

Eastern Lubber Grasshopper, *Romalea microptera* (Beauvois) (Insecta: Orthoptera: Acrididae)¹

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The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

This grasshopper is well known in the southeastern United States, and elsewhere, due to its large size and widespread use for dissection in biology classrooms. Also, it can be of economic importance in Florida. It is one of a few species of grasshoppers in Florida that occurs in large enough numbers to cause serious damage to citrus, vegetable crops, and landscape ornamentals.

The eastern lubber grasshopper is clumsy and slow, mostly traveling by walking and crawling feebly over the substrate. The "lubber" designation is derived from an old English word "lobre," which means lazy or clumsy. This term has come to mean a big, clumsy, and stupid person, also known as a lout or lumox. In modern times, it is normally used only by seafarers, who term novices "landlubbers." The lubber grasshopper is one of only four species in the family Romaleidae found north of Mexico, but there are many other species in South America (Rehn and Grant 1961). Many of the grasshoppers in this family are winged and agile, so it is inappropriate to call all of them lubbers.

Distribution

The eastern lubber grasshopper is limited to the southeastern region of the United States. It is found from North Carolina south through South Carolina, Georgia, and Florida, and west through Alabama, Mississippi, and Louisiana to central Texas (Capinera et al. 2004).



Figure 1. Distribution of *Romalea microptera*, the eastern lubber grasshopper.

Credit: John Capinera, UF/IFAS

Description

Eastern lubber grasshopper is the most distinctive grasshopper species found in the southeastern United States. Adults are colorful, but the color pattern varies. Often the adult of this species is mostly yellow or tawny, with black on the distal portion of the antennae, pronotum, and abdominal segments. The forewings extend two-thirds to three-fourths the length of the abdomen. The hind wings are short and incapable of providing lift for flight. The forewings tend to be pink or rose colored centrally, whereas the hind wings are entirely rose colored. Darker forms of this species also exist, wherein the yellow color becomes the minor rather than major color, and in northern Florida a predominantly black form is sometimes found. Adults attain a large size, males measuring at least 1.7–2.2 inches long and females often measuring 2–2.8 inches, sometimes 3.5 inches. Not only is this large, heavy-bodied grasshopper unable to fly, but it is poor at leaping as well, so mostly is observed walking. However, it is a good climber and often climbs trees to feed on new foliage at the tips of branches.

Both sexes stridulate (make noise) by rubbing the forewing against the hind wing. When alarmed, lubber grasshoppers spread their wings, hiss, and secrete foul-smelling froth from their spiracles (breathing tubes) (Whitman et al. 1991). They can spray toxic chemicals a distance of at least 0.6 inches. The chemicals discharged

from spiracles are believed to be an anti-predator defense, and to consist of chemicals both synthesized and sequestered from their diet (Hatle and Spring 1998). The variation in these toxins make adaption to them difficult for predators (Chapman and Joern 1990). Many vertebrate, but not invertebrate, predators are affected (Jones et al. 1987, 1989; Whitman et al. 1992). Their bright color pattern is believed to be a warning to vertebrate predators that lubber grasshoppers are not palatable. Their tendency to aggregate and climb vegetation, especially at night, is another defensive behavior.



Figure 2. Adult eastern lubber grasshopper, *Romalea microptera* (Beauvois), light color phase.

Credit: John Capinera, UF/IFAS



Figure 3. Adult eastern lubber grasshopper, *Romalea microptera* (Beauvois), intermediate color phase.

Credit: John Capinera, UF/IFAS



Figure 4. Adult eastern lubber grasshopper, *Romalea microptera* (Beauvois), dark color phase.

Credit: John Capinera, UF/IFAS



Figure 5. Black color form of adult eastern lubber grasshopper, *Romalea microptera* (Beauvois).

Credit: Lyle J. Buss, UF/IFAS



Figure 6. Mating adults of two color forms.

Credit: Lyle J. Buss, UF/IFAS

Eggs

The eggs of lubber grasshoppers are yellowish or brown, elliptical, and 0.4 inches long and 0.1 inches wide. They are laid in clusters, or pods, which consist of rows of eggs positioned parallel to one another and held together by a secretion. Under field conditions, a pod contains 25–50 eggs, with only 1–3 pods produced per female (Stauffer and Whitman 2007). Egg production is greater under solitary than crowded conditions, but pods tend to be clustered, with females preferentially ovipositing where eggs have already been deposited (Stauffer et al. 1998).

The interval between production of egg pods by a female is about two weeks. Ovipositing (egg laying) females prefer mixed broadleaf tree-pine habitats with intermediate soil moisture, avoiding both lowland, moist, compact soil and upland, dry, sandy soil (Watson 1941; Kuitert and Connin 1953). The female deposits the pod in the soil at a depth of 1.2–2 inches and closes the oviposition hole with a frothy secretion or plug (Herrman et al. 2010). The plug provides the young grasshoppers easy access to the soil surface when they hatch. The egg stage lasts 6–8 months and the eggs require a cool period, e.g., 20°C for 3 months, to hatch when exposed to warmer temperatures. Typically, eggs hatch in the morning.

Nymphs

The immature eastern lubber grasshoppers differ greatly in appearance from the adults (Capinera et al. 1999, 2001). Their color pattern is so different that the nymphs (immature grasshoppers) commonly are mistaken for a different species. Nymphs typically are almost completely black, but with a distinctive yellow, orange, or red stripe located dorsally, though occasionally they are reddish brown. The face, edge of the pronotum (area behind the head), and abdominal segments of the nymphs also may contain reddish accents that often change to yellow as they mature. When they first molt, the young nymphs may be brownish, but they soon darken to black. Normally there are five instars (phase between molts), though occasionally six instars occur. The early instars can be distinguished by a combination of body size, number of antennal segments, and form of the developing wings. The nymphs are about 0.4, 0.7, 0.9, 1.4, and 1.5 inches long in instars 1–5, respectively. There are 12, 14–16, 16–18, 20, and 20 segments per antenna respectively during instars 1–5. The shape of the wing buds immediately behind the pronotum change slightly with each molt. During the first instar, the distal surface is broadly rounded; during the second instar the edges begin to narrow slightly, point posteriorly, and acquire a slight indication of venation; and during the third instar the distal edges are markedly elongate, point strongly posteriorly, and have pronounced veins. At the molt to fourth instar, the small, developing wings shift from pointing downward to upward and posteriorly. The small forewings and hind wings are discrete and do not overlap during the fourth instar, though the forewings may be completely or partly hidden beneath the pronotum. In the fifth instar, the larger wings overlap, appearing as a single pair and the wing buds do not cover the tympanum (membranous hearing organ). In adults, however, the wings overlap and cover the tympanum, extending posteriorly to cover 3–4 abdominal segments. Young nymphs are highly gregarious but later instars begin to separate. They may climb vegetation during the night.



Figure 7. First instar eastern lubber grasshopper, *Romalea microptera* (Beauvois). The segments above the second and third legs bear wing buds, that are hardly visible.

Credit: Lyle J. Buss, UF/IFAS



Figure 8. Second instar eastern lubber grasshopper, *Romalea microptera* (Beauvois). The beginnings of the wing veins are visible.

Credit: Lyle J. Buss, UF/IFAS



Figure 9. Third instar lubber grasshopper, *Romalea microptera* (Beauvois). The developing wings extend slightly posteriorly and the veins are visible.

Credit: Lyle J. Buss, UF/IFAS



Figure 10. Fourth instar eastern lubber grasshopper, *Romalea microptera* (Beauvois). The small wings are visible and curved upward. They are above the oval, reddish-colored tympanum on the first abdominal segment.

Credit: Lyle J. Buss, UF/IFAS



Figure 12. Eastern lubber grasshopper nymph *Romalea microptera* (Beauvois), molting and discarding its previous (darker) body covering.

Credit: Lyle J. Buss, UF/IFAS



Figure 11. Fifth instar eastern lubber grasshopper, *Romalea microptera* (Beauvois). The wing extends posteriorly above the tympanum. The adult will emerge after the next molt and have a different, unpredictable color.

Credit: John Capinera, UF/IFAS

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