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## Notes on the Occurrence and Ecology of *Tadarida laticaudata yucatanica* in Eastern Cuba

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Jones and Alvarez (1962) have recently discussed the taxonomic status of *Tadarida yucatanica* Miller, which they consider, we think correctly, a subspecies of *T. laticaudata* É. Geoffroy. The species thus has a mainland range from northeastern Mexico to Paraguay, but has not hitherto been recorded from any part of the West Indies.

On December 8, 1960, the senior author was at a place 5 kilometers northwest of Omaja, Oriente Province, Cuba, collecting and photographing *Tadarida (Mormopterus) minuta* in palm trees. This locality is one of the two from which Sanborn (1953) had reported the species in eastern Cuba. To his surprise, the senior author discovered that two species of *Tadarida* were present. The second, larger, species, of which 29 individuals were collected, was tentatively identified as *T. yucatanica*. Two specimens (C.N.H.M. Nos. 19616, 19617) have been deposited in the Chicago Natural History Museum, and two (A.M.N.H. Nos. 185619, 185620) in the American Museum of Natural History. The remaining 25 specimens are in the collections of the Instituto de Biología, La Habana, Cuba.

The junior author wishes to thank Dr. Joseph Curtis Moore of the Chicago Natural History Museum for the loan of specimens. It is also a

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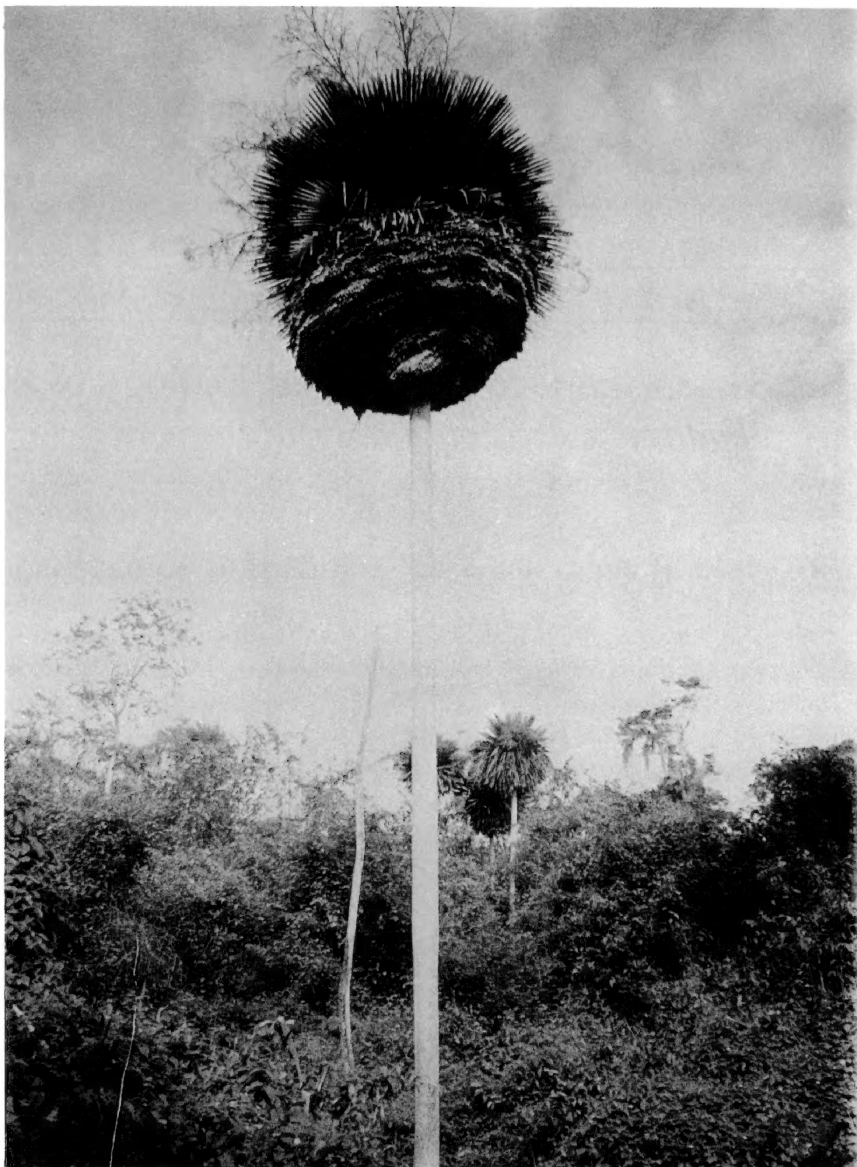


FIG. 1. General view of a palm (*Copernicia vespertilionum*) in which two species of *Tadarida* were found roosting. The bats roost only in the dry lower foliage.

pleasure to acknowledge the assistance and numerous courtesies of the following individuals and institutions in South America, who made available collections in their care:

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 Museo Argentino de Ciencias Naturales, "Bernardino Rivadavia," Buenos Aires, Argentina: Dr. Jorge A. Crespo and Srta. Elisa Kantis.

### TAXONOMIC ALLOCATION

The above-mentioned Cuban specimens have been compared by the junior author with the following in the American Museum of Natural History:

*Tadarida laticaudata ferruginea*: Mexico, Tamaulipas, 8 miles north of Antigua Morelos, three; vicinity of Monte, 10.

*Tadarida laticaudata yucatanica*: British Honduras, Corozal, two. Guatemala, Peten region, 17. Panama, Canal Zone, Fort Gulick, one.

*Tadarida europs*: Venezuela, Amazonas, Rio Cassiquiare, 22. Brazil, Amazonas, upper Rio Negro, 22.

*Tadarida laticaudata* ssp.: Brazil, Rio Branco, Mt. Roraima, eight.

*Tadarida laticaudata laticaudata*: Brazil, Santa Catarina, Joinville, two. Paraguay, Asuncion, two.

Many specimens in Brazilian museums from various parts of that country, including topotypes of *europs* and *gracilis* (see below), have been studied and measured (by Koopman).

All these specimens appear to belong to one species. This would include, besides the North American forms now considered conspecific, the following forms listed by Cabrera (1958) as separate species: *T. europs* H. Allen, *T. gracilis* Wagner, and *T. laticaudata* É. Geoffroy. The material examined falls into a fairly clear bipolar cline, the specimens from the north (*T. l. ferruginea*) and the south (*T. l. laticaudata*) being largest, while the Venezuelan and Brazilian *Tadarida laticaudata europs* are smallest. *Tadarida l. yucatanica* is intermediate in size between *T. l. ferruginea* and *T. l. europs*. Likewise, the Mt. Roraima specimens, though coming from a population surrounded by *europs*, are somewhat intermediate in size between *T. l. laticaudata* and *T. l. europs*, though considerably more like the former. Topotypes of *gracilis* from Cuiaba, in the uplands of central Mato Grosso, are likewise intermediate in size. They show somewhat greater resemblance to *T. l. laticaudata*, to which *gracilis* is here referred as a synonym. Though we have not compared specimens of it,

*T. femorosacca* of California, Arizona, and western Mexico may represent an extension of the northern cline.

Of all the segments of the cline, the Cuban specimens agree best with *T. l. yucatanica*. The forearm of the single male examined measures 43 mm.; the condylobasal length of the skull, 16.6. The three females have forearms measuring 41, 42, and 43. The condylobasal lengths of the two intact female skulls are 16.1 and 16.5. The only skull on which a greatest

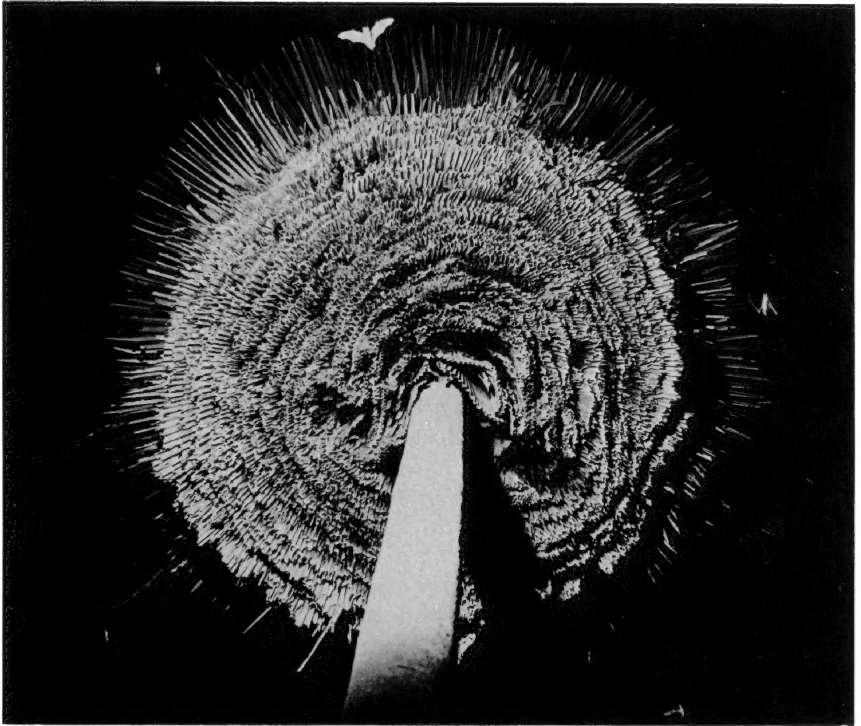


FIG. 2. A view of the palm from below, showing the crevices of the lower foliage in which the bats roost. Bats are beginning to emerge.

length measurement can be taken, a female, comes to 16.8 mm. The Cuban population, therefore, seems clearly referable to the subspecies *Tadarida laticaudata yucatanica*, previously known from Cozumel Island, Yucatan, Campeche, British Honduras, Guatemala, El Salvador, and Panama. This subspecies is also the one from which the Cuban population would be expected to have been derived on geographical grounds. Occurrence in western Cuba, the end nearest Yucatan, would also be

expected, if it be assumed that a suitable habitat occurs there. The palm tree, *Copernicia vespertilionum*, in which these bats roost, is, however, apparently confined to eastern Cuba in the provinces of Oriente, Camaguay, and Las Villas.

### HABITAT

*Tadarida l. yucatanica* has been found only in one locality in Cuba, 5 kilometers northwest of Omaja, Oriente Province. Here it apparently roosts in only one situation, namely, in crevices between the tightly



FIG. 3. View of the base of an occupied tree, showing thick layer of bat guano by which such roosts can be recognized.

packed dead leaves of one species of palm (figs. 1, 2). This species (*Copernicia vespertilionum*) is well known locally as a bat-roosting place, being called the "jata de los murciélagos." Not all trees of this species are occupied; those occupied are readily identified by the layer of bat guano on the ground around the base of the trunk (fig. 3). The foliage of this palm is quite unusual. The upper half is formed by erect green leaves and is not occupied by bats. The lower half, on the contrary, is a dense

mass of dry leaves, hanging downward, and this provides an excellent shelter for the bats. (The cropped appearance of the leaves is natural and not due to artificial pruning.) Both species of *Tadarida* (*T. laticaudata* and *T. minuta*) use this type of roost, but *T. laticaudata* forms only about 10 per cent of the total number of bats roosting in the palm. The senior author was assured by local farmers that Cuban boas (*Epicrates angulifer*) often crawled up to the foliage to eat the bats.

The tree shown in the photographs, where most of the observations were made, was a full-grown palm 13 meters high and 35 cm. in diameter, with a layer of bat guano 60 cm. thick around its base. As many as 2000 to 3000 bats roosted in this tree. On the night of these observations, December 8, 1960, the bats began emerging at 5.55 P.M. and continued until 7.30 P.M.

Bats of the family Molossidae in general seem to prefer roosting in narrow places where there is a good deal of close contact with the substrate or with other individuals. In connection with these habits, molossids show a number of adaptations, as shown by Vaughan (1959). It is therefore not surprising that, while molossids are often found in caves, houses, rock crevices, hollow trees, and similar places, they seldom roost under leaves. It is therefore interesting to note that where a tree has closely packed leaves, providing narrow crevices, molossid bats do roost. *Tadarida laticaudata* and other molossids should be looked for in palms with similar frond arrangement on the mainland and also elsewhere in the West Indies.

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