



Zootaxa 3658 (1): 001–081  
www.mapress.com/zootaxa/

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# Monograph

ISSN 1175-5326 (print edition)

**ZOOTAXA**

ISSN 1175-5334 (online edition)

<http://dx.doi.org/10.11646/zootaxa.3658.1.1>

<http://zoobank.org/urn:lsid:zoobank.org:pub:C02D1C74-25C0-41DD-B098-62098EB7B62A>

# ZOOTAXA

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## **Review of the Balkan *Isophya* (Orthoptera: Phaneropteridae) with particular emphasis on the *Isophya modesta* group and remarks on the systematics of the genus based on morphological and acoustic data**

DRAGAN P. CHOBANOV<sup>1,6</sup>, BEATA GRZYWACZ<sup>2</sup>, IONUȚ Ș. IORGU<sup>3</sup>, BATTAL CIPLAK<sup>4</sup>, MAYA B. ILIEVA<sup>5</sup> & ELŻBIETA WARCHAŁOWSKA-ŚLIWA<sup>2</sup>

<sup>1</sup>*Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvobodite Blvd., 1000 Sofia & 2 Gagarin Street, 1113 Sofia, Bulgaria*

<sup>2</sup>*Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland*

<sup>3</sup>*“Grigore Antipa” National Museum of Natural History, 1 Kiseleff Blvd., Bucharest, Romania*

<sup>4</sup>*Akdeniz University, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 07058 Antalya, Turkey*

<sup>5</sup>*University of Architecture, Civil Engineering and Geodesy, 1 Hristo Smirnenski, 1046 Sofia, Bulgaria*

<sup>6</sup>*Corresponding author. E-mail: dchobanov@gmail.com*



Magnolia Press  
Auckland, New Zealand

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(*Zootaxa* 3658)

81 pp.; 30 cm.

22 May 2013

ISBN 978-1-77557-170-4 (paperback)

ISBN 978-1-77557-171-1 (Online edition)

FIRST PUBLISHED IN 2013 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: [zootaxa@mapress.com](mailto:zootaxa@mapress.com)

<http://www.mapress.com/zootaxa/>

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ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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## Abstract

A critical review of the taxonomy and systematics of the genus *Isophya* from the Balkan Peninsula, together with a revision of the *I. modesta* group, including its representatives outside the Balkans, has been made using morphological, bioacoustic and karyological data. As a result, the following taxonomic considerations have been proposed: (1) the status of two taxa has been reconsidered: *Isophya rhodopensis leonorae* Kaltenbach, stat.n., *I. rhodopensis petkovi* Peshev, stat.n.; (2) five synonymies have been established: *I. hospodar* (Saussure) = *I. hospodar medimontana* Nedelkov, syn.n.; *I. plevnensis* Peshev, sensu novo = *I. pravdini pravdini* Peshev, syn.n.; *I. rhodopensis leonorae* Kaltenbach = *I. kisi* Peshev, syn.n.; *I. obtusa* = *I. pravdini bazyluki* Peshev, syn.n.; *I. modesta* Frivaldszky = *I. modesta intermedia* Kis syn.n. The descriptions of the taxa under consideration are supplemented with unpublished morphological and/or bioacoustic data. An updated list of the taxa occurring on the Balkans includes 24 taxa (21 species, including the doubtful data on *I. camptoxypha*). A dichotomic and tabulated key for recognition and maps of distribution of the established taxa are presented.

**Key words:** Bush-crickets, Barbitistini, Southeastern Europe, Anatolia, grouping, distribution, evolution, keys

## Introduction

The tribe Barbitistini, sometimes considered as the subfamily Barbitistinae (Phaneropteridae), is comparatively widely distributed in the Western Palearctic (Warchałowska-Śliwa *et al.* 2008; Braun 2010) and represents a group of short-winged, sluggish, herbivore bush-crickets. The barbitistines include at present 15 genera and nearly 300 species (Eades *et al.* 2013) and have their centre of speciation and (possibly) recent rapid divergence in the Pontic region. Two of these genera, *Isophya* Brunner von Wattenwyl, 1878 with 89 species (Eades *et al.* 2013)<sup>1</sup> and *Poecilimon* Fischer, 1853, with 134 species (Eades *et al.* 2013), are among the most evolutionary successful and taxonomically complicated bush-cricket groups in the Palearctic.

*Isophya* includes many sibling taxa, which grouping is problematic due to the morphological and bioacoustic transitions between them (e.g. Warchałowska-Śliwa *et al.* 2008; Chobanov 2009a; own unpublished data) and the intraspecific genetic variability observed (Warchałowska-Śliwa *et al.* 2008; Grzywacz-Gibała *et al.* 2010).

On the Balkan mainland, 28 taxa (25 species) of *Isophya* were previously recorded. These are (in alphabetical order): *I. amplipennis* Brunner von Wattenwyl, 1878, *I. andreevae* Peshev, 1981, *I. aff. brevicauda* Ramme, 1931, *I. bureschi* Peshev, 1959, *I. clara* Ingrisch & Pavičević, 2010, *I. dobrogensis* Kis, 1994, *I. gulae* Peshev, 1981, *I. hospodar hospodar* (Saussure, 1898), *I. hospodar medimontana* Nedelkov, 1907, *I. kisi* Peshev, 1981, *I. leonorae* Kaltenbach, 1965, *I. longicaudata adamovici* Peshev, 1985, *I. longicaudata longicaudata* Ramme, 1951, *I. miksici* Peshev, 1985, *I. modesta intermedia* Kis, 1960, *I. modestior* Brunner von Wattenwyl, 1882, *I. obtusa* Brunner von Wattenwyl, 1882, *I. pavelii* Brunner von Wattenwyl, 1878, *I. petkovi* Peshev, 1959, *I. plevnensis* Peshev, 1985, *I. pravdini bazyluki* Peshev, 1985, *I. pravdini pravdini* Peshev, 1985, *I. rectipennis* Brunner von Wattenwyl, 1878, *I. rhodopensis* Ramme, 1951, *I. speciosa* (Frivaldszky, 1867), *I. thracica* Karabag, 1962, *I. tosevski* Pavičević, 1983, *I. zubowskii* Bey-Bienko, 1954. Another poorly known species—*I. lemnotica* Werner, 1932, occurs on the Island of Limnos, neighbouring to the Balkans, but geographically belonging to Anatolia.

These species were referred to a few groups by Warchałowska-Śliwa *et al.* (2008), some of which hardly distinguishable. The richest in species and most complicated one is the *Isophya modesta* group, presently counting 18 taxa (after Chobanov 2009a; Ůnal, 2010): *I. andreevae*, *I. bureschi*, *I. clara*, *I. kisi*, *I. leonorae*, *I. longicaudata adamovici*, *I. longicaudata longicaudata*, *I. miksici*, *I. modesta intermedia*, *I. modesta modesta*, *I. modesta rossica* Bey-Bienko, 1954, *I. petkovi*, *I. plevnensis*, *I. pravdini bazyluki*, *I. pravdini pravdini*, *I. rhodopensis*, *I. tosevski*, and *I. yaraligozi* Ůnal, 2003. The latter has recently been related to the *I. rectipennis* group (Chobanov 2009b) but Ůnal (2010) placed it within *I. modesta* group. The first attempt to clarify the intragroup relationships using molecular genetics (Grzywacz-Gibała *et al.* 2010) revealed conflicting results, showing a combination of high intraspecific variation and poor interspecific resolution.

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1. Otte (Otte, D. 1997. Orthoptera Species File 7: 118) notes the species *I. nigrosignata* Miram, 1938 as a synonym of *I. redtenbacheri* Adelung, 1907 possibly according to the data by Ramme (1951), but Bey-Bienko (1954) gives a description and a diagnosis of the first species and considers both taxa separate species. We herewith prefer to follow the arguments by Bey-Bienko (1954) confirmed with unpublished own data.