

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Invertebrate Abstract

Element Code: IITRI34040

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE



ME: *Protoptila balmorhea*
COMMON NAME: Balmorhea Saddle-case Caddisfly
SYNONYMS: None
FAMILY: Glossomatidae

AUTHOR, PLACE OF PUBLICATION: Herbert R. Ross. June 11, 1941. Transactions of the American Entomological Society. 67: 35-126.

TYPE LOCALITY: Balmorhea, Texas.

TYPE SPECIMEN: H.H. and J.A. Ross. Male, no collection number given, April 19, 1939.

TAXONOMIC UNIQUENESS: There are six genera with more than 80 species. "Diagnostic characters are confined to male genitalia" (Raisanen 1991).

DESCRIPTION: Small caddisflies with larvae and adults measuring from 3.0-6.5 mm. Adults are small and dark colored and resemble the microcaddisflies in general appearance and action. The saddle case is an oval flat-bottomed dome of small and large rock fragments. It is open ventrally at both ends. The larvae have a case that resembles a tortoise shell made up of heterogeneous rock material; oval at the top and flat at the bottom. (Raisanen 1991).

AIDS TO IDENTIFICATION: "Wings are long and narrowed with very long fringes and often those of the hind wings are longer than the breadth of the wings. The antennae are shorter than the fore wings and the front tibia lacks apical spurs." (Usinger 1973) (From Raisanen 1991).

ILLUSTRATIONS: Line drawings larvae (Raisanen 1991: 82)
Line drawings larval case (Raisanen 1991: 83)
Line drawings male genitalia (Raisanen 1991: 85)
Color drawing (Voshell 2002)

TOTAL RANGE: Reeves County, Texas and Yavapai County, Arizona.

RANGE WITHIN ARIZONA: Page Springs/Bubbling Ponds/Lolomai Springs/Oak Creek Complex

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Saddle-case caddisfly larvae in general, readily abandon their cases under stress and rebuild them later. They also remake their cases each time they shed their skin. When it is time to pupate, mature larvae usually move to the sides or bottom of a stone where there is less current. Larvae of saddle-case makers use their mouthparts to cut away a strap on the bottom of the case; they then seal the edge of the case to the rock. They use their silk to spin a semi-transparent, capsule like, brown cocoon inside the attached stone case, and transform into the pupa inside of the silk cocoon. Saddle-case makers usually produce two generations per year, and adults emerge from late spring to early fall.

REPRODUCTION: NOTE: Not clear from Raisanen's status report if reference is to *Protophila* in general or to *Protophila balmorhea* specifically. "Adults which live from three weeks to two months mate either on the ground or on vegetation. Mating is often preceded by swarming activity. Oviposition behavior is varied but females generally lay strands or masses of eggs in the water by dipping the abdomen or by crawling or diving into the water" (Raisanen 1991).

FOOD HABITS: NOTE: Not clear from Raisanen's status report if reference is to *Protophila* in general or to *Protophila balmorhea* specifically. "Their method of feeding according to Wiggins (1977) is that of scrapers. Their scraper-like mandibles lacking separate teeth and a membranous fringe on the labrum are typical adaptations for this method of feeding.

Their particular feeding site is the uppermost and generally, more exposed surfaces of rocks where they graze on diatoms, green algae, and fine organic particles (Anderson and Bourne 1974). Wiggins (1977) suggests that the portable cases serve as a protective device for exploiting this food resource rather than enhancement of respiratory efficiency as in the tube-case making families.

They are categorized as herbivores or detritivores that feed on periphyton and fine organic molecules. Gut contents of larvae examined were largely fine organic particles with some diatoms present (Cummins 1973). Wiggins (1977) states that their principal food is diatoms" (Raisanen 1991).

HABITAT: Wiggins (1977) states that because *Protophila* larvae live in somewhat warmer streams, often larger and slower flowing than other members of family, they are the glossomatids of drier and more evenly contoured central parts of the continent (Raisanen 1991).

Merritt and Cummins (1978) report that *Protophila* prefers a lotic erosional habitat.

Adults taken by Milt Sanderson in 1978 along Oak Creek, a warm lotic habitat, characterized by having heavy film of red silt covering bottom (Raisanen 1991).

“Swift spring outfalls with sufficient cobble substrate to support the algal grazing habits of the larvae” (Moulton et al. 1994).

ELEVATION: 3,500 ft. (1,067 m).

PLANT COMMUNITY: Major aquatic macrophytes in Bubbling Springs include *Elodea occidentalis* and *Potamogeton gramineus*. The *Elodea* beds are maintained year-round but the *Potamogeton* beds die out in November and return late March to early April. Other aquatic plants found within the Page/Bubbling/Lolomai Springs/Oak Creek Complex during various times of the year include: *Nasturtium officinale*, *Lemna minor*, *Berula erecta*, *Hydrocotyl verticillata*, *Veronica anagallis-aquatica* and *Rumex verticillatus*. Major macroalgal groups include *Rhizoclonium hieroglyphicum* and *Oscillatoria rubescens*. For further details, see Raisanen, 1991.

POPULATION TRENDS: Collections attempted along Oak Creek in 1990 and 1991, revealing nothing. Appears that populations are either greatly decreasing or inefficient collection methods were used (Raisanen 1991).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]

STATE STATUS:

OTHER STATUS:

MANAGEMENT FACTORS: Unknown

PROTECTIVE MEASURES TAKEN: Unknown

SUGGESTED PROJECTS: Unknown

LAND MANAGEMENT/OWNERSHIP: AGFD – Bubbling Ponds and Page Springs Hatcheries; USFS – Coconino National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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- Moulton, S.R. II, K.W. Stewart, and K.L. Young. 1994. New records, distribution and taxonomic status of some northern Arizona caddisflies (Trichoptera). *Entomological News* 105(3):165.
- NatureServe Explorer: An online encyclopedia of life [web application]. 2002. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: August 12, 2003).
- Raisanen, C. 1991. Status survey of four invertebrates of the Page/Bubbling/Lolomai Springs/Oak Creek Complex. Prepared for U.S. Fish and Wildlife Service. 79-88.
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ADDITIONAL INFORMATION:

Revised: 1992-08-18 (DBI)
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