

Use of *Gochmatia barrosii* Cabrera (Asteraceae) by *Isodontia costipennis* Spinola 1851 (Hymenoptera; Sphecidae) for nest construction in the Boqueirão Reserve, MG

Uso de *Gochmatia barrosii* Cabrera (Asteraceae) por *Isodontia costipennis* Spinola 1851 (Hymenoptera; Sphecidae) para construção dos ninhos na Reserva Boqueirão, MG

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Resumo Neste estudo serão apresentadas novas informações sobre a utilização de *Gochmatia barrosii* Cabrera como material para construção dos ninhos por *Isodontia costipennis* Spinola 1851 na Reserva Biológica Unilavras – Boqueirão. As coletas foram realizadas em três ambientes distintos da RBUB: campo cerrado, borda de mata e campo de altitude. As amostragens foram realizadas com a utilização de ninhos-armadilha. Foi coletado um total de 67 ninhos-armadilha fundados por *I. costipennis*. Desses, 37 no campo cerrado, 26 na borda de mata e quatro no campo de altitude. Quanto à abundância de *G. barrosii*, foi registrado um total de 994 indivíduos nas três áreas de estudo, sendo 451 no campo cerrado, 344 na borda da mata e 199 no campo de altitude. *I. costipennis* mostrou forte tendência em usar partes *G. barrosii* na construção dos ninhos. Entretanto, estudos mais detalhados devem ser realizados para avaliar se este comportamento é uma característica da espécie ou uma determinação do ambiente.

Palavras-chaves: ninhos-armadilha, vespa solitária, Cerrado.

Abstract In this study, new information will be presented about the use of *Gochmatia barrosii* Cabrera as nesting material for *Isodontia costipennis* Spinola 1851 at the Unilavras Biological Reserve – Boqueirão (RBUB). Collections were carried out in three different RBUB environments: cerrado grassland, forest edge and high-altitude grasslands. Sampling was conducted using trap nests. A total of 67 trap nests established by *I. costipennis* were collected. Of those, 37 were in the cerrado grassland, 26 in the forest edge and four in the high-altitude grasslands. As for the abundance of *G. barrosii*, a total of 994 individuals were recorded in the three study areas – 451 in the cerrado grassland, 344 in the forest edge and 199 in the high-altitude grasslands. *I. costipennis* showed a strong tendency to use parts of *G. barrosii* in nest-building. However, more detailed studies should be conducted to evaluate whether this behavior is

a characteristic of the species or is determined by the environment.

Keywords: trap nests, solitary wasp, Cerrado.

Introduction

Wasps of genus *Isodontia* (Potton) are solitary, with about 60 described species showing solitary nesting behavior (Hanson and Gauld 1995). Females use natural as well as artificial cavities for nesting (Krombein 1967, Buschini and Woiski 2006), and generally use plant material as nest construction material (Krombein 1967, Soares *et al.* 2001).

Several studies have been conducted to evaluate certain aspects of the biology and nesting behavior of *Isodontia* (Krombein 1967, Evans and Eberhard 1970, Pérez-Maluf 1993, Soares *et al.* 2001, Buschini and Woiski 2006). However, data on the types of substrate used and the relationship of their abundance in the environment are scarce. In this study, new information will be presented on the materials used for construction of nests of *I. costipennis* in the Unilavras Biological Reserve - Boqueirão. To that end, the following hypothesis was tested: the number of nests built by *I. costipennis* increases with the abundance of *Gochmatia barrosii*.

Methods

Collections took place in cerrado areas at the Unilavras Biological Reserve-Boqueirão (RBUB), municipal district of Ingá, MG. The physiognomy of RBUB is of cerrado stricto sensu, high-

altitude grasslands, rupestrian field, riparian forests and brachiaria grass pasture areas (*Brachiaria* spp, Poaceae) (Pires *et al.* 2012).

The climate in the area is of the CWa type, characterized by humid summers and dry winters, the average annual temperature is 20.4 °C, ranging from 17.1° C in July to 22.8° C in February, and average annual precipitation is 1.517 mm (Dantas *et al.* 2007).

The collections took place in three different environments of the RBUB: cerrado grassland, forest edge and high-altitude grasslands. The sampling was carried out using trap nests designed with intranodal sections of bamboo, with one of the end points closed by the knot itself, with lengths varying from 90 to 200 mm and internal diameters from 0.9 to 24 mm installed on PVC shafts in three transects, five meters apart. On each shaft, a bundle of six nests were fastened 1.70 m from the ground. As such, 90 trap nests were installed in each area, totaling 270 trap nests. The traps were inspected every 15 days, from February 2008 to June 2009, and those colonized by wasps were removed and taken to the laboratory for selection. In this manner, it was possible to obtain information on the substrate used to build the nest. For each trap nest removed from the field, a new one with similar characteristics was placed in the same location.

After verification of the nests in the laboratory, they were incubated to allow emergence of the adult. The fruit fragments (achenes) and leaves in the plant substrate found in the nests were compared with exsiccates of the Asteraceae Family collection of the Lavras Herbarium (LUNA) at Lavras University Center. With the aid of LUNA researchers, the species used as plant substrate in the nests in question was determined as *Gochnatia barrosii* Cabrera, belonging to family Asteraceae.

After identification, some specimen samples were collected and then herborized and preserved in the collection of the aforementioned herbarium.

Sampling of *G. barrosii* was conducted monthly throughout the study, starting from the implantation of four 30 x 30 m non-continuous plots (900 m² each), 10 meters apart, arranged in the vicinity of the transects where the nests were installed in each area. The plants present between the transects of the nests were also counted.

To count the number of individuals in the plots, only plants with height equal to or greater than 15 cm (in projection) were included.

Results and discussion

A total of 67 trap nests established by *I. costipennis* were collected. Of those, 37 were found in the cerrado grassland, 26 in the forest edge and four in the high-altitude grasslands (Figure 1). As for the abundance of *G. barrosii*, a total of 994 individuals were recorded in the three study areas – 451 in the cerrado grassland, 344 in the forest edge and 199 in the high-altitude grasslands (Figure 1). Piel (1933) observed in a study with *Isodontia nigella* that there

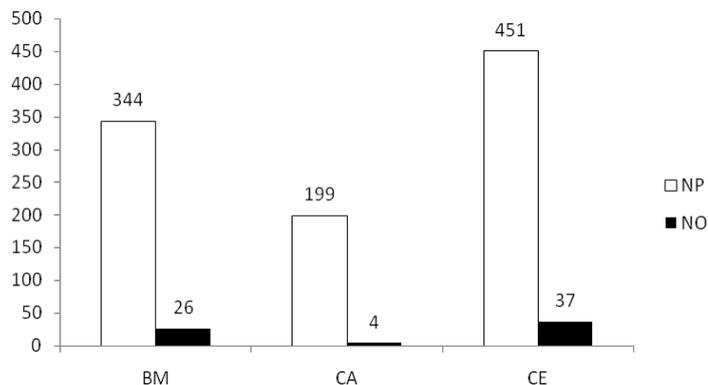


Figure 1 Number of plants (NP) of *Gochnatia barrosii* and number of nests occupied (NO), by *Isodontia costipennis* in forest edge (FE), high-altitude grassland (HAG) and cerrado grassland (CG) environments.

can be a relationship between the materials used to build nests and the availability of certain plant species in the area.

I. costipennis used achenes and leaves of *G. barrosii* as substrate to build nests. The achenes of this plant are hygroscopic and thus very efficient in the absorption of moisture (Barroso 1991). This efficiency can actually contribute to the development of juveniles, thus avoiding fungal attacks. The adsorption of water by the fruits in the nest (achenes) is followed by an increase in body size (Barroso 1991) and, consequently, a higher compacting of the spaces they occupy, possibly avoiding cannibalism and parasite attacks. Regarding the leaves, there is no record that they act as achenes, in the absorption of water; however, an auxiliary function can be attributed to them, because non-glandular hairs occur amid their high pilosity, whose stored compound is an oil. When exuded, this oil can help cover and waterproof plant fragments and, consequently, the nest wall. However, new, more detailed studies are necessary to support such propositions.

In the Unilavras Biological Reserve-Boqueirão, *I. costipennis* showed a strong tendency to use parts of *G. barrosii* in nest construction. Some situations were proposed to attempt to explain the advantage of using that plant. However, more detailed studies should be conducted to evaluate whether this behavior is a characteristic of the wasp species or is determined by the environment.

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