Ocimum pollen grains from the Subathu Formation (Late Ypresian) of Shimla Hills, Himachal Pradesh, India

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INTRODUCTION

WELL-PRESERVED pollen grains of Ocimum belonging to the family Lamiaceae have been recovered from the Subathu Formation, exposed in the Koshalia Nala section, near Koti, Sirmaur District, Himachal Pradesh (Fig. 1). The palynological information of fossil lamiaceous pollen is very meagre. Embolden (1964) reported fossil Salvia pollen from the Late Miocene of Alaska for the first time. Later, Von Campo (1976) and Menke (1976) reported some lamiaceous pollen from Late Miocene of Spain and Pliocene of Germany respectively. Boltenhagen (1976a, b) recorded hexacolpate pollen grains from Coniacian of Gabon which resembles Salvia pollen. Kar (1996) reported Ocimumpollenites indicus from Palana Formation (Eocene) of Rajasthan. As far as the authors are aware, this is the only record of fossil lamiaceous pollen from Indian Tertiary rocks. Ocimumpollenites resembles extant Ocimum pollen by having thick exine, pluricollumellate, broad reticulation and presence of collumella in the lumina. Ocimum is an important genus of the family Lamiaceae (Labiatae) because of its restricted species distribution in tropics. The objective of this communication is to describe Ocimum pollen recorded from the Subathu Formation of Lesser Himalayas as

PLATE 1

1. Ocimumpollenites indicus Kar, 1996 (ca x1000); BSIP Slide No. 12021, coordinates: 22 x 96.5.

2. Same specimen in different focus showing distinct collumellate condition (ca x 1000).

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well as to throw light on its distribution in India during the Tertiary Period.

**OBSERVATION**

The recorded pollen grains are found mostly in polar view (Pl. 1). Size range 50-60 μm in diameter, hexacolpate, brevicolpate, colpi slit funnel-shaped in polar view, exine 3.5 μm thick, tectate, collumellate, reticulate, reticulation pentagonal or hexagonal and of different shapes and sizes, muri pluricollumellate. The recorded pollen grains are very much similar to those recorded by Kar (1996) from a bore core (No. K-12) at Kuchaur-Benia area, about 30 km south west of Bikaner, Rajasthan. The pluricollumellate condition and prominent reticulation patterns are considered to be important characters for the identification of Ocimum pollen in fossil state. Nine species of Ocimum are found in India. Among them, the widely distributed species are O. basilicum, O. sanctum, O. americanum and O. killimundscharicum. It is difficult to assign recorded fossil Ocimum pollen to any particular extant species. However, the present specimens closely resemble pollen grains of extant Ocimum sp. (BSIP Slide No. 9705, Birbal Sahni Institute of Palaeobotany. Lucknow).

**REMARKS**

The present record of Ocimum pollen grains from the Lesser Himalayan sediments indicates that the genus Ocimum was widespread during Late Ypresian than hitherto known. On the basis of the restricted distribution and undoubted fossil record of Ocimumpollenites indicus in the Early Eocene sediments of India, Kar (1996) postulated that different species of Ocimum except O. killimundscharicum might have
originated in India and then migrated towards east and west. The Subathu Formation horizon from which *Ocimum* pollen grains have been described has been dated Late Ypresian on the basis of Larger Foraminifera (Bhatia & Singh, 1991; Bagi, 1992), nannofossils (Jafar & Singh, 1992) and dinoflagellates (Sarkar & Prasad, 2000). The close similarities between the recorded *Ocimum* pollen grains from widely separated areas viz., Rajasthan and Himachal Pradesh in Eocene times strongly indicates that during Early Eocene the Genus *Ocimum* was well established in the north-western part of India.

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**REFERENCES**


