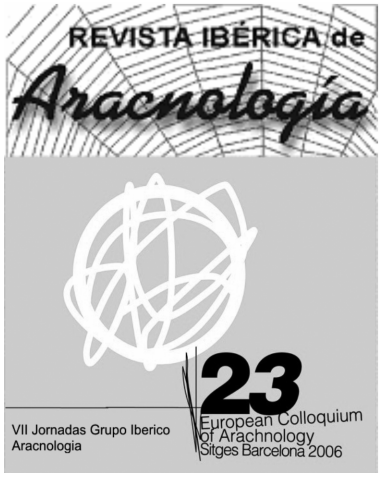

ARTÍCULO:

First assessment of spider rarity in Western France

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First assessment of spider rarity in Western France

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Abstract

Our current available up-to-date database on the regional occurrence of spiders allows to give a preliminary analysis of species rarity in Western France. This study provides a first list of 164 rare species in Western France (i.e. Armorican peninsula) and an overview of their distribution within families, habitats and macroclimatic sectors. The list is then compared to the one established in Great Britain.

Key-words: Araneae, rare species, conservation value, biogeography, Armorican peninsula.

Primera evaluación de la rareza de arañas en Francia Occidental

Resumen

Nuestra base de datos regional sobre la composición faunística de arañas nos ha permitido realizar un análisis preliminar de la rareza de especies en el oeste de Francia. Este estudio nos proporciona una primera lista de 164 especies raras en Francia Occidental (Península Armoricana) y una visión general de su distribución en familias, hábitats y sectores macroclimáticos. Finalmente se cotejan los resultados con los existentes en Gran Bretaña.

Palabras clave: Araneae, especies raras, valor de conservacion, biogeografía, Península Armoricana.

Introduction

Identification of rare species is one of the most popular topics in the field of conservation biology and represents an important task in prioritizing conservation efforts. General definitions about the different forms of rarity include ideas about the small abundances of individuals, the small geographic range of species, or very restricted habitat specificity (Gaston, 1994). Concerning European spiders, some attempts to estimate the rarity of communities were carried out (e.g. Ruzicka & Bohac, 1994; Gadjos & Sloboda, 1995; Harvey et al., 2002), however distribution maps still need to be completed for most countries. For the French territory, due to the lack of accurate studies dealing with spider distributions or abundances, no list of rare species is currently available. In this study, based on our current knowledge on the occurrence of spider species at a regional scale, we first aimed at identifying what are the so-called "rare species" in Western France and their distribution within families, habitats and macroclimatic sectors. Secondly, we tried to bring some specific attributes of rare species out (i.e., taxonomic belonging, auto-ecology and biogeography). The resulting list of rare species at regional scale is finally discussed and compared with similar list available near the studied region (i.e. Great Britain: Harvey et al., 2002).

Material and methods

The Armorican Peninsula

The region of reference -the Armorican peninsula or Western France- is situated at the Western end of the European continent between the English Channel and the Atlantic Ocean. It covers the administrative districts of Brittany, Normandy and 'Pays de Loire'. The Armorican peninsula has an area of approximately 65,000 km² and is a flattened erosional upland where elevation rarely exceeds 400 meters. It is characterized by a siliceous shelf supporting a great variety of habitats. From a biogeographical point of view, Western France belongs to the Atlantic sector globally characterised by an oceanic mild and humid climate. However, a more precise analysis of Western France climate enables to distinguish six macroclimatic areas (Bessemoulin, 1989) (Fig. 1). The first type (sector 1) is characterized by low annual rainfall, high number of sunny days and high number of freezing days (Table I). Sectors 2 and 3 correspond to coastal macroclimate areas; thus the number of freezing days is lower. In comparison to the others, the sector 2 exhibits rare sunny periods. Important annual temperature range and high rainfall are found for sectors 4 and 5. Sector 6 is characterized by the highest annual rainfall and scarce sunny periods (highest altitude, up to 400 m).

Data On Spider's Occurrences

Data in the reference base come from list found in general bibliography (from 1820 to 2005) as well as list of species found in regional scientific reports and in the collection of our own laboratory. Before being integrated in the reference base, all data were critically analysed and, in case of doubtful mention, specimens were re-examined if available. For each species, a detailed list of all localities is indexed. When available in the literature, a list of habitats based on the Corine Land Cover Classification is associated for each species. 22 habitat types are listed in the reference base (Table II).

For the present study, only species known from 1 or 2 localities were considered as rare. In order to characterize these species, their distribution was compared to the general distribution of all species using three discriminating factors, i.e. the repartition across families, habitats and macro-climatic areas. Statistics used was χ^2 tests under MINITAB version 12.1. Families and habitats with comparatively few references (total species richness) were omitted for statistics, leading to a sufficient probability of discovery of rare species (habitat and macro-climatic sectors of sufficient cover in the study area).

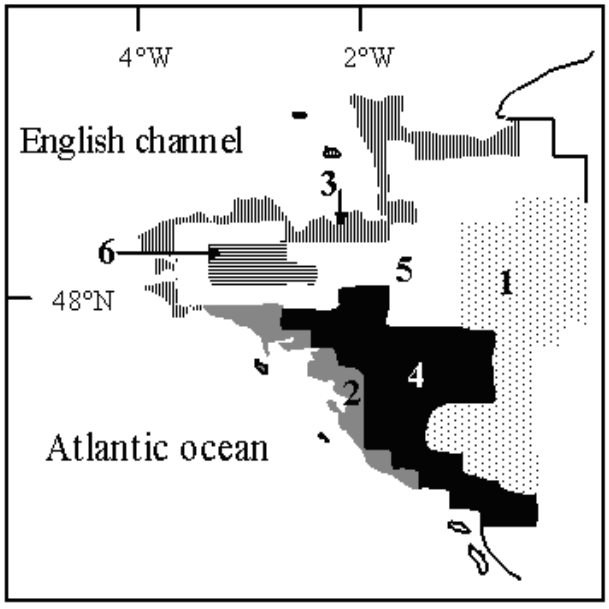

Figure 1. Location of the 6 macro-climatic sectors in Western France (after Bessemoulin, 1989). 1: dotted area, 2: grey area, 3: vertical-lined area, 4: black area, 5: white area, 6: horizontal-lined area. See Table I for climatic details.

Results and Discussion

To date, the reference base is rich of 10,340 references and the known western France araneofauna is currently of 695 species. No species were recorded in more than 130 different stations (Fig. 2). About 40% of the species were recorded in less than 6 stations and maximum rarity was reached for 15% of the species – 99 species exactly - which are to date recorded in one station only. A total of 164 species belonging to 23 families were recorded in 1 or 2 localities in Western France and were considered as "rare species" (taxonomic list in Appendix).

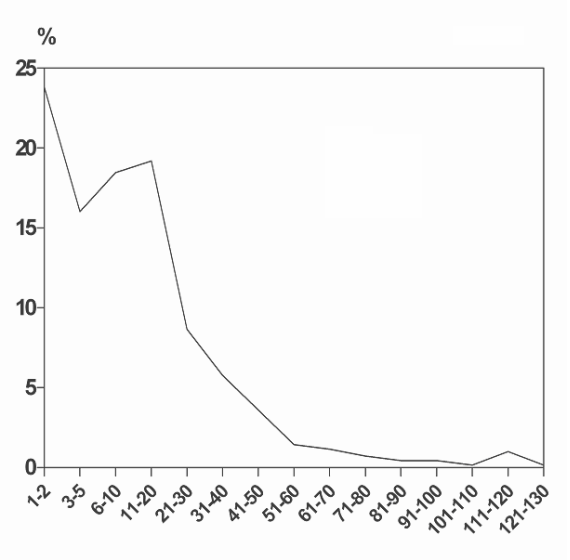

Figure 2. Percentage of species in relation to the number of stations where they are mentioned.

Most rare species were found in few families (mainly linyphiids, salticids, theridiids and gnaphosids: Fig. 3), but this is in respect with the total number of species in these families. Although rare species could be differently distributed between families (e.g. more frequent in linyphiids, less frequent in lycosids), their distribution was not significantly different from that of all species (χ^2 =13.51; 13 d.f., n.s.). This result is consistent to several studies that failed to model rarity distribution across taxonomic units (e.g. Gaston, 1994; Grytnes et al., 1999). Habitat was mentioned for 51% of rare species, which is similar to the level of available information for all species (53%). Rare species appeared to be differently distributed between habitats than the other species (χ^2 =341.75; 15 d.f., $p<0.001$). Several habitats presented a higher percentage of rare species (mainly dry heathlands, coastal dunes, deciduous forests and maritime rock cliffs: Fig. 4) whereas others showed a lower representation of rare species (mainly temperate shrub heathlands, shrubs, wet grasslands and coniferous woodlands). A great part (almost 45%) of rare species was recorded from sector 2 (the south coastal area), other macro-climatic sectors containing from 2 to 20% of the remaining rare species. The comparison of this distribution with that of non-rare species showed a significant difference (χ^2 =38.16; 5 d.f., $p<0.001$), emphasing a better representation of rare species in sector 2 and a lower one in sectors 3 (north coastal area) and 6 (Fig. 5).

The comparison of our list of rare species to the available status for Great Britain (belonging to the British Red Data Book and to the Nationally Notable species list: Harvey et al., 2002) first showed an important part of species rarely found in Western France and absent from Great Britain (case of 94/164 species). Among these 94 species, most of them are thermophilous species, typical of Southern France ecosystems and reach in the Armorican Peninsula the northern part of their distribution. This kind of rarity corresponds to a "diffusive rarity" according to Schoener (1987) and can be illustrated by several species of salticids and gnaphosids, like *Pellenes nigrociliatus* and *Zelotes gallicus* respectively. The remaining species are spiders seldom recorded in Western France but also in France and whose distributions are scattered. This is for instance illustrated by the tetragnathid *Tetragnatha isidis* (living in reed beds) which has only been recorded in 3 stations in France (Fig. 6). This kind of rarity corresponds to a "suffusive rarity" (Schoener, 1987).

Almost all the species rare in Western France and present in Great Britain are also listed as rare (case of 40 species) or qualified of local to very local (case of 24 species) in Great Britain. This group is composed by species finding their biogeographical limits in Great Britain and in Western France (mainly Northern species like *Dictyna major* or *Pelecopsis elongata*) and by species presenting a suffusive rarity on their whole distribution (case of *Thanatus formicinus*: Canard, 2005). Only 6 species are rare in Western France and common in Great Britain: *Agyneta decora*, *Coelotes atropos*, *Erigonella hiemalis*, *Megalepthyphantes obscurus*, *Oonops pulcher* and *Tenuiphantes alacris*. These species may be under-recorded or really rarer in Western France. Further studies should then investigate the occurrence of pseudo-rarity in our data set, mainly by assessing methodological, spatial or even temporal edge effects. Biogeographical ranges basically act on the presence-absence of species, but also by reducing abundances at distribution limits (Gaston, 2003). At least two species, *C. atropos* and *E. hiemalis*, could be in such a situation (i.e. finding the limits of their distribution in Western France).

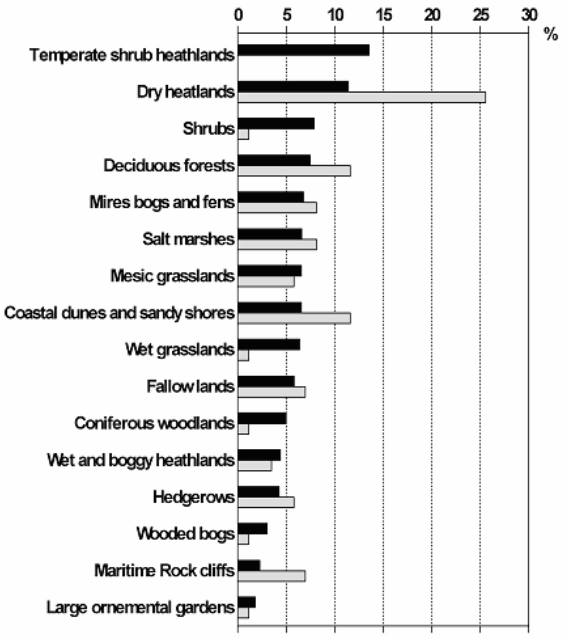

Figure 3. Comparative distribution of total (black) and rare (grey) species between different families of spiders, given as % of species per family. Only family containing more than 10 species (in total) were taken into account.

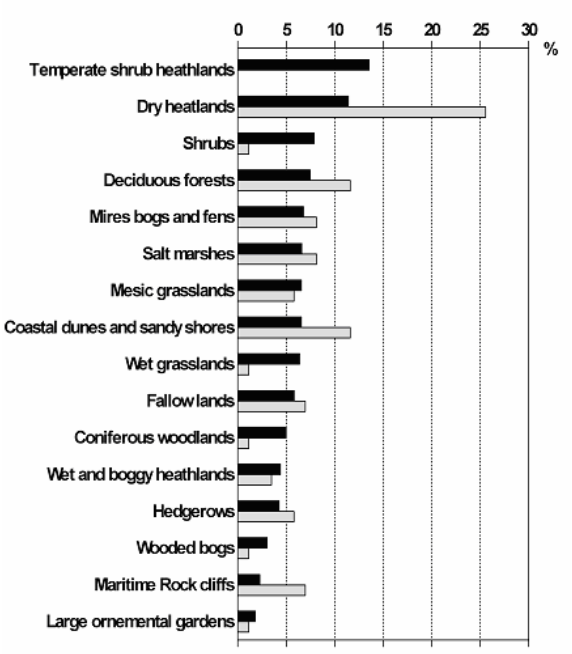

Figure 4. Comparative distribution of total (black) and rare (grey) species between different types of habitat, given as % of species per habitat. Only habitats containing more than 50 species (in total) were taken into account.

Finally, it can be underlined that most species rare in Great Britain are not such qualified in Western France (179/216!). This is the case of species absent from the studied region (e.g. the salt-marsh spider *Baryphyma duffeyi*, never recorded from France) or common in Western France (e.g. *Argiope bruennichi*, common in the Armorican Peninsula and Nationally Notable A in Great Britain).

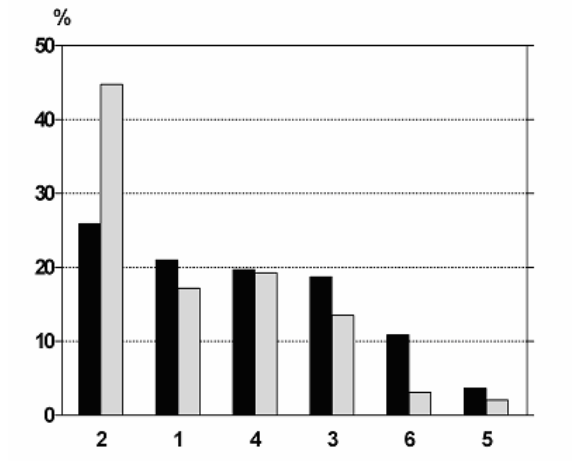

Figure 5. Comparative distribution of total (black) and rare (grey) species between different macro-climatic sectors (see Material and Methods for abbreviations), given as % of species per sector.

As a first conclusion it can be underlined that narrow range is the norm for most of the species and thus that rarity is quite "common" referring to the Western France araneofauna. Nevertheless an increase in the data base is necessary for supporting these preliminary results and avoiding under-sampling effects. Rare species are quite equally distributed between families, recently mentioned (more than 50% of rare species have been recorded since 1960 and more than 90% since 1900), seldom recorded on their whole distribution area or reaching their biogeographical limits in Western France. Because of its contrasted macroclimate sectors and of its mosaic of habitats, the Armorican Peninsula can be considered as a "biological crossroad" for spiders, including species typical from northern, central and southern parts from Europe. Others studies have previously underlined the role of biogeographic intersections in producing high beta diversity and consequently high species richness or rare species (Spector, 2002). This analysis also shows the importance of elaborating local or regional list of rare species, due to considerable variations in species abundances and also in auto-ecology across their distribution area. An illustration is the low number of rare and shared species between Great Britain and Western France, despite their close location. This list, if regularly up-dated and completed together with the whole data-base, can be useful for management and nature conservation in our region. However if only rare species are considered to evaluate the conservation value of habitat, few biota will be concerned. To date, rare species are absent from well-represented habitats (case for example of temperate shrub heathlands) and from rare but interesting habitats (case of coastal shingles). The integration of the "relative rarity" of all species (rare and common) of a given community is then a complementary approach because it will always give suitable information for any habitat. That is the way we are working by creating an index of conservation value (Canard & Ysnel, 2002) and testing it for hierarchy habitats and monitoring management plans (Ysnel, Pétillon & Canard, in prep.).

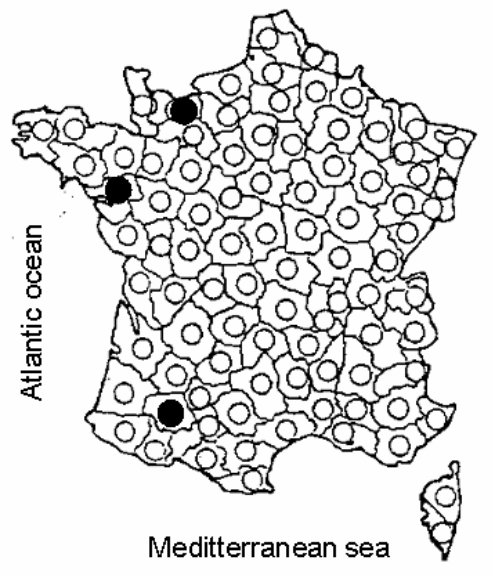

Figure 6. Distribution map of *Tetragnatha isidis* (black circles) in France (Canard, Pétillon & Ysnel, unpublished data).

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Table I

Mean annual values (years 1951-1999) of climatic parameters for the six macroclimatic sectors of Western France.

	Macro-climates of Western France					
	Sector 1	**Sector 2**	**Sector 3**	**Sector 4**	**Sector 5**	**Sector 6**
N° of sunny days/year (T° > 24°C)	39-41	36-37	2-15	30-41	30-39	11
N° freezing days/year (T° < 0° C)	43-54	9-34	6-28	33-43	39-45	31
Annual rainfall (mm / year)	<600	600	600-800	700-800	700-1000	>1000

Table II

Number of references (Nref) and Number of species (Nsp): total, per habitat and per macro-climatic sector (from 1 to 6, see Table I and Fig. 1)

Corine biotop	Nref	Nsp	Nref 1	Nsp 1	Nref 2	Nsp 2	Nref 3	Nsp 3	Nref 4	Nsp 4	Nref 5	Nsp 5	Nref 6	Nsp 6
Coastal dunes and sandy shores	446	184	0	0	273	146	173	92	0	0	0	0	0	0
Salt marshes	616	185	0	0	337	149	279	94	0	0	0	0	0	0
Coastal shingles	12	11	0	0	12	11	0	0	0	0	0	0	0	0
Maritime Rock cliffs	81	64	0	0	71	58	10	9	0	0	0	0	0	0
Temperate shrub heathlands	263	380	105	300	118	157	0	0	40	226	0	0	0	0
Wet and boggy heathlands	198	124	97	79	0	0	0	0	71	61	0	0	30	26
Dry heathlands	938	320	587	276	0	0	0	0	258	203	0	0	93	93
Shrubs	317	221	44	44	225	139	23	98	25	18	0	0	0	0
Dry calcareous grasslands	12	8	0	0	0	0	0	0	12	8	0	0	0	0
Wet grasslands	469	179	59	48	378	150	0	0	32	32	0	0	0	0
Mesophilous grasslands	435	184	1	1	376	171	0	0	58	53	0	0	0	0
Deciduous forests	380	209	103	86	215	143	0	0	61	51	1	1	0	0
Coniferous wood-lands	232	140	43	41	181	115	0	0	5	5	1	1	2	2
Wooded bogs	114	85	44	44	0	0	0	0	41	41	0	0	29	26
Mires, bogs and fens	412	190	50	48	150	105	3	3	100	75	41	31	68	58
Inland cliffs	47	41	3	3	0	0	0	0	44	39	0	0	0	0
Hedgerows	159	120	1	1	125	99	0	0	32	32	1	1	0	0
Tree plantations	32	28	3	3	27	24	0	0	2	2	0	0	0	0
Large ornamental gardens	58	51	35	34	1	1	2	2	20	85	0	0	0	0
Building towns	80	46	43	29	11	11	1	1	24	20	1	1	0	0
Fallow lands	251	163	2	2	36	36	83	69	130	124	0	0	0	0
Nºref with habitat	4788		644		2042		1354		328		71		349	

Appendix.

Taxonomic list of rare species in Western France (Code=status in Great Britain from Harvey et al., 2002, *: absent, +: local or very local, 1: RDB1, 2: RDB2, 3: RDB3, 4: Na, 5: Nb).

Family	Genus	species	Author
Agelenidae	*Tegenaria*	*inermis*[*]	Simon, 1870
Amaurobidae	*Coelotes*	*atropos*	(Walckenaer, 1830)
	Paracoelotes	*segestriformis*[*]	(Dufour, 1820)
Araneidae	*Aculepeira*	*ceropegia*[*]	Simon, 1885
	Araneus	*pallidus*[*]	(C.L. Koch, 1834)
	Araniella	*inconspicua*[5]	Olivier, 1798
	Cyclosa	*algerica*[*]	(Walckenaer, 1802)
	Hypsosinga	*pygmaea*[+]	(Simon, 1874)
	Parazygiella	*montana*[*]	(Sundevall, 1831)
Clubionidae	*Clubiona*	*germanica*[*]	Thorell, 1871
	Clubiona	*juvenis*[2]	Simon, 1878
Corinnidae	*Cetonana*	*laticeps*[*]	(Canestrini, 1868)
Dictynidae	*Dictyna*	*civica*[*]	(Lucas, 1849)
	Dictyna	*major*[2]	(Denis, 1947)
	Lathys	*jubata*[*]	(Simon, 1870)
	Nigma	*flavescens*[*]	(Walckenaer, 1830)
	Nigma	*hortensis*[*]	Menge, 1869
Gnaphosidae	*Gnaphosa*	*lucifuga*[*]	(L. Koch, 1866)
	Gnaphosa	*lugubris*[4]	Simon, 1914
	Gnaphosa	*nigerrima*[+]	Simon, 1914
	Haplodrassus	*umbratilis*[3]	(Müller & Schenkel, 1895)
	Kishidaia	*conspicua*[*]	(Simon, 1878)
	Micaria	*silesiaca*[5]	(L. Koch, 1870)
	Poecilochroa	*tescorum*[*]	(Simon, 1878)
	Scotophaeus	*quadripunctatus*[*]	(L. Koch, 1866)
	Scotophaeus	*retusus*[*]	(Canestrini, 1873)
	Trachyzelotes	*fuscipes*[*]	Linnneau, 1758
	Zelotes	*clivicola*[*]	(L. Koch, 1866)
	Zelotes	*exiguus*[*]	(Walckenaer, 1802)
	Zelotes	*fuscotestaceus*[*]	(C.L. Koch, 1839)
	Zelotes	*gallicus*[*]	L. Koch, 1875
	Zelotes	*sardus*[*]	L. Koch, 1878
	Zelotes	*tenuis*[*]	(L. Koch, 1866)
Hahniidae	*Hahnia*	*ononidum*[*]	Simon, 1875
	Hahnia	*petrobia*[*]	Simon, 1875
	Hahnia	*picta*[*]	Chyzer & Kulczynski, 1897
Linyphiidae	*Agyneta*	*decora*	(Simon, 1881)
	Alioranus	*pauper*[*]	Denis, 1965
	Allomengea	*vidua*[+]	Simon, 1884
	Centromerus	*arcanus*[+]	(Simon, 1881)
	Centromerus	*incilium*[5]	(Menge, 1869)
	Diplocentria	*bidentata*[+]	(Denis, 1964)
	Diplocephalus	*connatus*[2]	Wunderlich, 1972
	Diplocephalus	*graecus*[*]	(Miller, 1958)
	Dismodicus	*elevatus*[4]	(Denis, 1947)
	Entelecara	*aestiva*[*]	Denis, 1949
	Entelecara	*flavipes*[+]	Simon, 1926
	Erigonella	*hiemalis*	(Simon, 1884)
	Gonatium	*hilare*[*]	Denis, 1948
	Gonatium	*paradoxum*[2]	(de Lessert, 1909)
	Heterotrichoncus	*pusillus*[*]	(Kulczynski, 1881)
	Hylyphantes	*nigritus*[*]	Simon, 1918

	Hypsocephalus	*dahli*[*]	Denis, 1944
	Lasiargus	*hirsutus*[*]	(Simon, 1884)
	Leptothrix	*hardyi*[+]	(O.P.-Cambridge, 1875)
	Lessertia	*dentichelis*[+]	(O.P.-Cambridge, 1872)
	Linyphia	*tenuipalpis*[*]	(Thorell, 1875)
	Maro	*lepidus*[3]	(Simon, 1884)
	Maro	*minutus*[+]	(C.L. Koch, 1836)
	Megalepthyphantes	*nebulosus*	(Simon, 1884)
	Meioneta	*fuscipalpa*[+]	(C.L. Koch, 1838)
	Meioneta	*gulosa*[+]	(Menge, 1866)
	Meioneta	*simplicitarsis*[4]	(Simon, 1884)
	Micrargus	*pervicax*[*]	(Jackson, 1913)
	Mioxena	*blanda*[5]	(L. Koch, 1881)
	Moebelia	*penicillata*[+]	(O.P.-Cambridge, 1871)
	Neriene	*emphana*[+]	(Simon, 1884)
	Oedothorax	*gibbifer*[*]	(O.P.-Cambridge, 1871)
	Oreonetides	*vaginata*[+]	(O.P.-Cambridge, 1871)
	Oryphantes	*angulatus*[+]	(Sundevall, 1830)
	Palliduphantes	*arenicola*[*]	C.L. Koch, 1836)
	Palliduphantes	*culicinus*[*]	(Walckenaer, 1842)
	Panamomops	*mengei*[*]	(O.P.-Cambridge, 1875)
	Pelecopsis	*elongata*[2]	(Westring, 1851)
	Pelecopsis	*inedita*[*]	(L. Koch, 1879)
	Piniphantes	*pinicola*[5]	(Westring, 1861)
	Pityohyphantes	*phrygianus*[4]	(O.P.-Cambridge, 1881)
	Porrhomma	*convexum*[+]	(O.P.-Cambridge, 1873)
	Porrhomma	*oblitum*[5]	(Westring, 1851)
	Satilatlas	*britteni*[5]	(Simon, 1884)
	Syedra	*gracilis*[5]	(Blackwall, 1850)
	Tapinocyba	*discedens*[*]	(L. Koch, 1869)
	Tapinocyba	*insecta*[+]	(L. Koch, 1869)
	Tenuiphantes	*alacris*	O.P.-Cambridge, 1906
	Theonina	*cornix*[*]	(Emerton, 1882)
	Thyreosthenius	*biovatus*[+]	(Thorell, 1872)
	Trichoncus	*hackmani*[2]	(Blackwall, 1834)
	Trichoncus	*varipes*[*]	(Blackwall, 1841)
	Trichoncus	*vasconicus*[*]	(Blackwall, 1853)
	Trichopterna	*cito*[2]	(O.P.-Cambridge, 1875)
	Typhochrestus	*dubius*[*]	(L. Koch, 1869)
	Walckenaeria	*capito*[+]	Millidge, 1956
	Walckenaeria	*incisa*[5]	Bertkau, 1889
	Walckenaeria	*quarta*[*]	(Wider, 1834)
	Walckenaeria	*stylifrons*[1]	(O.P.-Cambridge, 1872)
	Wiehlea	*calcarifera*[4]	Casemir, 1961
Liocranidae	*Agraecina*	*lineata*[*]	(Simon, 1878)
	Apostenus	*fuscus*[1]	(Kulczynski, 1881)
	Liocranoeca	*striata*[5]	(Walckenaer, 1830)
	Liocranum	*rupicola*[5]	(Blackwall, 1859)
	Scotina	*gracilipes*[+]	Westring, 1851
Lycosidae	*Arctosa*	*villica*[*]	(C.L. Koch, 1834)
	Pardosa	*bifasciata*[*]	(Lucas, 1846)
	Pardosa	*tatarica*[*]	(Thorell, 1875)
Miturgidae	*Cheiracanthium*	*pennatum*[*]	Simon, 1878
	Cheiracanthium	*striolatum*[*]	Simon, 1878
Mysmenidae	*Mysmena*	*leucoplagiata*[*]	(Simon, 1879)
Oonopidae	*Oonops*	*amoenus*[*]	Dalmas, 1916
	Oonops	*pulcher*	(Simon, 1882)
	Tapinesthis	*inermis*[*]	Templeton, 1835
Philodromidae	*Philodromus*	*emarginatus*[5]	Simon, 1870

	Philodromus	*lepidus*[*]	Denis, 1939
	Philodromus	*poecilus*[*]	Blackwall, 1870
	Philodromus	*salinarum*[*]	(Thorell, 1872)
	Thanatus	*formicinus*[2]	(Schrank, 1803)
	Thanatus	*lineatipes*[*]	(Clerck, 1757)
Pholcidae	*Spermophora*	*senoculata*[*]	(Dugès, 1836)
Salticidae	*Attulus*	*helveolus*[*]	(Latreille, 1819)
	Bianor	*albobimaculatus*[*]	(C.L. Koch, 1848)
	Carrhotus	*xanthogramma*[*]	(Simon, 1871)
	Euophrys	*acripes*[*]	(Simon, 1871)
	Euophrys	*rufibarbis*[*]	L. Koch, 1875
	Euophrys	*terrestris*[*]	Lucas, 1846
	Evarcha	*laetabunda*[*]	(Simon, 1871)
	Heliophanus	*encifer*[*]	(Simon, 1868)
	Heliophanus	*melinus*[*]	L. Koch, 1867
	Heliophanus	*rufithorax*[*]	Lucas, 1846
	Icius	*hamatus*[*]	(Walckenaer, 1837)
	Neon	*levis*[*]	(C.L. Koch, 1846)
	Pellenes	*arciger*[*]	(Lucas, 1846)
	Pellenes	*brevis*[*]	(Simon, 1868)
	Pellenes	*nigrociliatus*[*]	Simon, 1871
	Pseudicius	*encarpatus*[*]	(Simon, 1871)
	Salticus	*cingulatus*[+]	Simon, 1868
	Salticus	*conjunctus*[*]	(Walckenaer, 1802)
	Salticus	*modicus*[*]	(Simon, 1876)
	Salticus	*propinquus*[*]	(Panzer, 1797)
Tetragnathidae	*Meta*	*bourneti*[5]	(Simon, 1881)
	Meta	*menardi*[+]	L. Koch, 1862
	Tetragnatha	*isidis*[*]	Simon, 1922
	Tetragnatha	*striata*[5]	(Latreille, 1804)
Theridiidae	*Achaearanea*	*riparia*[5]	Lucas, 1846
	Dipoena	*erythropus*[2]	(Lucas, 1846)
	Enoplognatha	*caricis*[*]	(Fickert, 1876)
	Enoplognatha	*oelandica*[3]	(L. Koch,1872)
	Episinus	*algericus*[*]	Simon, 1873
	Phoroncidia	*paradoxa*[*]	(De Geer, 1778)
	Phycosoma	*inornatum*[5]	(O.-P. Cambridge, 1861)
	Robertus	*neglectus*[+]	(Blackwall, 1834)
	Robertus	*truncorum*[*]	(Simon, 1873)
	Rugathodes	*bellicosus*[5]	(O.P.-Cambridge, 1871)
	Steatoda	*albomaculata*[5]	(Simon, 1881)
	Theridion	*nigrovariegatum*[*]	(Thorell, 1875)
Thomisidae	*Heriaeus*	*melloteei*[*]	Simon, 1875
	Ozyptila	*blackwalli*[5]	Simon, 1875
	Ozyptila	*rauda*[*]	Simon, 1886
	Tmarus	*stellio*[*]	Simon, 1875
	Xysticus	*bifasciatus*[+]	Simon, 1875
	Xysticus	*gallicus*[*]	C.L. Koch, 1837
	Xysticus	*luctator*[2]	L. Koch, 1870
Titanoecidae	*Titanoeca*	*quadriguttata*[*]	(Hahn, 1831)
Uloboridae	*Hyptiotes*	*flavidus*[*]	(Blackwall, 1862)
	Hyptiotes	*paradoxus*[3]	(C.L. Koch, 1834)
Zoridae	*Zora*	*manicata*[*]	Simon, 1878