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SEXUAL DIMORPHISM AND BODY TEMPERATURES OF *SCELOPORUS SINIFERUS* FROM GUERRERO, MÉXICO

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The biology of temperate North American lizards of the genus *Sceloporus* is relatively well known. We know substantially less about the majority of Mexican and Latin American *Sceloporus* species. Indeed, for too many species we know only what has been published in the original descriptions. Recently, herpetologists have begun to recognize the importance of studying the biology of tropical reptiles (see Vitt and Zani 1996). In some cases studies on tropical species have obtained results counter to those obtained in temperate systems that were sometimes thought to pertain to all reptiles (e.g., Shine and Madsen 1996). Thus, it is important to study the general biology and ecology of previously unstudied species, especially those from tropical or subtropical regions. Such information hopefully can serve as the basis of future syntheses on the biology of lizards. This note concerns the sexual dimorphism and body temperature of *Sceloporus siniferus*, a relatively unstudied species from the seasonal semiarid tropics of México.

The study population was located in a tropical deciduous forest located near the Bahia Papanoa (Km 161, Highway Mex 200 Acapulco-Zihuatanejo: 17°2′0.4″N, 101°3′0.0″W). Lizards were collected by rubber band during May 1996. We measured snout-vent length (SVL; to nearest mm) in the field. In addition, we took body temperatures (T_b; nearest 0.1°C) with a quick-reading cloacal thermometer immediately upon capture. We also measured air temperature (T_a; shaded thermometer 1 cm above substrate where individual first observed) and substrate temperature (T_s; shaded thermometer touching substrate where individual first observed). We also made various morphological measurements to analyze sexual dimorphism. We measured head width (HW; at the widest point), head length (HL; from anterior edge of ear to tip of snout), and femur length (FL; from knee to middle of pelvic region) using calipers.

Mean SVL was 51.2 ± 0.8 mm (N = 56; range = 38–62 mm). For all morphometric variables, the relationship with SVL was highly significant (all $r^2 > 0.80$; $P < 0.0001$); thus, we used ANCOVA to analyze for sexual dimorphism (on log-transformed data; after assumptions checked).

Males were larger on average than females (Table 1; df = 59, $t = 4.37$, $P < 0.0001$). Males had relatively wider heads than females (Fig. 1; Table 1; ANCOVA with SVL as covariate: $F_{1,58} = 7.6$, $P = 0.008$). The interaction between sex and the covariate was not significant and was not included in the final model. Males and females did not differ in the length of their heads after the effects of SVL were removed using ANCOVA (Table 1; ANCOVA with SVL as covariate: $F_{1,58} = 1.61$, $P = 0.21$). The interaction between sex and the covariate was not significant and was not included in the final model. The length of a male's femur was, on average, the same as the length of a female's femur (Table 1; ANCOVA with SVL as covariate: $F_{1,58} = 0.47$, $P = 0.50$). The interaction between sex and the covariate was not significant and was not included in the final model.

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TABLE 1. Measurements (mm) of SVL and measurements (mm) of head width, head length, and femur length corrected for SVL of male (N = 36) and female (N = 25) *Sceloporus siniferus* from Guerrero, México. Least squares means are given ± $1s_{\bar{x}}$.

	Male	Female
SVL	52.8 ± 0.9	47.1 ± 0.8
Head width	10.13 ± 0.09	9.73 ± 0.11
Head length	11.54 ± 0.09	11.36 ± 0.11
Femur length	14.56 ± 0.12	14.70 ± 0.14

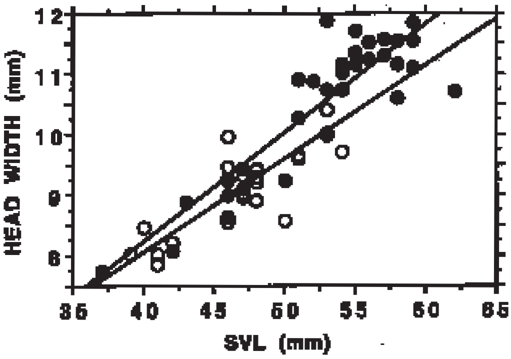

Fig. 1. The relationship between head width and SVL for male (closed circles; upper regression line) and female (open circles; lower regression line) *Sceloporus siniferus* from Guerrero, México.

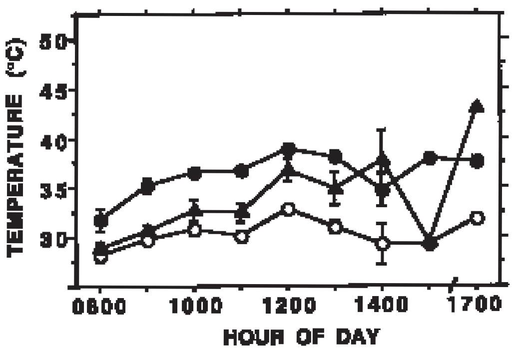

Fig. 2. Diel variation in body temperature (closed circles), air temperature (open circles), and substrate temperature (closed triangles) in *Sceloporus siniferus* from Guerrero, México. Means are given ± $1s_{\bar{x}}$.

Mean T_b was 36.2 ± 0.3°C (N = 64; range 27.6–39.4°C). Mean T_a was 30.4 ± 0.2°C (N = 64; range 25.9–36.8°C), and mean T_s was 34.0 ± 0.7°C (N = 64; range 27.1–49.6°C). Body temperature was significantly influenced by both T_a ($N = 64$, $r^2 = 0.42$, $P < 0.0001$; $T_b = 13.10 + 0.76T_a$) and T_s ($N = 64$, $r^2 = 0.28$, $P < 0.0001$; $T_b = 28.2 + 0.24T_s$). Body temperatures showed some diel fluctuations, as did T_a and T_s (Fig. 2). Body size did not influence T_b ($N = 56$, $r^2 = 0.02$, $P = 0.36$). Males and females had the same mean T_b (36.2°C; ANCOVA with T_a as covariate; $F_{1,61} = 0.12$, $P = 0.72$).

Sceloporus siniferus are sexually dimorphic in both body size and head width, but not in head length or length of femur. Males were larger and had wider heads than females. Several other *Sceloporus* species are sexually dimorphic, with males larger than females; however, not all *Sceloporus* species are sexually dimorphic (Fitch 1978). Male-biased sexual dimorphism in head size is relatively common in lizards (e.g., Vitt and Cooper 1985, Perez-Mellado and de la Riva 1993, Smith et al. 1997). We do not have enough information to determine the cause of sexual dimorphism in *S. siniferus* (i.e., whether it is due to sexual selection or niche diversification; see Shine 1989). However, the widespread occurrence of sexual dimorphism in *Sceloporus* suggests it may have a historical origin in the genus.

The mean T_b of *S. siniferus* in this study was 36.2°C, which places it among species having the highest mean T_b reported in the genus *Sceloporus*. Mean T_b ranges from 28.9°C in *S. variabilis* (Benabib and Congdon 1992) to 37.5°C in *S. horridus* (Lemos-Espinal et al. 1997b; see Lemos-Espinal et al. 1997c for a review). Environmental temperatures appear to play a relatively large role in determining the T_b of individual *S. siniferus*, as evidenced by the relatively large r^2 value for T_b on T_a regression, and the diel variation in T_b. Male and female *S. siniferus* did not have significantly different mean T_b, a situation that has been observed in other studies on Mexican *Sceloporus* (e.g., *S. grammicus,* Lemos-Espinal and Ballinger 1995; *S. gadovae,* Lemos-Espinal et al. 1997c; *S. ochoteranae,* Lemos-Espinal et al. 1997a). Such a lack of difference in T_b between males and females may suggest that in these species males and females behave similarly, such as using similar microhabitats or being active at the same time. Further work comparing the microhabitat use and activity of males and females in species with sexual T_b differences with those without sexual T_b differences would be useful.

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