

Lindenia tetraphylla (Odonata: Gomphidae) first record for Romania and future perspectives

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Summary: *Lindenia tetraphylla*, a dragonfly species belonging to the family Gomphidae, is recorded for the first time in Romania. This study documents the discovery and discusses its potential distribution and future perspectives in Romania. Given the changing climatic conditions and habitat modifications, this finding raises questions regarding the species' range expansion and conservation status in the region.

Key words: *Lindenia tetraphylla*, dragonflies, first record, conservation.

Introduction

In the last years, some shifts in distribution of dragonflies were recorded, with some southern species spreading further to the north and colonizing new areas in Central Europe (OLSEN *et al.* 2022). These are mostly known migrants, with *Selysiothemis nigra* (VANDER LINDEN, 1825) being the last one recorded from Romania (DE VRIES *et al.* 2017).

In the last years, several new dragonflies species were discovered for the first time in Romania, like *Somatochlora arctica* (DE KNIJF *et al.* 2011), *Aeshna subarctica* (FLENKER 2011), *Epitheca bimaculata* (MANCI 2012), *Selysiothemis nigra* (DE VRIES *et al.*

2017). Also, *Nehalennia speciosa* was rediscovered after 70 years (MANCI 2012), as well as new populations of *Cordulegaster heros* outside its known range (MANCI 2012).

Lindenia tetraphylla (VANDER LINDEN, 1825) is a widely distributed species in Eurasia, with an areal ranging from Spain to Afghanistan and western Pakistan, with few known records from North Africa (BOUDOT and KALKMAN 2015) (Fig. 1). In Africa, it was recently rediscovered after more than 100 years of apparent absence (KUNZ and KUNZ 2001, ELSOWAYEB *et al.* 2021). Despite its broad range, in Europe, it is primarily found in the Mediterranean region, with the highest number of populations in



Fig. 1. Known areal of *Lindenia tetraphylla* (after GBIF in 6 December 2025) modified to show this paper record (red dot).

Greece. In the region the species was recently recorded from Bulgaria (GASHTAROV and BESHKOV 2010) and Bosnia and Herzegovina (KULIJER *et al.* 2012) and the existence of breeding populations in the area has been demonstrated in 2018 (KOLEV and BOUDOT 2018).

Materials and methods

The last author (A.-R.D.), as the Iron Gate Natural Park biologist, during one of the routine biodiversity monitoring activities in the protected area, found one male of *L. tetraphylla*. In Iron Gate Natural Park biodiversity surveys are permanent activities being conducted by the park personnel (biologist and rangers) as well as volunteers.

The species identification was made based on morphological characteristics following standard Odonata identification keys (DIJKSTRA and LEWINGTON 2020). Photographic evidence and geolocation data were recorded to confirm the occurrence. The specimen was labeled and deposited in a dry envelope, in the personal collection of the second author (A.-R.D.).

Results

A single specimen, a male, of *L. tetraphylla* was found dead on side of the road presumably being hit by a car (Fig. 2). The specimen was labelled as follows:

“Romania, Caraş-Severin county, Iron Gate Natural Park, Sichevița (near), 44.6884°N, 21.8501°E, side of the road, killed by car, 16 July 2021, leg. Amalia-Raluca Dumbravă, *Lindenia tetraphylla* (VANDER LINDEN, 1825) det. Cosmin-Ovidiu Manci, 2021”.

No typical habitat for this species is known in the area. This record represents the first confirmed sighting of *L. tetraphylla* in Romania.

The Gomphidae family, to which *L. tetraphylla* belongs, is a group of dragonflies commonly known as clubtails. *L. tetraphylla* is the biggest species of Gomphidae from Europe and typically develops in freshwater habitats such as large lakes and slow-flowing rivers. It is distinguished by a slender, elongated body and its final segments of the abdomen with a unique structure, which gives it a „clubtail” appearance (Fig. 3). Adults of *L. tetraphylla* can often be spotted very far from suitable places for breeding, the species being well known for being a vagrant one (BOUDOT and KALKMAN 2015).

Discussion

The specimen of *L. tetraphylla* is most likely a vagrant specimen and it is known that this species has expanded its known breeding range in the last years (KOLEV and BOUDOT, 2018).

The presence of *L. tetraphylla* in Romania raises questions regarding its origin. It is possible that this



Fig. 2. *Lindenia tetraphylla* in Romania, showing also the collected specimen.



Fig. 3. Adult female of *Lindenia tetraphylla* from Greece (photo: Cosmin O. Mancu)

recorded male originated from breeding populations in Croatia or Bulgaria, where stable populations have been documented. However, given the species' strong migratory ability, it is also plausible that unknown breeding populations exist closer to Romania. Climate change, habitat alteration, and increasing connectivity between water bodies (dams on rivers) may contribute to the northward expansion of this species.

Another important aspect is also the fact that *L. tetraphylla* is a protected species of Community interest and is included in Annexes II and IV of Directive 92/43/EEC (known as the Habitats Directive). Future studies should focus on systematic monitoring to determine if more than vagrant specimens exist. Conservation measures should be considered if breeding populations are discovered, particularly in the context of wetland protection and biodiversity conservation.

Future Perspectives

Considering the species' ability to migrate over long distances and its preference for wetland habitats, there is a possibility that *L. tetraphylla* could establish breeding populations in Romania. Climate change is leading to increased temperatures and changes in precipitation patterns, which may create favorable conditions for the species. Monitoring efforts should focus on identifying potential breeding sites and assessing habitat suitability to determine whether the species is expanding its range naturally. Conservation strategies should also be developed in accordance with European biodiversity protection frameworks to ensure the species' long-term viability in Romania.

Conclusion

This study provides the first record of *L. tetraphylla* in Romania, highlighting the need for continued

monitoring and research on its distribution and ecological requirements. Understanding the factors driving its expansion will be crucial for assessing potential conservation strategies.

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