

Development of Allergenic and Melliferous Floral Pollen Spectrum Using Scanning Electron Microscopy

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Abstract : Morphological features of pollen (sculpturing) were useful for identification of different floral taxa. In this study 49 pollen grains, types belonging to 25 families were studied using Scanning Electron Microscope. Shape and sculpturing of pollen ranging from Psilate, scabrate to reticulate, biretulate and echinolophate. Honey pollen was identified using morphological features, number and arrangement of pore and colpi, size and shape. It presents the first attempt from Pakistan involving extraction of pollen from honey, its identification and taxonomic analysis. Among pollen studied diversity in shape and sculpturing has been observed ranging from Psilate, scabrate to reticulate to biretulate and echinolophate condition. Pollen has been identified with the help of morphological feature, number and arrangement of pore and colpi, size and shape, reference slides, light microscopic data and previous literature have been consulted for pollen identification. Pollen of closely related species resemble each other therefore pollen identification of airborne and honey pollen is not possible till species level. Survey of flora was carried in parallel to keep the record about the allergenic and melliferous preference of specific sites through surveys and interviews. Their pollination season and geographical distribution were recorded. Two hundred and five including wild and cultivated taxa were identified belonging to sixty-seven families. Major bee attracting wild shrub and trees includes *Justicia adhatoda*, *Acacia nilotica*, *Ziziphus jujuba*, *Taraxicum officinalis*, *Artemisia dubia*, *Casuarina sp.*, *Ulmus sp.*, *Broussonetia papyrifera*, *Cupressus sp.* or *Pinus roxburghii* etc. Cultivated crops like *Pennisetum typhoides*, *Nigella sativa*, *Triticum sativum* along with fruit trees of *Pyrus*, *Prunus*, *Eryobotria*, *Citrus* etc. are popular melliferous floras. Exotic/introduced species like *Eucalyptus* or *Parthenium hysterophorus*, are also frequently visited by bees indicating the significance of those plants in the honey industry. It is concluded that different microscopic analysis techniques give more clear and authentic pictures of and melliferous pollen identification which is well supported by the floral calendar. The diversity of pollen are observed in case of melliferous pollen, and most of the windborne pollen were found less sculptured or psilate expressing the adaptation to the specific mode of pollination. Pollen morphology and sculpturing would serve as a reference for future studies.

Keywords : pollen, allergenic flora, sem, pollen key, Scanning Electron Microscopy (SEM)

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