ECOMORPHOMETRY ANALYSIS: TESTING LIMITING SIMILARITY HYPOTHESYS AND ECOLOGICAL SEGREGATION OF WOODCREEPERS IN CANTAREIRA STATE PARK, SP, BRASIL.

Nathalia Cristine Freitas Domingues Gallizioli – Universidade Paulista, São Paulo, Brazil.
nathalia.gallizioli@gmail.com.

Flávia de Campos Martins – Ecology Doctor by Universidade de Brasília, Distrito Federal, Brazil.
flaatoba@yahoo.com.br.

INTRODUCTION

The Limiting Similarity Hypothesis (MacArthur and Levins, 1967) predicts that coexisting species should differ by a minimum in morphology, which reflects ecological differences in the use of resources, to avoid interspecific competition. A biological community consists of a set of species that occur in the same location and connect through their relationships food or other interactions governing the energy flow and nutrient recycling in the ecosystem and, consequently, influence population processes determining the relative abundance of species (Ricklefs, 2003). In this context, the study of the morphology of the species, which reflects ecological issues, can serve as a tool to analyze the ecological segregation caused by interspecific competition between woodcreepers, and thus indicate how the community structure occurred. Furthermore, woodcreepers comprise a family of species susceptible to habitat fragmentation, being considered as bioindicators (Poletto *et al*. 2004; Angels and Soares, 1999).

OBJECTIVE

The central objective of this work is to know how the ecological segregation of woodcreepers occurs by analyzing the ecomorphometry, besides checks whether the competition interspecific was relevant in structuring the community.

MATERIAL AND METHODS

Morphometric measurements were made with stuffed specimens of the Museum of Zoology, of Universidade de São Paulo (MZUSP), for the five species of woodcreepers found in Cantareira State Park according to the Management Plan (Plano de Manejo do Parque Estadua2009): *Sittasomus griseicapillus*, *Xiphorhynchus fuscus*, *Xiphocolaptes albicollis*, *Dendrocolaptes platyrostris* and *Lepidocolaptes falcinellus*. Thirty individuals were measured for each species, the parameters were: species, date of collection, collection site, sex (when possible), beak length (the nostril to the tip and culmen to tip), width and height of the beak, wing length (the meeting until the end of the longest rémige), wing width, tail length (the rectrix central to the end of rectrix longer) and tarsus length. All measurements were performed according to methodology Oniki & Willis (1993), with Mitutoyo digital caliper. In the statistical analysis we used the module "Overlay Size" from Ecosim (Gotelli and Entsminger, 2001) for analysis of null models and program MVSP 3.1 (Kovach, 2005) to Principal Component Analysis (PCA) and Cluster Analysis.

RESULTS

The Cluster analysis separated the species into three groups according to the morphology, the first group of *X. albicollis* and *D. platyrostris*, the second with *S. griseicapillus* and *X. fuscus*, and *L. falcinellus* was isolated. The Principal Component Analysis (PCA) showed that the items most relevant morphological this segregation is the length of the tail, wing and beak. To test the Limiting Similarity Hypothesis applied to an analysis of null models. Observed, then an index of niche overlap (Pianka Index) of 0.05954, which was higher but not significantly, that index of 0.02274 for a simulated random community. The results show a low rate of morphological overlap, indicating differences in morphology, however the analysis of null models these differences were not higher than in communities with morphological patterns simulated randomly.

DISCUSSION

Although *D. platyrostris* and *X. albicollis* resemble morphologically as well as *S. griseicapillus* and *X. fuscus*, they avoid or reduce this competition by adopting different foraging behaviors, as described in the literature (Poletto at al., 2004 and Soares and Anjos, 1999). The morphological data indicate that the competition, which could be due to a morphology very similar between species, was not a important factor in the structuring of this community, because it do not led to the displacement of characters as would be expected according to the Limiting Similarity Hypothesis. These data are corroborated with what was found by Martins (2007), who also found no significant morphological overlap between woodcreepers in Deciduous Forest in the Valley of Parana, GO. Thus, if the morphological differences between woodcreepers are not significant, certainly different ways of using the resources were adopted, through the foraging behavior or the capture of prey of different sizes, thereby avoiding intense competition interspecific should occur according to the Limiting Similarity Hypothesis and competitive exclusion.

CONCLUSION

It is concluded that despite morphological differences between species indicates that they differ in use of resources, analysis of null models showed that the rate of overlap between species is not significantly greater than would be expected in a community without these factors acting and therefore, we can think of three alternative hypotheses: 1) the community does not have any structure, which is unlikely since the community itself is the interaction of species in a given time and space, 2) that competition is not an important factor structuring but the historical factors and phylogenetic and 3) other factors, not morphology, such as diet, habitat selection and / or foraging behavior, led to a more effective ecological segregation in the community of woodcreepers in Cantareira State Park.

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ACKNOWLEDGMENT

I thank the Santander Universities Program, the Forestry Institute of São Paulo and the Museum of Zoology, Universidade de São Paulo, for allowing this work.