DIET OF *Hemidactylus mabouia* (SAURIA, GEKKONIDAE) IN URBAN AREA OF SOUTHERN BRAZIL

Fabrício Bonfiglio
Rafael Lucchesi Balestrin
Lize Helena Cappellari

ABSTRACT

*Hemidactylus mabouia*

*H. mabouia*

*Hemidactylus mabouia*

Key words: *Hemidactylus mabouia*

RESUMO

Dieta de *Hemidactylus mabouia* (Sauria, Gekkonidae) em área urbana no sul do Brasil

*Hemidactylus mabouia*

*H. mabouia*

*Hemidactylus mabouia*

Palavras-chave: *Hemidactylus mabouia*

INTRODUCTION
Possibilities of establishment and colonization of such species in new environments (Zamprogno and Teixeira, 1998).

Hemidactylus mabouia (Moreau de Jonnès, 1818) belongs to family Gekkonidae, from Africa, possibly brought to Brazil in slave ships (Vanzolini, 1968, 1978). It is an effective colonizer, widely distributed and frequently associated to urban areas (Howard et al., 2001). It is currently well distributed all over the country, generally in urban areas, but also found in natural environments of several biomes of Brazil (Vanzolini, 1968, 1978; Vitt, 1986; Zamprogno and Teixeira, 1998). Few studies evaluated natural history of this species in Brazil, and most information is about feeding habits (Vitt, 1986; Vitt, 1995; Zamprogno and Teixeira, 1998; Vanzolini et al., 1980; Ramires and Fraguas, 2004).

This study analyzes the diet of Hemidactylus mabouia in urban areas of Porto Alegre, Rio Grande do Sul State, evaluating sexual and ontogenetic variation in diet.

MATERIAL AND METHODS

The study was carried out in urban areas of Porto Alegre City (30°04' S, 51°11' W), Rio Grande do Sul, from January to December 2003. Specimens were captured between 19:00 and 23:00 h. Specimens captured (n = 80) were sacrificed, fixed in 10% formalin and preserved in 70% alcohol. The lizards weight was measured with Pesola® Spring Scales (precision 0.25 g) and their snout-vent length (SVL) was measured with Mitutoyo® caliper (accuracy 0.01 mm). The lizards were dissected in laboratory and their stomach contents were analyzed under stereomicroscope. Prey items were identified and classified to the taxonomic level of Order. The food remains we could not identify were grouped as "non-identified arthropods" (NIA). The food items of each specimen were counted and measured (larger length and width) with digital caliper. The volume of each item (mm$^3$) was estimated by the spheroid volume formula:

\[ V = \pi \left( \frac{\text{length}}{2} \right) \left( \frac{\text{width}}{2} \right)^2 \]

RESULTS

Among the captured lizards (n = 80), 55 specimens (28 juveniles, 14 females and 13 males) had stomach content.

The diet of Hemidactylus mabouia was basically composed of arthropods, including 12 orders of
Hemidactylus mabouia

Diet of Hemidactylus mabouia...

insects, two orders of crustaceans and two orders of arachnids. Two male specimens had one juvenile of Hemidactylus mabouia each in the stomach.

Diptera was the most frequent order, being present in 30.9% of stomachs, and the numerically most important taxon, corresponding to 39.27% of the total ingested prey (n = 275) and to 10.55% of the total volume of prey. Araneae was the second most frequent item in the diet of Hemidactylus mabouia, being present in 27.2% of the total sample, corresponding to 5.82% of the total number of prey and to 13.12% of the total volume. Numerically, the most important item after Diptera (39.27%) was Hemiptera, which corresponded to 26.5% of the total ingested, to 7.41% of the total volume of prey and was present in 21.82% of the stomachs (Tab. 1).

Regarding volume of prey, the most important item was Orthoptera (20.4%), corresponding to 5.45% and 1.09% of frequency and number of prey, respectively. The second most important item concerning volume was Araneae (Tab. 1).

The mean diversity of prey in each stomach was 1.98 (SD = 1.03) and 5 taxa was the maximum richness found in a stomach. The highest number of prey items found in one specimen was 51, and the general mean was 5.49 (DP = 9.38) items.

The mean number of prey consumed by adult males was 5.69 ± 11.35, and by adult females 4.69 ± 6.35; the difference between males and females was not significant (U = 75.0; p = 0.62). The mean volume of prey consumed by adult males was 239.58 ± 262.03 mm³, and by females 146.28 ± 223.10 mm³; the difference was not significant either (ANOVA F = 1.02; p = 0.32, n = 27).

Adult lizards (males and females) consumed mean number of 5.19 ± 9.03 prey, whereas juveniles consumed mean number of 5.83 ± 10.12 prey; the difference was not significant (U = 274.0; p = 0.46). The mean volume of prey consumed by adults (191.20 ± 239.51 mm³) was significantly larger than the mean volume of prey consumed by juveniles (65.03 ± 134.85 mm³) (U = 176.00; p < 0.001).

The correlation between number of prey in each stomach and the body size of the lizard was not significant (ANOVA, F = 0.47; p = 0.83). The correlation between the mean volume of prey in each stomach and the SVL of the lizards was positive and significant (ANOVA, R² = 0.15; F = 9.76, p < 0.01).

The feeding similarity (concerning number of prey groups) was higher between males and females (Oj = 0.94) than between females and juveniles (Oj = 0.57) or males and juveniles (Oj = 0.55). Concerning volume of prey, the feeding similarity was higher between juveniles and adult males (Oj = 0.32) than between adult males and females (Oj = 0.09) or juveniles and adult females (Oj = 0.10).

Trophic diversity was higher in the diet of adult females (H' = 2.83) than in the diet of juveniles (H' = 2.32) and males (H' = 2.09). The Importance Value Index of feeding items revealed Hemiptera as the most important item in the diet of juveniles (IVI = 1.02), whereas Diptera is the most important item in the diet of adult males and females (IVI = 0.93 and IVI = 0.90, respectively). In general, the most important item was Diptera (IVI = 0.83), followed by Araneae (IVI = 0.49) and Hemiptera (IVI = 0.46).

DISCUSSION

The data indicates that the population of Hemidactylus mabouia studied in the urban area of Porto Alegre is generalistic and opportunistic, feeding mainly on arthropods, corroborating other studies on the species in natural areas. However, differences in the proportion of certain prey categories are observed. VITT (1995) mentions that insect larvae are important in the diet of Hemidactylus mabouia in the Caatinga region of Brazil. In Porto Alegre, however, this category is represented by a single specimen in only one lizard. ZAMPROGNO and TEIXEIRA (1998) found Aranae, Homoptera, and Isopoda in a population of this species in the Sandy Costal Plain of Espírito Santo. In our data, Diptera was the most important item of Hemidactylus mabouia, most likely because of the higher availability of this prey category in urban areas. According to ZAMPROGNO and TEIXEIRA (1998), diet variation in Hemidactylus mabouia may be a consequence of its opportunistic behavior allied to differential prey availability in different areas studied.

Among the total of specimens captured (n = 80), 25 lizards did not present stomach content. According to Huey et al., 2001, nocturnal species of lizards tend to present higher proportion of individuals with empty stomachs when compared to diurnal species. This high number of empty stomachs may be due to the fact that most captures happened in early hours of night, when the lizards were emerging and had no long enough foraging time to catch prey.

According to Cooper (1994), family Gekkonidae presents “sit-and-wait” foraging mode, which is in accordance to the diet found for this population of Hemidactylus mabouia.
Hemidactylus mabouia

ACKNOWLEDGMENTS

REFERENCES

H. mabouia

Cnemidophorus longicaudus
Boletín de la Sociedad Biológica de Concepción

Hemidactylus mabouia

Comunicações do Museu de Ciências e Tecnologia da PUCRS, Série Zoologia

. Journal of Chemical Ecology

University of Kansas Science Bulletin

S. Scoloporus

Journal of Herpetology

Uma paraphygas

Thecadactylus rapicauda
Sphaerodactylus sputator
Caribbean Journal of Science

H. mabouia.

Ecology
Ecology:

Review of Ecology and Systematics

H. mabouia

Loxosceles

Journal of Venomous Animals and Toxins including Tropical Diseases

mabouia

intermedia

Loxosceles

Memórias do Instituto Butantan

mabouia

intermedia

Hemidactylus

Loxosceles

Oecologia

Hemidactylus

Arquivos de Zoologia

Papéis Avulsos de Zoologia
**Hemidactylus mabouia**

<table>
<thead>
<tr>
<th>Item</th>
<th>Juveniles (n = 28)</th>
<th>Adult Males (n = 13)</th>
<th>Adult Females (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>V (%)</td>
<td>F (%)</td>
</tr>
<tr>
<td><strong>Reptilia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>H. mabouia</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Crustacea</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Insecta</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hemiptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hymenoptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Isoptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lepidoptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lepidoptera Larvae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Neuroptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Orthoptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psocoptera</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arachnida</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Acari</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Araneae</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>NIA</em></td>
<td>152.14</td>
<td>8.25</td>
<td></td>
</tr>
</tbody>
</table>