ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** IITRI78190
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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Wormaldia planae*
COMMON NAME: A caddisfly
SYNONYMS: *Wormaldia arcopa* (Denning)
FAMILY: Philopotamidae

AUTHOR, PLACE OF PUBLICATION: Ross, H.H. (1956) Evolution and classification of the mountain caddisflies. University of Illinois Press, Urbana, Illinois, 213 pp.

TYPE LOCALITY: Mexico: Chiapas: Finca Vergel

TYPE SPECIMEN: Illinois Natural History Survey (INHS): Insect Collection #38042. A. Dampf (s/n), 19 May 1935. Holotype. INHS 38036, 38038, 38046 and 38044 are paratypes.

TAXONOMIC UNIQUENESS: The caddisfly family Philopotamidae contains five genera in the Nearctic Region, with *Wormaldia,* first described in 1865 by McLachlan, being the second largest (Munoz-Quesada and Holzenthal 2008). NatureServe (2018) list 19 species of *Wormaldia* in the continental U.S. and Canada. Munoz-Quesada and Holzenthal (2008) report 28 species in the New World, the 17 recognized species in the Nearctic Region and 14 in the Neotropical Region. Two species occur in Arizona: *W. arizonensis* is found in AZ, TX and UT, and in Durango and Nuevo Leon, Mexico, while *W. planae* is only found in Arizona (and numerous South and Central American countries, and the Caribbean). Both *W. arizonensis* and *W. planae* are also the only species found in both the Nearctic and Neotropical Regions. *Wormaldia planae* is the most common and widespread *Wormaldia* species in the New World.

DESCRIPTION: Adult: Length of male forewing 4.5–5.0 mm. Head brown, with yellowish setae. Antenna long, slender, yellowish, with small, brown and yellowish rings of small setae. Maxillary palps yellowish, with brown setae. Labial palps yellowish, with brown setae. Dorsum of thorax yellowish. Legs yellowish, with small, brown setae. Forewing yellowish, covered with fine, small, brown setae, with apical forks I, II, III, IV, and V present; hind wing translucent, with few fine, small, brown setae, with apical forks I, II, III, and V present (Munoz-Quesada and Holzenthal 2015).

In the revision of the Nearctic species of *Wormaldia* (Munoz-Quesada and Holzenthal 2008) there are detailed diagrams and description of the diagnostic features used to distinguish this species. Identifications in caddisflies are determined based of characteristics of the male genitalia. In

summary, *W. planae* can be distinguished from the other Nearctic species of this genus by the shapes of tergum VIII and segment X. Tergum VIII in *W. planae* has two conspicuous lateromesal processes posteriorly that enclose a broad U-shaped mesal emargination. Tergum X is complex and subtriangularly elongate with various lobate processes anteromesally and lateromedially, with the apex having a triangular appearance. Some specimens examined showed a slight morphological variation in the shape of the posterior margin of tergum VIII from that of the holotype. In those specimens examined, the two lateromesal processes are slightly shorter, and the U-shaped mesal emargination is shallow.

AIDS TO IDENTIFICATION: Munoz-Quesada and Holzenthal 2008 also provide a dichotomous key to the Nearctic species of *Wormaldia*:

1. Sternum VII with posteromesal process 8
- Sternum VII with posterior margin straight, without mesal process 2

2 (1'). Sternum VIII with slight, convex, posteromesal process 7
- Sternum VIII with posterior margin straight, without mesal process ……..…..…… 3

3 (2'). Tergum X complex, subtriangular, with conspicuous, lobate processes anteriorly or lateromedially 6
- Tergum X simple, triangular, without conspicuous, lobate processes 4

4 (3'). Segment IX, when viewed laterally, posteriorly straight; inferior appendages, when viewed ventrally, paired basal segments united for about their anterior 2/3, separated posteromesally by shallow, U-shaped emargination ..... *W. anilla* (Ross)
- Segment IX, when viewed laterally, posteriorly concave; inferior appendages, when viewed ventrally, paired basal segments united for about their anterior 2/5, separated posteromesally by deep emargination 5

5 (4'). Segment IX, when viewed laterally, narrow, C-shaped in appearance, anterior margin convex, when viewed ventrally, posteriorly projected sinuously with mesal process; inferior appendages, when viewed ventrally, with paired basal segments separated posteromesally by wider emargination ..... *W. pachita* Denning
- Segment IX, when viewed laterally, broad in appearance, enlarged ventrally, anterior margin straight, when viewed ventrally, posteriorly convexly projected with mesal concavity; inferior appendages, when viewed ventrally, with paired basal segments separated posteromesally by narrower emargination ..... *W. strota* (Ross)

6 (3). Segment X, when viewed laterally, its apex prominently balloon-shaped, without lobate projection; superior appendage, when viewed laterally, with dorsomedial margin extended convexly ..... *W. arizonensis* (Ling)
- Segment X, when viewed laterally, its apex semiovate, with lobate projections; superior appendage, when viewed laterally, dorsomedial margin straight ……..…… ***W. planae*** Ross and King

ILLUSTRATIONS:

Photos of generic caddisflies: http://eol.org/pages/1101/media?page=105.

TOTAL RANGE: United States: Arizona, and Mexico, Guatemala, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Venezuela, Guyana, Brazil, Trinidad, Tobago, Grenada and St. Vincent (Flint 1995).

RANGE WITHIN ARIZONA: Central Arizona, in the vicinity of Camp Verde and waterways to the northeast and southeast. The species has been reported from Beaver Creek, Sycamore Creek and Fossil Creek, and from below the outlet of Montezuma Well. Most locations are in eastern Yavapai County and extreme northwest Gila County (Fossil Creek serves as a boundary between the two counties).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Caddisflies are aquatic insects of streams, rivers and lakes. There are over 1200 species in North America. The larvae build a silken tubular case for protection. These slender, finger-shaped, silken tubes are attached in crevices underneath sticks or stones in rapidly flowing water (Flint 1991). They feed by cleaning fine organic particles from the tube's inner surfaces. *Wormaldia* adults are crepuscular and nocturnal (Munoz-Quesada and Holzenthal 2015).

REPRODUCTION: Like many other insects, caddisflies undergo complete metamorphosis (from egg, to larva, to pupae, to adult). Eggs are laid in a suitable aquatic setting, and usually hatch with a few weeks. The larvae build their protective cases and can take 1-2 years before they spin their pupae and become dormant. They remain as pupae for 2-3 weeks, then emerge as adults. When they leave their pupae, splitting their case, they must swim to the surface of the water. The new adults dry their wings and begin their short adult lives as active, sexually mature air-breathing insects. Most adult caddisflies live less than a month (J-Rank Articles and Chamisa, 2018).

FOOD HABITS: Adult caddisflies feed on plant nectar, other plant liquids, or nothing at all. Most caddisfly larva are herbivorous and feed on decaying plant tissue and algae, and diatoms are a preferred algae (Chamisa 2018).

HABITAT: *W. planae* prefer the cooler, spring fed streams in mountainous regions (Flint 1988 referenced in USDA Forest Service 2013, and Flint 1991). During a study in Mexico, larvae were found in the upper part of a slow speed stream, where the substratum was more rocky (Bueno-Soria et al 1981). Oak Creek has one of the highest diversities of aquatic insects in Arizona (Blinn and Ruiter 2009, cited in USDI Bur Rec 2014). Although *W. planae* has yet to be collected there, Spring (Oak) Creek is considered to be suitable habitat (USDI Bur Rec 2014).

ELEVATION: Not specified in the collection records or literature, but general elevations from Fossil Creek and Beaver Creek (in the vicinity of Montezuma Well) range from 2500 – 3700 feet (760 – 1130 m).

PLANT COMMUNITY: Not specified.

POPULATION TRENDS: No information available. The known collections for Arizona were made between 1981 and 1987. When the species was identified in 1999, it was a significant range extension northward from the type locality in southern Mexico. Since there is no further information, known collection sites should be re-visited to determine whether or not the species is still extant in Arizona (see Suggested Projects, below).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: None.
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3, 2013)
[Forest Service Sensitive (USDA, FS Region 3, 2007)]

MANAGEMENT FACTORS: Not specified, but actions that maintain the clean, flowing streams such as Fossil Creek are presumed to be beneficial.

PROTECTIVE MEASURES TAKEN: *W. planae* is listed as a Forest Service Sensitive species. Populations extant at the outlet of Montezuma Well are afforded the additional protection of being within a USNPS National Monument. It is likely that some of the Fossil Creek locations lie within the reach designated as a Wild and Scenic River by Congress in 2009. The occurrence of *W. planae* is a part of the unique faunal assemblage resulted an "outstandingly remarkable" finding in the Fossil Creek Wild and Scenic River Resource Assessment (USDA Forest Service and National Wild and Scenic Rivers System, 2017). The management and conservation of this Fossil Creek reach also serves as a protective measure.

SUGGESTED PROJECTS: The collections in Arizona were made in the 1980s, and then identified in 1999 (Illinois Natural History Survey, 2018). Some of the documented locations (e.g., below Montezuma Well outlet and Fossil Creek) should be resurveyed to ascertain whether or not *W. planae* is still extant. If found again at one or more of the previous collection sites, efforts should be extended to determine if there may be an even wider distribution within Central Arizona. According to the Bureau of Reclamation (2014), Spring (Oak) Creek has suitable habitat for this species.

LAND MANAGEMENT/OWNERSHIP: The vast majority of the collection sites would be on USDA Forest Service land (Coconino and Tonto NF), USDI National Park Service (Montezuma Well NM), and possibly some private land holdings.

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Oliver Flint, Curator Emeritus of Neuropteroid Orders, Smithsonian Institution, Washington, D.C.
Fernando Munoz-Quesada, Instituto de Biologia, Universidad de Antioquia, Medellin, Columbia.
Ralph Holzenthal, Department of Entomology, University of Minnesota, St. Paul, MN.

ADDITIONAL INFORMATION:

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