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New species of *Diamesa* (Diptera: Chironomidae) from Tibet: conspecific males and females associated with mitochondrial DNA

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Abstract

Undescribed females representing four morphological types were found in a collection of adult *Diamesa* from about 5000 m altitude in Rongbuk, Tibet. Short DNA sequences of cytochrome oxidase subunit 2 were used to associate two single males in the material with conspecific females. *Diamesa solhoyi* n.sp. and *Diamesa aculeata* n.sp. are described. The complete type material and additional specimens have been deposited in the Insect Collection at the Institute of Zoology, Academia Sinica, Beijing (IZAS). The sequences are deposited in Genbank with accession numbers AM051227–AM051233.

Key words: Diptera, Chironomidae, *Diamesa*, new species, Tibet, DNA taxonomy

Introduction

Taxonomic decisions are frequently based on studies of dead specimens that have been collected in remote or otherwise hard-to-access habitats. When organisms cannot easily be studied *in situ*, association of sexes and life-history stages can be a challenge. Taxonomies are accordingly rich in historical examples of erroneous associations of males, females, and immature stages. Since the advent of the polymerase chain reaction and the expanding use of automated DNA sequencing, taxonomists have a means to bridge morphological gaps between life-history stages and to establish species identity based on sequence similarities. Such procedures have recently become known as ‘bar coding’ (Hebert et al. 2003).

Diamesa Meigen is a genus of chironomids associated with cool and harsh environments. Larvae are dominant in the kryon zone of glacier fed streams (Sæther 1968, Steffan 1971, Steffan 1974, Flory & Milner 2000, Lods-Crozet et al. 2001) and adults are active on snow at sometimes very low temperatures (Shilova 1978, Koshima 1984). Many *Diamesa* species were originally described from arctic or high-altitude expeditions, and

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