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Dysdera hungarica Kulczyński, 1897 (Araneae, Dysderidae), an interesting new species for the arachnofauna of the Czech Republic

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Řezáč M. & Bryja V. 2002: *Dysdera hungarica* Kulczyński, 1897 (Araneae, Dysderidae), an interesting new species for the arachnofauna of the Czech Republic. *Acta Musei Moraviae, Scientiae biologicae* (Brno) **87:** 75–81. – *Dysdera hungarica* Kulczyński, 1897 was recently found for the first time in the Czech Republic. This very rare species occurs in the Czech Republic only in the warmest parts of southern Moravia. Interestingly, only females were found, which supports the hypothesis that only parthenogenetic populations are present in central Europe. Illustrations of the vulva and the cephalothorax are presented. Spider species living together with *Dysdera hungarica* in the localities examined are listed.

Key words. *Dysdera hungarica*, Czech Republic, thermophilous species, Pannonicum, parthenogenesis

Methods

Havraníky in the Podyjí National Park and Kočičí skála in the Pálava Biosphere Reserve are biogeographically located in the Pannonian area (Mařan 1958; Chytrý et al. 1999). The surroundings of Havraníky are arachnologically well-investigated. (Růžička et al. 1996, large unpublished collection of the Podyjí National Park, regular field trips from the Faculty of Sciences, Charles University) and many thermophilous and rare spider species have been found there (see species listed below). Although the arachnofauna of the Pálava Biosphere Reserve has already been studied, the technique of pitfall trapping to capture spiders in the Kočičí skála steppe was here employed for the first time. However, only a few species were found (see below).

Dysdera hungarica Kulczyński, 1897 (Fig. 1)

Dysdera hungarica Kulczyński in Chyzer & Kulczyński 1897, Araneae Hungariae 2 (2): 268, Figs. X/42 a, b; Charitonov 1956: 26, f. 17 (M); Loksa 1969: 78, f. 53 A–C (MF); Polenec 1985: 103, f. 8 (M); Deeleman-Reinhold & Deeleman 1988: 168, f. 60–65 (MF); Heimer & Nentwig 1991: 44, f. 96 (MF); Dunin 1992: 64, f. 9 (MF).

Material examined. 1 female: Podyjí National park: Havraníky – national monument Údolí Dyje Valley, Šobes (grid no. 7161d), rocky steppe,15 June 1999, M. Řezáč lgt., det. et coll.; 1 female: Pálava Biosphere Reserve: Mikulov – national monument Kočičí skála Rock (grid no. 7165d), rocky steppe , 25.5.–11.6.1999, M. Matuška lgt., V. Růžička det., V. Bryja coll., pitfall trap.

Diagnosis. The most common species of the genus *Dysdera* Latreille in the Czech Republic, *Dysdera erythrina* (Walckenaer), can be distinguished from *D. hungarica* by

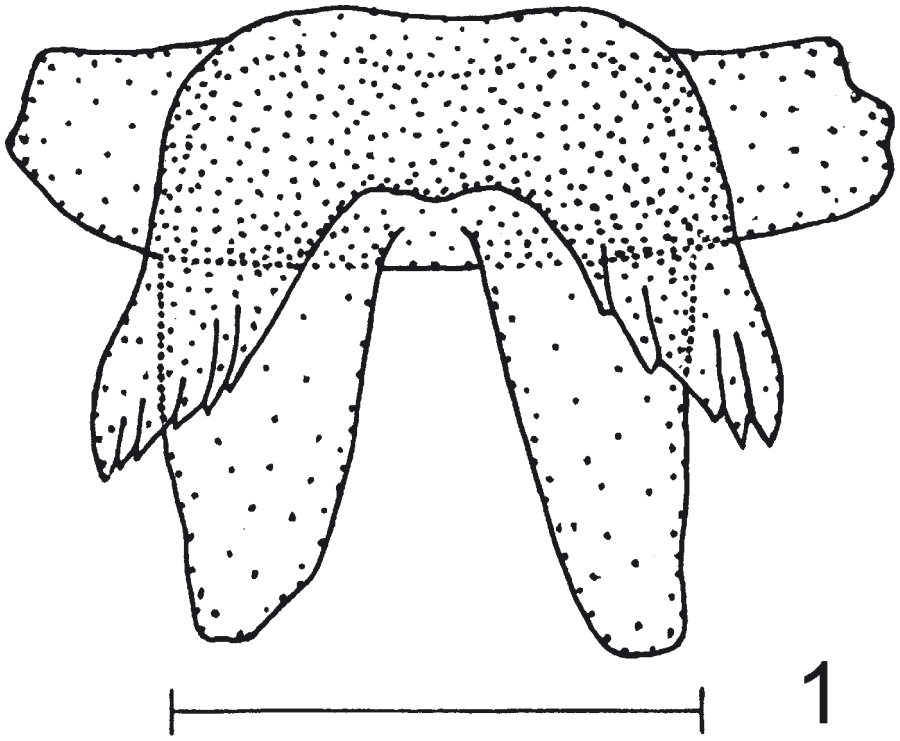


Fig. 1. Anterior diverticulum of vulva of *Dysdera hungarica* Kulc., scale line 0.1 mm.
Obr. 1. Anteriorní divertikulum vulvy druhu *Dysdera hungarica* Kulc., měřítko 0,1 mm.

the different shape of the carapace (Fig. 2) and the presence of tibial spines. The second *Dysdera* species known from Czech Republic, the rare and more thermophilous *D. ninnii* Canestrini, differs from the previous species in having distinct spots on the carapace (Miller 1971, Heimer & Nentwig 1991). However preparation of the vulva (Fig. 1) is necessary for correct determination and separation from other *Dysdera* species. Some other species of the genus *Dysdera* have been recorded from adjacent countries (Gajdoš et al. 1999; Samu & Szinetár 1999). In particular, the occurrence of *D. crocota*, which has been found only a few kilometres from the Czech-Slovak border in the Slovakian part of the Bílé Karpaty mountains (Gajdoš et al. 1999), can also be anticipated in the Czech Republic.

Distribution. *Dysdera hungarica* is widely distributed over south-eastern Europe and a part of Asia, from Austria, Slovakia and Hungary to Azerbaijan (Deeleman-Reinhold 1988, Gajdoš et al. 1999). Its occurrence in the Czech Republic is therefore not surprising, except for the fact that both localities are located in arachnologically very

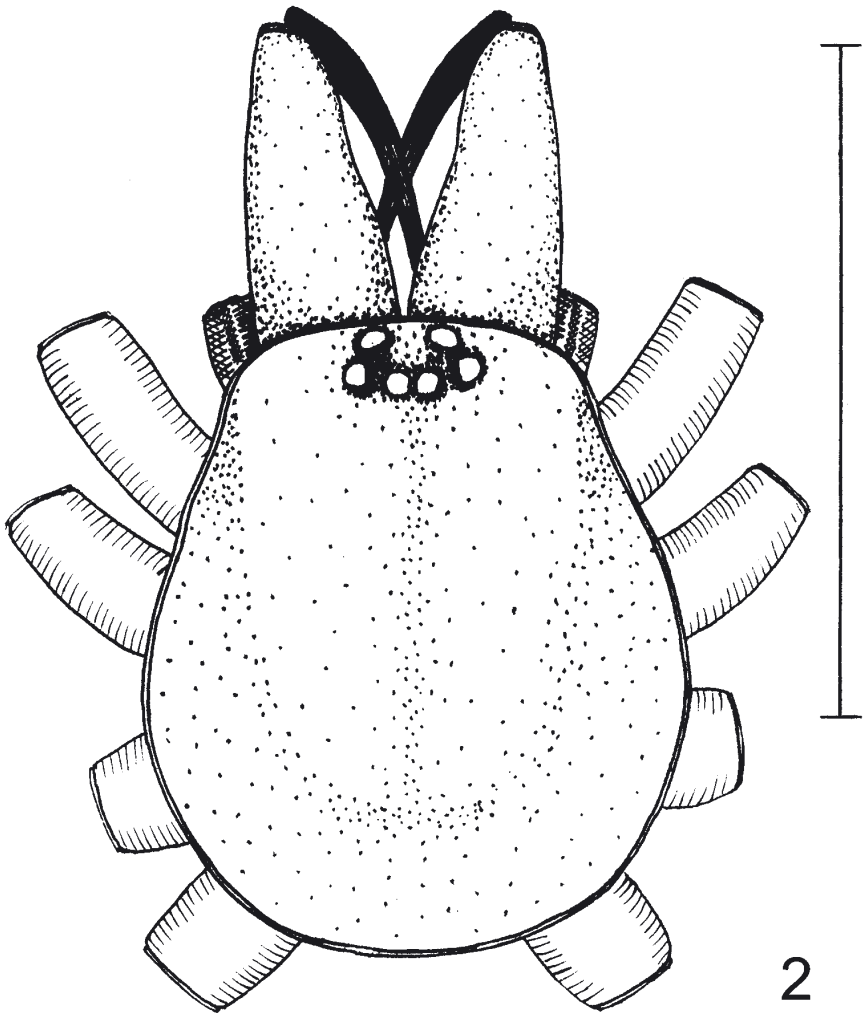


Fig. 2. Cephalothorax of *Dysdera hungarica* KULC., scale line 3 mm.
Obr. 2. Hlavohruď druhu *Dysdera hungarica* KULC., měřítko 3 mm.

well-investigated areas (see Fig. 3) (MAJKUS & SVATOŇ 1995, RŮŽIČKA et al. 1996). This suggests that the species is very rare in the habitats where it occurs.

A list of species found with *Dysdera hungarica*

A list of spider species inhabiting both the localities in which *Dysdera hungarica* was found is presented here. Only rare and relict species (*sensu* BUCHAR 1992) from Havraníky are listed.

The species are named after Buchar et al. (1995), except for the species not included in this check-list. Species appearing in bold have only recently been found in Moravia, i.e. the eastern part of the Czech Republic (Buchar 1997).

Havraníky: *Abacoproeces saltuum*, *Acartauchenius scurrilis*, *Alopecosa schmidti*, *Alopecosa sulzeri*, *Alopecosa trabalis*, *Agroeca cuprea*, *Arctosa figurata*, *Argiope bruennichi*, *Atypus affinis*, *Berlandina cinerea*, *Callilepis schuszteri*, *Cyclosa oculata*, *Dictyna latens*, ***Dipoena erythropus***, *Dipoena melanogaster*, *Drassodes cupreus*, *Drassyllus praeficus*, *Entelecara congenera*, *Entelecara flavipes*, *Eresus cinnaberinus*, ***Euophrys obsoleta***, *Euryopis flavomaculata*, *Euryopis quinqueguttata*, *Evarcha laetabunda*, ***Frontinella frutetorum***, *Gnaphosa lugubris*, *Haplodrassus kulczynskii*, *Heliophanus flavipes*, *Hypsocephalus dahli*, *Lepthyphantes geniculatus*, ***Macaroeris nidicolens*** , *Macrargus carpenteri*, ***Marpissa nivoyi***, *Misumenops tricuspidatus*, ***Neottiura suaveolens***, *Ozyptila claveata*, *Panamomops inconspicuus*, *Pardosa alacris*, *Pardosa bifasciata*, *Pardosa nigriceps*, *Pardosa riparia*, *Philodromus albidus*, *Philodromus dispar*, ***Scotina celans***, *Scotina palliardi*, *Synaema globosum*, *Talavera aequipes*, *Thanatus arenarius*, *Thanatus vulgaris*, ***Theonina kratochvili***, *Theridion nigrovariegatum*, *Thomisus onustus*, ***Titanoeca schineri***, *Tmarus piger*, ***Tmarus stellio***, *Trichopterna cito*, *Trochosa robusta*, *Typhochraestus digitatus*, *Xysticus ferrugineus*, *Xysticus ninnii*, *Zelotes electus*, *Zelotes longipes.*

Kočičí skála: *Aulonia albimana*, *Diplostyla concolor*, *Drassyllus praeficus*, *Drassyllus pusillus*, *Enoplognatha thoracica*, *Lepthyphantes mengei*, *Lepthyphantes tenuis*, *Micaria pulicaria*, *Ozyptila praticola*, *Pardosa agrestis*, *Pardosa lugubris*, *Phrurolithus festivus*, *Trachyzelotes pedestris*, *Xerolycosa miniata.*

Discussion

In the Czech Republic, only females of *Dysdera hungarica* have been found to date. The state of the posterior diverticulum of the vulva allows the investigator to distinguish between virgin (diverticulum wizened) and already mated females (diverticulum bulging) of *Dysdera* (Deeleman-Reinhold 1986). No females from our material exhibited the bulging posterior diverticulum; both females had wizened diverticula. Taken together, these facts support the hypothesis of Deeleman-Reinhold (1986) that parthenogenetic populations of *Dysdera hungarica* exist in Central Europe.

Bisexual populations of *Dysdera hungarica* exist in the southern part of Carpathian territory but only parthenogenetic populations occur in the Pannonian Basin (Deeleman-Reinhold 1986). We assume that this phenomenon is connected with climatic changes during the end of the Pleistocene and Holocene. Presumably, *Dysdera hungarica* could survive in the diversiform Carpathian territory, which offered various biotopes during unfavourable periods. After the improvement of climate, parthenogenetic populations were able to colonise surrounding areas more speedily (see Cuellar 1977).

However, the parthenogenetic populations in the Pannonian Basin could also represent the remnants of originally bisexual populations. Deterioration of climatic conditions could give rise to positive selection for parthenogenetic populations. This

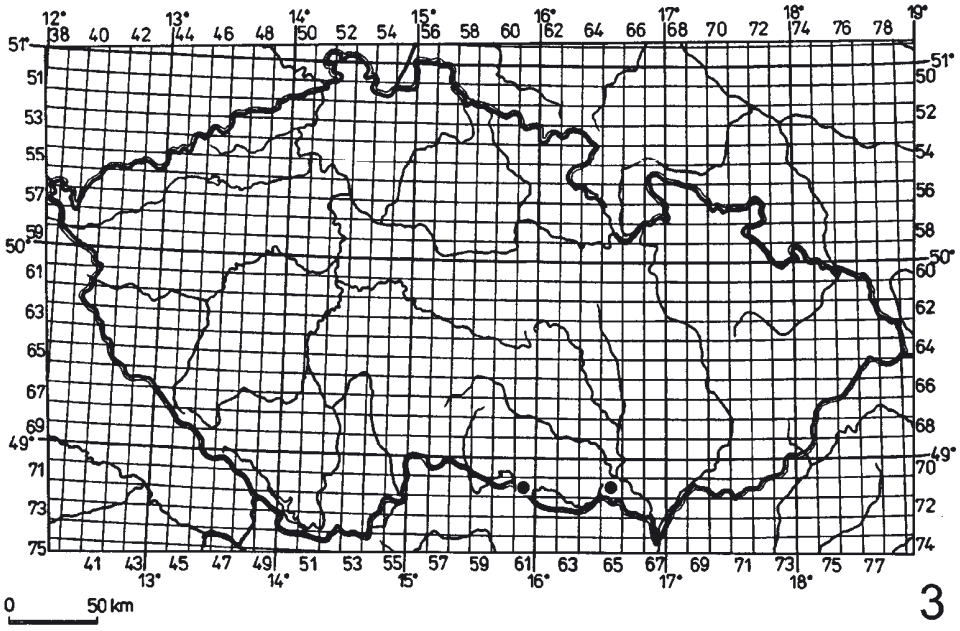


Fig. 3. Distribution of *Dysdera hungarica* KULC. in the Czech Republic.
Obr. 3. Rozšíření druhu *Dysdera hungarica* KULC. v České republice.

selection may be driven by at least two factors. First, parthenogenesis is preferable when population density is decreased (see SEILER 1961) and second, females of many species (see ENGHOFF 1976) are more tolerant to various stress-inducing environmental conditions.

The bisexual population in the Slovenský karst (SVATOŇ & MAJKUS 1988) that stands so far out to the north is remarkable. This very diversiform area is the northernmost locality for many relict species and many endemic species also occur here (ROZLOŽNÍK & KARASOVÁ 1990). These facts document that this area was the northernmost refuge of many thermophilous species even during the glacial periods.

Peripheral parthenogenesis (*sensu* ENGHOFF 1994) is well described among other groups of arthropods in the Czech Republic (for example Moravian populations of the locust *Saga pedo*, see GULIČKA 1992). But among spiders, parthenogenesis is generally very sporadic (DEELEMAN-REINHOLD 1986) and this mode of reproduction is more represented among the harvestmen (MUSTER 2000, TSURUSAKI 1985, etc.). Finally, the occurrence of *Dysdera hungarica* could represent the first case of parthenogenesis among spiders in the area of Czech Republic.

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Souhrn

Na území národního parku Podyjí a chráněné krajinné oblasti Pálava byl v roce 1999 nalezen nový druh pavouka pro Českou republiku, šestiočka *Dysdera hungarica* Kulczyński, 1897. Jedná se o vzácný teplomilný druh, jehož areál leží na území mezi panonskou oblastí a Ázerbájdžánem (Deeleman-Reinhold 1988). V rámci České republiky bude svým rozšířením zřejmě omezen na nejteplejší části jižní Moravy. Fakt, že byl nalezen v oblastech po arachnologické stránce velice dobře prozkoumaných, svědčí o jeho vzácnosti i v rámci těchto území.

Na zmíněných lokalitách byli nalezeni pouze jedinci samičího pohlaví. Jejich posteriorní divertikulum vulvy bylo scvrklé, což dokládá, že se jednalo o neoplozené samice (cf. Deeleman-Reinhold 1986). Tyto fakty podporují hypotézu, že u tohoto druhu je častá partenogeneze (Deeleman-Reinhold 1986).

V jižní části karpatské oblasti se vyskytují populace pohlavně se rozmnožujících jedinců, ale v oblasti panonské byly zatím zjištěny pouze partenogenetické populace (Deeleman-Reinhold 1986). Domníváme se, že tento jev souvisí s klimatickými změnami na konci pleistocénu a během holocénu. Nepříznivá období mohl tento druh přežít v členité karpatské oblasti skýtající rozmanité biotopy. Po zlepšení klimatických podmínek byly partenogenetické populace díky rychlejšímu způsobu rozmnožování schopny kolonizovat stejnorodou krajinu panonské pánve rychleji (viz Cuellar 1977). Partenogenetické populace v panonské oblasti mohou být ale také pozůstatky původně pohlavně se rozmnožujících populací. Zhoršení podmínek mohlo znevýhodňovat pohlavně se rozmnožující jedince. Pozitivní selekce partenogenetických populací mohla být umožněna fakty, že partenogeneze je výhodná při snížení populační hustoty (viz Seiler 1961) a že samice mnoha druhů (viz Enghoff 1976) jsou tolerantnější k některým stresujícím podmínkám prostředí.

Zajímavý je výskyt bisexuální populace ve Slovenském krase (Svatoň & Majkus 1988) vysunutý daleko na sever. Velice členitá krajina Slovenského krasu se vyznačuje výskytem mnoha reliktních druhů, které zde mají severní hranici svého rozšíření, a přítomností celé řady druhů endemických (Rozložník & Karasová 1990). Je tedy pravděpodobné, že tato oblast byla během posledního glaciálu nejsevernějším refugiem pro mnoho druhů včetně šestiočky *Dysdera hungarica*.

Partenogeneze je u pavouků velice vzácná (Deeleman-Reinhold 1986). O něco častější je tento způsob rozmnožování u sekáčů (např. Tsurusaki 1985, Muster 2000). U některých skupin členovců je však periferní partenogeneze (sensu Enghoff 1994) relativně častým jevem (například moravské populace populární kobylky ságy *Saga pedo*, Gulička 1992). Nález šestiočky *Dysdera hungarica* by mohl představovat první doklad o partenogenezi u pavouků z území České republiky.

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