



<http://dx.doi.org/10.11646/zootaxa.3694.1.5>

<http://zoobank.org/urn:lsid:zoobank.org:pub:D444950C-B742-4000-A9CF-81F42A892349>

## The Black Flies (Diptera: Simuliidae) of Iran

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### Abstract

Although Iran has a large geographic area encompassing 13 ecoregions, its simuliid fauna remains largely unexplored. To begin redressing this faunal gap, we reviewed literature records and coupled morphological and chromosomal identifications of material newly collected from 16 sites in Iran. Twenty-three nominal species are now recognized, including new country records for *Simulium crassicaulum* (Rubtsov) and *Simulium alajense* Rubtsov, and the southernmost world record for *Simulium transcaspicum* Enderlein. Multiple cytoforms of the *Simulium aureum* group, *Simulium bezzii* complex, and *Simulium ornatum* group were found.

**Key words:** aquatic insects, biodiversity, black flies, Iran, polytene chromosomes

### Introduction

With a total area of nearly 1.65 million km<sup>2</sup>—7% of it in water—Iran is the eighteenth largest country in the world. Its non-marine environment is comprised of 13 terrestrial ecosystems (World Wildlife Federation 2013a, 2013b). Despite its size, altitudinal range (>5600 m), and wealth of biological and geological diversity, Iran remains poorly known in terms of its simuliid fauna, with only 21 species heretofore known from the country—about 1% of the global total (Crosskey 2002, Adler & Crosskey 2013).

The published literature on the black flies of Iran is sparse, consisting of five dedicated papers and a scattering of notes in geographically more inclusive papers. Ardalan & Sanajian (1979) presented methods for rearing Iranian black flies in the laboratory. Crosskey (2002) summarized the species known from Iran (and Iraq) and provided identification keys to 16 species. Nikdel et al. (2003) reported lesions on cattle from bites by *Simulium margaritae* (Rubtsov), and Youssefi et al. (2008) described human dermatitis caused by black flies (*Simulium* sp.) in Iran. Yankovsky (2010) recorded four species from Iran, including three described as new on the basis of females.

Studies of larval ecology, host-feeding and vector dynamics, and a range of other biological subjects involving simuliids in Iran rely on an accurate and comprehensive taxonomic framework. Toward the goal of improved taxonomic understanding, we present an updated review of the black flies of Iran, including information on newly collected material that we analyzed chromosomally and morphologically.