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Notes on the Behavior of Three Argentine Sphecids
(*Microbembex uruguayensis*, *Tachytes fraternus*
and *T. amazonus*)

(Hymenoptera: Sphecidae)

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I report here new information on the behavior of three species of digger wasps based on observations made in two Argentine localities during December and January 1974–1975. Studies of *Microbembex uruguayensis* (Holmberg) took place on 30–31 December in an area of sand dunes situated in pasture, marshes, and woodlands 2 km south of Estación Paranacita, Prov. Entre Rios. Nests were found in a sandy roadside scrape by the edge of a reed-filled swamp. *Tachytes fraternus* Taschenberg and *T. amazonus* F. Smith nested on the edge of a dirt road 4 km east of Benavidez, Prov. Bs. Aires. The road bordered a drainage canal and ran through an area of pasture and marshy woodlands.

MICROBEMBEX URUGUAYENSIS

This species has been studied previously in Argentina by Llano (1959). In work that extended over several summers Llano found cells provisioned solely with one species of carabid beetle. He implied that the wasp captures living carabids in the morning when these beetles are prone to move about. Of the numerous species of *Microbembex* that have been studied subsequently, all have proved to be scavengers, taking dead and disabled arthropods (Matthews and Evans, 1974).

I excavated four nests (12–23 cm long; 8–13 cm deep) finding two that contained an egg laid upright in the single cell along with a number of ants (five in one case, seven in the other). Many of the ants were in poor condition, missing most or all of their legs, indicating that they had been picked up when already dead. In addition, I observed a perched female as she manipulated a dead wasp before dropping it and flying off. Moreover, twice I watched females as they foraged over open sandy areas; each collected an immobile object from the sand, presumably a dead insect of some sort, which they then manipulated in flight while hovering 2–4 cm above the ground. The wasp curved its abdomen strongly and touched the prey, as though stinging it. It is conceivable that this action misled Llano into believing that the wasp

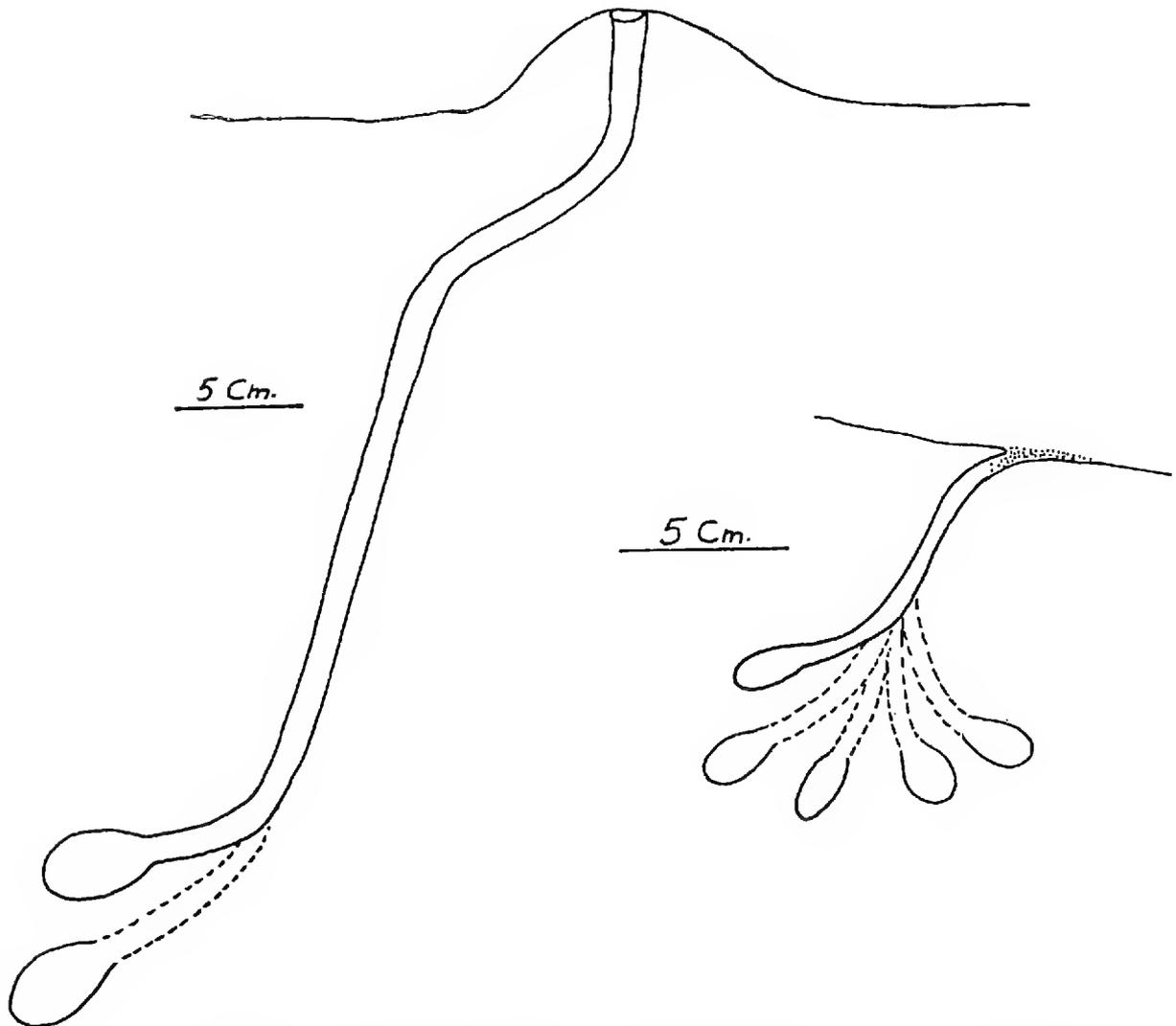


FIG. 1. Lateral views of the burrows of *T. fraternus* (left) and *T. amazonus* (right). Both were dug into moist firm sandy clay. The dotted lines indicate hypothetical side burrows leading to discovered cells.

was paralyzing living prey. I have, however, seen known scavengers, *M. nigrifrons* and *M. argyropleura*, do exactly the same thing and believe this "stinging movement" to be a vestigial behavior pattern. The evidence suggests that some individuals in the population of *M. uruguayensis* I studied do scavenge.

If Llano were mistaken about the capture of living prey, the only moderately distinctive behavioral trait of *M. uruguayensis* would be the rapid provisioning of the cell immediately following egg-laying. Although occasionally a female of other species of *Microbembex* will bring one or a few prey to the brood chamber prior to egg-hatching (Evans, 1966), none bring large numbers of food items to the cell before this event. On the whole, however, it would appear that *M. uruguayensis* is a typical member of a genus that is characterized by extreme behavioral uniformity.



FIG. 2. The egg of *T. fraternus* is attached to the base of a foreleg and extends transversely across the thorax.

TACHYTES FRATERNUS

A single nest of this species was discovered on 2 January 1975 when a prey-laden female was spotted as she dashed along the ground and into a small clump of weeds. The open nest entrance was hidden by the surrounding weeds and was located in the center of a large, 6 cm high, mound of soil. The design of the long and deep burrow is shown in fig. 1. There were two cells, one with five immature acridids and the other with three. All the hoppers (ranging from 16–21 mm in length) were positioned head first into the cells. In the chamber with five prey, the last individual placed in the cell (venter-up, on top of the others) carried an egg (fig. 2). Egg placement is very different in some other species of *Tachytes* that prey on tettigoniids (Evans and Kurczewski, 1966).

TACHYTES AMAZONUS

Nesting in the same area but in much greater numbers, the behavior of this small species differs in many respects from *T. fraternus*. Its burrows (fig. 1) were short and shallow (11.5–18 cm long; 5–9 cm deep; $N = 4$). They were placed in open areas and the entrance was kept closed at all times except when the wasp had just entered the nest with prey. *T. amazonus* performed a strikingly elaborate closure in



FIG. 3. A male *T. amazonus* resting on alert in his territory.

the early morning usually between 0800–0900. The female walked toward the nest entrance, kicking soil behind her as she moved along. Upon reaching the vicinity of the entrance, the wasp would fly out to a point as much as 15 cm from the burrow and would repeat the march toward the entrance. This activity commonly lasted as long as 20 min. As a result, much of the area from 5–15 cm about the entrance would be covered with loose soil kicked about in the wasp's maneuvers.

Provisioning females flew quickly to the closed nest entrance with their prey, acridid hoppers smaller than those taken by *T. fraternus* (0.9–1.5 cm in length; N = 13). Upon landing the wasp would walk a few cm forward straddling the prey and holding it by an antenna before dropping its victim by the concealed burrow. The female would then open the nest, and enter the burrow briefly before exiting to fly about the apron of raked soil. She would relocate her prey, straddle it, drag it right up to the nest opening, drop the hopper, reenter the nest, turn around, and finally pull the prey in by an antenna. The grasshoppers were placed head first into the cell with the egg laid on the *first* hopper introduced into the brood chamber. The position of the egg was the same as that of *T. fraternus*. In eight cells with complete complements of prey, seven held 3–4 acridids (for male offspring?) while one contained 8 (for a female offspring?).

This wasp, with its shallow nests, complex nest closure, and manner of carrying prey into the burrow, behaves rather more like a *Tachysphex*

(e.g. Kurczewski, 1966) than a typical *Tachytes* (H. E. Evans, pers. communication). The differences between *T. amazonus* and *T. fraternus* may have ecological significance (as in the different sizes of preferred prey) and phylogenetic implications (the differences in nest design, especially the prominent mound of *T. fraternus*). Reviews of Evans and Kurczewski (1966) and by Lin (1967) have revealed important variation in prey taken and burrow structure in the very few species of North American *Tachytes* that have been studied. Much more comparative work is needed on the nesting behavior of Neotropical *Tachytes*.

Male *T. amazonus* were common in and along the nesting area. They often rested on the ground or on a pebble or stick with their front legs drawn up (fig. 3). The approach of another insect generally stimulated the male to fly up and pursue the intruder. In addition, males regularly cruised low over the ground following a consistent route. Male *T. distinctus* behave in similar way when guarding mating territories early in the nesting season of this species (Lin and Michener, 1972).

Two male *T. amazonus* were marked with a dot of paint on their thorax. One was recaptured two days after it had been marked; at the time it was within $\frac{1}{2}$ m of the point where it had been taken previously. The other, marked on 19 December, was seen again in the same spot on 24 and 26 December and on 2 January (when it was collected). This male patrolled a strip of open roadside about 7 m long and $\frac{1}{2}$ m wide for consecutive periods of up to at least 3 hrs. between 0900–1600. It often clashed with males on adjacent territories and would drive them away in a swirling pursuit flight.

The territorial behavior of this species closely resembles that of *Sphecius speciosus* (Lin, 1963) and *S. grandis* (Alcock, 1975a). (For a review of territorial behavior by male sphecids, see Alcock, 1975b.) By guarding elongate zones through or by nesting area, male *T. amazonus* may gain exclusive rights to virgin females that emerge in or near their territory and to receptive females that must pass through the male's territory in search of nectar or prey in the vegetation away from the barren nesting site.

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