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Occurrence of Myrmeleontidae and Mantispidae (Neuroptera) in Campo Rupestre–Atlantic Forest Ecotone in the Serra do Espinhaço, Minas Gerais, Brazil

Ocorrência de Myrmeleontidae e Mantispidae (Neuroptera) em ecótono de Campo Rupestre e Mata Atlântica da Serra do Espinhaço, Minas Gerais, Brasil

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Marcos Magalhães de Souza[1*], Davi Gomes de Lima[2], Laura Tereza Inácio Borges[1], Gabriel de Castro Jacques[2]

MMS - https://orcid.org/0000-0003-0415-1714 DGP - https://orcid.org/0009-0007-9236-2461 LTIB - https://orcid.org/0009-0009-9594-1041 GCJ - https://orcid.org/0000-0002-9619-6065

1- Instituto Federal do Sul de Minas Gerais - Campus Inconfidentes

2- Instituto Federal de Minas Gerais - Campus Bambuí

* marcos.souza@ifsuldeminas.edu.br

ABSTRACT

Neuroptera communities remain poorly sampled in Campo Rupestre associated with the Atlantic Forest. This study aimed to document the occurrence of Myrmeleontidae and Mantispidae (Neuroptera) in an ecotone between Campo Rupestre and Atlantic Forest in the Serra do Espinhaço, Minas Gerais, Brazil. Sampling was conducted in the Parque Estadual do Pico do Itambé between May 2024 and February 2025 using active search and Malaise traps. A total of two species and 11 morphospecies of Myrmeleontidae and two species of Mantispidae were recorded, representing approximately 15% of the Brazilian Myrmeleontidae fauna. Notably, *Vella fallax* (Rambur, 1842) is reported for the first time for the state of Minas Gerais and for Campo Rupestre. These results highlight the importance of ecotonal areas for Neuroptera diversity and reinforce the need for inventories in under-sampled environments such as Campo Rupestre.

Keywords: Biodiversity, inventory, conservation.

RESUMO

As comunidades de Neuroptera são subamostradas em Campo Rupestre associado a Mata Atlântica, portanto

o objetivo é registrar a ocorrência de Myrmeleontidae e Mantispidae (Neuroptera) em um ecótono entre Campo Rupestre e Mata Atlântica na Serra do Espinhaço, Minas Gerais, Brasil. As coletas foram realizadas no Parque Estadual do Pico do Itambé entre maio de 2024 e fevereiro de 2025, por busca ativa e armadilhas Malaise. Foram registradas duas espécies e 11 morfoespécies de Myrmeleontidae e duas espécies de Mantispidae, o que corresponde a cerca de 15% das espécies brasileiras de Myrmeleontidae, com destaque para *Vella fallax* (Rambur, 1842), primeiro registro para o estado de Minas Gerais e para o Campo Rupestre. Os resultados evidenciam a importância de áreas ecotonais para a diversidade de Neuroptera e reforçam a necessidade de inventários em ambientes subamostrados, como o Campo Rupestre

Palavras-chave: Biodiversidade, inventário, conservação.

INTRODUCTION

The Serra do Espinhaço constitutes one of the main mountain ranges in Brazil, extending for approximately 1,000 km and are recognized as a UNESCO Biosphere Reserve, as well as a priority area for biodiversity conservation (DRUMMOND et al., 2005; FERNANDES et al., 2014). This region harbors a mosaic of ecosystems, including Atlantic Forest, Cerrado, and extensive areas of Campo Rupestre, often arranged in ecotones that promote high environmental heterogeneity and support distinct biological communities (PEREIRA et al., 2015; VIDAL et al., 2023). In this context, the Pico do Itambé State Park, located within the Espinhaço Range, stands out due to the association between Campo Rupestre and Atlantic Forest, forming a complex environment characterized by wide altitudinal variation, high diversity of microhabitats, and the occurrence of unique species (CHAVES et al., 2012; CARDOSO et al., 2020; DIAS-OLIVEIRA et al., 2026).

Among the ecosystems present in this region, Campo Rupestre are considered by some authors as a physiognomic subtype of the Cerrado (RIBEIRO, WALTER, 1998), whereas others recognize them as a distinct biome (SILVEIRA et al., 2016). Although occupying less than 1% of the Brazilian territory, they harbor approximately 15% of the Brazilian flora, exhibiting remarkable ecological singularity while being subjected to intense anthropogenic pressures (SILVEIRA et al., 2016; FERNANDES et al., 2020). Likewise, the Atlantic Forest is recognized as a global biodiversity hotspot, exhibiting high levels of species richness and endemism, but is severely threatened by habitat loss (MYERS et al., 2000; LIMA et al., 2020).

Despite the ecological importance of these environments, significant gaps remain in biodiversity knowledge, particularly for invertebrates, even within Protected Areas (PAs), which are considered the main tool for biodiversity conservation (MADEIRA et al., 2008; NEPOMUCENA et al., 2023; ARAÚJO et al., 2024; JACQUES et al., 2024). Among

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the groups that remain poorly investigated in these ecosystems is the order Neuroptera, composed predominantly of predatory insects with a wide distribution and an important ecological role in regulating arthropod populations (MACHADO et al., 2024).

Among the Neuroptera families, Myrmeleontidae and Mantispidae deserve special attention due to their distinct predatory strategies, including larvae that construct pitfall traps in sandy substrates and predators associated with spider egg sacs, respectively (BERTI FILHO et al., 2002; MACHADO et al., 2019). Despite this, these taxa remain poorly studied in neotropical environments, particularly in transitional areas between biomes, such as the ecotones between Campo Rupestre and Atlantic Forest found in the Espinhaço Range.

OBJECTIVES

This study aimed to report the occurrence of Myrmeleontidae and Mantispidae taxa in an ecotone between Campo Rupestre and Atlantic Forest in the Serra do Espinhaço, contributing to the knowledge of the distribution of these taxa and to the understanding of biodiversity in heterogeneous environments.

MATERIAL AND METHODS

The study was conducted in the Parque Estadual do Pico do Itambé (PEPI), a strict protection conservation unit located in the Serra do Espinhaço, Minas Gerais, Brazil (18°26'S; 43°20'W). The area is characterized by a mosaic of Campo Rupestre and Atlantic Forest, with an altitudinal range from 700 to 2,060 m.a.s.l. (CHAVES et al., 2012; CARDOSO et al., 2020).

Sampling was conducted in four campaigns, in May, September, and December 2024, and February 2025, distributed throughout the dry and rainy seasons, in both areas of Campo Rupestre, Atlantic Forest, and ecotone. Neuroptera specimens were collected by active search using an entomological net between 09:00–14:00 and 17:00–21:00 h, as well as by a Malaise trap that remained in the field for 180 days, with biological material collected every 45 days.

The specimens were preserved in 70% ethanol, identified by Dr. Caleb Califre Martins (Universidade Estadual Paulista, Rio Claro, SP) and deposited in the Coleção Entomológica Edmundo Navarro de Andrade (CENTENA), Instituto de Biociências, at the same university.

RESULTS AND DISCUSSION

A total of two species and 11 morphospecies of Myrmeleontidae and two species of Mantispidae were recorded (table 1).

The records obtained in this study correspond to approximately 15% of the Myrmeleontidae species known from Brazil, highlighting the importance of the study area for the conservation of this group. The higher richness of Myrmeleontidae compared to Mantispidae was expected, as Myrmeleontidae is the most diverse

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family of Neuroptera worldwide (MACHADO et al., 2019) and the second most diverse in Brazil, with 88 species (MACHADO, MARTINS, 2026a).

Table 1. Species and morphospecies of Myrmeleontidae and Mantispidae recorded in the Parque Estadual do Pico do Itambé, Minas Gerais, Brazil.

Tabela 1. Espécies e morfoespécies de Myrmeleontidae e Mantispidae registradas no Parque Estadual do Pico do Itambé, Minas Gerais, Brasil.

Family	Subfamily	Tribe	Species/morphospecies
Mantispidae	Mantispinae	-	*Dicromantispa gracilis* (Erichson, 1839)
			Zeugomantispa virescens (Rambur, 1842)
Myrmeleontidae	Ascalaphinae	Acanthaclisini	*Vella fallax* (Rambur, 1842)
		Haploglennini	*Amoea* sp.
			Haploglenius sp.
		Ululodini	*Ascalorphne macrocerca* (Burmeister, 1839)
			Ascalorphne sp.
			Ululodes sp. 1
			Ululodes sp. 2
	Myrmeleontinae	Brachynemurini	*Ameromyia* sp.
			Austroleon sp.
		Myrmeleontini	*Myrmeleon* sp. 1
			Myrmeleon sp. 2
	Nemoleontinae	Glenurini	*Eremoleon* aff. sp.
			Navasoleo aff sp.

The occurrence of species from different subfamilies (Ascalaphinae, Myrmeleontinae, and Nemoleontinae) highlights the environmental heterogeneity of the study area, which provides a variety of microhabitats suitable for distinct taxa, including species associated with sandy substrates and open areas, as well as those related to shrub and arboreal vegetation. For example, Myrmeleontinae exhibits a wide distribution in open and xeric environments (MACHADO et al., 2019), such as Campo Rupestre.

Notably, *Vella fallax* (Rambur, 1842) (figure 1b), collected in an open area of Campo Rupestre (figure 1a), is the largest Brazilian Neuroptera

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species, with a wingspan of up to 133 mm (MACHADO et al., 2024), and has no published record in the literature for the state of Minas Gerais. Previously, this species had been reported from the states of Ceará, Espírito Santo, Paraíba, and Rio de Janeiro (MACHADO, MARTINS, 2026b). There is limited information on the ethology and ecology of this species; however, it has been reported as a floral visitor of *Gaura villosa villosa* Torr. (Onagraceae) (CLINEBELL et al., 2004), and as prey of the pallid bat *Antrozous pallidus* (Le Conte, 1856) (CZAPLEWSKI et al., 2018) in the United States. Nevertheless, information on its behavior and ecological role in Brazilian ecosystems remains scarce.

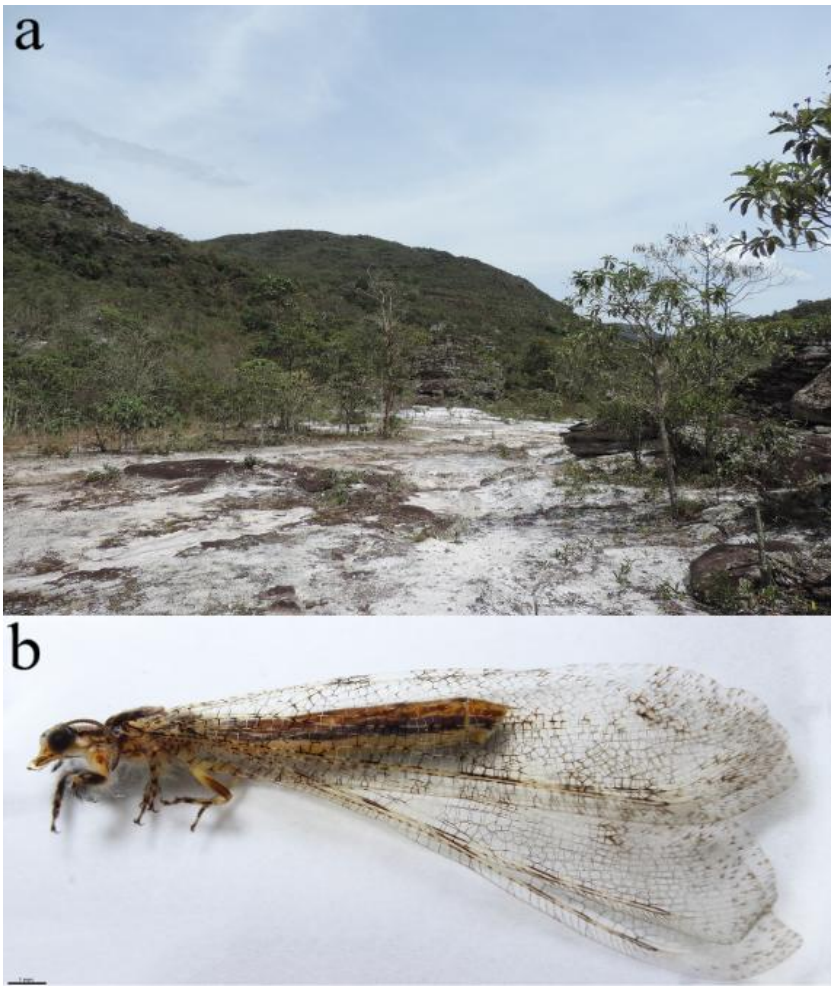


Figure 1. *Vella fallax* (Rambur, 1842) (b) recorded in the Parque Estadual do Pico do Itambé, in a Campo Rupestre area (a), Minas Gerais, southeastern Brazil.

Figura 1. Vella fallax (Rambur, 1842) (b) registrada no Parque Estadual do Pico do Itambé, área de Campo Rupestre (a), Minas Gerais, sudeste do Brasil.

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On the other hand, the low number of Mantispidae records may be related both to the lower diversity of the group in Brazil, with only 32 species (MACHADO, MARTINS, 2026c), and to aspects of their biology, as most species are obligate predators of spider egg sacs (BERTI FILHO et al., 2002; MACHADO et al., 2024), which may reduce their detectability in general surveys. Nevertheless, the record of two species highlights the importance of the study area for the occurrence of this taxon.

Despite advances in the knowledge of Neuroptera in Brazil, taxonomic gaps still persist (MACHADO et al., 2024), as evidenced by the presence of several morphospecies in this study. In under-sampled and environmentally relevant areas, such as Campo Rupestre (GIULIETTI et al., 1997; FERNANDES et al., 2020; PINHEIRO et al., 2026), occurrence records are essential to reduce these gaps, expanding knowledge on the diversity and distribution of these taxa.

CONCLUSION

In this context, occurrence records, even when limited, reinforce the need for further studies and taxonomic revisions, as well as provide important support for conservation strategies, particularly in biomes such as Campo Rupestre within protected areas.

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