PALYNOLOGICAL RECORDS OF HOLOCENE SEDIMENTS IN THE NORTHERN AMAZON BASIN

Maria Luisa ABSY, Michel SERVANT**, Antonio Carlos MARQUES-SOUZA*, Ires Paula de Andrade MIRANDA*, Ugo Souto ORLANDO****

❖ INTRODUCTION

The vegetation of Roraima is predominantly open savanna with isolated trees. The most common trees in the terra firme are : *Curatella americana, Byrsonima crassifolia and Byrsonima coccolobifolia*. The palm *Mauritia flexuosa occurs* in swampy patches which are very common in the region. The most frequent herbs are grasses and Cyperaceae.

In order to discuss the history of the vegetation of this area sediment samples from two localities in Roraima were collected for palynological study.

❖ METHODS

Material was collected from Roraima from two lakes : Lago Redondo and Lago da Fazenda São Joaquim, both situated 30 km frim Boa Vista.

The sediment samples were taken from each 2 cm of a 40 cm - long core from Lago Redondo and a 22 cm core from Lago da Fazenda São Joaquim.

All samples were boiled for 10 minutes in a 10 percent KOH aqueous solution (Faegri & Iversen, 1966), followed by acetolysis (Erdtman, 1960) and a specific-gravity separation using a bromoform-alcohol mixture (Kummel & Raup, 1965).

Most of the pollen grains were identified by comparison with the collection of recent pollen in the Palynology Laboratory of the Instituto Nacional de Pesquisas da Amazônia.

In the diagrams the total of both herb and arboreal pollen was used for calculating the percentage ocurrence of pollen for each taxon.

* CPBO/INPA, Alameda Cosme Ferreira, 1756, CP 478, 69083-000 Manaus, Amazonas, Brésil
** ORSTOM, 32 Avenue Henri Varagnat - 93143 Bondy, France
*** FUCAPI, Rua Governador Danil Areosa, 381, 69075-350, Manaus, Amazonas, Brésil

The two diagrams have been divided into local, provisional pollen zones, according to the fluctuations of pollen frequencies thought to be significant. These zones are indicated by the following letters : A, B, C, D.

To the left of the pollen diagrams is a stratigraphic column showing sediment types and 14C dates of the core samples. All 14C datings were carried out by Beta Analytic Inc., Miami, USA.

❖ RESULTS

Lago Redondo

The area surrounding Lago Redondo is covered with savanna, mainly with grasses, and the savanna trees : *Curatella americana* and *Byrsonima crassifolia.*

The diagram for Lago Redondo (Fig. 1) shows in the lowermost part, zone A, an increase of arboreal pollen. This phase is indicated between 30 and 40 cm of depth, representing approximately 2090 ± 60 years BP.

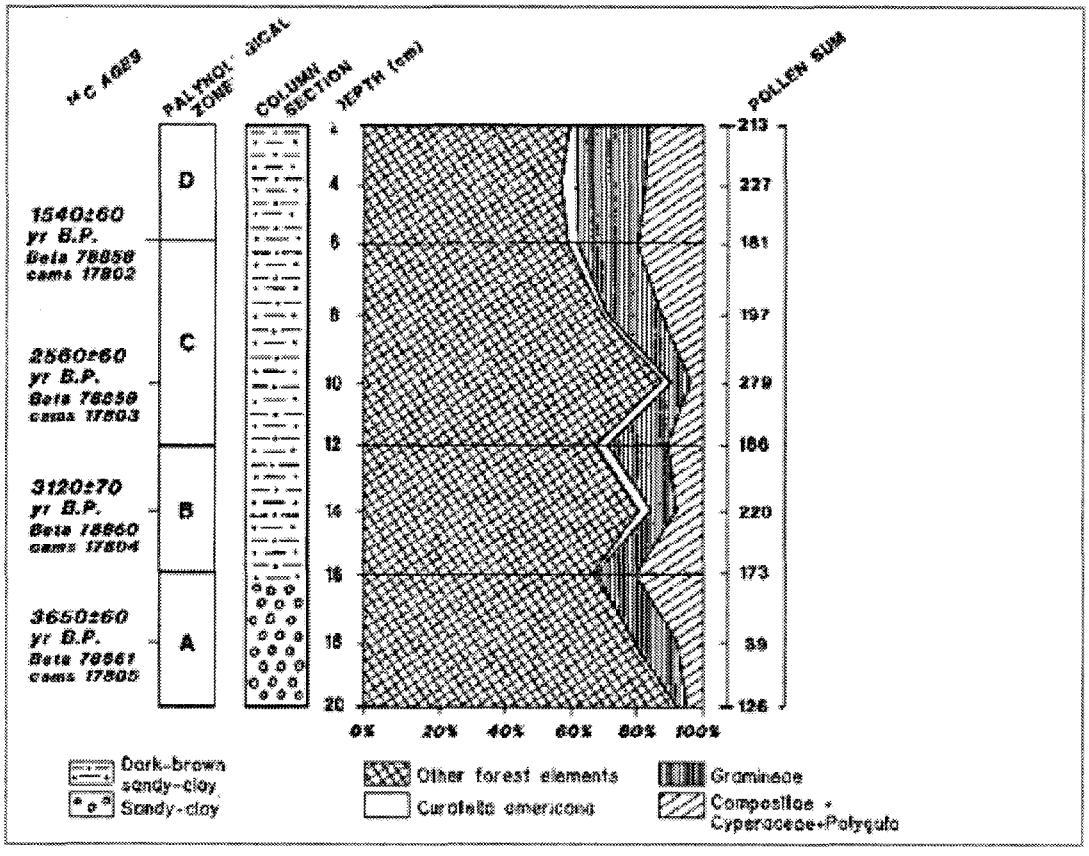

Figure 1- Redondo Lake (Boa Vista-RR)

In the upper part of the diagram, both zones B and C show a complete dominance of grass combined with herbs included in the group Compositae + Borreria + Cyperaceae.

At the beginning of zone C, at 18 cm, a sample was ^{14}C dated as 1590 ± 60 years BP.

Lago da Fazenda São Joaquim

Lago da Fazenda São Joaquim is at present surrounded partly by secondary forest and savanna.

Lago da Fazenda São Joaquim (Fig. 2) shows a dominance of arboreal pollen for the whole diagram.

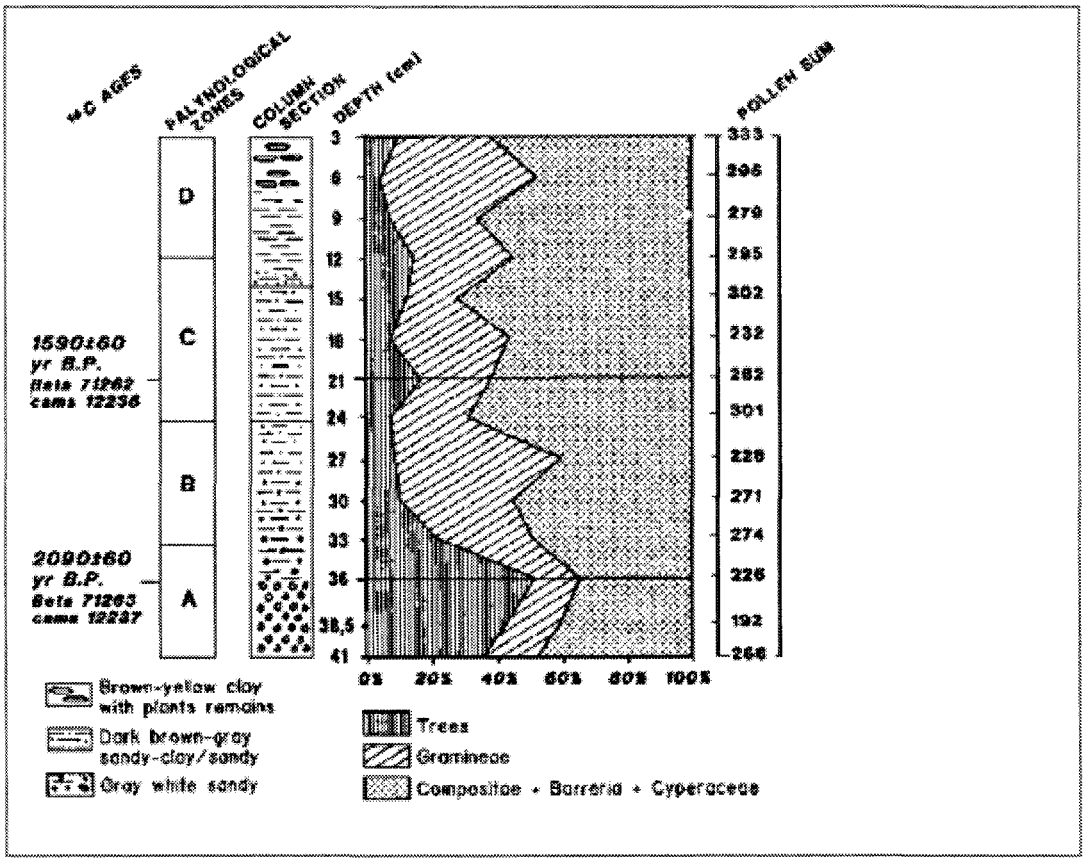

Figure 2- Sao Joaquim lake (Boa Vista-Roraima)

In the lowermost part, represented by zone A, the percentages of arboreal pollen are high. This interval, between 20 and 16 cm, was ^{14}C dated as 3650 ± 60 years BP.

In the beginning of zone B there is a decrease in the percentages of arboreal pollen and an increase in the percentages of Gramineae and the group Compositae + Cyperaceae + Polygala.

The curve for arboreal pollen rises again in zone B around 3120 ± 70 years BP.

Zone C begins with a relatively high percentage of arboreal pollen. This interval was 14C dated as 2560 ± 60 years BP. The percentage of arboreal pollen decreases at the end of this zone, while the percentage of Gramineae and the group Compositae + Cyperaceae + Polygala increases at 1540 ± 60 years BP.

The last pollen zone D shows an extension of savanna with grasses, mainly Gramineae and the savanna tree Curatella americana.

Very little vegetational changes were found in the savannas of Boa Vista, Roraima, at least during the last 3650 years BP.

The diagram for Lago Redondo shows a dominance of open savanna like the previous palynological investigation by Absy (1979, 1985). This is in agreement with the present vegetation in the area. The dominance of forest vegetation reflected in the pollen diagram of Lago da Fazenda São Joaquim is partly, caused by secondary elements, like Cecropia and Piper.

❖ REFERENCES

Absy, M.L. (1979). A palynological study of holocene sediment in the Amazon basin. Ph.D Thesis. University of Amsterdam, 86 p..

Absy, M.L. (1985). The palynology of Amazonia : The history of the forests as revealed by the palynological record. In : Prance, G.T. & Lovejoy, T.E. (eds) - Key Environments Amazonia, Oxford, Pergamon Press, p. 72-82.

Erdtman, G. (1960). The acetolysis method in a revised description. Sv. Bot. Tdsk Lund, 54 (4), p. 561-564.

Faegri, K. & Iversen, J. (1966). Textbook of pollen analysis. 2nd ed. Copenhagen, Munksgaard, 228 p., 8 pl., 23 fig., 8 tabl..

Kummel, B. & Raup, D. (1965). Handbook of Paleontological techniques. San Francisco, Freeman, xiii + 852 p., ill..

DYNAMIQUE À LONG TERME DES ÉCOSYSTÈMES FORESTIERS INTERTROPICAUX

Paris, France 20 - 21 - 22 Mars, 1996

symposium

CNRS — ORSTOM