THE ROLE OF CHEMOSENSORY CUES IN DISCRIMINATION OF PREY ODORS BY THE AMPHISBAENIAN \textit{Blanus cinereus}

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Abstract—Responses of amphisbaenians (\textit{Blanus cinereus}) to deionized water, a control for pungency (cologne), and integumental prey odors (coleopteran larvae and adult ants) on cotton swabs were studied in experiments with a randomized blocks design to discover whether amphisbaenians use chemical cues to detect and identify prey. No individual bit the applicators. Amphisbaenians tongue-flicked at lower rates than epigean saurians, which are active foragers. Tongue-flick rate differed among treatments, but responses to prey odors were not significantly different from those to cologne. The number of directed tongue-flicks emitted during the 60-sec trials was, however, lower in response to deionized water than in response to cologne or prey odors. Response details, the low rate of tongue-flick, and absence of biting are discussed in relation to the foraging behavior and fossoriality of amphisbaenians. Evidence from this study indicates that the vomeronasal sense is used by amphisbaenians to identify odors, but our experiments failed to demonstrate that amphisbaenians discriminate between prey and nonprey odors.

Key Words—Lacertilia, Amphisbaenidae, \textit{Blanus cinereus}, prey odor, tongue-flicking, fossoriality.

INTRODUCTION

Epigean saurians use visual and olfactory senses to locate prey. The prevalence of one of these senses seems to be related to foraging mode. Active foragers
appear to use chemosensory senses. They regularly tongue-flick during foraging and can detect and recognize prey by chemical cues. Sit-and-wait predators, however, do not tongue-flick at high rates and detect prey visually while foraging (Bissinger and Simon, 1979; Huey and Pianka, 1981; Cooper, 1989, 1990). There have been few studies on senses used in prey detection by subterranean saurians (Hetherington, 1989).

Amphisbaenians are squamate reptiles showing many adaptations to a burrowing life (Gans, 1978). Their foraging behavior is unknown, specially in relation to prey detection. Vision is reduced. Hearing and olfactory capabilities, however, are enhanced (Gans and Wever, 1975; Gans, 1978), indicating an important role in predation. Nevertheless, no evidence is available of a chemosensory role in any amphisbaenian species.

*Blanus cinereus* is an amphisbaenian endemic to the Iberian Peninsula (Busack, 1988). Its diet mainly consists of insect larvae and ants, which are the most abundant invertebrates in their habitat, but insect larvae of large size are selected (López et al., 1991). The use of chemosensory cues by *B. cinereus* in the discrimination of prey was tested using responses to prey chemicals presented on cotton-tipped applicators (Cooper and Burghardt, 1990). We tested the ability of *B. cinereus* to detect prey odors and to discriminate between prey odors and nonprey odors. We also address the way fossoriality influences the foraging behavior of a burrowing reptile, in comparison to epigean saurians.

**METHODS AND MATERIALS**

Eighteen *Blanus cinereus* (six adult males, three adult females and nine immatures; snout-vent length: $\bar{X} \pm SE = 147 \pm 8$ mm), were captured in March 1990 near Torrelodones (40°35'N, 3°56'W; Madrid Province, Spain). They were housed at "El Ventorrillo" Field Station laboratory (Navacerrada, Madrid Province). The photoperiod was that of the surrounding region, but ambient temperature was maintained at a constant 20°C. Individuals were maintained in 5-liter glass jars containing sand substrate from the capture area. They were fed twice weekly on coleopteran larvae, adult ants, ant eggs, and earthworms, which they readily consumed. Humidity was raised daily with a spray. All animals were acclimatized to laboratory conditions and the experimenter's presence for at least one month before testing. Amphisbaenians were not fed for five days prior to the study.

In a first experiment, each of 18 amphisbaenians was tested with coleopteran larvae odors, deionized water, and cologne (Eau Jeune, L’Oréal). The water served as an odorless control. Cologne was used to determine response to an odorous but nonprey stimulus. Every amphisbaenian was tested with each stimulus once in a randomized block design. Order of presentation was coun-