THE ANT FAUNA (HYMENOPTERA, FORMICIDAE) OF THE ÑACUÑAN BIOSPHERE RESERVE

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ABSTRACT: We present a list of known ant species present in the Ñacuñan MAB Biosphere Reserve near Mendoza. The reserve lies in the monte biogeographical province, and is characterized by arid conditions. We analyze the distribution of this fauna with respect to the number and types of other biogeographical provinces in which these species have been recorded.

KEYWORDS: Ant; Formicidae; Biosphere Reserve; Argentina; biogeography.

Introduction

Since the death of Nicholas Kusnezov, myrmecological studies in Argentina have practically ceased. Although his collection is still maintained at the Instituto Miguel Lillo, no systematist is employed there, and the difficulties of performing faunal surveys are thus tremendous. Although a number of studies have begun in Brazil and Venezuela on ant communities, these have focused primarily on forest and cropping systems. Few studies have examined ant communities in natural arid systems, such as the cerrados[8]. Because most of temperate and subtropical Argentina is characterized by open plant formations, often under arid or semi-arid climatic regimes[4], we still have not begun detailed biogeographic analyses to detect trends and affinities, although an earlier study did this on a continental scale but not in a quantitative manner[16].

Here, we present the results of a survey of the ants known to occur in the Ñacuñan MAB Biosphere Reserve, lying in the semi-arid monte of Argentina. We examine the ant fauna with respect to its trophic ecology, biogeographical affinities,

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and expected richnesses of both genera and species based upon a recent survey of the available data[8].

Materials and methods

The Ñacuñan MAB Biosphere Reserve lies near Mendoza (32°48'S, 68°52' W), within the monte biogeographical province[4]. In this region, creosote, *Larrea divaricata*, *L. cunefolia*, and *L. nitida*, are the dominant vegetational indicators of this arid and semi-arid region, which bridges the espinal, Chaco, and Patagonia provinces, all of which are within the Chaco Domain[4]. We surveyed ants through nest census techniques. All taxonomy follows Kempf[10], with specimens deposited in Cricyt and confirmed in the Instituto Miguel Lillo and the "Museo de Historia Natural de Buenos Aires".

To examine the affinities with respect to biogeographic province, we used recorded distributions[1,10,11-16], which were then compared for similarity using the Jaccard[9] similarity coefficient for binary data. For affinity analysis, we deleted the two species which we were unable to identify taxonomically with a confirmed Latin binomial. We used the regression equations furnished by Fowler[8] to predict the expected number of species and genera, and to compare these predictions with the registered species. The equations are, for nest counts, species richness = 26.382 – 0.382[° latitude], and, generic richness = 13.848 – 0.171[° latitude].

Field observations on the ant species were used to characterize their trophic ecology, and discuss their similarities with other arid and semi-arid regions of the Americas.

Results and discussion

The expected species richness, 13.9, and generic richness, 7.2, are very close to our observed values of 14 and 8, respectively (Table 1). Thus, the ant fauna of the Ñacuñan Biosphere Reserve is neither richer nor poorer than would be expected based solely upon latitude.

In decreasing biogeographic affinities, the ant fauna of the Ñacuñan Biosphere Reserve is related to the espinal province 0.833, the pampas province 0.833, the Chaco province 0.667, the Patagonia province 0.500, the Paranense and prepuna provinces, both 0.333, and least related with the yungas province 0.167. All similarity coefficients of 0.5 or more are shared with neighboring provinces, with the exception of the pampas province. This suggests that ant species perceive these areas as more similar than do plants or other animal groups. However, most other animal groups, especially

vertebrates, also show little specificity for these biogeographic regions[2]. Nevertheless, the neighboring Patagonian province is apparently limiting for most ant species present in the reserve.

Table 1 – Ant species of the Ñancuñan MAB Reserve (monte biogeographical province) as determined through nest collections, and their respective occurrence (+) or absence (-) in other recognized biogeographical provinces of South America

Taxon	Biogeographic Province*						
	Esp	Pam	Cha	Par	Yun	Pre	Pat
Acromyrmex lobicornis Emery	+	+	+	-	-	-	+
Acromyrmex striatus Roger	+	+	+	-	-	-	-
Pheidole bergi Mayr	+	+	+	-	-	-	+
Pheidole spininodis Mayr	+	+	-	+	-	-	-
Ponognomyrmex inermis Forel	+	+	-	-	-	+	-
Pogonomyrmex pronotalis Santschi	-	-	-	-	-	-	-
Pogonomyrmex rastratus Mayr	+	+	-	-	-	-	+
Solenopsis sp	?	?	?	?	?	?	?
Crematogaster quadriformis Roger	-	+	+	+	+	-	-
Camponotus mus Roger	+	+	+	+	-	-	+
Camponotus punctulatus Mayr	+	+	+	+	+	+	+
Camponotus sp	?	?	?	?	?	?	?
Dorymyrmex exanguis Forel	+	-	+	-	-	+	+
Forelius nigritiventris Forel	+	+	+	-	-	+	-

* Biogeographic provincess Esp = espinal; Pam = pampas; Cha = chaco; Par = paranense; Yun = yungas; Pre = prepuna; Pat = patagonica. ? = because species determination was not possible, the occurrence in other biogeographic regions is not known.

Because of the strongly seasonal, and arid or semi-arid climates experienced in these biogeographic provinces, ant species also demonstrate strongly seasonal patterns of activity and abundance[3]. All recorded species of *Pogonomyrmex* and *Pheidole*, 36 % of the recorded fauna, are facultative seed harvesters, with their peak seed harvesting occurring in the fall[1,2]. Additionally, species of *Acromyrmex* also harvest seeds frequently, especially those of species of *Larrea*. The two sympatric species of *Acromyrmex* belong to differing subfamilies, and little overlap in diet occurs as A. lobicornis uses more broad-leaved vegetation than does *A. striatus*[3]. The Formicines and Dolichoderines are opportunist feeders, tending scale insects and scavaging dead or dying insects[2]. The Myrmicine species of *Solenopsis* and *Crematogaster* also can be classified as opportunistic feeders[2]. We have yet to record any Ponerinae or

Ecitoninae, although subterranean *Neivamyrmex* species should probably be present[16]. However, none have been recorded from the soil surface during more than eight years of field work.

The composition of the fauna and their respective trophic relations are similar to those recorded in the physiographically and climatically similar Chihuahuan and Sonoron Deserts of North America[5,7,17], and suggest a dietary ecological convergence[6] at the community level.

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- *RESUMO: São enumeradas as 14 espécies de formigas com presença documentada na Reserva da Biosfera Ñacuñan, próxima a Mendoza. A reserva fica na província biogeográfica do monte e é caracterizada pelas condições áridas. Uma análise das afinidades da mirmecofauna desta reserva indica semelhanças fortes com as províncias biogeográficas pampa e espinal. Somente uma espécie,* Pogonomyrmex pronotalis *é restrita à província biogeográfica do monte.*

- *UNITERMOS: Formiga; Formicidae; Reserva da Biosfera; Argentina; biogeografia.*

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