First record of the jumping spider *Icius subinermis* (Araneae, Salticidae) in Hungary

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Abstract. We report the first record of *Icius subinermis* Simon, 1937, one female, from Budapest, Hungary. We provide photographs of the habitus and of the copulatory organ. The possible reasons for the new record and the current jumping spider fauna (Salticidae) of Hungary are discussed. So far 77 salticid species (including *I. subinermis*) are known from Hungary.

Keywords: distribution, faunistics, introduced species, urban environment

Zusammenfassung. Erstnachweis der Springspinne *Icius subinermis* (Araneae, Salticidae) aus Ungarn. Wir berichten über den ersten Nachweis von *Icius subinermis* Simon, 1937, eines Weibchens, aus Budapest, Ungarn. Fotos des weiblichen Habitus und des Kopulationsorgans werden präsentiert. Mögliche Ursachen für diesen Neunachweis und die Zusammensetzung der Springspinnenfauna Ungarns werden diskutiert. Bisher sind 77 Springspinnenarten (einschließlich *I. subinermis*) aus Ungarn bekannt.

The spider fauna of Hungary is well studied (Samu & Szinetár 1999). Due to intensive research and more specialized collecting methods, new records frequently emerge. Some of these new species are indigenous, others are newcomers. International trade is one of the most important factors that contribute to the spread of invasive arthropod species, including spiders (Nedvěd et al. 2011). In addition, climate change may also facilitate the establishment of exotic species originating from warmer areas (Nentwig 2015). Due to a warmer climate, Mediterranean spider species have extended their range northwards (e.g. Kumschick et al. 2011, Nedvěd et al. 2011). Among 87 introduced alien spiders, 44 expanded their range from the Mediterranean or the Eastern Palaearctic to western and northern Europe (Kobelt & Nentwig 2008).

Jumping spiders (Salticidae) are one of the most common spider families (after Theridiidae and Pholcidae) in which species are indicated as alien (Nentwig 2015). Salticidae is the richest family worldwide with over 620 genera and more than 5900 described species (WSC 2017). Within Salticidae, the genus *Icius* comprises 34 described species (WSC 2017) and five *Icius* species are confined to the Mediterranean region of Europe (Nentwig et al. 2017). Two of them, *I. hamatus* (C.L. Koch, 1846) (Tomasiewicz & Wesołowska 2006, Schäfer & Deepen-Wieczorek 2014) and *I. subinermis* Simon, 1937 (Jäger 1995, Helsdingen 2006) have also been reported from Central and Western Europe in recent years. No representatives of *Icius* have been found in Hungary until now (Szűts et al. 2003, Helsdingen 2017).

Material and methods

The arthropod community of *Acer campestre* was surveyed in a green area of Budapest (Mátyás tér, 47°29'32"N, 19°4'48"E, 110 m a.s.l.), Hungary, in the growing season of 2016. This area is covered by trees (e.g. *Acer* spp., *Fraxinus* spp., *Robinia* spp.), small bushes (e.g. *Berberis* spp., *Juniperus* spp., *Rosa* spp.), grassy patches and concrete surfaces, and surrounded by multi-storey buildings and traffic roads.

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The specimen was collected on June 22nd 2016 using the beating method. The study was carried out at the Department of Entomology of Szent István University. The specimen was examined with Leica MZ6 and photographed with a Sony XCD-SX90CR camera attached to a Zeiss Stemi stereomicroscope. We used the key available in Alicata & Cantarella (1994) for identification. The female vulva was prepared and macerated with 20 % KOH and photographed with a Zeiss Imager A2 light microscope equipped with AxioCam MRc5. Measurement are given in millimetres. The specimen was deposited in the second author's private collection.

Results

The adult female jumping spider specimen was identified as *Icius subinermis* Simon, 1937 (leg. D. Korányi, det. L. Mezőfi). The specimen's general appearance is shown in Fig 1. The

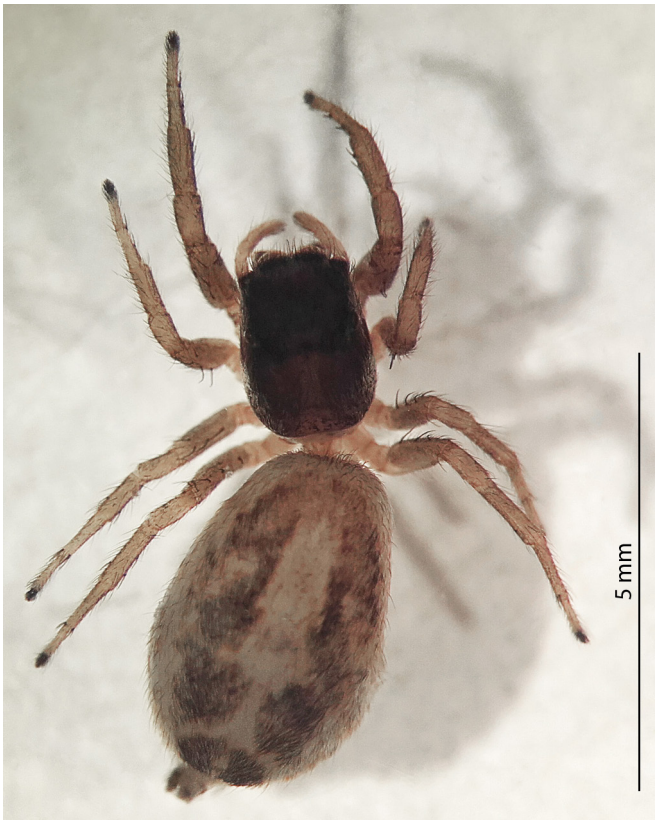

Fig. 1: *Icius subinermis* female general appearance, dorsal view

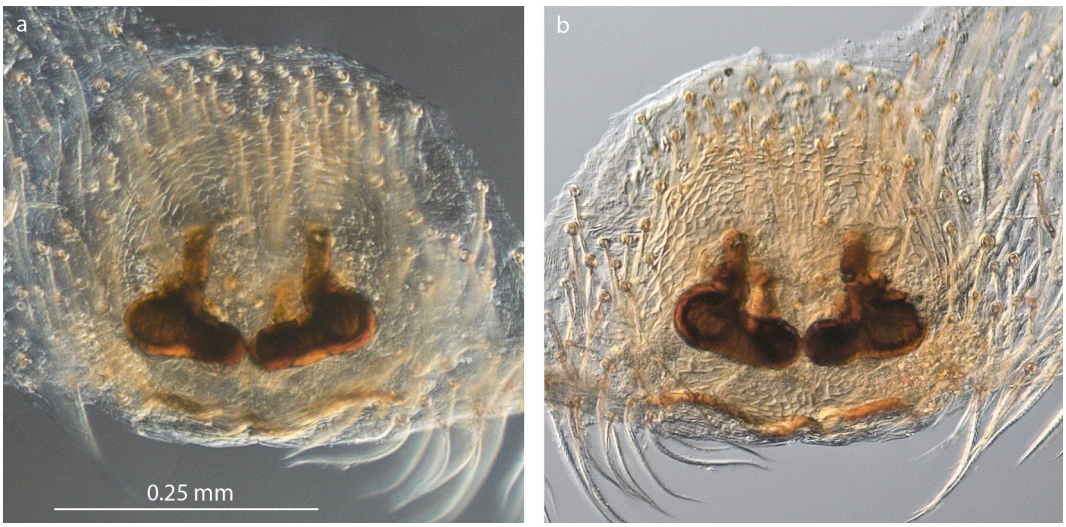

Fig. 2: Cleared, dissected epigyne/vulva of *Icius subinermis* female from Hungary; **a.** epigyne, ventral view; **b.** vulva, dorsal view

specimen's opisthosoma has a light brown or off-white tincture and reddish-brown spots which form a horseshoe-shaped pattern. The epigyne and vulva are shown in Fig. 2.

Discussion

Icius subinermis is known from Spain, France (including Corsica), Italy (including Sicily and Sardinia), Portugal, Macedonia, Slovenia, Switzerland (Helsdingen 2017), Germany (Blick et al. 2016) and Serbia (Stanković 2012). *I. subinermis* was also reported from the Netherlands (Helsdingen 2006) and recently from the Czech Republic (Šich 2015) although its establishment has not been confirmed in these two countries.

This species generally occurs in moist habitats, for example near streams or on moist meadows. It builds a silken retreat on rush plants or under rocks near rivers or creeks (Stanković 2012). It may also occur on trees, especially in the vegetation bordering aquatic environments, but is usually present at the waterside at the time of its reproduction. Females are often seen guarding their eggs (Ledoux 2007).

Although *I. subinermis* has a Mediterranean origin (Alicata & Cantarella 1994), it has also been reported from Central and Western Europe (e.g. from Germany and the Netherlands) (Jäger 1995, Helsdingen 2006). *Icius subinermis* probably lives in moist habitats under natural conditions (Stanković 2012, Leroy et al. 2014). However, it was also observed in urban environments or near residential areas (Jäger 1995, Komnenov 2005, Kostanjšek & Fišer 2005, Helsdingen 2006, Stanković 2012). Furthermore, in most cases the specimens were found in buildings (e.g. in a house, greenhouse or apartment) (Jäger 1995, 1996, Komnenov 2005, Helsdingen 2006). This supports the findings of Nedvěd et al. (2011) that occurrence in buildings is a prerequisite for range expansion in many arachnid species. Moreover, these observations suggest that an urban environment and its microclimate may provide suitable conditions for this species, particularly northwards from the Mediterranean region.

How this specimen of *I. subinermis* got to Hungary is unclear and hard to speculate about. The warming climate and/or human mediation could be suspected. Since the specimen was found in a semi-natural habitat in Budapest, it may have an established population here. To confirm this, further surveys are needed, mainly in residential areas and semi-natural habitats nearby.

In Hungary, the most comprehensive checklist of the Salticidae family was published by Szűts et al. (2003), with 70 salticid species from Hungary. Since then several jumping spider species have been reported: *Chalcoscirtus nigritus* (Thorell, 1875), *Saitis tauricus* Kulczyński, 1904 (Szita et al. 2004), *Sitticus inexpectus* Logunov & Kronestedt, 1997 (Déri et al. 2007), *Euophrys herbigrada* (Simon, 1871), *Talavera parvistyla* Logunov & Kronestedt, 2003 (Kis 2007, cited in Kovács et al. 2012) and *Talavera aperta* (Miller, 1971) (Batáry et al. 2008). The Fauna Europaea Database lists 78 valid salticid species for Hungary (Helsdingen 2017). However *E. herbigrada* and *Talavera monticola* (Kulczyński, 1884) (for the latter see Szűts et al. 2003) is missing from the list, whereas *Pellenes campylophorus* (Thorell, 1875), *Aelurillus simplex* (Herman, 1879), *Myrmarachne simonis* (Herman, 1879) and *Synageles dalmaticus* (Keyserling, 1863) are erroneously listed. *Pellenes campylophorus* was recognized as a nomen dubium by Logunov et al. (1999), while *A. simplex, M. simonis* and *S. dalmaticus* have no records from the present territory of Hungary. Although the latter three species were on the spider faunal list of Hungary made by Chyzer & Kulczyński (1918), these records originated from regions that are not part of Hungary today. Chyzer & Kulczyński (1918) reported *A. simplex* from Doroszló (Doroslovo, now in Serbia), *M. simonis* (as *Salticus simonis*) from Körösfeketető (Negreni, now in Romania) and *S. dalmaticus* from Buccari (Bakar, now in Croatia, also erroneously noted as being in Hungary by Logunov 2004) and Crkvenica (Crikvenica, now in Croatia).

In total, including the new record of *I. subinermis*, 77 jumping spider species are recorded from Hungary so far.

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