

Thanatus aridorum Šilhavý, 1940 from Czechia is a junior synonym of *Thanatus formicinus* (Clerck, 1757) (Araneae: Philodromidae)

Milan Řezáč & Vlastimil Růžička



doi: 10.30963/aramit6305

Abstract. We revised the type material of *Thanatus aridorum* Šilhavý, 1940, and noticed that it is a subadult female. Consideration of morphological characters of the three *Thanatus* species which co-occur at the type locality of *T. aridorum* led us to conclude that it is a junior synonym of *Thanatus formicinus* (Clerck, 1757), **new synonymy**.

Key words: new synonymy, pre-epigyne, subadult female, *Thanatus*

Zusammenfassung. *Thanatus aridorum* Šilhavý, 1940 aus Tschechien ist ein jüngerer Synonym von *Thanatus formicinus* (Clerck, 1757) (Araneae: Philodromidae). Das Typenmaterial von *Thanatus aridorum* Šilhavý, 1940 wurde untersucht und dabei festgestellt, dass es sich um ein subadultes Weibchen handelt. Die Betrachtung der morphologischen Merkmale der drei an der Typuslokalität von *T. aridorum* vorkommenden Arten der Gattung *Thanatus* führten zu dem Ergebnis, dass es sich um ein jüngerer Synonym von *Thanatus formicinus* (Clerck, 1757), **neues Synonym**, handelt.

Abstrakt. *Thanatus aridorum* Šilhavý, 1940 z Česka je mladší synonymum druhu *Thanatus formicinus* (Clerck, 1757) (Araneae: Philodromidae). Zrevidováním typového exempláře druhu *Thanatus aridorum* Šilhavý, 1940 jsme zjistili, že se jedná o nedospělou samici. Porovnali jsme jí se subadultními samicemi všech tří druhů rodu *Thanatus* vyskytujících se na Mohelenské hadcové stepi a na základě velikosti a tvaru pre-epigyny jsme došli k závěru, že se jedná o nedospělou samici druhu *Thanatus formicinus* (Clerck, 1757), **nová synonymie**.

The serpentinite steppe near Mohelno in South Moravia (today Mohelenská hadcová step National Nature Reserve) was very popular among Czech zoologists during the second world war as it was the only steppe with a rich Pannonian fauna that remained in Czech territory at that time. František Miller (1902–1983) performed very detailed faunistic and taxonomic research on spiders at this site (Miller 1943, 1947, 1949). Type material of five valid spider species comes from this site (Růžička et al. 2005) – syntypes of *Erigonoplus jarmilae* (Miller, 1943), *Civizelotes pygmaeus* (Miller, 1943) and *Altella biuncata* (Miller, 1949), as well as paratypes of *Zelotes aurantiacus* Miller, 1967 and *Theonina kratochvili* Miller & Weiss, 1979. More recently, spiders at this site were studied by Jan Buchar (Buchar 1997).

Harvestmen from this site were studied by another prominent Czech arachnologist, Vladimír Šilhavý (1913–1984) (Šilhavý 1948). Šilhavý was also involved in spider research at this site. He described two *Thanatus* (Araneae: Philodromidae) species from there (Šilhavý 1940, 1941). The second one, *Thanathus dvoraki* Šilhavý, 1941, was synonymised with *Thanatus arenarius* by Miller (1971), but the first one, *Thanatus aridorum* Šilhavý, 1940, is still listed as a valid species (cf. World Spider Catalog 2022, Nentwig et al. 2022). In this short contribution, we demonstrate that the first Šilhavý species is a junior synonym of *Thanatus formicinus* (Clerck, 1757).

Material and methods

In order to check the identity of *Thanatus aridorum*, we searched for the single type specimen mentioned in the original description (Šilhavý 1940). According to Růžička et al. (2005), it was deposited at the National Museum, Prague

(NMPC). We found it there under the inventory number P6E-2870. The original label (Fig. 1f) states Mohelno as the site, 1937 as the collecting year and V. Šilhavý as the collector. The specimen in the vial (Fig. 1d) is without an epigyne (Fig. 1e), the epigyne is conserved separately on a permanent microscopic slide (Fig. 1f). The type specimen was photographed with a Hirox Japan digital microscope and its epigyne was photographed with a Nikon Eclipse 80i.

We compared this specimen with the three *Thanatus* species known to occur at the type locality of *Thanatus aridorum* (Kůrka 1997, Buchar & Růžička 2002), namely *Thanatus arenarius* L. Koch, 1872, *Thanatus atratus* Simon, 1875 and *Thanatus formicinus* (Clerck, 1757). We measured and compared the body size (carapace length) and (pre-)epigyne height (length of the epigynal slits) of the material coming from the north Pannonian region (south Moravia and south Slovakia) where the type locality of *Thanatus aridorum* is located.

Material examined. *Thanatus atratus*: CZECHIA, 2 ♀♀, 1 subadult ♀, Mohelno, 20. Jun., coll. František Miller in NMPC, P6A-701/39; 1 ♀, 3 subadult ♀♀, Pavlov, 15. Jun. 1956, coll. František Miller in NMPC, P6A-701/42; SLOVAKIA, 3 ♀♀, 3 subadult ♀♀, Štúrovo, 10. Jun. 1956, coll. František Miller in NMPC, P6A-701/55.

Thanatus arenarius: CZECHIA, 3 ♀♀, 2 subadult ♀♀, Pouzdřany, 20. May 1965, coll. František Miller in NMPC, P6A-701/6; 1 subadult ♀, Pouzdřany, 5. May, coll. František Miller in NMPC, P6A-701/9; 1 subadult ♀, Pavlov, coll. František Miller in NMPC, P6A-701/4; 1 subadult ♀, Vranov, 10. Oct., coll. František Miller in NMPC, P6A-701/12.

Thanatus formicinus: CZECHIA, 1 subadult ♀, Říčky, Aug., coll. František Miller in NMPC, P6A-701/32; 4 ♀♀, 3 subadult ♀♀, Dráčov, 30. May, coll. František Miller in NMPC, P6A-701/17.

Results

The type specimen re-examined here is faded and shrunken (probably after temporarily drying out), but it otherwise corresponds well to the original illustration (Fig. 1a).

Milan ŘEZÁČ, Crop Research Institute, Drnovská 507, CZ 161 06 Praha 6, Czechia; E-mail: rezac@vurv.cz, ORCID: <https://orcid.org/0000-0003-4373-7064>
Vlastimil RŮŽIČKA, Institute of Entomology, Biology Centre, Branišovská 31, CZ 370 05 České Budějovice, Czechia; E-mail: vrucz@entu.cas.cz, ORCID: <https://orcid.org/0000-0002-1144-952X>

Academic editor: Petr Dolejš

submitted 24.12.2021, accepted 2.7.2022, online 26.8.2022

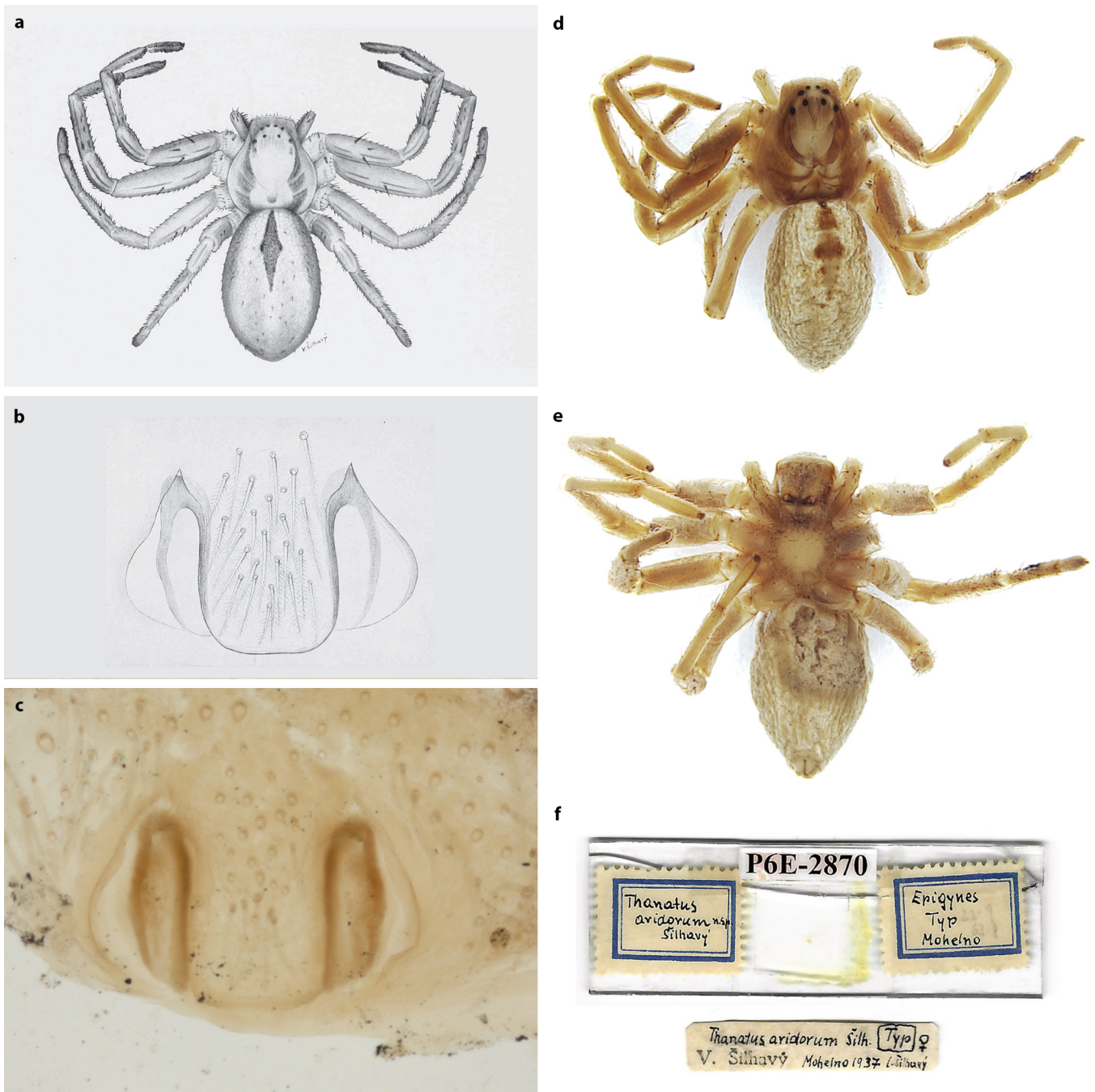


Fig. 1: *Thanatus aridorum* Šilhavý, 1940, type specimen. **a.** figure of habitus from the original description (Šilhavý 1940); **b.** figure of epigyne from the original description (Šilhavý 1940); **c.** epigyne, ventral view; **d.** habitus, dorsal view; **e.** habitus, ventral view; **f.** slide with mounted “epigyne” and original labels written by V. Šilhavý

The carapace length is 2.8 mm, width 2.5 mm. The length of the first pair of legs is 9.4 mm (coxa 0.9, trochanter 0.4, femur 2.4, patella 1.2, tibia 1.9, metatarsus 1.4, tarsus 1.2). Also the “epigyne” in the slide (Fig. 1c) corresponds well to the original description (Fig. 1b). However, in contrast to the author of the original description, we consider it to be a pre-epigyne of a subadult female – it is small relative to the body size (epigynal slit length 0.14 mm, distance of the epigynal slits in the middle 0.11 mm; the ratio epigynal slit length/carapace length = 0.05), and the spermathecae are not developed. In adult *Thanatus* females, the epigyne is larger relative to the body size (the ratio epigynal slit length/carapace length in *T. arenarius* is 0.12–0.13, in *T. atratus* 0.14–0.17, and in *T. formicinus* 0.13–0.16). We therefore conclude that *Thana-*

tus aridorum (Šilhavý, 1940) is a junior synonym of *Thanatus formicinus* (Clerck, 1757), **new synonymy**.

Discussion

Seven species of the genus *Thanatus* occur in Czechia: *Thanatus arenarius* L. Koch, 1872, *Thanatus atratus* Simon, 1875, *Thanatus formicinus* (Clerck, 1757), *Thanatus pictus* L. Koch, 1881, *Thanatus sabulosus* (Menge, 1875), *Thanatus striatus* C. L. Koch, 1845 and *Thanatus vulgaris* Simon, 1870 (Buchar & Růžička 2002, Růžička & Buchar 2008, Řezáč et al. 2021). The Mohelenská hadcová step National Nature Reserve is one of the arachnologically best-investigated sites in Czechia (Buchar 1997). Four species of the genus *Thanatus* have been recorded from the site: *T. arenarius* (Fig. 2a), *T. atratus*

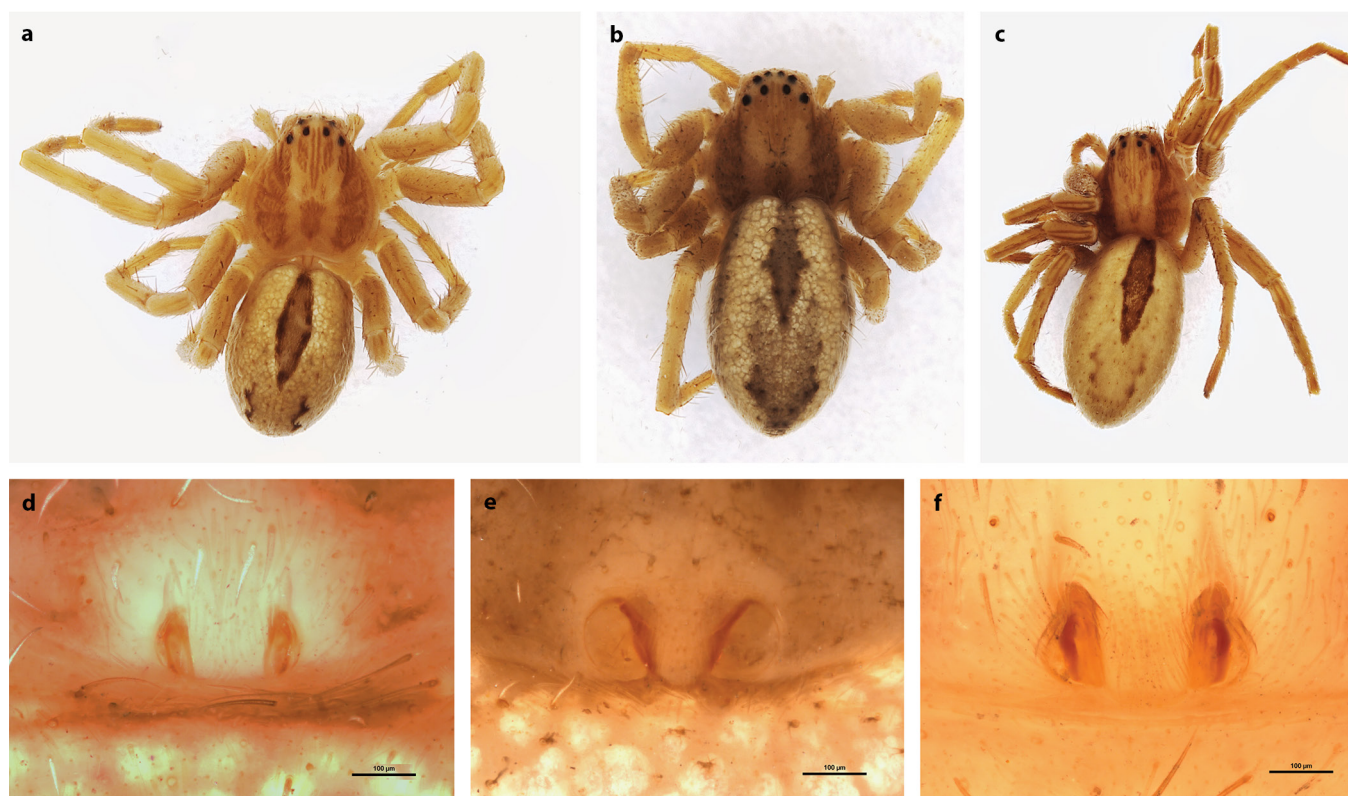


Fig. 2: Subadult females of three species of *Thanatus*. **a, d.** *Thanatus arenarius*, subadult female, Czechia: Pouzdřany; **b, e.** *Thanatus atratus*, subadult female, Slovakia: Štúrovo; **c, f.** *Thanatus formicinus*, subadult female, Czechia: Dráčov. a-c. habitus, dorsal view; d-f. pre-epigyne, dorsal view, scale bar 100 µm

(Fig. 2b), *T. formicinus* (Fig. 2c) (see Buchar 1997, Kůrka 1997, Buchar & Růžička 2002) and *T. aridorum* (Šilhavý 1940). The only specimen of *T. aridorum* that has ever been found is a subadult female that obviously belongs to one of the other three species known from this site. Also, in similar habitats in Baden-Württemberg (Badberg, Kaiserstuhl) only the two species, *T. arenarius* and *T. formicinus*, have been found (Bauer & Höfer 2017). It is probably neither *T. arenarius* nor *T. atratus*, as these species are smaller (Logunov 1996). On the other hand, the body size corresponds well to the body size of *T. formicinus* subadult females (Tab. 1). Concerning pre-epigyne morphology, the parallel slits resemble those in *T. formicinus* and *T. arenarius* (Fig. 2d, f), rather than the diverging ones in *T. atratus* (Fig. 2e, j). Comparing *T. formicinus* and *T. arenarius*, it is closer to *T. formicinus* (Fig. 2f), where the sclerotized pockets, visible under transparent cuticle, run deeper to the sides than in *T. arenarius* (Fig. 2d).

The immature epigyne irregularly present in subadult females of some spider species (e.g. in Eresoidea, Lycosoidea, Dionycha) has been a source of confusion in many taxonomic studies. For example, the type specimen of *Storkaniella jani-*

nensis Kratochvíl & Miller, 1940 appeared to be a subadult female of *Adonea fimbriata* Simon, 1873 (Miller et al. 2012).

After his short interest in spiders, Vladimír Šilhavý focused on harvestmen. Despite being an amateur (he was a medical doctor), he became one of the greatest experts in opilionology (Pinto-da-Rocha et al. 2007). Among other topics, he invested great efforts to describe juvenile stages of central European harvestman species in particular (Šilhavý 1948, 1956). However, at the time when he found and described *T. aridorum*, he was still in his twenties and had only just started to gain experience in arachnology.

Acknowledgements

We thank Petr Dolejš for finding, loaning and measuring the type material of *Thanatus aridorum* and the *Thanatus* material for comparison, Simeon Indzhov, Carmen Urones and Ěva Szita for comments and Ondřej Vaněk for help with the photographs. MŘ was supported by the Ministry of Agriculture of the Czech Republic (MZe RO0418). VR was supported by the institutional project RVO: 60077344.

References

Bauer T & Höfer H 2017 Erstnachweis von *Oxyopes lineatus* in Deutschland und faunistisch-taxonomische Anmerkungen zu weiteren besonderen Arten aus Baden-Württemberg (Araneae: Lycosidae, Oxyopidae, Salticidae, Thomisidae, Trachelidae). – Arachnologische Mitteilungen 53: 29–37 – doi: [10.5431/aramit5305](https://doi.org/10.5431/aramit5305)
 Buchar J 1997 Změny ve složení arachnofauny mohelenské hadcové stepi v letech 1942 až 1995. [Changes in the composition of the arachnofauna of the Mohelno serpentine stony steppe between 1942 and 1995]. – Přírodovědný sborník Západoomoravského muzea v Třebíči 28: 1–28 [in Czech, with English summary]
 Buchar J & Růžička V 2002 Catalogue of spiders of the Czech Republic. Peres, Praha, 351 pp.

Tab. 1: Carapace lengths of the adult and subadult females of the three *Thanatus* species occurring at the type locality of *Thanatus aridorum*. The measured material comes from the north Pannonian region (south Moravia and south Slovakia). Measurements are in mm. The only interval to which the carapace length of the type specimen of *Thanatus aridorum* fits (2.8 mm) is marked in bold

<i>Thanatus</i> species	Subadult female	Adult females
<i>atratus</i>	1.5–1.9 (n = 7)	1.8–2.2 (n = 6)
<i>arenarius</i>	1.9–2.7 (n = 5)	2.3–2.5 (n = 4)
<i>formicinus</i>	2.7–2.9 (n = 3)	2.6–3.3 (n = 5)

- Logunov DV 1996 A critical review of the spider genera *Apollophanes* O. P.-Cambridge, 1898 and *Thanatus* C. L. Koch, 1837 in North Asia (Araneae, Philodromidae). – *Revue Arachnologique* 11: 133-202
- Kůrka A 1997 A survey of spider species (Araneida) in Prof. F. Miller's collection (Department of zoology, Museum of Natural History – National Museum), part III: Thomisidae and Philodromidae. – *Časopis Národního muzea, Řada přírodovědná* 166: 47-54
- Miller F 1943 Neue Spinnen aus der Serpentinsteppe bei Mohelno in Mähren. – *Entomologické listy* 6: 11-29
- Miller F 1947 Pavoučí zvířena hadcových stepí u Mohelna [Spiders of the serpentine rocky steppes near Mohelno]. *Archiv Svazu na výzkum a ochranu přírody i krajiny v zemi Moravskoslezské* 7: 1-128 [in Czech, with French summary]
- Miller F 1949 The new spiders from the serpentine rocky heath near Mohelno (Moravia occ.). – *Entomologické listy* 12: 88-98
- Miller F 1971 Řád Pavouci – Araneida [Order Spiders – Araneida]. In Daniel M & Černý V (eds), *Klíč zvířeny ČSSR IV* [Key to the fauna of Czechoslovakia IV]. ČSAV, Praha. pp. 51-306 [in Czech]
- Miller JA, Griswold CE, Scharff N, Řezáč M, Szűts T & Marhabaie M 2012 The velvet spiders: an atlas of the Eresidae (Arachnida, Araneae). – *ZooKeys* 195: 1-144 – doi: [10.3897/zookeys.195.2342](https://doi.org/10.3897/zookeys.195.2342)
- Nentwig W, Blick T, Bosmans R, Gloor D, Hänggi A & Kropf C 2022 Spiders of Europe, version 02.2022. – Internet: <https://www.araneae.nmbe.ch> (1. Feb. 2022) – doi: [10.24436/1](https://doi.org/10.24436/1)
- Pinto-da-Rocha R, Machado G & Giribet G (eds) 2007 *Harvestmen: the biology of Opiliones*. Harvard University Press, Cambridge, MA. 608 pp.
- Řezáč M, Růžička V, Hula V, Dolanský J, Machač O & Roušar A 2021 Spiders newly observed in Czechia in recent years – overlooked or invasive species? – *BioInvasions Records* 10: 555-566. – doi: [10.3391/bir.2021.10.3.05](https://doi.org/10.3391/bir.2021.10.3.05)
- Růžička V & Buchar J 2008 Dodatek ke katalogu pavouků České republiky 2001–2007 [Supplement to the Catalogue of Spiders of the Czech Republic 2001–2007]. – *Sborník Oblastního muzea v Mostě, řada přírodovědná* 29-30 [2007/2008]: 3-32 [in Czech and English]
- Růžička V, Kůrka A, Buchar J & Řezáč M 2005 Czech Republic – the type material of spiders (Araneae). – *Časopis Národního muzea, Řada přírodovědná* 174: 13-64
- Šilhavý V 1940 *Thanatus aridorum* n. sp., nový pavouk z mohelnské hadcové stepi [*Thanatus aridorum* n. sp. (Aran., Thomisidae), e desertis serpentinicis apud Mohelno, Moravia occidentalis, descriptus]. – *Entomologické listy* 3: 14-15 [in Czech and Latin]
- Šilhavý V 1941 *Thanatus dvořáki* nov. spec., nový pavouk z Mohelnské hadcové stepi [*Thanatus dvořáki* nov. spec. (Aran. Thomisidae), e desertis serpentinicis apud Mohelno, Moravia occidentalis, descriptus]. – *Časopis Československé společnosti entomologické* 38: 77-78 [in Czech and Latin]
- Šilhavý V 1948 Zvířena sekáčů (Opiliones) mohelnské hadcové stepi [Les Opilions de la steppe de serpentine pres de la ville de Mohelno]. Mohelno. Soubor prací věnovaných studiu významné památky, Sv. 8. Svaz na výzkum a ochranu přírody i krajiny v zemi Moravskoslezské, Brno, 99 pp. + 10 tab.
- Šilhavý V 1956 Sekáči – Opilioneida. NČSAV, Praha, 275 pp. [in Czech, Russian and German summaries]
- World Spider Catalog 2022 World spider catalog. Version 23.0. Natural History Museum, Bern. – Internet: <http://wsc.nmbe.ch> (1. Feb. 2021) – doi: [10.24436/2](https://doi.org/10.24436/2)