



DNA barcoding reveals andropolymorphism in *Aclerogamasus* species (Acari: Parasitidae)

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Abstract

Andropolymorphism, defined as discontinuous morphological variability in males, can lead to taxonomic confusion when different male morphs are determined and described as separate species. This study addresses this issue in two occasionally sympatric mite species *Aclerogamasus similis* (Willmann, 1953) and *A. holzmannae* (Micherdziński, 1969) collected in Poland. The females of these two taxa are morphologically indistinguishable but males are quite different, and could be either separate species or one species with two male morphs. We address this question by performing molecular assays, testing variation in a fragment of the mtDNA COI gene and the D2 region of 28S rDNA. Molecular analysis of populations revealed very low variation in the studied gene fragments. All sequences of the D2 region of 28S rDNA (size 375 bp) were identical. Only two COI haplotypes were found, differing by two out of 644 nucleotide positions (0.3% K2P distance). The variant haplotype was found in one *A. similis* male, and probably represents intraspecific variability. The results strongly suggest that all studied females and males belong to only one species with dimorphic males. This finding confirms some earlier opinions on synonymy of both species. Therefore, *Aclerogamasus holzmannae* (Micherdziński, 1969) should be regarded as a junior synonym of *Aclerogamasus similis* (Willmann, 1953). As andropolymorphism has been rarely observed in gamasid mites, we briefly discuss its possible origins and consequences.

Key words: DNA barcode, COI, D2 region of 28S rDNA, polymorphism, gamasid mites, synonymy

Introduction

Sexual dimorphism is well developed in several groups of mites, motivating taxonomists to construct separate keys for males and females. If only one sex of a new species is available for description, there is a considerable risk of synonymous description of an already known species. Similarly, the presence of two or more female or male morphs (gyno- and andropolymorphism, respectively) can increase taxonomic confusion. This study reports a case of andropolymorphism in Gamasida, a phenomenon rarely observed in this group.

Our study concerns two species of gamasid mites, *Aclerogamasus similis* (Willmann, 1953) and *A. holzmannae* (Micherdziński, 1969) (Parasitidae). The original description of *A. similis*, as *Pergamasus similis*, was based only on male specimens (three specimens are present on slides nos. 344-14, 344-16, 232-17 in Willmann's Collection in Zoologische Staatssammlung München, München, Germany, but none is designated as a type) from Salzburg, Austria. The female described by Willmann as *P. similis* did not actually belong to this species. Schmölzer (1953) found this species in Carinthia, and subsequently also in other Austrian localities (Schmölzer, 1995). Athias-Henriot (1967) completed the species description with details of a female from Admont (Styria, Austria), and also found this species in the Sierra de Cazorla (Jaén, Spain). Micherdziński (1969) then described a new species *Pergamasus* (= *Aclerogamasus*) *holzmannae* from Ojców near Krakow, southern Poland.

The males of *A. similis* and *A. holzmannae* are morphologically distinct, but the females are practically identical. In 1971 the following synonyms were proposed, without the use of numerical or molecular data: *A. holzmannae* female = *A. similis*; *A. holzmannae* male = *A. bicalliger* (Athias-Henriot, 1967) by Athias-Henriot (1971); and *A. holzmannae* = *A. similis*, by Karg (1971). Since the males of *A. bicalliger* (Athias-Henriot, 1967; Juvara-Bals,