

**NOTES ON
THE ACRIDIDAE (ORTHOPTERA) OF IOWA***

Herbert Knutson

Considerable taxonomic work has been published on the grasshoppers of many of the midwestern states, such as that of Hebard on species of South Dakota ('25), Kansas ('31), Minnesota ('32), and Illinois ('34). Also, some work of economic character has been done in each of the midwestern states.

The first investigator to publish on the Orthoptera of Iowa was Professor C. E. Bessey ('76). Sixteen years later Herbert Osborn ('92) listed forty-three species of Iowa Orthoptera (a few of which are synonyms). In this paper, Osborn largely deals with species occurring in the vicinity of Ames, and the central portion of the state, and gives notes on the relative numbers. E. D. Ball ('97) gives records on the seasonal and geographical distribution, habitat, and relative abundance of several species. Ball lists fifty-four "species" of grasshoppers. Melvin P. Some ('11) presented a Master's thesis on "The Orthoptera of Iowa", which is still in Manuscript in the State University Library at Iowa City. Some's thesis records more species of grasshoppers than any previous paper, with considerable data on each species. When we consider the comparatively small amount of literature and specimens available to Some at that time, the accuracy of his specific determinations seems remarkable. Knutson and Jaques ('35) published a list including seventy-three species and races of Iowa grasshoppers.

In museum-collections, the locality label usually states month, day, year, collector, and county or city where the

*The writer is deeply indebted to Professor Jaques for the use of the Iowa Insect Survey Collection records; to Professor S. W. Geiser of Southern Methodist University for constant advice, help, and encouragement; to Professor R. L. King of the State University of Iowa for helpful criticism and many additional records for this paper; to Professor H. H. Knight of Iowa State College for records from the Iowa State College Collection; and to Mr. Morgan Hebard of the Academy of Natural Sciences of Philadelphia, for determining or checking the determination, of many of the specimens.

specimens were caught. But, it is often difficult to ascertain the habitat favored by a species from the data on a typical locality label; since many diverse habitats occur within a county or even within a neighborhood. Correspondence with the collector of a given museum-specimen regarding the habitat in which the given specimen was caught, nets little of value for it is often difficult if not impossible for the collector to recall from memory such habitat data.

In the present paper, new distributional and ecological data, not found on the locality label of many previous collectors, are recorded. The habitat data given in this paper were collected by the writer in the field, unless otherwise specified.

Professor H. E. Jaques, of Iowa Wesleyan College, has given the writer complete access to the Acrididae in the Iowa Insect Survey Collection of Iowa Wesleyan College. In the formation of this collection Professor Jaques and his students have been studying the seasonal and geographical distribution of Iowa insects for a period of more than ten years. This rapidly growing collection includes over 5,000 species and 100,000 specimens of Iowa insects. Most of the county and date records below are from specimens in the Iowa Insect Survey Collection. Twenty-six species, and distributional data on many others, are added to the list on the authority of Professor R. L. King of the State University of Iowa.

The catalogue numbers used are taken from Blatchley ('20). New numbers have been given to species not listed by Blatchley. For brevity's sake, counties are numbered instead of named, in conformity with the numbering on the Iowa Insect Survey Record Cards, figured here. Distributional county numbers with seasonal range for adults are given for each species. Seasonal range is noted by Roman numerals I-XII (January to December).

Although each species of grasshopper seems to favor a certain type of ecological habitat, most species are not restricted entirely to a certain soil, or climate, or food plant. Some species, however, are found but rarely outside of a given ecological range. For instance, *Dichromorpha viridis* (Scudder) seems to favor a damp area; *Dissosteira carolina*

(Linnaeus) a dusty roadside; and *Encoptolophus sordidus costalis* (Scudder) wheat and other grasses. Certain species are found most frequently on sandy areas while other species are largely found on grass land. On an area where sand is partly covered with grass, one often finds both the sand and the prairie inhabitant. Many grasshoppers, such as *Melanoplus viridipes viridipes* Scudder favor the forest. In Iowa it appears that a larger percentage of the grasshoppers with poorly developed wings are found in woods, tall vegetation, or other habitats in which long flights are difficult.

List of Species

ACRYDIINAE

64a. *Nomotettix cristatus compressus* Morse

Counties 65, 88, 89. V 12 to X 15. One male taken on V 18 on Pansy Hill west of Mt. Pleasant on the side of a steep wooded hill close to Skunk River. At Oakland Mills State Park more than 200 specimens were taken in short grass along a railroad track, near a dense woods. This race differs from the typical *cristatus* by having front part of the pronotum extending farther over the head, and the pronotal carina higher. These specimens appear to be intermediates between the two races.

65. *Acrydium subulatum* (Linnaeus)

Counties 3, 6, 21. V 9 to VIII 13. Synonyms of this species are *granulatum* and *luggeri*. This northern spring species taken along the Mississippi River south of McGregor along the edge of a dense woods, which contained an unusually thick layer of dead leaves.

67. *Acrydium ornatum* (Say)

Counties 3, 12, 52, 64, 75, 85, 87, 88, 89, 96. IV 21 to XI 16. Both nymphs and adults of this common species taken in the east edge of Mt. Pleasant, near Cole's Pond, in short bluegrass. Several were found during November in the crack of a hedge post, where they had retreated during the cold weather.

68. *Acrydium acadicum acadicum* (Scudder)

Counties 3, 52, 63, 64, 65, 88, 89. X 10 to 21. Over fifty adults and fifteen immatures taken near Oakland Mills at the junction of a cornfield, meadow, and a woods. Most abundant in the meadow, although specimens were taken in each of the three habitats.

69c. *Acrydium arenosum angustum* (Hancock)

Counties 12, 14, 16, 21, 30, 37, 40, 41, 47, 52, 53, 54, 63, 64, 65, 73, 75, 76, 77, 78, 86, 87, 88, 89, 96, 98, 99. IV 19 to XII 8. One nymph taken III 23 in Henry County. The majority were taken in May and June, and the majority were caudate. Twelve specimens, six males and six females, taken in an open timothy pasture east of the Des Moines Y. M. C. A. Camp, in Boone County. Specimens taken in abundance along the fence of a level wheat field west of Mt. Pleasant. In both instances the specimens were taken at least a mile from water.

73. *Paratettix cucullatus cucullatus* (Burmeister)

Counties 2, 3, 14, 21, 33, 41, 47, 52, 53, 54, 63, 64, 65, 66, 73, 75, 76, 77, 79, 83, 87, 88, 89, 90, 95, 98, 99. III 25 to XII 23. This species seems to reach the adult peak in June, and apparently favors areas close to water. Taken in abundance along the Des Moines River in Boone County; a single sweep along the mud shore of

the river would sometimes net forty or more immatures. Found in like abundance along the Mississippi River near Port Louisa and Muscatine, also Skunk River near Rome and Oakland Mills.

Ord. & Fam. VII-4	Catalog Number 125a	Scientific Name Trachyrhachis kiowa fuscifrons (Stål)			
Order Orthoptera					
Family Acrididae					
Habitat					
Food					
Jan	Feb.	Mar	Apr	May	June
Jul	Aug	Sep	Oct	Nov	Dec
✓	✓	✓			

Iowa Insect Survey

Ord. & Fam. VII-4	Catalog Number 125b	Scientific Name Trachyrhachis kiowa kiowa Thomas			
Order Orthoptera					
Family Acrididae					
Habitat					
Food					
Jan	Feb.	Mar	Apr	May	June
Jul	Aug	Sep	Oct	Nov	Dec
✓	✓				

Iowa Insect Survey

Fig. 1. Facsimiles of record cards of the Iowa Insect Survey Collection, showing method of graphically recording distribution by counties, and seasonal distribution.

77a. *Tettigidea lateralis parvipennis* (Harris)

Counties 3, 16, 35, 41, 47, 48, 52, 63, 64, 65, 73, 75, 76, 77, 78, 83, 85, 87, 88, 89, 91, 96, 98, 99. III 25 to XI 12. Found in about equal numbers from May through August. I found it at the Ledges State Park near Boone, in a partially wooded area some distance from the Des Moines River. Professor R. L. King, reports this species as common in spring and fall, the number falling off during the summer.

ACRIDINAE

82. *Pseudopomala brachyptera* (Scudder)

Counties 1, 12, 23, 42, 48, 64, 65, 77, 90. VII 7 to 24. Two males taken among *Andropogon* along a railroad track north of Dubuque on U. S. Highway 61. The closest stream was a quarter-mile distant.

84. *Mermiria neomexicana* (Thomas)

Counties 67, 79, 90. VIII 11 to 25. Rehn ('19) records this species from Hamburg. One male taken along the sand bank of the Missouri River, in Fremont County. This seems not to be the typical habitat for this species. Most records for this species state that they are most common on a high, open, dry plain; the area where this specimen was taken was entirely surrounded by timber. I have observed this species in great abundance on high, native prairies near Dallas, Texas.

87. *Mermiria maculipennis macclungii* Rhen

Counties 12, 22, 43, 67, 77, 79, 90.

88. *Syrbula admirabilis* (Uhler)

Counties 31, 52, 60, 61, 63, 64, 65, 72, 74, 75, 76, 77, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99. III 29 to X 18. One of the more common species in southeastern Iowa. The most northern record in the Iowa Insect Survey Collection for the state is a female taken in an open timothy field just north of Des Moines. This species favors open fields rather than wooded areas, although specimens have been taken in the middle of a woods at Oakland Mills, and in Flint Hills State Park.

88½. *Opeia obscura* (Thomas)

Counties 1, 3, 22. VII 30 to VIII 28. In Iowa, this species is limited to the northwest portion. Hebard ('32) records Mankato, Minnesota as "a northern and eastern limit point in the known distribution of this Great Plains species", and also states, ('25) that it does not occur in eastern Nebraska.

89. *Eritettix simplex simplex* (Scudder)

Counties 1, 3, 4, 12, 22, 31, 90. VI 8 to VII 10.

89½. *Phliostrotra quadrimaculatum* (Thomas)

Counties 12, 22, 90. VIII 28.

91. *Chocaltis conspersa* Harris

Counties 3, 4, 28, 41, 43, 47, 48, 52, 54, 60, 63, 64, 65, 74, 76, 77. VI 14 to X. This species seems to favor sparsely wooded areas and has been observed depositing eggs in decaying wood. A female was taken near a hedge fence bordering timber west of Iowa City.

98. *Orpbulella speciosa* (Scudder)

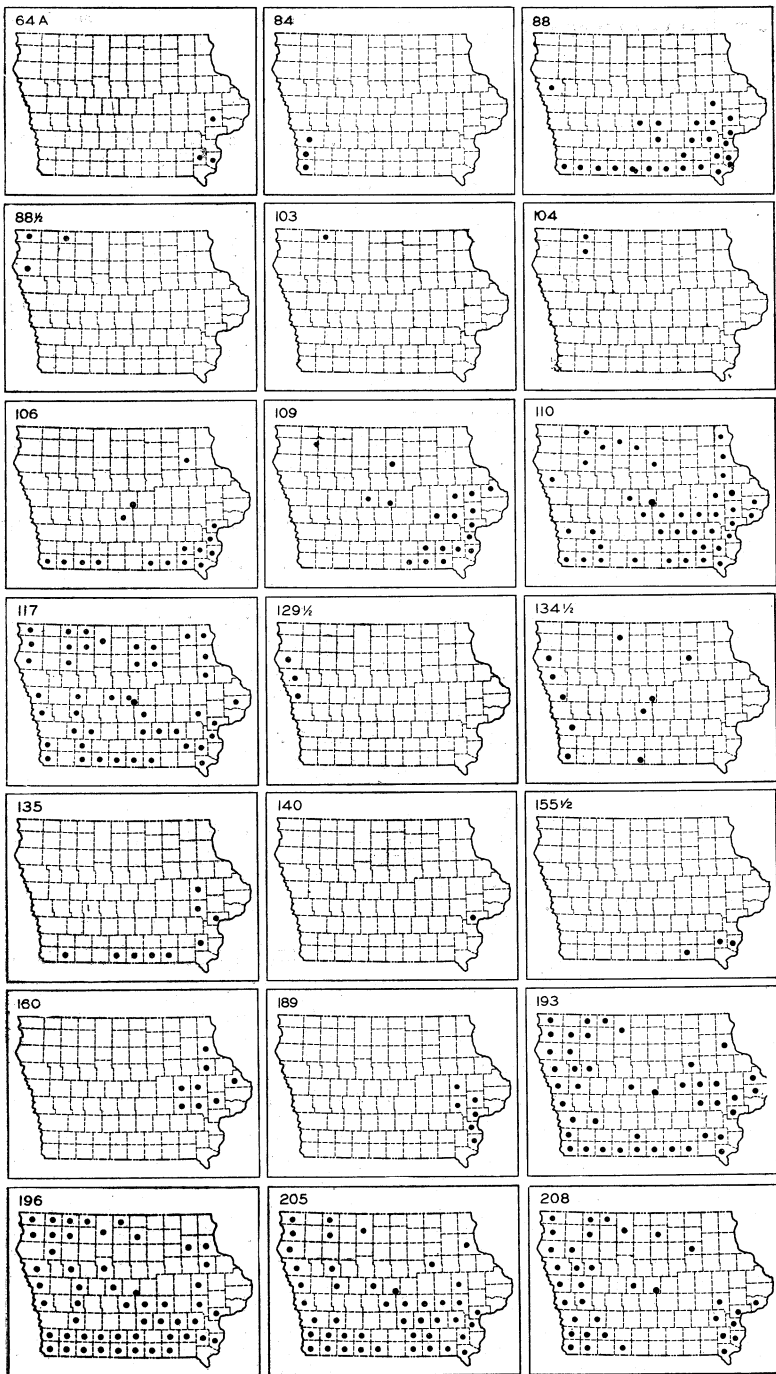
Counties 1, 3, 4, 5, 10, 12, 15, 18, 21, 22, 23, 25, 27, 31, 33, 45, 47, 60, 64, 68, 72, 74, 75, 76, 79, 88, 89, 90, 91, 92, 94, 95, 97, 99. VII 10 to X. Distribution statewide. Found in abundance in short grassy pastures, oats- and wheat-stubbles. Numerous specimens taken on a sloping, short-grass pasture in eastern part of Yellow Spring Township, Des Moines County.

99. *Dichromorpha viridis* (Scudder)

Counties 1, 3, 4, 12, 14, 15, 31, 43, 47, 52, 60, 61, 62, 63, 64, 65, 72, 74, 77, 88, 89, 92, 97, 98. VII 24 to X 27. This species has been found only moderately abundant, except along the DesMoines River in Boone County; and along Yellow Spring Creek in Des Moines County, (where fifty specimens, all of the green color phase, were taken).

101. *Chorthippus longicornis* (Latreille)

Counties 1, 3, 4, 14, 15, 30, 41, 64. VII to VIII 18. *Chorthippus curtipennis* is a synonym. Taken in the tall prairie grass north of Lake Okoboji. Blatchley ('20) records this species as common throughout Indiana and states that "if records can be relied upon, the range of *Chorthippus curtipennis* is almost as great as that of any other North American locust." I made special effort to find this species when collecting along swamps, streams, and in other damp places but found it only once.



102. *Ageneotettix deorum* (Scudder)

Counties 1, 3, 4, 12, 13, 14, 15, 22, 23, 30, 31, 32, 33, 43, 52, 55, 63, 64, 65, 67, 73, 77, 79, 81, 90, 91, 92, 93. VI 28 to X 8. This species reaches its greatest numbers in July and August, and apparently is most abundant in the western portion of the state. It has been taken in abundance on a partially-bare slope near woods north of Cherokee. The species has wide color variation; and some have a white stripe of a varying width extending from the posterior extremity of the pronotum to the apex of the wings. Our numbers of specimens are insufficient to show what per cent of the general population possess the white stripe; but they are in the minority.

103. *Stethobothyma lineatum* (Scudder)

County 3. VII 22 to VIII 18.

104. *Stethobothyma gracile* (Scudder)

Counties 3, 14. VII 20 to VIII 23.

105 $\frac{1}{4}$. *Boopedon auriventris* (McNeill)

County 90. VIII 12 to 29.

105 $\frac{1}{2}$. *Anolocara ellioti* (Thomas)

County 3. VIII 13.

OEDIPODINAE

106. *Arphia xanthoptera* (Burmeister)

Counties 20, 60, 76, 77, 87, 88, 89, 90, 91, 92, 93, 96, 97, 98, 99. VII 27 to X 30. This species is common in the vicinity of Mt. Pleasant. Specimens have been taken in open woodlands, closely-grazed pastures, roadsides, cornfields, wheat-stubbles, and along railroad tracks and the bank of the Mississippi River in Des Moines County. Twenty students caught sixty specimens in less than five minutes along the old "K Line" west of Mt. Pleasant. The adults are most common in September and early October in southeastern Iowa. Specimens differ widely in outward appearance. In Des Moines County some specimens collected west of Mediapolis are nearly black; while some caught along the Mississippi River are reddish brown. There is also variation in wing color. The specimens taken near Mediapolis have a bright orange-yellow mesothoracic wing; while those caught along the Mississippi River have a yellow wing, or shades intermediate between orange and yellow.

108. *Arphia pseudonietana* (Thomas)

Counties 1, 3, 12, 14, 15, 64. VII 26 to IX 17.

108 $\frac{1}{2}$. *Arphia simplex* Scudder

Counties 3, 90. VII 28. A nymph was collected VI 1.

109. *Arphia sulphurea* (Fabricius)

Counties 28, 41, 47, 52, 54, 63, 64, 65, 76, 77, 86, 87, 88, 89, 96, 97, 98. V 8 to VI 28. Adults of this species reach a peak in late May and June. The species is probably confined to the eastern two-thirds of the state. The most western occurrence recorded in Iowa by Hebard ('31) is Iowa City. Specimens were taken at the south end of the Des Moines Y. M. C. A. Camp in Boone County, near the Interurban station landing, in moderately tall grass, at the edge of timber.

109 $\frac{1}{2}$. *Arphia conspersa* Scudder

Counties 3, 22, 90, 91.

110. *Chortophaga viridifasciata* (DeGeer)

Counties 3, 5, 11, 15, 16, 21, 24, 28, 31, 41, 52, 53, 60, 61, 62, 63, 64, 65, 66, 67, 68, 72, 73, 74, 75, 76, 77, 78, 81, 87, 88, 90, 91, 92, 94, 96, 97, 98, 99. IV 20 to X 6. One immature XII 8, from Henry County. Statewide in distribution,

Fig. 2. Some Iowa Acridians whose geographical distribution is more nearly completely known. Numbers on the maps correspond with those given in the body of the paper.

and one of the more common species. Specimens are most abundant in short-grass fields, although they have been collected in a great variety of places.

111. *Encoptolophus sordidus sordidus* (Burmeister)

Counties 3, 5, 12, 15, 35, 57, 60, 61, 64, 73, 76, 77, 80, 81, 87, 89, 91, 92, 97, 98. VII 27 to X 29. Usually larger than *Encoptolophus sordidus costalis* (Scudder). Fairly abundant among *Ambrosia* and other tall weeds, along the old "K Line" in the western part of Mt. Pleasant.

111a. *Encoptolophus sordidus costalis* (Scudder)

Counties 1, 3, 22. The writer has not collected this race in Iowa, but specimens from near Dallas, Texas, are at present being studied by the writer. In the neighborhood of Dallas, this species is most abundant in short-grass fields and typical north-central Texas prairie. Several specimens have been taken on the campus of Southern Methodist University; and on one occasion three specimens were taken on a grass lawn in front of a residence near the North Dallas High School well within the closely built-up residential district.

112. *Camnula pellucida* (Scudder)

Counties 1, 3. VII 24.

113. *Paradolphora apiculata* (Harris)

Counties 12, 31, 41, 52, 64, 65, 76, 77, 86, 87, 88, 89, 90, 98. V 9 to IX 6. A common synonym is *Hippiscus apiculatus*. Over twenty specimens of this large spring species were caught one afternoon on the side of a steep, grassy, semi-wooded hill, near the Skunk River, at Pansy Hill in Henry County. The males are much better fliers, and therefore much harder to capture. In agreement with Blatchley ('20) this species was found in association with *Arphia sulphurea* (Fabricius).

115. *Pardalophora baldemani* (Scudder)

Counties 1, 2, 3, 12, 22, 31, 41, 52, 64, 77, 80, 90. VI 25 to VII 29. Specimens taken in a kettle hole southwest of Lake Okoboji, and on a typical prairie in Plymouth County.

116. *Hippiscus rugosus* (Scudder)

Counties 22, 31, 60, 61, 64, 65, 74, 75, 76, 77, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99. VII 24 to 27. One immature from Plymouth County on August 14. Most common during the late summer and early fall. Abundant on a grassy, open woodland slope in east part of Yellow Spring Township, Des Moines County. The pronotum of several specimens caught at this place, shows a cream-colored dorsal surface.

117. *Dissosteira carolina* (Linnaeus)

Counties 1, 3, 4, 5, 10, 11, 12, 14, 15, 16, 17, 18, 19, 21, 22, 24, 28, 29, 30, 31, 33, 41, 43, 45, 47, 48, 55, 57, 60, 61, 64, 66, 68, 69, 72, 73, 74, 76, 77, 79, 81, 82, 87, 89, 90, 91, 93, 94, 95, 96, 98, 99. V 27 to X 18. This dusty roadside grasshopper is found through the state, and is easily recognized by the black, white bordered metathoracic wing. While most commonly observed alighting on a dusty, bare spot, it is often found in oat- and wheat-stubbles and pastures.

117½. *Dissosteira longipennis* (Thomas).

County 89.

118. *Spharagemon bolli* Scudder

Counties 3, 4, 16, 21, 30, 31, 41, 47, 55, 64, 68, 77, 88, 89, 90, 97, 99. VII 11 to X 16. One specimen caught in a high, open, grassy area, surrounded by woods, south of the parking lot at Oakland Mills State Park, Henry County.

121½. *Spharagemon equale* (Say)

County 3. VII 21 to VIII 24.

122. *Spharagemon collare* Scudder

Counties 2, 3, 12, 43, 47, 64, 65, 77, 90. VII 5 to VIII 1. One specimen taken on the side of a steep, wooded hill; and one specimen below this hill on the

Des Moines River bottom, north of the Des Moines Y. M. C. A. Camp in Boone County. These specimens flew a distance of over 100 yards before alighting, and were very alert and difficult to catch.

124. *Psinidia fenestralis fenestralis* (Serville)

Counties 3, 64, 77. VIII 22 to X 20.

125a. *Trachyrbachis kiowa fuscifrons* (Stal)

Counties 64, 65, 74, 76, 77, 88, 89, 93, 97. VII 5 to VIII 14. One male specimen taken along railroad tracks, near the "Overhead Bridge" two miles west of Mt. Pleasant.

125b. *Trachyrbachis kiowa kiowa* Thomas

Counties 1, 2, 3, 12, 14, 22, 32, 47, 48. VII 5 to VIII 14. One male specimen taken in a grass pasture at the north city limits of Boone. This specimen has the clear wing typical of this race.

125½. *Metator pardalinus* (Saussure)

Counties 1, 3, 22. VII 15 to 22.

127. *Trimerotropis citrina* Scudder

Counties 3, 64, 76, 77, 89, 99, and Ft. Dodge. Numerous along the sand bank of the Mississippi River, near Port Louisa, in Louisa County.

129½. *Hadrotettix trifasciatus* (Say)

Counties 22, 31, 43. VII 6 to VIII 28. Confined to the extreme western portion of the state. Numerous specimens taken on the side of loess bluff at "Joy Creek", in Plymouth County.

CYRTACANTHACRINAE

134. *Schistocerca americana americana* (Drury)

Counties 60, 64, 73, 75, 76, 77, 88, 89, 91, 98, 99, and Milton. V5 to IX 6. This fast- and far-flying species seems never to be found in great abundance. I have observed an individual flying more than seventy-five feet above the ground. A specimen was caught in a clover meadow west of Mt. Pleasant.

134½. *Schistocerca lineata* (Scudder)

Counties 5, 22, 31, 43, 60, 67, 90. VIII 10 to X 2.

135. *Schistocerca alutacea* (Harris)

Counties 52, 64, 77, 88, 91, 94, 95, 96, 97. VIII 10 to X 21.

137½. *Hypochlora alba* (Dodge)

Counties 1, 3, 12, 65, 77. VIII 7 to X 18.

140. *Campylacantha olivacea olivacea* (Scudder)

County 77. IX 4 to X 18.

145. *Hesperotettix viridis pratensis* Scudder

Counties 1, 2, 3, 12, 1, 55, 67, 90. VII 17 to VIII 25.

155½. *Paratylotropidia brunneri* Scudder

Counties 88, 89, 97. VII 25 to X 11. A female specimen in the R. L. King Collection, taken near the Burlington Golf Grounds, in Des Moines County. Harley Courtney has shown the writer the place where the Henry County specimen was caught on October 11—a sloping, shaded area covered with short, unmowed grass and dead leaves, just east of the cement dam in Saunders Grove Park in Mt. Pleasant.

158. *Phoetaliotes nebrascensis* (Thomas)

Counties 1, 3, 4, 12, 31, 55, 77, 90. VII 20 to X 20.

159. *Melanoplus gracilis* (Bruner)

Counties 47, 77, 88, 97. VII 29 to XII 12. Found among forest-floor vegetation in parts of the Des Moines Y. M. C. A. Camp in Boone County.

160. *Melanoplus viridipes viridipes* Scudder
Counties 21, 41, 51, 52, 54, 63, 64, 65, 76. VI 15 to VII 5. One male taken in timber, at the south end of Myerholtz Lake, near Wapello.
165. *Melanoplus rusticus obovatipennis* Blatchley
Counties 88, 97. VIII 31 to XI 7.
182. *Melanoplus dawsoni* (Scudder)
Counties 1, 3, 4, 31. VII 21 to VIII 19.
183. *Melanoplus scudderi scudderi* (Uhler)
Counties 21, 47, 52, 64, 65, 74, 77, 87, 88, 89, 91, 97, 98. VII 18 to X 25. Probably the most abundant short winged *Melanoplus* in southeastern Iowa. Most abundant in September and October. Occasional along the nature trails of Oakland Mills State Park, and abundant along U. S. Highway 61 at the bottom of Flint Hill north of Burlington. This species seems to be locally abundant, but of restricted distribution.
- 183½. *Melanoplus buroni* Blatchley
County 65. VII 2 to VIII 1.
189. *Melanoplus walsbii* Scudder
Counties 52, 64, 65, 76, 77, 89. VIII 5 to IX 5. One male taken north of the Mediapolis Chautauqua Grounds, at Kossuth in Des Moines County. This area is covered with tall grass with a few scattered trees.
193. *Melanoplus mexicanus mexicanus* (Saussure)
Counties 1, 3, 4, 12, 13, 14, 22, 23, 30, 31, 33, 43, 44, 47, 50, 51, 52, 54, 55, 63, 64, 65, 66, 67, 68, 77, 79, 83, 87, 88, 90, 91, 92, 93, 94, 96, 97, 99. VI 19 to XI 13. A common synonym is *Melanoplus atlantis*. Found throughout the state as one of the most destructive species. One of the more common species, it occurs in a variety of places, including roadsides, pastures, open woodlands, cloverfields, and wheat- and oat-stubbles. I saw large swarms flying overhead in Taylor County during July, 1936. This species is often found with *Melanoplus femur-rubrum femur-rubrum* (De Geer), and the males can be distinguished from *femur-rubrum* by the notched apex of the subgenital plate and the longer tegmina. The migratory phase, *Melanoplus mexicanus* migratory phase *spretus* (Walsh) has been reported by Hebard ('31) from Harrison County.
194. *Melanoplus flavidus flavidus* Scudder
Counties 64, 77. IX 12 to X 20.
196. *Melanoplus femur-rubrum femur-rubrum* (De Geer)
Counties 1, 2, 3, 4, 5, 6, 12, 14, 15, 17, 23, 31, 33, 35, 41, 43, 45, 47, 52, 55, 57, 60, 61, 62, 64, 68, 73, 74, 75, 77, 79, 81, 82, 84, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98. VII 7 to X 28. Found in a variety of habitats. During July, 1936, immatures and adults were in an alfalfa field in great numbers. They had almost completely stripped off the leaves over a five-acre area and they clung to the alfalfa stems in such numbers that these appeared at a distance a half-inch thick. Fifteen hundred adults were collected with a sweeping net in the course of a few hours.
- 197a. *Melanoplus borealis junius* (Dodge)
Counties 3, 47. VII 11 to 29. A southern race of a species, widely distributed throughout the northern region of North America, as the specific name indicates. Specimens with wings much reduced taken in short grass near a creek in a sparsely-wooded area north of the Des Moines Y. M. C. A. Camp, in Boone County.
198. *Melanoplus angustipennis* (Dodge)
Counties 64, 65, 77, 99. VI 24 to X 20.
199. *Melanoplus impiger* Scudder
Counties 43, 90. VIII 29.

200. *Melanoplus packardii* Scudder
 Counties 3, 12, 14, 22, 67, 79, 90, 92. VIII 6 to VIII 25. This species probably limited to the western half of the state. Hebard ('25) reports this species from Dallas County, Iowa, and Jefferson.
201. *Melanoplus foedus fluviatilis* Bruner
 Counties 3, 12, 43, 64, 65, 67, 77, 90. VII 7 to IX 7.
- 201½. *Melanoplus gladstoni* (Scudder)
 Counties 3, 12, 22. VII 29 to VIII 28.
203. *Melanoplus confusus* Scudder
 Counties 3, 16, 22, 66. VI 14 to VIII 24. Found locally on prairie during the spring in Dickinson County.
- 204a. *Melanoplus keeleri luridus* (Dodge)
 Counties 1, 3, 22, 31, 47, 52, 64, 65, 77, 90, 97. VII 29 to IX 7.
205. *Melanoplus differentialis* (Thomas)
 Counties 1, 3, 5, 12, 14, 21, 22, 31, 33, 39, 43, 45, 47, 51, 52, 55, 60, 61, 62, 63, 64, 67, 68, 72, 73, 74, 75, 76, 77, 79, 80, 81, 82, 85, 86, 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99. VII 7 to XII 8. This large, common grasshopper is found throughout the state in a variety of habitats. It invades corn and other crops and when in sufficient numbers causes much damage. It is found commonly in the late fall on *Ambrosia* in fence corners. Two thousand individuals were collected with little difficulty during the summer of 1936.
208. *Melanoplus bivittatus* (Say)
 Counties 1, 3, 4, 5, 12, 14, 17, 22, 23, 30, 31, 32, 33, 43, 44, 47, 55, 56, 64, 67, 68, 75, 76, 77, 78, 79, 80, 81, 88, 90, 91, 93, 99. VI 2 to X 1. A common, destructive species found in a great variety of habitats. I have observed enormous numbers in hay stubble in Monona County, during July, 1934.

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