



Combination of morphological characters and ITS-sequence to characterize a new species of *Macrocheles* (Acari: Macrochelidae)

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Abstract

Macrocheles seraphim sp. nov. is described from French and Moroccan populations. This species was found phoretic on three species of dung beetles: *Scarabaeus laticollis*, *Geotrupes mutator* and *G. spiniger*. It was identified on the basis of morphological characters as belonging to the *M. glaber* group, but also has similarities with *M. muscaedomesticae*. Its systematic position as investigated by genetic analyses using the ITS-1 marker showed that this species was closely related to *M. muscaedomesticae*. Its relationship with *glaber* group species is discussed.

Key words: *Macrocheles seraphim* sp. nov., phoretic mite, ITS-1 sequence, morphology, description, phylogeny

Introduction

Coprophilous mites of the family Macrochelidae are often phoretic on dung beetles, notably Scarabaeidae and Geotrupidae (Costa, 1969; Krantz, 1983), and to a lesser extent on coprophilous flies. *Macrocheles* Latreille 1829 is a widely distributed genus with both widespread species, e.g. *Macrocheles glaber* (Müller, 1860) and those with more restricted distributions, e.g. *M. saceri* Costa, 1967 (Hyatt & Emberson, 1988; Halliday, 2000; Niogret & Bertrand, 2005). Species belonging to the *M. glaber* group are generalist mites carried by various unrelated hosts. Their identification at species level is complex, due to the variability of morphological characters commonly used in taxonomy. In the modern approach to systematics, genetic data can provide new criteria for identification to complement morphological information. A new macrochelid species from France and Morocco has been found on the body of the dung beetles *Scarabaeus laticollis* L. 1867, *Geotrupes mutator* Marsham, 1802 and *G. spiniger* (Marsham, 1802). The new species is described using both morphological characters and genetic analysis of the Internal Transcribed Spacer 1 (ITS-1) of PCR amplified rDNA. This new species has been compared with three related species on the basis of these combined characters as the first step in the reconsideration of the genus *Macrocheles*.

Materials and methods

Specimens of *Macrocheles seraphim* sp. nov. were collected at three sites in France and Morocco on the bodies of various dung beetles: 10 individuals and the holotype came from Trucy l'Orgueilleux, France, 47°45'N, 3°41'E, clay soil, pastured meadow, continental climate, elevation 160 m, April 2006, on *Geotrupes mutator*; 5 individuals from St Martin de Londres, France, 43°46'N, 3°4'E, clay soil, scrubland, Mediterranean climate, elevation 250 m, May 2006, on *Geotrupes spiniger*; 2 individuals from Ifrane, Morocco, 30°N, 5°W, sandy