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New data on the distribution of *Zodarion rubidum* SIMON,  
1914 (*Araneae*, *Zodariidae*) in Poland

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Nowe dane na temat lokalizacji *Zodarion rubidum* SIMON, 1914  
(*Araneae*, *Zodariidae*) w Polsce

SUMMARY

The paper presents the information about a new locality of *Zodarion rubidum* SIMON, in the eastern outskirts of Świnoujście (NW Poland). The discovered station is the first locality in Poland where a larger number of *Z. rubidum* individuals was collected. This fact shows that this invasive spider species became a stable component of the Polish araneofauna. The station discovered in Świnoujście is its farthest northwards site of occurrence in Europe.

STRESZCZENIE

W pracy przedstawiono informacje o wykryciu stanowisk *Zodarion rubidum* SIMON (*Araneae*, *Zodariidae*) na wschodnich obrzeżach Świnoujścia. Prezentowane lokalizacje są pierwszymi na terenie Polski, gdzie zebrano większą liczbę okazów *Z. rubidum*. Świadczy to jednoznacznie, że ten ekspansywny gatunek pająka na stałe wszedł w skład krajowej araneofauny. Odkryte stanowiska w okolicach Świnoujścia są jednocześnie jednymi z najdalej na północ wysuniętych miejsc występowania tego inwazyjnego gatunku pająka w Europie.

**K e y w o r d s:** invasive species, *Zodarion rubidum*, distribution, Poland

*Zodarion rubidum* is the expansive spider species which came from southwestern regions of France (BOSMANS 1994, 1997, PEKÁR, KRÁL 2002). In the 80's and 90's of the 20th century a number of new data showed its widening distribution in Central Europe (BROEN, MORITZ 1987, BUCHAR et al.

1995, PEKÁR 1994, 2002a, THALER, NOFLATSCHER 1989, TÓTH et al. 1994) and in British Islands (HARVEY 1999). *Z. rubidum* was also brought to North America (CUSHING, SANTANGELO 2002, VOGEL 1968).

In Poland the first information about *Z. rubidum* came from Wrocław (WOŻNY, SIWEK 1996) and recently its occurrence was reported from the neighborhood of Hrubieszów in southeastern Poland (ROZWALKA, GOSIK 2006). These two locations in two extreme parts of Poland and the general distribution range of the species in Central Europe (ROZWALKA, GOSIK 2006, Fig. 1) suggested possibilities of finding a new station of this thermopiles species in the south of the country. The present authors reported the occurrence of *Z. rubidum* in northwestern Poland. In the material collected during the inventory works in the grounds of the planned gas port at Świnoujście *Zodarion rubidum* was found at the following stations mentioned below.

#### MATERIAL

Świnoujście, Przytor Peninsula; Barber traps: 1 juv. – 29.04–17.05.2007 – gray hair-grass sward of anthropogenic origin, the area of about 0.30 ha lying in a seaside forest, 54°54'39"N, 14°17'33"E; 2♂;1♀ – 17.05–14.06.2007 – a grey dune overgrown with pine, 53°55'00"N, 14°17'41"E; 1♂ – 17.05–14.06.2007 – a grey dune, 53°55'00"N, 14°17'41"E; 1♀ – 17.05–14.06.2007 – a white dune slightly overgrown with lyme grass, 53°55'04"N, 14°17'42"E; 1♂ – 17.05–14.06.2007 – productive pine forest about 20 years of age, 53°54'25"N, 14°17'46"E.

The discovery of *Z. rubidum* location at the outskirts of Świnoujście is interesting. Finding of single specimens of this species has been reported so far by ROZWALKA & GOSIK (2006) and WOŻNY & SIWEK (1996), while at the eastern outskirts of Świnoujście a total of seven individuals was found at five standings (cf.: material). The occurrence of both sexes and juvenile individuals in the samples shows the presence of a larger population of this species in the region of Świnoujście. At the same time it is a decisive argument confirming the process of colonization (and acclimatization) of this spider species in Poland. Moreover, the recorded locality of *Z. rubidum* in the vicinity of Świnoujście induces a revision of data concerning the distribution range of this expansive species in Europe. As late as 2006 the northern borderline of *Z. rubidum* occurrence ran slightly northwards of Berlin (ROZWALKA, GOSIK 2006, fig. 1). In 2007 new data were published informing that individuals of *Z. rubidum* were caught in Copenhagen and Rodby Havn in Denmark (SCHARFF et al. 2007). The above data from Denmark and the occurrence of this species at Świnoujście suggest its possible distribution in northern Germany and central Poland. It should be stressed that on the other side of the Atlantic Ocean the widening of *Z. rubidum* distribution area was also recorded. PAQUIN, DUPÉRRÉ (2006) reported a site of this species at Quebec in Canada. The sites of this thermophilic spider species lying so far northwards suggest that in the course of expansion certain not definitely determined adaptations must have occurred allowing its existence in conditions of the temperate climatic zone. PEKÁR, VAŇHARA (2006) carried out morphometric analysis of a series of *Z. rubidum* specimens from 15 different localities representing both southern and northern populations of this species. Authors did not find distinct differences between male individuals from different populations. On the other hand, females from the populations living in warmer climatic zones were larger than these from areas with the cooler climate. According to PEKÁR and VAŇHARA (2006) differences in body size are due to the different length of the vegetation season which affects the activity and hence the feeding period and growth of *Z. rubidum*. However, neither the above quoted publication nor any other report explained why *Z. rubidum* was acclimatized so easily in the area of almost whole western and Eastern Europe. It is true that the dispersion mechanism of this species is fairly well known since the main role is played by the railway transport of aggregate, gravel and sand (BROEN, MORITZ 1987, PEKÁR 2002b). All this explains only the role of man in the first stage of *Z. rubidum* distribution by moving

it to new habitats while after the acclimatization in a given new region, further distribution occurs spontaneously and the known mechanism of dispersion does not explain the successful expansion of this spider. The cases of bringing species from southern European countries or other continents to Central Europe are constantly recorded. From the area of Poland only *Uloborus plumipes* (KUPRY-JANOWICZ, STANKIEWICZ 2001, ROZWALKA 2007a); *Hasarius adansoni* (DZIABASZEWSKI 1978, ROZWALKA 2007b) or *Icius hamatus* (TOMASIEWICZ, WESOŁOWSKA 2006) can be mentioned. In most cases such introductions do not have positive results in permanent acclimatization and the area of occurrence of the immigrants remains limited to glasshouses or flats, i.e., environments where the climatic conditions approximate to these in the regions of origin (ROZWALKA 2007a, b). However, *Z. rubidum* from southwestern France successfully colonizes natural biotopes in conditions of moderate climate with a distinct periodicity of seasons. Hence a hypothesis is permitted that in the populations of this species certain adaptations must have occurred on the metabolic-molecular and behavioural level.

In the case of invasive species like *Zodarion rubidum* the influence of such immigrants on the native fauna is a significant problem. This species like all representatives of the genus *Zodarion* WALCKENAER, is a specialized myrmecophilous, chiefly feeding on ants of the genus *Tetramonium* and the other ants with a similar body size (PEKÁR 2004, PEKÁR, KRÁL 2001). There is no such specialized spider species as *Z. rubidum* in northern Poland which could be food competitor. In the southern part of Poland a similar autochthonous species *Zodarion germanicum* (C. L. KOCH) is noted (STAREGA 1984, fig. 1), however, it prefers larger prey, chiefly ants of the genus *Lasius* (PEKÁR 2004, PEKÁR, KRÁL 2001, 2002). Thanks to different food preferences of both spiders, which are myrmecophilous spider species the influence of *Z. rubidum* on native araneofauna could be considered as none. This lack of antagonistic interactions with other spider species (except for normal predaciousness) partly explains the successful expansion of *Z. rubidum* in Central Europe.

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