

## The Oklahoma Cooperative Extension Service WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



## EXTENSION

## Grasshoppers of the Choctaw Nation in Southeast Oklahoma June 2021

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### Grasshoppers and Relatives

Orthoptera is the order of insects that includes grasshoppers, katydids and crickets. These insects are recognizable by their shape and the presence of jumping hind legs. The differences among grasshoppers, crickets and katydids place them into different families. The Choctaw recognize these differences and call grasshoppers – *shakinli*, crickets – *shalontaki* and katydids – *shakinli chito*.

### Grasshoppers and the Choctaw

Because of their abundance, large size and importance to agriculture, grasshoppers regularly make their way into folklore, legends and cultural traditions all around the world. The following legend was described in Tom Mould's Choctaw Tales, published in 2004.

### The Origin of Grasshoppers and Ants

During the emergence from Nanih Waiya, grasshoppers traveled with man to reach the surface and disperse in all directions. While travelling to the surface, the mother of the grasshoppers was stepped on by the men, which stopped the rest of her children from reaching the surface. Those already above ground spread in all directions, just as the first tribes of man had done. From then on the Choctaw called the creatures 'eske ilay,' which translates to "mother dead."



As the men emerged from the hill and spread throughout the lands, they would trample many more grasshoppers, killing and harming the orphaned children. Fearing that they would all be killed as the men multiplied while continuing to emerge from Nanih Waiya, the grasshoppers pleaded to Aba, the Great Spirit, for aid. Soon after, Aba closed the passageway, trapping many men within the cavern who had yet to reach the surface.

In an act of mercy, Aba transformed these men into ants, allowing them to rule the caverns in the ground for the rest of history.

### What is a Grasshopper?

Technically, the term grasshopper refers only to insects in the suborder Caelifera, sometimes referred to as the short-horned grasshoppers. These range from tiny, ground-dwelling



A katydid (left) with thin, hair-like antennae versus a grasshopper (right) with short, thick antennae.

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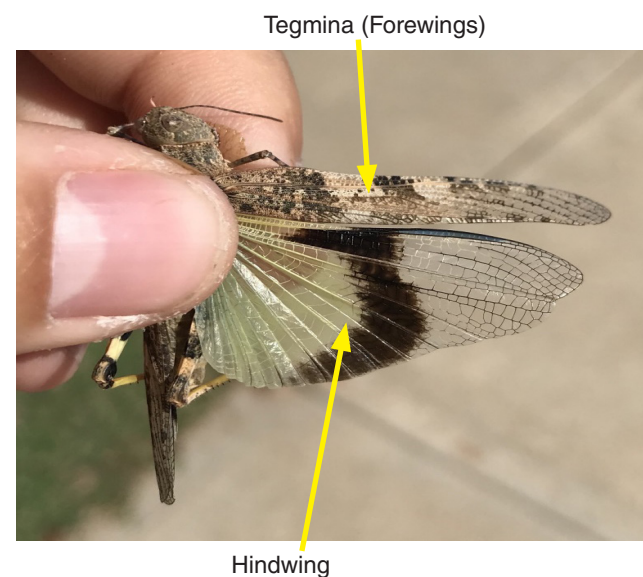
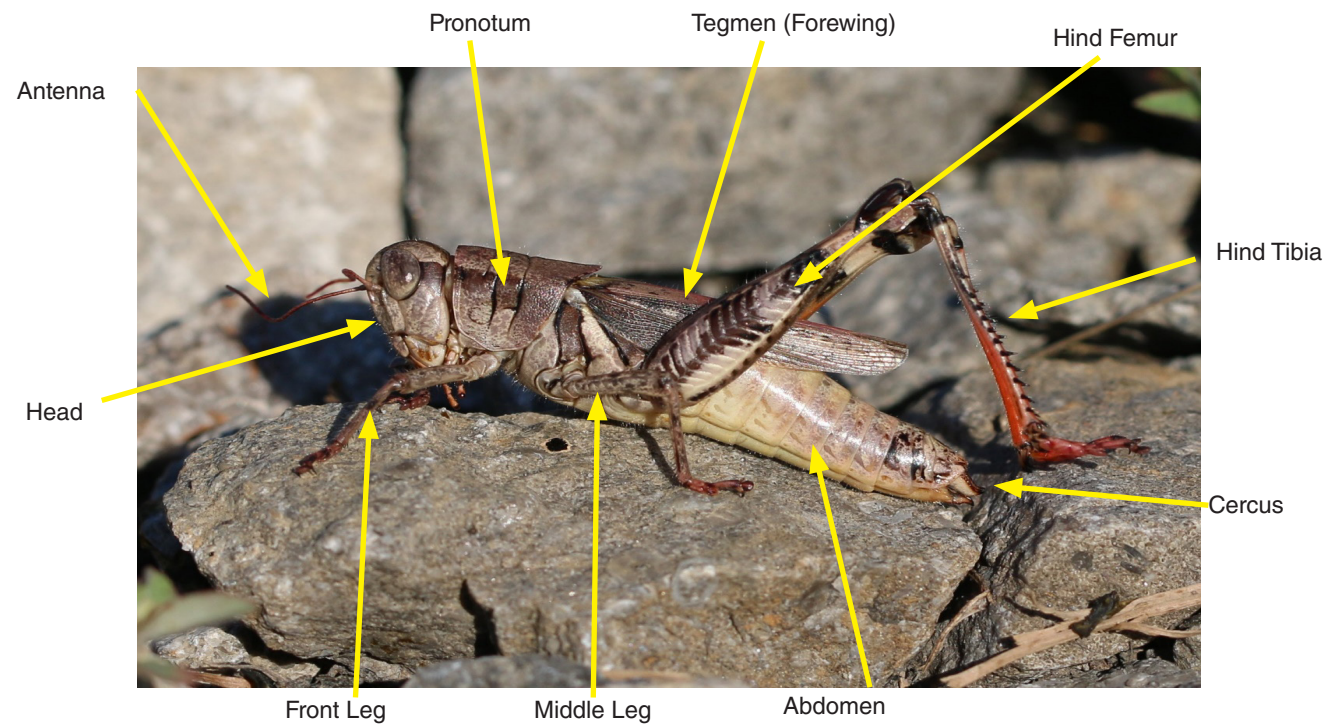
pygmy mole crickets (which are not closely related to true mole crickets) to the large, short-winged lubber grasshoppers found in western Oklahoma. The most commonly encountered grasshoppers in Oklahoma, and all the species discussed in this publication, belong to the family Acrididae, the true grasshoppers.

True grasshoppers as a group are easy to identify. They are elongated insects with short antennae and hind legs lengthened for jumping. Katydid and crickets, both of which are close relatives of grasshoppers, are often mistaken for them. Both groups possess similar hind legs, but katydids

and crickets tend to have thin antennae that are longer than their bodies, while grasshoppers have short, thick antennae.

Grasshoppers have three main stages in their life cycle. They start out as eggs, usually deposited in egg pods within loose soil. The small, immature grasshoppers that hatch from these eggs are referred to as nymphs. They look similar to the adults but have very small wing buds. As they grow, they shed their skin, growing in size until they reach adulthood. At this point, many species have long, fully functioning wings, allowing them to fly. This publication focuses on the adults, as they are the easiest to identify and the most noticeable.

## Parts of a Grasshopper



### Grasshopper Glossary

**Creptitate:** The act of making noise in flight, usually snapping or buzzing sounds.

**Dorsal:** Relating to the upper side of the grasshopper.

**Sexual Dimorphism:** Males and females of the same species differ significantly in appearance.

**Ventral:** Relating to the underside of the grasshopper.

## List of Choctaw Grasshoppers

This document may not include all of the grasshoppers found in the Choctaw Nation. Many of the species not included here are discussed in the 'similar species' portion of the species accounts. Since some of these species lack common names, they are all listed by scientific name. The scientific names easily can be searched for to obtain additional information. This is a complete list of grasshoppers collected during our surveys in the Choctaw Nation.

### Subfamily Cyrtacanthacridinae

*Schistocerca americana*  
*Schistocerca obscura*  
*Schistocerca lineata*  
*Schistocerca alutacea*  
*Schistocerca damnifica*

### Subfamily Melanoplinae

*Melanoplus differentialis*  
*Melanoplus bivittatus*  
*Melanoplus ponderosus*  
*Melanoplus punctulatus*  
*Melanoplus bispinosus*  
*Melanoplus angustipennis*  
*Melanoplus sanguinipes*  
*Melanoplus keeleri*  
*Melanoplus femurrubrum*  
*Melanoplus rusticus*  
*Melanoplus arkansas*  
*Campylacantha olivacea*  
*Paroxya clavuliger*

### Subfamily Leptysminae

*Leptysma marginicollis*

### Subfamily Oedipodinae

*Hippiscus ocelote*  
*Hadrotettix trifasciatus*  
*Trachyrhachys kiowa*  
*Dissosteira carolina*  
*Spharagemon bolli*  
*Spharagemon cristatum*  
*Trimerotropis maritima*  
*Arphia sulphurea*  
*Arphia xanthoptera*  
*Encoptolophus costalis*  
*Chortophaga viridifasciata*

### Subfamily Gomphocerinae

*Syrbula admirabilis*  
*Boopedon gracile*  
*Amblytropidia mysteca*  
*Orphulella pelidna*  
*Orphulella speciosa*  
*Dichromorpha viridis*  
*Mermiria bivittata*  
*Mermiria picta*

### Spotted-winged Grasshopper

*Orphulella pelidna*, Gomphocerinae

**Description:** A nondescript, small grasshopper commonly found throughout eastern Oklahoma. It varies from brown to green, with the brown form being most abundant in Oklahoma. No bold markings aside from the two dark stripes along the sides of the pronotum, note the row of dark forewing spots.

**Length:** 0.8 inch to 1.2 inches (20 mm to 30 mm).

**Similar species:** The slant-faced pasture grasshopper, *Orphulella speciosa*, is very similar. It differs by averaging a bit smaller (15 mm to 25 mm), having shorter wings that barely extend beyond the abdomen tip and being found in drier, more open environments.

**Habitat:** Found in a wide variety of habitats, but most often encountered in open woodland and forest edges.

**Seasonality:** New adults begin appearing in July and live until winter.

**Discussion:** One of the most widespread grasshoppers in Oklahoma.



A brown-morph spotted-winged grasshopper.

### Two-striped Mermiria

*Mermiria bivittata*, Gomphocerinae

**Description:** This long-legged, very slender slant-faced grasshopper is one of the longest slant-faced grasshoppers in our region. It is usually pale brown, although occasionally greener, with two dark stripes extending from the eye to the wings. The wings are primarily dark brown, but with a light stripe on top and usually with one white stripe on each side. Males in some parts of Oklahoma lack the white stripe on the forewing.

**Length:** 1.2- inches to 2.2 inches (30 mm to 55 mm).

**Similar species:** Most similar to the lively mermiria, *Mermiria picta*. *M. picta* usually is green with reddish-brown markings and lacks the light stripes on the sides of the wings.

**Habitat:** Found in open grassy habitats, usually associated with tall grass.

**Seasonality:** New adults begin appearing in July and live until winter.

**Discussion:** The two-striped mermiria is another species that will regularly dive into grass bunches to escape predators.



A female (top) and male (bottom) two-striped mermiria.

### Introduction to Oklahoma Grasshoppers

There are more than 120 species of grasshopper recorded in Oklahoma. This high diversity is a result of Oklahoma's location within the U.S. Sitting toward the center of the U.S., Oklahoma encompasses a wide variety of ecoregions. Many eastern species reach the western limit of their range here, while many western species reach their eastern limits here, and the same can be said for northern and southern species.

While most species of grasshoppers have little impact on human activities, there are a few species that can be serious pests. Grasshoppers are considered to be the most important pests of rangeland in Oklahoma, where they annually consume approximately 22% of available forage. Additionally, at least one species, the high plains grasshopper, has had population outbreaks following droughts, forming swarms that have damaged crops and grasslands.

### American Bird Grasshopper

*Schistocerca americana*, Cyrtacanthacridinae

**Description:** The American bird grasshopper is a large, red to orange-brown grasshopper. It has a yellow dorsal line extending down the back and is covered in a variety of dark spots and white lines.

**Length:** 1.2 inches to 2.8 inches (30 mm to 70 mm).

**Similar species:** No other large grasshopper in eastern Oklahoma possesses brown coloration and dark spots on the wings.



### Grasshoppers of the Choctaw Nation

Thirty-eight species of short-horned grasshoppers were recently collected from counties associated with the Oklahoma Choctaw Nation boundaries. This publication highlights the 15 most common or most distinctive species. The grasshoppers covered in this publication can be divided into four subfamilies, based on a variety of characteristics. Becoming familiar with these subfamilies will help narrow down which species to choose from and make it easier to identify any grasshoppers not covered in this publication.

**Bird Grasshoppers**, Cyrtacanthacridinae – large grasshoppers with long wings, powerful flight and a spur on the underside of the throat.

**Spur-throated Grasshoppers**, Melanoplinae – similar to bird grasshoppers, but usually shorter and more robust. Also have a spur on the throat.

**Band-winged Grasshoppers**, Oedipodinae – usually cryptically patterned with bright hindwings that are flashed during flight. No throat spurs.

**Slant-faced Grasshoppers**, Gomphocerinae – thin grasshoppers, usually with a slanted face. No throat spurs.

**Habitat:** Found in a variety of open habitats including wheat fields, parks and prairies. Often attracted to lights at night.

**Seasonality:** Adults begin to appear in late July, with some surviving through the winter until the following May. Peak season occurs August to October.

**Discussion:** American bird grasshoppers are strong fliers and will regularly fly into the nearest shrub or tree when flushed. While occasionally a pest of citrus in Florida, it rarely attains pest status elsewhere.



A male (left) and female (right) American bird grasshopper.

### Obscure Bird Grasshopper

*Schistocerca obscura*, Cyrtacanthacridinae

**Description:** The obscure bird grasshopper is a large, green grasshopper with brown wings and a bright yellow-green stripe down its back.

**Length:** 1.4 inches to 2.6 inches (35 mm to 65 mm).

**Similar species:** The spotted bird grasshopper, *S. lineata*, is very similar, but usually with a cream dorsal stripe instead of yellow-green, and highly variable in color, ranging from green to brown to orange.

**Habitat:** Found in a variety of semi-open habitats including wheat gardens, parks, and roadsides. Usually the most abundant bird grasshopper in urban areas.

**Seasonality:** Adults begin to appear in late July, remaining active until cold winter temperatures kill them off.

**Discussion:** Like most bird grasshoppers, the obscure bird grasshopper is a strong flier. While this species is usually not an important pest, a population outbreak of obscure bird grasshoppers following the dust bowl of the 1930s resulted in significant damage to crops and ornamental plants.



A female obscure bird grasshopper.

### Mischievous Bird Grasshopper

*Schistocerca damnifica*, Cyrtacanthacridinae

**Description:** The mischievous bird grasshopper is a medium-sized, brown grasshopper with a light brown dorsal stripe. This is the smallest of the bird grasshoppers in Oklahoma, with the females being short-winged and nearly flightless.

**Length:** 1.0 inch to 2.0 inches (25 mm to 50 mm).

**Similar species:** A light brown spotted bird grasshopper, *S. lineata* could appear similar, but are longer winged and usually found in grasslands.

**Habitat:** Found in open wooded habitats, such as forested floodplains and along roads that cut through woodland. It is usually found on the ground where it is well camouflaged amongst the leaf litter.

**Seasonality:** This species overwinters, with new adults appearing in August and living until the following spring. Peak activity is usually September to October and April to May.

**Discussion:** Mischievous bird grasshoppers are secretive and rely more on their camouflage to avoid predators than their poor flight capabilities. However, they are one of the most noticeable grasshoppers in woodlands when very few species are active in early spring.



A male (top) and female (bottom) mischievous bird grasshopper.

### Admirable Grasshopper

*Syrbula admirabilis*, Gomphocerinae

**Description:** This long-legged, slender slant-faced grasshopper is highly sexually dimorphic – the males and females look very different from each other. The males are much smaller and are brown with dark and light patterning. The larger females are primarily green, with similar dark and light patterning. Both sexes have dark spots on the wings.

**Length:** Males: 0.8 inch to 1.2 inches (20 mm to 30 mm), females: 1.4 inches to 2.0 inches (35 mm to 50 mm).

**Similar species:** The two species of *Mermiria* found in the region look similar but lack dark spots on the wings.

**Habitat:** Open grassy habitats, most commonly found in lawns and roadsides.

**Seasonality:** New adults begin appearing in July and live until winter.

**Discussion:** Admirable grasshoppers, like many species of slant-faced grasshoppers, will often dive toward the ground when disturbed, where they can easily hide amongst the grass stems to avoid detection.



A female (top) and male (bottom) admirable grasshopper.

### Prairie Boopie

*Boopedon gracile*, Gomphocerinae

**Description:** This medium-sized slant-faced grasshopper is also highly sexually dimorphic. The smaller males are dark brown to black with white markings on the thorax and the legs. The larger females are either green or brown, with similar patterning to the males. Both sexes have red hind tibia and male have red undersides.

**Length:** Males: 1.0 inch to 1.4 inches (25 mm to 35 mm), females: 1.2 inches to 2.0 inches (30 mm to 50 mm).

**Similar species:** The only similar species that may occur in the region is the short-winged boopie, *Boopedon auriventris*. This species has shorter wings, longer legs and a yellow underside.

**Habitat:** Found in open grassy habitats, such as roadsides and savannas. Avoids areas where grass is too tall.

**Seasonality:** New adults begin appearing in June and live through September.

**Discussion:** While male prairie boopies show little variation, the females are highly variable. In addition to being either brown or green, they also can have either long or short wings. The short-winged forms may be confused with a spur-throated grasshopper nymph, but lack the throat spur that characterizes that subfamily.



A short-winged female (top) and male (bottom) prairie boopie.

### Autumn Yellow-winged Grasshopper

*Arphia xanthoptera*, Oedipodinae

**Description:** Autumn yellow-winged grasshoppers are medium-sized, cryptically colored grasshoppers with a broad black band near the outer edge of the hindwings. The inner portion of the hindwings varies from yellow to orange.

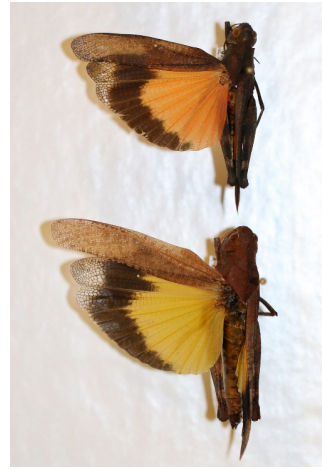
**Length:** 1.4 inches to 1.8 inches (35 mm to 45 mm).

**Similar species:** There are many similar species of *Arphia* in Oklahoma, some of which are difficult to separate. However, only the autumn yellow-winged grasshopper has a smooth raised crest on its pronotum.

**Habitat:** Found in open woodlands, forest edges and grassy fields. Often found on bare ground, but will fly into brush when disturbed.

**Seasonality:** New adults begin appearing in August and live until winter.

**Discussion:** Like many band-winged grasshoppers, the males make crackling noises, called crepitating, while in flight to attract females.



A female autumn yellow-winged grasshopper and two hindwing color morphs.

### Green-striped Grasshopper

*Chortophaga viridifasciata*, Oedipodinae

**Description:** Green-striped grasshoppers are small to medium band-winged grasshoppers with translucent yellow and black bands on the hindwings. The body color is usually either brown or green, but occasionally pink morphs occur. The stripe that divides the eyes in half is distinct.

**Length:** 0.8 inch to 1.6 inches (20 mm to 40 mm).

**Similar species:** The various species of *Arphia* look similar when resting but have much bolder colors on the hindwing.

**Habitat:** Any open habitat, from lawns and sidewalks to forest edges and rock outcroppings.

**Seasonality:** Adults can be found essentially year-round in Oklahoma, with peaks in April to May and August to October.

**Discussion:** The most abundant grasshopper in eastern Oklahoma, this species can be found everywhere but the densest forests. It feeds primarily on grasses, so despite its abundance it is not noted to be a major pest.



A green and brown morph green-striped grasshopper with a specimen showing the hindwing pattern.



EPP-7341-8

### Differential Grasshopper

*Melanoplus differentialis*, Melanopliinae

**Description:** The differential grasshopper is a large spur-throated grasshopper that varies in color from dark green to light orange. The large size and the herringbone pattern (chevrons) on the hind femur are distinctive.

**Length:** 1.2 inches to 2.0 inches (30 mm to 50 mm).

**Similar species:** Ponderous spur-throated grasshoppers, *M. ponderosus*, are similar, but are generally found in woodland habitats and have light bands interrupting the herringbone pattern on the hind femur.

**Habitat:** Found in a variety of open habitats, especially grasslands, gardens, crop fields and other disturbed areas.

**Seasonality:** New adults begin appearing in late July and live until winter.

**Discussion:** Differential grasshoppers are notable pests of crops throughout their range. They are one of the most common species found in gardens.



Two color variants of the differential grasshopper.

### Two-striped Grasshopper

*Melanoplus bivittatus*, Melanopliinae

**Description:** The two-striped grasshopper is a spur-throated grasshopper that is usually dark brown above, cream-colored on the side, with two light stripes going down the back.

**Length:** 1.0 inch to 1.8 inches (25 mm to 45 mm).

**Similar species:** The rare *Paratylotropidia brunneri* looks very similar but has shorter wings and red hind tibiae (the hind tibiae are gray to blue in two-striped grasshoppers in Oklahoma).

**Habitat:** Found in a variety of open habitats, especially grasslands, gardens and crop fields. Often found near water.

**Seasonality:** New adults begin appearing in late June and live until winter.

**Discussion:** The two-striped grasshopper is another common pest species of gardens, crop fields and disturbed areas. It can be common in urban habitats.



Two color variants of the two-striped grasshopper.

EPP-7341-5

### Keeler's Spur-throat Grasshopper

*Melanoplus keeleri*, Melanoplinae

**Description:** Keeler's spur-throat grasshopper is a medium-sized grasshopper characterized by red tibiae and a femur that is banded dorsally and entirely light underneath. The cerci of males have two branches, with the top branch being larger.

**Length:** 0.6 inch to 1.6 inches (15 mm to 40 mm).

**Similar species:** Many species of medium-sized *Melanoplus* are similar, but the pattern on the hind leg and the cerci shape are distinct. It is more robust than most other similarly sized *Melanoplus*.

**Habitat:** Common in open woodlands, also in pastures and open fields.

**Seasonality:** New adults begin appearing in August and live until winter.

**Discussion:** The Keeler's spur-throat grasshopper is often found in sandy areas in Oklahoma.



M. L. Brust

A male Keeler's spur-throat grasshopper with a close-up of its cercus.

### Grizzled Grasshopper

*Melanoplus punctulatus*, Melanoplinae

**Description:** Grizzled grasshoppers are gray-green, medium-sized grasshoppers covered in dark speckles. The inside of the hind femur is red.

**Length:** 0.8 inch to 1.8 inches (20 mm to 45 mm).

**Similar species:** No other species in eastern Oklahoma has such evenly speckled patterning.

**Habitat:** Associated with a variety of tree species including ash, cottonwood and pine. Most abundant in savanna settings with scattered trees.

**Seasonality:** New adults begin appearing in August and live until winter.

**Discussion:** Grizzled grasshoppers were once thought to be nocturnal because they were rarely collected. However, the high number submitted on citizen science websites suggests they are active during the day, but the fact that they live on trees rather than in the open grassy habitats frequented by most grasshoppers makes them difficult to find. The females lay their eggs in tree bark, which is unusual amongst grasshoppers.



A female grizzled grasshopper on a tree trunk.

EPP-7341-6

### Wrinkled Grasshopper

*Hippiscus ocelote*, Oedipodinae

**Description:** Wrinkled grasshoppers are large, thick-bodied band-wing grasshoppers. The hindwing color is usually yellow or pink, but intermediates occasionally occur. The inner hind femur is banded black and yellow.

**Length:** 1.2 inches to 2.2 inches (30 mm to 55 mm).

**Similar species:** Many similar species of *Xanthippus* and *Pardalophora* occur throughout Oklahoma, but they are all early-season species that rarely last until July. In addition, the hind femur color and pattern are distinct.

**Habitat:** Found in a wide variety of open habitats. Common on lawns, mowed roadsides and bare clay.

**Seasonality:** New adults begin appearing in late July and live until winter.

**Discussion:** Wrinkled grasshoppers are one of the most readily noticed grasshopper species in late summer throughout Oklahoma. Despite their abundance, they feed primarily on grass and rarely reach pest status.



A female wrinkled grasshopper and two hindwing color morphs.

### Carolina Grasshopper

*Dissosteira carolina*, Oedipodinae

**Description:** Carolina grasshoppers are long, slender, cryptically colored grasshoppers that range from tan to gray. The hindwings are distinct, almost entirely black with a pale yellow outside edge.

**Length:** 1.2 inches to 2.4 inches (30 mm to 60 mm).

**Similar species:** While many band-winged grasshoppers appear similar while resting, the black hindwings are distinct. In flight, it is often mistaken for a butterfly, particularly mourning cloaks, *Nymphalis antiopa*.

**Habitat:** Found open flat habitats, usually associated with humans, such as parking lots and sidewalks.

**Seasonality:** New adults begin appearing in late June and live until October.

**Discussion:** One of the most widespread band-winged grasshoppers in the U.S., this species may have been able to expand its range to utilize human-made habitats.



A female Carolina grasshopper and a specimen showing the hindwing pattern.

EPP-7341-7