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Clubiona pseudoneglecta and *Paratrachelas maculatus*, two spider species new to the Slovak fauna (Araneae: Clubionidae, Trachelidae)

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Abstract. Two spider species, *Clubiona pseudoneglecta* Wunderlich, 1994 and *Paratrachelas maculatus* (Thorell, 1875), have been recorded for the first time in Slovakia. One male and five females of *C. pseudoneglecta* were collected at three sites in the Danube Plain. Two females of *P. maculatus* were found in the parks of the town of Galanta. Photos of the habitus and genitalia, an overview of the current distribution and habitat preferences are presented.

Keywords: Danube Plain, faunistics, new records, Slovakia

Zusammenfassung. *Clubiona pseudoneglecta* und *Paratrachelas maculatus*: zwei Spinnenarten neu für die Fauna der Slowakei (Araneae: Clubionidae, Trachelidae). Zwei Spinnenarten, *Clubiona pseudoneglecta* Wunderlich, 1994 und *Paratrachelas maculatus* (Thorell, 1875) wurden erstmals in der Slowakei nachgewiesen. Ein Männchen und fünf Weibchen von *C. pseudoneglecta* wurden an drei Stellen in der Donauebene gesammelt. Zwei Weibchen von *P. maculatus* wurden in den Parks der Stadt Galanta gefunden. Fotos von Habitus und Genitalien sowie ein Überblick der bekannten Verbreitung und Habitatpräferenzen werden präsentiert.

In the course of recent investigations, our knowledge of the Slovak spider fauna has increased significantly (Šestáková et al. 2018, Gajdoš et al. 2019a). The number of recorded spider species in Slovakia is currently 969 (Gajdoš et al. 2018). Two independent studies, focusing on investigating spider assemblages in threatened and synanthropic habitats in the Danube Plain, discovered two spider species hitherto unknown in Slovakia. The first of these is *Clubiona pseudoneglecta* Wunderlich, 1994 belonging to the family Clubionidae. In Slovakia, 28 species of this family had previously been documented (Gajdoš et al. 2018, Nentwig et al. 2020). The second new record is *Paratrachelas maculatus* (Thorell, 1875) from the family Trachelidae. Only one species from this family, *Cetonana laticeps* (Canestrini, 1868), had previously been recorded in Slovakia (Gajdoš et al. 2018). The genus *Paratrachelas* is thus new to the Slovakian spider fauna. The aim of our study was to provide new information on the distribution and habitats of these two very rare spider species in Central Europe.

Material and methods

The study sites are situated in the Pannonian Region of the Danubian Lowland (south-western Slovakia). According to Pecho et al. (2008) climate in the Danubian Lowland has recently begun to show some features typical for the Mediterranean region with its warmer spells and aridization trends.

The presented species were recorded at the following four studied sites (Figs 1, 2):

A. Šenkvice cattle farm (48.3402°N, 17.3606°E, 175 m a.s.l.) – Šenkvice cadastre. The farm consists of several cattle

shelters. Malaise traps were placed in nitrophilous ruderal vegetation with shrubs near a dunghill. Four traps were used from May to Oct. 2015 and two traps from May to Aug. 2016. Their detailed location, along with habitat characteristics, was published by Semelbauer & Vidlička (2015) and Majzlan & Vidlička (2016).

B. Tomášikovský presyp Natural Monument (48.0863°N, 17.6728°E, 110 m a.s.l.) – rural area of Tomašikovo cadastre. The habitat was an abandoned and partly excavated sand dune (used as a sand pit) with psammophilous grasslands located in the intensively used agricultural landscape. Pitfall traps were set from 14. Feb. to 8. Nov. 2019. Their detailed location, along with habitat characteristics and composition of ground living spider community was published by Gajdoš et al. (2019b).

C. Nature Reserve Síky (48.2208°N, 17.8972°E, 115 m a.s.l.) – rural area of Močenok cadastre. The habitat consists of grass-herb stands on strongly saline soils located near the agricultural landscape. Pitfall traps were set from 17. Apr. 2018 to 16. Apr. 2019.

D. Urban parks in the town of Galanta (48.1884°N, 17.7355°E, 123 m a.s.l.) – urban park of the Neo-Gothic castle of Galanta (the oldest and largest park in the city with a rich collection of trees). Bark trapping was used during the winter of 2017/2018 (3. Dec. 2017 – 20. Jan. 2018). Corrugated cardboard trap bands were placed around the trunk (Szinetár & Horváth 2006).

Specimens were identified to species level using the determination keys in Nentwig et al. (2020). Nomenclature follows the World Spider Catalog (2020). The epigyne of *C. pseudoneglecta* was cleared and photographed in lactic acid, then returned to 70% ethanol. Pictures of spiders were taken using different stereomicroscopes: an Olympus SZX16 with an Olympus SC 100 camera and Olympus Stream basic software; a Nikon SMZ18 with NIS-Elements software; and an Intraco Micro STM 823 5410 with a Canon EOS 100D camera using EOS Utility software. Photos were stacked using Zerene Stacker and edited in Adobe Photoshop®; all measurements were made from photographs using Axio Vision v. 4.6. The specimens were stored in 70% ethanol and have been deposited in the collections of P. Gajdoš at the Institute

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Fig. 1: Map of Slovakia showing the four localities. **A.** Šenkvice cattle farm; **B.** Natural Monument Tomášikovský presyp; **C.** Nature Reserve Síky; **D.** Urban parks in the town of Galanta. Sites A-C: *Clubiona pseudoneglecta*, D: *Paratrachelas maculatus*

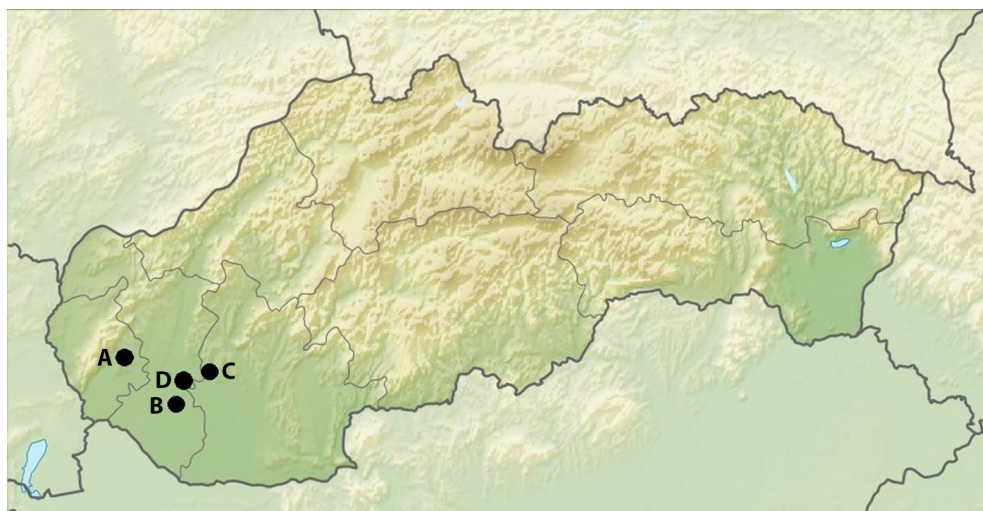


Fig. 2: Photos of study site habitats. **A.** Šenkvice cattle farm; **B.** Natural Monument Tomášikovský presyp; **C.** Nature Reserve Síky; **D.** The urban parks in the town of Galanta

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Results and discussion

Clubiona pseudoneglecta Wunderlich, 1994

Material. SLOVAKIA, Šenkvice, farm, Malaise trap 10. – 30. Jun. 2016, 4 ♀♀, leg. O. Majzlan, det. P. Gajdoš; Síky Nature

Reserve, pitfall traps, 7. Jul. – 8. Aug. 2018, 1 ♀, leg. and det. P. Gajdoš; Tomášikovský presyp Natural Monument, pitfall traps, 24. Jun. – 8. Jul. 2019, 1 ♂, leg. P. Gajdoš & P. Purgat, det. P. Gajdoš.

Distribution. Morocco, Algeria, Europe, Caucasus (World Spider Catalog 2020). This species has been reported in many European countries, but seems to be lacking in the northern part of Europe, including the Baltic region and Scandinavia

(Nentwig et al. 2020, van Helsdingen 2013, 2020). It was first found and described in Germany (Wunderlich 1994), and thereafter recorded in Europe in Hungary (Mikhailov & Szinetár 1997), Belgium and the Netherlands (Roberts 1998), Ukraine, Bulgaria and Moldavia (Mikhailov 2003, Polchaninova & Prokopenko 2019), Switzerland (Pozzi & Hänggi 1998), Great Britain and France (Merrett 2001), Czechia (Buchar & Růžička 2002), Slovenia (Kuntner 1997), Serbia (Grbić & Savić 2010), the European part of Russia (Ponomarev & Polchaninova 2006, Sozontov & Esyunin 2012, Ponomarev & Khnykin 2013), the European part of Turkey (van Helsdingen 2013), North Macedonia (Komnenov 2014), Spain and Greece (Bosmans et al. 2017), Croatia and Bulgaria (Blagoev et al. 2018), Italy (Pantini & Isaia 2019), Cyprus (Bosmans et al. 2019) and now in Slovakia. Bosmans et al. (2017) inadvertently confused the country names Slovenia and Slovakia, thus giving the impression that the occurrence of this species in Slovakia had already been published by Kuntner & Šereg (2002).

The species has so far been confirmed in Slovakia at three of the localities described above, but we consider it likely that *C. pseudoneglecta* might have been mistaken in the past with the very similar species – *C. neglecta*. A review of old records of *C. neglecta* in Slovakia is therefore called for. This has already been done elsewhere: the first reports of *C. pseudoneglecta* from Great Britain included reassignment of older reports of *C. neglecta* (Merrett 2001).

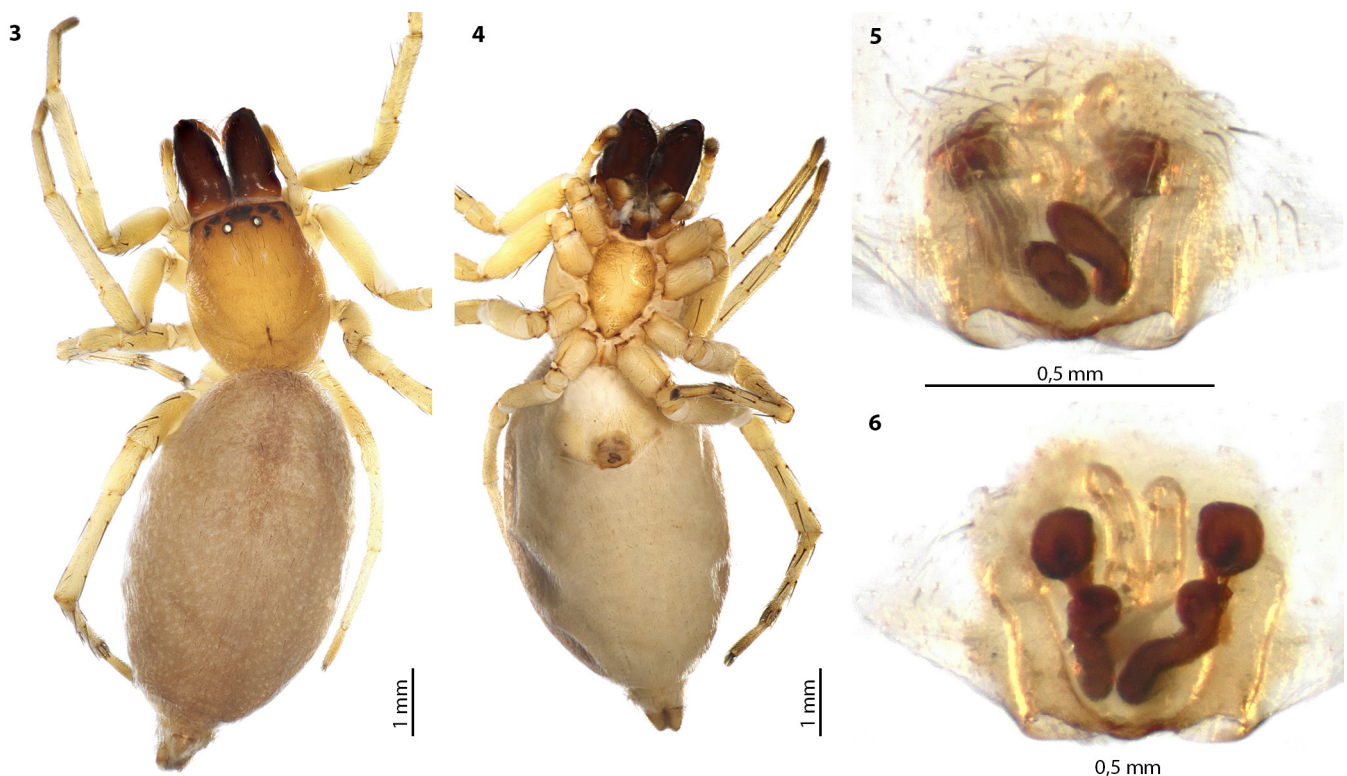
Body size. Female: body length 5.94–7.41 mm; prosoma length 2.38–2.47 mm, width 1.85–1.94 mm; opisthosoma length 3.72–5.14 mm, width 2.29–2.98 mm.

General appearance of the female from dorsal and ventral side is as depicted in Figs 3–4 and its epigyne as in Figs 5–6.

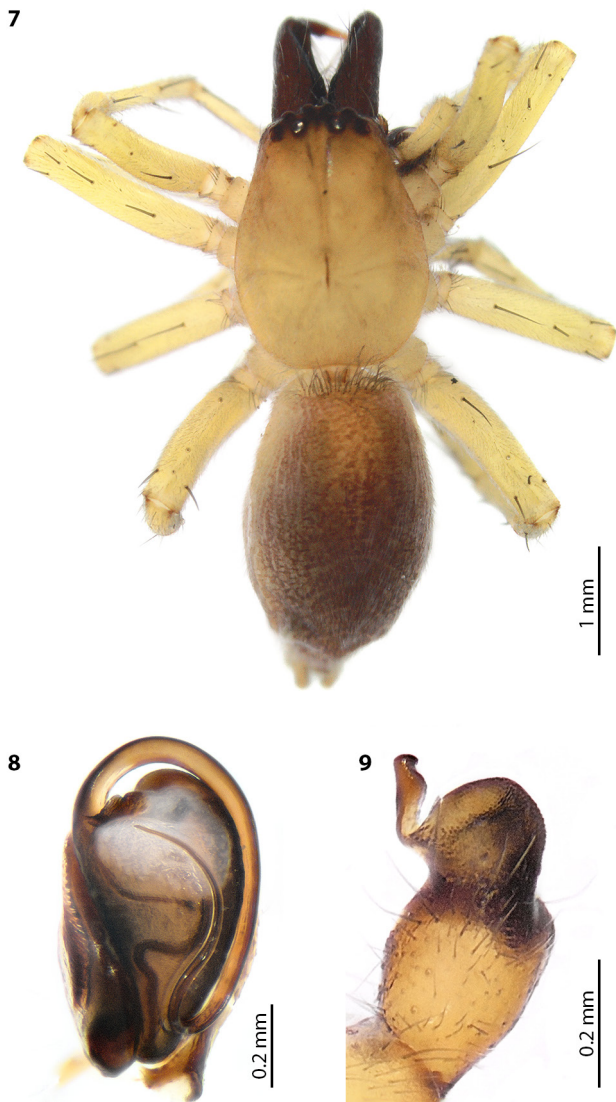
Male: body length 5.01 mm; carapace length 2.40 mm,

width 1.78 mm; opisthosoma length 2.36 mm, width 1.60 mm. General appearance of the male from dorsal side as depicted in Fig. 7; its bulbus is shown in Fig. 8 and details of the tibial apophysis in Fig. 9.

Habitats. This species is classified as xerophilic and thermophilic (Buchar & Růžička 2002, Isaia et al. 2007), but very little is known about its biology. It has been recorded in dry meadows and on warm, south-exposed slopes (Nentwig et al. 2020). In Germany, it was reported from a vineyard fallow adjacent to semi-dry grasslands (Wunderlich 1994). In Britain, it has been recorded on sand dunes with sparse vegetation on fore-dunes and also on dense grassland on stabilised dunes (Merrett 2001). It has also been recorded on sand dunes in Belgium and the Netherlands (Russell-Smith 2009). However, further south in Europe, it was collected in oak forests in France (Le Peru 2007), in deciduous woodland forest edges in Serbia (Grbić & Savić 2010), and from relatively dry to mesophilic grassland habitats in Germany and Hungary (Russell-Smith 2009) and Serbia (Grbić & Savić 2010). Russell-Smith (2009) collected this species in a sycamore woodland on the Mediterranean coast of Turkey. In the European part of Turkey, it was found in a wet area with *Juncus* sp. (van Helsdingen 2013). Italian specimens were recorded on low vegetation in meadows (Isaia et al. 2007). Other specimens were collected in ungrazed dry grassland (Milasowszky et al. 2016) and from salt meadows in Austria (Milasowszky & Waitzbauer 2008). The only historical record without information on the habitat is from the Czech Republic. A specimen recorded in 1958 in Lednice (south Moravia – the warmest part of Czechia) was discovered in F. Miller's collection among the material of *C. neglecta* (Buchar & Růžička 2002). All our records are from southern part of Slovakia (Pannonian Region) from areas with very dry and hot climate. Based on published records



Figs 3-6: *Clubiona pseudoneglecta* female from Slovakia. **3.** Habitus, dorsal view; **4.** Idem., ventral view; **5.** Cleared epigyne, ventral view; **6.** Idem., dorsal view (photos: A. Šestáková)



Figs 7-9: *Clubiona pseudoneglecta* male from Slovakia. **7.** Habitus, dorsal view; **8.** Bulbus, ventral view; **9.** Palpal tibia, retrolateral view (photos: P. Gajdoš, P. Purgat)

and our findings, it has been confirmed that *C. pseudoneglecta* occurs in both natural and anthropogenic habitats, but appears to prefer dry and warm habitats.

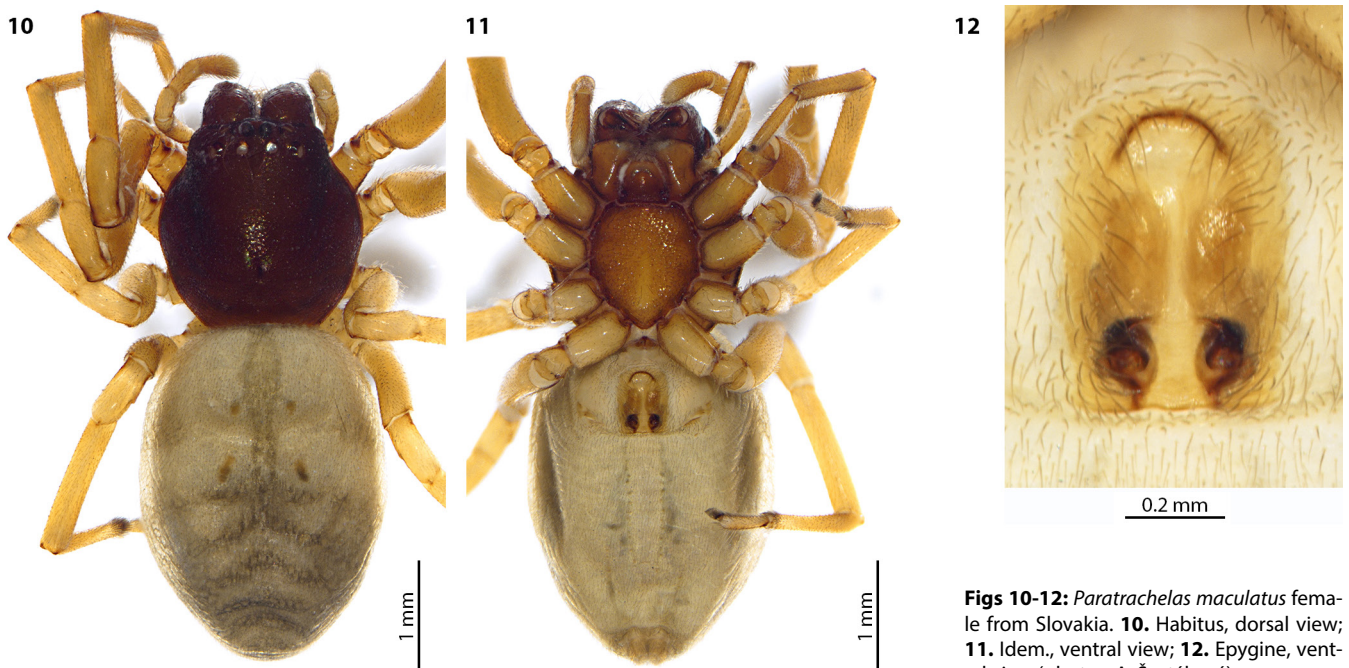
Red list. *Clubiona pseudoneglecta* was included in the red lists of many countries or regions. In Belgium it is listed in the regional red list of Flanders in category IN (Indeterminate) (Maelfait et al. 1998), in Czechia in the national red list in category CR (Critically Endangered) (Řezáč et al. 2015) and in the regional red list of the Czech Carpathians in category CR (Critically Endangered) (Gajdoš et al. 2014), in Germany in the category G (Generally Threatened) (Blick et al. 2016) and in the regional red list of Bavaria in category 2 (Endangered) (Blick & Scheidler 2004), in the United Kingdom in the national red list in category VU (Vulnerable) (Harvey et al. 2017), in Hungary in the regional red list of the Hungarian Carpathians in category LC (Least Concern) (Gajdoš et al. 2014), and in Slovenia in the national red list in category R (rare) (Uradni list Republike Slovenije 2002).

Paratrachelas maculatus (Thorell, 1875)

Material. SLOVAKIA, Galanta, urban parks; the specimens were in the bark trap, suggesting that the species lives under the bark of *Tilia cordata* and *Pinus nigra*, 3. Dec. 2017 – 18. Jan. 2018, 2 ♀♀, leg. K. Román & C. Szinetár, det. C. Szinetár.

Distribution. This species has been recorded in Europe in ten countries, namely Austria and Germany (Bauer & Grabolle 2012, Bauer & Höfer 2017, Bauer et al. 2019), Bulgaria (Blagoev et al. 2018), France (Bosselaers et al. 2009), Spain – Mallorca (Pons & Palmer 1996), Croatia (Grbac et al. 2019), Hungary (Kolosváry 1932), Italy (Trotta 2005, Pantini & Isaia 2019), Slovenia (Kostanjšek & Kuntner 2015), Ukraine (Kovblyuk & Nadolny 2009), and now in Slovakia. There are also records from Turkey and Israel (World Spider Catalog 2020).

Body size. Female: body length 4.20 and 4.82 mm; prosoma length 1.60 and 1.85 mm, width 1.70 and 1.81 mm; opisthosoma length 2.60 and 2.97 mm, width 2.20 mm each.



Figs 10-12: *Paratrachelas maculatus* female from Slovakia. **10.** Habitus, dorsal view; **11.** Idem., ventral view; **12.** Epigyne, ventral view (photos: A. Šestáková)

General appearance of the female from dorsal and ventral side is as depicted in Figs 10–11, and its epigyne as in Fig. 12. **Habitat:** *Paratrachelas maculatus* was collected using pitfall traps and under tree bark in the sub-mediterranean parklands of south Crimea (Kovblyuk & Nadolny 2009). Several records point to its synanthropic occurrence in Europe. In Austria, the species was found inside a house, and in Germany in a cellar and bathroom (Bauer & Grabolle 2012, Bauer et al. 2019). Recently, it has been observed on the walls of the buildings in the town centre of Keszthely (Balaton Uplands, Hungary) (B. Keresztes pers. comm.). So far, the species has not been considered a typically bark-dwelling Central European spider (Szinetár & Horváth 2006). Specimens from Slovakia have been found outside buildings under the bark of two different tree species (*Tilia cordata*, *Pinus nigra*). The observations of Kovblyuk & Nadolny (2009) and our data from Slovakia support classifying *P. maculatus* as a facultative bark-dweller, which permanently or seasonally uses tree trunks as typical, but not exclusive, microhabitats. This is similar to other facultative bark-dwellers such as *Gnaphosa montana* (L. Koch, 1866) or *Phrurolithus festivus* (C. L. Koch, 1835), for which rocks, cracks in rocks, and artificial walls also constitute typical habitats (Szinetár & Horváth 2006). We assume that this species is already present on the trees of city parks of many other countries in Central Europe. The further spread of *P. maculatus* to the north and west is to be expected.

Red list: *Paratrachelas maculatus* has not been included in any Red List, e.g., in the German Red List this species is still stated as not established (Blick et al. 2016). Based on new records Bauer et al. (2019) discussed whether it can be regarded as established, alien species in Germany.

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