

ON THE ORTHOPTERA FOUND ON THE FLORIDA KEYS AND IN EXTREME
SOUTHERN FLORIDA. II.

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During the month of July, 1912, the authors undertook a careful field examination of the Florida Keys and the adjacent mainland in order to complete their studies in the Orthoptera of the subtropical area of southern Florida. Material procured by field work undertaken by the junior author in January and February, 1903 and 1904, and in March, 1910, as well as small collections made at Miami during the summer of 1903 and at that locality and Key West in November, 1911, have already been studied.¹ The supplementary results obtained from the present collection, when compared with the material of the two previous papers noted above, afford a very complete knowledge of all but the scarcest species of the Orthoptera of this region. A number of species of tropical origin are there so scarce and so difficult to find that our knowledge of them is based on the single or very few specimens taken; such species can only be fully studied by a resident or through definite search for these forms alone. We feel satisfied, however, that the present paper gives the final results of a very careful general examination of the region under consideration.

The recent summer work indicates several important facts. The families Mantidæ, Acrididæ, and Tettigoniidæ are shown to be severely affected in winter by the cold, the Acrididæ the least of the three families. Almost all of the fairly plentiful or abundant species are to be found in greatly increased numbers in the summer, but the scarce or very rare species are in the great majority of cases quite as difficult to find in the summer as during the winter. Certain species, particularly some of those belonging to the Acrididæ and Tettigoniidæ, which are numerous or very abundant during the summer, are wholly absent in the winter. The following table² will indicate the comparative abundance of forms as found in midsummer.

¹ PROC. ACAD. NAT. SCI. PHILA., 1905, pp. 29-55; *Ibid.*, 1912, pp. 235-276.

² This table should be compared with that already given (PROC. ACAD. NAT. SCI. PHILA., 1912, p. 235) which shows the comparative abundance of forms as found just before the appearance of the spring forms.

Family.	Number of species.	Found on mainland only.	Found on keys only.	Very abund- ant.
Forficulidæ.....	6	2	3	1
Blattidæ.....	16	2	8	2
Mantidæ.....	4	.....	2	.....
Phasmidæ.....	4	2	1	.....
Acrididæ.....	29	9	5	3
Tettigoniidæ.....	16	9	2	1
Gryllidæ.....	14	8	2	3

	Abund- ant.	Small num- bers.	Rare.	Very rare.	Nymphs only.
Forficulidæ.....	3	1	.....	1	.....
Blattidæ.....	5	5	1	3	.....
Mantidæ.....	.....	2	1	1	.....
Phasmidæ.....	1	2	1	.....	.....
Acrididæ.....	15	6	4	1	.....
Tettigoniidæ.....	6	4	1	4	.....
Gryllidæ.....	2	5	2	1	1

The number of specimens taken on the trip of July, 1912, is seventeen hundred and seventy-five (there are seventeen hundred and eighty specimens recorded in this paper) and eighty-nine species are represented. Of these species three are new, while one circum-tropical species is recorded from the United States for the first time and the definite establishment of five tropical species within the United States is first demonstrated.

Besides the eighty-nine species discussed in the present paper, we have already recorded from this region the following species:

<i>Labia curvicauda</i> (Motsch.).	<i>Stilpnochlora marginella</i> (Serv.).
<i>Ceratinoptera diaphana</i> (Fabr.).	<i>Scudderia texensis</i> S. & P.
<i>Chorisoneura plocea</i> Rehn.	<i>Scudderia cuneata</i> Morse.
<i>Neotettix variabilis</i> Hancock.	<i>Pyrgocorypha uncinata</i> (Harris).
<i>Macneillia obscura</i> (Sc.).	<i>Atlanticus glaber</i> R. & H.
<i>Scirtetica marmorata picta</i> (Sc.).	<i>Scapteriscus abbreviatus</i> Sc.
<i>Psinidia fenestralis</i> (Serv.).	<i>Ellipes minuta</i> (Sc.).
<i>Stenacris vitreipennis</i> (Marschall).	<i>Anaxipha pulicaria</i> (Burm.).
<i>Melanoplus keeleri</i> (Thomas).	<i>Orocharis saulcyi</i> (Guerin).

In addition, *Blatta orientalis* Linn., has been recorded from Miami,³ bringing the total number of species recorded from subtropical Florida to one hundred and eight, of which sixty-four have been taken on the keys.

³ Caudell, *Entom. News*, XXVI, p. 216 (1905).

Principal Localities and Dates of Examinations.

- Miami, Dade County, Florida.—January–February, 1903, (H.); January–February, 1904, (H.); March, 1905, (Caudell); March, 1910, (H.); November, 1911, (Englehardt).
- Homestead, Dade County, Florida.—March, 1910, (H.); July, 1912, (R. & H.).
- Detroit, Dade County, Florida.—July, 1912, (R. & H.).
- Jewfish, Monroe County, Florida.—July, 1912, (R. & H.).
- Key Largo, Monroe County, Florida.—March, 1910, (H.); July, 1912, (R. & H.).
- Long Key, Monroe County, Florida.—March, 1910, (H.); July, 1912, (R. & H.).
- Key Vaca, Monroe County, Florida.—March, 1910, (H.); July, 1912, (R. & H.).
- Boot Key, Monroe County, Florida.—March, 1910, (H.).
- Big Pine Key, Monroe County, Florida.—July, 1912, (R. & H.).
- Key West, Monroe County, Florida.—January, 1904, (H.); March, 1905, (Caudell); March, 1910, (H.); November, 1911, (Englehardt); July, 1912, (R. & H.).
- Garden Key, Dry Tortugas, Monroe County, Florida.—July, 1912, (R. & H.).
- Bird Key, Dry Tortugas, Monroe County, Florida.—July, 1912, (R. & H.).
- Loggerhead Key, Dry Tortugas, Monroe County, Florida.—July, 1912, (R. & H.).

Relative Value of Tropical Element.

In this region the truly tropical element is shown by the following species:

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| <i>Prolabia arachidis</i> (Yersin). | * <i>Mantoida maya</i> S. & Z. |
| <i>Ischnoptera rufescens</i> (Beauv.). | * <i>Aplopus mayeri</i> Caudell. |
| <i>Neoblattella detersa</i> (Walk.). | * <i>Stilpnoclora marginella</i> (Serv.). |
| <i>Supella supellectilium</i> (Serv.). | * <i>Oligacanthopus prograptus</i> R. & H. |
| * <i>Ceratinoptera diaphana</i> (Fabr.). | <i>Gryllodes sigillatus</i> (Walk.). |
| <i>Leurolestes pallida</i> (Brunn.). | * <i>Cyrtoxipha gundlachi</i> Sauss. |
| <i>Blaberus atropos</i> (Stoll). | * <i>Orocharis saulcyi</i> (Guerin). |
| <i>Holocompsa nitidula</i> (Fabr.). | * <i>Tafalisca lurida</i> Walk. |
| * <i>Plectoptera poeyi</i> (Sauss.). | |

The species preceded by an asterisk appear to be the only forms which have not been accidentally introduced by man. Three of these nine species are known only from the keys, five from the keys and the jungle-like "hammock" land of the subtropical region of Florida, and one from the latter only. This evidence shows that half of the tropical species which have become permanently fixed in this region were, in all probability, accidentally introduced by man,

and that outside of these species the tropical element is very weak, equalling but 11.3% of the non-introduced species, and only found in the scrub of the keys and the limited areas of jungle-like "hammock" land on the southernmost portion of the Florida peninsula, distinguished particularly by the presence of the gumbo limbo (*Bursera simarubra*). Of these species the genus *Mantoida* is tropical American, while *Oligacanthopus* is known only from a single specimen from Miami, Fla. All of the other species are West Indian, *Plectoptera poeyi*, *Stilpnochlora marginella*, and *Cyrtoxipha gundlachi* being found elsewhere in tropical America as well. One species, *Paratettix toltecus* (Sauss.), taken at Homestead, Fla., only, alone represents a purely Sonoran and Mexican form.

The following species are tropical intruders in the Lower Austral zone of the southeastern United States which are found in the region under discussion:

<i>Anisolabis annulipes</i> (H. Lucas).	<i>Pycnoscelus surinamensis</i> (Linn.).
<i>Periplaneta australasiae</i> (Fabr.).	* <i>Scapteriscus abbreviatus</i> Sc.
<i>Periplaneta brunnea</i> (Burm.).	* <i>Cryptoptilum antillarum</i> (Redt.).

The species preceded by an asterisk again appear to be the only forms in this list which have not been accidentally introduced by man. The species *Pycnoscelus surinamensis* shows, however, very long residence in this region by its widespread abundance.

Pine trees are found only on Big Pine and the adjacent keys, and in the undergrowth of these forests three species, *Radinotatum brevipenne peninsulare*, *Schistocerca damnifica calidior*, and *Aptenopedes aptera*, were found, which species were not present elsewhere on the keys. In this situation the resemblance of specimens of a number of species to mainland individuals of the same was closer than to those taken in the keys scrub, the latter series as a rule differing in paler coloration.

FORFICULIDÆ.

Anisolabis annulipes (H. Lucas).

Homestead, Fla., July 10, 1912; 1 ♀.

Key West, Fla., July 5, 7, 1912; 3 ♂, 2 ♀.

The femoral annuli are prominent in all of these specimens, one female from Key West having these markings particularly heavy.

The specimen from Homestead was taken from under a board in a yard. The series from Key West was taken chiefly from under coquina boulders about the East Martello tower, while one specimen was captured between boards in the wood shed where *Blaberus atropos* was found numerous.

Anisolabis maritima (Gené).

Key West, Fla., July 5, 1912; 4 ♂, 5 ♀, 1 n.

This species was found, as in the winter, swarming under coquina boulders and drift on the beach. Individuals have almost always been found in the proximity of salt water.

Labidura bidens (Olivier).

Key West, Fla., July 7, 1912; 1 ♂, 1 ♀.

One of these specimens was taken moving actively across a coquina road after dark. At that hour, with the aid of a flash-lamp, this species was seen in numbers near piles of coquina and about dwellings near the beach. This insect is frequently found with the preceding species.

Labia minor (Linn.).⁴

Key West, Fla., July 7, 1912; 1 ♀.

This specimen, the first record of this cosmopolitan species from Florida, was found between boards in the wood shed where the series of *Blaberus atropos* was taken.

Prolabia unidentata (Beauv.).

Homestead, Fla., July 10, 1912; 1 ♂, 1 ♀.

These two individuals, both lacking wings, were taken under the bark of a dead pine log in the pine woods, where in like situations the species is occasionally found throughout the year in this region, though seldom in large numbers.

Prolabia arachidis (Yersin).

1876. *Labia brunnea* Scudder, Proc. Bost. Soc. Nat. Hist., XVIII, p. 264.

Homestead, Fla., July 10-12, 1912; 7 ♂, 13 ♀, 3 n.

This cosmopolitan species was found rather numerous in the greasy kitchen of the boarding house at Homestead. After dark the insects would appear in numbers accompanied by swarms of *Periplaneta americana*, but the series was secured with difficulty, as the insects were very active and invariably scuttled away into cracks in the walls and tables at the first approach of a light. Individuals were greasy and unclean.

Caudell⁵ has recently placed Scudder's *Labia brunnea* correctly in the synonymy under the present species.

Though this species has been found introduced in the United

⁴ The species, *Labia curvicauda*, which was found so plentiful in March, 1910, on Long Key, was not seen in the summer of 1912. Peculiar conditions following the hurricane of 1909 afforded the opportunity to take the series on the earlier date, and had dying tops of cocoanut palms been present in the summer of 1912 there is little doubt but that the species would have been then found abundant.

⁵ Proc. U. S. Nat. Mus., XLIV, p. 598 (1913).

States at several localities, it is probably permanently and thoroughly established only in southern Florida.

BLATTIDÆ.

Ischnoptera deropeltiformis (Brunner).

Homestead, Fla., July 10, 1912; 1 ♂, 2 ♀, 2 n. (Nymphs numerous.)

Detroit, Fla., July 12, 1912; 1 ♀.

Key West, Fla., July 7, 1912; 1 ♂, 1 ♀.

At Homestead the species was found under boards lying on very wet ground in the prairie-like everglades, while at Detroit and Key West the specimens were taken in debris and leaf mold in heavy jungle-like areas of trees, bushes, and vines. The species had not been previously taken on the keys.

Ischnoptera uhleriana fulvescens S. and Z.

Homestead, Fla., July 10-12, 1912; 2 ♂, 1 ♀.

The remains of the above recorded males and an additional specimen of the same sex were found entangled in the webs of spiders at the railroad station, where they had probably been attracted by the lights.

Ischnoptera rufescens (Beauv.).

(*Ischnoptera blattoides* of authors.)

Key West, Fla., July 4, 1912; 1 ♂.

This individual, the first United States record of this circumtropical species, was taken in a very greasy cupboard in the Hotel Jefferson in company with swarms of *Blattella germanica* and a few specimens of *Supella supellectilium*. The much paler coloration made this specimen, the only one of the species seen, very conspicuous among the many other darker roaches disclosed by the light of a flash-lamp.

We follow Saussure in placing this species in the genus *Ischnoptera*. It is the only species of that genus found within the United States which has the ventro-cephalic margin of the cephalic femora armed with a complete row of spines, the more distal shorter than the more proximal. All of the other North American species of *Ischnoptera* have this margin armed with 3 to 5 strong spines succeeded distad by a close-set row of minute piliform spinulations.

*Blattella*⁶ *germanica* (Linn.).

Big Pine Key, Fla., July 6, 1913; 1 ♂.

Key West, Fla., July 4, 1912; 4 ♀.

⁶ Vide Shelford, *Entom. Monthly Mag.*, (2), Vol. XXII, p. 154, 155 (1911).

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912. Few seen in house.

The present species infests larders and kitchens throughout this region.

*Neoblattella*⁷ *detersa*⁸ (Walk.).

Homestead, Fla., July 11, 1912; 1 ♀.

A single specimen of this tropical species was found in spider webs at the railroad station, where it had probably flown attracted by the lights.

*Supella*⁹ *supellectilium* (Serv.).

Key West, Fla., July 4-7, 1912; 8 ♂, 4 ♀, 1 n.

One specimen of this circumtropical species was taken in a fruit store, while the others of the series were captured at night in the Hotel Jefferson in the rooms and kitchen cupboards. The males occasionally appeared in lighted rooms running about with extreme rapidity and often taking flight. The females were all taken in cupboards where *Blattella germanica* was found in swarms.

The only previous record of the present species from the United States is that of Rehn,¹⁰ as Saussure's synonymous *Phyllodromia cubensis*, from Miami, Fla.

Ceratinoptera lutea (S. and Z.).

Homestead, Fla., July 10, 1912; 1 ♀.

Key West, Fla., July 7, 1912; 1 ♀, 2 n.

The adult from Homestead was taken from under a board on very wet ground on the prairie-like everglades, while nymphs were found frequently under bark on decaying pine logs in the pine woods. At Key West nymphs were occasional in the leaf mold in the heavier jungle-like scrub.

*Leurolestes pallidus*¹¹ (Brunner).

Phætalìa lævigata of authors (not *Blatta lævigata*, Beauv., 1805).

Key West, Fla., July 4-7, 1912; 16 ♂, 25 ♀, 9 n.

⁷ *Ibid.*

⁸ Records of *Blattella* (*Neoblattella*) *adspersicollis* (Stål) from the United States all apply to this species. Material recently received from Brazil shows *N. adspersicollis* to be a very different insect.

⁹ Vide Shelford, *Entom. Monthly Mag.*, (2), Vol. XXII, pp. 154, 155 (1911).

¹⁰ *Entom. News*, XIV, p. 125 (1903).

¹¹ Λευρός, flat, ληστής, plunderer. The authors propose this name to replace *Wattenwyliella* which was recently erected by them to replace "*Phætalìa*" of authors (*Entom. News*, XXV, pp. 216, 217, May, 1914). The name *Wattenwyliella*, however, was proposed in the month of April, 1914, by Carl (*Revue Suisse de Zoologie*, XXII, p. 174) for a member of the Pseudophyllinæ from Madagascar, in consequence of which preoccupation, we here propose *Leurolestes*.

The series was taken in a fruit store where the species was common in a pile of old burlap bags and in cracks under the stands which it shared with one fairly large colony of *Blattella germanica*, occasional specimens of *Holocompsa nitidula*, a few specimens of *Periplaneta americana*, and one specimen of *Supella supellectilium*. The present species was previously known from the United States from a single female taken on Key Largo, Fla.

A single female was captured which had just moulted into the adult condition, this specimen was uniform pale straw color. Nymphs of this species are above bay in coloration, below more tawny, especially on the limbs, while that portion of the head from the interantennal space to the clypeal suture is very dark; the entire dorsal surface of these nymphs is rough, much as are the distal abdominal segments in nymphs of *Pycnoscelus surinamensis*.

Eurycotis floridana (Walker).

Homestead, Fla., July 10-12, 1912; 1 ♂, 1 ♀, 1 n.

Detroit, Fla., July 12, 1912; 1 n.

Key West, Fla., July 3-7, 1912; 2 n.

The single specimen from Detroit was found concealed in an epiphyte (*Tillandsia fasciculata*), growing on the limb of an oak in "hammock" land. Two specimens were taken revealed by a flash-lamp at night; an adult climbing on the trunk of a pine at Homestead and a nymph climbing about in a clump of weeds over a foot from the ground at Key West. It appears that this species moves about at night, hiding under bark of logs and in other recesses during the day. Where pines were present individuals of this species have almost invariably been found hiding under the bark of dead logs and stumps of this tree.

Periplaneta americana (Linn.).

Homestead, Fla., July 10-12, 1912.

Big Pine Key, Fla., July 6, 1912; 1 ♂.

Key West, Fla., July 4, 1912; 1 ♀.

One specimen was found in a spider web at Homestead Station where the species swarmed at the boarding house. The species was very abundant in a quarter-boat at Pine Channel and a few adults but many nymphs were present in refuse under the stands in a fruit store at Key West.

Periplaneta australasiæ (Fabr.).

Homestead, Fla., July 10-12, 1912; 1 ♂, 1 ♀.

Big Pine Key, Fla., July 6, 1912; 1 ♀.

Key West, Fla., July 4, 1912; 1 ♂, 2 ♀, 2 n.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912. Few seen in houses.

In company with *Periplaneta americana* this species was found abundant at Pine Channel in a quarter-boat, while it was numerous everywhere in the Hotel Jefferson at Key West.

Periplaneta brunnea (Burm.).

Jew Fish, Fla., July 11, 1912; 1 ♀.

Pycnoscelus surinamensis (Linn.).

Homestead, Fla., July 10, 1912; 1 ♀.

Jew Fish, Fla., July 11, 1912; 1 ♀.

Key West, Fla., July 3-7, 1912; 4 ♀, 4 n.

Blaberus atropos (Stoll).

Key West, Fla., July 7, 1912; 15 ♂, 28 ♀, 10 n.

Adults of this species were found common, nymphs few, between old boards in a wood shed; many nymphs but few adults were also found under boards on the ground near by. This great insect is widely distributed and well known to the natives about Key West, where it is found in wood piles, under boards and other refuse about the town. The insects, when exposed, either remained motionless or scuttled toward another place of concealment with no great speed. The nymphs were usually found half buried in loose damp earth under boards, where they remained motionless, looking much like lumps of earth (with which they were usually much dusted) until disturbed. Two very small nymphs were observed which had recently moulted, these individuals were pure white and very soft.

Holocompsa nitidula (Fabr.).

1838. *C[orydia]* (*Holocompsa*) *cyanea* Burmeister, Handb. Ent., II, p. 492.

1838. *C[orydia]* (*Holocompsa*) *collaris* Burmeister, Handb. Ent., II, p. 492.

Key West, Fla., July 4-7, 1912; 16 ♂, 10 ♀.

These diminutive roaches were found in the folds of burlap bags under the counter of a fruit store where other interesting roaches were taken, and also with *Blaberus atropos* between old boards in a wood shed, where nymphs were more numerous than adults. The insects when disturbed ran about with great speed, but did not go far to hide, often stopping in the first bits of refuse to which they came. This is the first time that *Holocompsa nitidula* has been found established within the United States; the only previous record of the species being found in this country is that of Caudell,¹² of a single specimen found on cotton batting from the store room of the

¹² *Proc. Entom. Soc. Wash.*, VIII, p. 133 (1907).

National Museum at Washington, D. C., which specimen was unquestionably accidentally introduced.

The present series enables us to synonymize Burmeister's *Holocompsa cyanea*, which was based upon males of the species, while his *Holocompsa collaris* was described from individuals of the opposite sex. The latter species was first recognized as a synonym of *Holocompsa nitidula* by Kirby in 1904.¹³ Previous authors have failed to recognize *cyanea* and *collaris* as sexes of the same species owing, apparently, to their lack of sufficient material. The males are rather slender and almost uniformly shining blackish (the antennæ have three pale yellowish joints in the distal portion and the limbs are very dark brown), while the females are much more robust, the pronotum is strikingly cinnamon-rufous and the tegmina are a very dark metallic blue in the colored portion; in the latter sex somewhat more than the distal half of the antennæ is pale yellowish. Such striking differences between the sexes explains their being described as different species in the same paper.

Plectoptera poeyi (Sauss.).

Big Pine Key, Fla., July 6, 1912; 4 ♀.

Key West, Fla., July 7, 1912; 8 ♂, 12 ♀, 3 n.

On Big Pine Key the species was beaten from a fringe of tall bushes growing on the edge of a mangrove swamp, where individuals were scarce. The insects were found fairly common on Key West in rather scattered bushes, particularly *Ilex cassine*. One nymph was also taken at night at the latter locality, running about on the leaves of a buttonwood bush (*Conocarpus erecta*).

MANTIDÆ.

Mantoida maya S. and Z.

Key West, Fla., July 7, 1912; 1 ♀.

This is the second United States record of this peculiar mantis, which was described from Temax, northern Yucatan. The first record from within the United States was given with certainty from Florida and probably from Kissimmee.¹⁴ The present specimen fully agrees with the original description and was taken while swiftly running about on the ground under high jungle brush.

Stagmomantis carolina (Johannson).

Homestead, Fla., July 10-12, 1912; 3 n.

Detroit, Fla., July 12, 1912; 1 n.

¹³ *Synon. Catal. Orth.*, p. 169.

¹⁴ Caudell, *Canad. Entom.*, XLIII, p. 156 (1911).

Long Key, Fla., July 13, 1912; 1 n.

Big Pine Key, Fla., July 6, 1912; 2 n.

Key West, Fla., July 3-7, 1912; 4 n., 1 oötheca.

The individuals from Homestead and Detroit are in the instar preceding maturity, while the others represent three less developed stages.

Gonatista grisea (Fabr.).

Key West, Fla., July 3-7, 1912; 3 ♂, 4 ♀, 9 n.

The nymphal individuals are in four stages of development, the most immature specimen having the body 8.25 millimeters in length, the same measurement in the largest nymph being 39 mm. The males show but little variation in size, all, however, equalling or exceeding the maximum measurements given by Caudell for this form.¹⁵ The females show some size variation, the length of the pronotum in all being slightly longer than Caudell's measurements, although the tegminal length is under his maximum in all four individuals. The coloration of both sexes shows no decided variations. Specimens from more northern localities in the range of the species apparently average smaller than individuals from the keys, judging from a male from Tarpon Springs, Fla., and two females from Fort George, Fla., and Thomasville, Ga.

The present specimens were taken chiefly from gumbo-limbo trees in the heavy key scrub jungle, but the species also occurred on sea grape. The insects were always on the trunks or branches and generally about six feet from the ground, infrequently higher and very rarely lower. They were perfectly protected when in their resting position, being then closely pressed against the bark of the tree. When disturbed they would make off with a rapid scuttling run.

Thesprotia graminis (Scudder).

Homestead, Fla., July 10-12, 1912; 1 ♂, 2 ♀.

Big Pine Key, Fla., July 6, 1912; 1 ♂, 2 n.

Key West, Fla., July 3-7, 1912; 2 ♀, 4 n.

The nymphs are in three stages of development, the least mature being from Big Pine Key, taken the same day as an adult female. From this it would appear that the species matures over a considerable part of the year.

At Homestead the females of this species were taken in the undergrowth of pine woods, while the male was found dead in a spider's

¹⁵ *Psyche*, XIX, p. 161 (1912).

web; on Big Pine Key the nymphs were taken in the pine woods and the adult in grass, while at Key West individuals frequented low ground vegetation in the more open scrub.

PHASMIDÆ.

Manomera tenuescens (Scudder).

Homestead, Fla., July 10-12, 1912; 3 ♂, 1 ♀, 1 n.

Detroit, Fla., July 12, 1912; 1 ♂, 4 n.

On careful examination of our Florida series of twenty adults of this genus, two species were found to be present, distinguishable by very good characters in the male and female genitalia and also in the distal abdominal segments. The original description and figure of *tenuescens* show conclusively that the form with the elongate sub-cylindrical anal segment in the male is that species.

The two species of *Manomera* were taken together in the same situations; on prairie, in undergrowth of pine woods, and at night on the extremities of the leaves of the saw palmetto (*Serenoa*) at Homestead and in pine woods undergrowth on the edge of a hammock at Detroit.

Manomera brachypyga n. sp.

1907. *Manomera tenuescens* R. and H. (not *Bacunculus tenuescens* Scudder, 1900), Proc. Acad. Nat. Sci. Phila., 1907, p. 283. (In part.) (San Pablo, Florida.)

1912. *Manomera tenuescens* R. and H., (not *Bacunculus tenuescens* Scudder, 1900), Proc. Acad. Nat. Sci. Phila., 1912, p. 242. (Miami, Florida.)

Closely allied to *M. tenuescens* (Scudder), agreeing in general form, structure of the limbs, and coloration, but differing in the much more abbreviate seventh, eighth, and ninth abdominal segments and the form of the apex of the male abdomen. In the male the seventh, eighth, and ninth dorsal abdominal segments together are hardly or not at all longer than the sixth dorsal segment, while in *tenuescens* they are half again as long; the eighth dorsal segment in *brachypyga* is transverse instead of longitudinal; the ninth segment fornicate and subinflated instead of decidedly longitudinal and cylindrical as in *tenuescens*; while the cerci of *tenuescens* have a delicate spine at the internal base, which is represented in *brachypyga* by a much more robust tooth. The two forms can be very readily separated when the apex of the male abdomen is viewed from either the dorsal or lateral aspect. In the female the sixth dorsal abdominal segment is considerably longer than the seventh and eighth segments, while in *tenuescens* it is less than the seventh and eighth segments in length; the ninth segment is equal in length to the prothorax, which

segment is longer than the prothorax in *tenuescens*, and the subgenital plate has the caudal margin less produced and more subtruncate than in that species.

TYPE: ♂; Homestead, Dade County, Fla. July 10-12, 1912. (Rehn and Hebard.) [Hebard Collection.]

Size, form, general structure and proportions, and coloration as in *tenuescens*, differing in the following characters: Abdomen with the first to sixth segments slightly more longitudinal, the apex of the caudal femora not quite reaching the distal margin of the fourth segment; seventh, eighth and ninth dorsal segments together no longer than the sixth segment; seventh segment longitudinal, lateral margins subparallel, not expanding caudad; eighth segment slightly transverse, but slightly more than half the length of the seventh segment, not compressed; ninth dorsal segment shorter than the seventh segment, the greatest width (caudal) but slightly greater than the length, fornicate, lateral margins converging proximad, distal margin arcuato-emarginate, exposing the strongly arcuate extremity of the supra-anal plate; cerci of the bent-arcuate type found in *tenuescens*, but with the proximo-internal base with a very blunt, subincrassate obliquely directed tooth; subgenital opercule small, shallower, and less pendulate than in *tenuescens*.

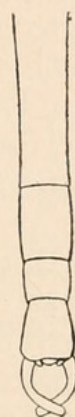
AlloTYPE: ♀; Miami, Dade County, Florida. March 28, 1910. (Hebard.) [Hebard Collection.]

Size, form, general structure and proportions, and coloration as in *tenuescens*, differing in the following characters: abdomen with the sixth dorsal segment considerably longer than the seventh and eighth dorsal segments; ninth dorsal segment equal in length to prothorax; subgenital plate with caudal margin very little produced, rotundato-subtruncate.

Fig. 1.



Fig. 2.

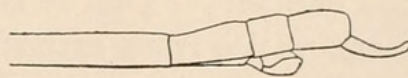


Figs. 1 and 2.—Dorsal outline of apex of abdomen of *Manomera tenuescens* (1; Homestead, Fla.) and of *M. brachypyga* (2; type). (× 3.)

Fig. 3.



Fig. 4.



Figs. 3 and 4.—Lateral outline of apex of abdomen of *Manomera tenuescens* (3; Homestead, Fla.) and of *M. brachypyga* (4; type). (× 3.)

Measurements (in millimeters).

	Homestead, Fla.		
	♂ TYPE.	♂ Paratype.	♂ Paratype.
Length of body.....	87.5	87.4	88.5
Length of head.....	4.5	4.3	4.2
Length of prothorax.....	3.	3.2	3.
Length of mesothorax.....	20.5	20.6	21.4
Length of metathorax (including median segment).....	18.5	18.3	18.7
Length of abdomen.....	41.	41.	41.2
Length of cephalic femur.....	22.3	24.	23.8
Length of median femur.....	18.2	19.4	19.5
Length of caudal femur.....	23.3	25.	25.3
	Miami, Fla. ♀ Allotype.	Detroit, Fla. ♂ Paratype.	San Pablo, Fla. ♂
Length of body.....	92.6	86.6	69.6
Length of head.....	5.1	4.5	3.5
Length of prothorax.....	3.2	3.	2.7
Length of mesothorax.....	21.	20.5	15.8
Length of metathorax (including median segment).....	17.2	18.6	13.3
Length of abdomen.....	46.1	40.	34.3
Length of cephalic femur.....	23.8	22.	18.5
Length of median femur.....	18.4	19.1	15.3
Length of caudal femur.....	23.8	24.7	20.

The present authors have recorded a male of this species, taken at San Pablo, Fla., August 13, 1905, as *M. tenuescens*, at that writing not recognizing it as distinct from individuals of that species in the same series. A series of one adult female and eleven nymphs taken at Miami, Fla., March 28, 1910, have also been recorded as that species. The above-measured five males and one female constitute the known series of adult specimens of *brachypyga*, the San Pablo specimen showing that there is considerable variation in size, regarding which our series is too small for us to say whether it is geographical or individual in character. We consider the two additional Homestead specimens and the single Detroit individual, paratypes. The differential characters show almost no variation, there being but a slight amount of proportional difference in the length of the eighth dorsal segment. The distal margin of the ninth dorsal abdominal segment varies from arcuato-emarginate to obtuse-angulate emarginate. In coloration the Homestead and Detroit individuals are

uniform, while the San Pablo specimen is of similar pattern but with the tones paler.

The new form was found on July 10-12, 1912, under exactly the same conditions at Homestead and Detroit as was *tenuescens*, the San Pablo specimen having been taken in the undergrowth of pine woods.

Aplopus mayeri Caudell.

Long Key, Fla., July 13, 1912; 1 n.

Key West, Fla., July 3-7, 1912; 1 n.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912; 16 ♂, 6 ♀, 19 n.

Bird Key, Dry Tortugas, Fla. Observed by Dr. Mayer.

Garden Key, Dry Tortugas, Fla. Observed by Dr. Mayer.

A special trip to secure specimens of this striking species was made to Loggerhead Key, where, with the kind assistance of Dr. Alfred G. Mayer, the Director of the Carnegie Marine Biological Laboratory, we were able to secure the above interesting series. All were taken from bushes of the bay cedar (*Suriana maritima*), to which, as shown by Stockard in his paper on the habits of this species,¹⁶ the species is there restricted. The adult females show the marked color variations spoken of by Stockard, while the males vary only in the extent to which the greenish of the limbs tinges the thoracic segments.

Our series shows the following extremes in the length of the body, ♂ 83.-93. mm., ♀ (exclusive of the oviscapt) 114.-127.5. The oviscapt varies considerably in length individually, the extremes, which are in specimens of approximately the same general bulk, being 25.-29.5 mm. The Loggerhead Key nymphs represent three stages of development.

According to Dr. Mayer, the species occurs on Bird Key and Garden Key, the other islands of the Tortugas group. On Long Key the single very immature individual was beaten from heavy key scrub. The nearly half-grown male from Key West was found in the afternoon, climbing up the trunk of a bush in a heavy tangle.

Anisomorpha buprestoides (Stoll).

Homestead, Fla., July 10-12, 1912; 8 ♂, 3 ♀, 2 n.

Key West, Fla., July 3-7, 1912; 1 ♂, 3 n.

At Homestead this species was taken from under boards in the

¹⁶ Habits, Reactions and Mating Instincts of the "Walking Stick," *Aplopus mayeri*. Papers from the Tortugas Laboratory, Carnegie Institution, Washington, Publ. 103, II, No. 2, (1908).

day time in pine woods, and at night from the leaves of saw palmetto (*Serenoa*) in pine woods.

ACRIDIDÆ.

Paratettix rugosus (Sc.).

(*Apotettix rugosus* of authors.)

Homestead, Fla., July 10, 12, 1912; 2 ♂.

Jewfish, Fla., July 11, 1912; 26 ♂, 23 ♀, 6 n.

The larger series was taken in bare spots on semi-baked marsh soil at Jewfish, where more than an hour was spent in collecting the material, for the species was frequent but not abundant. All of these specimens are decidedly rugose, the specimens from Homestead recorded above as well as a few of those taken in 1910 in this region are considerably less rugose. All of the specimens from southern Florida before us are very uniform and dark in coloration, with the exception of two of the Jewfish series which individuals have the pronotum a lighter brown except on each side for a short distance caudad of the humeral angles. The extremes of pronotal length in the above series are: ♂♂ 11.7 to 13.3 mm.; ♀♀ 13.8 to 15.6 mm.

We are unable to consider *Apotettix* of Hancock a valid genus. Comparison of the type of the genus *Apotettix*, *A. convexus* (Morse), with specimens of the type species of the genus *Paratettix*, *P. meridionalis* (Ramb.), and study of the literature gives convincing proof that no valid characters have been given nor do any exist to have warranted the erection or retention of the genus *Apotettix*.

Paratettix toltecus (Sauss.).

Homestead, Fla., July 12, 1912; 1 ♂, 2 ♀.

These specimens agree in all respects with topotypical Mexican material ("Mexico calida," Jalapa taken as representative). The species is here recorded from Florida for the first time, New Mexican records being hitherto the most eastern for the United States.

Neotettix coarctatus Hanc.

Homestead, Fla., July 10-12, 1912; 50 ♂, 27 ♀, 1 n. 15 ♂, 6 ♀, elongate type.

Detroit, Fla., July 12, 1912; 2 ♂, 5 ♀. 1 ♂, elongate type.

Long Key, Fla., July 13, 1912; 1 ♂. 1 ♂, elongate type.

Big Pine Key, Fla., July 6, 1912; 8 ♂, 1 ♀, 1 n.

Key West, Fla., July 3-7, 1912; 6 ♂, 1 n.

The majority of the specimens from Big Pine Key and Key West are the smallest in size of the entire series and are of the extreme abbreviate type.

At Homestead the species was common on the prairie-like everglades and also in the "pot holes" in the pine woods, but not as numerous as in March, 1910. The specimen from Long Key was beaten from tall grasses in an open depressed area where *Mermiria intertexta* was taken.

***Paxilla obesa* (Sc.).**

Homestead, Fla., July 10, 12, 1912; 1 ♂, 2 ♀, 2 n.

Detroit, Fla., July 12, 1912; 1 ♂.

These specimens were all taken in the low undergrowth of the pine woods in not the usual very wet situations.

***Tettigidea lateralis* (Say).**

Homestead, Fla., July 10-12, 1912; 6 ♂, 11 ♀, 1 n.

***Tettigidea spicata* Morse.**

Jewfish, Fla., July 11, 1912; 4 ♂, 5 ♀, 2 n.

This is the first record for a species of the present genus from the Florida Keys. The series was taken in company with *Paratettix rugosus*, in bare spots on sun-baked marsh soil, where it was found to be very scarce.

***Radinotatum brevipenne peninsulare* R. and H.**

Homestead, Fla., July 10-12, 1912; 49 ♂, 22 ♀, 3 ♀ n.

Detroit, Fla., July 12, 1912; 14 ♂, 4 ♀, 1 ♀ n.

Big Pine Key, Fla., July 6, 1912; 30 ♂, 6 ♀, 5 ♂ n., 11 ♀ n.

The extensive Homestead and Detroit series of this race are perfectly typical in character, the Big Pine Key representation also having all the distinguishing features of *peninsulare*, although of slightly smaller size. There is considerable individual variation in size in all three lots, the extremes in length of body of each being as follows: Homestead, ♂ 32.2-35.7, ♀ 42.3-46.7; Detroit, ♂ 33.3-35.2, ♀ 45.2-48; Big Pine Key, ♂ 28.3-33, ♀ 37.3-40.8 mm. It will be seen that the Big Pine Key maximum measurements no more than touch the minimum of the other lots in the male sex and do not reach the same in the female. The average of the Big Pine Key series is very appreciably less than the maximum dimensions given for the same lot.

The Homestead series has the brown phase predominating, while the Detroit and Big Pine Key lots have the green phase outnumbering the brown in the male sex.

At all three localities the form was found common in the low undergrowth in the pine woods. The record from Big Pine Key is the first for the genus on the keys. It is doubtless found on all the

islands possessing stands of pine, and not elsewhere, as the distribution of the forms of this genus is limited by this controlling factor.

***Mermiria intertexta* Scudder.**

Homestead, Fla., July 10-12, 1912; 5 ♂, 1 ♀.

Big Pine Key, Fla., July 6, 1912; 18 ♂, 1 ♀, 7 ♀ n.

Long Key, Fla., July 13, 1912; 7 ♂, 3 ♀.

The present series has been compared with a male from Georgia, which is one of Scudder's types. In size the present representation shows no noteworthy difference except that the Long Key females are slightly smaller than the other two of that sex. In color the Homestead and Big Pine Key series are very similar, with the pale base color showing no greenish except in the Big Pine Key female. The Long Key series, on the other hand, has the pale base color greenish-yellow in the males, subochraceous in the females. The three individuals of the latter sex from Long Key have the discoidal area of the tegmina more or less distinctly maculate, superficially somewhat suggesting Bruner's *M. maculipennis*. In all of the Big Pine Key males the dark medio-longitudinal line is present on the head and pronotum, indicated but incomplete in the accompanying female, indicated more or less distinctly in all of the Homestead males and entirely absent in the female, indicated on the head and pronotum in four Long Key males, on the head and as a lining on the pronotal carina in two males and all three females, and present on the head and entirely absent from the pronotum in one male from the same locality. In two of the seven Big Pine Key nymphs there is no indication of this line and in the others it is only faintly marked.

At Homestead the species was infrequent in high grasses near the edge of the prairie-like everglade, on Long Key it was not uncommon in places where high grasses grew in an open depressed area, while on Big Pine Key it was taken from low plants on the edge of a mangrove swamp, where the males were not infrequent, the females mostly immature and but two adults of that sex seen.

***Amblytropidia occidentalis* (Saussure).**

Homestead, Fla., July 10-12, 1912; 2 ♂, 5 ♀, 1 ♀ n.

Detroit, Fla., July 12, 1912; 1 ♂ n.

Big Pine Key, Fla., July 6, 1912; 8 ♂, 3 ♀, 2 ♂ n., 2 ♀ n.

Key West, Fla., July 3-7, 1912; 1 ♀.

The present series shows that the measurements previously given by us of specimens from Miami, Homestead, Long Key, Key Vaca,

and Boot Key¹⁷ are probably individual in the main and not geographic. As there stated, however, south Florida material is always larger than Thomasville, Ga., specimens, although occasionally but slightly so. The Big Pine Key series is quite similar in general size to the individuals previously measured from Boot Key and Key Vaca, although a single female is distinctly larger and subequal to the smallest of the Long Key females, while one Homestead male is subequal in proportions to the maximum Long Key males. Extremes of the present Homestead and Big Pine Key series, as well as the Key West female, show the following measurements in millimeters:

	Homestead.		♂ Big Pine Key.	
Length of body.....	22.	22.8	22.	22.2
Length of pronotum.....	4.4	4.5	4.2	4.4
Length of tegmen.....	16.2	20.	17.	18.2
Length of caudal femur.....	13.6	15.3	13.4	14.5

	Homestead.		♀ Big Pine Key.		Key West.
Length of body.....	29.	33.	31.2	33.8	31.3
Length of pronotum....	5.2	6.	5.8	6.	6.
Length of tegmen.....	20.8	21.8	22.	22.8	23.7
Length of caudal femur.....	16.8	18.8	18.8	19.4	19.

The material from the keys which have scrub cover (Key Biscayne, Long Key, Key Vaca, Boot Key, and Key West) is all either uniformly colored or of the strongly bicolored phase (*i.e.*, dorsum solidly paler than the lateral aspects), while that portion of the material from pine woods (Miami, Homestead, Detroit, and Big Pine Key) contains thirteen specimens distinctly lined with black on each side of the median carina of the pronotum, in a number also distinctly punctulate with dark brownish on the tegmina. The single nymph from Detroit and one of the four from Homestead have the blackish lineations on the pronotum, showing that this coloration is fixed before the adult condition is reached.

At Homestead the species was uncommon in the pine woods, nymphs, however, being abundant, while the single nymph from Detroit was in similar surroundings. In the pine woods on Big Pine Key the species occurred in fair numbers, while the Key West female, all seen at that locality, was taken in the scrub.

¹⁷ PROC. ACAD. NAT. SCI. PHILA., 1912, p. 252.

Orphulella pelidna (Burmeister).

Homestead, Fla., July 10-12, 1912; 2 ♀.

Long Key, Fla., July 13, 1912; 2 ♂.

Big Pine Key, Fla., July 6, 1912; 3 ♂, 5 ♀, 1 ♀ n.

Key West, Fla., July 3-7, 1912; 3 ♂, 7 ♀.

Garden Key, Dry Tortugas, Fla., July 8, 1912; 1 ♀.

None of the Big Pine Key series are in the green phase, although five of the seven Key West females and both of the same sex from Homestead are in that phase. The Garden Key specimen is pale rufescent, but in structure normal for the species.

At Homestead and on Big Pine Key the species occurred in the undergrowth of pine woods, on Garden Key it was very common in short grass growing in the enclosure of Fort Jefferson, on Long Key it was secured in the depressed grassy area where *Mermiria intertexta* was also taken, and on Key West it was scarce among green herbage and grasses in scattered gumbo-limbo forest. At the latter locality nymphs were numerous.

Clinocephalus elegans pulcher R. and H.

Homestead, Fla., July 10-12, 1912; 30 ♂, 17 ♀, 1 ♂ n., 1 ♀ n.

Detroit, Fla., July 12, 1912; 2 ♂, 2 ♀.

Big Pine Key, Fla., July 6, 1912; 5 ♂, 3 ♀.

Key West, Fla., July 3-7, 1912; 6 ♂, 9 ♀, 1 ♀ n.

The range of this beautiful form is extended by the present records from the vicinity of Miami to Key West. In size the Homestead and Detroit series average rather large, but display a considerable amount of individual variation among themselves, the Big Pine Key series averages smaller and is much more uniform in size, while the Key West series is quite large but individually variable. The following measurements in millimeters are of the extremes of the Homestead and Key West series and of an average pair from Big Pine Key.

	Homestead.		♂ Key West.		Big Pine Key.
Length of body.....	17.	21.2	18.5	19.5	16.8
Length of pronotum....	3.5	4.4	4.	4.2	3.5
Caudal width of dor- sum of pronotum.....	2.	2.2	2.2	2.3	2.
Length of tegmen.....	10.8	12.	7.5	9.	7.5
Length of caudal fe- mur.....	10.8	12.2	11.8	12.8	10.7

	Homestead.		♀ Key West.		Big Pine Key.
Length of body.....	26.3	30.2	27.5	29.	24.
Length of pronotum....	5.	5.8	5.	5.8	5.
Caudal width of dor- sum of pronotum.....	3.	3.3	3.3	3.2	2.8
Length of tegmen.....	15.8	12.2	10.	11.3	10.
Length of caudal fe- mur.....	14.	17.	15.7	17.8	14.6

The Key West and Big Pine Key series are uniformly short-winged, while the Homestead and Detroit representations have a far greater proportion long-winged, abbreviate tegmina being present in five females and the same condition approximated in two males. It is probable that environment is the governing factor in regard to tegminal and wing length in this form.

All of the color phases known for this race are present in the series in hand, the only lot very uniformly colored being the male series from Key West, which are greenish with the usual postocular bars. The females from Key West, however, show three different color phases.

At Key West this form was common in green herbage or grasses in or near a gumbo limbo forest in company with *Orphulella pelidna*, while on Big Pine Key it was taken in pine woods undergrowth.

***Arphia granulata* Sauss.**

Homestead, Fla., July 10-12, 1912; 4 ♂.

Detroit, Fla., July 12, 1912; 1 ♀.

Big Pine Key, Fla., July 6, 1912; 1 ♂, 1 ♀.

Key West, Fla., July 3-7, 1912; 3 ♂, 9 ♀.

Cruciform markings on the dorsum of the pronotum are more or less noticeable in five specimens of the present series. The differences in coloration previously noted¹⁸ are found in the series before us.

Examination of the material shows that Caudell's record of *Arphia sulphurea* from Key West is incorrect, the specimens belonging unquestionably to the present species.

At the first three localities given above the species was scarce in the low undergrowth of the pine woods, but at Key West it was well distributed through the scrub and also in the open gumbo-limbo forest.

***Chortophaga australior* R. and H.**

Homestead, Fla., July 10-12, 1912; 1 ♂, 2 ♀, 1 ♂ n.

Detroit, Fla., July 12, 1912; 1 ♂.

¹⁸ PROC. ACAD. NAT. SCI. PHILA., 1912, p. 253.

Jewfish, Fla., July 11, 1912; 1 ♂, 2 ♀.

Key West, Fla., July 3-7, 1912; 7 ♂, 9 ♀.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912; 7 ♂, 7 ♀.

The color phases of this species are well illustrated by the above series. No approach whatever is shown to *Chortophaga cubensis* (Sc.).

Spharagemon orepitans (Sauss.).

Key West, Fla., July 7, 1912; 2 ♂, 4 ♀.

The specimens of this splendid insect from the above locality are the most attenuate of a series of 37 individuals of the species before us. Length of body, ♂♂ 26.7-27.3 mm., ♀♀ 34.-37.; length of tegmen, ♂♂ 30.2-32.2, ♀♀ 34.-35.8. The caudal tibiae lack the bright red coloration of *Spharagemon bolli* as is true of the entire series of this species before us.

The only situation in which this species was found was on the ground under bushes in high jungle growth of the keys, where a few scattered individuals and one small colony was encountered. The species was very difficult to capture as the brush was too heavy to use a net and the insects flew up hurriedly. Their flight was observed to be usually low and for short distances.

Trimerotropis citrina Sc.

Key West, Fla., July 4-5, 1912; 5 ♂, 4 ♀.

This species was very scarce on bare roads and occasional on the sand of the southern beach.

Romalea microptera (Beauv.).

Homestead, Fla., July 10-12, 1912; 25 ♂, 13 ♀.

Detroit, Fla., July 12, 1912; 5 ♂, 5 ♀.

This series shows a considerable amount of individual variation in size, the extremes measuring as follows: Length of body, ♂♂ 48.-54. mm., ♀♀ 60.-71.; length of pronotum, ♂♂ 13.4-18.8, ♀♀ 18.2-21.7; length of tegmen, ♂♂ 22.3-27.5, ♀♀ 23.8-32; length of caudal femur, ♂♂ 23.7-31.; ♀♀ 30.7-36.5. All of the specimens are of the typical phase of coloration.

These insects were widely distributed in moderate numbers through the undergrowth of the pine woods at both the above localities.

Leptysma marginicollis (Serv.).

Homestead, Fla., July 10-12, 1912; 9 ♂, 8 ♀, 1 ♂ n., 1 ♀ n.

Detroit, Fla., July 12, 1912; 2 ♂.

Two males and seven females are of the greenish phase of coloration, while the postocular bars are strongly indicated in all of the adults.

At Homestead the species was common in the tall saw-grass of the everglades and occasional over the prairie-like expanse, while at Detroit it was taken in grasses on the edge of the "hammock" in the pine woods.

Schistocerca alutacea (Harris).

Detroit, Fla., July 12, 1912; 1 ♂.

Long Key, Fla., July 13, 1912; 1 ♂.

Big Pine Key, Fla., July 6, 1912; 4 ♂, 2 ♀.

Key West, Fla., July 3-7, 1912; 15 ♂, 1 ♀.

All of these specimens are of the rusty-brown phase of coloration. Several specimens have two darker markings weakly indicated on the dorsal surfaces of the caudal femora.

The species was found occasional at Big Pine Key on the edge of a fringe of mangroves in tall bushes and low plants and not scarce locally in the scrub on Key West. It was taken in the same situation as *Schistocerca obscura* at both Detroit and Long Key, at which places the latter species was the more numerous.

Schistocerca obscura (Fabr.).

Detroit, Fla., July 12, 1912; 3 ♂.

Key Largo, Fla., July 11, 1912; 2 ♂.

Long Key, Fla., July 13, 1912; 3 ♀.

The males are of the brilliant yellow striped phase of coloration, while the females are rusty brown without a medio-longitudinal stripe but somewhat mottled and, as in nearly all other specimens of the species before us, the dorsal surfaces of the caudal femora have two decidedly darker markings.

The present species was found in the heavy "hammock" at Detroit, occasional in weeds beside the railroad on Key Largo and in the prevailing scrub on Long Key.

Schistocerca americana Sc.

Homestead, Fla., July 10, 1912; 1 ♂.

Detroit, Fla., July 12, 1912; 1 ♂, 1 ♀.

Jewfish, Fla., July 11, 1912; 1 ♂.

Key Largo, Fla., July 11, 1912; 1 ♀.

Long Key, Fla., July 13, 1912; 1 ♂.

Big Pine Key, Fla., July 6, 1912; 1 ♀.

Key West, Fla., July 3-7, 1912; 7 ♂, 7 ♀.

Bird Key, Dry Tortugas, Fla., July 9, 1912; 1 ♂.

Garden Key, Dry Tortugas, Fla., July 8, 1912; 1 ♀.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912; 7 ♂, 5 ♀.

This series bears out still more clearly the fact that the size and

wing length in the present species is much less in southern Florida individuals than in more northern specimens and that this is particularly emphasized in individuals from the keys. A series of fifteen male specimens from the outermost keys, Key West and the Tortugas, give the following averages: Length of pronotum, 7.7 mm. (7.1–8.4); length of tegmen, 34.9 (32.3–38.).¹⁹ The females bear out these facts in like manner.

In the series from Loggerhead Key, there are three males remarkable for the fact that the tegmina wholly lack maculations of any kind, which gives the insects a very distinctive appearance. No intermediates between this and the normal color phase were seen, but no characters exist to separate the specimens from typical *americana*, the difference being simply due to a loss of a portion of the color pattern through recession.

Though only occasional at the majority of localities, this species was very common through the scrub on Key West and quite numerous on Loggerhead Key in open spots where the sandy soil was covered with beach plants, grasses, and prickly pear.

Schistocerca damnifica calidior R. and H.

Homestead, Fla., July 10–12, 1912; 3 ♂, 1 ♀.

Big Pine Key, Fla., July 6, 1912; 2 ♂, 1 ♀.

At both of the above localities individuals were very scarce in the low undergrowth of the pine woods. One male, taken at Homestead, was very soft when captured, having but recently moulted into the mature condition.

Eotettix signatus Sc.

Homestead, Fla., July 10–12, 1912; 39 ♂, 42 ♀, 1 ♀ n.

Detroit, Fla., July 12, 1912; 2 ♂, 4 ♀.

The large series before us shows that not only is there great variation in size and tegminal length in specimens from the same locality, but also that specimens from the more southern localities in the species distribution average much smaller than those found further north.

Measurements (in millimeters) of extremes.

	Pablo Beach, Fla.	
	5 ♂♂	3 ♀♀
Length of body.....	19.4–20.5	26. –26.5
Length of pronotum.....	4.7– 4.9	6.2– 6.3
Length of tegmen.....	5. – 6.1	7.6– 8.5
Length of caudal femur.....	12. –12.6	15.5–16.6

¹⁹ For further notes on this variation see Rehn and Hebard, PROC. ACAD. NAT. SCI. PHILA., 1912, p. 257.

	Homestead and Detroit, Fla.	
	41 ♂♂	46 ♀♀
Length of body.....	14.2-17.6	19.5-24.8
Length of pronotum.....	3.4- 4.	4.3- 5.7
Length of tegmen.....	4.3- 5.6	5.1- 7.6
Length of caudal femur.....	10. -11.4	12. -15.1

The present species, in spite of the great variability in tegminal length, always has these organs longer than the pronotum and broad lanceolate with acute apex, which readily distinguishes the species from *Eotettix palustris* which has the tegmina not as long as the pronotum and broadly oval with rounded apex.

Like *Eotettix pusillus* and *E. sylvestris*, this form has in life a striking metallic lustre which has almost wholly disappeared in all of the dried specimens.

The species was found very common on the prairie-like everglades and in much fewer numbers about pot-holes in the pine woods, it has never been definitely recorded previously except from Pablo Beach in northeastern Florida.

Melanoplus puer Sc.

Homestead, Fla., July 10-12, 1912; 2 ♂, 2 ♀, 2 ♀ n.

Detroit, Fla., July 12, 1912; 1 ♂, 1 ♀, 1 ♀ n.

The species was very scarce at the above localities in the undergrowth of the pine woods.

Paroxya atlantica Sc.

Homestead, Fla., July 10-12, 1912; 10 ♂, 2 ♀.

Detroit, Fla., July 12, 1912; 1 ♂, 2 ♀.

The Detroit specimens show a slight tendency toward the keys race, *P. atlantica paroxyoides*.

Paroxya atlantica paroxyoides (Sc.).

Jewfish, Fla., July 11, 1912; 3 ♂, 3 ♀, 1 ♀ n.

Ley Largo, Fla., July 11, 1912; 1 ♂, 1 ♀ n.

Long Key, Fla., July 13, 1912; 3 ♂.

Big Pine Key, Fla., July 6, 1912; 6 ♂, 1 ♀ n.

Key West, Fla., July 3-7, 1912; 13 ♂, 10 ♀.

On Big Pine Key this geographic race was found in the undergrowth of the pine woods and along the edge of the key in few numbers. At Key West it was not scarce in the scrub and common in the vegetation back of the beach, while in the heavy jungle-like tangle it was the only species of grasshopper that was not scarce.

Paroxya floridana (Thomas).

Detroit, Fla., July 12, 1912; 5 ♂, 3 ♀.

The species was common in the typical saw-grass growing in knee-high water in the everglades.

Aptenopedes clara Rehn.

Homestead, Fla., July 10, 12, 1912; 3 ♂, 3 ♀, 1 ♀ n.

Detroit, Fla., July 12, 1912; 3 ♂, 1 ♂ n., 2 ♀ n.

Long Key, Fla., July 13, 1912; 2 ♂, 2 ♀, 1 ♂ n.

Big Pine Key, Fla., July 6, 1912; 4 ♂, 3 ♀ n.

Key West, Fla., July 3-7, 1912; 10 ♂, 12 ♀.

This species was found in the undergrowth of the pine woods and keys scrub, usually in damper situations than *Aptenopedes aptera*.

Aptenopedes aptera Sc.

Homestead, Fla., July 10-12, 1912; 1 ♂, 3 ♂ n., 4 ♀ n.

Detroit, Fla., July 12, 1912; 1 ♂ n., 2 ♀ n.

Big Pine Key, Fla., July 6, 1912; 1 ♂ n., 3 ♀ n.

The majority of the series are somewhat less than half grown. As this is an apterous species, none of the nymphs have any trace of tegmina, this together with their greater rugosity makes them easily separable from nymphs of *Aptenopedes clara*, which show tegminal sheaths from the earliest instars.

This species has not been recorded previously south of Miami, Fla.

TETTIGONIIDÆ.**Arethæa phalangium** (Scudder).

Homestead, Fla., July 10, 1912; 1 ♂, 2 ♀.

These specimens were found dead in spider-webs on the railroad station building.²⁰

Amblycorypha floridana R. and H.

Homestead, Fla., July 10-12, 1912; 8 ♂, 6 ♀, 1 ♀ n.

Detroit, Fla., July 12, 1912; 2 ♂, 2 ♀, 1 ♂ n.

Big Pine Key, Fla., July 6, 1912; 1 ♂.

The character of the tympanum of the male tegmina is typical in all of the individuals of that sex, while the ovipositor varies somewhat in depth and appreciably in length, the extremes of the latter in the Homestead females being ten and a half and eleven and eight-tenths millimeters. The blackish markings on the tympanum of the males vary considerably in intensity, in one extreme covering practically all of that field except the sutural half of the area proximad

²⁰ Vide, Rehn and Hebard, *Trans. Amer. Entom. Soc.*, XL, pp. 147, 148 (1914).

of the stridulating vein, while in the other this coloration is decided only in spots, one proximad, one distad, and one immediately distad of the stridulating vein. One male from Homestead is quite brownish, two females from the same locality are dull straw colored or washed with brownish, while two Detroit females are much tinged on the pronotum and proximad on the tegmina with pale reddish-brown. A half-grown nymph from Miami, Fla., taken March 28, 1910, gives us an idea of the condition of individuals of the species at that time of year.

At Homestead this species occurred locally on the prairie-like everglades, where they were scarce in the daytime, but plentiful at night, perched on the grasses, stridulating fearlessly. Their note is an indescribable buzz and click. The Detroit specimens were taken in pine woods on the edge of a hammock, and on Big Pine Key the species was beaten from green bushes in the pine woods. Two specimens were found dead in spider-webs at the railroad station at Homestead on July 10.

Amblycorypha uhleri Stål.

Homestead, Fla., July 10-12, 1912; 5 ♂, 6 ♀.

When compared with Texan material of this species, the present series is seen to be identical, although the size is much greater than in individuals from New Jersey, which, however, show no specific differences from Texan topotypes. When careful examination of all the available material has been made, it will probably be found that the size regularly decreases northward. All of the males and several of the females have much of the pronotum, pleura, and proximal portion of the tegmina more or less ochraceous. Four of the males have the blackish tympanal maculation decided. The species was fairly common at Homestead, more numerous at night than in the daytime, always in the pine woods and in or near large-leaved small bushes of several species. When search was made for them at night with the aid of a flash-lamp, they proved to be quite shy, flying frequently before their exact location could be ascertained. Two specimens were taken from spider-webs on the station building at Homestead, July 10.

Microcentrum rhombifolium (Saussure).

Key West, Fla., July 3, 1912; 1 ♂.

The present specimen was taken from high bushes about twelve feet from the ground, several others being heard in the same vicinity. This is the first record of this widespread species from the keys.

Microcentrum rostratum R. and H.

Key West, Fla., July 3-7, 1912; 10 ♂, 1 ♂ n.

Long Key, Fla., July 13, 1912; 1 ♂ n., 1 ♀ n.

This striking and peculiar species was taken in but one location on Key West, and there it was found at night locally numerous but hard to secure. Individuals were taken only on buttonwood (*Conocarpus erecta*) on the two occasions on which the spot was visited. All the specimens were stalked with flash-lamp by the aid of their song, in consequence none but males being captured. Their note is quite different from that of any of the other species of the family found on the keys, being low and rasping, much like zrrrp-zrrrp, zrrrp. On Long Key the nymphs were taken from buttonwood (*Conocarpus erecta*), which there grows on the edge of mangrove swamps.

As the species was previously known only from the unique type, a female, we have made some notes on the differences of that sex from the original description.²¹

Allotype: ♂; Key West, Florida. July 3-7, 1912. (Rehn and Hebard.) [Hebard Collection.]

Fastigium slightly more compressed than in the female, but otherwise similar. Tympanum of tegmina half again as long as the disk of the pronotum, stridulating vein broad, depressed, arcuate, slightly oblique. Disto-dorsal abdominal segment arcuato-truncate mesad, with a medio-longitudinal depression; supra-anal plate trigonal, with a deep median sulcation; cerci tapering, nearly straight, considerably surpassing the distal margin of the subgenital plate, the apex blunted and slightly hooked dorsad, furnished dorsad with a pair of teeth placed side by side and with a single tooth placed ventrad of the same; subgenital plate ample, narrowing distad, lateral margins slightly arcuate but subregularly converging, distal extremity narrow, arcuato-emarginate, styles articulate, slightly tapering, their length not greater than the width of the distal extremity of the plate.

Measurements (in millimeters).

	Allotype, ♂.
Length of body.....	20.8
Length of pronotum.....	5.3
Caudal width of the disk of the pronotum.....	4.1
Length of tegmen.....	28.8
Greatest width of tegmen.....	7.5
Length of caudal femur.....	15.6
Length of caudal tibia.....	16.8

²¹ By an unfortunate transposition, the original description states that the lateral angles of the pronotal disk are "more apparent cephalad than caudad," when the reverse is true of the type and the present material. (PROC. ACAD. NAT. SCI. PHILA., 1905, p. 43.)

In size the present series shows but little variation. The two Long Key nymphs are in quite different stages, the male being in the instar preceding maturity, while the female is not a third the size of the male. The Key West nymph is in the second instar preceding maturity.

Belocephalus sabalis Davis.

Homestead, Fla., July 10, 1912; 28 ♂.

Marathon, Kay Vaca, Fla., July 9, 1912; 1 ♂.

A comparison of this interesting series, the largest known of any single species of the genus, with a paratype male from Punta Gorda, kindly presented to us by Mr. Davis, shows that while fully in accord in all the important specific characters the Homestead series uniformly differs in having the fastigium shorter, though of similar form, while the black marking of the clypeal suture is pronounced only in the brown phase and not always present in that condition. One single green male shows indications of this sutural marking, but in the others the face is unicolorous. The Marathon male has the fastigium more as in the paratype than is true of the Homestead specimens, but the apex is even there less elongate than in the Punta Gorda specimens, while the clypeal suture has no black. These differences are probably environmental or geographic but hardly specific in character.

In size there is considerable individual variation, the extremes of the Homestead series presenting the measurements in millimeters given below, with which are placed those of the Marathon male, which appreciably surpasses in build any from the mainland, and of the Punta Gorda paratype.

	Homestead.		Marathon, Key Vaca.	Punta Gorda (paratype).
Length of body.....	34.	41.	45.	38.6
Length of fastigium from eyes	3.1	3.5	4.2	4.5
Length of pronotum.....	8.6	8.6	10.4	9.2
Length of tegmen.....	5.2	6.7	7.9	7.1
Length of caudal femur.....	15.9	16.2	19.7	18.

Seven of the Homestead males are in the brown phase, all of the remainder in the green phase of coloration. The brown specimens have the broad dorsal darker bar mentioned by Davis.

At Homestead the species was very common on scrub palmetto (*Serenoa serrulata*) in the pine woods, rarely on other plants (two on sugar cane, one on a pine tree, and one on a low bush) and only found at night, when their stridulations permitted stalking with a flash-

lamp. The song was faint and ceased on an approach of even as much as twenty feet. However, they were easy to capture when located, as they almost invariably made no attempt to escape, but instead merely slipped down the palmetto leaf a few inches or around to the other side and there flattened themselves out with caudal limbs extended backward and cephalic limbs forward. When picked up they would violently attempt to bite their captor, and if successful could inflict a painful bite on a tender portion of the hand. Their jaws are capable of cutting the tough palmetto leaves and in consequence are very powerful. Their note is very low and consists of a succession of sounds like zip-zip-zip-zip-zip-zip-zip-zip.

Neoconocephalus mexicanus (Saussure).

Conocephalus fusco-striatus Redtenbacher, Verh. K.-k. Zool.-botan. Gesell. Wien, XLI, p. 399 (1891).

Homestead, Fla., July 10-12, 1912; 6 ♂, 1 ♀.

Jewfish, Fla., July 11, 1912; 1 ♂.

Key West, Fla., July 3-7, 1912; 5 ♂, 1 ♀ n.

At Homestead two perfectly typical males of *fusco-striatus* were taken in company with typical specimens of *mexicanus*, of which we are thoroughly convinced the former is merely the brown-color phase, absolutely no structural differences being found on careful examination. The song of individuals in the different phases was noted as being the same, a krzzzzz-krzzzzz-krzzzzz, each preceded, when one is near enough to detect it, by a sharp buzz. Individuals were only occasional in the pine woods at Homestead at night and exceedingly shy, although permitting a near approach until they ceased singing, when, however, they would dart wildly away. At Jewfish many were heard singing in high grasses, from which one was taken. All the specimens from Key West were secured in the scrub jungle, both in the daytime and at night, many nymphs being seen.

As remarked above, two individuals from Homestead are in the brown phase, all the others being in the green phase. The specimens in the latter condition show considerable variation in the blackish fastigial marking, this varying from the faintest possible median indication to quite a broad solid band crossing the entire fastigium.

Neoconocephalus velox n. sp.

This peculiar species has been carefully compared with all the available material of the genus from the United States, Central America, and the West Indies, as well as with all the literature bearing on the subject, and is found to show nearest relationship to *N.*

palustris. From this species it differs in the more slender, compressed form, which is unusually pronounced for the male sex of this genus, with the tympanum in consequence much narrowed, while the pronotum is exceptionally attenuate.

TYPE: ♂; Homestead, Dade County, Florida. July 12, 1912. (Hebard.) [Hebard Collection.]

Size moderately large; form compressed, slender, elongate. Head with the dorsal length considerably less than that of the pronotum; fastigium with its length beyond the eyes slightly greater than the space between the latter, subattenuate, tapering very gently distad, the apex very bluntly rounded, ventral tooth distinct, blunt, well separated from the facial fastigium; face strongly retreating; eyes ovato-trigonal, their depth slightly less than their length, compressed and but little prominent when seen from the dorsal aspect;

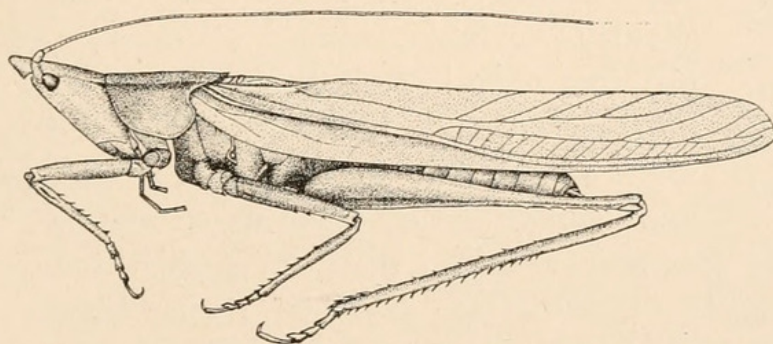


Fig. 5.—Side view of type of *Neoconocephalus velox* n. sp. ($\times 1\frac{1}{4}$.)

antennæ moderately elongate, in an incomplete condition four-fifths as long as the tegmina. Pronotum with the surface impresso-punctate, elongate, narrow, the greatest (caudal) width of the dorsum but slightly more than half the length of the same, the cephalic width about two-thirds the caudal width, cephalic margin of disk truncate, caudal margin of same arcuate, obtuse-angulate, the dorsal length of the prozona contained three and one-half times in that of the metazona, lateral angles distinct, rotundato-subrectangulate caudad, well rounded cephalad, regularly but not decidedly diverging caudad; lateral lobes elongate, the greatest depth contained slightly more than one and one-half times in the greatest dorsal length, cephalic margin strongly oblique, faintly arcuate, ventro-cephalic angle broad arcuate, ventral margin more oblique than usual, straight, ventro-caudal angle arcuato-obtuse, caudal margin with a deep rotundato-subrectangulate humeral sinus, the ventral portion of the same margin oblique arcuate. Tegmina elongate, the greatest width contained about six and

one-half times in the length; costal margin gently arcuate distad to the rather narrow suboblique rotundato-truncate apex; tympanum slightly longer than the disk of the pronotum, its greatest width subequal to the caudal width of the latter, stridulating vein short, slightly oblique, greatly thickened. Prosternum



Fig. 6, — Dorsal outline of head, pronotum and tympanum of type of *Neoconocephalus velox* n. sp. ($\times 1\frac{1}{4}$.)

long bispinose; lobes of the mesosternum and metasternum slightly acute-angulate. Disto-dorsal abdominal segment with the distal margin arcuato-emarginate, subacute and faintly tuberculate laterad, strongly arcuato-emarginate at the base of each cercus; supra-anal plate trigonal, slightly elongate, lateral margins moderately concave, apex narrowly rounded, medio-longitudinal sulcus pronounced; cerci with the shaft robust, the surface of same subpustulate, ventral extremity bent mesad and slightly proximad, sinuate, acuminate, with a strong terminal spine, dorsal extremity with a shorter process, which is, however, similarly developed and with a slightly longer spine; subgenital plate moderately broad, tricarinate ventrad, the lateral

carinae heavier and more rounded than the median, being the trunks bearing the styles, which latter are brief, rather blunt, and faintly tapering, distal margin of plate obtuse-angulate emarginate. Cephalic femora about four-fifths as long as the dorsum of the pronotum, ventro-cephalic margin distad with two to three spines, ventro-caudal margin unarmed; cephalic tibiae unarmed dorsad. Median femora a fourth longer than the cephalic femora, margin similar. Caudal femora about three-fifths as long as the tegmina, slender, armed on the distal half of each of the ventral margins with six spines.

General color tawny-olive. Head with the dorsum of the fastigium, occiput, and postocular region multilined with weak bister lines, lateral margins and apex of fastigium bordered with cream-buff, ventral surface of fastigium with a faint purplish tinge, but no black; eyes seal-brown; antennae of the general color. Pronotum with the dorsum very weakly and the lateral lobes, particularly dorsad, more strongly washed with warm sepia, the position of the lateral angles indicated by chamois lines. Tegmina with the discoidal field sprinkled with small points varying from blackish to seal-brown in tone. Limbs unicolorous, spines narrowly tipped with blackish brown.

Measurements (in millimeters).

	♂
Length of body.....	40.5
Length of fastigium (from eyes).....	2.7
Length of pronotum.....	9.
Greatest caudal width of pronotum.....	5.2
Length of tegmen.....	42.
Length of caudal femur.....	25.2

This species was very shy and scarce in the pine woods at Homestead. It was only encountered at night, and while some few were heard, but one other than the type was seen. The song of this insect consists of a loud and sustained buzzing note.

Homorocoryphus malivolans (Scudder).

Conocephalus hoplomachus Rehn and Hebard, Proc. Acad. Nat. Sci. Phila., 1905, p. 46. (Chokoloskee, Monroe Co., Fla.)

Detroit, Fla., July 12, 1912; 1 ♂.

After a careful examination of the present specimen, the types of *Conocephalus hoplomachus* and of *Conocephalus malivolans* Scudder, we are convinced that *hoplomachus* represents the female of *malivolans*. The latter was based on a single male from Cedar Keys, Fla., which remained unique until the very different female was described by us as *C. hoplomachus*. At that time we examined the description of *malivolans*, but the sexual differences are so great that we could not recognize the female then in hand as the other sex of Scudder's species. The present specimen enables us to establish the above synonymy, agreeing as the individual does exactly with the original description and clearly being the male sex of the apparently very different *hoplomachus*.

The present specimen was taken during the daytime from saw grass growing in knee-high water on the edge of the everglades.

Odontoxiphidium apterum Morse.

Homestead, Fla., July 10-12, 1912; 8 ♂, 9 ♀, 2 ♀ n.

Detroit, Fla., July 12, 1912; 7 ♂, 5 ♀, 1 ♀ n.

Key Largo, Fla., July 11, 1912; 1 ♀.

Long Key, Fla., July 13, 1912; 1 ♀.

Big Pine Key, Fla., July 6, 1912; 4 ♂, 1 ♀, 3 ♀ n.

Key West, Fla., July 3-7, 1912; 18 ♂, 6 ♀, 6 ♀ n.

These specimens average considerably larger than individuals from southern Georgia and northern Florida, although each of the present lots shows in itself considerable individual variation in size. The maximum-sized individuals are from the keys, particularly in the female sex, the greater majority of the males being no larger than

Homestead specimens, all, however, larger than northern Florida representatives. The minimum and maximum measurements in millimeters of each sex in the present series are as follows:

	Homestead. ♂		Detroit.	
Length of body.....	12.5	14.2	12.8	13.
Length of pronotum.....	4.2	4.8	4.	4.5
Length of tegmen.....	3.	3.2	3.3	3.2
Length of caudal femur.....	12.5	14.5	12.2	13.2

	Big Pine Key. ♂		Key West.	
Length of body.....	11.7	12.8	12.7	15.3
Length of pronotum.....	4.	4.	3.9	4.6
Length of tegmen.....	2.8	2.8	3.5	4.2
Length of caudal femur.....	12.2	12.5	12.1	15.

	Homestead.		♀ Detroit.		Key Largo.
Length of body (exclusive of ovipositor).....	11.6	17.	15.	14.	20.3
Length of pronotum.....	4.7	5.	4.9	5.3	6.
Length of caudal femur.....	13.8	16.	14.	16.7	17.4
Length of ovipositor.....	13.	13.	13.9	13.5	18.8

	Long Key.	Big Pine Key.	♀ Key West.	
Length of body (exclusive of ovipositor).....	17.1	14.2	12.5	17.
Length of pronotum.....	5.2	4.9	5.3	5.5
Length of caudal femur.....	17.4	13.5	16.5	16.
Length of ovipositor.....	17.	13.	16.2	18.5

The range of the species is considerably extended to the southward by the present records, as it was not previously known from south of Sanford, Fla.

At Homestead the species was not scarce in rank grasses in potholes in the pine woods, at Detroit it was found in pine woods, on Key West a few adults and many nymphs were encountered in weedy tangles and grassy spots in jungle brush, while on Big Pine Key it was occasional in green herbage in the pine woods.

Orchelimum nitidum Redtenbacher.

Detroit, Fla., July 12, 1912; 4 ♂, 3 ♀.

The present record is the most southern known for the species, which has a considerable range to the northward.

At Detroit the species was not scarce in saw grass growing in the knee-high water of the everglades.

Orchelimum militare R. and H.

Detroit, Fla., July 12, 1912; 1 ♂, 1 ♀.

These specimens are inseparable from typical material of the species, the range of which is here extended to the southward of its former southern limit, Gainesville, Alachua County, Fla.

This pair was taken in the same situation as the series of *O. pulchellum*.

Orchelimum concinnum Scudder.

Homestead, Fla., July 10-12, 1912; 5 ♂, 9 ♀.

The present record slightly extends the range of this species to the southward, the most southern previous record being from Chokoloskee, Fla. Three males have the facial maculation indistinct, this certainly being due to desiccation in one specimen, but in the remaining eleven it is decided and moderately variable in width.

Individuals of this species were not uncommon in the prairie-like everglades.

Conocephalus fasciatus (DeGeer).

Miami, Fla., July 17-20, September 12, 1904 (Hebard); 2 ♂, 2 ♀.

Detroit, Fla., July 12, 1912; 2 ♀.

The range of the species is extended to the end of the Florida peninsula by the present records.

Conocephalus gracillimus (Morse).

Homestead, Fla., July 10-12, 1912; 10 ♂, 7 ♀.

Detroit, Fla., July 12, 1912; 1 ♂.

Jewfish, Fla., July 11, 1912; 12 ♂, 6 ♀.

Big Pine Key, Fla., July 6, 1912; 5 ♂, 1 ♀.

Key West, Fla., July 3-7, 1912; 2 ♂, 5 ♀, 1 ♀ n.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912; 2 ♂, 3 ♀, 1 ♂ n., 1 ♀ n.

These specimens show that considerable color variation is present in the species, and while in a certain measure geographic, it is chiefly individual. The Homestead series is in general uniformly quite dark, two males, however, being rather pale. The single Detroit individual is pale, as are most of the Jewfish specimens, none of which are as dark as the average Homestead representative. Big Pine Key specimens vary greatly, several having an average degree of marking, while three have the general color pale yellowish. Key West representatives are of the usual pattern in the female sex, but

the males are much paler with a weak pattern. The Loggerhead Key series varies greatly in color, three adults and both of the nymphs having the pattern more or less distinctly indicated on a pale base color, while the other two adults are uniformly ochraceous without markings.

The specimens from the keys average slightly larger than the individuals from the mainland, the Key West females having this most apparent.

At Homestead the species occurred in potholes and in the prairie-like everglades, at Jewfish it was common in grasses on the edge of the everglades, on Key West it was not scarce in grassy tangles scattered through the jungle scrub, while on Loggerhead Key it frequented grasses growing on open areas among the bay-cedar thickets.

***Ceuthophilus peninsularis* n. sp.**

Apparently nearest to *C. spinosus* Brunner from Georgia, but differing in the absence of pronounced spines on the external margin

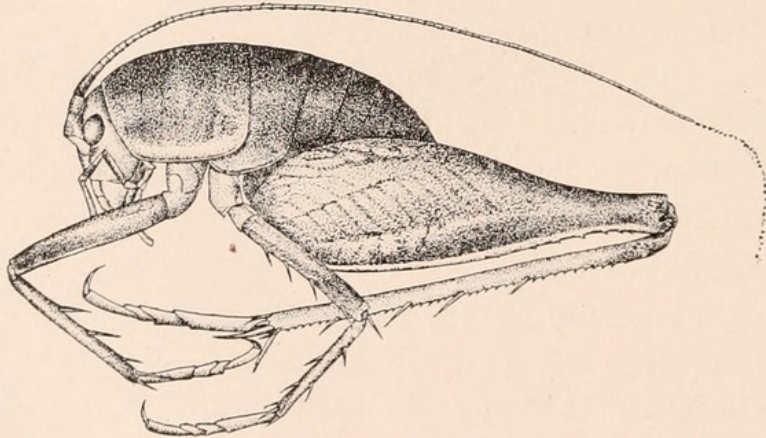


Fig. 7.—Side view of type of *Ceuthophilus peninsularis* n. sp. ($\times 3$.)

of the caudal femora, in the non-arcuate caudal tibiae, in the smaller size, and in the rather different coloration. It also shows some relationship to *C. nigricans* Scudder in the longer caudal femora and tibiae, in the long distal spine on the ventro-cephalic margin of the cephalic femora, in the same margin of the median femora having four spines, in the caudal femora being longer instead of shorter than the body, slenderer and three times as long as broad, in the ventro-internal margin of the caudal femora being more strongly serrato-dentate than the external, inner middle spur of the caudal tibiae not markedly longer than the external middle one and but little shorter than the metatarsus.

TYPE: ♂; Homestead, Dade County, Fla. July 12, 1912. (Hebard.) [Hebard Collection.]

Size rather small; body subfusiform, glabrous. Fastigium strongly declivent, low; eyes not at all prominent; antennæ in an imperfect condition reaching to the apices of the caudal femora, rather heavy. Pronotum with the cephalic and caudal margins truncate, ventral margin of the lateral lobes flattened arcuate. Mesonotum and metanotum with their caudal margins subarcuate. Abdomen with the segments glabrous; cerci shorter than the pronotum, robust at the base and decidedly tapering to the acute apex. Cephalic femora about a tenth longer than the pronotum, armed on the ventro-cephalic margin with three spines placed on the distal half, the distal spine quite long and equalling the cephalic tibial spines in length, the others diminishing in length, ventro-caudal margin unarmed. Median femora subequal to the cephalic femora in length, slightly less robust, armed on the ventro-cephalic margin with four spines proportioned as on the cephalic femora, ventro-caudal margin armed with three subequal spines, caudal genicular lobe bearing a long spine. Caudal femora longer than the body, moderately robust, the greatest width contained three times in the length, dorsal surface with the dark areas of the pattern bearing numerous depressed points, a group of more decided spiniform points present dorsad on the internal face, ventro-external margin of the caudal femora with weak recumbent serrulato-spinulations, ventro-internal margin distad with seven distinct but recumbent serrato-spinulations; caudal tibiæ less than a twelfth longer than the caudal femora, straight, spurs subopposite distad, subalternating proximad, about one and one-half times as long as the tibial depth, slightly hooked at the tips, inner middle spur appreciably longer than the outer middle spur and subequal to the metatarsus in length, dorsal spurs of both faces slightly longer than the ventral ones, ventral surface of tibiæ distad with a single spine in addition to the apical pair; caudal tarsi with the third joint about half the length of the second, together very slightly shorter than the fourth.

Dorsal surface solidly brownish-black, passing into cinnamon-buff on the ventral surface, the pale coloration on the femora antique brown (Ridgway, Plate III), the head, pronotum, and dorsum of abdomen with a distinct continuous medio-longitudinal line of ferruginous. Face and palpi of the ventral color, the facial fastigium, a spot under each eye and a touch on the genæ of the dorsal color, the third palpal joint lightly and the fourth heavily marked with

the same; eyes black; antennæ cream-buff, proximad passing into bister. Ventral section of the lateral lobes of the pronotum and corresponding portions of the mesonotum and metanotum stippled with the ventral color. Abdomen dorsad bearing on each side two complete and several incomplete longitudinal series of circular ferruginous spots; cerci of the ventral color, becoming bister distad. Cephalic and median femora with their distal halves and greater portion of corresponding tibiæ brownish-black. Caudal femora with a decided scalariform pattern of blackish-brown, the latter color nearly solid distad and along the ventro-lateral margin; caudal tibiæ honey-yellow, proximal extremity and dorsal surface brownish-black. All tarsi uniformly cream color.

<i>Measurements (in millimeters).</i>	Type, ♂.
Length of body.....	10.8
Length of pronotum.....	4.9
Length of cephalic femur.....	5.2
Length of caudal femur.....	12.6
Length of caudal tibia.....	13.5

The type of this species was found under a coquina boulder in the everglades near the edge of the pine woods. A very immature specimen of what is apparently this species was also taken at Homestead, March 17-19, 1910, by Hebard.

GRYLLIDÆ.

Cryptoptilum antillarum (Redt.).

Homestead, Fla., July 10-12, 1912; 5 ♂, 4 ♀, 1 ♂ n.

Detroit, Fla., July 12, 1912; 2 ♀.

Big Pine Key, Fla., July 6, 1912; 4 ♂, 3 ♀.

Long Key, Fla., July 13, 1912; 2 ♂, 3 ♀.

Key West, Fla., July 3-7, 1912; 15 ♂, 22 ♀, 1 ♂ n., 1 ♀ n.

Loggerhead Key, Dry Tortugas, Fla., July 8, 1912; 1 ♀.

This species is widely distributed through the keys scrub and in "hammock" shrubbery on the mainland, as well as in weedy spots and vine tangles. One specimen was taken from an epiphyte (*Epidendron tampense*) growing on an oak in the "hammock" at Detroit. The species was found scarce in the bay-cedar bushes (*Suriana maritima*) on Loggerhead Key.

Cryptoptilum trigonipalpus R. and H.

Homestead, Fla., July 10-12, 1912; 1 ♂ n.

Detroit, Fla., July 12, 1912; 1 ♀ n.

The specimen from Detroit was taken from an oak in the "hammock."

Cycloptilum zebra R. and H.

Key West, Fla., July 7, 1912; 1 ♂.

A number of specimens were heard after dark stridulating in short grass growing in the street railway track. The song is a faint krik-krik-krik-krik, suggesting that of a species of *Nemobius*, but much fainter.

Nemobius fasciatus socius Sc.²²

Homestead, Fla., July 10-12, 1912; 1 ♂.

Nemobius ambitiosus Sc.²²

Homestead, Fla., July 10-12, 1912; 1 ♂.

Nemobius cubensis Sauss.²²

Homestead, Fla., July 10-12, 1912; 3 ♂, 3 ♀.

Nemobius carolinus Sc.²²

Homestead, Fla., July 10-12, 1912; 1 ♂, 1 ♀.

Miogryllus saussurei (Sc.).

Homestead, Fla., July 10-12, 1912; 2 ♀, 1 ♀ n.

Found in the undergrowth of the pine woods.

Gryllus firmus Sc.

Homestead, Fla., July 10-12, 1912; 1 ♂. Macropterous.

Detroit, Fla., July 12, 1912; 1 ♀.

Jewfish, Fla., July 11, 1912; 2 ♂, 1 ♀. 1 ♂, macropterous.

Key West, Fla., July 3-7, 1912; 2 ♂.

Great variation in size is found in this small series, the males measuring in length 20.5-29. mm., the females 25.-25.7. The song is a loud, sharp, vigorous chirruping.

Gryllus rubens Sc.

Homestead, Fla., July 12, 1912; 1 ♂. Macropterous.

This specimen was taken on the railroad track, "making a slower stridulation noticeably different from the hearty chirp of *Gryllus firmus*."

Gryllodes sigillatus (Walk.).

Jewfish, Fla., July 11, 1912; 2 ♀.

Key West, Fla., July 3, 7, 1912; 4 ♂, 1 ♀.

A few individuals of this species were found under boards in the station yard at Jewfish, while the species was everywhere common at Key West about the town. After dark at the latter locality the

²² These specimens have recently been fully studied by the junior author. PROC. ACAD. NAT. SCI. PHILA., 1913, pp. 394-491.

high, hurried, shrilling song of the species was to be heard on all sides, and with the aid of a flash-lamp individuals were easily taken when carefully approached and suddenly seized; this was apparently due to the fact that the specimens were blinded by the light, for the species is certainly the most active gryllid found within the United States.

***Cyrtoxipha gundlachi* Sauss.**

Homestead, Fla., July 10-12, 1912. Numerous in fig trees near house.

Detroit, Fla., July 12, 1912; 1 ♀.

Key Largo, Fla., July 11, 1912; 1 ♂.

Long Key, Fla., July 13, 1912; 1 ♂, 2 ♀.

Big Pine Key, Fla., July 6, 1912; 4 ♂, 3 ♀.

Key West, Fla., July 3-7, 1912; 9 ♂, 12 ♀, 1 gynandromorph.

This series of specimens is very uniform in size, the male from Key Largo only being slightly larger than the other specimens. One specimen from Key West is a gynandromorph, the left tegmen is typical of the male sex while the right is that of the female, the left valves of a much distorted and shrivelled ovipositor are present, while the right half of the genitalia are masculine.

This species was found occasional everywhere through the Keys scrub, but in numbers only in bushes and low trees with broad leaves. The pleasant, clear, tinkling song of this insect is a familiar night sound almost everywhere in this region.

***Hapithus quadratus* Sc.**

Homestead, Fla., July 10-12, 1912; 2 ♂ n.

Detroit, Fla., July 12, 1912; 1 ♂, 2 ♂ n.

Long Key, Fla., July 13, 1912; 1 ♂, 8 ♀.

Big Pine Key, Fla., July 6, 1912; 1 ♀.

Key West, Fla., July 3-7, 1912; 4 ♂, 9 ♀, 1 ♂ n., 1 ♀ n.

The present species is occasional throughout this region in low shrubbery and tangles of bushes and vines; it was found once in moderate numbers, in the keys scrub on Long Key.

***Tafalisca lurida* Walk.**

Detroit, Fla., July 12, 1912; 1 ♀, 1 ♀ n.

The adult was taken from an epiphyte (*Tillandsia fasciculata*) growing on the limb of an oak in the heavy "hammock," while the nymph was later beaten from a low bush there.

THE VASCULAR SYSTEM OF THE FLORIDA ALLIGATOR,

BY ALBERT M. REESE.

The account given by Bronn in his *Thierreich* is apparently the only published description of the circulatory organs in the Crocodilia. This account, even when translated, is not very satisfactory, especially because it contains no diagrams of the circulation. It was, therefore, deemed worth while to work out the circulation in the Florida alligator in order that we might have not only a written description, but also a series of more or less accurate diagrams of the veins and arteries.

A number of departures from the description of Bronn were found, some of which are noted below.

Most of the work was done upon animals of about 30 inches length, which were obtained alive from the Arkansas Alligator Farm at Hot Springs, Ark.

The arteries were injected with a colored starch mass by inserting a two-way cannula into the dorsal aorta. With the blood thus forced into them from the arteries, the veins could, in most cases, be traced without difficulty.

In the diagrams the outlines of the more important organs are accurately shown by dotted lines, and the relative diameters of the blood-vessels are shown as accurately as possible by the solid black lines.

THE HEART.

In the Crocodilia, as is well known, the heart is four-chambered and has about the same general shape as in the higher vertebrates.

The venous blood is emptied into a thin-walled sinus venosus on the dorsal side of the heart by three large vessels and one small one. The largest of these, the postcava, empties into the posterior side of the sinus venosus and brings blood from the posterior regions of the body; it is quite wide, but is exposed for a very short distance between the liver and the heart. Two large hepatic veins empty into the postcava so near the sinus venosus that they practically have openings into the sinus, as is shown in a somewhat exaggerated way in Plate XIII, fig. 1. Near the postcaval and hepatic openings



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