REVIEW OF LITERATURE

The study of pollen grains is closely associated with the invention and improvement of microscopy. The initial studies were confined to the structure and function of pollen grains, resulting into the preparation of pollen floras, monographs, etc., and a wide range of investigations in allied aspects. Wodehouse (1935) in his book "Pollen Grains" has given an excellent historical account of pollen morphology including their structure, function and significance and also provided some principles of pollen evolution (Wodehouse, 1936).

Greatly influenced by the theory and principles of pollen analysis given by Von Post in 1916, Erdtman started his researches on quaternary pollen analysis of peat and allied sedimentary materials from various parts of the world. He published a book "An Introduction to Pollen Analysis" in 1943, which was followed by his monumental work "Pollen Morphology and Plant Taxonomy/Angeiosperms" (1952) in which he laid the principles, methods for the study of pollen morphology, and also proposed terminology for pollen spore descriptions.

In 1963, 1964 he has given the NPC (Number, position and character of aperture) system of palynotaxonomy and evolution. The pioneer work of Wodehouse and Erdtman on palynology initiated workers from different parts of the
world. Some other important works on the subject were by Faegri and Iversen (1950), Ikuse (1956), Nair (1966, 1970), Kuprianova (1974), Barnes and Blackmore (1986), Blackmore and Ferguson (1986), Crane (1986) and Thanikiamoni (1986).

Preparation of some local and regional pollen flora has been made from New Zealand (Cranewell, 1942), Hawaii (Selling, 1947), South Africa (Bakker, 1953), and India (Nair, 1965), etc.

Besides these pollen floras, monographic works on monocotyledonous plants have been done by Kuprianova (1948), Cranewell (1953), and Sharma (1967) and on dicotyledonous plants by Strix (1960), Raj (1961), Saad (1960), Straka and Ihlenfeldt (1965), Stuchlik (1967), Chanda (1962, 1965), Sahay (1969) and Nilsson (1967a, 1967b).

In India Palynological studies date back to the later half of nineteenth century where Hooker (1872 - 1897) in the Flora of British India gave information on the pollen grains of Apocynaceae, Leguminosae, Malvaceae and Passi-floraceae. The aspects of palynology in India were discussed from time to time by Sahni (1948), Nair (1960, 1966), Vishnu - Mittre (1961), Srivastava (1962), and Khan (1968). Pollen descriptions on several Indian families with notes on plant taxonomy, have been attempted by Vishnu - Mittre and Gupta (1964), Ramjai and Randhawa
(1965a, 1965b); Nair and Sharma (1965); Rao (1965); Raj and Suryakanta (1968); Varghese (1968); Sharma (1968, 1960); Raj (1961); Desai and Thorne (1973); Mukherjee (1973); Sahay (1973); and Nair et al., (1976).

Apart from the above, some of the pollen floras were prepared by Nair (1965) for Western Himalayan plants; Jain and Nanda (1966) for some desert plants of Pilani; Gaur (1972) for Meerut; Rau and Chukla (1975) for upper Gangetic Plains; Sharma (1981) for Garhwal Himalaya; Sharma (1985) for herbs of Western Himalaya; Gupta and Sharma (1986) for North Western Himalaya, etc.

The beginning of the pollen analysis of the honey dates back to the year 1895 when Pfister by microscopical examination of a number of honey samples from different countries, showed for the first time that it is possible to determine the geographical source of the honey by observing the pollen grains in it. For their identification, he referred to the works of Mohl (1834), Pritzsche (1837) and Fisher (1890) on basic palynology.

This was followed by works on the microscopical study of pollen grains by Young (1908) and Fehlmann (1911). Fehlmann was first to state on the differentiation between the flower honey and honeydew honey. His publication has many valuable observations on pollen spectra of Swiss honey.
After about 20 years, there emerged the works of Armbruster and Oenika (1920), Armbruster and Jacobs (1934/35), and Griebel (1930/31) over the pollen analysis of honey, and especially the fundamental work of Zander (1932, 1935, 1937, 1941). His investigations published in 3 volumes of the "Beiträge Zur Herkunftsbestimmung bei Honig", constitute a standard work, contain more than a thousand pollen microphotographs and extensive references. These works are very useful to honey pollen analysis as well as to palaeontologists analysing the ancient honeys from the Egyptian graves (Zander, 1941), or in dry methanoline remains which may occur in old drinking horns.

On account of these works, in the following years, the microscopical investigations of honey were taken up and developed on a wider scale in different European countries. As for instance, in Britain, Allen (1937) worked with the European Bee Plants, while Deans (1939) analysed the heather honey for pollen, and Mikkelsen (1948) worked with honey analysis attempting to identify the Cruciferae pollen in it. Some of the notable works from different countries are: Finland, Martimo (1945); Germany, Evenius (1932, 1933a, 1933b); Gassner (1931), Koch (1933), and Zander (1941); Holland, de Boer (1933); Hungary, Hazlinsky (1938, 1943); Italy, Grandi (1934); Portugal, de Mendia (1939); Spain, Vieitez (1948); Sweden, Lunder (1945); Switzerland, Maurizio (1936a, 1936b, 1938, 1939, 1940a,

The basis, aims and methods of melissopalynology have been described by Maurizio (1951, 1975), Manten (1966), and Louveaux et al. (1970). These workers also analysed the scope and application of this branch. Recently, a bibliographical detail together with the sources of honey has been published by Crane et al. (1984). It includes about 467 plants of the world as important bee forage.
