

ORCHELIMUM CARINATUM, A NEW MEADOW KATYDID
FROM THE SOUTHEASTERN UNITED STATES
(ORTHOPTERA: TETTIGONIIDAE)¹

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ABSTRACT

Orchelimum carinatum, known from western Tennessee and western Florida, is easily distinguished from other *Orchelimum* 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 *Orchelimum*.

Species of the genus *Orchelimum* are known only from North America, and, with the exception of 2 Mexican species in the subgenus *Metarhoptrum*, 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 subsequent change in the species classification by demonstrating the distinctness of *delicatum* Bruner and *campestre* Blatchley, 2 species that Rehn and Hebard had confused with *concinnum* Scudder.

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

Orchelimum carinatum, NEW SPECIES

This species is morphologically most similar to *Orchelimum 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 specimens are easily separable from *carinatum* by the sinuate lower hind margins of the lateral pronotal lobes and other features (see key below). The male cercus of *carinatum* resembles that of *bullatum* but has a more prominent medial dorsal swelling just distal of the base of the cercal tooth.

Holotype.—♂, FLORIDA: Franklin Co., 17 July 1965, T. J. Walker, Coll. #2, Univ. Fla. Tape 265-3. Similar to *pulchellum* in habitus and coloration except that stridulatory 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 proximate 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.

Allotype.—♀, TENNESSEE: Obion Co., 10 Aug. 1966, T. J. Walker, Coll.

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#1, 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 ♂ 30, ♀ 26; pronotal disc (length × caudal width) ♂ 5.7 × 3.8, ♀ 5.2 × 3.5; length of tegmen ♂ 27.4, ♀ 31.4; length of hind femur ♂ 21.9, ♀ 21.6; length of ovipositor 11.7.

Paratypes. 6 ♂, 1 ♀. 3 ♂ (including tape-recorded specimen UFT 265-4) same data as holotype; 3 ♂ (including UFT 265-1), 1 ♀, same data as allotype. All paratypes are in Fla. Sta. State Coll. Arthropods, Gainesville, except for 1 ♂ sent to Univ. Mich. Mus. Zool. and 1 ♂ 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).² The only other *Orchelimum* that pairs its wingstrokes during the prolonged part of its calling song is *campestre* (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 carinae of the hind femora unarmed. It is smaller than my specimens of *bullatum* and *carinatum* and

²Interpreting audiospectrographs of tettigoniid 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 (=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.

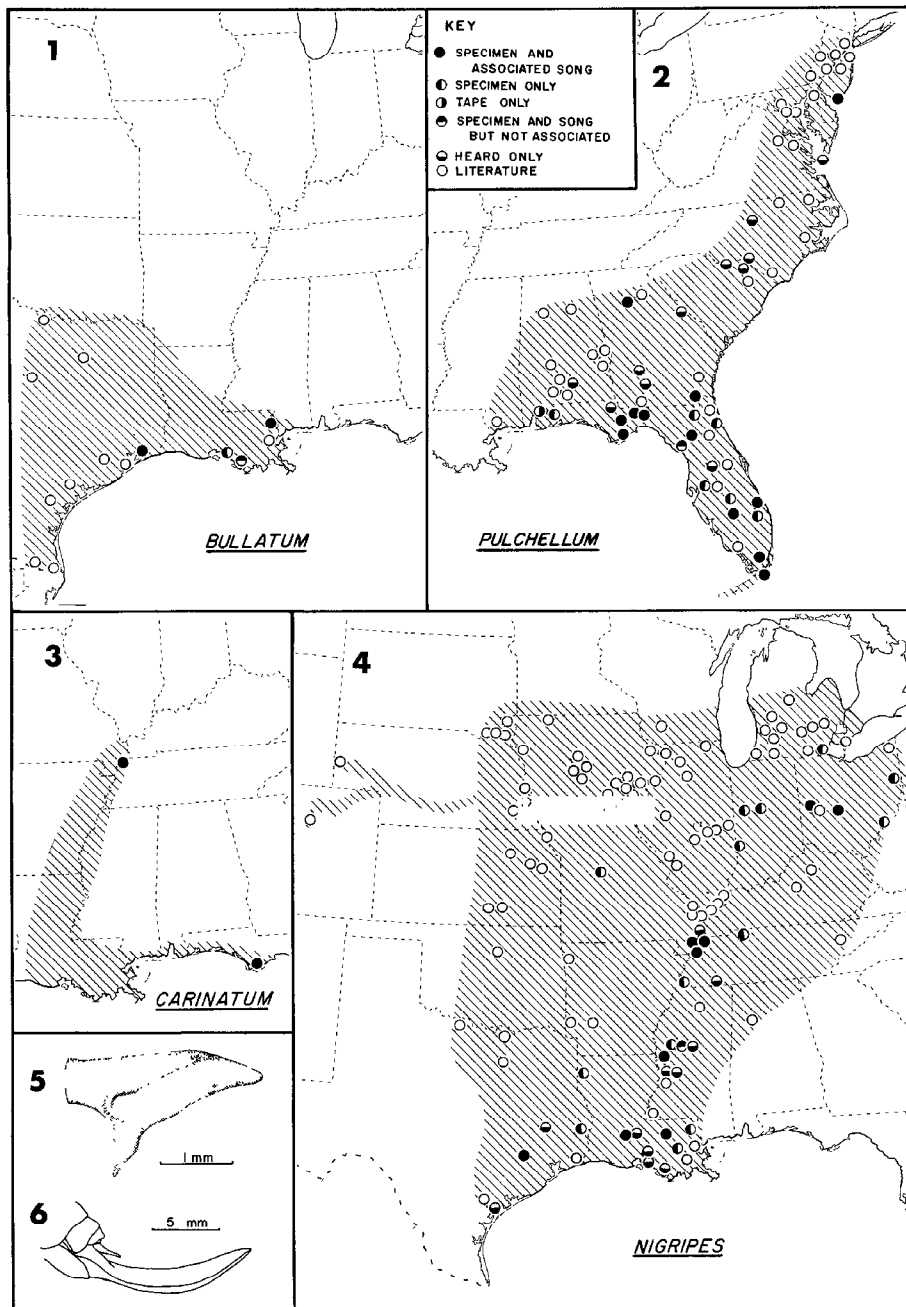


Fig. 1-4. Distribution of species of the *Orchelimum nigripes* group. Circles show county records except that the upper and lower Florida Keys are plotted independently of continental Monroe County. The predicted general distribution for each species is shaded. Fig. 5. Dorsomedial view of right cercus 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 south 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)

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