

## *Mysmenella jobi* (Kraus, 1967), a rare species in Europe: first records from Poland (Araneae: Mysmenidae)

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### Summary

The first locality for *Mysmenella jobi* (Kraus, 1967) in Poland is described. Data on the biology and environmental preferences of *M. jobi* in Europe are analysed, and a distribution map is provided.

### Introduction

The species *Mysmenella jobi* (Kraus, 1967) is known only from about twenty localities in Europe (Fig. 1, Table 1). The identification of specimens of *M. jobi* from Japan (Yaginuma, 1973; Shinkai, 1977) and Korea (Namkung & Lee, 1987) seems uncertain (Brignoli, 1980; Thaler & Noflatscher, 1990). Verification of available material from the Far East has shown that the specimens belong to an undescribed species (Marusik & Koponen, 2000).

Spiders of the family Mysmenidae have rarely been collected, probably because of their very small size (about 1 mm), restricted activity (being web spiders), and specific habitat requirements (Brignoli, 1980). In Europe only five species have been listed so far: *Trogloneta granulum* Simon, 1922, *Cepheia longiseta* (Simon, 1881) and *Mysmenella jobi* from Central Europe, *Mysmena leucoplagiata* (Simon, 1899) from the Mediterranean region, and *Mysmena gibbosa* Snazell, 1986 from Spain (Wunderlich, 1980; Platnick, 2001; Nentwig *et al.*, 2002). However, in Poland only *Trogloneta granulum* was known until now (Czajka & Pomorski, 1987; Prószyński & Starega, 1997).

### Localities, materials and methods

In Poland *Mysmenella jobi* was found in Poleski National Park (Fig. 1), which is situated in the Polesie region, formerly a vast complex of mires in eastern Europe. During the last 40 years many mire areas have been drained and changed to meadows and cultivated fields. To the south, Polesie is bordered by a region rich in steppe fauna and flora extending from the Black Sea region.

Specimens of *Mysmenella jobi* were collected at two sites situated 10 km apart:

(1) 1♀, 2 August 1994, collected by sieving, leg. R. Rozwarka; near Załucze Stare village (UTM FB49), in Splawy Marsh, a fen and transitional bog complex with birch and willow scrub around the eutrophic Łukie Lake. This area is flooded during spring and autumn. The specimen was recorded in a relatively open part of the area, among tussocks of sedge.

(2) Near Jamniki village (UTM FC40), a peat bog around the dystrophic Moszne Lake, three specimens as follows:

(a) 1♂, 17 June 1996, collected by sieving, leg. R. Rozwarka; Ledo-Sphagnetum *magellanici* — forest raised bog community. Tree cover consisted of single small pines (*Pinus sylvestris*) and birches (*Betula pubescens*). The specimen was recorded from a strongly sunlit situation among moss (*Sphagnum* spp.) and sedges (*Carex* spp.) on the edge of a *Sphagnum*–pine wood (*Vaccinio uliginosi*-Pinetum).

(b) 1♀, 2–17 June 1998, collected by pitfall traps, leg. I. Hajdamowicz; mosaic of Ledo-Sphagnetum *magellanici* and Sphagno-Caricetum *rostratae* — transitional peat bog community. On this strongly sunlit plot only a few small pines and birches were present. *Oxycoccus quadripetalus* and *Andromeda polifolia* were dominant in the shrub layer. On the transitional bog *Carex* spp. were also dominant.

(c) 1♂, 17–30 June 1998 (Fig. 2), collected by pitfall traps, leg. I. Hajdamowicz; Ledo-Sphagnetum *magellanici* — a plot with a very open stand of pine and birch, moderately sunny. *Oxycoccus quadripetalus*, *Andromeda polifolia*, *Ledum palustre* and *Vaccinium uliginosum* were dominant in the shrub layer and *Menyanthes trifoliata* in the herb layer.

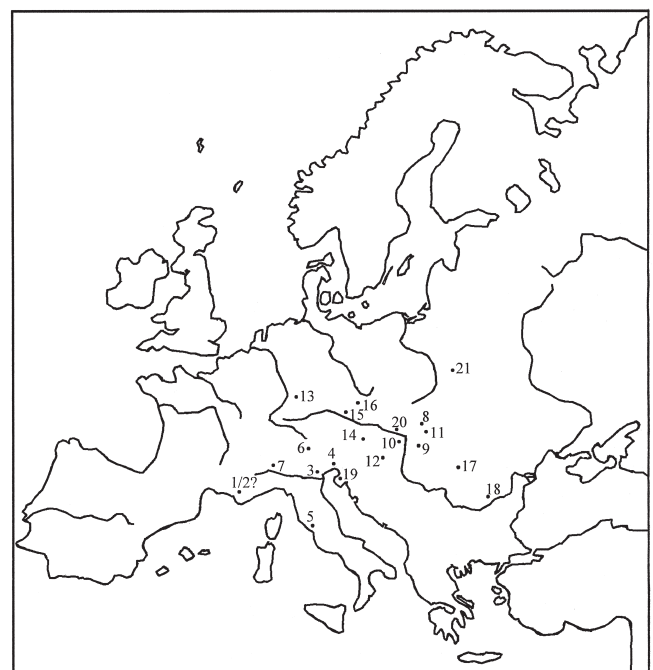


Fig. 1: Known distribution of *Mysmenella jobi* in Europe. Locality numbers as in Table 1.

No.	Locality	Habitat	Material	Authors
1	Southern France, Mediterranean region	Not given	1 (2?) ♂, leg. Simon	Kraus, 1967
2	Southern France, without precise data	Not given	1♂, 1 juv ♀, leg. Simon	Levi, 1956*
3	Italy, Veneto, Colli Euganei, M. della Madonna presso Teolo	Not given	1♂, 1968?, leg. G. Marcuzzi?	Brignoli, 1970
4	Italy, Veneto, estuary of Tagliamento river, Valle Grande, inland dunes, xerothermic and wetland areas	Transitional zone between area with oaks (Iecceta) and areas with <i>Alnus glutinosus</i> and <i>Fraxinus ornus</i> ; partly grass and ruderal vegetation; near small artificial lake	1♂, 8 April–5 August 1997, pitfall traps	Hansen & Iaconcig, 1999
5	Italy, Lazio, Riano Flaminio	Not given	1 subad. ♀, 5 March 1966, leg. V. Sbordoni	Brignoli, 1970
6	Italy, South Tirol, Bolzano (Bozen), Guntzschna, c. 470 m, west slope	Xerothermic site — dry grassland and edge of open oak stand ( <i>Quercus pubescens</i> ) on red porphyry	1♂ 1♀, 5–27 April 1988; 1♂, 16 May–7 June 1988; 1♀, 7–28 June 1988; pitfall traps	Thaler & Noflatscher, 1990
7	Switzerland, Tessin (Ticino), Maggia, bottom of valley	Not given	1♂, end of May, leg. N. Patocchi	Maurer & Hänggi, 1990
8	Hungary, Jósvalfő	Wet habitat along stream	1♂, 16 June 1934	Balogh, 1938*
9	Hungary, Tilalmas erdő, Újszentmargita	Oak forest “Galatello-Querquetum roboris festucetosum sulcatae”, in litter layer Shrubby margin of same forest, in litter layer	Several juveniles, 1969–70 1♂, 27 July 1972, leg. L. Szombathelyi	Loksa, 1973* Loksa, 1973*
10	Hungary, Mts. Pilis and Mts. Szentendre-Viségrad Bubánat völgye, Kerek-tó Miklósdeák-völgy	<i>Carex elata</i> stand, in detritus of tussocks growing in water <i>Phragmites communis</i> stand, in marginal detritus of lakeside Wet <i>Alopecurus</i> meadow, along small stream	2♀, 1 juv., 30 June 1972, sieving 1 juv. ♀, 18 April 1972 1 juv., ♂, 18 April 1972	Loksa, 1973* Loksa, 1973* Loksa, 1973*
11	Hungary, Vásárosnamény, peat bog Nyirestő-reserve area	Eriophoro vaginati-Sphagnetum “Dryopteridi-Alnetum thelypteridetosum populosum tremulae”	1 specimen, 30 May 1973–19 June 1974, pitfall traps 1 specimen, 30 May 1973–19 June 1974, pitfall traps	Loksa, 1981* Loksa, 1981*
12	Hungary, north-western region of Balaton Lake, Balantonyörök	Reeds, in vegetation debris along edge of water	1♂, 31 July–8 August 1993, pitfall traps	Szinetár, 1995
13	Germany, Mainz-Gonsenheim, Gonsenheimer Wald, Mainzer Sand, reserve area, little precipitation	Pine-oak forest (height of trees 2.5–3.5 m) on sand, in moss layer ( <i>Hylocomium splendens</i> )	1♂, 20 April 1967, leg. W. Job; 1♂ (3♂ according to Braun), 2♀, May–July 1967, pitfall traps, leg. W. Job	Kraus, 1967; Braun, 1976
14	Austria, Niederösterreich, Burgenland, Leithagebirge, in low warm location	Not given	1♀, July–October 1960, pitfall traps, leg. J. Gruber	Kraus, 1967; Knoflach & Thaler, 1998
15	Austria, Oberösterreich, Linz, Plesching, bank of Danube river, sand-pit	Flat gravel area in progressive stage of succession with <i>Salix alba</i> , <i>Clematis vitalba</i> and ruderal communities	1♂, May 1990–1991, pitfall traps	Freudenthaler, 1994
16	Czech Republic, central part, Slapy, valley of Vltava river, northern slope	Deciduous forest — <i>Betula verrucosa</i> , <i>Carpinus betulus</i> with isolated spruces ( <i>Picea excelsa</i> ) in moss ground cover ( <i>Hylocomium splendens</i> )	1♂ 1♀, 2 June 1973	Kasal, 1982
17	Romania, Transylvania, Seica Mare, on slope of hill	Thick blackthorn (sloe) bushes in xerothermic site, among relatively humid litter Dry grassland ( <i>Carex</i> sp.), grassland ( <i>Stipa</i> sp.)	4♂, May–July 1980; 6♀, June–August 1980; 5 juv., 26 March 1980–18 March 1981, pitfall traps Single specimens	Weiss, 1984 Weiss, 1984
18	Romania, Danube lowland; Southern Romania, Comana	Deciduous forest	Single specimens	Weiss & Andrei, 1989
19	Slovenia, Kubeč	Not given	Not given	Nikolić & Polenec, 1981
20	Slovakia, Burda (volcanic uplands), steppe-forest of Kováčov area (Kováčovské kopce Mts.)	Steppe-forest with single oaks, bushes of <i>Rosa</i> sp. and <i>Crataegus</i> sp., xerothermic grasses	1♀, 12 April–6 May 1977; 1♀, 20 June–18 July 1977; pitfall traps	Gajdoš, 1998
21	Poland, Lublin, Poleski National Park	This paper		

Table 1: Review of data on *Mysmenella jobi* in Europe. Numbers in first column refer to Fig. 1. \*In these papers referred to as *Mysmena leucoplagiata*, after revision *Mysmenella jobi* (Thaler & Noflatscher, 1990; Szinetár, 1995).

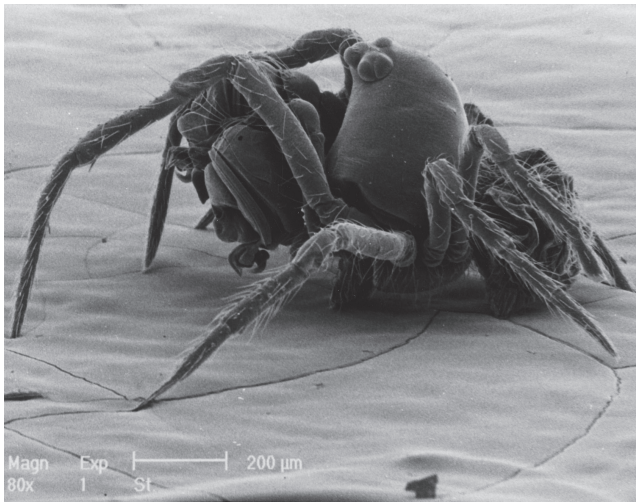


Fig. 2: *Mysmenella jobi*, SEM photograph of male.

Specimens (b) and (c) were collected during a long-term investigation of the spider fauna in Poleski National Park, carried out from 1995–1998. Ten pitfall traps were placed in a line and were emptied fortnightly from March/April to November. *Mysmenella jobi* was not recorded in other studied habitats, including: *Sphagnum*–pine woodland, alder swamp forest, birch–willow scrub, fen and meadows (Kupryjanowicz *et al.*, 1998; Hajdamowicz, unpubl. data).

## Discussion

Heimer & Nentwig (1991) considered *M. jobi* to be a Mediterranean species. However, Thaler & Noflatscher (1990) noted that this species occurs “very discontinuously in southern and in mid-Europe”. On the basis of the data presented here from 11 countries, especially with the most northerly locality in Poland, it can be stated that it is more widely distributed in Europe (Fig. 1, Table 1). There are still no records from southern Italy, along the Dalmatian coast, in Greece or in Spain.

In mid-Europe, specimens of *M. jobi* have been found in both highland and lowland areas, in various habitats, in open and semi-enclosed areas, such as open tree stands, scrub and reed-beds. They have been recorded in habitats with varied humidity, from xerothermic sites: dry grasslands, steppes and steppe-forests, to wetter sites: forests, humid forests, meadows, fens, transitional and raised peat bogs, and along the banks of lakes and streams (Table 1).

Microhabitat data have been provided by Kraus (1967), Loksa (1973, 1981), Kasal (1982), Weiss (1984) and Szinetár (1995), and from Poleski National Park. This species was found in the litter of sites with deciduous trees or shrubs, in reed-beds, grass, sedge litter and in the moss layer (*Hylocomium splendens*, *Sphagnum* spp.).

It is difficult to define the temperature and humidity requirements of a species that has been recorded from only a small number of specimens in different habitats or if it is known from only one location. Kraus (1967) regarded *Mysmenella jobi* as hemiombrophile –

hemihygrophile, but Braun (1976) did not determine its requirements. Loksa (1973, sub *M. leucoplagiata*) regarded it as hygrophile on the basis of his data, whereas Weiss (1984), who recorded it from xerothermic sites, considered it to be a species of distinctly wider humidity tolerance.

*Mysmenella jobi* is regarded as a thermophilic species (Heimer & Nentwig, 1991). In Germany (Kraus, 1967) and the Czech Republic (Kasal, 1982), in forest areas where this species was recorded, other thermophilic species of fauna and flora have been found. *Mysmenella jobi* was most numerous in the litter below bushes in a xerothermic area in Romania (Weiss, 1984) and in similar habitats in Hungary (Loksa, 1973). In other habitats, despite regular and long-term studies, only a few specimens have been found (Loksa, 1973, 1981; Thaler & Noflatscher, 1990; Gajdoš, 1998; and in Poleski National Park). Therefore the relatively humid litter of xerothermic bushes seems to be an optimal habitat for this species. The small number of specimens of *M. jobi* recorded from Germany, Austria, Czech Republic, Slovakia and from Poland may be a result of their proximity to the northern limit of the species’ range as much as a lack of optimal habitats. The small number of specimens recorded from southern Europe is probably related to the relatively small number of investigations into spider faunas in this region. *Mysmenella jobi*, occurring discontinuously in mid-Europe, may be a relict dry climate species or a new element in the fauna. Deforestation and drainage in most areas in Europe have caused the appearance of many xerothermic species of plants (Szafer & Zarzycki, 1977). This, or a warmer climate, could also be a reason for the appearance of xerothermic spider species.

It seems surprising that *M. jobi* occurs on peat bogs — in a typical boreal habitat. In Poleski National Park on the peat bog at Moszne Lake, where this species was recorded, the spider association was characteristic of peat bog habitats (Kupryjanowicz *et al.*, 1997, 1998). However, the microclimatic conditions of this habitat are apparently adequate for the reproduction and development of *M. jobi*. Thermic and humidity conditions, especially of tussocks, may become suitable during some periods in the spring and summer; the surface of tussocks is sometimes very dry. On the other hand mosses are also a permanent element of steppe vegetation (Podbielkowski, 1991).

In the Poleski National Park plots adult specimens were collected only from mid-June to the beginning of August, whereas in other sites in Europe adults were generally recorded from April to the beginning of August, with juveniles occurring early in March.

In Europe, the biology of *M. jobi* has not been studied so far. Specimens from Japan, which are closely related to *M. jobi*, mature after 3 moults (Shinkai, 1977). If *M. jobi* in Europe has a similar pattern of development, its rapid maturation would possibly aid survival in xerothermic habitats, where the vegetative growth season is short, or enable it to use transitory suitable conditions in different habitats of raised peat bogs.

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