

New Data on the Range Extension of *Trithemis arteriosa* (Burmeister, 1839) (Odonata) in Turkey

Kamil Hupał¹, Grzegorz Tończyk¹

¹Department of Invertebrate Zoology and Hydrobiology, University of Lodz, 90-237, Banacha 12/16, 90-237 Lodz, Poland;
E-mail: hrupeq@gazeta.pl

Abstract: *Trithemis arteriosa* is one of the most widespread and abundant dragonfly species in Africa, which dominates in open and temporary freshwater habitats. This species is known for its migratory abilities and has expanded its range to Madagascar and Eurasia, reaching to southern Anatolia. Since the first record of *T. arteriosa* in Turkey in 1988, the species has been recorded in other locations reaching as far as Gözcü in the west. This paper provides new data on the range extension of *T. arteriosa* in Belek area, which confirm its further expansion towards north-western part of the Mediterranean coast.

Keywords: *Trithemis arteriosa*, Odonata, Libellulidae, Turkey, range extension

Introduction

The red-veined dropwing *Trithemis arteriosa* (Burmeister, 1839) is one of the most widespread dragonflies in Africa. The distribution of this species ranges from the semi-arid to tropical and humid regions (PINHEY 1970). It is also widespread on the eastern Mediterranean coast as well as in southern Anatolia (BOUDOT 2009). The first record of this species in Turkey was made by DUMONT *et al.* (1988), but prior to that the species had been mentioned by DUMONT (1977) as likely to occur in Turkey. Then, it was recorded in a few other localities as far as Gözcü in the west (KALKMAN *et al.* 2003, KALKMAN, VAN PELT 2006a). Two other records from Hatay and İçel were added by KALKMAN, VAN PELT (2006b) and it appeared as if the species was restricted only to the eastern part of the Mediterranean coast. KALKMAN *et al.* (2012) reported that the range expansion of *T. arteriosa* to the western parts of Turkey was probable on the basis of personal communication by E. van der Ploeg.

The new record described in the present paper was made in June 2011 in Belek area, Serik district, in the coastal area in Turkey (Fig. 1).

Materials and Methods

Two males of *T. arteriosa* were observed at an artificial reservoir (the fountain in front of a hotel) in the Barcelo Tat Beach and Golf Resort.

Results

Trithemis arteriosa (Burmeister, 1839): 1 ♂ found dead, floating on the water surface in the fountain and 1 ♂ perching around the fountain, western Turkey, Belek area; 36.86115°N, 30.984313°E; 25.07.2011.

Discussion

The origin of the genus *Trithemis* is dated to the late Miocene, approximately 6–9 Mya, when savannah was a dominant habitat in Africa. It seems that the evolution of *Trithemis* has started in this period of savannah bloom. However, the main lineages appeared afterwards, in the wet early Pliocene (3.5–5 Mya) (JACOBS 2004, SEPULCHRE *et al.* 2006, DAMM *et al.* 2010). In most cases, aridification disadvantages water-dependent species but it favours adaptations to exposed and temporary conditions, which determine good dispersal ability (SUHLING *et al.* 2009). This may provide the explanation of eurytopicity in the most members of *Trithemis*. Presently, the members of this genus dominate dragonfly communities across Africa. Apart from about 40 continental African species, the genus includes five Asian and two Madagascan endemics (PINHEY 1970, DIJKSTRA 2007). These species inhabit most freshwater habitats in tropical Africa and Asia, from cool permanent streams to warm temporary pools, from desert to rainforest, and from lowlands to highlands. With such a wide range of

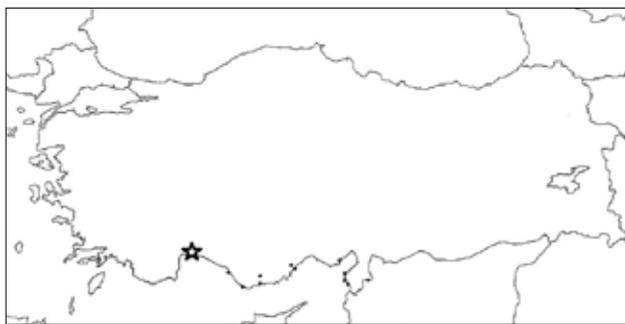


Fig. 1. Distribution of *Trithemis arteriosa* in the Turkey (after Kalkman & van Pelt 2006a). Star refers to the new record of *T. arteriosa* in Belek and dots refer to records presented in Kalkman & van Pelt 2006a

habitat preferences, these dragonflies differ in their dispersal capacities and colouration: the species of open, often temporary, habitats are in most cases bright red and have high dispersal capacity, while those of more sheltered permanent conditions tend to be dark-bodied. In the research conducted by DAMM *et al.* (2010), nine of the 14 of studied red species favoured standing (often temporary) waters and 12 lived in open habitats, whereas only three of the 24 dark species favoured such waters, while 13 dark species preferred half-open or closed habitats, such as forest. Moreover, while the three dark lineages each produced between six and 11 species, the red lineages each gave rise to only one or two, indicating different evolutionary potentials.

As concluded from molecular data, *Trithemis arteriosa* appeared in the early Pleistocene, around

1-1.5 Mya (DAMM *et al.* 2010). Since then it has been able to establish a large range and nowadays, it dominates in the open freshwaters in Africa, Madagascar, and Eurasia. Along with *T. annulata*, this species is the most widespread and abundant odonate in Africa. *T. arteriosa*, as many other red-coloured species of the genus *Trithemis*, inhabits mainly open and temporary water bodies. Interestingly, its sister species *T. hartwigi* is known only from six sites in central Africa and it inhabits exclusively open pools within rainforest, whereas *T. arteriosa* rarely penetrates dense forest (DIJKSTRA 2007, BOUDOT 2009, DAMM *et al.* 2010). In the recent years, the range of *T. arteriosa* outside Africa seemed to be restricted only to the eastern part of the Mediterranean coast with the last documented sighting in Alanya area of western Anatolia (KALKMAN, VAN PELT 2006a). KALKMAN *et al.* (2012), in their work concerning another migrant species, *Orthetrum trinacria*, mentioned that *T. arteriosa* possibly expanded westwards, with being seen in the Muğla province in 2011.

The present study provides first well-documented and described evidence for range expansion of *T. arteriosa* to the western part of Turkey, according to the suppositions of KALKMAN *et al.* (2012). It seems that the red-veined dropwing has been dispersed towards Western Europe since its first record in Turkey in 1988. Therefore, the new records of that species from other parts of the Mediterranean, close to Turkey appear to be just a matter of time.

Acknowledgments: We are grateful to Michal Grabowski for helpful comments on the manuscript.

References

- BOUDOT J. P. 2009. Atlas of the Odonata of the Mediterranean and North Africa. M. Kotarac (Ed.). Gesellschaft deutschsprachiger Odonatologen.
- DIJKSTRA K.-D.B. 2007. Demise and rise: the biogeography and taxonomy of the Odonata of tropical Africa. In: DIJKSTRA (Ed.), Demise and rise: the biogeography and taxonomy of the Odonata of tropical Africa. Ph.D. Thesis, Leiden University, pp. 143–187.
- DUMONT H. J. 1977. A review of the dragonfly fauna of Turkey and adjacent Mediterranean islands (Ins. Odonata). – *Bulletin et Annales de la Société Royale Belge d'Entomologie*, **113**: 119–171
- DUMONT H. J., A. DEMIRSOY and J. MERTENS 1988. Odonata from South-East Anatolia (Turkey) collected in spring 1988. – *Notulae Odonatologicae*, **3** (2), 17–36.
- JACOBS B. F. 2004. Palaeobotanical studies from tropical Africa: relevance to the evolution of forest, woodland and savannah biomes. – *Philosophical transactions of the Royal Society of London B*, **359**: 1573–1583.
- KALKMAN V. J., G. J. VAN PELT 2006a. The distribution and flight period of the dragonflies of Turkey. – *Brachytron*, **10** (1): 83–153.
- KALKMAN V. J., G. J. VAN PELT 2006b. New records of rare or uncommon dragonflies in Turkey (Odonata). – *Brachytron*, **10** (1): 154–162.
- KALKMAN V. J., M. WASSCHER and G. J. VAN PELT 2003. An annotated checklist of the Odonata of Turkey. – *Odonatologica*, **32** (3): 215–236.
- KALKMAN V. J., R. M. KLEUKERS and J. T. TAVARES 2012. First well documented records of *Orthetrum trinacria* for Greece and Turkey (Odonata: Libellulidae). – *Libellula*, **31** (1/2): 89–96.
- PINHEY E. 1970. Monographic study of the genus *Trithemis* Brauer (Odonata: Libellulidae). – *Memoirs of the Entomological Society of Southern Africa*, **11**: 1–159.
- SEPULCHRE P., G. RAMSTEIN, F. FLUTEAU, M. SCHUSTER, J. J. TIERCE-LIN and M. BRUNET 2006. Tectonic uplift and Eastern Africa aridification. – *Science*, **313**: 1419–1423.
- SUHLING F., A. MARTENS and E. MARAIS 2009. How to enter a desert – patterns of Odonata colonisation of arid Namibia. – *International Journal of Odonatology*, **12** (2): 287–308.

Received: 14.04.2014
Accepted: 16.10.2014