

NESTING BEHAVIOR OF SPHEX TEPANECUS  
SAUSSURE (HYMENOPTERA: SPHECIDAE)

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In the fall of 1960 a resident of Alpine, Texas reported to me a colony of large, orange-winged wasps nesting in his yard. On September 7 I investigated and found one female engaged in digging. She belonged to a species of Sphecinae at that time unknown to me, but since identified as *SpheX tepanecus* Saussure [det. Arnold Menke]. The species is a strikingly colored Mexican form previously known in the United States only from Arizona (Murray, 1951, p. 972). As there appears to be no information on its life history, the observations I made seem worth reporting.

The site was an area of dry, hard, fine sandy loam soil, bare of vegetation, about 4.3 meters long in an east-west direction by about 2.0 m. wide, bounded on the north by a concrete driveway, on the east and south by walls of a wooden building, and on the west by a sidewalk. Four nest entrances were evident, each about 2.5 centimeters in diameter, with a mound of excavated soil to one side. On September 8 two nests near the driveway were excavated and found to slant downward at angles of about 45° and 75° with the surface to depths of 45 cm. and 48 cm., with no evidence of cells or prey. On September 18 one male and five females were collected in another part of town, about a mile away, visiting mainly the higher flowers (4-5 m.) of a large shrub, the chaste-tree, *Vitex agnuscastus* (Verbenaceae). On September 21 further observations were made at the nesting site. One female with prey, a green long-horned grasshopper or katydid (Tettigoniidae), was seen entering her nest in a clump of grass against the garage wall, across the driveway to the north of the original site, but was not further observed. One of the four nests originally noted was between the roof-drip line and the south wall. At 12:25 a male was near the entrance of this nest, which the female was filling from the dirt pile before it. This mound slanted from the entrance to a height of about 7 cm., and extended about 25-30 cm. from the entrance, eastward. The female left, the male remained a minute or so and then also left. At 12:35 the female reappeared carrying an immature green katydid, accompanied by a male. She alighted about 20-25 cm. from the entrance, on the dirt pile. The male immediately mounted, his abdomen curling downward, hers turned upward, bending mainly at the base of the petiole. Copulation con-

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tinued in this position for about 2-3 minutes, the female still in possession of her prey, with little activity on the part of either. Finally the male fell away on his back, suspended at an angle, the parts still engaged for a time. After disengagement the female placed her prey about 13 cm. from the entrance, started opening the nest. Another wasp appeared, engaged in a swift-moving struggle with the original male, and one departed, the remaining male then mating with the female in the nest entrance. Again the female merely halted in place, this time in the act of opening the nest, and copulation took place as before, with the male falling away backward at the end of 2-3 minutes. The female then completed opening the burrow and dragged the katydid in headfirst by the antennae. The male remained until she had reappeared, closed the burrow, and left, then he also left after a short time. One male and three females were again taken from the *Vitex* on September 24, and on September 27 a female was seen engaged in closing her nest at the colony site. The last specimen taken was a freshly dead male found on a downtown parking lot on October 22.

On November 26 excavation of the nesting area was undertaken. All surface indications of nesting had been obliterated by heavy rainfall and runoff from the roof which had thoroughly permeated the soil to a depth of at least 1.2 m. One tunnel, apparently produced by one of the wasps, was toward the center of the area, away from walls and driveway. It reached a depth of 74 cm., turned sharply to the horizontal, and terminated, empty. A considerable area was excavated, but the only occupied cells that were found apparently belonged to the female that had nested near the south wall, within the drip line. The soil here was drier, and it is possibly noteworthy that only one of the five burrows was not in the immediate vicinity of either a wall or the concrete driveway. Eight cocoons were found within an area about 30 cm. in diameter. Depths were 31, 39, 41, 46, 49, 51, 55, and 60 cm., and it was noted that the shallowest cocoon was in particularly moist soil and appeared soft and in poor condition. Cells were generally about 5 cm. long, 2.5 cm. in diameter (one was 3.5 cm. in diameter) and horizontal, with little evidence of access tunnels or prey remains. Cocoons ranged in length from 3 cm. to 4 cm. and in diameter from 0.8 cm. to 1.3 cm. They were elongate-oval, with a thin, light-brown outer fibrous cover and a blackish-brown, papery inner cover revealed by the microscope to consist of layered, non-fibrous, and seemingly quite water-repellent material.

LITERATURE CITED

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