

# UPPER SIWALIK PALYNOFLORA FROM GAGRET-BHARWAIN ROAD SECTION, HIMACHAL PRADESH

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Palynofloral studies on the Siwalik Group started about a decade earlier. BANERJEE (1968) published the first paper on the Siwalik palynology which deals with the palynofloral assemblage and its application in interpreting palaeoclimate and depositional environment of the Lower and Middle Siwalik sediments exposed in the Bhakra-Nangal area of Punjab. Thereafter, LUKOSE (1969), NANDI AND BANDYOPADHYAY (1970), VENKATACHALA (1972), NANDI (1972, 1975), MATHUR (1973), SINGH, KHANNA AND SAH (1973), GHOSH (1977) and SAXENA AND SINGH (1980, in press) have made significant contributions to the Siwalik palynology. A review of the above mentioned papers indicates that most of them deal with the Lower and Middle Siwalik only.

Pioneering efforts on the Upper Siwalik palynoflora have been made by NANDI (1975) and GHOSH (1977) reporting 8 genera of pteridophytic spores and gymnospermous and angiospermous pollen. Subsequently a fairly rich, Upper Siwalik (Pinjor Formation) palynoflora has been recovered from the vicinity of Chandigarh by SAXENA AND SINGH (1980, in press). This assemblage includes fungal and pteridophytic spores and gymnospermous and angiospermous pollen assignable to 19 genera and 23 species.

The object of the present note is to record the occurrence of another Upper Siwalik palynofloral assemblage from the Gagret-Bharwain Road Section, Himachal Pradesh. The samples were collected from the carbonaceous/grey shale bands and lenses within the massive, medium-coarse grained sandstone of the Upper Siwalik by one of us (H. P. S.). The palynotaxa recorded from these sediments are: *Pinuspollenites siwalikus* Singh & Saxena (Ms.) *Aplanosporites robustus* Kar, *A. bharwainensis* Singh & Saxena (Ms.) *Laricoidites magnus* (Potonié) Potonié, Thomson & Thiergart, *L. minutus* Singh & Saxena, *Araucariacites australis* Cookson, *Verruletes assamicus* Singh & Saxena, *Graminidites pliocenicus* Singh & Saxena (Ms.) *Inapertisporites vulgaris* Sheffy & Dilcher, *I. subcapsularis* Sheffy & Dilcher, *I. maximus* Singh & Saxena (Ms.) *Multicellaesporites* sp., *Monoporisporites minutus* van der Hammen and *Tetraploa* sp.

An analysis of the above assemblage reveals that it consists of 10 genera and 14 species. Of these, 3 genera and 4 species belong to gymnospermous pollen (65%), 2 genera and 2 species to angiospermous pollen (7%), 4 genera and 6 species to fungal spores (14%) and 1 genus and 2 species are of unknown affinity (14%). Besides, a few reworked microplanktons (probably of Eocene age) have also been encountered. The bisaccate (33%) and inaperturate (32%) pollen are the dominant constituents of the assemblage. The Upper Siwalik palynomorphs have been compared with the living pollen. This study indicates the possible representation of the following 3 families, viz., Pinaceae, Potamogetonaceae and Gramineae.

The present assemblage is distinctly different from that recorded by NANDI (1975) and GHOSH (1977) from the Upper Siwalik of Jawalamukhi Unit of Punjab. This difference is perhaps due to the disparity in the stratigraphic position of the two. On the other hand, the present palynoflora appears to be identical to that recorded by SAXENA AND

SINGH (1980, in press) from the Pinjor Formation exposed near Chandigarh. The frequencies of most of the palynomorph groups of the two assemblages are closely comparable but for few minor and insignificant differences. The occurrence of reworked microplanktons is also a common feature with both the assemblages. It may therefore be suspected that both the assemblages may be synchronous.

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