Nesophrosyne sp.

Terrestrial Invertebrates

Leafhoppers
Order Homoptera
Family Cicadellidae

FAMILY INCLUDES:
6 Native Genera
>266 Native & Endemic Species

GENERAL INFORMATION:
Genera with endemic species
Balclutha: 9 spp.
Nesophrosyne: >250 spp.
Balolina, *Kirkaldiella*, *Nesolina*, *Nesophryne*: 1–3 spp.

Leafhoppers are jumping insects that suck sap from the leaves of plants. The endemic genus *Nesophrosyne* is by far the largest group of native species. It currently contains 72 described species and subspecies, but the bulk of the diversity remains undescribed, with at least 150 undescribed species known in collections. All are endemic to individual islands, sometimes to one volcano, and are host-specific to one native plant genus. This enormous undescribed diversity presents challenges for identification and monitoring for conservation. However, many are already documented by DNA barcodes and associated photos. The other genera are much smaller, rarer, and more restricted in distribution. *Kirkaldiella* and *Nesophryne* are related to *Nesophrosyne* and have similar habits, feeding on dicots in mesic and dry forests. *Balclutha*, *Balolina*, and *Nesolina* belong to a different lineage and feed on grasses.

DISTRIBUTION: Leafhoppers are found on all the MHI except Niʻihau and Kahoʻolawe, from the coast to high-elevation forests.

ABUNDANCE: Some species may be seasonally abundant, especially those that feed on more common plants. They often become rare or completely disappear during the drier summer and fall months.

LOCATION AND CONDITION OF KEY HABITAT: Because these leafhoppers produce honeydew, an attractive food for ants, *Nesophrosyne* have been noted to be better able to survive in the presence of non-native ant (Formicidae) populations than most native insects which are not adapted to these non-native predators. However, these leafhoppers can only survive where their host plants do. It is unknown how well they are able to disperse naturally to find new populations of host plants, such as restoration sites. The grass-feeding groups are particularly affected by the loss of native host plants.

THREATS:

- Habitat loss and degradation due to conversion for agriculture, logging, grazing and soil disturbance by a suite of non-native ungulates, and the introduction of invasive plants.
- Loss of native host plants.
- Insufficient information, especially for rare species, hampers conservation efforts.
- Non-native predatory wasps (Crabronidae) and parasitoids (various Hymenoptera) may adversely affect some species.

CONSERVATION ACTIONS: The goals of conservation actions are not only to protect current populations and key breeding habitats but also to establish additional populations, thereby reducing the risk of extinction. In addition to common statewide and island conservation actions, specific management directed toward leafhoppers should include:

- Conduct surveys to determine distribution and abundance of known leafhopper species and to document and identify new species.
- Outplanting of native host plants that support rare species.
- Preserve, maintain, and restore habitats supporting existing populations.

MONITORING:

- Continue monitoring the status of known populations to detect declines in native species and to detect new non-native species.

RESEARCH PRIORITIES:

- Initiate studies to determine species' distributions to determine areas supporting large numbers of native species.
- Initiate efforts to locate and identify new species.
- Initiate studies to determine the effects of introduced arthropods on species in the family Cicadellidae.
- *Nesophrosyne* should be reviewed and revised as appropriate.

References:

Bennett GM, O'Grady PM. 2013. Host–plants shape insect diversity: Phylogeny, origin, and species diversity of native Hawaiian leafhoppers (Cicadellidae: *Nesophrosyne*). Molecular Phylogenetics and Evolution 65:705–717.

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