

POLLEN-ANALYTICAL INVESTIGATIONS OF SOME UPPER PLEISTOCENE SAMPLES FROM TOCKALAI, CINNAMARA, ASSAM

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ABSTRACT

The paper embodies results of pollen-analytical investigations of six Upper Pleistocene samples from a trench dug near Tockalai experimental Station, Cinnamara, Assam. Out of six samples only two samples (11' & 12' deep) have yielded pollen grains and spores. The pollen-analysis has brought out minor fluctuation in the Assam subtropical hill forest.

INTRODUCTION

THE present paper describes results of the pollen-analytical investigations of six samples collected from Tockalai, Cinnamara, Assam. Of the six only two samples (11' & 12') have yielded pollen grains and spores. Pollen and spores encountered in the above two samples are quite frequent. The samples are silty clay in nature with greyish yellow colour. These deposits in Assam largely consist of soft unconsolidated clays, silts and sands which lie at the foot of Himalaya are washed down by Brahmaputra and its tributaries. The recent alluvium which is being deposited can be readily identified from the ancient alluvium. The former is known as *Khadar* and the latter as *Bhangar*, corresponding to the Recent and Middle-Upper Pleistocene respectively. The older alluvium is mostly made up of massive clay, pale-reddish brown in colour which on exposure, very often turns into yellow colour. The Middle-Upper pleistocene age of older alluvium is quite evident from the faunal remains of extinct species of elephant, horse, ox, rhinoceros and hippopotamus, etc. found in it (DEY, 1968).

The pleistocene geology of Assam consists of the huge thickness of the alluvial deposits. The great alluvial tract of the Brahmaputra valley has been deposited during the last epoch and as such blanketed the structure and stratigraphy beneath it.

The rocks are undoubtedly fluvial and sub-areal in origin and consist of sand,

clay and silt with sporadic beds of gravel, kankar and peat (GOSWAMI, 1960). MacLaren (1904) arranged the pleistocene stratigraphy of Assam as:

3. Recent deltaic deposits
2. Khadar — New alluvium
1. Bhangar — Older alluvium — unconformity.

MATERIAL

The material comprising 1 to 6 samples collected at the depth of 5', 8', 11', 12', 13' and 14' respectively from a trench dug near Tockalai, Experimental Station, Cinnamara (Assam) was kindly sent by Shri D. N. Barua, Senior Botanist of Tea Research Association, Tockalai, to the Director of Birbal Sahni Institute of Palaeobotany. The Director of the Institute passed on the material to Head of the Department of Quaternary Palaeobotany who very kindly handed over to me for pollen-analytical investigation. To them I owe my sincere thanks for very kindly passing over the material to me.

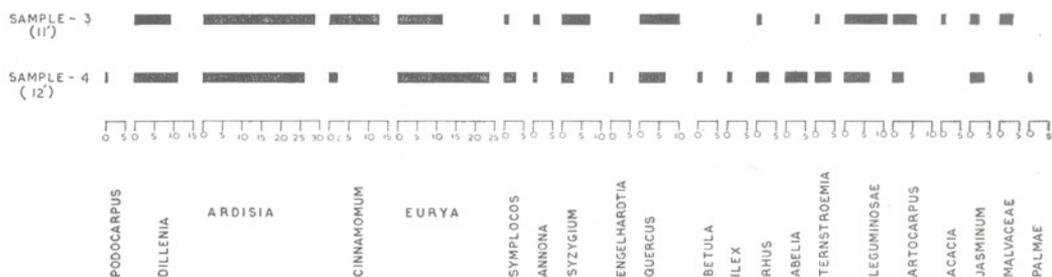
METHOD

Approximately 10 gms of each sample was ground gently and boiled for about ten minutes in 10% KOH solution in order to deflocculate the matrix. After deflocculation, the material was sieved. The residue was examined for seeds and fruits, and to the filtrate Hydrofluoric acid was added and boiled in a platinum crucible and then the residue was acetolysed by Erdtman's method of Acetolysis (ERDTMAN, 1943) and the slides were mounted in concentrated glycerine mixed with phenol.

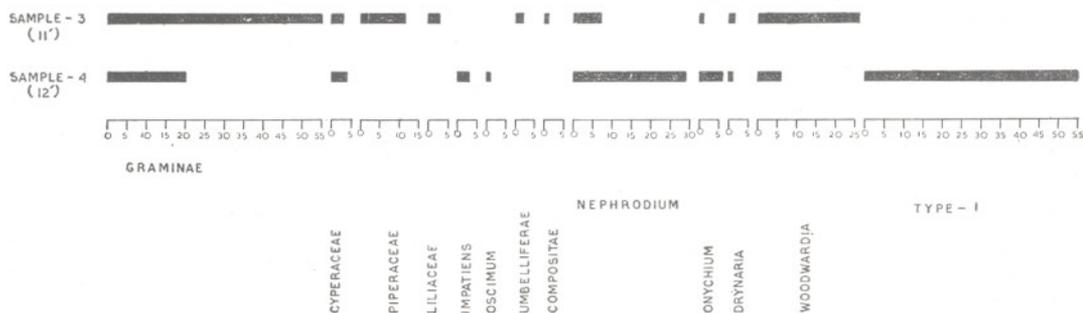
More than two hundred arboreal pollen grains were counted for each sample and the percentage for each pollen type was calculated in terms of total arboreal pollen. Quite a few pollen bunch comprising nearly

POLLEN SPECTRA FROM TOCKALAI CINNAMARA
ASSAM

TREES AND SHRUBS



HERBS AND FERNS



four hundred and fifty pollen have also been encountered. Since their identity could not be ascertained, they have been put together under a pollen type. The pollen spectra have been arranged in two sets one for arboreal pollen and another for non-arboreal pollen.

DESCRIPTION OF POLLEN SPECTRA

Sample No. 3 — Depth 11 feet

The pollen spectrum reveals the abundance of arboreal vegetation comprising

Dillenia, *Ardisia*, *Cinnamomum*, *Eurya*, *Syzygium*, *Quercus*, *Artocarpus* and Legumes. The other components of this forest although lowly represented are *Symplocos*, *Annona*, *Rhus* and *Acacia*. The shrubby vegetation is represented by *Jasminum* along with a few members of Malvaceae.

The ground vegetation is dominated by Gramineae followed by Piperaceae, Cyperaceae, Liliaceae, Umbelliferae and Compositae. Amongst filicales *Woodwardia* and *Nephrodium* are present in low percentages.

Sample No. 4—Depth 12 feet

This pollen spectrum represents almost the same pattern of vegetation as found in Sample 3. *Dillenia*, *Ardisia*, *Eurya*, *Symplocos*, *Syzygium*, *Quercus*, *Abelia*, *Ternstroemia*, *Artocarpus* and Legumes are the constituents of subtropical hill forest whose pollen grains are found in high frequencies whereas *Podocarpus*, *Cinnamomum*, *Annona*, *Engelhardtia*, *Betula*, *Ilex*, *Rhus* and *Palmae* are under represented. The shrubs are represented by *Jasminum* spp.

The undergrowth of the forest is dominated by Gramineae, *Nephrodium*, Type 1, *Onychium*, *Woodwardia*, *Cyperaceae* and *Impatiens*. *Oscimum* and *Drynaria* are represented by very low frequencies.

DISCUSSION

The pollen analytical investigation of two samples from Tockalai has brought out minor fluctuation in the forest vegetation. The pollen spectra depict a composition of Assam subtropical hill forest in Tockalai during the Upper Pleistocene time as it is evidenced by the high frequencies of *Dillenia*, *Ardisia*, *Cinnamomum*,

Eurya along with *Syzygium*, *Quercus*, *Ternstroemia*, *Abelia*, etc. The ground vegetation is dominated by Gramineae, Piperaceae, Cyperaceae and a few members of filicales such as *Nephrodium*, *Onychium*, *Drynaria* and *Woodwardia*. *Dillenia*, *Ardisia*, *Eurya*, *Symplocos*, *Quercus* Leguminosae and *Jasminum* continue to remain dominant throughout the spectra. *Cinnamomum* is present in reduced percentages during fourth sample but the values increase considerably in the third sample. *Podocarpus*, *Betula*, *Ilex*, *Abelia* and *Engelhardtia* are present in the fourth sample but disappear in the third sample showing a step towards the decline in the forest vegetation.

Amongst non-arboreal vegetation Gramineae shows a tremendous rise followed by an overall decline in the filicales. *Impatiens* and *Oscimum* are lowly present in fourth sample but disappear in third sample.

The material is too meagre to provide any information regarding the climate of the past. It is hoped that a detailed study will surely bring out fluctuations of the past vegetation and the climatic incidences.

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