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Cacopsylla fraudatrix sp.n. (Hemiptera: Psylloidea) recognised from testis structure and mitochondrial gene *COI*

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Abstract

Cacopsylla fraudatrix Labina & Kuznetsova **sp.n.**, collected from *Vaccinium myrtillus* in Bieszczady Mountains (S. Poland) is described and compared with the most closely related species, *C. myrtilli* (developing on *V. myrtillus*) and *C. ledi* (on *Ledum palustre*) as well as with a distantly related species *C. vaccinii* (on *V. bracteatum*). The identity of the new species is supported by the structure of testes consisting of two follicles each, in contrast to four in *C. myrtilli* and *C. ledi*, and by a molecular phylogenetic analysis based on a 714 bp fragment of the mitochondrial *COI* gene. *C. fraudatrix* **sp. n.** forms a distinct clade in MP, ML and BI trees and differs from *C. myrtilli* by 28 fixed nucleotide substitutions (uncorrected p-distance = 3.92%) and from *C. ledi* by 26 fixed nucleotide substitutions (uncorrected p-distance = 3.64%).

Key words: Psylloidea, *Cacopsylla*, karyotype, testes, *COI*, new species, Poland

Introduction

The holarctic boreo-alpine species *Cacopsylla myrtilli* (Wagner) is widely distributed in North Europe, North Asia and North America, extending south through mountain ranges to Bulgaria (42°N), north-eastern China (35°N) and eastern Canada (52°N). This species is narrowly oligophagous, developing on two species of *Vaccinium* (Ericaceae): bilberry (*Vaccinium myrtillus*) and bog bilberry (*V. uliginosum*). It has been shown that *C. myrtilli* exploits a peculiar reproductive strategy involving either all-female populations or populations heavily biased towards females (Ossiannilsson, 1975; Hodkinson, 1976, 1983; Hodkinson & Bird, 2006; Nokkala *et al.*, 2008; Labina *et al.*, 2009).

Klimaszewski (1971) referred to an unusual, bisexual population of *C. myrtilli* in Bieszczady Mountains (S. Poland, ridges Połonina Caryńska, Wielka Rawka, and Tarnica), at altitudes from 1300 m down to 800 m (Fig. 1). In this population, males and females were found to be equally abundant. We noticed, however, a mismatch in that paper: the surface spinule distribution in *c+sc* cell on the fore wing figured on page 171 is characteristic of another holarctic species, *C. ledi* (Flor), but not of *C. myrtilli* (Fig. 2) according to Ossiannilsson (1992).

Unfortunately, the original material of Klimaszewski has been lost. Therefore, we conducted our own research to clarify the status of this population. During 2007 and 2009, at the locations noted by S. Klimaszewski, we collected 970 specimens of *Cacopsylla* from *V. myrtillus*. Based on body colour and fore wing surface spinule distribution the specimens were identified as *C. ledi*, and this identification was confirmed by D. Burckhardt (Naturhistorisches Museum, Basel, Switzerland). However, *C. ledi* is known to be monophagous on *Ledum palustre* (Ericaceae), but not recorded from *V. myrtillus*. The evidence thus suggested that the Bieszczady specimens belong to an unknown species of *Cacopsylla* close to *C. myrtilli* and *C. ledi*.

We initiated an investigation of this population using different approaches. Specimens from Bieszczady Mountains were analyzed in respect of characters of external morphology traditionally used in taxonomy of