ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code: IIDIP46010**
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agathon arizonicus*
COMMON NAME: Net-winged midge
SYNONYMS: *Dioptopsis arizonica*, *Dioptopsis alpina*
FAMILY: Blephariceridae

AUTHOR, PLACE OF PUBLICATION: C.P. Alexander. 1958. Geographical distribution of the net-winged midges (Blephariceridae, Diptera). X International Congress of Entomologists (Montreal, 1956) 1:813-828. (Dr. Hogue has reviewed this abstract and has corrected **AUTHOR, PLACE OF PUBLICATION:** to: **AUTHOR, ORIGINAL PLACE OF PUBLICATION:** C.P. Alexander.1958. Undescribed species of nematocerous Diptera. Part V. Bull. Brooklyn Entomological Society 53:48.52 [described on pp.50-51]).

TYPE LOCALITY: *A. arizonica*: Workman Creek, Sierra Ancha Mountains, Gila County, Arizona. *A. alpina*: Lake Alpine, Alpine County, California.

TYPE SPECIMEN: Holotype: Male of *arizonica* in USNM C.P. Alexander collection. No number. Holotype: Male of *alpina* in USNM. No number.

TAXONOMIC UNIQUENESS:

DESCRIPTION: Slender delicate flies, 3.0-13.0 mm long. The eye in both sexes is usually divided transversely into an upper region with larger ommatidia and a lower region with smaller ommatidia. The legs are long with hind leg being stouter than the rest. "A medium-sized, sturdily built, well sclerotized blephericerid. Male distinctly smaller than female. Male coloration: generally dull gray-brown, pruinose. Mesoscutum evenly brownish-gray. Wing membrane hyaline" Hogue (1987). The mouthparts are usually sexually dimorphic with the mandible being present in the female but not the male.

AIDS TO IDENTIFICATION: Mosquito-like in size with long legs. Resemble crane flies but without a V-shaped suture on mesonotum. Anal angle of wing prominent. Wings sometimes with a network of fine lines between the veins. Ocelli present. These flies occur along swift-moving streams in which the larvae live. They are relatively rare. For detailed genera key, see Hogue (Blephariceridae, 1987). *A. arizonicus* adult females superficially resemble those of *A. doanei* and *A. markii*. The well-pigmented body coloration distinguishes it from both. From *A. doanei* it is normally separated by the lack of wing vein R_{2+3} (rarely absent in that species) and by the 14- rather than 15-segmented antennae.

ILLUSTRATIONS: Line drawings of various body parts (Hogue 1987:33)
Line drawings of larval segments and pupa (Hogue 1987:36.)

TOTAL RANGE: According to Hogue (1987), "*A. arizonicus* exhibits a somewhat unusual distributional pattern, ranging through the Cascades from central Oregon, south in the Sierra Nevada and Transverse Ranges of southern California, then reoccurring disjunctly in the highlands of southeastern Arizona."

RANGE WITHIN ARIZONA: Occurs disjunctly in the highlands of southeastern Arizona including Gila and Graham counties.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The following information is for the Blephariceridae as a whole, but is believed to be accurate for the genus *Agathon* as well. "Members of this family are confined to areas in the immediate vicinity of rapidly flowing streams. Larvae and pupae occur on smooth-faced rocks and boulders in swiftly moving or torrential waters, often in waterfalls. The female glues eggs in small groups to rock surfaces. Oviposition evidently occurs when the water level of the stream drops after the onset of the dry season. Eclosion is initiated when the eggs become submerged with the coming of the wet season" (Hogue 1987).

Four larval instars which are able to adhere to rock surfaces because of their flattened bodies and ventral sucking organs. Locomotion accomplished by sideways progression, occurring only when the larvae are alarmed and forward motion accomplished by undulation. Prepupal larvae migrate to cracks and hollows or bare faces of rocks. Only 5-10 minutes required for transformation to pupal stage. Pupa is white with dark gills at first but quickly turns black. Adheres to rock surfaces.

Time required for the emergence of adult from pupal case is unusually short, only 3-5 minutes. Emergence occurs when pupa is submerged or in shallow water, but is probably most common when pupa is at edge of receding water. Wings expand to full size during growth within pupal case, unfolding during emergence and adult is able to fly immediately.

REPRODUCTION: The female glues eggs in small groups to rock surfaces. Oviposition evidently occurs when the water level of the stream drops after the onset of the dry season. Eclosion is initiated when the eggs become submerged with the coming of the wet season. (Hogue 1987).

FOOD HABITS: Larva feeds on diatoms and perhaps algae browsed from the substratum surface. Females in Blephariceridae having mandibles, suck the blood of other similar-sized or smaller, weak, slow-flying Diptera. Food of males and nonmandibulate females is unknown; may feed on flower nectar or on nothing at all.

HABITAT: Members of the family are confined to areas in the immediate vicinity of rapidly flowing streams. Larvae and pupae occur on smoothed-faced rocks and boulders in swiftly moving torrential waters, often in waterfalls. (Hogue 1987).

ELEVATION: Above 6,000 ft. (1830 m), up to 9,300 ft (2835 m) in the Pinaleno Mountains in Arizona.

PLANT COMMUNITY: Pinyon-juniper woodland.

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: None
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)

MANAGEMENT FACTORS:

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: USFS - Tonto National Forest, Pleasant Valley Ranger District.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Borror, D.J. and R.E. White. 1970. A field guide to insects. Houghton Mifflin Co. Boston. P.264.

Hogue, C.L. 1987. Blephariceridae. In G.C.D. Griffiths. Flies of the nearctic region. II (4) 32-38 and 191-197.

Mohlenbrock, R.H. 1989. Workman Creek Falls, Arizona. Natural History Magazine. Pp 87-90.

NatureServe Explorer: An online encyclopedia of life [web application]. 2002. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: http://www.natureserve.org/explorer. (Accessed: June 12, 2003).

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Hogue, C.L. Curator of Entomology, Natural History Museum of Los Angeles County.

ADDITIONAL INFORMATION:

According to Hogue in Blephariceridae, "The classification of the North American Blephariceridae is unsatisfactory. The genera are provisional, some doubtlessly polyphyletic (*Agathon*) or worthy of new status distinct from Old World genera (*Dioptopsis*). Only recently have the immature stages of many of the known Nearctic species been correlated with their adults (Hogue 1973), but many remain in doubt. The only subfamily found in North America is the Blepharicerinae with two tribes, the Blepharicerini and the Paltostomini. The blepharicerini includes the gen[us] *Agathon*..."

Dr. Hogue stated in a letter on file that *A. arizonicus* is very abundant where it is found, however, more collecting is needed to see if it is found more widely in Arizona. He stated that on his collection trip to Workman Creek within the Tonto, which was done in the spring of 1991, that samples were collected in every stage of life from larval to adult. He said that when a group is found there are "millions of individuals, they are very abundant."

He also stated, however, that observing these individuals could be problematic because if searches are made during the wrong part of the life cycle, they could easily be missed. The eggs are laid during low water season and as the water rises, the rocks wet out and the larvae emerge, and then pupate. If the search is made when the water is high, or after the flies emerge and leave, no evidence of the population will be found.

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