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USE OF AN UPLAND PINE FOREST BY THE STAR-NOSED MOLE, *CONDYLURA CRISTATA*

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The star-nosed mole *(Condylura cristata)* is a semi-aquatic insectivore, commonly found near marshy areas and streams (Hamilton, 1931; Petersen and Yates, 1980; Webster et al., 1985). We report two captures of star-nosed moles from a xeric, upland pine forest more than 500 m from the nearest persistent source of water. Both captures occurred during rainy nights, suggesting that star-nosed moles use rain events as opportunities for dispersal through upland habitats.

We captured star-nosed moles on 22 April and 17 July 1998 in a loblolly-pine (*Pinus taeda)* plantation at the Savannah River Site National Environmental Research Park (SRS; 33°20'N, 81°31'W) in the Upper Coastal Plain Province of South Carolina. The forest in which the moles were captured was approximately 45 *yr* old, with sparse mid- and under-story vegetative cover. Both natural and planted pine forests dominated the upland habitats at the SRS (Workman and McLeod, 1990). Soils were sandy and well-drained; leaf-litter consisted exclusively of pine leaves.

Moles were captured with arrays of drift-fences and pitfall traps that were monitored daily over the periods 3 April to 9 May and 3 to 17. July 1998. Other insectivores captured in this forest included the southern short-tailed *shrew* (*Blarina carolinensis*), southeastern *shrew* (*Sorex Zongirostris),* and least shrew (*Cryptotis parva*). We did not capture *the* eastern mole (*Scalopus aquaticus),* though it is present at the study area (Cothran et al., 1991).

Distances between capture locations and water sources were calculated using an ArcView geographic information system and geographic databases of SRS. Moles were captured 5 15 and 805 m from the nearest marsh, 810 and 880 m from the nearest stream, and 3,320 and 2,295 m from the nearest pond, respectively. Distance between the captures was 2,120 m.

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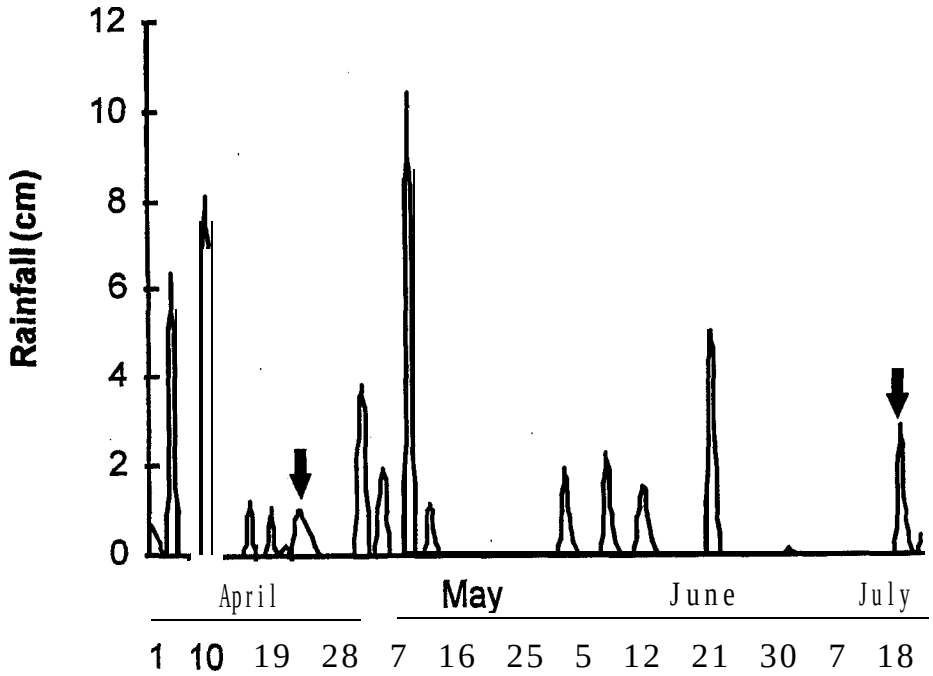

FIG. 1. Dates of the capture (arrows), in 1998, of two star-nosed moles (*Condylura cristata*) with respect to precipitation at the NOAA Weather Station in Aiken, South Carolina.

Both individuals were males with testicular dimensions (7 X 4 and 8 X 3 mm) smaller than those *reported* for sexually mature males (>15 mm in length; Hamilton, 1931; Eadie and Hamilton, 1956). Stomachs contained little digesta, with no identifiable food items. Weights of the two individuals (22.2 and 34.0 g) were typical for the species in the southern portion of its range (mean = 31.6 g, n = 13; Lee, 1987).

Many small mammals, especially shrews, demonstrate increased capture rates during or following rain (Bider, 1968; Kirkland and Sheppard, 1994). Response of masked shrews (*Sorex cinereus*) to rain was greater in xeric than mesic habitats (McCay, 1994), presumably because rain increases the suitability of xeric habitats for vertebrates requiring moist conditions. It may be particularly important for semi-aquatic vertebrates, such as the star-nosed mole, to use periods of rain to move through xeric environments. Both captures of star-nosed moles occurred during periods of rain (Fig. 1). Road-killed star-nosed moles have also been collected during rainy nights near a swamp (*Lee,* 1987) and *Rhododendron* thickets (D. S. Lee, pers. comm.) in North Carolina.

Distribution of star-nosed moles in the Southeastern Coastal Plain apparently is fragmented (Lee, 1987; Lee et al., 1982). It has been proposed that Carolina bays, pocosins, and other isolated wetland habitats have served as refugia for the star-nosed mole and other species found more commonly farther north (Lee et al., 1982; Clark et al., 1985). Captures reported here suggest that dispersal of semi-aquatic mammals depend, to some extent, on periods of rain and that dispersal through upland environments may aid in the maintenance of isolated populations.

Alternatively, the star-nosed mole may be more tolerant of xeric conditions than previously thought. Burrow systems of star-nosed moles have been discovered in upland forests of both North Carolina and South Carolina (D. S. Lee, pers. comm.).

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