trochosa terricola*, appear under stones and in leaf litter of forest areas.

The genus *Pardosa* C.L. Koch, 1847 is the most heterogeneous group among lycosids. These small spiders form abundant, often unstable populations. They are especially visible in open spaces, in the grass or among the leaves, and it is not uncommon to appreciate successional phenomena during spring and summer in certain enclaves. Although there are differences in size and pigmentation between species, the genitalia should be examined for an accurate identification of specimens. *Pardosa proxima* and *Pardosa hortensis* are the most widespread and frequent species. They can be found anywhere in the reference area. *Pardosa monticola* is also common, but prefers slightly altered spaces, herbaceous environments or open forested areas with poor plant coverage. Of those represented in this collection, *Pardosa amentata* and *Pardosa pullata* are larger and less frequent, although they are common species in mountainous areas and therefore one could have expected a more generous representation of these two species in this collection.

#### Nemesiidae Simon, 1889

*Nemesia ungoliant* Decae, Cardoso & Selden 2007  
ASTURIAS: Tarna, 3/10/1984, 1♂ (R. Moral).

#### Comments on the family Nemesiidae:

This is the first record of *Nemesia ungoliant* from outside Portugal, but its presence in Spain had already been predicted in its description, using the ecological niche model of Decae *et al.* (2007); however, the Tarna region was not included in the first potential distribution map, which shows the lack of knowledge we have about this group and what we still need to know about its biology and habitats to predict its adaptability (Fig. 1).

#### *Holocnemus hispanicus* (Wiehle, 1933)

BURGOS: Aranda de Duero, 15/8/1990, 1♂ (M. Gañón). LEÓN: Ambasaguas del Curueño, 15/5/1986, 1♀. Fresno del Camino, 15/7/1995, 1♀ (Rodríguez M. M.). La Vecilla, 14/5/1989, 1♀ (Carcedo Espino). León, 6/9/1984, 1♀. León, 10/11/1984, 1♂. León, 8/6/1986, 1♂ (González Fernández). León, 29/5/1989, 1♂ (E. M. Vidal). León, 23/6/1990, 1♀ (A. Alonso). Palazuelo de Órbigo, 1/10/1989, 1♂ (C. Garate). Ponferrada, 13/7/1989, 1♂ (María J. Orello). Santa María del Páramo, 11/8/1989, 1♀ (S. Cabrerros). Valderas, 24/3/1990, 1♀ (C. Mañas). Valdevimbre, 9/12/1984, 1♂ (A. González). Villamor de Órbigo, 28/8/1986, 1♀ (Campos Marcos M. A.). SORIA: Soria, 10/8/1989, 1♀ (M. Gañón). VALLADOLID: Canillas de Esgueva, 2/10/1986, 1♂ (Moyano Fernández C.). Boecillo, 12/8/1994, 1♀ (E. Alonso).

#### *Holocnemus pluchei* (Scopoli, 1763)

LEÓN: San Feliz de Torio, 2/6/1986, 1♂ (Arias Ordás). ZARAGOZA: Cadrete, 30/8/1992, 2♀ (María J.)

#### *Pholcus phalangioides* (Fuesslin, 1775)

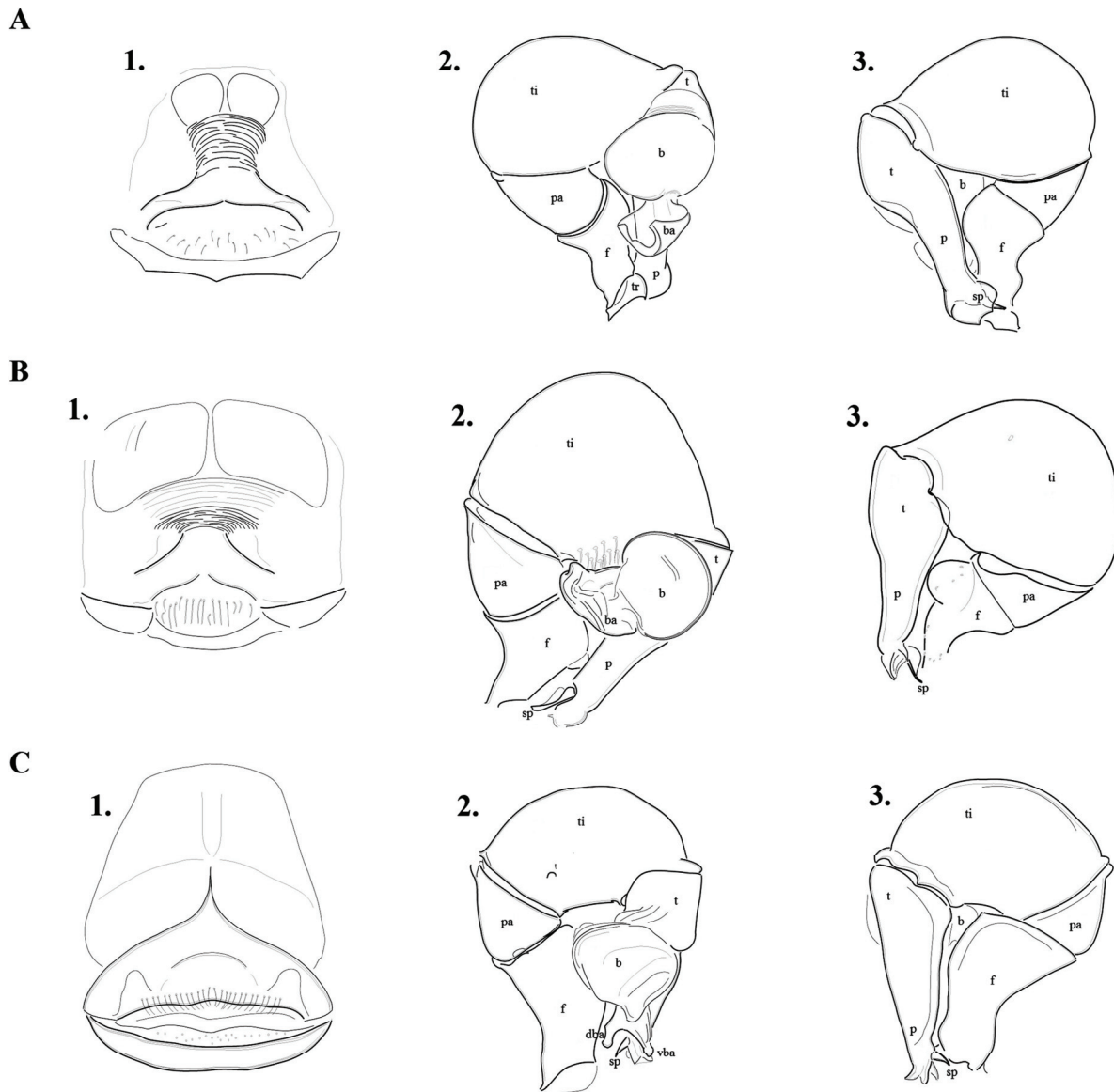
CANTABRIA: Santander, 21/7/1987, 1♀ (Augusto B.). Soto de la Marina, 20/6/1989, 1♀ (Ángel Herrero C.). LEÓN: Campo de la Lomba, 7/1989, 1♀ (M. M.). Carral, 4/7/1987, 1♂ (Martínez Martínez). Castrocontrigo, 12/8/1994, 2♀ (A. C. Lafuente). León, 1983, 1♂ (Peñín Mazías M. J.). Mansilla de las Mulas, 23/4/1994, 1♂ (P. Riaño). Pontedo, 20/8/1987, 1♂ (Ana P.). Ribaseca, 30/7/1984, 1♂ (García P.). San Miguel de las Dueñas, 25/7/1989, 1♂ (M. Álvarez). San Pedro de Trones, 7/1992, 1♀ (Manuel C.). Valdespino de Vaca, 20/7/1989, 1♀ (J. de la Viuda). Villacé, 9/6/1987, 1♂ (R. M. de Castro). PALENCIA: Villanueva, 12/7/1989, 1♂ (M. García). VALLADOLID: Valladolid, 16/10/1989, 1♂ (R. Alonso).

#### Comments on the family Pholcidae:

*Holocnemus hispanicus* is a species endemic to the Iberian Peninsula, and often appears under rocks, in rock crevices and inside houses. It is known from scarce records concentrated in the center of the peninsula (Morano, 2001), and had not been previously mentioned from the provinces of Burgos, León, Soria and Valladolid (Morano & Cardoso, 2011). Taxonomically, *H. hispanicus* is related to *H. caudatus*, separated by the distinctive features of its copulatory organs (Fig. 2A and 2B).

*Holocnemus pluchei* has a fairly wide distribution in the Mediterranean region, having been introduced into various countries. In the Iberian Peninsula records of this species are scattered, with no previous records from the province of León (Morano & Cardoso, 2011). This species differs from the previous two by its size, the presence of enlarged pedipalps in the female and the distinctive features of its copulatory organs (Fig. 2C).

*Pholcus phalangioides* is a cosmopolitan species that often appears in underground caverns, where it is a common element of the parietal fauna. It is a regular trogliphilic species with hydrophilic and lucifugous habits (Ribera *et al.*, 2000). Records of this species are relatively abundant in the Iberian Peninsula, although it had not been mentioned pre-



**Fig. 2.** Genital structures of: **A.** *Holocnemus caudatus*. **A1:** Epigynum. **A2:** Palp (prolateral view). **A3:** Palp (retrolateral view). **B.** *Holocnemus hispanicus*. **B1:** Epigynum. **B2:** Palp (prolateral view). **B3:** Palp (retrolateral view). **C.** *Holocnemus pluchei*. **C1:** Epigynum. **C2:** Palp (prolateral view). **C3:** Palp (retrolateral view). Abbreviations according to Huber (1995): **ba** - bulbal apophysis, **dba** - dorsal bulbal apophysis, **vba** - ventral bulbal apophysis, **b** - genital bulb, **f** - femur, **p** - procurus, **pa** - patella, **sp** - spur on procurus, **t** - tarsus, **ti** - tibia, **tr** - trochanter.

viously from the provinces of León, Palencia or Valladolid (Morano & Cardoso, 2011).

### Conclusion

The arachnological material stored in the CaULE collection, although not extremely abundant, does contribute to a better understanding of the area's wildlife and its influence (since the collection is well structured and standardized). It is clearly a stimulus for future studies in this region and establishes a reference collection for future projects.

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## References

- BARRIENTOS, J. A. 1978. La colección de Araneidos del Departamento de Zoología de la Universidad de Salamanca, I: familia Agelenidae. *Boletín de la Asociación española de Entomología*, **2**: 215-221.
- BARRIENTOS, J. A. 1979. La colección de Araneidos del Departamento de Zoología de la Universidad de Salamanca, II: familias Lycosidae, Oxyopidae y Pisauridae. *Boletín de la Asociación española de Entomología*, **3**: 203-212.
- BARRIENTOS, J. A. 1980. L'identité de *Tegenaria feminea*, E. Simon, 1870 (Agelenidae, Araneae). *C. r. Coll. Arachnol.*, **5**: 15-20.
- BARRIENTOS, J. A. 1982. Discussion préliminaire du genre *Lycosa* Latr., 1804, dans la Péninsule Ibérique. *Atti della Società Toscana di Scienze Naturali, Memorie. Serie B. Supplemento*, **88**: 204-208.
- BARRIENTOS, J. A. & M. A. FERRÁNDEZ 1982. La colección de Araneidos del Departamento de Zoología de la Universidad de Salamanca, III: arañas migalomorfas, haploginas y cribeladas. *Boletín de la Asociación española de Entomología*, **5**: 75-86.
- BARRIENTOS, J. A. & C. RIBERA 1988. Algunas reflexiones sobre las especies del grupo "atrica", en la Península Ibérica (Araneae, Agelenidae, *Tegenaria*). *Revue arachnologique*, **7**: 141-162.
- BARRIENTOS, J. A. & C. URONES 1985. La colección de Araneidos del Departamento de Zoología de la Universidad de Salamanca, V: arañas clubionoides y tomisoideas. *Boletín de la Asociación española de Entomología*, **9**: 349-366.
- BARRIENTOS, J. A., E. MORANO & M. A. FERRÁNDEZ 1983. La colección de Araneidos del Departamento de Zoología de la Universidad de Salamanca, IV: familias Argiopidae, Tetragnathidae, Zodariidae y Urocteidae. *Boletín de la Asociación española de Entomología*, **7**: 285-295.
- BEBBER, D. P., M. A. CARINE, J. R. WOOD, A. H. WORTLEY, D. J. HARRIS, G. T. PRANCE, G. DAVIDSE, J. PAIGE, T. D. PENNINGTON, N. K. ROBSON & R. W. SCOTLAND 2010. Herbaria are a major frontier for species discovery. *Proceedings of the National Academy of Science*, **107**(51): 22169-22171.
- BUCHAR, J., B. KNOFLACH & K. THALER 2006. On the identity of *Arctosa varians* C. L. Koch and *Arctosa similis* Schenkel, with notes on related species. *Bulletin of the British Arachnological Society*, **13**: 329-336.
- CARPENTER, G., A. N. GILLISON & J. WINTER 1993. DOMAIN: a flexible modelling procedure for mapping potential distributions of plants and animals. *Biodiversity and Conservation* **2**: 667-680.
- DECAE, A. E., P. CARDOSO & P. A. SELDEN 2007. Taxonomic review of the Portuguese Nemesiidae (Araneae, Mygalomorphae). *Revista Ibérica de Aracnología*, **14**: 1-18.
- FERRÁNDEZ, M. A. 1987. *Los Dysderidae (Arachnida: Araneae) de la península Ibérica*. Tesis Doctoral. Universidad Complutense de Madrid. Madrid. 486 pp. (Unpublished).
- FUHN, I. O. & F. NICOLESCU-BURLACU 1971. *Fam. Lycosidae*. In Fauna Republicii Socialiste Romania. Arácnida. Volumul V. Fascicula 3. Academiei Republicii Socialiste Romania. 256 pp.
- GUSEINOV, E. F., Y. M. MARUSIK & S. KOPONEN 2005. Spiders (Arachnida: Aranei) of Azerbaijan 5. Faunistic review of the funnel-web spiders (Agelenidae) with the description of a new genus and species. *Arthropoda Selecta*, **14**: 153-177.
- HEIMER, S. & W. NENTWIG 1991. *Spinnen Mitteleuropas: Ein Bestimmungsbuch*. Verlag Paul Parey, Berlin. 543 pp.
- HIDALGO, I. 1983. Los Thomisidae y Philodromidae (Araneae) de la colección del Departamento de Zoología de la Universidad de León. *Actas del I Congreso Ibérico de Entomología*, **2**: 359-368.
- HUIJMANS, R. J., S. E. CAMERON, J. L. PARRA, P. G. JONES & A. JARVIS 2005. Very high resolution interpolated climate surfaces for global land areas. *International Journal of Climatology*, **25**: 1965-1978.
- HUBER, B. A. 1995. Copulatory Mechanism in *Holocnemus pluchei* and *Pholcus opilionoides*, With Notes on Male Cheliceral Apophysis and Stridulatory Organs in Pholcidae (Araneae). *Acta Zoologica*, **76**(4): 291-300.
- LUGETTI, G. & P. TONGIORGI 1965. Revisione delle specie italiane dei generi *Arctosa* C. L. Koch e *Tricca* Simon con note su una *Acantholycosa* delle Alpi Giulie (Araneae-Lycosidae). *Redia*, **49**: 165-229.
- LUGETTI, G. & P. TONGIORGI 1969. Ricerche sul genere *Alopecosa* Simon (Araneae-Lycosidae). *Atti della Società Toscana di Scienze Naturali. Memorie. Serie B*, **76**: 1-100.
- MILLER, J. A., C. E. GRISWOLD, N. SCHARFF, M. ŘEZÁČ, T. SZÜTS & M. MARHABAIE 2012. The velvet spiders: an atlas of the Eresidae (Arachnida, Araneae). *Zookeys*, **195**: 1-144.
- MORANO, E. 2001. Especies nuevas o poco conocidas de arañas (Arachnida, Araneae) de la Fauna Ibérica. *Revista Ibérica de Aracnología*, **3**: 67-68.
- MORANO, E. & J. BENHADI-MARÍN 2012. La colección de Araneidos del Departamento de Biodiversidad y Gestión Ambiental de la Universidad de León: Familias Araneidae, Filistatidae, Pisauridae y Tetragnathidae (Arachnida: Araneae). *Revista Ibérica de Aracnología*, **20**: 105-112.
- MORANO, E. & P. CARDOSO 2011. *Iberian spider catalogue (v2.0)*. Disponible en <http://www.ennor.org/iberia>. [Consultado: 21/2/2012].
- NENTWIG, W., T. BLICK, D. GLOOR, A. HÄNGGI & C. KROPF, 2013. *Spiders of Europe*. Available at [www.araneae.unibe.ch](http://www.araneae.unibe.ch). Versión 2.2013. [Accesed: 10/02/2013]
- PLATNICK, N. I. 2012. *The world spider catalog, version 12.5*. American Museum of Natural History, online at <http://research.amnh.org/iz/spiders/catalog>. DOI: 10.5531/db.iz.0001. [Consultado: 21/2/2012].
- RIBERA, C., E. DE MAS & P. BARRANCO 2000. Araneidos cavernícolas de la provincia de Almería (I) y descripción de cuatro especies nuevas. *Revista Ibérica de Aracnología*, **7**: 3-17.
- ROBERTS, M. J. 1985. *The spiders of Great Britain and Ireland, Volume 1: Atypidae to Theridiosomatidae*. Harley Books, Colchester, England. 229 pp.
- ROBERTS, M. J. 1996. *Collins Field Guide: Spiders of Britain & Northern Europe*. HarperCollins, London. 383 pp.
- SIMON, E. 1914-1937. *Les arachnides de France. Tome VI. Synopsis générale et catalogue des espèces françaises de l'ordre des Araneae*; 5<sup>e</sup> et dernière partie. Paris. 6: 979-1298.
- TONGIORGI, P. 1966. Italian wolf spiders of the genus *Pardosa* (Araneae: Lycosidae). *Bulletin of the Museum of Comparative Zoology*, **134**: 275-334.

Appendix. Coordinates and elevation of the localities cited.

Province/Locality	Longitude	Latitude	Altitude
<b>Asturias</b>			
Gijón	42° 35' N	5° 34' O	841
Tarna	43° 6' N	5° 13' O	1005
<b>Ávila</b>			
Candeleda	40° 9' N	5° 14' O	432
<b>Burgos</b>			
Aranda de Duero	41° 40' N	3° 41' O	806
<b>Cantabria</b>			
Bárcena	43° 25' N	3° 30' O	9
Santander	43° 27' N	3° 48' O	4
Soto de la Marina	43° 8' N	3° 53' O	11
Torrelavega	43° 21' N	4° 2' O	25
<b>Córdoba</b>			
Peñarroya-Pueblo Nuevo	38° 17' N	5° 16' O	539
<b>Guipúzcoa</b>			
Placencia de las Armas	43° 10' N	2° 24' O	140
<b>La Coruña</b>			
Carral	43° 13' N	8° 21' O	143
<b>La Rioja</b>			
Nájera	42° 24' N	2° 44' O	492
<b>León</b>			
Albares de la Ribera	42° 36' N	6° 21' O	705
Ambasaguas del Curueño	42° 42' N	5° 22' O	879
Armunia	42° 34' N	5° 35' O	826
Azadinos	42° 38' N	5° 37' O	851
Bárcena del Bierzo	42° 36' N	6° 35' O	542
Boñar	42° 52' N	5° 19' O	976
Cabreros del Río	42° 24' N	5° 32' O	765
Campo de la Lomba	42° 45' N	5° 59' O	1199
Carbajal de la Legua	42° 39' N	5° 36' O	898
Carral	42° 24' N	5° 58' O	812
Castrocontrigo	42° 10' N	6° 11' O	914
Congosto	42° 37' N	6° 31' O	692
Fabero	42° 46' N	6° 37' O	701
Fresno del Camino	42° 33' N	5° 39' O	878
Grajal de Campos	42° 19' N	5° 1' O	805
La Robla	42° 48' N	5° 37' O	956
La Vecilla	42° 50' N	5° 24' O	1010
La Virgen del Camino	42° 34' N	5° 38' O	910
León	42° 35' N	5° 34' O	841
Luyego de Somoza	42° 22' N	6° 14' O	1070
Mansilla de las Mulas	42° 29' N	5° 24' O	798
Matadeón de los Oteros	42° 20' N	5° 22' O	862
Matalana de Torío	42° 51' N	5° 31' O	1016
Palazuelo de Órbigo	42° 31' N	5° 52' O	850
Pallide	42° 57' N	5° 13' O	1145
Ponferrada	42° 32' N	6° 35' O	540
Pontedo	42° 58' N	5° 34' O	1176

Province/Locality	Longitude	Latitude	Altitude
Puente de Domingo Flórez	42° 24' N	6° 49' O	381
Quintanilla de Somoza	42° 22' N	6° 15' O	1066
Riaño	42° 58' N	5° 00' O	1108
Ribaseca	42° 32' N	5° 36' O	829
San Ciprián	42° 10' N	6° 39' O	1174
San Cristóbal de Valdeza	42° 27' N	6° 31' O	1130
San Feliz de Torío	42° 41' N	5° 32' O	878
San Justo de la Vega	42° 27' N	6° 0' O	853
San Miguel de las Dueñas	42° 35' N	6° 31' O	577
San Pedro de Trones	42° 24' N	6° 48' O	678
Santa María del Páramo	42° 21' N	5° 44' O	812
Val de San Román	42° 25' N	6° 8' O	896
Valderas	42° 4' N	5° 26' O	753
Valdespino de Vaca	42° 18' N	5° 9' O	794
Valdevimbre	42° 25' N	5° 37' O	811
Valencia de Don Juan	42° 17' N	5° 31' O	767
Vega de Infanzones	42° 28' N	5° 32' O	780
Villablino	42° 56' N	6° 19' O	991
Villabuena	41° 22' N	5° 24' O	698
Villacé	42° 20' N	5° 35' O	774
Villacelama	42° 28' N	5° 27' O	790
Villalfeide	42° 52' N	5° 30' O	1054
Villamor de Órbigo	42° 29' N	5° 52' O	833
Villaobispo de las Regueras	42° 36' N	5° 32' O	835
Villaquilambre	42° 38' N	5° 33' O	865
Villasinta de Torío	42° 39' N	5° 33' O	903
<b>Palencia</b>			
Palencia	41° 0' N	4° 31' O	744
Terradillos de los Templarios	42° 21' N	4° 53' O	880
Valoria de Aguilar	42° 46' N	4° 16' O	899
Villanueva	42° 14' N	4° 44' O	841
<b>Salamanca</b>			
Sobradillo	40° 55' N	6° 47' O	651
<b>Segovia</b>			
Cuéllar	41° 24' N	4° 19' O	859
<b>Soria</b>			
Soria	41° 45' N	2° 27' O	1068
<b>Valladolid</b>			
Boecillo	41° 32' N	4° 41' O	727
Canillas de Esgueva	41° 45' N	4° 7' O	809
Mucientes	41° 44' N	4° 45' O	765
Sardón de Duero	41° 36' N	4° 25' O	721
Tordesillas	42° 35' N	5° 34' O	841
Valladolid	41° 39' N	4° 43' O	700
<b>Zamora</b>			
Villadepera	41° 32' N	6° 8' O	727
<b>Zaragoza</b>			
Cadrete	41° 33' N	0° 57' O	306