sensory modalities are used to locate the head of their prey? Diefenbach and Emslie (1971) suggested that the position of the initial strike, the taper of the prey’s body, the direction of hair and the chemical cues from the mouse may all be used by Elaphe climacophora to locate the head of its prey. In my study, the position of the initial strike did not play a role because the mice were not presented live. The prevalence of tongue-flicking throughout the investigation period suggests the use of chemical cues. The engaged time was less for hairless mice, which suggests that the presence of hair actually inhibited snakes from locating the prey’s head. The absence of hair possibly allows easier detection of chemical cues, such as gradients along the body. The lack of hair might also provide stronger visual cues. Thus, it is possible that either chemical or visual cues, or possibly a combination of the two, are responsible for the ability of rattlesnakes to locate the head of their prey.

Acknowledgments—I thank H. M. Smith for introducing me to the hairless mice; G. Ackerman and S. Richeson of the Transgenic Animal Facility (University of Colorado, Boulder) for providing mice; A. de Queiroz, D. Chiszar, and H. M. Smith for comments and discussion. The Institutional Animal Care and Use Committee, University of Colorado at Boulder, approved this research.

LITERATURE CITED


Accepted 30 October 2001.

Copyright 2002 Society for the Study of Amphibians and Reptiles

Sexual Dimorphism in Hind-Limb Muscle Mass Is Associated with Male Reproductive Success in Bufo marinus

JULIAN C. LEE1 AND ALBERTO D. CORRALES

Department of Biology, University of Miami, Coral Gables, Florida 33124, USA

In many anurans, adult females significantly exceed adult males in average body size (Shine, 1979; Halliday and Verrell, 1988), yet for some such species, males typically exceed females in certain body dimensions. For example, males may have much more robust forelimbs than females (Oka et al., 1984; Duellman and Trueb, 1986). In explosive breeding species (Wells, 1977) males with robust forelimbs presumably are better able to maintain their grasp of the female during amplexus and thus to resist attempted take-overs by competing males. This common shape dimorphism has often been interpreted as the result of sexual selection, expressed as male-male competition (Howard and Kluge, 1985; Lee, 1986). Lee (2001) explored this idea by dissecting and weighing forelimb muscles of males and females and of amplexant and nonamplexant males of Bufo marinus. He showed that, for those muscles likely to be important in clasping the female, males significantly exceeded females in muscle mass, and amplexant males significantly exceeded nonamplexant males, independent of body size. He concluded that sexual dimorphism in forelimb musculature was indeed the result of sexual selection, expressed primarily, if not exclusively, as male-male competition, and he provided evidence that selection was operating still on the forelimb musculoskeletal complex. According to that interpretation, muscles not involved in the clasping movements of the forelimbs should not be sexually dimorphic in mass, nor should they differ in mass between amplexant and nonamplexant males. We tested these predictions by quantifying the mass of three hind-limb muscles.

1 Corresponding Author. E-mail:jlee@miami.edu