



A new feather mite species of the genus *Proctophyllodes* Robin, 1877 (Astigmata: Proctophyllodidae) from the Long-tailed Tit *Aegithalos caudatus* (Passeriformes: Aegithalidae)—morphological description with DNA barcode data

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Abstract

A new feather mites species, *Proctophyllodes valchukae* sp. n., is described from the Long-tailed Tit, *Aegithalos caudatus* (Linnaeus, 1758) (Passeriformes: Aegithalidae), captured in the Primoriye (Russian Far East). The new species belongs to the *tricetratus* species group and is most closely related to *P. stachyris* Atyeo et Braasch, 1966. For the first time for feather mites the standard morphological description is supplemented by sequence data of the mitochondrial cytochrome *c* oxidase subunit I gene fragment (COI) and nuclear D2 region of 28S rDNA.

Key words: Astigmata, feather mites, Proctophyllodidae, new species, DNA barcoding, COI, D2, 28S rRNA, nondestructive DNA extraction

Introduction

The feather mite genus *Proctophyllodes* Robin, 1877 (Astigmata: Analgoidea: Proctophyllodidae: Proctophyllodinae) is the most species-rich genus among all recently recognized feather mite families (Gaud & Atyeo 1996) and currently includes about 155 species (Fritsch 1961; Atyeo & Braasch 1966; Gaud & Fain 1990; Mironov & Kopij 1996; Mironov & Galloway 2002; Badek *et al.* 2008). In the plumage of their avian hosts, these mites, as for most proctophyllodids, inhabit the flight feathers and greater coverts of the wings and also the tail feathers, where they are located in narrow corridors on the ventral surface of the vanes. Mites of the genus *Proctophyllodes* are predominantly distributed on birds of the order Passeriformes and have been recorded so far from representatives of about 35 families; just a few species were reliably recorded from hosts of the orders Apodiformes and Charadriiformes (Atyeo & Braasch 1966).

The systematics and species identification of the genus *Proctophyllodes* are mainly based on the structure of the body terminus and genital region in males, while females of this genus are rather uniform morphologically. In the world revision of this genus, Atyeo and Braasch (1966) arranged all species they had at their disposal into ten morphological groups. Although these authors constructed a clear key to groups, they did not give uniform diagnoses to groups and characterized them in a rather free format listing only main diagnostic features. Besides, these authors clearly acknowledged that some recognized groups are artificial because they were based on arbitrary characters. Subsequently, two more species groups were established (Gaud & Fain 1990; Mironov & Kopij 1996) by splitting some species off groups previously created by Atyeo and Braasch.

A recent preliminary study of phylogenetic relationships in the family Proctophyllodidae (Knowels & Klimov 2011) based on molecular data from four nuclear genes showed that the genus *Proctophyllodes* in the current taxonomic concept is paraphyletic in relation to the two derived genera, *Joubertophyllodes* Atyeo et Gaud, 1971 and *Monojoubertia* Oudemans, 1905.