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SPECIES DIVERSITIES OF HERPETOFANAL SAMPLES FROM SIMILAR MICROHABITATS AT TWO TROPICAL SITES¹

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Abstract. Amphibians and reptiles were collected from tree buttresses in two different regions to determine whether within-habitat species diversity differences were evident. Using the method suggested by Pielou (1966), the average species diversity per individual was $H' = 1.92 \pm .47$ for the collection of amphibians and reptiles taken from tree buttresses in a tropical dry forest formation in Thailand, $H' = 4.95 \pm .84$ for the tree buttress collection taken in Ecuador. Part of the within-habitat diversity differences are due to a difference in kind of organism: a large number of terrestrial frogs are present in Ecuador; there are no terrestrial frogs from the Thai site. Other differences are also operating, however. The number of lizard species are comparable in the two collections (8 from Thailand, 10 from Ecuador), yet the Brillouin diversity measure of the Ecuadorian lizard collection was $NH = 2.24$, higher than the diversity of the Thai lizard collection, $NH = 1.25$. The diversity differences are postulated to be due to different sizes of the total forest herpetofaunas of the two regions.

INTRODUCTION

The role of within- and/or among-habitat differences in explaining species diversity gradients has been a topic of much discussion based primarily on hypotheses with few direct data. The purpose of this paper is to examine the species diversities of amphibians and reptiles from apparently similar microhabitats from two different tropical forests. If the two forests are thought of as collections of microhabitats, certain of the microhabitats are equivalent, but the total number of microhabitats differ in each forest. If diversity differences are due solely to among-habitat differences, the diversities of similar microhabitats should be similar, but the total diversities would differ because of the unequal number of microhabitats in each forest. If within-habitat diversity differences are present in addition to among-habitat differences, the diversities of similar microhabitats will differ. Analysis should allow distinction of whether or not within-habitat differences are operating.

The tree buttress system was examined (Ecuador). The by either hoe (Thailand) or machete (Ecuador). The buttress system was examined to the point where the buttress originated from the trunk or to eye level in the few cases where the buttresses were taller than the collectors. When individual animals were captured, we recorded their exact location as well as the diameter of the tree at breast height. The sampling in Thailand was done in conjunction with random quadrat sampling, and covered the 10-month period of March-December 1969. The sampling in Ecuador was done specifically to determine the composition of the buttress herpetofauna and was done in June and July of 1971. In Ecuador, additional information on the extent of the buttresses and extent of litter lying between the buttresses was also recorded and an effort was made to sample the trees randomly. The data on tree diameters, buttress diameters, degree of leaf litter development, and occurrence of animals are available on request from the first author to anyone who wishes to utilize them. The Thai specimens are in the collections of the Field Museum of Natural History; the Ecuador specimens are in the collections of the Los Angeles County Museum of Natural History. Pielou's (1966) method and the Brillouin (1956) measure are used to determine the species diversities of the two collections. The Pielou method allows determination of a standard error and has already been used in analyzing quadrat data for amphibians and reptiles (Lloyd, Inger, and King 1968). In this case, each "quadrat" is a tree buttress that had amphibians or reptiles associated with it. Empty tree buttresses were not used.

METHODS AND MATERIALS

The tree buttress increases the interface of tree and ground. We examined this interface for reptiles and amphibians. The ground surface lying among buttress extensions was examined, the surface litter system for the tall, monolayered trees of tropical forests. The tree buttress system has evolved as a support system for the tall, monolayered trees of tropical forests. The buttress consists of flat, triangular plates

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