The Tettigoniidae (Orthoptera) of Oklahoma

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The long-horned grasshoppers receive their name from the fact that their antennae exceed the body in length. They are noted songsters, stridulating mainly in the evening, with only the males of the species doing the "singing".

Habitat and color seem to coincide in the tettigoniids. The color is usually a leaf green for those found in trees, and brown or gray for the ground-dwelling species. Forms well adapted for flying use their legs only for support; others are very saltatorial.

Tettigoniids usually overwinter in the egg stage, and reach adulthood in late June and early July. Generally the tettigoniids are plant feeders, but a few prey on other insects.

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This work includes 10 genera and 31 species in six subfamilies of the Tettigoniidae; however, due to the lack of taxonomic characters, the keys, in some genera, do not include the females. Twenty-two species were listed in papers by Caudell (1902), and Hubbell and Ortenburger (1927), concerning Tettigoniidae of Oklahoma. The additional species added in this paper were from collections in the Oklahoma State University Entomological Museum and the Stovall Museum of the University of Oklahoma, and from literature, as follows: Rehn and Hebard (1914, 1914a, 1914b, 1915, 1915a, 1915b, 1916), Rehn (1957), Hebard (1925, 1929, 1931, 1934, 1934a, 1934b, 1941), Blatchley (1903, 1920), Caudell (1907, 1924), Tinkham (1944), Thomas (1951) and Thomas and Alexander (1962).

KEY TO THE SUBFAMILIES OF TETTIGONIDAE

1.	Wings absent or vestigial; pronotum exceeding five mm in length; usually gray or brown2
	Wings present and well developed; if not, the pronotum never exceeds five mm in length; usually greenish in color3
2.	Tegmina longer than pronotum Listroscelinae Tegmina shorter than pronotum Decticinae
8.	Prosternal spines absent
4.	Vertex not produced forward as a tubercle or conePhaneropterinae Vertex produced forward as a rounded tubercleConocephalinae
5.	Pronotum about as long as wide with two transverse grooves
	Pronotum longer than wide with only one transverse groove
6.	Vertex produced into a long sharp cone

LISTROSCELINAE

Rehnia Caudell

Rehnia victoriae Caudell

Characteristics: Length of body, male and female, 29-42 mm; length of pronotum, male and female, 7-9 mm; length of tegmina, male and female, 10-14 mm; length of ovipositor, 33-39 mm; color green, abdomen with some brown; head inserted into pronotum; eyes round and very prominent; pronotum smooth, dorsally rounded, posterior margin elevated, slightly rounded; prosternum armed with two spines; tegmina longer than hind wings, not exceeding abdomen, about two times as long as pronotum; cerci short and apically produced as an incurved tooth.

County records: Beaver, Harper, and Woodward.

DECTICINAE

Pediodectes Rehn and Hebard

Characteristics: Robust; color generally yellow, some dark portions in varying degrees on pronotum; pronotum large, disk usually flat, lateral margins rounded, lateral lobes well developed; prosternum armed with a pair of spines; tegmina and hind wings rudimentary, tegmina partially exposed in males, completely concealed by pronotum in females; supra-anal plate small; cerci simple in female, armed on inner side with tooth in male; ovipositor arcuate and long.

KEY TO MALES

1.	Cercal tooth inserted apically beyond middle
2.	Pronotum 11-12 mm in length haldemanic Pronotum 5-8 mm in length stevensonic
3.	Pronotal disk little if at all lighter in color than upper portions of lateral lobes; lateral carinae not evidentgrandist Pronotal disk distinctly lighter than upper portions of lateral lobes; lateral carinae at least slightly indicatednigromarginata
	Pediodectes haldemanii (Girard)
	Characteristics. Length of proportion made and devole 11.18 mm.

Characteristics: Length of pronotum, male and female, 11-16 mm; length of ovipositor, 25-32 mm; robust; color yellow; pronotum posteriorly produced over the abdomen, anterior margin truncate, posterior margin rounded.

County records: Cimarron, Ellis, Harper, Jackson, Osage, and Roger Mills.

Pediodectes stevensonii (Thomas)

Characteristics: Length of pronotum, male and female, 5-8 mm; length of ovipositor, 14-18 mm; color generally brown, sometimes yellowish brown; pronotum rounded dorsally, posterior margin may be truncate.

County records: Beaver, Harper, and Pawnee.

Pediodectes grandis (Rehn)

Characteristics: Length of pronotum, male and female, 8-13 mm; length of ovipositor, 15-29 mm; color dark to light brown.

Reported by A. P. Morse to be found in Oklahoma (Caudell, 1907).

Pediodectes nigromarginata (Caudell)

Characteristics: Length of pronotum, male and female, 7-9 mm; length of ovipositor, 16-21.5 mm; color various shades of brown.

County records: Alfalfa, Harper, Jackson, Osage, Pawnee, and Payne.

PHANEROPTERINAE

Characteristics: Color usually a bright green; head short, face vertical, vertex either a blunt deflexed attenuation or broadly rounded; eyes small, situated close to basal joint of antennae; pronotum short, flat or concave, median carina absent or faint, lateral carina usually distinct, usually narrowed in front, caudal margin usually rounded; prosternal spines absent; tegmina shorter than hind wings, in Amblycorypha parvipennis parvipennis and Amblycorypha parvipennis brachyptera hind wings not evident when tegmina folded; ovipositor and male genitalia vary in shape with species.

KEY TO GENERA

1.	Hind legs nearly or fully four times as long as body; eyes oblong oval; pronotum saddle shapedArethaec
	Hind legs less than three times as long as body; eyes globose; pronotum not saddle shaped
2.	Tegmina long and narrowScudderic

Tegmina broad

Arethaea Stal

Characteristics: Color green, some areas paler; fastigium triangular; eyes oblong oval, always deeper than wide; pronotum saddle shaped with faint median carina; lower lobe of femoral apices of hind legs ending in a pointed spine. Key to species modified from Hebard (1934a).

KEY TO SPECIES

1.	Eyes approximately 1.5 times as deep as wide2 Eyes approximately twice as deep as wide3
2.	Pronotum with caudal margin of disk sharply angulate c. constricts Pronotum with caudal margin of disk convex or rounded c. constricts
3.	Pronotal disk with median carina grallator Pronotal disk without median carina ambulator

Arethaea constricta constricta Brunner

Characteristics: Length of body, male and female, 12-14 mm; length of pronotum, male and female, 4 mm; length of ovipositor, 5 mm; color green; sutural margin of tegmina darkened; legs long, femora not compressed dorsally; male cerci bent down apically forming a heavy acute tooth; ovipositor arcuate.

County records: Harper, Jackson, Jefferson, Kiowa, Osage, and Tillman.

Arethaea gracilipes gracilipes (Thomas)

Characteristics: Differs from A. c. constricts by the key characteristics and the not darkened sutural margins of the tegmina.

County record: Texas.

Arethaea grallator (Scudder)

Characteristics: Length of body, male and female, 16 mm; length of pronotum, male and female, 4.5-5 mm; length of ovipositor, 5-5.8 mm; color green; fore and median femora compressed dorsally; male cerci each with small apical tooth; ovipositor arcuate.

County records: Pontotoc and Sequoyah.

Arethaea ambulator Hebard

Characteristics: Length of body, male and female, 15-21.5 mm; length of pronotum, male and female, 4-6.1 mm; length of ovipositor, 6.8 mm; color green; fore and median femora compressed dorsally; apical portion of cerci bent inward at almost a 90° angle terminating in a tooth.

County record: Comanche.

Boudderia Stal

Characteristics: Color green with traces of yellow on face and ventral surface; vertex compressed into narrow fastigium; pronotal disk flat, hind margin broadly rounded; caudal femora almost as long as tegmina; supraanal plate of male with a long decurved spine notched apically; ovipositor broad, arcuate.

KEY TO MALES

- 2. Notch of supra-anal spine square with minute median tooth, lateral processes slender and laterally compressed texensis. Notch of supra-anal spine acute, without median tooth, lateral processes broad c. curvicauda

Scudderia furcata furcata Brunner

Characteristics: Length of body, male, 14-20 mm, female, 18-21 mm; length of pronotum, male and female, 4.6-5 mm; length of ovipositor, 5-7 mm; color green and greenish yellow, antennae green basally; pronotal disk with parallel or nearly parallel sides, lateral carina rather sharply elevated with no yellow color present; tegmina reticulate.

County records: Alfalfa, Beaver, Ellis, Grant, Harper, LeFlore, McCurtain, Murray, Okfuskee, Osage, and Woodward.

Scudderia texensis Saussure and Pictet

Characteristics: Length of body, male, 21-25 mm, female, 24-28 mm; length of pronotum, male and female, 5.5-6.5 mm; length of ovipositor, 7-8 mm; body and face pale green, extremities grass green; pronotum narrower in front, distinct yellow lines on lateral carina.

County records: Alfalfa, Ellis, Harper, LeFlore, Osage, Pawnee, Payne, Pittsburg, Woods, and Woodward.

Scudderia curvicanda curvicanda (DeGeer)

Characteristics: Length of body, male, 18-23 mm, female, 19-25 mm; length of pronotum, male and female, 5-6 mm; length of ovipositor, 7-8 mm; differs from S. texensis by the absence of yellow carinal lines and in the shape of the supra-anal plate of the males, as stated in the key.

County records: Delaware, Hughes, McClain, Nowata, Okmulgee, Osage, Pawnee, and Payne.

Amblycorypha Stal

Characteristics: Color generally green; fastigium rounded; pronotum with disk flat, narrowed in front; tegminal apices broadly rounded, may exceed apices of hind wings; supra-anal plate short, broad, and truncate; ovipositor broad.

KEY TO SPECIES

1.	Tegmina definitely longer than wings p. parvipennis, p. brachyptere
	Tegmina shorter than wings
2.	Hind femora always slightly and usually decidedly surpassing apices of tegmina
3.	Subgenital plate of male V-emarginated distally; ovipositor arcuate oblongifolic
	Subgenital plate of male truncate, never V-emarginated;

Amblycorypha parvipennis parvipennis Stal

Characteristics: Length of body, male and female, 21 mm; length of pronotum, male and female, 7 mm; length of ovipositor, 8 mm; color green; wings never evident when tegmina folded; subgenital plate of male V-emarginated distally; ovipositor arcuate.

County records: Carter, McCurtain, Murray, and Pawnee.

Amblycorypha parvipennis brachyptera Ball

Characteristics: Length of body, male and female, 21-22 mm; length of pronotum, male and female, 6.5-7 mm; length of ovipositor, 8.5 mm.

County records: Osage, Pawnee, and Payne.

Amblycorypha uhleri Stal

Characteristics: Length of body, male, 14-15 mm, female, 16-17.5 mm; length of pronotum, male, 4.8-6 mm, female, 5.5-7 mm; length of ovipositor, 7.5-10 mm; color pale green; distal margin of subgenital plate of male truncate; ovipositor arcuate.

County records: Alfalfa, Hughes, Osage, and Pawnee.

Amblycorypha oblongifolia (DeGeer)

Characteristics: Length of body, male, 19-23 mm, female 22-25 mm; length of pronotum, male, 6-6.5 mm, female, 7 mm; length of ovipositor, 11.5-13 mm; color bright green.

County records: Alfalfa, Beckham, Caddo, Choctaw, Delaware, Harper, Jackson, Kay, Latimer, LeFlore, Love, McCurtain, McIntosh, Murray, Muskogee, Osage, Pawnee, Payne, Pontotoc, Pottawatomie, Sequoyah, Texas, Tillman, and Tulsa.

Amblycorypha huasteca (Saussure)

Characteristics: Length of body, male and female, 23-25.5 mm; length of pronotum, male and female, 7.5-8 mm; length of ovipositor, 19-21 mm; color green.

County records: Alfalfa, Beckham, Caddo, Cleveland, Grant, Harper, Jackson, Osage, Pawnee, Pontotoc, Tillman, Woods, and Woodward.

Microcentrum Scudder

Characteristics: Color green to pale green; fastigium obtuse; eyes prominent; disk of pronotum flat; tegmina broad, not reaching apices of wings; supra-anal plate of males oblong-triangular; ovipositor strongly arcuate.

KEY TO SPECIES

Microcentrum rhombifolium (Saussure)

Characteristics: Length of body, male, 25-28 mm, female, 28-30 mm; length of pronotum, male and female, 6-7 mm; length of ovipositor, 4.5-5 mm; color dark green; tegmina broad, greatly exceeding apices of hind femora.

County records: Payne and Woodward.

Microcentrum retinerve (Burmeister)

Characteristics: Length of body, male 20-22 mm, female, 24-26 mm; length of pronotum, male and female, 5-6.5 mm; length of ovipositor, 5.5-6.5 mm; color pale green; tegmina broad, with tips more broadly rounded than M. rhombifolium, exceeding apices of hind femora.

County record: Payne.

PSEUDOPHYLLINAE

Pterophylla Kirby

Characteristics: Robust; color green; vertex terminating in a sharp flat tubercle; eyes small; pronotum saddle shaped, front margin truncate, hind margin rounded, lateral lobes deeper than long, disk crossed by two distinct transverse sulci; prosternum armed with two spines; tegmina broad, leaf-like, completely enclosing abdomen and hind wings, exceed apices of hind femora; cerci broad at the base, widely forked; subgenital plate long, narrow, spear shaped; ovipositor more than twice as long as pronotum. To identify females, they must be taken with males, since there are no stable diagnostic characters to use in separation.

KEY TO MALES

1.	Cerci each with ventral projection not forked distad
	Cerci each with ventral projection forked distad
	Pterophylla camellifolia camellifolia (Fabricius)

Characteristics: Length of body, male, 25-30, female, 26-34 mm; length of pronotum, male and female, 5.5-6 mm; color green.

County records: Mayes, Muskogee, Pontotoc, and Tulsa.

Pterophylla furcata furcata (Caudell)

Characteristics: Description same as P. c. camellifolia except for the characters mentioned in the key.

County records: LeFlore and McCurtain.

COPIPHORINAE

Neoconocephalus Karney

Characteristics: Color pale green to brown; vertex of fastigium projected forward and upward into a cone, below bearing a pointed basal tooth; eyes small; pronotal disk much longer than wide, never crossed by more than one transverse sulcus, truncate anteriorly, rounded posteriorly, lateral carinae distinct; prosternum with two slender spines; tegmina long, narrow, greatly surpassing abdomen and slightly exceeding apices of hind wings; hind femora greatly exceeded by tegmina; male with supra-anal and subgenital plates emarginate; ovipositor narrow, straight, very long.

KEY TO SPECIES

Cone of vertex distinctly longer than wide _____robustus crepitans
 Cone of vertex not or very slightly longer than wide _____triops

Neoconocephalus robustus crepitans (Scudder)

Characteristics: Length of body, male and female, 80-37 mm; length of fastigium, male and female, 2.7-3.7 mm; length of pronotum, male and female, 7.8-9 mm; length of ovipositor, 25-31 mm; color pale green or brown.

County records: Aifalfa, Beaver, Ellis, Harmon, Harper, Hughes, Noble, Osage, Pawnee, Payne, Pontotoc, Roger Mills, Woods and Woodward.

Neoconocephalus triops (Linnaeus)

Characteristics: Length of body, male and female, 27.5-36 mm; length of fastigium, male and female, 2.1-2.6 mm; length of pronotum, male and female, 8.7-9.7 mm; length of ovipositor, 21-25 mm; color green to brown.

County record: Payne.

CONOCEPHALINAE

Characteristics: Color green to pale brown; vertex projected to form a blunt rounded tubercle; eyes large; pronotum saddle shaped; prosternum usually with two slender spines; tegmina usually well developed; legs variable in length; ovipositor and male genitalia vary with genera and species.

KEY TO GENERA

Orchelimum Serville

Characteristics: Color variable, may be green, reddish brown, or brown; pronotum saddle shaped, caudal margin broadly rounded, lateral lobes usually deeper than long; tegmina narrow, tapering, shorter than hind wings; supra-anal plate of male with apex emarginate, subgenital plate apically "U" or "V" shaped; ovipositor arcuate.

KEY TO MALES

- 1. Cerci each with tooth longer than apical portion _____silvaticum Cerci each with tooth not longer than apical portion _____2
- 2. Cerci with distal portion beyond insertion of median tooth longer than proximal portion _______concinnum group Cerci with distal portion beyond insertion of median tooth not longer than proximal portion ______3
- 4. Cerci with median tooth thickened at the base ______vulgare Cerci with median tooth flattened at the base _____agile

Orchelimum silvaticum McNeill

Characteristics: Length of body, male and female, 17-23 mm; length of pronotum, male and female, 5.2-6.2 mm; length of ovipositor, 9-9.6 mm; color pale green; lateral lobes of pronotum longer than deep; tegmina surpassed by hind wings and usually exceeded by hind femora.

County records: Comanche, Jefferson, Pittsburg, and Pottawatomie.

concinnum group

Several species have been included in the concinnum group. Two of these species have been positively identified as being found in Oklahoma. Thomas and Alexander (1962) list Orchelimum compestre and Orchelimum delicatum in Oklahoma. Orchelimum concinnum, a very closely related

species which is almost impossible to separate from campestre and delicatum, is found in Texas and Illinois. There is a good possibility that this species may be found in Oklahoma.

Rehn and Hebard (1915a) placed O. campestre Blatchley and O. delicatum Bruner as synonyms of O. concinnum Scudder. They stated that O. concinnum is a widely diverse species. Blatchley (1920) placed campestre and delicatum as trinomials of O. concinnum. Hebard (1934b) placed campestre as a synonym of O. concinnum concinnum and left O. concinnum delicatum as a subspecies.

Thomas (1951) considered campestre, delicatum and concinnum as three distinct species due to their existence together in a number of places without evident intergradation. Thomas and Alexander (1962) pointed out that morphological characters in the O. concinnum group vary, both geographically and within local populations, and that song features are the most reliable characteristics for separating the species.

We have not attempted to separate the three species in the key due to lack of distinct morphological characters. The three species are listed with their synonomy and a short description. Refer to Thomas and Alexander (1962) for a detailed discussion of the three species.

Orchelimum concinnum Scudder

Characteristics: Length of body, male and female, 16.5-18 mm; length of pronotum, male and female, 4-5.5 mm; length of ovipositor, 7.5-8.2 mm; body color variable, face nearly always with conspicuous midfacial stripe extending from mouth to vertex; male cerci with carinae distinctly developed; ovipositor is usually less than half the length of the hind femur and relatively straight for the distal two-thirds of its length.

Orchelimum delicatum Bruner

Characteristics: Length of body, male and female, 16-17.5 mm; length of pronotum, male and female, 3.8-4 mm; length of ovipositor, 10.5-11 mm; body color variable, ground color of face is usually clear pea green; male cerci with carinae distinctly developed; ovipositor is always more than one-half as long as the hind femur and the upper margin of the ovipositor is relatively straight for the distal two-thirds of its length.

County records: Beaver, Craig, Osage, Tulsa and Washington.

Orchelimum campestre Blatchley

Characteristics: Length of body, male and female, 17.5-19 mm; length of pronotum, male and female, 4.2-5 mm; length of ovipositor, 7-7.5 mm; body color variable, ground color of face is nearly always a translucent dull amber, suffused with red which is usually concentrated along the lateral margins of the face; male cerci with carinae clearly developed; ovipositor is definitely upcurved from about the middle posteriorly.

County records: Pushmataha and Tulsa.

Orchelimum nigripes Scudder

Characteristics: Length of body, male and female, 18-21 mm; length of pronotum, male and female, 4.3-5 mm; length of ovipositor, 9-10.5 mm; color green, tibiae and tarsi black; tegmina almost equaling hind wings and exceeding apices of hind femora.

County records: Craig, Osage, and Washington.

Orchelimum vulgare Harris

Characteristics: Length of body, male and female, 18-23 mm; length of pronotum, male and female, 5-6.5 mm; length of ovipositor, 7.5-8.5 mm;

robust; color green or pale reddish brown; lateral lobes nearly as long as deep; hind femora may exceed tips of tegmina.

County records: Alfalfa, Craig, Osage, Payne, and Woodward.

Orchelimum agile (DeGeer)

Characteristics: Length of body, male and female, 21.5-22.5 mm; length of pronotum, male and female, 5-5.6 mm; length of ovipositor, 7-8 mm; color dull reddish brown dorsally, green ventrally; pronotum often with pair of dark brown diverging stripes; tegmina approximately equaling hind femora in length, hind wings extending beyond tegmina.

County records: Caddo, Craig, Harmon, Murray, Osage, Payne,

Roger Mills, and Tulsa.

Conocephalus Thunberg

Characteristics: Slender; color green, tinged with brown; caudal margins of pronotum rounded; tegmina narrow, usually abbreviated in length; subgenital plate of male truncate; ovipositor slender, straight.

KEY TO SPECIES

- 1. Hind tibiae armed with one pair of spines at apices; prosternal spines wanting saltans Hind tibiae armed with three pair of spines at apices, prosternal spines short 2

Conocephalus saltans (Scudder)

Characteristics: Length of body, male and female, 11-15.5 mm; length of pronotum, male and female, 3-3.5 mm; length of ovipositor, 11.5-15.5 mm; slender; color dull reddish brown, sides of abdomen with narrow yellow stripe; tegmina and hind wings when abbreviated usually covering about one fourth of abdomen; cerci incurved wth tooth bent downward and inward; ovipositor at least as long as body.

County records: Cleveland and Jefferson.

Conocephalus fasciatus (DeGeer)

Characteristics: Length of body, male and female, 11-15.5 mm; length of pronotum, male and female, 2.8-3.5 mm; length of ovipositor, 7.3-9.5 mm; slender; color brown dorsally, green laterally, tegmina reddish brown; tegmina not exceeding apices of hind wings; apical portion of cerci more or less depressed, its apices broad and rounded.

County records: Custer, Delaware, LeFlore, Noble, Okmulgee, Pawnee, Payne, and Washington.

Conocephalus strictus (Scudder)

Characteristics: Length of body, male and female, 14-19 mm; length of pronotum, male and female, 3.5-4.5 mm; length of ovipositor, 18-32 mm; slender; sides of head, body, femora green, occiput pronotum reddish brown, dorsum of abdomen dark brown; pronotum with distinct lateral carina; tegmina no more than one-half the length of the abdomen, always much shorter than hind femora; apical portion of cerci very weakly flattened, the apices narrow; ovipositor slender, longer than the body.

County records: Alfalfa, Harper, Kay, Osage, and Pawnee.

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