THE COMPOSITION OF SPIDER ASSEMBLAGES VARIES ALONG REPRODUCTIVE AND ARCHITECTURAL GRADIENTS IN SHRUBS *BYRSONIMA INTERMEDIA* (MALPIGHIACEAE)

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INTRODUÇÃO

The influence of plant structural traits on microhabitat selection has been demonstrated for spiders around the world. The spiders preferences for particular microhabitats result in variation of spider diversity related to both, the structure of vegetative parts (Souza 2005) and the presence of reproductive structures (Souza & Martins 2004). Floral structures may provide refuge from predators and harsh environmental conditions, facilitating camouflaging for prey capture and serving as breeding sites (Johnson 1995). Abundance of potential prey for spiders is high in buds and flowers, as these structures are often visited by herbivores and pollinating insects (Louda 1982). Furthermore, fruits attract insects and may depend on these to complete their life cycles (Burkhardt *et al.*, 2009). The presence and succession of reproductive elements of plants mask the effects of plant structural complexity on spider diversity, because reproductive structures not only modify plant architecture (by changing biomass spatial arrangement), but also amplify the local prey availability, being attractive to spiders for a many reasons (Schmidt & Rypstra 2010).

OBJETIVOS

We evaluated if relative amount of each reproductive element, height and biomass of the *Byrsonima intermedia* A. Juss (Malpighiaceae) shrubs explain variation in composition of spider assemblage.

MATERIAL E MÉTODOS

Data were collected from an area of the Brazilian savanna ("cerrado *stricto sensu*") in Campo Grande, Mato Grosso do Sul, southwestern Brazil (Embrapa Gado de Corte, 20°26'36.6"S, 54°43'30.6"W). A total of 44 shrubs (typically six each week) were sampled. All the buds, flowers, fruits and leaves from each shrub were collected and the fresh mass of each of these types of structure was weighed. All the spiders collected in each shrub were identified at the family level. The 44 plant specimens were randomly grouped into 11 samples of four plants to avoid arch effect for the representation of the gradients in the spiders community. Ordination by non - metric multidimensional scaling (NMDS) was employed to represent the variation in relative amount of leaves, buds, flowers, and fruits across plant samples. We considered the relative biomass of vegetative structures (leaves) and reproductive structures (buds, flowers, and fruits). A BrayCurtis dissimilarity matrix was employed for this ordination. NMDS was also used to represent spider family composition. A BrayCurtis dissimilarity matrix based on relative frequencies was employed for this purpose.

RESULTADOS

Ordination of *B. intermedia* samples by relative mass of leaves, buds, flowers, and fruits using NMDS (n = 11, $R^2 = 0.94$) was capable of representing variation in composition of reproductive elements. A total of 195 spiders from nine families were collected from 44 shrubs. Salticidae (62 specimens), Anyphaenidae (33), and Thomisidae (21) were the most abundant families. A mean Shannon's index of 1.49 was found for family diversity, ranging from 0.67 to 1.86 for the 11 samples and varying randomly with reproductive plant elements, height, and biomass in a multiple regression model (n = 11; $R^2 = 0.68$; $P = 0.35$). Samples ordination by NMDS (n = 11, $R^2 = 0.73$), considering relative frequencies of spider occurrence, represented the gradient of spider family composition. Spiders of the family Salticidae were found throughout this gradient; Theridiidae and Thomisidae were more likely to occur at the beginning of the gradient; Araneidae and Oxyopidae, at the end. Other families occurred in intermediate portions of the gradient. In a multiple regression model (n = 11; $R^2 = 0.68$; $P = 0.036$), NMDS scores for spider family composition varied as a linear function of NMDS scores for composition of reproductive plant elements (b = 1.68; $P = 0.043$) and height ($b = 0.38$; $P = 0.008$), but not of biomass ($P = 0.573$). This finding reveals that, regardless of aboveground biomass, *B. intermedia*'s structural complexity (represented by height) and composition of reproductive elements (represented by sample ordination based on bud, flower, fruit, and leaf biomasses) explained 68% of the variation in the spider assemblage. The present study is, to our knowledge, the first to demonstrate how the composition of a spider assemblage varies with a quantitative measure of reproductive elements composition, irrespective of total plant biomass. Since variation in plant architecture as a function of size influences habitat complexity (Faria & Lima 2008), this investigation evaluated the isolated effect of architecture by measuring shrub height and disregarding the variation due to biomass, which was achieved by taking into account the multiple regression model. Taller shrubs have more branches and these are more spread out, whereas biomass represents the amount of habitat available for spiders. In the present study, effects of leaf, bud, flower, fruit and biomass on spider occurrence revealed a pattern of family turnover in which, Theridiidae occured in samples with the major proportions of buds and flowers, while Oxyopidae occurred only in sample with the major proportions of fruits. This pattern suggests that niche partitioning is dependent on the reproductive phenology of *B. intermedia*, more specifically dependent on the composition of reproductive elements.

CONCLUSÃO

We concluded that spider composition depends on habitat structure, with a pattern of family turnover occurring along gradients of reproductive elements and height, irrespective of plant biomass.

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