

# Notes on the frog fauna of the Amazon Basin

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## Abstract

The natural history of the frog fauna of the Amazon Basin is considered, based on data obtained from four major collections. Population structures in both forest and open environments are compared. Associations of species pairs in open formations are studied. It is estimated that at least 100 species are present in the Amazon Basin. Five speciation models are proposed to explain the high diversity of species.

I have had the opportunity to participate in two expeditions to the western Amazon region. This report deals with the natural history observations made on these trips together with an ecological analysis of the collections from these trips and collections from two other expeditions. All natural history observations and analyses on frogs are included here, rather than fragment the information. Taxonomic matters will be discussed in another paper.

The four expeditions on which this report is based are summarized briefly as:

1) Porto Velho: Departamento de Zoologia da Secretaria da Agricultura (now Museu de Zoologia, Universidade de São Paulo (MZUSP) expedition to Porto Velho, Rondônia, Brasil, from 28 October to 6 November 1954. This collection is represented by 17 species and 4086 individuals.

2) Expedição Permanente da Amazônia (EPA), supported by MZUSP, Fundação de Amparo à Pesquisa do Estado de São Paulo and Museu Goeldi; in 1973 a collaborative venture with the Museum of Comparative Zoology, Harvard University (Russell A. Mittermeier), from 20 August to 5 December 1973 along major rivers from Belém to Leticia, Colombia. Russell Mittermeier purchased 8238 individuals of 40 species incidental to the main purpose of the expedition.

3) Joint MZUSP and Smithsonian (USNM) expedition on the rio Purus, Brasil, from 2 December 1974 to 19 January 1975. This collection contains 811 specimens of 58 species.

4) Joint EPA-MZUSP and USNM expedition on the rio Madeira, Brasil from 31 October to 19 December 1975. The collection is represented by 1232 specimens of 53 species.

The itineraries of these trips will be described in the taxonomic paper where they are more appropriate.

## ECOLOGICAL GENERALIZATIONS

*Faunal — Habitat Associations:* At any locality in the Amazon basin, two major types of habitats are evident: forest and open. Of course, neither is a clear cut category for they grade into one another smoothly or abruptly, depending more or less on the human activity of the region. Open habitats have always been present, particularly at the edges of rivers. For all of the specimens collected by scientific personnel on the Madeira and Purus expeditions, the major habitat type was recorded for each specimen collected. Categories were either: (1) forest, (2) modified forest, such as selective logging or old second growth, and (3) open formations, such as river edges and human clearings. For purposes of analysis, any intermediate habitat, recorded in the field notes, was scored as the more forested category. The results of percent of individuals taken from each habitat type for the common species are presented in Table 1. The criterion used for common species in this case is 10 or more individuals (pooled localities), except for *Adenomera hylaedactyla* and *Hyla boans* for which calling specimens (not collected) supplement the actual specimens in the col-

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