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FIELD NOTE

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Two new records of *Trithemis annulata* (Palisot de Beauvois, 1807) (Odonata: Libellulidae) in Slovenia

Novi najdbi ciklamnega telovnikarja *Trithemis annulata* (Palisot de Beauvois, 1807) (Odonata: Libellulidae) v Sloveniji

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For Slovenia, 73 dragonfly and damselfly species (Insecta: Odonata) are reported (Vinko et al. 2022a), with *Trithemis annulata* (Palisot de Beauvois, 1807) being the most recent addition to the Odonata fauna of the country (Vinko & Šalamun 2021).

Trithemis annulata is a widespread Afrotropical species, with its range in Europe restricted to the extreme south and eastern Mediterranean coast until the end of the 19th century (Ferreras Romero 1981, Kalkman et al. 2015). Due to the effects of global warming, the species has rapidly expanded its range in Europe in the recent two decades and is now widespread and common in large parts of the eastern and western Mediterranean (Ott 2010, Kalkman et al. 2015, Stefanov & Vasilev 2021, Cabana et al. 2022, Rebassa & Canyelles 2022). Its distribution in Europe is outlined in Vinko & Šalamun (2021), who also prepared a map of its distribution in Slovenia and nearest neighbouring countries. Only recently, the species was discovered for the first time also in Croatia (Koren et al. 2022, Observation.org 2022). Up to this note, only one male imago of *T. annulata* was recorded in Slovenia in July 2021 at Lake Vogršček in the Vipava Valley (Vinko & Šalamun 2021).

In July 2022, two additional interesting observations of the species were made. We recorded *T. annulata* during field trips to Lake Vogršček in the Vipava Valley (W Slovenia) and Lake Škalsko jezero in the Šaleška Valley (N Slovenia) (Fig. 1). The weather was sunny and hot on both occasions. One imago on each location was caught with entomological net. No voucher specimens were taken, and no larvae were sampled. Search for exuviae was performed at Lake Vogršček, although none belonged to *T. annulata*.

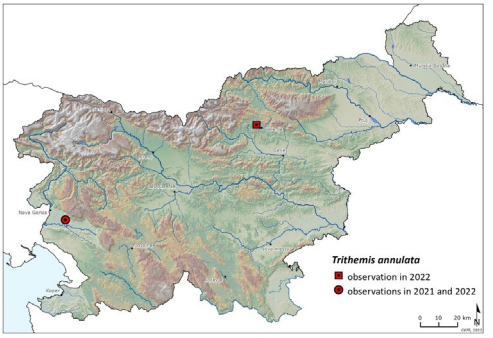

Figure 1. Observations of *Trithemis annulata* in Slovenia.
Slika 1. Najdbe ciklamnega telovnikarja *Trithemis annulata* v Sloveniji.

The first observation originates from the north-eastern inlet of Lake Vogršček (45°54'39.7" N 13°45'05.0" E, 100 m alt., Fig. 1 in Vinko & Šalamun (2021), where the area is also described). Three *T. annulata* males were recorded by the first and the third authors on 2. 7. 2022 (around 12:20 p.m.), almost exactly at the site of the first record for the country (Vinko & Šalamun 2021). Observation of the individuals lasted nearly an hour. At least two males performed rapid flights low over the water up to 15 m from the bank. Two males were also observed engaging in territorial behaviour with males of *Crocothemis erythraea* (Brullé, 1832) and *Orthetrum albistylum* (Sélys, 1848), or with each other. Besides the aforementioned behaviour, one male used a small black alder bush *Alnus glutinosa* (L.) on the bank as a perching site for at least 10 minutes, while another male occasionally perched also on sedges *Carex* sp. and dry reed remnants (Fig. 2).

On the same day prior to this observation, other two inlets of Lake Vogršček were also surveyed without detecting *T. annulata*. In the afternoon of the same day (around 15:30–16:30 p.m.), the north-eastern inlet was surveyed again. However, no *T. annulata* was recorded (Tivadar N. & Kogovšek P., pers. comm.).

Figure 2. One of three *Trithemis annulata* males recorded at the north-eastern inlet of Lake Vogršček (Vipava Valley, W Slovenia) in 2022. The species can be easily identified by its abdomen colour and patterning, frons colour, thorax patterning, wings and veins colouration (photo: D. Goertzen, 2.7.2022).

Slika 2. Eden od treh zabeleženih samcev ciklamnega telovnikarja *Trithemis annulata* na severovzhodnem kraku jezera Vogršček (Vipavska dolina, Z Slovenija) leta 2022. Vrsto zlahka prepoznamo po barvi in vzorcih na zadku, barvi temena, vzorcih oprsja in barvi kril ter ožilja (foto: D. Goertzen, 2. 7. 2022).

Figure 3. Southern shore of the Lake Škalsko jezero (Šaleška Valley, N Slovenia) is the second known location of *Trithemis annulata* in Slovenia, where a single male imago was recorded on the sunny part of the lake further away from the tree on the photo (photo: M. Bahor, 20.7.2022).

Slika 3. Južno obrežje Škalskega jezera (Šaleška dolina, S Slovenija) je drugo znano najdišče ciklamnega telovnikarja *Trithemis annulata* v Sloveniji. Samec je bil zabeležen na osončenem delu jezera naprej od drevesa na fotografiji (foto: M. Bahor, 20. 7. 2022).

Second surprising observation of *T. annulata* was made 120 km as the crow flies northeast from Lake Vogršček at Lake Škalsko jezero in the Šaleška Valley, N Slovenia (46°22'26.43"N 15°06'18.06"E, 375 m alt.). On 20. 7. 2022, a single male was observed there at around 12:10 p.m. Lake Škalsko jezero is one of three lakes where the mining of lignite caused subsidence of the valley, which was gradually flooded with the water from passing streams. It is the oldest and smallest of the three lakes, covering 16 ha, and is nowadays designated for human activities. Southern and south-eastern shores of the lake were investigated during the short excursion by the second author. Some small reeds were present only at the south-eastern part of the lake. Before caught, a single *T. annulata* male flew low over the water at the southern shore of the lake very near to the bank. The bank had recently been mowed, with some bushes and trees present nearby (Fig. 3), hence there was hardly any place available for dragonflies to perch. The recorded *T. annulata* male perched on a wooden stick intended for holding a fishing rod and aggressively defended it against *Orthetrum cancellatum* (Linnaeus, 1758) and *O. albistylum* males.

No additional *T. annulata* individuals were recorded during other field trips to Lake Škalsko jezero later in the season, specifically on 12.8. 2022 (Šabeder N., pers. comm..) and 17. 8. 2022 (Bedjanič M., pers. comm.).

Although new records of *T. annulata* for the country were expected, in western Slovenia at least (Vinko & Šalamun 2021), the record from north-eastern Slovenia is surprising. On the other hand, at least occasional dispersal of the species in Europe also to the east had already been documented some years ago in Hungary (Farkas 2017). The finding of a single imago at Lake Škalsko jezero suggests that our record concerns a wandering specimen of unknown origin not belonging to the local population, whereas individuals from Lake Vogršček are questionable in terms of their origin due to repeated observations in the ensuing years. It is possible that the species reproduced at Lake Vogršček in 2021, with its eggs or/and larvae surviving the winter. However, dispersal of imagoes in both years separately from other populations is also plausible. No female has yet been recorded in Slovenia.

Trithemis annulata inhabits a wide variety of sun-exposed, stagnant and slow-flowing waters, including man-made habitats (Kalkman et al. 2015),

with its larvae developing in 7–8 weeks (Boudot et al. 2017). The species has so far been recorded in Slovenia at two large reservoirs, both of which seem suitable for the establishment of this ubiquitous pioneer species. Due to the ecological characteristics of the species and ongoing climatic changes, further detections, including breeding records, are expected in Slovenia nationwide.

Systematic, state-funded monitoring of the Odonata fauna is not conducted in Slovenia and there are no data on the occurrence of 11 species since 2014 at least (Vinko et al. 2022a, b). The state should immediately start investing more in odonatological knowledge, also owing to the fact that dragonflies and damselflies are a cost-effective and sensitive group to monitor the consequences of human activities, apart from being considered good indicators of climate change (Ott 2010, Termaat et al. 2019). The present article additionally indicates changes in the environment in Slovenia that also affect the Odonata fauna, further confirming an urgent need for monitoring.

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References

Boudot J.-P., Grand D., Wildermuth H., Monnerat C. (2017): Les libellules de France, Belgique, Luxembourg et Suisse (2nd ed.). Biotope, Mèze (Collection Parthénope), 456 pp.

Cabana M., Prunier F., Cordero-Rivera A., Díaz-Martínez C., Miralles-Núñez A., Luque P. (2022): *Trithemis annulata* and *Trithemis kirbyi*: their recent expansion in the Iberian Peninsula. In: Vinko D., Bedjanič M. (Ed.), ECOO 2022, 6th European Congress on Odonatology, 27–30th June 2022, Kamnik, Slovenia. Book of Abstracts, Slovensko odonatološko društvo, Ljubljana, pp. 71.

Farkas S. (2017): A *Trithemis annulata* (Palisot de Beauvois, 1807) elõfordulása Magyarországon. Folia Hist.-Nat. Mus. Matra. 41: 9-10.

Ferreras Romero M. (1981): Un odonato nuevo para la fauna ibérica, *Trithemis annulata* (Palisot de Beauvais, 1805) (Anisoptera, Libellulidae). Bol. Asoc. esp. Entom. 4: 191-193.

Kalkman V.J., Riservato E., Hardersen S. (2015): *Trithemis annulata* (Palisot de Beauvois, 1807). In: Boudot J.-P., Kalkman V.J. (Ed.), Atlas of the European dragonflies and damselflies. KNNV Publishing, Utrecht, pp. 313-315.

Koren T., Koller Šarić K., Kelava L. (2022): The first records of *Trithemis annulata* (Palisot de Beauvois, 1807) (Odonata: Libellulidae) in Croatia. Nat. Croat., *in press*.

Observation.org (2022): Stichting Observation International and local partners, https://observation.org/observation/255595306 [accessed on 7.10.2022]

Ott J. (2010): The big trek Northwards: Recent changes in the European dragonfly fauna. In: Settele J. (Ed.), Atlas of Biodiversity Risk. Pensoft Publishers, Sofia-Moscow, pp. 82-83.

Rebassa M., Canyelles X. (2022): Actualització de l'estatus dels odonats de les Illes Balears. Un repàs a la seva situació des de començaments del segle XX fins a l'actualitat. Boll. Soc. Hist. Nat. Balears 65: 97-115.

Stefanov T., Vasilev V. (2021): First Record of the Violet Dropwing *Trithemis annulata* (Palisot de Beauvois, 1807) (Odonata: Libellulidae) in Bulgaria. Acta Zool. Bulg. 73(4): 637-639.

Termaat T., van Strien A.J., van Grunsven R.H.A., De Knijf G., Bjelke U., Burbach K., Conze K.-J., Goffart P., Hepper D., Kalkman V.J., Motte G., Prins M.D., Prunier F., Sparrow D., van den Top G.G., Vanappelghem C., Winterholler M., Wallis de Vries M.F. (2019): Distribution trends of European dragonflies under climate change. Divers. Distrib. 25(6): 936-950.

Vinko D., Šalamun A. (2021): First record of Violet Dropwing *Trithemis annulata* (Palisot de Beauvois, 1807) (Odonata: Libellulidae) in Slovenia. Nat. Slov. 23(2): 25-37.

Vinko D., Šalamun A., Bedjanič M. (2022a): On the odonates, odonatology and odonatologists in Slovenia. In: Vinko D., Bedjanič M. (Ed.), ECOO 2022, 6th European Congress on Odonatology, 27–30th June 2022, Kamnik, Slovenia, Book of Abstracts. Slovensko odonatološko društvo, Ljubljana, pp. 9-22.

Vinko D., Bedjanič M., Kogovšek P., Tratnik A., Šalamun A. (2022b): Osrednja tema: Kačji pastirji in njihova ogroženost, tudi v luči podnebnih sprememb. Trdoživ 11(1): 11-16.