

THE LEPIDOPTERA OF WHITE SANDS NATIONAL MONUMENT 7: A NEW SPECIES OF THE GENUS *ARENISCYTHRIS* (SCYTHRIDIDAE), A RECENTLY DISCOVERED ICONIC SPECIES FROM THE MONUMENT

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ABSTRACT. A new species of Scythrididae, *Areniscythis whitesands* sp. nov. Metzler and Lightfoot, is described from a series of specimens that were found active during the daytime on open bare sand of the white gypsum dunes at White Sands National Monument, Otero Co., New Mexico. Adults and genitalia of the male and female are illustrated, and the bionomy of the species is shortly discussed.

Additional key words: New Mexico, Otero County, Tularosa Basin, U. S. National Park Service, white species, endemism, gypsum.

The description of this species is part of a series of papers based on the discoveries of new moth species at White Sands National Monument (White Sands), Otero Co., New Mexico, USA. An arthropod inventory survey of White Sands by Lightfoot resulted in the discovery of a new species of *Areniscythis*, which is here described.

Jean-François Landry (1991) revised the supraspecific taxa of Nearctic Scythrididae with *Areniscythis* Powell, a monotypic genus. Powell (1976) described this genus to include a new species, *A. brachypteris*, collected in 1972 in California coastal dunes. The purpose of this paper is to describe a recently discovered new species of *Areniscythis* in the white gypsum dunes at White Sands, and it is part of efforts by the authors to detect and provide names for new taxa which occur in White Sands. Taxa described in the scientific literature provide tools, ease, and convenience to the National Park Service in administering, managing, and promoting the appropriate and wise use of its natural resources.

MATERIALS AND METHODS

A general arthropod inventory survey was conducted at White Sands during the years 2009–2012 by a team of entomologists from the University of New Mexico. Arthropod sampling was conducted throughout White Sands using a variety of arthropod collection methods including light traps, pitfall traps and general collecting, during the daytime and nighttime in the spring, summer and fall seasons. Specimens of *Areniscythis* were collected during the morning and evening hours in the early summer of 2011 and 2012 on the open gypsum dune crests in association with widely scattered frosted

mint (*Poliomintha incana* (Torr.) A. Gray (Lamiaceae)) shrubs. Specimens collected live in June of 2012 and June 2013 were used for this description.

Genitalia were dissected following procedures outlined in Metzler et al. (2009), except that the dissected parts were dehydrated in 2-Propanol and mounted in Euparal. Terms for morphology and genital structures follow Landry (1991). Photographs of the mounted male and female genitalia were taken with a Nikon™ model D200 camera mounted on the photo tube of a Zeiss® Lumipan Universal Research Microscope using a Leitz 1x plan objective and bright field transmitted light. The camera raw images were processed with Adobe Photoshop® CS6. Measurement for the forewing was made with an ocular micrometer in the eyepiece of a Wild® model M5 stereo-microscope at magnification of 6x.

Identification was made by comparing the specimens to published illustrations of adults and genitalia. Jerry A. Powell examined photographs of adults and male genitalia of this new species. Jean-François Landry examined specimens and genitalia of this new species. Powell and Landry agreed with the diagnosis that this is an undescribed species of *Areniscythis*. Four hind legs, one from each of four specimens of *A. whitesands*, were removed by Landry in 2012 for subsequent BOLD DNA barcoding at the University of Guelph based Biodiversity Institute of Ontario Barcode of Life Database (BOLD).

Specimens examined in this paper are deposited in the following collections:

MSUC A.J. Cook Arthropod Research Collection,
Michigan State University, East Lansing, MI

slopes or on the interdune flats. Two plant species were growing on the dune to

FIGS. 8–11. *Areniscythris whitesands* habitat and collecting technique. **8**, David Lightfoot kneeling over a net with a captured adult. **9**, habitat where type series was collected. **10**, aerial photograph of the type locality (image from Google Earth). The sinuous dark line is a 2 lane road. **11**, male and female in copulation on the open gypsum sand on a dune crest.

Landry (in litt. 2013) obtained results from the University of Guelph based Biodiversity Institute of Ontario Barcode of Life Database (BOLD) DNA CO1 analysis showing that *A. whitesands* is 1.15 % dissimilar from another undescribed species of *Areniscythris*, also collected in New Mexico at La Joya State Game Refuge in Socorro County and at Oasis State Park in Roosevelt Co. BOLD barcode data was obtained from 14 specimens from Socorro and Roosevelt counties. BOLD barcode data was obtained from the legs of four specimens, provided by Metzler, from the type series of *A. whitesands*. The specimens from Socorro and Roosevelt counties are not white. An examination of the genitalia of the specimens from Socorro and Roosevelt counties was not made. *Poliomintha incana* does not occur in the dunes at the Socorro Co. site. DNA barcode results have been shown to distinguish numerous species of Lepidoptera (e.g. Burns et al. 2010, Hajibabaei et al. 2006, Hebert et al. 2004, Janzen et al. 2005, & Landry & Hebert 2013) although in some cases they failed to differentiate closely related species of *Schinia* (Noctuidae) (Pogue et al. 2013). Study of the utility of DNA barcode results pertinent to *Areniscythris*, and more work on the undescribed species from Socorro and Roosevelt counties, NM, is

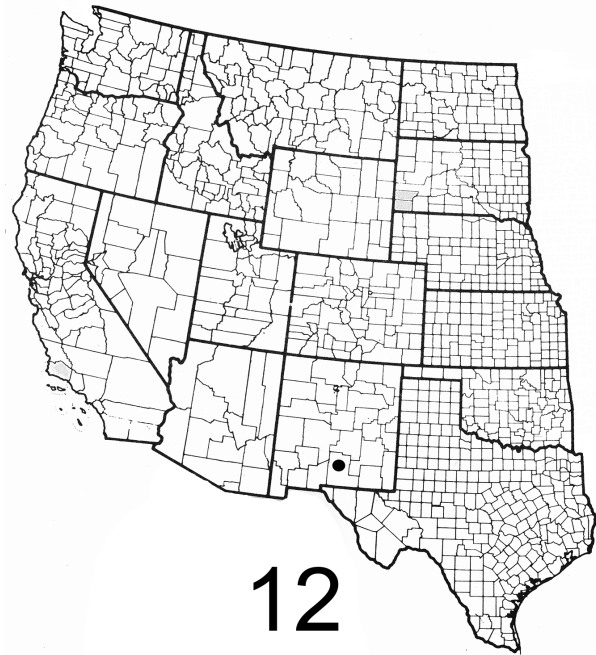


FIG. 12. *Areniscythris whitesands* distribution map. The black dot is in the Tularosa Basin in Otero County in south central New Mexico.

outside the purpose and scope of our research. Landry will presumably pursue the identity of the Socorro and Roosevelt county species.

The species described here joins a growing list of recently discovered species of so called “white species” of moths from White Sands (Metzler et al. 2009, Metzler & Forbes 2011, 2012) (pers. comm. R. W. Hodges 2012, J. D. Lafontaine 2012, J. F. Landry 2012, R. W. Poole 2007, D. J. Wright 2012). White species are those that exhibit white or very pale phenotypes when compared to the same species or closely related species outside the white gypsum dunes.

Genital preparations of *Areniscythris whitesands* require great care. The structure of the gnathos is not obvious when viewed laterally or ventrally. We found it necessary to remove the gnathos while maintaining proper orientation to the genital structure. The female structure is lightly sclerotized and membranous. The parts cannot be discerned without the aid of light staining to distinguish sclerotization from membrane. Most of the structures are membranous and very difficult to separate, especially when placing the structure in mounting medium on a slide. Genitalic slides of six males and four females were studied.

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