
Reproductive ecology, foraging and burrow behavior of *Dermatonotus muelleri* (Anura, Microhylidae)

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Abstract

The majority of species which lives in environment with a high degree of temporal heterogeneity of the resources distributions presents specific adaptations which allow solving ecological problems. *Dermatonotus muelleri* is an endemic species which lives in a system of high unpredictability, and presents specific adaptations to the habitat. A population of *D. muelleri* was accompanied for two rainy seasons in Vitória Brasil, northwestern region of São Paulo State. The aims of this study were: determine the reproductive pattern of *D. muelleri*, with emphasis on the mechanisms which determine the synchronism between males and females, the regulation of the operational sex ratio (OSR), and the adaptability of *D. muelleri* to semi-arid environments by the forage and burrow behaviors. For determination of the OSR the abundance of males and females was estimated by visual encounter. The abundance of calling males was determined by survey at breeding site. These data were correlated with environmental factors (temperature, relative humidity and rainfall). Specimens collected were marked by toe clipping and the neighbor distance between calling males and between a clasped pair and a neighbor male were measured to verify the occurrence of sexual selection. The male and female behavior was observed by focal animal, all occurrence and *ad libitum* methods. The monthly abundance of males and females were positively correlated with the rainfall and with the minimum air temperature, and negatively with the air temperature variation. However, at a daily scale, was observed a time lag between the formation of the reproductive events and the environmental fluctuations, which could be associated with the termite reproductive phenology, the principal food item of *D. muelleri*. The males show no territoriality and exhibit two different patterns of active search behavior, which make improbable the occurrence of females sexual selection. Females rarely return in posterior reproductive events and stay in the pond a only night per reproductive event. The males mating call could be heard for great distances, and should stimulate females' reproductive behavior, but grants no opportunity for sexual selection by females. Males also exhibit behaviors which reduce costs to long distance communication (specific microhabitat selection to calling activity, reproduction in open areas, mating call emission with only one contraction of the chest region). The specialized feeding habits,

the calling activity and the environmental fluctuations (rainfall, minimum air temperature and/or temperature air variation) are important to synchronous between males and females of *D. muelleri* during reproductive events. The foraging activity is modulated in accord to spatial distribution of the resources, being designed to an efficient harvesting of a key resource (Isoptera). These energy, harvested in a limited amount of time, must be sufficient to satisfied the reproduction and aestivation activities. In the other hand, the aestivation activity also contributes to the feeding specialization, since allow *D. muelleri* to survive in time when food is scarce. *Dermatonotus muelleri* is the second known species that have the ability to flex the head at an acute angle while keeping the vertebral column stationary, in addition to *Hemisus marmoratus* (Hemisotidae). In conclusion, the patchy spatial distribution of the prey and the severe dry season, act strongly in the selection of the widely foraging tactic and of the burrow behavior with a subterranean chamber, related to the organism maintenance, and shown the high degree of specialization of *D. muelleri* to arid environments.

Key-words: termites, sexual synchronism, behavioral ecology.

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