

ODONTOTAENIUS FLORIDANUS NEW SPECIES
(COLEOPTERA: PASSALIDAE): A SECOND U.S. PASSALID
BEETLE

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ABSTRACT

Larvae and adults of *Odontotaenius floridanus* **New Species** are described from the southern end of the Lake Wales Ridge in Highland Co., FL. This species may have evolved as a population isolated during times of higher sea level from the mainland species *O. disjunctus* (Illiger) or a close common ancestor. It differs notably from *O. disjunctus* in having much wider front tibiae and a less pedunculate horn. A key is given to the species of the genus.

Key Words: Florida, endemism, Lake Wales

RESUMEN

Son descritas las larvas y adultos de *Odontotaenius floridanus* **Nueva Especie** del extremo sur de Lake Wales Ridge, en Highland Co., Florida. Esta especie pudo haber evolucionado, como una población aislada en épocas en que el nivel del mar era

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más alto, a partir de *O. disjunctus* (Illiger) o de otro ancestro común cercano. Difiere notablemente de *O. disjunctus* en tener las tibias delanteras más anchas y el cuerno menos pedunculado. Se ofrece una clave para las especies del género.

Only one species of Passalidae, *Odontotaenius disjunctus* (Illiger), is known to occur in the U.S. at present, though two other species may have occurred in Arizona at the turn of the century (Schuster 1983).

Recently, while examining *O. disjunctus* in the Florida State Collection of Arthropods in Gainesville, I noted two specimens with a somewhat different morphology. On examining the labels, I noticed that the collector, L. L. Lampert, had also remarked on their uniqueness. Both came from the same area of south-central Florida in Highlands Co. Later, I had an opportunity to examine the collection of the Archbold Biological Station and encountered three more similar specimens. Subsequently, with the aid of four other Florida entomologists, I conducted a search for this elusive insect at the Archbold site. One of the collaborators, Paul Skelley, managed to find an oak log with a pair of adults and four larvae. All seven adult specimens fit the description below.

The genus *Odontotaenius* was revalidated by Reyes-Castillo (1970) and includes eight species (Reyes-Castillo 1970, Castillo et al. 1988). Three of these species, known only from the types, are probably synonyms of either *O. striatopunctatus* (Percheron) or *O. zodiacus* (Truqui). The types need to be examined to make further synonymies.

Odontotaenius is characterized by a marked fronto-clypeal suture, thick anterior clypeal border, median frontal structure of "striatopunctatus" type, posterior half of supraorbital ridges bifurcate, and short antennal lamellae with the distal margins rounded (Reyes-Castillo 1970).

Odontotaenius floridanus Schuster **New Species**

DESCRIPTION. Head: Anterior border of labrum deeply concave. Clypeus greatly swollen in middle. Median frontal structure ("horn") of "striatopunctatus" type (Reyes-Castillo 1970) (Fig. 1). Supraorbital ridge bifurcated posteriorly. Canthus extends laterally same distance as eye margin, anterior corner with right angle. Eyes small, ratio of dorsal eye width to head width 1:11.4. Lateral circular scars of mentum indistinct or absent.

Thorax: Lateral fossa of pronotum with 1-4 light punctations. Mesosternum bare, without lateral depressions, with wide (0.7 mm) matt bands along anterior borders. Mesepisternum pubescent. Metasternum with 10-18 punctations delimiting each latero-posterior side of disk, anterior angles pubescent, lateral fossae narrow and pubescent.

Elytra: Anterior profile convex, anterior face of elytra sloping. Striae 7 and 8 united anteriorly.

Wing: Normal size, not reduced.

Legs: Tibia I very wide (Fig. 2), tibia ratio (see Fig. 3) 0.264-0.333, $\bar{x} = 0.312$, $n = 7$.

Dimensions (mm): Total length, mandible tip to elytral tip 36-42, $\bar{x} = 40.2$; elytral length 18.5-21, $\bar{x} = 20.2$, elytral width 12-15, $\bar{x} = 13.6$, pronotal width 11.5-14.5, $\bar{x} = 13.5$.

LARVA. The larva has only 12-14 AR setae and 7-8 internal coxal setae. Otherwise, the basic setal pattern is the same as in *O. disjunctus*. Larval head widths: instar III = 6.0, instar II = 4.1-4.3.

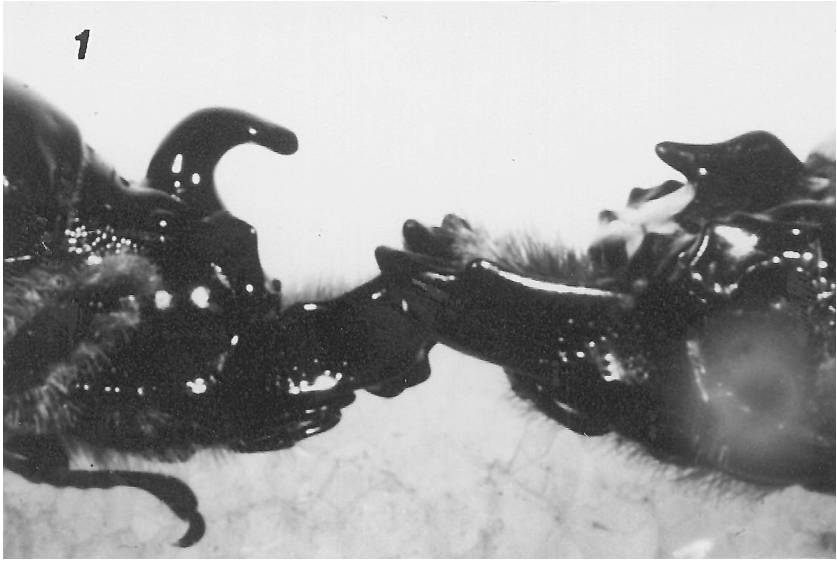


Fig. 1. Lateral view of heads of *O. disjunctus* (left) and *O. floridanus* (right) showing "horn" (median frontal structure) shapes.

DIAGNOSIS. The adult is most similar to *O. disjunctus*. The latter species differs from *O. floridanus* in having a rounded canthus which projects beyond the eye margin, larger eyes (dorsal eye width to head width ratio 1:9.5 - 1:10), mentum with dis-

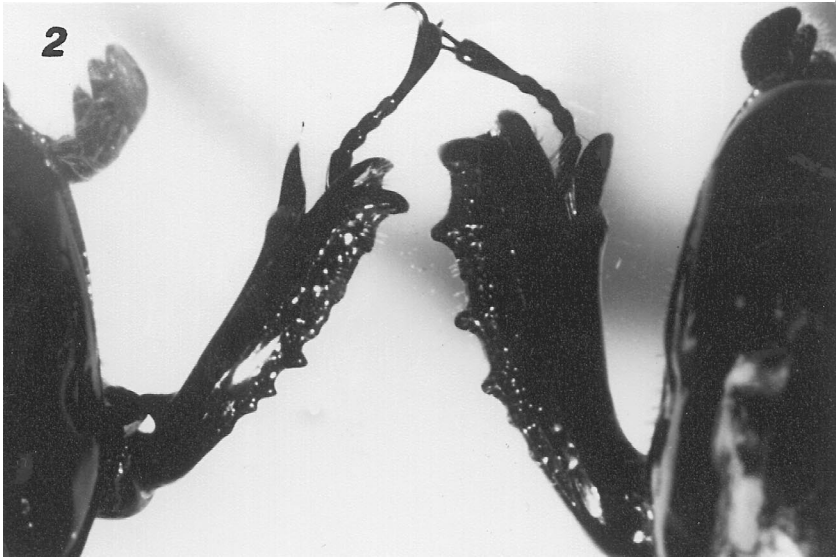


Fig. 2. Dorsal view of front tibiae of *O. disjunctus* (left) and *O. floridanus* (right) showing size difference.

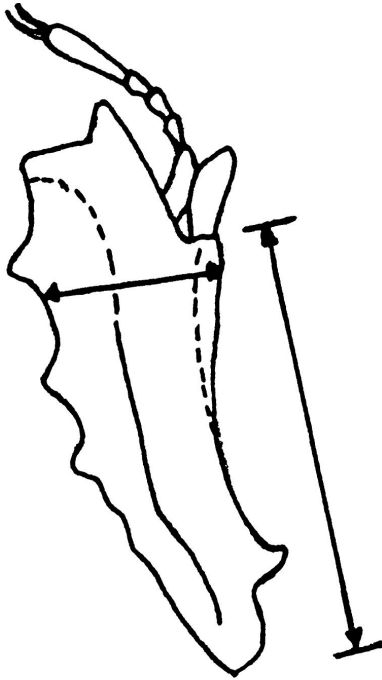


Fig. 3. Passalid tibia, ventral view, showing parameters of tibia ratio. The ratio is the width at the widest point divided by the length shown.

tinct lateral circular scars, usually no punctations in lateral prothoracic fossae, mesosternum with narrow (0.3 mm) matt bands along anterior borders, metasternum without punctations delimiting latero-posterior sides of disk, flatter anterior profile of elytra, anterior face of elytra vertical, elytral striae 7 and 8 not united anteriorly, and narrow tibia I (ratio 0.185-0.239, \bar{x} = 0.216, n = 8 Florida specimens). The aedeagi of the two species are very similar. The "horn" on the head of *O. floridanus* is not as pedunculate as in *O. disjunctus* or *O. striatopunctatus* (Fig. 1).

The larva is similar to that of *O. disjunctus* (Schuster & Reyes-Castillo 1981). It has fewer AR setae and usually more internal coxal setae than larvae of the latter species.

MATERIAL EXAMINED. Seven adults and four larvae.

TYPE MATERIAL. Holotype male, **Florida**, Highlands Co., Archbold Biological Station near Lake Placid, 18 I 93, P. Skelley, in a hardwood log. Allotype female, same data as holotype, together with four larvae.

Paratypes: Four specimens collected at Archbold Biological Station: 28 III 1973, L.L. Lampert, in pitfall trap; VIII 1970, J. Douglas; 20 IX 1992, U.G. Mueller; 23 IV 1983, M. Deyrup, ground. Another specimen was collected at Sebring, Highlands Co., Flamingo Villas Scrub by P. Martin, 11 IX 1987.

Types will be deposited in the Florida State Collection of Arthropods and the collection of the Universidad del Valle de Guatemala.

ETYMOLOGY. The trivial name "floridanus" refers to the state where this species is apparently endemic.

DISCUSSION

This species is obviously derived from *Odontotaenius disjunctus* or a close common ancestor. It differs most notably in the "horn", or median frontal structure, and the enlarged front tibiae. This latter characteristic is found in passalids which burrow in the ground under logs, as in *Taeniocerus* spp. (Kon & Araya 1992, Kon & Johki 1987), in leaf-cutter ant detritus as in *Ptichopus angulatus* (Percheron) or in passalids in other detritus-like habitats (Johki & Kon 1987). Almost nothing is known concerning the habits of *O. floridanus*.

O. floridanus is known only from the southern terminus of the Lake Wales Ridge of Highlands Co., Florida. A high concentration of endemic Florida scrub biota is recognized from this area (Deyrup 1989, 1990).

The history of *Odontotaenius* in North America may be proposed as follows: at some point during the Cenozoic when mesic forest (*Quercus*, *Liquidambar*, *Acer*, etc.), similar to that of the southeastern U.S. at present, extended relatively unbroken as far as Honduras, the ancestor of the U.S. species migrated into the U.S. from eastern Mexico. Subsequently, a dry barrier formed in southern Texas and Tamaulipas, isolating the U.S. populations. At various times since the Miocene, the ridges of Florida, especially the Lake Wales ridge, may have been isolated from the rest of the mainland by marine transgressions (Deyrup 1989). The ridges, then islands in the "Florida Archipelago", may have given rise to various endemic species, including *O. floridanus*; however, if one considers the fact that many endemic species of the Florida ridges appear to be relict species which had wider distributions at one time (Deyrup 1990), *O. floridanus* may have originated elsewhere and migrated into Florida, only now being restricted in its range. Of particular interest now is whether *O. floridanus* is restricted to the Lake Wales ridge (as are various other taxa (Deyrup 1989)), or whether it or other endemic passalid species occur on other Florida ridges. Although its wings appear normal, *O. floridanus* has not been found in other than Highlands Co., despite the fact that I have examined hundreds of passalid specimens from Florida. *O. disjunctus* is found throughout much of Florida north of Lake Okeechobee (Schuster 1983), including the Archbold Biological Station, where it is sympatric with *O. floridanus*.

Other interesting questions concern the degree of ecological overlap between these two Florida species. Does habitat sympatry occur, i.e., do they occur in the same forest types? I suspect this may be the case, considering that *O. disjunctus* inhabits a wide variety of broadleaf forests in North America, including the relatively dry turkey-oak sandhills of north central Florida (Schuster 1978). Does microhabitat sympatry occur, i.e., do they occur in the same kind (species, degree of decomposition) of logs, or even the same log? This would not be surprising, considering that Luederwaldt (1931) found 10 species in a single log in Brazil, and frequently three or four species are found in the same log in the tropics. Further collecting in Florida should answer some of these questions.

The following key is based on that of Castillo et al. (1988):

KEY TO THE SPECIES OF *ODONTOTAENIUS*

1. Frontal fossae glabrous, clypeus swollen or with triangular projection in middle 3
- 1' Frontal fossae pubescent, clypeus uniform width throughout or narrower in middle 2

2. Metasternal disc delimited by punctations, eyes reduced; **Mexico**, Sierra Madre Oriental *O. zodiacus*
- 2' Metasternal disc not delimited by punctations, eyes normal; **Mexico**, Jalisco, Sierra de Manantlán *O. cerastes*
3. Clypeus with triangular projection in middle, body length <35mm; **Mexico to Colombia** *O. striatopunctatus*
- 3' Clypeus gently swollen in middle 4
4. Body length >35mm; **U.S.A., Canada** 5
- 4' Body length 25-26mm; **Ecuador** *O. striatulus*
5. Prothoracic tibiae narrow, horn pedunculate (Figs. 1,2); eastern **U.S.A.**, southeastern **Canada** *O. disjunctus*
- 5' Prothoracic tibiae wide, horn extends forward without marked peduncle (Figs. 1,2); south-central **Florida** *O. floridanus*

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