



Great Grig

Cyphoderris monstrosa

Field Notes



Male great grig (*Cyphoderris monstrosa*) found on the forested slopes of Crater Lake National Park. NPS/Leela Hickman.

General Description

En route to her vegetation monitoring plot at Crater Lake National Park this summer, Klamath Network field technician Leela Hickman encountered a strange looking, cricket-like insect she'd never seen before. Turns out, she had stumbled upon a great grig, a primitive orthopteran insect related to crickets, katydids, and grasshoppers. Belonging to the family, Prophalangopsidae, the great grig is one of 3 species in the only North American genus of this family, *Cyphoderris*. The other two species are the Buckell's grig (*C. buckelli*) and the sagebrush grig (*C. strepitans*). Prophalangopsidae is an ancient family containing the remnants of a previously more populated lineage. Its members are known as hump-winged grigs for the humped, flightless wings covering part of the male's back.

Grig is an English term for a grasshopper or cricket. *Cyphoderris* comes from the Greek "kyphos" (bent) + "derris" (a covering) for its hump shaped wings.

Grigs, like other insects in the order Orthoptera, have long hind legs and two

pairs of wings, with the hind pair hidden beneath the forewings. The hind pair is either lacking or is much reduced in females. A large, shield-like pronotum covers most of their mid-section (thorax). Great grigs, the largest of the 3 species, measure 20–30 mm (~ 1 in) long.

Habitat

In North America, grigs occur in coniferous and high altitude sagebrush habitats of the northwestern United States and southwestern Canada. The great grig prefers forests of lodgepole pine, Englemann spruce, and mountain hemlock, similar to where Hickman made her find.

Behavior and Feeding

During the day, adults hide beneath leaf litter or stones. At dusk in the summer, males begin climbing a tree trunk to broadcast their short musical trills to attract females and maintain their territories. In the invertebrate world, orthopterans are known for their acoustical talent, rubbing their wings or legs together (stridulation) to make sound. Grigs do their singing with modified and slightly hardened forewings (tegmina). The right and left forewing on a grig each contains a scraper and a file—the two structures that vibrate when rubbed together. *Cyphoderris* are sometimes known as ambidextrous crickets because they can alternate which wing does the scraping and which wing does the filing. Grigs hear each other, or rather, hear each other's vibrations, through "ears" on their forelegs known as tibial organs. Males make use of their musical prowess during territorial disputes, with the winners usually calling for the longest duration.

Grigs feed on the male flowers (stamens) of conifers, as well as pollen and parts of the flower in broadleaved shrubs. They may also eat fruit and small insects.

Life Cycle and Reproduction

Grigs, like most orthopterans, go through incomplete metamorphosis. Eggs hatch into nymphs, which then mature into adults without a pupal stage. Later stage nymphs and adults overwinter underground, which suggests a two-year lifespan for this species.

Reproduction in grigs is a grisly affair. The male offers its fleshy, blood-filled hindwings in trade for copulation. Once the female mounts the male's back to eat, the male locks her in place with a trap on the tip of his abdomen. After mating, he leaves her an additional nutritious snack—a gelatinous package of carbohydrates and proteins (a spermatophylax) that further boosts her reproductive success. Females prefer virgin males with an intact wing-snack, but sometimes mate with nonvirgins if unwittingly snared by the male's trap.

Where to See

In the Klamath Network, grigs have only been documented in Crater Lake National Park. In the summertime, look for them in the leaf litter below coniferous forest or listen for them calling in the evening from their perch up in a tree.

More Information

<https://thesmallermajority.com/2013/09/03/a-song-of-ancient-earth/>

<https://bugguide.net/node/view/38159>

<http://entnemdept.ufl.edu/walker/buzz/s337a.htm>

<http://tolweb.org/Haglididae/13297/2002.10.18>

<https://phys.org/news/2017-03-rare-cricket-family-extinct-jurassic.html#jCp>

Song of the grig:

https://sixlegspphoto.files.wordpress.com/2013/09/cyphoderris_monstrosa2.wav