

Summer pollen sources for honey bees in the coastal belt of East Godavari District, Andhra Pradesh

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546 summer pollen loads (comb loads) collected from the hives/combs of *Apis cerana* and *A. florea*, honey bees in the coastal belt of East Godavari District were studied for their pollen contents. *Borassus flabellifer*, followed by *Cocos nucifera* represent the major and, *Guazuma ulmifolia*, *Syzygium cumini* and *Mollugo cerviana* constitute the minor sources of pollen.

Key-words—Mellitopalynology, Honey bees, Pollen sources, East Godavari District, Andhra Pradesh.

INTRODUCTION

NECTAR and pollen provide the nutritional requirements of the honey bees. Nectar is the primary source of carbohydrates and pollen, that of proteins, lipids, vitamins and minerals. For the healthy and robust multiplication of any bee colony involving higher production and rearing of brood, a continual and adequate supply of pollen is of paramount importance. A critical microscopical analysis of pollen loads of the honey bees of an area furnishes unequivocal information regarding their chief pollen sources which concomitantly could be considered as an expression of their floral fidelity.

Studies involving the analysis of pollen loads are very few compared to those of honeys in the Indian context. The pollen load study of *Apis cerana* from Kangra valley, Himachal Pradesh (Sharma, 1970a, 1970b) and Banthra near Lucknow (Chaturvedi, 1973) brought to light various plants serving as major or minor sources of pollen. Seethalakshmi and Percy (1979) analysed numerous pollen loads from the bee colonies at Kuzhuthurai (Tamilnadu) and highlighted *Borassus flabellifer* as an important pollen source all through the year. *Cocos nucifera*, *Cucumis sativus*, *Citrullus lanatus* and *Citrus* sp. were reported to be major sources of pollen for the honey bees at Vijayarai, Andhra Pradesh (Singh *et al.*, 1987). Information pertaining to the pollen sources for *A. florea* and *A. cerana* bees in Hyderabad and Ranga Reddy districts of Andhra Pradesh was provided by Kalpana *et al.* (1990) and Ramanujam and Kalpana (1990-91). More recently

Suryanarayana *et al.* (1992) carried out studies on the pollen loads of *A. cerana* and *A. mellifera* from Muzaffarpur, Bihar and identified major, medium and minor sources of pollen.

The present study is mainly aimed at identifying the major and minor pollen sources for the honey bees in coastal belt of East Godavari District during summer.

MATERIAL AND METHODS

546 pollen loads (comb loads) were collected from the coastal belt of East Godavari District during the month of April, 1992. Of these, 306 were obtained from the hives of *Apis cerana* at Sarpavaram and 240 from the combs of *Apis florea* at Coringa in the vicinity of Kakinada.

The pollen loads (pellets), neatly stacked one above the other in the pollen storing cells of the combs/hives were recovered carefully with the help of clean needles and preserved in paper packets. Small quantity of pollen from each pollen load was subsequently dispersed in 1 ml glacial acetic acid and subjected to acetolysis. One slide was prepared for each pollen load and the contents examined. Reference pollen slides of the local flora and relevant literature were made use of for identifying the pollen types recorded. Pollen loads consisting of a single pollen type were designated as unifloral, those with 2 types, bifloral and with more than 2 types, multifloral (Sharma, 1970a).

OBSERVATIONS

- (a) *Analysis of Sarpavaram pollen loads*— Of the 306 pollen loads examined, 290 (94.77%) were found to be unifloral, 12 (3.92 %) bifloral and 4 (1.31 %) multifloral. 188 of the 290 unifloral loads showed *Borassus flabellifer*, 99 *Cocos nucifera* and 3 *Guazuma ulmifolia* pollen types. 8 of the 12 bifloral loads were of *Borassus flabellifer* and *Cocos nucifera*, 2 of *Cocos nucifera* and *Syzygium cumini*, 1 of *Borassus flabellifer* and *Guazuma ulmifolia* and 1 of *Borassus flabellifer* and *Syzygium cumini*. Of the 4 multifloral loads, 3 had the pollen of *Borassus flabellifer*, *Cocos nucifera* and *Guazuma ulmifolia* and 1 of *Borassus flabellifer*, *Cocos nucifera* and *Syzygium cumini*.
- (b) *Analysis of Coringa pollen loads*— Of the 240 pollen loads studied, 231 (96.25 %) were found to be unifloral, 7 (2.92 %) bifloral and 2 (0.83%) multifloral. All the unifloral loads were of *Borassus flabellifer*. Of the 7 bifloral loads, 5 contained the pollen of *Borassus flabellifer* and *Mollugo cerviana* and 2 of *Borassus flabellifer* and *Cocos nucifera*. Both the multifloral loads had the pollen of *Borassus flabellifer*, *Cocos nucifera* and *Mollugo cerviana* (Pl. 1, figs 1-8).

The unifloral pollen loads are of characteristic colours which often facilitate their identification. Thus, the pollen loads of *Borassus flabellifer* were bright yellow, *Cocos nucifera* pale or whitish yellow and *Guazuma ulmifolia*, yellowish orange.

DISCUSSION

The study highlights that in the coastal belt of East Godavari District, *Borassus flabellifer*, *Cocos nucifera*, *Guazuma ulmifolia*, *Syzygium cumini* and *Mollugo cerviana* constitute important pollen sources for the honey bees during the month of April (summer). Of these, however, *Borassus flabellifer* followed by *Cocos nucifera* in Sarpavaram village and *Borassus flabellifer* in Coringa village should be considered as the major pollen suppliers.

Earlier, Seethalakshmi and Percy (1979) brought to

light the importance of *Borassus flabellifer* as significant pollen source for the honey bees more or less throughout the year at Kuzhuthurai in Tamilnadu. According to Singh *et al.* (1987), *Cocos nucifera* is the most important source of pollen at Vijayarai in Andhra Pradesh. More recently *Borassus flabellifer* was shown to be a major pollen source and *Cocos nucifera*, a medium pollen source for *Apis cerana* and *A. mellifera* bees at Muzaffarpur in Bihar (Suryanarayana *et al.*, 1992). It is being increasingly realized of late that some members of *Arecaceae*, viz., *Elaeis*, *Phoneix*, *Borassus*, *Cocos*, *Roystonea* etc., are not only major suppliers of pollen but also reliable sources of nectar and thus represent important bee forage plants (Seethalakshmi, 1980; Eva Crane *et al.*, 1984; Agwu & Akanbi, 1985; Jhansi & Ramanujam, 1986; Ramanujam & Khatija, 1991; Ramanujam *et al.*, 1992a, 1992b) that can be depended upon in commercial bee-keeping ventures.

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Plate 1

(All figures x 300)

Figs. Pollen types recorded in the unifloral pollen loads.
1-3.

1. *Borassus flabellifer*
2. *Cocos nucifera*
3. *Guazuma ulmifolia*

Figs. Pollen types recorded in the bifloral pollen loads.
4-8.

4. *Borassus flabellifer* and *Cocos nucifera*
5. *Borassus flabellifer* and *Mollugo cerviana*
6. *Cocos nucifera* and *Syzygium cumini*
7. *Borassus flabellifer* and *Guazuma ulmifolia*
8. *Borassus flabellifer* and *Syzygium cumini*

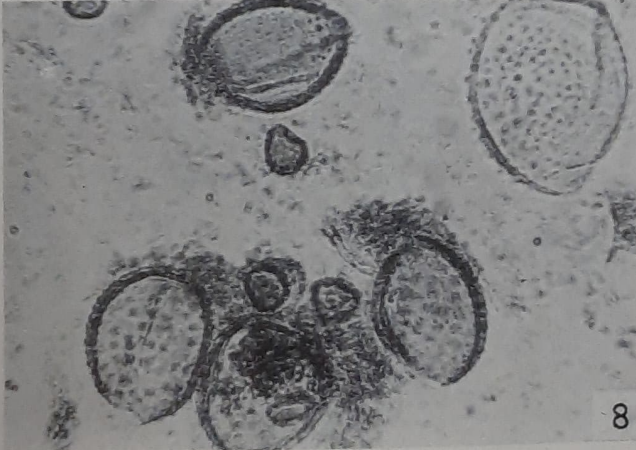
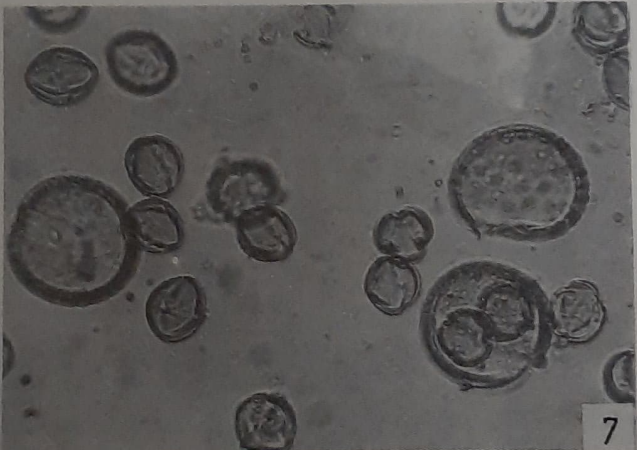
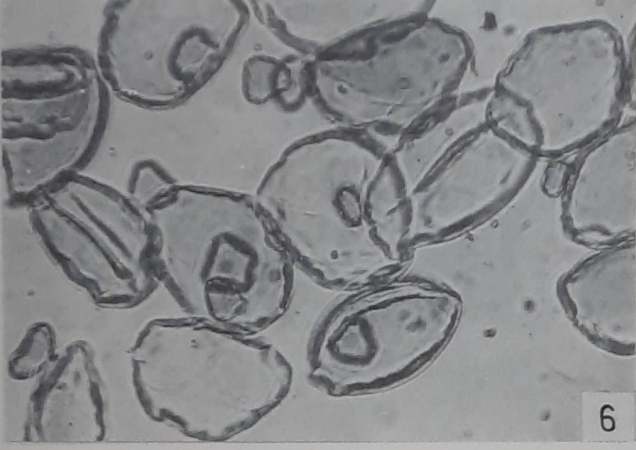
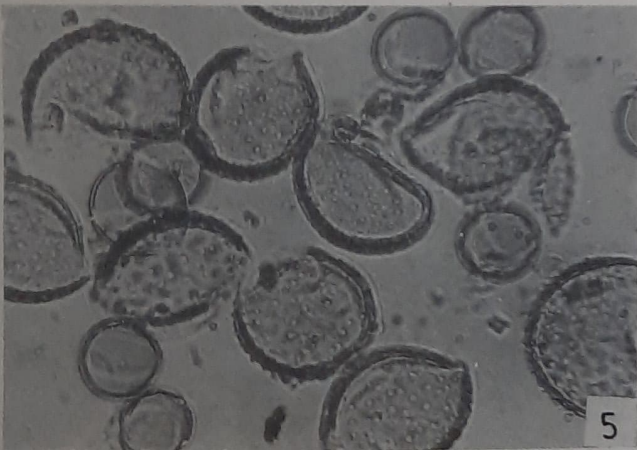
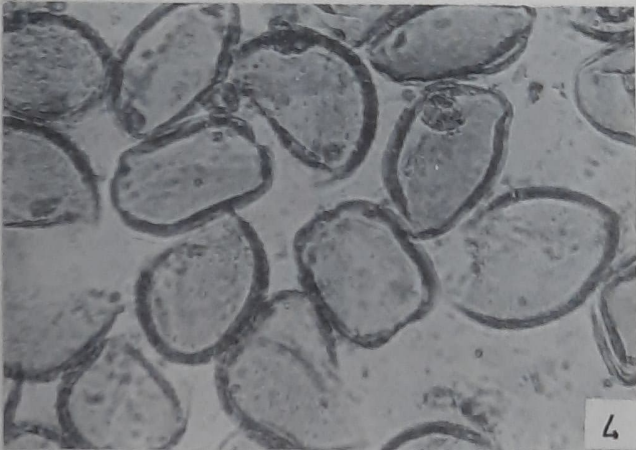
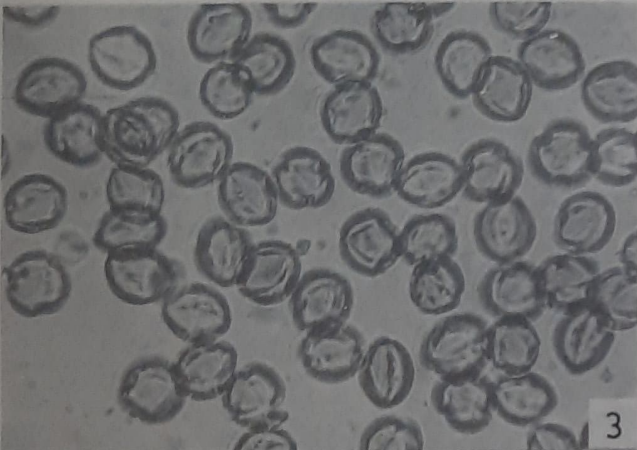
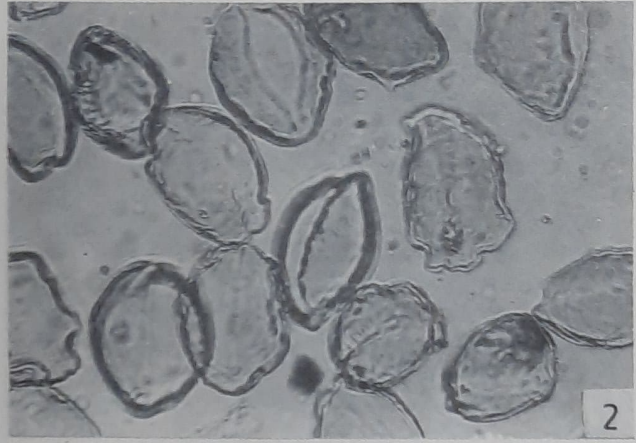
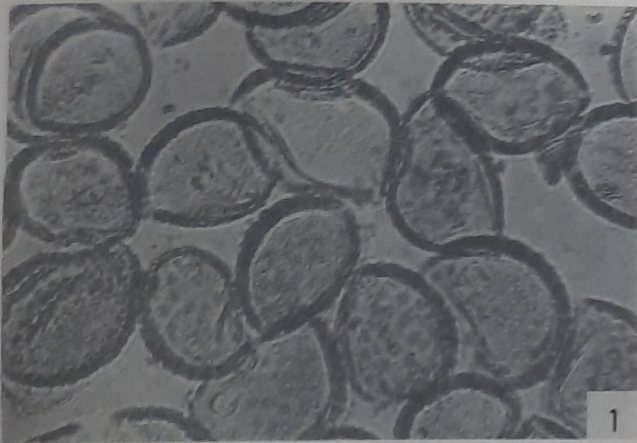


Plate 1

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