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SYSTEMATICS AND NATURAL HISTORY OF THE AMERICAN MILK SNAKE, *LAMPROPELTIS TRIANGULUM*. By Kenneth L. Williams. 1978. Milwaukee Public Museum, Publications in Biology and Geology No. 2. 1–258, 70 figures, 24 tables, 8 plates. $20.00—*Lampropeltis triangulum* has perhaps the widest distribution of any living snake species, and exhibits substantial geographic variation in morphology and ecology. For example, *L. t. triangulum* of the northeastern U.S. and adjacent Canada is a relatively large snake (≥1 m) with a rounded snout, has a blotched pattern of brownish red and gray, and frequently eats rodents; *L. t. elapsoides* of the southeastern U.S. is a smaller snake (<.5 m) with a pointed snout, has a pattern of bright red, yellow, and black rings, and perhaps feeds largely on skinks; and *L. t. gaigeae* (≥1.5 m) of high elevations in Costa Rica and Panama changes from a brightly ringed to a solid black pattern with increasing size. Studies of variation in this species clearly have potential for addressing broader issues in evolutionary biology.

This slightly revised doctoral dissertation includes introductory sections, subspecies accounts, a discussion of fossil history and phylogeny, and 248 references. There are 53 good line drawings of head and body color patterns. The binding is sturdy, the print is clear, and the paper covers have color photographs of *L. t. elapsoides* and *L. t. multistrata*. Most of the color plates are fair to excellent, but one wonders if they justify the high cost. I found it hard to reconcile some of them with descriptions in the text (e.g., head color in *L. t. multistrata*). Several of the 16 maps illustrating geographic variation are difficult to read, and the photograph comparing head shapes of *L. t. elapsoides* and *L. t.*

triangulum is of very poor quality. There are a number of confusing, redundant, misleading or erroneous statements. For example, on p. 5, three terms are defined to indicate the amount of black tipping on red scales, including "moderate, about three-eighths to one-fourth." On p. 55, "of considerable importance is the posterior limit of black pigment on the parietal. One could use the anterior limit of the first light body band and obtain virtually the same result." On p. 95, Ditmars' comments on diet are accepted uncritically as being based on wild snakes. On p. 99, we read that there is a single date for captive egg deposition and three lines later of two more records. On p. 153, a specimen is cited both as examined and as a literature record.

Williams' systematic conclusions are suspect on both conceptual and empirical grounds. There is no attempt to diagnose the species, although the problematical relationships of *L. triangulum* to *L. pyromelana* and *L. zonata* are briefly mentioned. The author claims (p. 1) to have studied geographic, sexual, ontogenetic and individual variation in "most of the characters normally utilized in taxonomic work on snakes at the specific level with emphasis on head and body pattern." Later he asserts that there is little geographic variation in hemipenes and dentition, but admits that few specimens were examined for these attributes. Williams (p. 69) relies on Mayr's 1963 (not "1965") opus as the "most recent review and discussion" of the subspecies problem, and concludes (p. 70) that "the important points in determining subspecific level versus infrasubspecific level are that the groups under consideration differ consistently in several important characteristics and that they inhabit different major physiographic regions or major subdivisions thereof . . . ." Williams (p. 69) states that variation in color pattern "can be correlated to a great degree" with such areas, and that color pattern "would be more important to the adaptability of a population than would . . . the number of ventrals or subcaudals." He then sinks two taxa and erects six new ones, recognizing a total of 23 subspecies. Even granting that trinomials might usefully be applied to this species, I find the arguments vague and unconvincing. What is a "major subdivision" of a physiographic region? Why do these aspects of color pattern vary as they do, and how likely is it that very similar patterns have arisen more than once? If (p. 70) concordance in several "important" characteristics is required for subspecific recognition, why (p. 223) recognize *L. t. gaigeae* ("defined primarily by the color attained by large adults") if it "reflects the genetic influence of several subspecies when the pattern is analyzed"? The phylogenetic and biogeographic discussions could have been clarified by figures, but are based on weakly justified or unsupported assumptions about natural groups, centers of origin, and primitive color patterns. No attempt at outgroup comparisons with other species of *Lampropeltis* and with other colubrid genera is made, and no attempt is made to refute alternative hypotheses.

Despite these criticisms, this book represents a very useful and important contribution to the herpetological literature. The description of geographic variation required a tremendous amount of work, and much of the natural history literature on this species is cited. There is a stimulating discussion of overlap without apparent intergradation between *L. t. triangulum* and *L. t. elapsoides*, and the intriguing suggestion that the black color of adult *L. t. gaigeae* is of thermoecological significance. In short, Williams' monograph lays the groundwork for future studies of these interesting and sometimes strikingly beautiful snakes, but much remains to be done. We still know very little about variation in some parts of the range (or anywhere for some characters), and much overlooked and recently collected material is available. We know nothing about allometric relationships within and among populations of this species, or of historical and dynamic aspects of the *triangulum-elapsoides* interactions. Are there morphological correlates of geographic variation in diet? What are the relationships of *L. triangulum* to other taxa, and what about the coral snake mimicry problem?—HARRY W. GREENE, *Museum of Vertebrate Zoology and Department of Zoology, University of California, Berkeley, California 94720.*