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Short Communication

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

SAMIR SARKAR AND VANDANA PRASAD

Birbal Sahni Institute of Palaeobotany, 53 University Road, Lucknow 226 007, 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 Coniacean 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

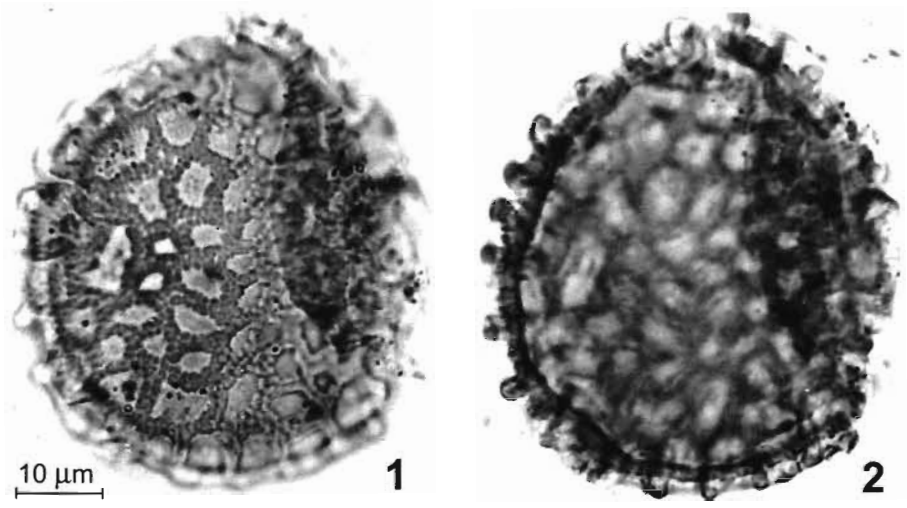

PLATE 1

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).

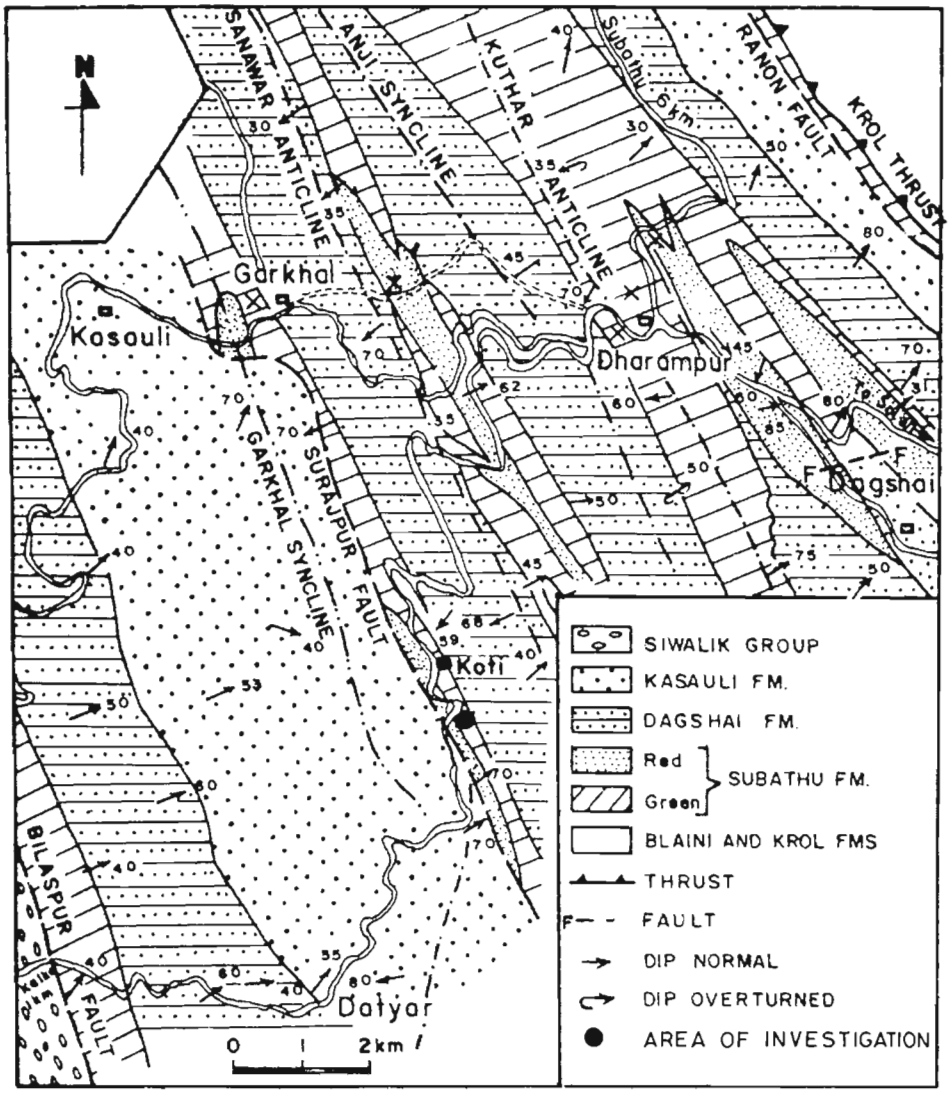

Fig. 1—Geological map of the area showing the locality (after Mathur & Juyal, 2000).

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. basillicum*, *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

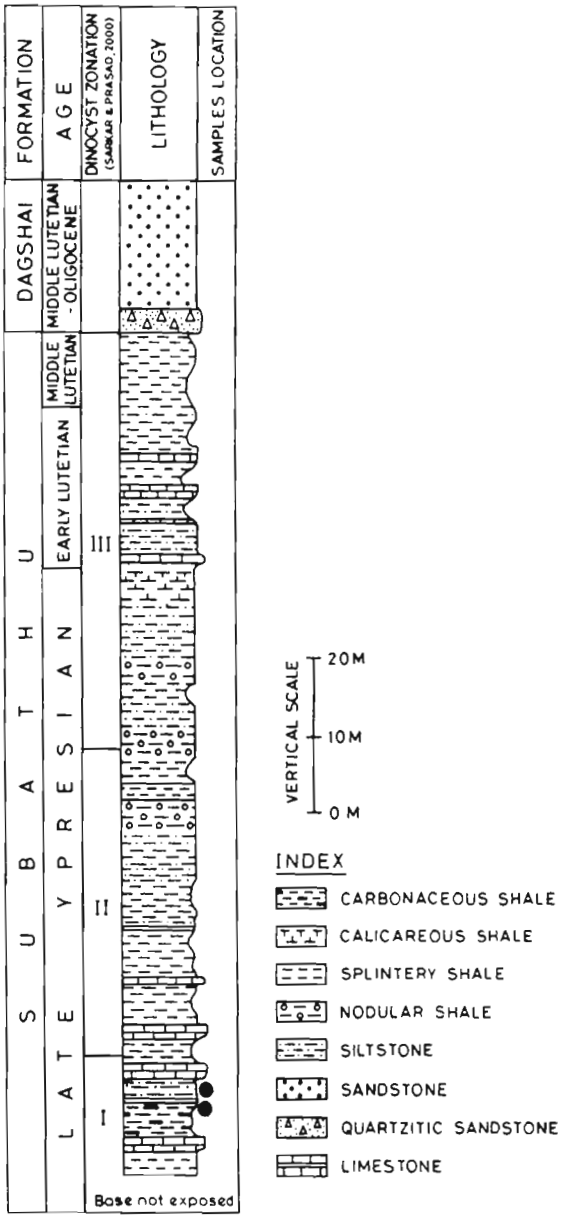

Fig. 2—Litholog (modified after Bhatia & Singh, 1991) showing the location of samples.

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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