ZOOLOGIA 28 (1): 8–16, February, 2011
doi: 10.1590/S1984-46702011000100002

Living in a caatinga-rocky field transitional habitat: ecological aspects of the whiptail lizard *Cnemidophorus ocellifer* (Teiidae) in northeastern Brazil

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ABSTRACT. The ecology of the active forager lizard *Cnemidophorus ocellifer* (Spix, 1825) was studied to analyze food habits, thermal ecology and habitat use, in the Morro do Chapéu municipality (11°29'S, 41°07'W), state of Bahia, Brazil. Lizards (N = 34) were collected with rubber bands or with an air rifle and, for each individual, we recorded cloacal temperature (T_c), air temperature (T_a) (1 cm above the substrate) and substrate temperature (T_s) (to nearest 0.2°C). We registered the microhabitat used by each animal at the moment of first sight and measured its morphological variables (nearest 0.1 mm). In the laboratory, we registered the number of items of each prey category to the taxonomic level of Order, its dimensions and frequencies. Data showed that, numerically, the category most consumed was Isoptera (84.4%). Volumetrically, the diet was composed predominantly by Orthoptera (27.5%) and Isoptera (21.5%). Prey items that occur aggregated in the environment (termites) were important in the diet of *C. ocellifer*, a characteristic of active foragers. Males and females did not differ in the types of prey consumed. *Cnemidophorus ocellifer* had a mean T_c in activity of 37.6 ± 1.6°C and the relationship between T_c and ambient temperatures (T_s and T_a) was positive and significant ($F_{2,28} = 4.814$; $R^2 = 0.256$; $p < 0.05$). Most lizards were first sighted on leaf litter inside shrubs (45.5%) and on leaf litter at shrub edge (42.4%). *Cnemidophorus ocellifer* had a relatively high mean T_c during activity, with T_s explaining most of the variation in lizard T_c.

KEY WORDS. Bahia; *Cnemidophorus*; diet; microhabitat; thermal ecology.

Cnemidophorus Wagler, 1830 (Teiidae) is composed of active foraging lizard species distributed throughout much of cisandean South America (Reeder *et al.* 2002). These lizards generally occur in open habitats with sandy soil and high temperatures, such as cerrados, Amazonian savannas, caatingas and restingas (Schall & Ressel 1991, Menezes *et al.* 2000, Dias & Rocha 2007). Like other wide foraging species, these lizards need to maintain high body temperatures during activity (Rocha *et al.* 2009). *Cnemidophorus* behaviorally regulate their activity temperature at 37-40º C (Bergallo & Rocha 1993, Magnusson 1993, Teixeira-Filho *et al.* 1995, Menezes *et al.* 2000, Mesquita & Colli 2003a,b) and usually have a diversified diet, although frequently with predominance of insect larvae and termites (Parker & Pianka 1975, Pianka 1977, 1986, Magnusson *et al.* 1985, Bergallo & Rocha 1994, Dias & Rocha 2007, Menezes *et al.* 2008, Mesquita & Colli 2003 a,b, Teixeira-Filho *et al.* 2003).

Cnemidophorus ocellifer (Spix, 1825) is a bisexual species and is the most widely distributed species in the *ocellifer* group, occurring in the Cerrado of central Brazil, in the Caatinga of northeastern Brazil, and in restingas along the northeastern Brazilian coast, from Salvador (Bahia) northwards (Vanzolini *et al.* 1980, Dias & Rocha 2007). Some aspects of the ecology of *C. ocellifer* have been described for populations from the Caatinga (Vitt 1983a, 1995), Cerrado (Anderson & Vitt 1990, Vitt 1991, Vitt & Carvalho 1995, Mesquita & Colli 2003a,b) and Atlantic Rainforest (coastal Restinga habitats) (Dias & Rocha 2004, 2007) biomes. However, no information regarding populations living in transitional habitats has yet been published. In this study we investigate the diet, thermal ecology and habitat use of a population of *C. ocellifer* at a transitional area between caatinga and "campos rupestres" (rocky fields) habitats in northeastern Brazil.

MATERIAL AND METHODS

The study was carried out in an area at about 1000 m elevation in the Morro do Chapéu municipality (11°29'S, 41º07'W), state of Bahia, northeastern Brazil. The area is at the transition between Caatinga and "campos rupestres" (rocky fields – see Eiten 1992) habitats. The vegetation is predominantly herbaceous and shrubby on rocky and sandy substrates. The climate of the region is warm and dry. During the study period (November-December 2000), mean air temperature was 29.3°C and relative air humidity was 48.9% (values obtained with a thermohygrometer, measured every hour between 7:00 and 17:00 h, under vegetation in the shade, at a height of 1 m above ground). In this area, five other lizard species occur in sympatry with *C. ocellifer,* the tropidurids *Tropidurus hispidus* (Spix, 1825), *T. erythrocephalus* Rodrigues, 1987, *T. semitaeniatus* (Spix, 1825) and *T. cocorobensis* Rodrigues, 1987, and the teiid *Ameiva ameiva* (Linnaeus, 1758).

Lizards were collected from 27 November to 3 December, 2000, with rubber bands and an air rifle, during their period of activity. The collected individuals were euthanized with ether, fixed in formalin (dilution of 1:9) for 48 hours and stored in 70% ethanol. The microhabitat where each lizard was first seen was recorded according to the following categories: a) leaf litter inside shrubs; b) leaf litter at shrub edges; c) open sand; d) uncovered rocks; e) rocks covered by shrubs; and f) leaf litter outside shrubs. The difference between males and females in the frequency of microhabitats used was tested using a chi-square test (ZAR 1999). For each lizard, we recorded its body temperature (T_c), together with air (T_a) (1 cm above ground) and substrate temperatures (T_s), with a quick-reading Schultheis (near 0.2°C) cloacal thermometer. For each individual (prior to fixation), we measured snout-vent length (SVL), head length (HL, measured from posterior margin of tympanum to snout) and head width (HW, taken at the angle of the jaw) using a Vernier caliper (to the nearest 0.1 mm), and body mass (to the nearest 0.001g) with an electronic balance. Morphological differences in SVL between males and females were tested using analyses of variance for one factor (ANOVA). The differences in HL and HW between sexes were tested by analysis of covariance (ANCOVA), using SVL as covariate (ZAR 1999). To estimate the activity of *C. ocellifer* at the Morro do Chapéu, we performed hourly transects from 07:00 to 18:00 h during one day, looking for lizards.

In the laboratory, stomach contents were identified and arthropods found were categorized to the taxonomic level of Order. Unidentified arthropod remains were grouped in a separate category "unidentified parts of arthropods" and used only in volumetric analyses. Diet composition was estimated based on relative number, volume, and frequency of each prey type in stomachs. We measured the length and width of each prey with Vernier calipers (to the nearest 0.1 mm) and estimated its volume (mm^3) using the elipsoid formula: $4/3\pi(\text{prey length}/2)(\text{prey width}/2)^2$. The number of items was counted and the mean length (mm) and mean volume (mm^3) of the five largest items were estimated for each lizard and related to lizard morphology (head width and head length) by simple regression analyses (ZAR 1999). Due to the wide variation, all these values were log-transformed prior to analysis. A relative importance index (I_x) for each prey category was estimated by the sum of the proportional values of volume, number and frequency of occurrence of prey in the diet divided by three (sensu HOWARD *et al.* 1999).

Differences between males and females in prey consumption, based on mean length, mean volume and number of prey consumed (log-transformed) were tested by analyses of variance (ANOVA) and by analyses of covariance (ANCOVA) with SVL as covariate (ZAR 1999). The diference between numeric proportions of prey categories consumed by males and females was tested with a Paired t-Test (ZAR 1999).

For females we recorded the number of vitellogenic follicles in each ovary, the size and color of the largest follicle (yellow follicles were considered vitellogenic), the presence and size of corpora lutea, and the number and size of oviductal eggs. We measured the length and width of each egg and estimated its volume using the formula for the elipsoid (DUNHAM 1983). Females were considered reproductive if they had vitellogenic ovarian follicles or oviductal eggs. Mean clutch size was estimated by averaging the number of oviductal eggs and vitellogenic follicles (when eggs were absent). We considered the simultaneous occurrence of vitellogenic follicles, oviductal eggs or corpora lutea as an evidence of multiple clutches per year in the studied population.

Variations throughout the day in mean body temperatures of lizards in activity and in mean substrate and air temperatures were tested by analysis of variance (ANOVA) (including only samples with $N \geqslant 2$) (ZAR 1999). We analyzed the effect of environmental temperatures (T_a e T_s) on lizard body temperature using a multiple regression analysis (ZAR 1999). The effect of lizard SVL and mass on body temperature was also tested by multiple regression analysis (ZAR 1999) and differences in mean body temperature between males and females were tested by analysis of variance (ZAR 1999). Additionally, the tails of all individuals were examined for evidence of previous autotomy and differences between sexes in the frequency of regenerated tails were tested using the *Z*-test for proportions (lizards with broken tails or that lost their tails when captured or handled were ignored).

Results of descriptive statistics are presented throughout the text as mean ±1 standard deviation, except for volume and length mean values of the five largest preys, which are presented as mean ±1 standard error of mean.

Lizards used for this study were deposited in the herpetological collection of the Museu Nacional, Rio de Janeiro, Brazil (MNRJ 13816-13849).

All data were tested for homocedasticity of variances and for normality of distributions before performing statistical analyses.

RESULTS

Cnemidophorus ocellifer at the Morro do Chapéu had a mean SVL of 66.0 ± 7.9 mm (range 36.0-78.4 mm, N = 34) and a mean body mass of 7.7 ± 2.5 g (range 1.1-12.5 g, N = 34). Males ($\bar{x}$= 69.5 ± 5.7 mm SVL, N = 19) were larger than females ($\bar{x}$= 63.3 ± 4.2 mm SVL, N = 14) (ANOVA, $F_{1,31} = 11.53$; $p = 0.002$) (Fig. 1). Males also had wider heads than females (males: $\bar{x}$ = 10.9 ± 1.2 mm, N = 19; females: $\bar{x}$ = 8.9 ± 0.7 mm, N = 13) (ANCOVA, $F_{1,29} = 58.27$; $p < 0.001$).

Cnemidophorus ocellifer consumed 12 different prey categories (Tab. I) and no lizard had an empty stomach. The most

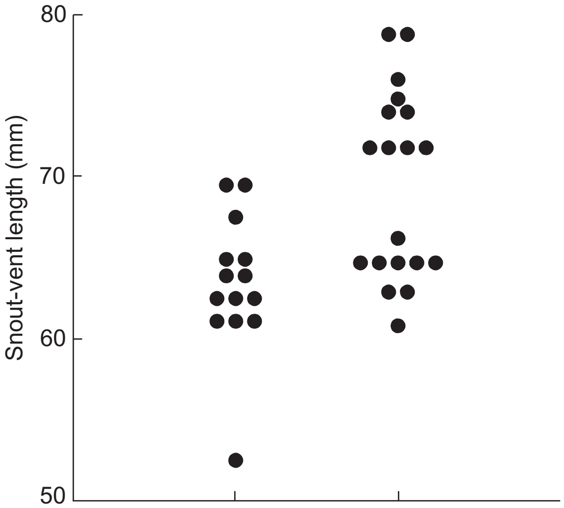


Figure 1. Snout-vent length (mm) of adult males and females of *C. ocellifer* from the Morro do Chapéu, Bahia.

frequent items were termites (71.9%), orthopterans (46.9%), larvae (34.4%) and spiders (31.2%). Termites were also the most numerous item, corresponding to 84.4% of the total of prey consumed (N = 568, Tab. I). Volumetrically, the dominant prey types were orthopterans (27.5%), termites (21.5%) and cockroaches (11.8%). Termites (59.2) and orthopterans (25.7) were the most important items (highest I_x), followed by larvae (15.3) and spiders (13.4). Among larvae, coleopterans were more important than lepidopterans (Tab. I).

Mean volume and mean length of the five largest items and the number of preys consumed were not correlated with body measurements, except for head length which was positively correlated with prey volume (Tab. II). The number of preys consumed per lizard varied from two to 90 ($\bar{x}$= 23.2 ± 23.1, N = 29) and males consumed significantly more prey than females (males: 31.6 ± 27.3, N = 16; females: 12.5 ± 10.6, N = 12; ANOVA: $F_{1,26} = 4.469$, p = 0.004), but after removing the effect of body size there was no sex difference in the mean number of ingested prey (ANCOVA: $F_{1,1,25} = 3.732$, p = 0.065). The numeric proportion of each prey category did not differ between

Table I. Number, volume, and frequency of prey categories in the diet of *C. ocellifer* (N = 32), at the Morro do Chapéu, Bahia. (I_x) relative importance index.

Food item	Number	(%)	Volume	(%)	Frequency	I_x
Arachnida						
Aranae	12	1.78	587.83	7.18	31.25	13.40
Diplopoda	4	0.59	63.09	0.77	12.50	4.62
Hexapoda						
Orthoptera	19	2.82	2251.42	27.50	46.87	25.73
Isoptera	568	84.40	1758.71	21.49	71.87	59.25
Blattoidea	5	0.74	968.53	11.83	15.62	9.40
Hemiptera	1	0.15	33.28	0.41	3.12	1.23
Homoptera	5	0.74	201.92	2.47	15.62	6.28
Coleoptera						
Adults	8	1.19	69.31	0.85	18.75	6.93
Larvae	14	2.08	566.53	6.92	25.00	11.33
Neuroptera Larvae	1	0.15	2.49	0.03	3.12	1.10
Hymenoptera Formicidae	4	0.59	1.88	0.02	9.37	3.33
Lepidoptera						
Adults	2	0.30	9.95	0.12	6.25	2.22
Larvae	3	0.45	154.55	1.89	9.37	3.90
Total of larvae	19	2.83	724.16	8.85	34.37	15.30
Insect eggs	10	1.49	109.3	1.34	9.37	4.06
Unidentified arthropods			1067.46	13.04		
Plant material						
Flowers	15	2.23	338.21	4.13	21.87	9.41
Seeds	1	0.15	0.68	0.01	3.12	1.09
Total	673		8185.73			

Table II. Regression statistics relating lizard morphology (log-transformed) to number, mean length (mm) and mean volume of the five largest prey items of *C. ocellifer* at the Morro do Chapéu.

	Number of prey	Mean length of five largest prey	Mean volume of the five largest prey
Head width	F1.27 = 0.360, p = 0.553	F1.27 = 0.000, p = 0.991	F1.27 = 1.854, p = 0.185
Head length	F1.27 = 0.850, p = 0.365	F1.27 = 0.254, p = 0.618	F1.27 = 5.939, p = 0.022

males and females of *C. ocellifer* (Paired t-Test; t = 1.000, df = 13, $p > 0.05$) (Tab. III). Mean prey volume was $\bar{x} = 43.5 \pm 13.4$ mm^3 (N = 29) and males and females ingested similar volumes of prey (males: 35.3 ± 8.4 mm^3, N = 16; females: 57.7 ± 30.6 mm^3, N = 12; ANOVA: $F_{1,26} = 0.022$, p = 0.883). Mean prey length was $\bar{x} = 6.4 \pm 0.5$ (N = 29), with no differences between sexes (males: 5.7 ± 0.4 mm, N = 16; females: 7.5 ± 1.0 mm, N = 12; $F_{1,26} = 2.312$; p = 0.140).

Table III. Diet composition by number (% in parenthesis) of prey consumed by males (N = 16) and females (N = 12) of *C. ocellifer* at the Morro do Chapéu.

Prey types	Males	Females
Isoptera	458 (90.3)	94 (63.5)
Orthoptera	11 (2.2)	8 (5.4)
Coleoptera	7 (1.4)	1 (0.7)
Larva	6 (1.2)	11 (7.4)
Flower	6 (1.2)	9 (6.1)
Aranae	6 (1.2)	6 (4.1)
Hymenoptera (Formicidae)	3 (0.6)	1 (0.7)
Lepidoptera	2 (0.4)	0 (0.0)
Blattaria	2 (0.4)	3 (2.0)
Diplopoda	2 (0.4)	2 (1.4)
Insect eggs	1 (0.2)	9 (6.1)
Homoptera	1 (0.2)	4 (2.7)
Seed	1 (0.2)	0 (0.0)
Hemiptera	1 (0.2)	0 (0.0)

Mean SVL of reproductive females was 63.4 ± 4.4 mm (range 52.5-69.9 mm, N = 13). Clutch size averaged 2.7 ± 1.6 (range = 1-6, N = 11, vitellogenic follicles). For females bearing oviductal eggs, mean egg volume was 494.1 ± 40.4 mm^3 (range = 458.5-538.1, N = 3) for the eggs in the right oviduct and 421.4 ± 37.8 mm^3 (range = 381.2-456.3) for the eggs in the left oviduct. Only one female simultaneously bore oviductal eggs and vitellogenic follicles.

The first active *C. ocellifer* was observed at 7:00 h and, from then on, the number of active lizards increased until a maximum between 10:00 h and 14:00 h, decreasing afterwards (Fig. 2). After 16:00 h no active *C. ocellifer* was seen. Mean body temperature in activity was 37.6 ± 1.6°C (range 34.0 to 40.8°C, N = 29). Mean body temperature did not vary throughout the activity period ($F_{8,21} = 0.574$, p = 0.747). Most (75.9%) lizards had body temperatures above 37.0ºC. Mean body temperature did not differ between males and females ($F_{1,28} = 0.119$, p = 0.733). Mean air temperature was 30.7 ± 2.3ºC (range 25.0-36.6ºC, N = 31) and mean substrate temperature was 33.0 ± 3.4ºC (26.0-42.0ºC, N = 31). Mean air temperature ($F_{8,21} = 1.093$, p = 0.406) and mean substrate temperature ($F_{8,21} = 2.150$, p = 0.077) did not vary throughout the day (Figs 3-5). Relationship between lizard body temperature and environmental temperatures (air and substrate) was positive and significant ($F_{2,28} = 4.814$; $R^2 = 0.256$; p = 0.016), but only substrate temperature (p = 0.035) explained an additional portion of the variation in body temperature. Body temperature was not significantly ($p > 0.05$) related to lizard SVL and body mass.

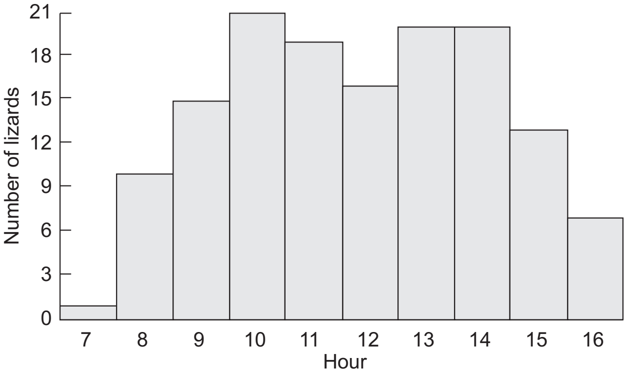
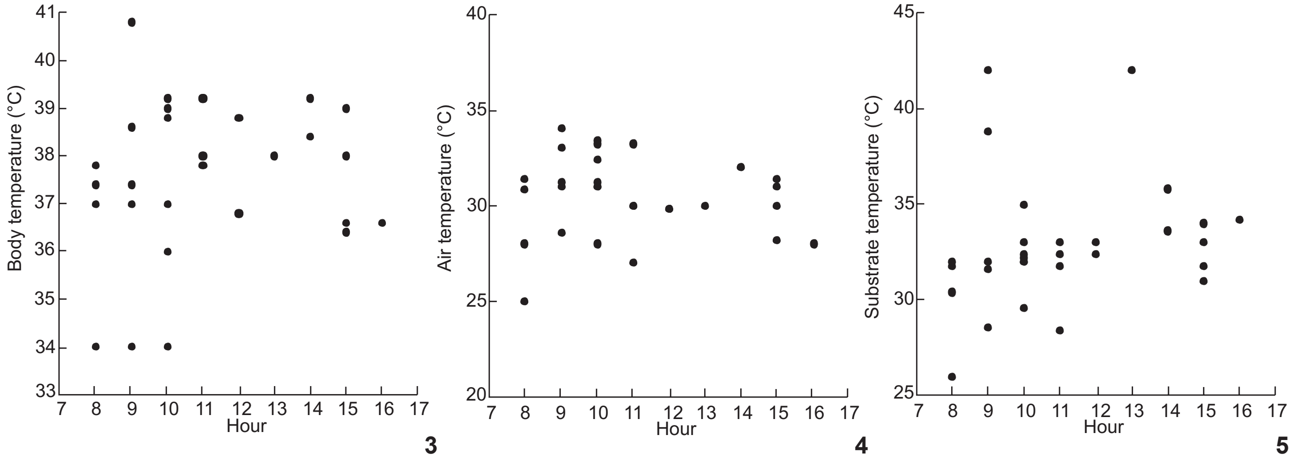


Figure 2. Activity period of *C. ocellifer* at the Morro do Chapéu, Bahia, during a single sunny day, with mean air temperature of 29.2 ± 4.2°C and mean relative air humidity of 50.0 ±13.9 mm.

The main microhabitats used by *C. ocellifer* at Morro do Chapéu were leaf litter inside shrubs (45.5%) and leaf litter at shrub edge (42.4%) (Fig. 6). We saw no *C. ocellifer* on rocky substrates. Males and females did not differ in the proportion of microhabitats utilized (chi-square = 0.111, p = 0.739).

The frequency of regenerated tail was 33.3% (10/30), not significantly different between males (5/16) and females (5/13) (Z = -0.406, p = 0.342).



Figures 3-5. Body temperatures recorded during activity of *C. ocellifer* (3) and air (4) and substrate (5) temperatures (°C) throughout the day in the Morro do Chapéu, Bahia. Dots represent observations in different days.

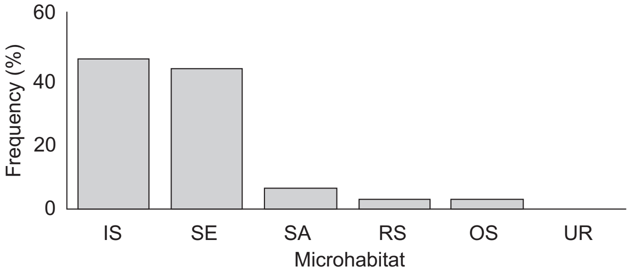


Figure 6. Frequency of the different types of microhabitats used by individuals of *C. ocellifer* at the Morro do Chapéu, Bahia, Brazil. (IS) Leaf litter inside shrubs, (SE) leaf litter at shrub edge, (SA) open sand, (RS) rocks covered by shrubs, (OS) leaf litter outside shrubs, (UR) uncovered rocks, N = 33.

DISCUSSION

Diet of *C. ocellifer* in Morro do Chapéu was composed mainly by arthropods, with isopterans, orthopterans, larvae and cockroaches being the dominant items. Isopterans have low mobility and occur aggregated in the environment, being frequently preyed upon by active foraging lizards (e.g. PIANKA 1986, BERGALLO & ROCHA 1993, EIFLER & EIFLER 1998, ZALUAR & ROCHA 2000, MESQUITA & COLLI 2003a, TEIXEIRA-FILHO *et al.* 2003, DIAS & ROCHA 2007). Insect larvae also have low mobility and high nutritive value, being sometimes found grouped on leaves and plant stems (PIANKA 1986). Isopterans and larvae are usually consumed in high proportions by *Cnemidophorus* spp. (e.g. BERGALLO & ROCHA 1993, VITT & CARVALHO 1995, VITT *et al.* 1997, MESQUITA & COLLI, 2003a, TEIXEIRA-FILHO *et al.* 2003, DIAS & ROCHA 2007, MENEZES *et al.* 2008) and, in general, are important sources of energy and hydric balance for lizards (NAGY *et al.* 1984, ANDERSON & KARASOV 1988). Because active foraging lizards usually rely on chemical cues to detect and recognize their prey (COOPER 1990), they are efficient in finding preys with low mobility, which live in the leaf litter or in the upper soil layer (such as termites, insect larvae, and spiders). Cockroaches and spiders also constitute important preys for *C. ocellifer* from other populations (MESQUITA & COLLI 2003a, DIAS & ROCHA 2007), and also for other *Cnemidophorus* species (e.g. VITT 1991, MAGNUSSON & SILVA 1993, VITT *et al.* 1993, 1999, DIAS & ROCHA 2007, MENEZES *et al.* 2006, 2008), with some exceptions (MESQUITA & COLLI 2003b).

Plants are an important source of water to omnivorous and herbivorous lizards in environments with little availability of free water (e.g. SCHALL & RESSEL 1991, ROCHA 1996a, 2000). The consumption of plant material has been reported for different species of active foraging lizards, including *Cnemidophorus* species (e.g. SCHALL & RESSEL 1991, MAGNUSSON & SILVA 1993, PAULISSEN & WALKER 1994, SCHALL & DEARING 1994, VITT *et al.* 1997, SCHALL 2000, DIAS & ROCHA 2007). At the Morro do Chapéu, flowers were the fifth most frequent item (21.9%) in the diet of *C. ocellifer*. This fact, associated with the presence of intact flowers in stomachs, does not support the hypothesis of accidental ingestion during capture of insects. All flowers found in the stomachs were identical (*Cassia* sp.).

The fact that no individuals examined had empty stomachs suggests that the population is in a positive energetic balance (sensu HUEY *et al.* 2001). In general, *Cnemidophorus* lizards have low proportions of individuals with empty stomachs – e.g. 3.0% for *C. nativo* Rocha, Bergallo & Peccinini-Seale, 1997 (MENEZES *et al.* 2008), 2.9% for *C. littoralis* Rocha, Araújo, Vrcibradic & Costa, 2000 (TEIXEIRA-FILHO *et al.* 2003).

Despite the apparent differences among sexes in the number of prey consumed, the statistics showed that when the effect of body size was removed from the analysis, no differences were detected. So, for this *C. ocellifer* population we can infer that there are no differences among sexes in mean number of prey consumed. Similarly, the frequency of occurrence of prey categories did not differ among sexes, indicating that the diet of males and females are also similar qualitatively, in spite of the larger body size of males compared to females.

The mean number and mean length of prey of *C. ocellifer* in Morro do Chapéu were similar to those reported for the unisexual *C. nativo* in Guaratiba, Bahia, $\bar{x}_{\text{number of preys}} = 23.0 \pm 2.8$, $\bar{x}_{\text{prey length}} = 8.2 \pm 0.4$ (Menezes *et al.* 2008), and for the bisexual *C. deppii* Wiegmann, 1834 in Nicaragua, $\bar{x}_{\text{number of preys}} = 16.7 \pm 5.1$; $\bar{x}_{\text{prey length}} = 4.4 \pm 0.2$ (Vitt *et al.* 1993). However, mean prey volume for *C. ocellifer* in the Morro do Chapéu (Bahia) was higher than other cogeneric species, e.g. *C. nativo*: $\bar{x} = 20.4 \pm 2.2$ Menezes *et al.* (2008) and *C. deppii*: $\bar{x} = 15.0 \pm 2.6$ (Vitt *et al.* 1993). This difference can be associated to the greater consumption of orthopterans (large and voluminous prey) in the Morro do Chapéu when compared to the other cited species (Vitt *et al.* 1993, Menezes *et al.* 2008). In general, prey size varies among lizard species and body size of the lizards explains some of this variation (Magnusson *et al.* 1985, Vitt & Zani 1998). However, in terms of number of prey, larger lizard species do not necessarily eat more prey items (Vitt & Zani 1998). In *Cnemidophorus* spp., on the contrary, this is not always the case. As *Cnemidophorus* spp. generally feed on large quantities of Isoptera, the proportion of termites influence the mean prey size per lizard species/population. In general, there is no relation between number, length and mean volume of the prey and the morphology in many species of *Cnemidophorus* (e.g. Vitt *et al.* 1997, Mesquita & Colli 2003a,b, Teixeira-Filho *et al.* 2003, Dias & Rocha 2007, Menezes *et al.* 2008), a consequence of the consumption of large numbers of isopterans, small prey with little variation in body size (Mesquita & Colli 2003a, Teixeira-Filho *et al.* 2003, Dias & Rocha 2007, Menezes *et al.* 2008).

Mean clutch size of *C. ocellifer* at the Morro do Chapéu was similar to that of other conspecific populations and congeneric species in South America, suggesting that clutch size may be phylogenetically restricted for most species [e.g. *C. ocellifer* in Brazilian cerrado (2.3 – Vitt 1991; 2.0 – Mesquita & Colli 2003a) and caatinga (2.7 – Vitt 1983a); *C. nativo* in northeastern Brazil (2.2 – Menezes *et al.* 2004); *C. lemniscatus* (Linnaeus 1758) in Cumaná, Venezuela (2.6 – Fitch 1985); *C. lacertoides* Duméril & Bibron 1839 in Córdoba, Argentina (3.0 – Aún & Martori 1996)], although there are some exceptions of species with a fixed clutch size of a single egg (e.g. *C. mumbuca* – Colli *et al.* 2003 and *C. jalapensis* – Colli *et al.* 2009).

There is sexual dimorfism in body size and head width (males had greater values than females in both cases), similar to other species/populations of *Cnemidophorus* in Brazil (Vitt 1983a, Vitt *et al.* 1997, Rocha *et al.* 2000, Mesquita & Colli 2003b, Teixeira-Filho *et al.* 2003, Dias & Rocha 2007). This can be related to the fact that larger bodies and jaws may confer an advantage during intraspecific male-male agonistic interactions (e.g. Vitt 1983a, Anderson & Vitt 1990, Rocha 1996b).

Frequency of regenerated tails in *C. ocellifer* from the Morro do Chapéu was relatively low when compared to other species of active foraging lizards [e.g. 62.3% in *Vanzosaura rubricauda* (Boulenger, 1902) – Vitt 1983b; 83.3% in *Mabuya agilis* (Raddi 1823) – Vrcibradic & Rocha 2002; 82.4% in *Mabuya frenata* (Cope 1862) – Van Sluys *et al.* 2002]. Nevertheless, it was similar to those reported for other cnemidophorines [e.g. 38.4% in *C. ocellifer* – Vitt 1983b; 25.9% in *Ameiva ameiva* Zani 1996; 27.2% in *Aspidoscelis sexlineata* (Linnaeus 1766) – Fitch 2003]. This similarity in tail break frequencies among cnemidophorines may be due to phylogenetic similarities in ease of tail shedding. Tail loss in lizards is a highly complex process and affects several physiological activities (Daniels 1983). As a consequence, loss of tail (whole or part of it) can be energetically expensive, particularly so during the breeding season, because of their potential role as energy storage for reproduction (Vitt & Cooper 1986). Similarly, tail loss also impairs locomotion and reduces escape speed in some species (Ballinger *et al.* 1979, Brown *et al.* 1995).

Body temperatures of active *C. ocellifer* in the Morro do Chapéu were similar to those recorded for other populations (Dias & Rocha 2004, Mesquita & Colli 2003a, Vitt 1995) and also for other species of *Cnemidophorus* (Vitt & Carvalho 1995, Teixeira-Filho *et al.* 1995, Menezes *et al.* 2000, Dias & Rocha 2004). Our data is in agreement with the idea of Bogert (1949) and Schall (1977) that closely related lizards tend to have similar body temperatures even living in different habitats or geographical areas. In the Morro do Chapéu, at least the two measured environmental sources of heat (substrate and air) were associated with body temperature of *C. ocellifer*. Substrate and air temperatures jointly explained about 26% of the variation in the lizard body temperature, but only substrate temperature explained an additional portion of lizard body temperature. This is suggestive that direct insulation (which was not measured here) may also play an important role together with air and substrate temperature. For this population, mean activity temperature was not influenced by lizard size or body mass, similar to other species of lizards (e.g. Smith & Ballinger 1994, Vrcibradic & Rocha 1998, Kiefer *et al.* 2005, Ibargüengoytía 2005).

Lack of sexual dimorphism in body temperature of *C. ocellifer* can be related, among other factors, to the similarity in use of different microhabitats in the study area. *Cnemidophorus* lizards normally occur in environments with sandy soils and where humidity is relatively low. In these environments, they generally forage in open places such as shrub edges (Teixeira-Filho *et al.* 1995, Menezes *et al.* 2000, Mesquita & Colli 2003a, Dias & Rocha 2007). The high frequency with which *C. ocellifer* in the Morro do Chapéu used the interior of shrubs suggests that this microhabitat may provide an appropriate thermal and foraging environment as well as shelter from potential predators.

We conclude that *C. ocellifer* at the Morro do Chapéu is an omnivorous lizard that preferentially consumes termites and orthopterans. Sexes do not differ in the types of consumed prey. Mean body temperature while active is relatively high, as expected for an active foraging lizard. Ecology of *C. ocellifer* at the Morro do Chapéu, despite representing a population living in a transitional habitat, did not differ much from previous reports for other conspecific populations.

ACKNOWLEDGMENTS

This study is part of the Programa de Ecologia, Conservação e Manejo de Ecossistemas do Sudeste Brasileiro and of the Projeto Ecologia de Répteis do Leste Brasileiro, both of the Departamento de Ecologia, Instituto de Biologia, Universidade do Estado do Rio de Janeiro. We thank the Conselho Nacional de Desenvolvimento Científico e Tecnológico for research grants to C.F.D.R. (304791/20010-5 and 470265/2010-8), to M.V.S. (307773/2008-6 and 479874/2001-8) and a Graduate fellowship to V.A.M. and to A.F.F., the Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro for research grants to M.V.S. (E-26/172.383/2000). CFDR also received a grant from the Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (through the Programa Cientistas do Nosso Estado, Process E-26/102.404.2009). Currently VAM is associated to the Programa de Pós-Graduação em Ecologia of the Universidade do Estado do Rio de Janeiro and receives a Post-Doctoral grant from the FAPERJ. We are grateful to D. Vrcibradic for the review of the manuscript.

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Submitted: 30.X.2009; Accepted: 02.I.2011.
Editorial responsibility: Ana Lúcia da C. Prudente