ORCHELIMUM CARINATUM. A NEW MEADOW KATYCID
FROM THE SOUTHEASTERN UNITED STATES
(ORTHOPTERA: TETTIGONIIDAE)*

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ABSTRACT

Orachelium carinatum, known from western Tennessee and western
Florida, is easily distinguished from other Orachelium by morphology and
by calling song: O. pulchellum Davis, O. nigripes Scudder, O. bullatum
Rehn and Hebard, and O. carinatum constitute the nigripes group of Or-
achelium.

Species of the genus Orachelium are known only from North America,
and, with the exception of 2 Mexican species in the subgenus Metarhop-
trum, all occur in the area east of the Rocky Mountains in the United
States and southern Canada. Rehn and Hebard recognized 17 species in
their 1915 monograph. Thomas and Alexander (1962) made the only sub-
sequent change in the species classification by demonstrating the distinct-
ness of delicatum Bruner and campestria Blatchley, 2 species that Rehn and
Hebard had confused with concinnum Scudder.

In this paper I describe a new species of Orachelium that is distinctive
in both morphology and calling song.

Orachelium carinatum, New Species

This species is morphologically most similar to Orachelium nigripes
Scudder, O. bullatum Rehn and Hebard, and O. pulchellum Davis (=lati-
cauda Redtenbacher of Rehn and Hebard 1915).

Among the 4 species of the nigripes group, only carinatum regularly
has the inner carinae of the hind femora armed. Occasional specimens of
nigripes have 1 or 2 spines on 1 or both of these carinae, but these speci-
mens are easily separable from carinatum by the sinuate lower hind mar-
gins of the lateral pronotal lobes and other features (see key below). The
male cercus of carinatum resembles that of bullatum but has a more promi-
nent medial dorsal swelling just distal of the base of the cercal tooth.

#2, Univ. Fla. Tape 265-3. Similar to pulchellum in habitus and colora-
tion except that striatory field is less prominent and head has no reddish
pigment. Lateral lobes of pronotum as in pulchellum: arcuate below a
moderate humeral sinus. Cerci (Fig. 5) with medial concavity at prox-
nimate end of dorsal carina and a pronounced medial dorsal swelling just
distal to base of cercal tooth. Right femur with 8 spines on outer and 5
on inner carina. Holotype and allotype deposited in U. S. Nat. Mus.


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Similar to holotype. Right femur with 11 spines on outer and 5 on inner carina; left femur with 9 and 7. Ovipositor as in Fig. 6.

Measurements of Holotype and Allotype (in mm): Length of body $\varnothing 30$, $\delta 26$; pronotal disc (length $\times$ caudal width) $\varnothing 5.7 \times 3.8$, $\delta 5.2 \times 3.5$; length of tegmen $\delta 27.4$, $\varnothing 31.4$; length of hind femur $\delta 21.9$, $\varnothing 21.6$; length of ovipositor 11.7.

Paratypes. 6 $\delta$, 1 $\varnothing$. 3 $\delta$ (including tape-recorded specimen UFT 265-4) same data as holotype; 3 $\delta$ (including UFT 265-1), 1 $\varnothing$, same data as allotype. All paratypes are in Fla. Sta. State Coll. Arthropods, Gainesville, except for 1 $\delta$ sent to Univ. Mich. Mus. Zool. and 1 $\delta$ to Acad. Nat. Sci. Phila.

The calling song of *carinatum* is easily distinguished from those of all other U. S. species of *Orchelimum* (Morris and Walker, in preparation, will give detailed descriptions of the songs of 18 species of *Orchelimum*, including *carinatum*.) It consists of a prolonged rattle usually preceded by a sequence of short coarse buzzes. The rattle usually lasts about 4 sec., and audiospectrographic analysis reveals that the wingstrokes are paired (average wingstroke rate: 40/sec. at 25°C; i.e. 20 pairs/sec). The only other *Orchelimum* that pairs its wingstrokes during the prolonged part of its calling song is *campestrum* (Thomas and Alexander 1962).

The short (0.10 to 0.15 sec.) coarse buzzes of *carinatum* are apparently homologous to the ticks or clicks of most other *Orchelimum* songs. The only other *Orchelimum* with similar short buzzes is *bradleyi*. Both *carinatum* and *bradleyi* sometimes omit the short buzzes in the dark and increase the number when disturbed. In *carinatum* the short buzzes consist of individual sounds that resemble those of the rattle and presumably are produced by similar wing movements. However, in contrast to the wingstrokes of the rattle, those of the short buzz are unpaired and at a rate of 24/sec. at 25°C.

Fig. 1-4 depict the known and projected geographical distributions of the 4 species of the *nigripes* group. In keeping with their indistinguishable calling songs, *pulchellum* and *nigripes* are allopatric—except perhaps in Walker Co., Ala. (see Dakin and Hays 1970). The projected distribution of *bullatum* is complicated by specimens collected by Henry Fox at Lafayette, Ind., Oct. 1913. Blatchley (1920) suggested, on the basis of a drawing of the male cercus, that these specimens were a northern form of *bullatum*. Rehn and Hebard had earlier identified these specimens as a "race" of *nigripes* (Fox 1915). Their identity is further obscured by the resemblance of the male cercus to *bullatum*, suggesting that they might be *carinatum* (which has a cercus very similar to *bullatum*). Thanks to Dr. A. B. Gurney, USDA Systematics Laboratory, U. S. National Museum, I've examined one female of Fox's material. It resembles *bullatum* and differs from *carinatum* and *nigripes* in having the carinac of the hind femora unarmed. It is smaller than my specimens of *bullatum* and *carinatum* and

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2Interpreting audiospectrographs of tettigonid songs in terms of wing movements is risky. High speed motion pictures may reveal that the sounds here interpreted as produced by a single cycle of wing movement ($\rightarrow$ wingstroke) are produced by a pair of cycles instead. If so, *carinatum* produces pairs of pairs of wingstrokes during its rattle and pairs of wingstrokes during its buzz.
Fig. 1-4. Distribution of species of the *Orchelimum nigripes* group. Circles show county records except that the upper and lower Florida Keys are plotted independently of continental Monroe County. The predicted general distribution for each species is shaded. Fig. 5. Dorsomedial view of right cercus of holotype male, *O. carinatum*. Fig. 6. Ovipositor of allotype female, *O. carinatum*.
larger than most of my nigripes. Its pronotal lobes most closely resemble nigripes. It is apparently not carinatum but could be northern bullatum, atypical nigripes, or an undescribed species. (Fox also collected typical nigripes at Lafayette, and I have examined a male and female from the USNM collection).

I collected my 2 series of carinatum in tall grass near water. The specimens from Franklin Co., Fla., were with pulchellum in grass emergent from the southern edge of East Bay along the U. S. Route 98 causeway just east of Apalachicola. Those from Obion Co., Tenn. were with nigripes and vulgare in grass along a drainage ditch in largely wooded bottomland near Reelfoot Lake Biological Station. Both nigripes and pulchellum are often in trees and shrubs in wet places, whereas bullatum, carinatum, and Fox's atypical nigripes are known only from herbaceous vegetation.

KEY TO MALES OF NIGRIPES GROUP OF ORCHELIMUM

This group of species corresponds to Rehn and Hebard's (1915) Group C of the subgenus Orchelimum. It is characterized by a prominent sinuate carina on the dorsal surface of the shaft of the male cercus.

1. Hind margins of lateral lobes of pronotum arcuate below the humeral sinus (edge not inflexed) ......................................................... 2

1' Hind margins of lateral lobes of pronotum sinuate below the humeral sinus because of inflexed edge ......................................................... 4

2(1). Number of spines on outer carinae of hind femora (left and right) totaling 6 or more ............................................................................ 3

2' Number of spines on outer carinae of hind femora totaling 4 or less ........................................................................................................... bullatum (part)

3(2). Cerci swollen mediad of dorsal carina (Fig. 5); inner carina of each hind femur armed with 2 to 6 spines; Mississippi embayment east to Florida panhandle (Fig. 3) ......................................................... carinatum

3' Cerci not swollen mediad of dorsal carina; inner carinae of hind femora unarmed; east of Appalachians west to Florida panhandle (Fig. 2) ........................................................................................................... pulchellum

4(1). Extended hind tibiae black above; number of spines on outer carinae of hind femora totaling 2 to 11 (usually 4 to 10); wingstroke rate during continuous portion of calling song about 40/sec. at 25°C .......... nigripes

4' Hind tibiae not black above; spines on outer carinae of hind femora totaling 0 to 4 (usually 0); wingstroke rate during continuous portion of calling song about 20/sec. at 25°C ......................... bullatum (part)

LITERATURE CITED


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