

Rediscovery of *Libellulosoma minutum* in the littoral forests of southeast Madagascar (Odonata: Corduliidae)

Sam Hyde Roberts^{1,2}, Larissa Barker¹, Lucia Chmurova¹, Klaas-Douwe B. Dijkstra³ & Kai Schütte⁴

¹SEED Madagascar. Studio 7, 1A Beethoven Street, London, W10 4LG, UK;
samhyderoberts@seedmadagascar.org

²Oxford Brookes University, Headington Road, Gipsy Lane, Oxford, OX3 0BP, UK

³Naturalis Biodiversity Center, P.O. Box 9517, 2300 RA Leiden, The Netherlands;
kd.dijkstra@naturalis.nl

⁴University of Hamburg, Animal Ecology and Conservation, 20146 Hamburg, Germany;
kai.schuette@uni-hamburg.de

Abstract. After a period of 109 years without detection, we can here confirm the rediscovery of *Libellulosoma minutum* Martin, 1907, in the southeast of Madagascar. Previously known only from historical collections with vague locality data, five individual males were observed in and around the littoral forest fragments of Sainte Luce between 2016–2017. These observations represent the first reported sightings of this ‘Data Deficient’ (IUCN) species in the wild since René Martin first described it in 1907. Although we cannot be certain Sainte Luce represents the type locality for the species, it must be considered an important area for future monitoring and conservation. A crucial correction is provided regarding the species name.

Further key words. Dragonfly, Anisoptera, Sainte Luce, Data Deficient, conservation, emendation of specific name

Discovery of a new population of the endangered *Calopteryx exul* in central North Algeria (Odonata: Calopterygidae)

Abdelmadjid Chelli¹, Rabah Zebsa² & Rassim Khelifa³

¹Laboratoire de Zoologie Appliquée et d'Ecophysiologie Animale, Faculté des Sciences de la Nature et de la Vie, Université de Bejaia, Algeria; mchelli70@yahoo.fr

²Département de Biologie, Université 8 Mai 1945 Guelma, BP. 401 Guelma 24000, Algeria; rabahzebsa@yahoo.fr

³Biodiversity Research Centre, University of British Columbia, 2212 Main Mall Vancouver, B.C. V6T1Z4, Canada; rassimkhelifa@gmail.com

Abstract. A new population of the endangered North African endemic damselfly *Calopteryx exul* Selys, 1853, is reported from Algeria. The species was found on the Bousselam river in Bejaia province, central North Algeria, in three different localities. Reproductive behaviour was observed. These new findings extend the known geographic range of the extant populations of the species in Algeria.

Further key words. Damselfly, Zygoptera, North Africa, Maghreb

***Sympetrum arenicolor* (Odonata: Libellulidae) new to Armenia**

Vasil Ananian¹ & John L. Muddeman²

¹ Bashinjaghyan street 179., apartment 23, 0078 Yerevan, Armenia; gomphus@gmx.com

² Calle Alcocer 1 1C, Fresnedillas de la Oliva, 28214 Madrid, Spain; john@spainbirds.com

Abstract. *Sympetrum arenicolor* is reported from Armenia, for the first time on the basis of a voucher specimen and photographic records. On 09-ix-2017 a putative female was photographed, and on 09-ix-2019 a male and a female, initially in tandem linkage, were photographed and examined in the hand. The occurrence of *S. arenicolor* in the Caucasus region is briefly summarised and discussed.

Further key words. Dragonfly, Anisoptera, Transcaucasus, southern Caucasus ecoregion, new record

Introduction

Sympetrum arenicolor Jödicke, 1994, has a predominantly Central Asian distribution with its range stretching westwards to northern Iran, south-eastern Turkey, Iraq, north-eastern Syria and Israel (BORISOV 2006; BORISOV & HARITONOV 2008; BOUDOT et al. 2009). The species is widespread in the east of its range, but known locations at the western limits are scarce. In the Caucasus region, BARTENEV (1929) lists four specimens possibly pertaining to this species from the Tbilisi area, Georgia (under the erroneous name *Sympetrum decoloratum* Selys, 1884). SCHRÖTER (2010) rejected these records due to the impossibility of making an unambiguous species determination of the former, mentioned “*S. decoloratum*” and reported the first authenticated record for the country in June 2006, again in the Tbilisi area. General doubts on the reliability of *a priori* attribution of old records of “*S. decoloratum*” to *S. arenicolor* were confirmed by examination of the remnants of the odonate collection of the Georgian National Museum (GNM) (*cf.* SEEHAUSEN et al. 2016). One year earlier the species was discovered in Azerbaijan (JÖDICKE et al. 2009), and this was followed by an additional record from Georgia (SEEHAUSEN et al. 2016).

Description of a putative hybrid between *Ischnura cyane* and *I. capreolus* from Colombia (Odonata: Coenagrionidae)

Néstor Galindo-Ruiz^{1*}, María Isabel Velasquez-Velez¹, Yiselle Cano-Cobos¹, Rosa Ana Sánchez-Guillén² & Emilio Realpe¹

¹Laboratorio de Zoología y Ecología Acuática LAZOE, Departamento de Ciencias Biológicas, Universidad de los Andes, Bogotá, Colombia; nf.galindo1363@uniandes.edu.co

²Red de Biología Evolutiva, Instituto de Ecología INECOL, Xalapa, Veracruz, México

*Corresponding author

Abstract. Putative hybrids between the sibling species *Ischnura capreolus* and *I. cyane* from the Colombian Cordillera Oriental are reported from the department of Cundinamarca, central Colombia, where species are known to occur sympatrically. *Ischnura capreolus* is quite widespread in South America, from sea level to 1 750 m a.s.l., while *I. cyane* is a Colombian endemic restricted to altitudes between 1 300 and 2 200 m a.s.l. Hybridisation may be a result of the changes in distribution of both species leading to increasing sympatry. The putative hybrid is described and illustrated and compared with both putative parental species.

Further key words. Damselfly, Zygoptera, hybridisation, heterospecific matings, Andes, Eastern Ranges, endemic

How do emerging damselflies cope with predator attacks? (Odonata: Zygoptera)

Beat Schneider¹ & Hansruedi Wildermuth^{2*}

¹ Wolfbühlstrasse 34A, CH-8408 Winterthur, Switzerland; beatsch@bluemail.ch

² Haltbergstrasse 43, CH-8630 Rüti, Switzerland; hansruedi@wildermuth.ch

* Corresponding author

Abstract. Emerging damselflies are vulnerable to predator attacks and considered to be at high risk at this stage of their life cycle. We filmed bird and frog attacks on damselflies ready to emerge in slow motion and analysed their reactions. Pharate damselfly larvae that had left the water reacted to approaching wagtails and frogs by disengaging from the substrate, dropping with flipping movements back into the water and trying to swim away rapidly thus escaping these predators. It is inferred that until immediately before eclosion, pharate larvae that have left the water are able to recognize approaching predators and to react adaptively. Death feigning only occurs after physical contact with the predator.

Further key words. Damselfly, Zygoptera, White Wagtail, Marsh Frog, *Enallagma cyathigerum*, predator avoidance, predator recognition, escape behaviour, death feigning, thanatosis

The West Palearctic biting midge *Forcipomyia paludis* (Diptera: Ceratopogonidae): first evidence as a parasite on Odonata wings from the Caucasus ecoregion

Hansruedi Wildermuth^{1*}, Asmus Schröter² & Stefan Kohl³

¹ Haltbergstrasse 43, 8630 Rüti, Switzerland; hansruedi@wilderdmuth.ch

² Tsulukidse street 18, 0190 Tbilisi, Georgia; Asmus.Schroeter@gmx.de, ORCID ID: 0000-0002-3655-2304

³ Fuchsgasse 5, 8610 Uster, Switzerland; Stefan.kohl@bluewin.ch

* corresponding author

Abstract. The biting midge *Forcipomyia paludis* (Macfie, 1936) was found parasitizing seven Odonata species and subspecies in Georgia, southern Caucasus ecoregion, ca 1 800 km east of the nearest known occurrence in Europe. It is suggested that the distribution of this species ranges continuously from Ireland and Spain to the Caucasus. Three new host species and two new host subspecies are added to the list of considerably more than 70 Odonata species previously recorded as hosting this midge.

Further key words. Dragonfly, damselfly, Anisoptera, Zygoptera, Georgia, southern Caucasus ecoregion, Transcaucasus, biogeography, ectoparasites

The biting midge *Forcipomyia paludis* as a parasite of Odonata in North Africa (Diptera: Ceratopogonidae)

Jean-Pierre Boudot¹, Peter Havelka² & Andreas Martens³

¹Immeuble Orphée, Apt 703, Cidex 62, 78 rue de la Justice, Ludres, France; jean.pierre.boudot@numericable.fr

²Staatliches Museum für Naturkunde Karlsruhe, Erbprinzenstr. 13, 76133 Karlsruhe, Germany; peter.havelka@smnk.de

³Institut für Biologie und Schulgartenentwicklung, PH Karlsruhe, Bismarckstr. 10, 76133 Karlsruhe, Germany; martens@ph-karlsruhe.de

Abstract. In June and July 2013, at two streams in the Middle Atlas Mountains, Morocco, ceratopogonid midges were photographed on and taken from the wings of six species of odonates. The specimens were identified as *Forcipomyia paludis*, a widespread European ceratopogonid midge new to Africa. The data increase the range of known hosts with the addition of *Cordulegaster princeps*, *Gomphus simillimus maroccanus* and *Onychogomphus boudoti*.

Further key words. Dragonfly, Anisoptera, Maghreb, Morocco, first record

An ectoparasite of caterpillars, *Forcipomyia fuliginosa* (Diptera: Ceratopogonidae), recorded sucking haemolymph from an *Aeshna juncea* just before maiden flight (Odonata: Aeshnidae)

Malte Seehausen¹, Bernd Kunz², Peter Havelka³ & Andreas Martens⁴

¹Museum Wiesbaden, Friedrich-Ebert-Allee 2, 65462 Wiesbaden, Germany; malte.seehausen@museum-wiesbaden.de

²Hauptstraße 111, 74595 Langenburg, Germany; libellenbernd@gmail.com

³Staatliches Museum für Naturkunde Karlsruhe, Erbprinzenstraße 13, 76133 Karlsruhe, Germany; peter.havelka@smnk.de

⁴Institut für Biologie und Schulgartenentwicklung, PH Karlsruhe, Bismarckstraße 10, 76133 Karlsruhe, Germany; martens@ph-karlsruhe.de

Abstract. In June 2014, in a mire near Nadibani, Georgia, a female biting midge of *Forcipomyia* (*Microhelea*) *fuliginosa* was found parasitizing a female of *Aeshna juncea* just before its maiden flight. The midge was observed sucking at a soft area of the mesothorax. *Forcipomyia fuliginosa* is well known as an ectoparasite of caterpillars and sawfly larvae.

Further key words. Dragonfly, Anisoptera, Transcaucasus, southern Caucasus ecoregion