Lachlania dencyanna (Gila Mayfly)

No Photo Available

Taxonomy

- **Class**: INSECTA
- **Order**: EPHEMEROPTERA
- **Family**: OLIGONEURIIDAE
- **Genus**: Lachlania
- **Scientific Name**: *Lachlania dencyanna* Koss, 1970
- **Common Name**: Gila Mayfly
- **Synonyms**:
- **Taxonomic Name Source**:

Agency Status

- **NMDGF**:
- **Federal Status**:
- **BLM Sensitive**:
- **USFS**:
- **IUCN Red List**: Endangered
- **Nature Serve Global**: G1
- **NHNM State**: S1
- **NM Endemic**:YES

Description

The Gila Mayfly can be distinguished from other known *Lachlania* species by the number of cross veins in the wings of adults (the number can be anywhere from 5 to 14), and by the unique mid-dorsal abdominal tubercles in the nymph. The male imago body is about 12-15mm in length, with caudal filaments from 38-43mmm in length. It is primarily light brownish, though the forewings are bright iridescent blue in live and preserved specimens, and iridescent green in specimens preserved in alcohol. Female imagos range from 11-17 mm in body length and 8-11 mm in caudal filament length. Their coloration is similar to the males. Larvae are 15-17 mm in body length and 10-12 mm in caudal filament length. General coloration ranges and can be whitish, dull green, red-brown or blackish brown (Koss and Edmunds 1970).

Habitat and Ecology

At the type locality this species has been recorded in a warm, turbid, and rapid stream, mostly 0.15 m to 0.61 m deep, 1.8 to 3 m wide, and unshaded for most of the day (Koss and Edmunds 1970). The larvae of this species utilize sticks and other vegetation caught in crevices among the rocks, unlike the closely related *Lachlania saskatchewanensis* larvae, which cling to rocks (Koss and Edmunds 1970).

The feeding behaviors of Gila Mayfly larvae are unknown, but typically mayfly larvae feed on a variety of detritus and algae, as well as some macrophyte and animal material (Waltz and Burian 2008). Adult mayflies have non-functional mouthparts and do not feed (Waltz and Burian 2008). The behavior of subimagos of the Gila Mayfly is unique compared to other species in this genus; the subimago sheds the exoskeleton and molts into an adult without alighting, instead of perching on the shoreline vegetation during the molting process, as other species do (Jordan *et al.* 2010).

Mating adults first appeared around 11:30 am and remained active until approximately 1:30 pm when the air temperature reached 82^{o}F. The males fly 1 to 1.5 m back and forth across the stream, while facing upstream at about a 45^{o} angle to the direction of current. They maintain a height of about 2.5 to 5 cm above the water, with their tails widespread. Males occasionally dart up or downstream a distance of 1.5 m or more, or fly in one or more circles before continuing the back and forth flight pattern. Males occasionally land on the water surface briefly, before resuming flight.

Males were also observed sitting and clambering about in the grass along the edge of the water. Mated pairs of this species floated on the water when in tandem, the male on top of the female with his head posterior to hers (Koss and Edmunds 1970).

Geographic Range:

The Gila Mayfly is endemic to New Mexico, where it is known from just a few localities. In July of 1967, the type specimen was collected at Lobo Creek, one mile south of Cliff in Grant County (Koss and Edmunds 1970). Additional specimens have also been collected from the East Fork of the Gila River at the junction with the main stem of the Gila River. In 1969, additional specimens were collected from the type locality. In 1998 and 1999 monitoring at the type locality revealed 29 different macroinvertebrate taxa, four of which were mayfly species. The Gila Mayfly was not collected in these surveys, despite targeted collections of mayflies at a suitable time of year for the larvae of the species. Similarly, extensive monitoring in other parts of the watershed has not revealed this species (Jordan *et al*. 2010). Therefore, the Gila Mayfly is not known to have been observed or collected since 1969, and it is quite possible it has declined or disappeared from the type locality. The species may occur in other suitable habitats throughout the relatively pristine wilderness between the two known localities (Macadam 2024).

Conservation Considerations:

There are no conservation actions in place for this species. It was petitioned for protection under the endangered species act in 2021 (Jordan *et al.* 2020). It received a positive 90-day finding that listing may be warranted (USFWS 2012), so the USFWS has included the species in its FY23-27 National Domestic Listing Workplan (USFWS 2023). In the meantime, appropriate conservation measures include preventing the erosion of riparian areas by managing recreation activities and limiting cattle grazing in the upper watershed (Macadam 2024).

Threats:

The Gila Mayfly requires clean, rapidly flowing, well-oxygenated water and a substrate composed of rocks, leaves and other vegetation, that is free of heavy siltation (Koss and Edmunds 1970). Impaired water quality has historically been documented in many streams in the upper Gila River drainage, including the East Fork of the Gila River, the type locality for this species. In the past, the watercourse was found to have high concentrations of aluminum, which is highly toxic to aquatic insects. Aluminum is a major component of both basalt and andesite (the main rock types which the East Fork Gila River runs through), so it is not surprising that this metal is dissolved in the water column. Activities which lead to increased erosion are likely to result in the release of aluminum into surface waters (Macadam 2024).

Recreation activities may also be a threat to the species. The type locality is at Grapevine Campground, a popular and very heavily used Forest Service dispersed campground. Hiking, fishing, rafting, visiting hot-springs, swimming in the river, driving, horseback riding, and off-road vehicle use are the most common recreational activities in and around the campground. Possible habitat disturbance mechanisms include increased erosion and sedimentation from foot, bike, car, and off-road vehicle traffic, runoff of pollutants from roads and off-road vehicle trails, introduction of bacteria and excess nutrients in the water from dog and horse waste, manipulation and alteration of stream flow by swimmers, and the trampling of streamside riparian habitat by campers, hikers, rafters, and anglers (Macadam 2024).

Livestock grazing may also be problematic as it can degrade water quality and negatively impact aquatic species. Overgrazing can alter plant communities, due to herbivory and trampling, which can in turn increase sedimentation and damage the stream banks. Water quality may also be impacted due to defecation and urination on stream banks. Both

the East Fork Gila River and Lobo Creek have been impacted by grazing-related habitat degradation (Macadam 2024).

Population:

Little is known about the population size or trend for this species, though it is possible the species has declined at the type locality, given it has not been observed there since 1969. At the time of description in July of 1967, over 200 larvae were collected. Monitoring between 1987 and 1997 at the type locality did not find any specimens of the Gila Mayfly (Koss and Edmunds 1970). While the species has not been recorded since 1969, it is likely it still persists (Macadam 2024).

References:

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More Information