



Three new species of *Grylloblatta* Walker (Insecta: Grylloblattodea: Grylloblattidae), from southern Oregon and northern California

SEAN D. SCHOVILLE

Université Joseph Fourier Grenoble, Centre National de la Recherche Scientifique, TIMC-IMAG UMR 5525, Equipe Biologie Computationnelle et Mathématique, 38041 Grenoble, France. E-mail: Sean.Schoville@imag.fr

Abstract

Grylloblatta oregonensis new species, *Grylloblatta siskiyouensis* new species, and *Grylloblatta marmoreus* new species are described from the Klamath Mountains region of Oregon and California, U.S.A. Two species were found at Oregon Caves National Monument, with *G. oregonensis* inhabiting the dark zone of caves and *G. siskiyouensis* inhabiting surface habitat and the twilight zone of caves. The third species, *G. marmoreus*, is known from Big Foot Cave and Planetary Dairy Cave, Marble Mountains, California. These three species are recognized on the basis of morphological characters and distinguished from nearby *Grylloblatta* species. Analysis of genetic data from the cytochrome oxidase subunit II gene supports the morphological diagnosis of these three species as unique lineages and confirms their genetic divergence from other ice-crawler populations found in Oregon and California.

Key words: Oregon Caves National Monument, Marble Mountains, endemic species, ice-crawler, grylloblattid

Introduction

In 1913, Walker discovered and subsequently described *Grylloblatta campodeiformes* from Banff, Canada and established the family Grylloblattidae (1914). Since that time, 10 additional species and two subspecies (Caudell 1924, Gurney 1937, 1953, 1961, Kamp 1963, 1979, Silvestri 1931) have been described in North America, ranging from the Sierra Nevada, California to the Cassiar Mountains in northern British Columbia. Grylloblattids are notoriously rare throughout their range and the lack of adult specimens has resulted in numerous references to isolated populations that have remained undescribed for half a century (Gurney 1953, 1961). The rarity of grylloblattids has also raised concern over their conservation status (IUCN 2010, Jarvis & Whiting 2006).

A need currently exists to update the taxonomy and distributional knowledge of the grylloblattids, particularly in light of recent phylogenetic work identifying several unique genetic lineages that might represent new species of *Grylloblatta* (Jarvis & Whiting 2006, Schoville & Roderick 2010). Here I examine adult specimens from Oregon Caves National Monument and the Marble Mountains, California, and provide a morphological assessment that recognizes three new species. Additionally, I use DNA sequence data to assess the genetic divergence among these three species and confirm their status as unique lineages relative to other grylloblattids from Oregon and northern California.

Material and methods

Morphological analysis. This report is based on the study of adult female specimens from Oregon Caves National Monument, described here as representing two new species, and one adult male specimen from Marble Mountains, California. All specimens in the type series were collected directly into ethanol. Additional samples of grylloblattids from these localities were all juveniles and were not used in the morphological diagnosis, although they were assignable to species based on morphological and genetic criteria. Comparisons were made to museum specimens and published species descriptions. The institutional code CAS cited in the text represents the California Academy of Sciences, San Francisco, California, USA.