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Two New Species of *Trox* from Florida (Coleoptera, Scarabaeidae)

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The two species of *Trox* described in this paper, one of which came from a bird's nest, were taken in central peninsular Florida in the Kissimmee Prairie region from 1 to 3 miles southwest of Lake Marion. Typically the prairie has large expanses of open grass land, with widely separated clumps or hammocks of oak and cabbage palm. According to Joseph Howell, University of Tennessee ornithologist, who was instrumental in finding the *Trox*, the area is one of the better habitats for locating bird nests, because the larger birds are forced to concentrate in the relatively few thickets.

***Trox floridanus*, new species**

Figure 1A

DIAGNOSIS: This species is related to *Trox tuberculatus* (DeGeer) in that it has the setae irregularly grouped along the elytral margins, similar hind tarsi, and only the third elytral interval evidently elevated. It differs from *tuberculatus* by having the elytral setae very short as in the *sonorae-robinsoni* group, by its larger size, and in the male genitalia. In addition to these characters, *floridanus* differs from *robinsoni* and the other species having short elytral setae by having the clumps of setae on the elytral intervals generally circular in outline except on the basal portion

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of the third interval, by the poorly elevated odd intervals, and in the male genitalia.

In the description that follows, the characters given by Vaurie (1955, p. 21) as typical for the *tuberculatus* group and of no aid in specific identification are omitted.

DESCRIPTION OF HOLOTYPE, MALE: Greatest length, 11.1 mm.; greatest width, 5.8 mm. Head not tuberculate, but with a slight median indentation. Frons, before the transverse row of setae, coarsely punctate. Clypeus evenly arcuate and coarsely punctate. Antennal setae and club fulvous. Pronotum alutaceous, with scattered short yellow setae that are lacking in the longitudinal median depression; lateral tubercles indicated by indistinct swellings.

Elytra dully shining and finely alutaceous. Except for the third elytral interval, which is elevated in the anterior half, the odd intervals are not elevated between the setae-bearing tubercles. These tubercles on the odd intervals are circular to oval, generally not confluent, and covered with

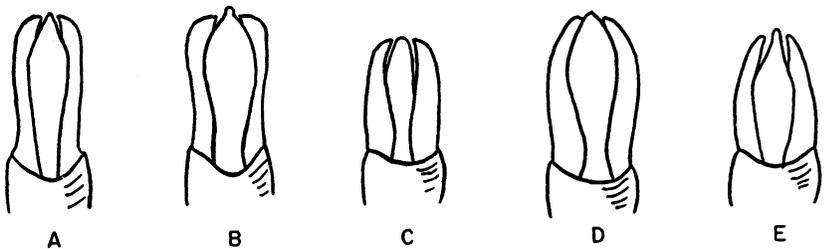


FIG. 1. Male genitalia of some *Trox* of the *tuberculatus* group. A. *T. floridanus*, new species. B. *T. tuberculatus* (DeGeer). C. *T. robinsoni* Vaurie and *T. plicatus* Robinson. D. *T. sonorae* LeConte. E. *T. contractus* Robinson.

from 15 to 40 short yellow setae that scarcely extend beyond the tubercles, each seta being approximately three times as long as wide. Elytral margin slightly crenulate and bearing short spatulate marginal setae that are unevenly spaced, sometimes separated by their own length, sometimes appearing in groups of two or three. Hind tibia similar to that of *T. tuberculatus*, but with the spines and setae considerably shorter and more slender. Male genitalia illustrated in figure 1A.

ALLOTYPE, FEMALE: Similar to, but larger than, the male. Greatest length, 11.5 mm.; greatest width, 6.1 mm. The head of this female has, in addition to and in front of the row of transverse setae between the eyes, a number of short yellow setae scattered over the frons.

TYPE MATERIAL: Holotype and allotype, 3 miles southwest of Lake

Marion, Florida, March 15, 1956, H. Howden and J. Howell; under pellets from vulture. Paratypes: Two males, one female, same data as type; one male from Flamingo, Florida, March 13, 1920, W. L. Brooks; one female from Sanford, Florida, February 10, 1916, W. J. Green. Holotype and two paratypes in the American Museum of Natural History. Allotype and three paratypes in the Howden collection.

Variation in the series is slight. Size ranges from 8.6 to 12 mm. in length and from 5.1 to 6.1 mm. in width. The females have the marginal setae of the elytra apparently more regularly spaced, but otherwise the specimens are quite uniform.

In Vaurie's key (1955, pp. 24–28), *T. floridanus* will usually key out to couplet 42, *T. plicatus* and *tuberculatus*. It can be separated from *plicatus* by the absence of tubercles on the head and from both species by the much shorter marginal and dorsal setae of the elytra and by the male genitalia. Some specimens of *floridanus* may run to couplet 48 which includes *T. sonorae* and *robinsoni*, in which case the male genitalia and the poorly raised odd elytral intervals should serve to separate it.

The male genitalia (fig. 1A) show similarities to, as well as slight differences from, those of other closely related species. Thus the median lobe in *sonorae* is very close in outline to that of *floridanus*, but it is flattened apically, even concave in *sonorae*, whereas it is convex in *floridanus*. In *robinsoni* and *plicatus* the median lobe is convex as in *floridanus*, but in these species it is proportionately shorter, and is about the same width as the lateral lobes, not wider than the lateral lobes. In *tuberculatus* and *contractus* the apex of the median lobe is constricted laterally. See figure 1A–E.

This is the only species of the *tuberculatus* group known to occur in peninsular Florida, although *tuberculatus* itself occurs in extreme northwestern Florida. Lake Marion and Sanford are on the east coast, in Osceola and Seminole counties, respectively, while Flamingo is at the tip of Florida near Key West. Vaurie (1955, p. 52) had seen the Sanford and Flamingo specimens, as well as one other specimen from Sarasota, and had placed them, although with reservations, in the species *tuberculatus*.

HABITS: Five specimens of the type series were discovered by Howell under a roost occupied by Black and Turkey Vultures (*Coragyps atratus* and *Cathartes aura*) in an oak-cabbage palm hammock. The specimens were found under pellets apparently composed of food regurgitated by the vultures. The pellets were from 1½ to 2 inches long and approximately ½ to ¾ inch in diameter. The pellets under the vulture

roost attracted not only *floridanus*, but also *T. monachus*, *suberosus*, *variolatus*, and *foveicollis*.

***Trox howelli*, new species**

Figures 2A, 3A

DIAGNOSIS: This species is closely related to *Trox suberosus* Fabricius and to a lesser degree to *tytus* Robinson. It differs from all the large species except *suberosus*, *tytus*, and *loxus* by having the ridges and tubercles of the pronotum rather indistinct anteriorly and poorly indicated posteriorly. It has the bituberculate head and indented pronotal margin of *suberosus*, characters that distinguish it from both *tytus* and *loxus*. It can be separated from *suberosus* by the short hairs along the pronotal margin, the less pronounced basal angle of the pronotum, and

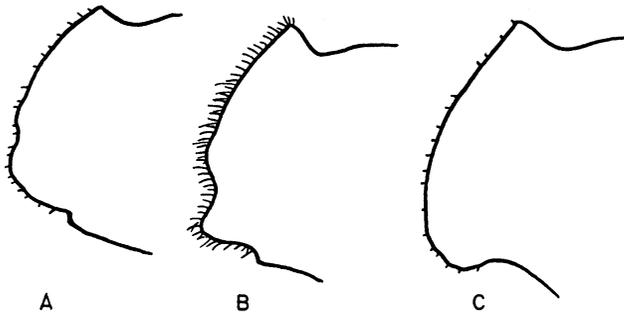


FIG. 2. Pronotum in three species of *Trox*. A. *T. howelli*, new species. B. *T. suberosus* Fabricius. C. *T. tytus* Robinson.

the more robust shape. The elytra are very feebly tuberculate and generally finely tomentose, as in the afore-mentioned species and also as in *rubricans* Robinson, but *rubricans* has more pronounced pronotal tubercles, and the middle and hind femora are narrower and less sinuate than in *howelli*. Also the male genitalia distinguish *howelli* from all the related species. See figures 2 and 3.

In the following description the characters common to all the species in the *suberosus* group and discussed by Vaurie (1955, p. 23) are omitted.

DESCRIPTION OF HOLOTYPE, MALE: Greatest length, 12.9 mm.; greatest width, 7.3 mm. Head distinctly bituberculate. Clypeus similar to that of *suberosus*, but more sharply reflexed. Antennal club and hairs of scape fulvous. Pronotum with both anterior and posterior angles much less pronounced than in *suberosus*, but with lateral outline similar. Pronotal

ridges and tubercles developed to a greater degree than in *suberosus*, but still evident largely in posterior half, the anterior half mostly smooth. Pronotal surface finely tomentose medially, and with scattered deep punctures. Lateral margin of pronotum with scattered short hairs less than one-half of length of those on *suberosus*.

Umbone of elytra prominent. Alternate intervals of elytra slightly elevated and with occasional scattered, smooth, irregular, shining areas along their length which alternate with small tomentose tubercles. Except for the shining areas the elytra are finely tomentose, and when degreased they have the velvety brown color of *tytus*. The appearance

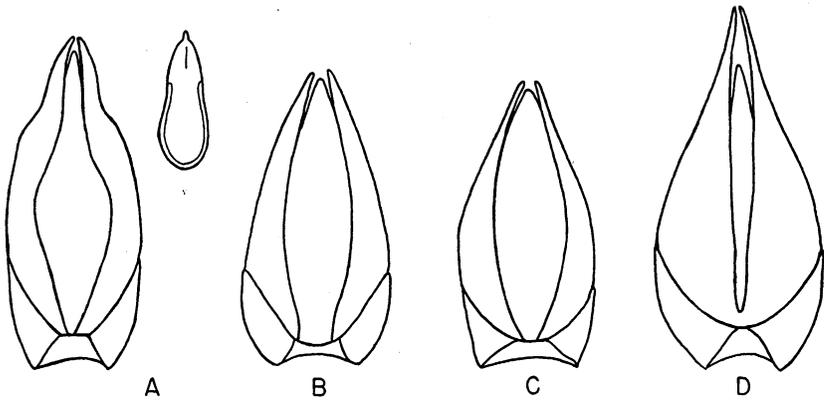


FIG. 3. Male genitalia of some *Trox* of the *suberosus* group. A. *T. howelli*, new species, showing also sclerotized internal sac. B. *T. tytus* Robinson. C. *T. rubricans* Robinson. D. *T. suberosus* Fabricius.

normally is black and greasy. Elytra with inner part of reflexed margin delimited by row of deep punctures. Margin laterally slightly convex and lacking distinct tubercles or long setae. Metasternal depression approximately as long as wide. Posterior distal edge of mesothoracic and metathoracic femora are more strongly sinuate than in *suberosus*, but in general the tibiae and tarsi are similar. The tarsal segments do not appear to be ridged. Male genitalia illustrated in figure 3A.

Female unknown.

TYPE MATERIAL: Holotype, 1 mile south of Lake Marion, Florida, March 15, 1956, H. Howden, J. Howell, and H. Denmark; nest of Caracara. Paratype: Texas, one male; Nason collection. Holotype in Howden collection, paratype in collection of the Illinois State Natural History Survey, Urbana.

Variation exhibited by the one paratype is not great. Its greatest length is 11.5 mm.; greatest width, 7 mm. The paratype is brown in

color, not greasy black as is the type. The clypeal margin is not so sharply reflexed as in the type, nor are the tubercles of the head so pronounced. In other respects the two specimens are very similar.

In Vaurie's key (1955, pp. 24-28), *T. howelli* will key to *T. suberosus* in couplet 8. It can be separated from *suberosus* by the absence of long hairs along the pronotal margins and by the distinct male genitalia. Although the male genitalia are somewhat similar to those of *tytus* and *rubricans*, the lateral lobes or parameres of *howelli* have the inner margins more sinuate than in either of the other species, and the sclerotized portion of the internal sac is quite distinctive. There is no sclerotized piece present in *tytus*, and that of *rubricans* is rather soft and of a vague elongate shape. The genitalia of *suberosus* differ from those of the other species by having the lateral lobes almost contiguous and hiding the median lobe.

The species is named in honor of Dr. Joseph Howell who found the nest in which the type was taken.

HABITS: The type was collected from the nest of a Caracara (*Polyborus cheriway*), a large, carrion-eating bird found in central Florida, Cuba, central Texas, southwest Arizona, and northern Baja California south to the Guianas and Peru. The nest was located in an oak-palm hammock at the top of a cabbage palm, and it was only after considerable difficulty that Howell was able to dislodge it in order to examine its contents. The nest was composed of small twigs (mainly St. John's wort) and a 2-inch thick mat of animal residue. The Caracara seemed to have fed largely on reptiles (snakes, lizards, and turtles), but it was impossible to determine all the components of the residue. There was little fresh material in the nest, because the young birds had apparently vacated it a week or so before. The single specimen of *Trox howelli* was the only member of the genus in the nest, but many other insects were present, including numerous larvae of *Dermestes* and some Histeridae. It seems probable that *howelli* should be taken throughout much of the range of the Caracara. Unfortunately its close resemblance to the widespread *suberosus* may cause it to be undetected. Almost all specimens of *tytus*, which ranges from Pennsylvania to Arizona to Cuba, were taken in the nests of the Barn Owl, and the distribution of *rubricans* in Mexico and Central America suggests that it too may be associated with a bird host.

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