sicaudus (Duméril et Bibron, 1841), amphibien apode vivipare. C. R. Acad. Sci. Paris: 294:757-762.

———, AND M.-T. LAURENT. 1986. Quelques observations sur la reproduction en élevage de *Typhlonectes compressicaudus*, amphibien apode vivipare. Possibilité de rythmes endogénes. Bull. Soc. Herp. France 40:52-62.

———, M. DELSOL, AND J. LESCURE. 1983. La viviparité chez *Typhlonectes compressicaudus*, amphibien apode. Bull. Soc. Herp. France 26:23-24.

SARASIN, P., AND F. SARASIN. 1887-1890. Ergebnisse Naturwissenschaftlicher Forschungen auf Ceylon. Zur Entwicklungsgeschichte und Anatomie der Ceylonischen Blindwühle *Ichthyophis glutinosus*. C. W. Kreidel's Verlag, Wiesbaden.

SESHACHAR, B. R. 1936. The spermatogenesis of *Ichthyophis glutinosus* (Linn.). Part I. The spermatogonia and their division. Z. Forsch. 24:662-706.

———. 1937. The spermatogenesis of *Ichthyophis glutinosus* (Linn.). Part II. The meiotic divisions. Z. Forsch. 27:133-158.

———. 1939. The spermatogenesis of *Uraeotyphlus narayani* Seshachar. La Cellule 48:63-76.

———. 1942. Stages in the spermatogenesis of *Siphonops annulatus* Mikan and *Dermophis gregorii* Blgr. (Amphibia: Apoda). Indian Acad. Sci. Proc. 15B: 263-277.

———. 1943. The spermatogenesis of *Ichthyophis glutinosus* Linn. Part 3. Spermatelosis. Proc. Nat. Inst. Sci. India 9:271-286.

———. 1945. Spermatelosis in *Uraeotyphlus narayani* Seshachar and *Gegenophis carnosus* Beddome (Apoda). Proc. Nat. Inst. Sci. India 11:36-40.

WAKE, M. H. 1968. Evolutionary morphology of the caecilian urogenital system. Part I. The gonads and the fat bodies. J. Morphol. 126:291-332.

———. 1970. Evolutionary morphology of the caecilian urogenital system. Part II. The kidneys and the urogenital ducts. Acta Anat. 75:321-358.

———. 1972. Evolutionary morphology of the caecilian urogenital system. Part IV. The cloaca. J. Morphol. 136:353-366.

———. 1977. The reproductive biology of caecilians: an evolutionary perspective. *In* S. Guttman and D. Taylor, (eds.), Reproductive Biology of the Amphibia, pp. 73-102. Plenum Press, New York.

———. 1980. Reproduction, growth, and population structure of *Dermophis mexicanus* (Amphibia: Gymnophiona). Herpetologica 36:244-256.

———. 1981. Structure and function of the male Mullerian gland in caecilians (Amphibia: Gymnophiona), with comments on its evolutionary significance. J. Herpetol. 15:17-22.

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Food Habits of *Pseudemys concinna suwanniensis* in a Florida Spring

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The herbivorous feeding habit of the river cooter (*Pseudemys concinna*) has been well documented (Allen, 1938; Marchand, 1942; Carr, 1952; Ernst and Barbour, 1989). *Pseudemys c. suwanniensis* (Suwannee river cooter) is one of the five recognized subspecies of this predominantely freshwater turtle. In Florida, the Suwannee river cooter ranges from the Apalachicola river southward along the Gulf coast to the Tampa Bay region (Jackson, 1992). Although the abundance of *P. c. suwanniensis* is not well documented, it is believed to have declined in recent years, and has been designated as a "Species of Special Concern" in Florida (Jackson, 1992).

One population of the Suwannee river cooter in Florida occurs in Wakulla Springs. The spring bowl and approximately 4.5 km of the Wakulla River are located within the Edward Ball Wakulla Springs State Park. Since the early 1970s, *Egeria densa*, an exotic, aquatic plant, has been present in Wakulla Springs. Currently, it is estimated to cover 60% of the river that occurs within the park boundary (Ledbetter, unpubl.). The use of *E. densa* as a food source by the Suwannee river cooter is unknown. The objective of this study was to determine the use of *E. densa* as a food source by the Suwannee river cooter and to evaluate management options for the control or removal of this exotic plant.

We collected turtles in the spring run of the Edward Ball Wakulla Springs State Park, Wakulla County, Florida between 24 April and 2 June 1991. Turtles were captured with a dip net (53 cm diameter opening, 5.7 cm stretched mesh) from the bow of a 12 ft, V-hulled aluminum boat, powered by a 7.5 hp motor. Location of capture, time, and date were recorded. Captured animals were placed individually in woven plastic sacks and transported to the laboratory. Maximum straight-line plastron length and body mass were recorded for each animal. Animals were sexed as males based on the secondary sexual characteristics of three long front claws and observed position of the vent beyond the carapace (Cahn, 1937; Jackson, 1970; Buhlmann and Vaughan, 1991). Each turtle was marked by notching the marginal scutes with a hand saw for future individual identification. The upper digestive tract (mouth, esophagus, and stomach) of each animal was gently flushed according to Legler (1977) and Parmenter (1980). Flushed upper digestive tract (UDT) contents were frozen until they were analyzed. We released the turtles at the site of capture either the same day of capture or the following morning.

Contents obtained from the UDTs were thawed and

TABLE 1. Items obtained from flushing upper digestive tracts of *Pseudemys concinna suwanniensis* collected from Edward Ball Wakulla Springs State Park, Florida, 1991 (N = 66).

Species name	Common name	Native/ exotic
Algae		
Cladophora sp.	filamentous algae	
Vascular plants		
Ceratophyllum demersum	coontail	Native
Egeria densa	Brazilian elodea	Exotic
Sagittaria kurziana	strap-leaf sag	Native
Vallisneria americana	tapegrass	Native
Snails		
Amnicola dalli dalli	peninsula amnicola	Native
Elimia floridensis	rasp elimia	Native
Nassarius cf. *vibex*	bruised nassa	Native
Olivella sp.		
Fish		
Opsanus beta	gulf toadfish	Native

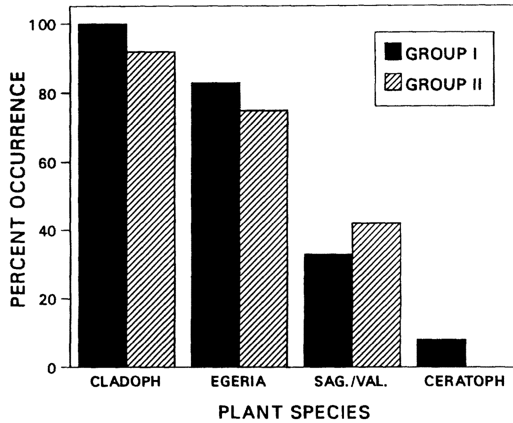

FIG. 1. Percent occurrence of food items flushed from *Pseudemys concinna suwanniensis* captured in Edward Ball Wakulla Springs State Park, Florida, 1991 (N = 48). Group I was <15 cm plastron length, sex not determined and Group II was ≥15 cm plastron length, male; CERATOPH = *Ceratophyllum demersum*, all other abbreviations as in Table 2.

food items in each sample were separated under a dissecting scope and identified to lowest taxon. We combined *Sagittaria kurziana* and *Vallisneria americana* (Sag./Val.), both strap-leaf plants, for the analyses because we could not always distinguish between them. We will abbreviate this combination of plants as "Sag./Val." in this paper. Wet mass and volume were recorded for each plant species within each sample. Volume was measured by water displacement in a graduated cylinder, and samples were dried at 60 C for 48 h to obtain dry mass.

A total of 59 UDT samples were separated by food item and measured. However, 14 samples were eliminated from the analyses of percent volume and dry mass for the following reasons: samples were comprised of only trace amounts of each food item and could not be analyzed, samples from females were excluded because of the small sample size (N = 4), or because the animal was a recapture (only one UDT sample per animal was included in the analyses). A total of 45 UDT samples were included in the analyses from turtles that were divided among the following two groups based on plastron length and sex: group I was <15cm, sex could not be determined; and group II was ≥15cm, male.

Volume and dry mass percentages were arcsine square root transformed for statistical analyses. A one-way ANOVA was used to test if the percentages of food items found in the two turtle groups differed significantly. We used an F-test to verify the ANOVA assumption that the variances of the size classes are equal (Sokol and Rohlf, 1981). When this assumption was not met we used a t-test with Satterthwaite correction for unequal variances. To determine if food items were differentially consumed, we used a t-test to compare if the mean log ratio of *Cladophora* sp. to *E. densa*, *Cladophora* sp. to Sag./Val., and *E. densa* to Sag./Val. were significantly different from zero. Mean values are followed by standard deviation (SD). Computations were made in SAS (SAS Institute, 1987).

A total of 77 Suwannee river cooters were captured during 19 d, five were recaptured once and one was recaptured twice. On average, 1.35 turtles were captured per hour (61.3 total capture hours) with a capture efficiency rate of one turtle captured in every four attempts. Capture hours are the total number of hours spent searching and capturing turtles. Plastron length and mass ranged from 4.5–33.6 cm ($\bar{x}$ = 18.9 cm ± 7.4, N = 70) and from 19.0–6750 g ($\bar{x}$ = 1652 g ± 1433, N = 69), respectively.

An average of 10.7 g (±14.7, range 0–75 g, N = 49) wet mass of material was obtained during an average stomach flushing time of 11.6 min (±4.7, range 4–28 min, N = 49). We attempted to flush the UDT of 67 Suwannee river cooters and obtained contents from 89.6% (N = 60) of the turtles. In addition to the predominant occurrence of plant matter, a small number of snails, other invertebrates, one fish mandible and several fish vertebrae were found in the UDT contents (Table 1).

Plastron lengths of turtles included in the analyses of food items ranged from 7.0–28.5 cm. Percent occurrence of food items that occurred in each group is presented in Fig. 1. *Cladophora* sp., a filamentous algae, and *E. densa* were present most frequently in both turtle groups. The strap-leaf plants, Sag./Val., occurred in UDTs with less frequency in both groups. *Ceratophyllum demersum* was found in only one sample in trace amounts and was not included in the analyses.

An ANOVA indicates no significant difference for volume and dry mass in the extent to which the two groups (group I was <15 cm, sex could not be deter-

TABLE 2. Mean, SD, range, and *P*-values for percent volume and dry mass of food items flushed from *Pseudemys concinna suwanniensis* captured in Edward Ball Wakulla Springs State Park, Florida, 1991 (N = 45). Group I was <15 cm plastron length, sex not determined; and Group II was ≥15 cm plastron length, male; Cladoph = *Cladophora* sp.; Egeria = *Egeria densa*; Sag./Val. = *Sagittaria kurziana* and *Vallisneria americana* combined. No significant difference was found in the extent to which each turtle group consumed each food item (ANOVA).

	Group I		Group II				
	x̄ ± SD	Range	x̄ ± SD	Range	F/t[1]	df	*P*
% volume							
Cladoph	0.45 ± 0.38	0–1.0	0.67 ± 0.40	0–1.0	2.55	1,43	0.12
Egeria	0.43 ± 0.37	0–1.0	0.32 ± 0.40	0–1.0	0.55	1,43	0.46
Sag./Val.	0.12 ± 0.30	0–1.0	0.00 ± 0.00	0–0.02	1.40[1]	10	0.19
% dry mass							
Cladoph	0.50 ± 0.39	0–1.0	0.68 ± 0.38	0–1.0	2.04	1,43	0.16
Egeria	0.39 ± 0.37	0–1.0	0.31 ± 0.39	0–1.0	0.43	1,43	0.51
Sag./Val.	0.11 ± 0.30	0–1.0	0.006 ± 0.02	0–0.1	1.32[1]	10	0.22

[1] t-test with Satterthwaite correction for unequal variances.

mined; and group II was ≥15 cm, male) of turtles consumed *Cladophora* sp. ($F_{1,43}$ = 2.55, *P* = 0.12 and $F_{1,43}$ = 2.04, *P* = 0.16, respectively; Table 2) and *E. densa* ($F_{1,43}$ = 0.55, *P* = 0.46 and $F_{1,43}$ = 0.43, *P* = 0.51, respectively; Table 2). The assumption of equal variances for the two groups is not met for either volume or dry mass for the Sag./Val. category. In the case of Sag./Val., once we account for unequal variances in the two turtle groups, the t-tests of differences in proportions of volume and dry mass are not significant (t_{10} = 1.40, *P* = 0.19 and t_{10} = 1.32, *P* = 0.22, respectively; Table 2).

Because there was no difference in the extent to which the two groups consumed each food item all turtles were analyzed together to determine if food items were differentially consumed. Overall, there is a significant difference in the consumption of plant items for both volume and dry mass for the mean log ratio of *Cladophora* sp. to *E. densa* (t_{44} = 2.70, *P* = 0.0098 and t_{44} = 2.72, *P* = 0.0092, respectively; Table 3), *Cladophora* sp. to Sag./Val. (t_{44} = 12.90, *P* = 0.0001 and t_{44} = 9.68, *P* = 0.0001, respectively; Table 3) and *E. densa* to Sag./Val. (t_{44} = 6.81, *P* = 0.0001 and t_{44} = 4.66, *P* = 0.0001, respectively; Table 3). Because the mean log ratio of *Cladophora* sp. to *E. densa* is a positive value for both volume and dry mass, we conclude that the turtles ate more *Cladophora* sp. than *E. densa* and that both of these plants were eaten more than Sag./Val. (Table 3).

Although as a group the turtles ate, by volume and dry mass, more *Cladophora* sp. than *E. densa*, data for individual turtles indicate that the majority of the UDT contents contained 75% or more by volume and dry mass of either *Cladophora* sp. or *E. densa*. By volume 53.3% (N = 24) of the animals and by dry mass 57.8% (N = 26) of the animals ate 75% or more of *Cladophora* sp. By volume 26.7% (N = 12) of the animals and by dry mass 20% (N = 9) of the animals ate 75% or more of *E. densa*. Only one animal (2.2%) ate 75% or more, by volume and dry mass, of Sag./Val. By volume 17.8% (N = 8) of the animals and by dry mass 20% (N = 9) of the animals ate less than 75% of any one of the plant species.

Fahey (1987) discontinued flushing the digestive tract of *P. concinna* that he captured in Alabama because nearly all of the animals dissected after flushing still contained a bolus of plant material and because two adults were suffocated when water discharged into their lungs. Although Fahey (1987) does not describe his flushing methods, on average we flushed the UDT for 11.6 min and obtained contents from 89.6% of the animals flushed. We believe that UDT

TABLE 3. Mean log ratios of Cladoph:Egeria, Cladoph:Sag./Val., and Egeria:Sag./Val., SD, and *P*-value of volume and dry mass for the comparison of the three plant species consumed by *Pseudemys concinna suwanniensis* captured in Edward Ball Wakulla Springs State Park, Florida, 1991 (N = 45). Abbreviations are as in Table 2 (t-test).

	Volume				Dry mass			
Plant species	x̄ (SD)	t	df	*P*	x̄ (SD)	t	df	*P*
Cladoph:Egeria	3.64 (9.06)	2.70	44	0.0098	3.15 (7.78)	2.72	44	0.0092
Cladoph:Sag./Val.	11.73 (6.10)	12.90	44	0.0001	7.97 (5.50)	9.68	44	0.0001
Egeria:Sag./Val.	8.09 (7.98)	6.81	44	0.0001	4.82 (6.98)	4.66	44	0.0001

contents can be removed non-injuriously. Other advantages to flushing the UDT is that seasonal food habits and food habits throughout the life history of individual turtles may be studied because animals do not have to be sacrificed. In addition, flushing of the UDT allows samples to be analyzed quantitatively which is not possible due to differential rates of digestion when using fecal samples.

Most authors have reported the food habits of *P. concinna* to be herbivorous (Allen, 1938; Marchand, 1942; Ernst and Barbour, 1989). However, Fahey (1987) and Buhlmann and Vaughan (1991) identified animal matter from the digestive tract, and Cahn (1937) reported the species to be largely carnivorous. Fahey (1987) suggested that animal matter (mussels, snails, insect larvae, and fish) found in the stomachs of *P. concinna* from Alabama was ingested incidentally when feeding on vegetation or, in the case of the fish remains, was evidence of scavenging by the turtles. The scavenging habit of *P. concinna* has been reported by Cahn (1937) and Ernst and Barbour (1989). Both Cahn (1937) and Buhlmann and Vaughan (1991) report the occurrence of crayfish remains as well as mussel fragments, Asiatic clams (*Corbicula fluminea*), tadpoles, small fish, grasshoppers, crickets, caterpillars, and other invertebrates in the digestive tract of *P. concinna*.

Our results indicate that the diet, by percent occurrence, volume, and dry mass, of juvenile and adult male Suwannee river cooters from Wakulla Spring consists of plant material and that non-plant matter was ingested incidentally (snails and other invertebrates) or while scavenging (fish).

The marine snails and fish found in the UDT contents of one turtle in our study had probably been consumed by the turtle after they had been regurgitated by double-crested cormorants (*Phalacrocorax auritus*) returning to the park to roost after having fed in the Gulf of Mexico. It is unlikely that the fish or snails migrated upstream from the Gulf of Mexico (K. Auffenberg and S. Scudder, pers. comm.) or that a 7.5 cm turtle would migrate downstream to feed near the Gulf of Mexico.

The UDT samples obtained from the four adult females (range 24.0–33.6 cm maximum straight-line plastron length) that were not included in the analyses contained *Cladophora* sp. (0.6 ml volume, 0.07 g dry mass, N = 1), *E. densa* (range trace–6.0 ml volume, range trace–0.34 g dry mass, N = 4), and *S. kurziana* (trace amounts of volume and dry mass, N = 1). In addition, an adult female found floating dead in the spring run had very little contents in the digestive tract other than a crayfish (sp. indet.) pincer in the lower tract.

By percent occurrence, volume, and dry mass, the Suwannee river cooters in this study ate primarily *Cladophora* sp., a filamentous algae, and *E. densa*, an exotic, aquatic, vascular plant. The strap-leaf plants, *S. kurziana* and *V. americana* were eaten in much smaller amounts. The only quantitative studies with which we can compare our results on the food habits of *P. concinna* were conducted by Marchand (1942) and Fahey (1987). Marchand (1942) found the percent volume of food items from ten *P. c. suwanniensis* collected from Hart Springs, Gilchrist County, Florida to be the following: *Naias* sp. 82.3%, *Lemna* sp. 7.2%, *Ceratophyllum* sp. 5.5%, filamentous algae 2.5%, and *Sagittaria* sp. 2.5%. In Alabama, Fahey (1987) found only two plant species in 41 stomachs analyzed. He reported that the riverweed, *Podostemon ceratophyllum*, is the most important food item both by percent frequency of occurrence and percent dry mass, 97.6% and 95.9%, respectively, followed by the filamentous algae, *Spirogyra* sp., 19.5% frequency of occurrence and 1.3% dry mass. Both of these studies contrast to our study in which the percent volume and dry mass of the filamentous algae, *Cladophora* sp., was consumed to a larger extent (57.6% and 70.6%, respectively) than the percent volume and dry mass of the vascular plants (*E. densa* and Sag./Val.) combined, 42.4% and 29.4%, respectively.

Our results indicate that the exotic *E. densa* is not the most common component of the Suwannee river cooter diet, at least during late spring (between 24 April and 2 June). Our study has not evaluated the effects of seasonality on the feeding habits of Suwannee river cooters in the Wakulla River, the relative abundance of plant species in relation to feeding habits, nor the historic distribution of native plants prior to the introduction of *E. densa*. Whitford (1956) found that *Cladophora* sp. varied in abundance in the Wakulla River, with large amounts present in June and a subsequent decrease in July. Although it has been 35 years since the study by Whitford (1956), the seasonality of plant species found in the Wakulla River may account for the dominance of *Cladophora* sp. in the turtle diet during this time of year. Seasonal variation in relative abundance of plants could affect the diet of Suwannee river cooters. A recent study by Buhlmann and Vaughan (1991) on *P. concinna* in West Virginia indicated that frequency of occurrence of food items changed throughout the year. Filamentous algae appeared in all samples collected in April. However, from May to September macrophytes accounted for the majority of the diet. Although *P. concinna* remained active throughout the year in Alabama, Fahey (1987) only found food in turtles collected from March through October. However, Jackson (1964) found that *P. c. suwanniensis* fed throughout the year in a Florida freshwater spring with near constant temperatures.

Because the Suwannee river cooter is a Species of Special Concern in Florida (Jackson, 1992), further studies should be conducted on the importance of *E. densa* to the diet of the Suwannee river cooter before a program of eradication is implemented. Future studies should consider the seasonal importance of food items, determine if turtles feed selectively, and compare food habits of Suwannee river cooters in areas further down the Wakulla River where *E. densa* does not yet occur. If a program to remove *E. densa* is implemented, it should be monitored to insure the reestablishment of native plants.

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LITERATURE CITED

ALLEN, E. R. 1938. Notes on the feeding and egg-laying habits of the *Pseudemys*. Proc. Florida Acad. Sci. 3:105–113.

BUHLMANN, K. A., AND M. R. VAUGHAN. 1991. Ecology of the turtle *Pseudemys concinna* in the New River, West Virginia. J. Herpetol. 25:72–78.

CAHN, A. R. 1937. The turtles of Illinois. Illinois Biol. Monogr., Univ. of Illinois Bull, Urbana. 35:1–218.

CARR, A. 1952. Handbook of Turtles: The Turtles of the United States, Canada, and Baja California. Cornell Univ. Press, Ithaca, New York.

ERNST, C. H., AND R. W. BARBOUR. 1989. Turtles of the World. Smithsonian Institution Press, Washington D.C.

FAHEY, K. M. 1987. Aspects of the life history of the river cooter, *Pseudemys concinna* (Le Conte), in the Tallapoosa River, Tallapoosa County, Alabama. Unpubl. Ph.D. Diss., Auburn Univ., Alabama.

JACKSON, C. G., JR. 1964. A biometrical study of form and growth in *Pseudemys concinna suwanniensis* Carr (Order: Testudinata). Unpubl. Ph.D. Diss., Univ. of Florida, Gainesville.

———. 1970. A biometrical study of growth in *Pseudemys concinna suwanniensis*. I. Copeia 1970:528–534.

JACKSON, D. R. 1992. River cooter (*Pseudemys concinna* (Le Conte). *In* Paul E. Molar (ed.), Rare and Endangered Biota and Florida, Vol. III: Amphibians and Reptiles, pp. 166–170. University Press of Florida, Gainesville.

LEGLER, J. M. 1977. Stomach flushing: a technique for chelonian dietary studies. Herpetologica 33: 281–284.

MARCHAND, L. J. 1942. A contribution to a knowledge of the natural history of certain freshwater turtles. Unpubl. Ph.D. Diss., Univ. of Florida, Gainesville. 83 pp.

PARMENTER, R. R. 1980. Effects of food availability and water temperature on the feeding ecology of pond sliders (*Chrysemys s. scripta*). Copeia 1980: 503–514.

SAS INSTITUTE INC. 1987. SAS/STAT Guide for Personal Computers, Version 6 Ed. Cary, North Carolina.

SOKAL, R. R., AND F. J. ROHLF. 1981. Biometry. W. H. Freeman and Co., San Francisco, California.

WHITFORD, L. A. 1956. The communities of algae in the springs and spring streams of Florida. Ecology 37:433–442.

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Temperature Relationships of the Tree Lizard, *Urosaurus ornatus*, from Desert and Low-elevation Montane Populations in the Southwestern USA

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The tree lizard, *Urosaurus ornatus* (Phrynosomatidae) occurs in southwestern North America from desert flatlands with sparse vegetation to juniper-oak and pine-oak woodlands. The thermal ecology of *U. ornatus* in a desert population has been previously studied (Vitt et al., 1981; Congdon et al., 1982). Lowe and Vance (1955) investigated aspects of the thermal tolerance of *U. ornatus*. In this study, we look at the relationship between *U. ornatus* and its thermal environment at a desert site in southwestern New Mexico and a low elevation montane habitat in southeastern Arizona. We pay special attention to the effect of season, altitude, sex, and reproductive state on body temperature in *U. ornatus*.

Body temperatures were obtained for *U. ornatus* from a low altitude montane population (1700 m) in the Chiricahua Mountains, Cochise County, Arizona, and from a desert population (1350 m) near Animas, Hidalgo County, New Mexico from 1973 to 1976 (both ca. 31°50'N, 109°20'W). The low altitude montane site was in the vicinity of the Southwestern Research Station, 8 km SW of Portal, Arizona near the study site of Smith (1981). The desert site is described in Ballinger (1976).

We measured snout-vent length (SVL, to nearest mm) using a ruler, and body mass (BM, to nearest 0.1 g) using a triple-beam balance. Body temperatures (T_b, to the nearest 0.1 C) were obtained from active lizards (i.e., foraging or basking), captured by hand or by noose, using quick reading cloacal thermometers. Care was taken to prevent temperature from being influenced by handling and all lizards requiring extensive effort to capture were excluded for purposes of temperature records. Temperatures were taken at similar times throughout the year. Air temperatures (T_a, at 1 cm above substrate where a lizard was first seen using a shaded bulb to nearest 0.1 C) were taken at the site of capture. We determined female reproductive state by palpation. In addition, the substrate on which individual lizards were first observed was recorded. Substrate categories used were: (1) on a rock, (2) on a log, (3) in a tree, (4) in a crack, and (5) under cover. All measurements are reported as mean ± one standard error.

Assumptions of ANOVA were tested using the F_{max} test for homogeneity of variance and visual inspection for normality (Sokal and Rohlf, 1969). When the assumptions of ANOVA were violated, Kruskal-Wallis tests were used (Sokal and Rohlf, 1969).

Mean SVL of *U. ornatus* was 46.9 ± 0.2 mm (N = 496; range 22.0 to 57.0 mm) and mean BM was 2.82 ± 0.04 g (N = 447; range 0.68 to 5.50). Males had both significantly larger SVLs (48.48 ± 0.35 mm (N = 209)