GORDON'S GRASSHOPPER

TAXONOMY

Scientific name: *Melanoplus gordonae* - Vickery, 1969
Common name: Gordon's grasshopper
Family: Acrididae
Taxonomic comments:
At least 200 *Melanoplus* species occur in North America. Sexual or terminal abdominal structures of male specimens are commonly used to distinguish among species in the genus (Capinera et al. 2004).

DESCRIPTION

Basic description: A spur-throated grasshopper.

General description:
A medium-sized grasshopper with yellow ventral abdomen and red hind tibia, compound eye is brown to burgundy with light yellow or tan spots. Lacks dark bars on the external face of the hind femur (Vickery 1969). Spur-throated grasshoppers bear a spine, or "spur", ventrally between the front legs (Capinera et al. 2004). Size and appearance resembles the red-legged grasshopper (*M. femurrubrum*) but *M. gordonae* is distinguished by its broader frontal costa, trilobate subgenital plate and other characteristics of the male genitalia (Vickery 1969). Females larger than males.
Length (mm): body length 17-23 (males), 24-28 (females)

Reproduction:
No specific information is available for this species. Adult migratory grasshoppers (*M. sanguinipes*) and Northern grasshoppers (*M. borealis*) in Alaska produce one generation every 2 years; females oviposit a pod of eggs into sod; eggs overwinter twice then hatch in late spring/early summer (Fielding pers. comm.).

Ecology:
Grasshoppers are an important prey item for many terrestrial birds and mammals, as well as fish and amphibians. In interior Alaska, native grasshopper populations (primarily migratory grasshoppers) comprise a large proportion of food items brought to nestlings by adult Savannah Sparrows (*Passerculus sandwichensis*) during years of high grasshopper population growth (Miller et al. 1994).

The migratory grasshopper, Northern grasshopper, and clear-winged grasshopper (*Camnula pellucida*) are important pest species in North America and have caused severe crop damage in southcentral and interior Alaska during high population growth (Vickery 1997, Fielding et al. 2001, ARS 2002). In Alaska, the migratory grasshopper has a broad

diet and relies on a variety of native and introduced plant species for oviposition and shelter (Fielding pers.comm.).

Migration:
Unknown.

Food:
Unknown, but presumably phytophagic.

Phenology:
Unknown, but outbreaks of other grasshopper species have been observed in even-numbered years (semivoltine) around Delta Junction, Alaska (ARS 2002). Washburn (1964) observed that grasshopper outbreaks in southcentral Alaska generally occurred after unusually hot weather in May and June, which might hasten their development after hatching and increase their potential for movement before cooler, rainy weather in July and August; however, environmental factors leading to outbreaks are generally unknown, and may include diseases and parasites in addition to weather (Fielding pers. comm.).

Habitat:
Natural habitats for many grasshopper species in Alaska include dry, grassy, south facing bluffs along major rivers, although specific habitat for *M. gordonae* is unknown. The original collection location from 1968 is listed as "near Fairbanks, 2 mi. along Gilmore Trail" (Vickery 1969). In general, grasshoppers are found in open grassy or weedy habitats (Capinera et al. 2004), including agricultural areas, roadsides and fallow fields (Fielding et al. 2001).

STATUS

Global rank: G1G3 (01Dec2000)
Global rank reasons:
Imperiled - at high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

State rank: S1 (08May2006)
State rank reasons:
Alaska endemic. Complete absence of observations since the original collection of this species in 1968 from one location near Fairbanks, Alaska (see Vickery 1997). Potentially considered a relict population that was once more widely distributed (Vickery 1997). Potentially threatened by integrated pest management practices that target other grasshopper species.

DISTRIBUTION AND ABUNDANCE

Range:
Global range:
Alaska endemic; see State range.

State range:
Known from one location near Fairbanks, Alaska; it is not known from the adjacent Yukon Territory (Vickery 1969, Vickery and Kevan 1985). Range is thought to be very restricted, perhaps indicating a relict population that was once more widely distributed (Vickery 1997).

Abundance:
State abundance:
Unknown, although suspected rare; there is a complete lack of any collections or reports since original description by Vickery in 1968 (see Vickery 1997). In interior Alaska, grasshopper populations (predominantly *M. sanguinipes*) fluctuate biennially; densities of more than 25/m² have been reported during high years; densities in low years are less than 1/m² (Miller et al. 1994).

Trends:
State trend:
Unknown. Lack of any collections or reports since original description in 1968. Inventory specific to this species is needed before trends can be identified.

EXISTING PROTECTION

State protection:
No policies or measures protect this species in Alaska.

CHALLENGES

State challenges:
Integrated pest management measures pose a possible threat to this species in interior and southcentral Alaska. Alaska's Cooperative Bait Program has tested use of locally grown barley as a carbaryl poison bait for grasshoppers (Vandre and Quarberg 2000), and grasshopper species may be targeted indiscriminately for control where population outbreaks occur near agricultural areas (e.g., Delta Junction and Palmer areas). Much current research is devoted to *M. sanguinipes* life history in order to develop effective, environmentally benign controls including habitat management such as the reduction of fallow fields (Fielding 2001, Fielding et al. 2001, ARS 2002, Fielding 2004). The effects of such population controls on *M. gordonae* are unknown. Increasing insect damage is correlated with increasing production of monoculture crops in Alaska; this practice could lead to more frequent use of insecticides or other controls (Quarberg and Jahns 2002).

RESEARCH AND INVENTORY NEEDS

State research needs:
Research is needed to understand aspects of this species' life history including reproduction, plant and habitat associations during different life stages, population periodicity, and whether this species is affected by grasshopper control measures employed to eradicate other pest species.

State inventory needs:
Surveys are needed to verify the continued occurrence of this species in Alaska; identify current distribution beginning with the area near Fairbanks where the species was originally described; assess population status. Inventories could be combined with other insect or Integrated Pest Management (IPM) surveys in interior Alaska; a review of private insect collections within the state may reveal additional specimens.

CONSERVATION AND MANAGEMENT NEEDS

State conservation and management needs:
Conservation priorities include identification and inventory of this species' distribution and assessment of population status. To enable resource managers/farmers to make more informed decisions about pesticide usage, information is needed on the effects grasshopper control measures employed to eradicate other pest species.

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Photo credit: obtained online at:
http://www.sidney.ars.usda.gov/grasshopper/ID_Tools/F_Sheets/redleg.htm.
