

Responses to Chemical Cues From Animal and Plant Foods by Actively Foraging Insectivorous and Omnivorous Scincine Lizards

WILLIAM E. COOPER, JR.,^{1*} AWADH M. AL-JOHANY,² LAURIE J. VITT,³
AND JASON J. HABEGGER¹

¹Department of Biology, Indiana University-Purdue University Fort Wayne,
Fort Wayne, Indiana 46805

²Department of Zoology, College of Science, King Saud University, Riyadh
11451, Saudi Arabia

³Sam Noble Oklahoma Museum of Natural History, University of Oklahoma,
Norman, Oklahoma 73072-7029

ABSTRACT If tongue-flicking is important to lizards to sample chemical cues permitting identification of foods, tongue-flicking and subsequent feeding responses should be adjusted to match diet. This hypothesis can be examined for plant foods because most lizards are insectivores, but herbivory/omnivory has evolved independently in many lizard taxa. Here we present experimental data on chemosensory responses to chemical cues from animal prey and palatable plants by three species of the scincine lizards. When tested with chemical stimuli presented on cotton swabs, the insectivorous *Eumeces fasciatus* responded strongly to prey chemicals but not to chemicals from plants palatable to omnivorous lizards or to pungent or odorless control stimuli. Two omnivorous species, *E. schneideri* and *Scincus mitranus*, responded more strongly to chemical cues from both prey and food plants than to the control chemicals. All available data for actively foraging lizards, including these skinks, show that they are capable of prey chemical discrimination, and insectivores do not exhibit elevated tongue-flicking or biting responses to chemical cues from palatable plants. In all of the several species of herbivores/omnivores tested, the lizards show elevated responses to both animal and plant chemicals. We suggest two independent origins of both omnivory and plant chemical discrimination that may account for the evolution of diet and food chemical discriminations in the eight species of skinks studied, five of which are omnivores. All data are consistent with the hypothesis that acquisition of omnivory is accompanied by acquisition of plant chemical discrimination, but data on a broad diversity of taxa are needed for a definitive comparative test of the evolutionary hypothesis. *J. Exp. Zool.* 287:327-339, 2000.