



# Grasshoppers of the Osage and Pawnee Nations in North-Central Oklahoma

## EXTENSION

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## What is a Grasshopper?

The term “grasshopper” refers only to insects in the suborder Caelifera, sometimes referred to as the “short-horned grasshoppers.” These grasshoppers range from tiny, ground-dwelling pygmy mole crickets (not related to true mole crickets) to the large lubber grasshoppers found in western Oklahoma. 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 developmental stages. 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 exoskeleton, growing in size until they reach adulthood. At this point, most species have long, functional wings allowing them to fly. This publication focuses on grasshopper adults, as this is when they are the largest and easiest to identify.

## Introduction to Oklahoma Grasshoppers

There are more than 120 species of grasshopper recorded from Oklahoma. The high diversity of grasshoppers in the state is due to the wide variety of ecoregions that Oklahoma encompasses. Many eastern species reach the western limit of their range in Oklahoma, while many western species reach their eastern limits in Oklahoma, 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 are serious pests. Grasshoppers are considered the most important pests of rangeland in the United States, where they annually consume approximately 22% of available forage. At least two species, the obscure bird grasshopper and the high plains grasshopper, underwent a sudden population increase following drought during the dust bowl, leading to crop and grassland damage.



**Figure 1.1 and 1.2.** A katydid (top) with thin, hair-like antennae versus a grasshopper (bottom) with short, thick antennae.

## Grasshoppers of the Osage and Pawnee Nations

More than 50 species of short-horned grasshoppers have been collected from the Osage and Pawnee Nations, of which this publication highlights the 15 most common and most distinctive species. The grasshoppers covered in this publication can be divided into four taxonomic subfamilies, based on a variety of characteristics. Becoming familiar with these subfamilies will help the reader narrow down which species is observed and make it easier to identify 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 brown or tan with bright hindwings that are flashed during flight. No throat spurs.
- **Slant-faced Grasshoppers**, Gomphocerinae – thin grasshoppers, usually with a slanted face, and lack throat spurs.

## Grasshopper Glossary

**Crepitae:** The act of making noise in flight, usually clicking or buzzing sounds.

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

**Savanna:** a grassland habitat with scattered trees, sharing characteristics of both forests and prairies.

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

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

## Parts of a Grasshopper

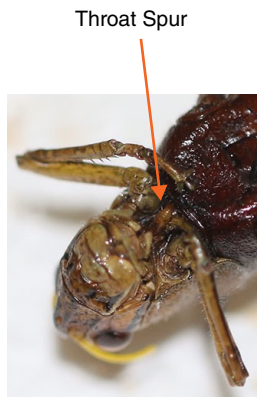
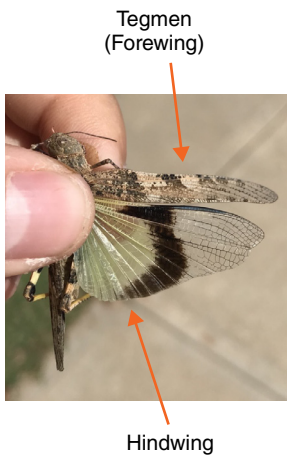
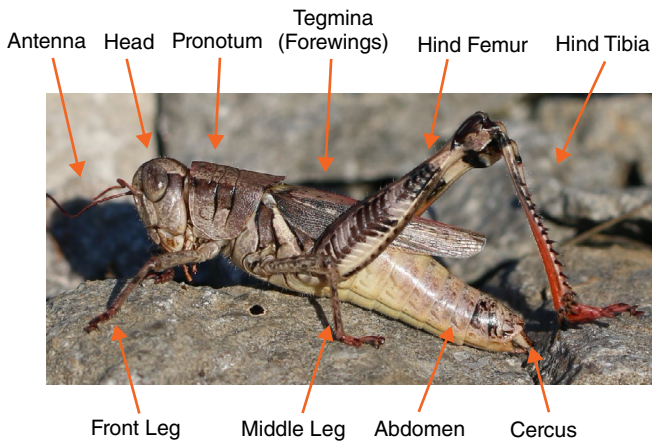


Figure 2. Bird Grasshopper.



Figure 3. Spur-Throated Grasshopper.



Figure 4. Band-Winged Grasshopper.



Figure 5. Slant-Faced Grasshopper.

## 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 center of its back and is covered in a variety of dark spots and white lines.

**Length:** 1.2-2.8 in. (30-70 mm).

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

**Habitat:** 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 population occurs August-October.

**Discussion:** American bird grasshoppers are strong fliers and will regularly fly into the nearest shrub or tree when disturbed. It rarely attains pest status in Oklahoma.



Figure 6. A male American Bird Grasshopper.



Figure 7. A female American Bird Grasshopper.

## Obscure Bird Grasshopper

*Schistocerca obscura*, Cyrtacanthacridinae

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

**Length:** 1.4-2.6 in. (35-65 mm).

**Similar species:** The spotted bird grasshopper, *S. lineata*, is very similar, but usually has a cream dorsal stripe instead of yellow-green and is 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:** The obscure bird grasshopper is a strong flier. While this species is normally 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.



Figure 8. A female Obscure Bird Grasshopper.

## Differential Grasshopper

*Melanoplus differentialis*, Melanoplinae

**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:** 1.2-2.0 in. (30-50 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 the most common species found damaging gardens and ornamental plants.



Figure 9.1 and 9.2. Two color forms of the Differential Grasshopper.

## Ponderous Spur-Throat Grasshopper

*Melanoplus ponderosus*, Melanoplinae

**Description:** The ponderous spur-throat grasshopper is a large, primarily brown spur-throated grasshopper. This species has a herringbone pattern (chevrons) on the hind femur that is interrupted by light bands. Hind tibia color can vary from yellow to red.

**Length:** 1.0-1.8 in. (25-45 mm).

**Similar species:** Differential grasshoppers, *M. differentialis*, are similar but are usually brighter colored and have an uninterrupted herringbone pattern.

**Habitat:** Found in wooded environments, especially at forest edges. Occasionally found in grasslands, but usually found around scattered trees.

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

**Discussion:** Ponderous spur-throat grasshoppers appear to hybridize with differential grasshoppers in prairie regions. These intermediates combine the broken herringbone pattern of ponderous spur-throat grasshoppers with the bright yellow color of differential grasshoppers.



Figure 10. A female Ponderous Spur-Throat Grasshopper.

## Red-Legged Grasshopper

*Melanoplus femurrubrum*, Melanoplinae

**Description:** The red-legged grasshopper is a medium-sized spur-throated grasshopper that is usually grayish brown above, greenish along the sides, yellow below and has red tibia on the hind legs.

**Length:** 0.6-1.2 in. (15-30 mm).

**Similar species:** Many species of *Melanoplus* look similar, but the combination of the yellow underside, unmarked hind femurs and red hind tibia is unique.

**Habitat:** This species is found in a wide variety of open habitats but is particularly common in the tallgrass prairie.

**Discussion:** The red-legged grasshopper is a common pest species in rangeland, where the grasshoppers compete with cattle for available forage.



**Figure 11.** A male Red-Legged Grasshopper.



**Figure 12.** A female Red-Legged Grasshopper. Featuring the characteristic yellow coloration seen on the underside of this species.

## Two-Striped Grasshopper

*Melanoplus bivittatus*, Melanoplinae

**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:** 1.0-1.8 in. (25-45 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 a common pest species of gardens, crop fields and disturbed areas. It is common in urban habitats.



**Figure 13.** A mating pair of Two-Striped Grasshoppers.

## 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:** 0.8-1.8 in. (20-45 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 historically considered 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 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 grasshopper behavior.



**Figure 14.** A female Grizzled Grasshopper on a tree trunk.

## Plains Yellow-Winged Grasshopper

*Arphia simplex*, Oedipodinae

**Description:** The plains yellow-winged grasshopper is a medium-sized, brown grasshopper with bright yellow/orange and black hindwings.

**Length:** 1.0-1.6 in. (25-40 mm).

**Similar species:** The autumn yellow-winged grasshopper, *A. xanthoptera*, is similar but has a raised crest on its pronotum and is active in the fall. The plains yellow-winged grasshopper, *A. simplex*, is longer and has a thinner black band on the hindwing.

**Habitat:** Open woodlands, forest edges and grassy fields. Often found on bare ground such as road edges but will fly into brush when disturbed.

**Seasonality:** Active in spring, adults are most abundant in April-May, but some individuals live until August.

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



**Figure 15.** A male Plains Yellow-Winged Grasshopper.



**Figure 16.** A female Plains Yellow-Winged Grasshopper showing the hindwing pattern.

## 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:** 1.2-2.2 in. (30-55 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 easily seen grasshopper species in late summer throughout Oklahoma. Despite their abundance, they feed primarily on grass and rarely reach pest status.



Figure 17. A female Wrinkled Grasshopper.



Figure 18. Two hindwing color variants.

## Seaside Grasshopper

*Trimerotropis maritima*, Oedipodinae

**Description:** The seaside grasshopper is a medium-sized, tan grasshopper. They are usually speckled to match the sandy habitats where they occur. In Oklahoma, the hind tibiae are red. The hind wings are yellow with a black band.

**Length:** 1.2-1.6 in. (30-40 mm).

**Similar species:** Other *Trimerotropis* species in eastern Oklahoma are similar but have bold bands on the forewings and most have yellow tibia. The ridgeback grasshopper, *Spharagemon cristatum*, has similar colors but has a high crest on the pronotum.

**Habitat:** Seaside grasshoppers are most commonly found along rivers, especially sandbars and beaches. However, they can be found wherever large areas of open sand are present and can even occasionally be found on gravel roads.

**Seasonality:** Adult seaside grasshoppers can be found as early as May and as late as October but are most abundant July-August.

**Discussion:** Seaside grasshoppers are alert, strong fliers making them difficult to approach. However, they almost always land on open sand, where they can easily see predators approaching and blend in extremely well. The coloration of different populations varies to match the sand they are found on.



Figure 19. An adult Seaside Grasshopper.



Figure 20. A nymph Seaside Grasshopper.

## 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 edge.

**Length:** 1.2-2.4 in. (30-60 mm).

**Similar species:** While resting, Carolina grasshoppers appear similar to many other band-winged grasshoppers. When its wings are spread during flight, the solid black hindwings edged in pale yellow are distinctive. This coloration is strikingly like that of the mourning cloak butterfly, *Nymphalis antiopa*.

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

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

**Discussion:** One of the most widespread band-winged grasshoppers in the United States, this species has been able to expand its range to utilize human-made habitats.



Figure 21. A female Carolina Grasshopper.



Figure 22. A specimen showing the hindwing pattern.

## Green-Striped Grasshopper

*Chortophaga viridifasciata* Oedipodinae

**Description:** Green-striped grasshoppers are medium-small band-winged grasshoppers with translucent yellow and black bands on the hindwings. The body color is usually either brown or green but occasionally pink variants occur. The pale stripe dividing the eyes in half helps separate it from similar species.

**Length:** 0.8-1.6 in. (20-40 mm).

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

**Habitat:** Found in any open habitat, from lawns and sidewalks to forest edges and rocky outcroppings.

**Seasonality:** Adults are observed year-round in Oklahoma, with population peaks in April-May and August-October.

**Discussion:** This species is the most abundant grasshopper in eastern Oklahoma and can be found in all habitats but the densest forests. It feeds primarily on grasses, so it is not considered a major pest despite its abundance.



Figure 23.1, 23.2 and 23.3. Green and brown variations of the green-striped grasshopper (top) and a specimen showing the translucent hindwing pattern (left).



## Admirable Grasshopper

*Syrbula admirabilis*, Gomphocerinae

**Description:** This long-legged, slender slant-faced grasshopper is sexually dimorphic – males and females of the same species vary greatly in appearance. Male admirable grasshoppers are small and brown with dark and light patterning. The larger females are green, with similar dark and light patterning. Both sexes have dark spots on the wings.

**Length:** Males: 0.8-1.2 in. (20-30 mm), females: 1.4-2.0 in. (35-50 mm).

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

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

**Seasonality:** New adults appear 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 avoid detection by hiding among grass stems.



Figure 24. A female Admirable Grasshopper.



Figure 25. A male Admirable Grasshopper.

## Spotted-Winged Grasshopper

*Orphulella pelidna*, Gomphocerinae

**Description:** A small, unremarkable grasshopper commonly found throughout eastern Oklahoma. It varies from brown to green, with brown 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:** 0.8-1.2 in. (20-30 mm).

**Similar species:** The slant-faced pasture grasshopper, *Orphuella speciosa*, is similar. On average, it is slightly smaller (15-25 mm), has shorter wings extending just beyond the end of the abdomen, and is 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 appear in July and live until winter.

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



Figure 26. A brown variant of the Spotted-Winged Grasshopper.

## Lively Mermiria

*Mermiria picta*, Gomphocerinae

**Description:** This is a long-legged, slender slant-faced grasshopper. It is most commonly green but occasionally pale brown, and is marked with reddish-brown lines extending laterally along each side of the thorax from the eye to the wing.

**Length:** 1.2-2.4 in. (30-60 mm).

**Similar species:** Most similar to the two-striped mermiria, *Mermiria bivittata*. The two-striped mermiria is usually pale brown with dark brown markings and has light stripes on the sides of the wings.

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

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

**Discussion:** The lively mermiria is another species that will dive into grass bunches to escape predators.



Figure 27. A male Lively Mermiria Grasshopper.

## List of Osage and Pawnee Grasshoppers

Not all grasshoppers found in the Osage and Pawnee Nations could be included in this guide. Many of the species not included are discussed in the "similar species" portion of the species accounts. Since some of these species lack common names, they are listed by scientific name, which can easily be searched to obtain additional information. All species listed here have been recently found in the Osage or Pawnee Nations.

### Cyrtacanthacridinae

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

### Melanoplinae

*Melanoplus differentialis*  
*Melanoplus bivittatus*  
*Melanoplus ponderosus*  
*Melanoplus punctulatus*  
*Melanoplus bispinosus*  
*Melanoplus sanguinipes*  
*Melanoplus keeleri*  
*Melanoplus femurrubrum*  
*Campylacantha olivacea*  
*Phoetaliotes nebrascensis*  
*Paratylotropidia brunneri*  
*Dendrotettix quercus*  
*Hesperotettix speciosus*

### Leptysminae

*Leptysmia marginicollis*

### Oedipodinae

*Hippiscus ocelote*  
*Hadrotettix trifasciatus*  
*Trachyrhachys kiowa*  
*Dissosteira carolina*  
*Spharagemon bolli*  
*Trimerotropis maritima*  
*Trimerotropis pallidipennis*  
*Arphia sulphurea*  
*Arphia simplex*  
*Arphia xanthoptera*  
*Chortophaga viridifasciata*  
*Trachyrhachys kiowa*  
*Pardalophora phoenicoptera*

### Gomphocerinae

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

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