



FLORAL BIOLOGY AND VISITORS OF *MOQUINIA KINGII* D.C. (ASTERACEAE) IN MUCUGÊ, CHAPADA DIAMANTINA, BAHIA, BRAZIL: PRELIMINARY APPROACHES

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INTRODUCTION

The family Compositae (Asteraceae) is one of the largest plant families and it is represented by almost 1535 genera and almost 23000 species in 5 subfamilies: Barnadesioideae, Mutisioideae, Carduoideae, Cichorioideae and Asteroideae, (Pruski & Sancho, 2004). In spite of that, very little attention has been paid to this family in contrast to the many publications focusing on the general problems of pollination and outstanding specializations in many others groups of plants (Mani & Saravan, 1999).

The Asteraceae is one of the most frequently occurring plant families in the rupestrian fields within the states of Minas Gerais and Bahia (Oliveira, 2006). This family is well represented in the Chapada Diamantina, an important center of diversity for Brazilian mountain flora. This region is home to many genera showing a remarkable degree of diversification, as well as many endemic species (Harley & Simmons, 1986).

Literature suggests that the Asteraceae utilize a wide array of pollination processes such as anemophily, entomophily and ornithophily (Mani & Saravan, 1999, Cerrana, 2003); however, little is known about pollination of the family in rupestrian fields such as those of Mucugê, Bahia. Therefore, the goal of this study was to document some of the pollination characteristics of *Moquinia kingii* D.C, a little studied aster common in the rupestrian fields of Mucugê.

MATERIAL AND METHODS

Study area and species

The study was conducted between 15 and 17 May, 2007 in the city of Mucugê near the "Parque Sempre Viva", on the Tiburtino trail (12° 59.840' S; 41° 20.496' W, altitude 935m). The main vegetation present in this area is typical of rupestrian fields. While the soil of this area is acidic and nutrient poor, quartzite outcrops are common and often

occur with an extremely diverse and endemic flora. The climate is mesothermic with dry winters and rainy summers (Harley, 1995).

Moquinia kingii belongs to the tribe Vernonieae in a genus of only two species. *Moquinia kingii* is a 2m erect, moderately-branched shrub and each capitula has single florets, contrasting from most of the Asteraceae. This species occurs only in Bahia and blooms between March and August.

Processing of the collected material

1. *Floral biology*: Five flowers were marked prior to anthesis and their development was observed throughout their lifecycle.

2. *Nectar production*: Eleven plants were tagged and five inflorescences per plant were bagged. Five flowers in different stages were selected for comparison of nectar production, concentration and total sugar production (n=50). The data were analyzed using SAS version 9.1 using the PROC GLM function to conduct a variance analysis.

3. *Visitor analyses*: Three plants were observed for visitation by potential pollinators, the observations took place in two periods (6:30 - 11:30, 14:30 - 16:30).

RESULTS AND DISCUSSION

1. Floral biology

The flowers began anthesis around 6 a.m. and after 2 hours all were in the first floral stage (the male flowers). Around 4 or 5 hours after anthesis the flowers had entered in the second floral stage (transitional phase). The flowers were still male but they showed the emergence of the unreceptive stigma (closed) that exposes the pollen grains which stuck to the stigma during development. Finally, by the second day (about 27 hours after the anthesis) the flowers had reached the third floral stage (female). As with other Asters, *Moquinia kingii* uses protandry in its floral development; this characteristic is known to be an important factor in prolongation of floret life, allowing for more

pollinators to visit the flowers at different times (Mani & Saravan, 1999).

2. Nectar production

While flowers in the first floral stage did not produce enough nectar for accurate measurements (< 0,05 µL), flowers from the transitional and female stages did produce enough. Nectar volume and sugar content were found very different between transitional flowers (volume average: 0,96µL and sugar content average: 0,43 mg) and female flowers (volume average: 2,196 and sugar content average: 1,40 mg) (volume: $F= 8,36$; $p<0,0001$; sugar content: $F= 11,93$; $p<0,0001$).

Visitors would be expected spend more time in the female flowers as they had a larger quantity of nectar, and also sweeter nectar in comparison to transitional flowers. That may favour the transfer of pollen grains to the female flowers.

3. Visitor data

The most common visitors were the bees *Bombus* sp and *Apis mellifera* with 51 and 48 visits respectively. At least two species of hummingbirds were also represented with 30 visits. Visitation differed by time of day with hummingbirds being more common in the morning, and *Bombus* sp. being more common in the afternoon.

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