

PP-540 [Pollination and Bee Flora]



MAIN POLLEN STRUCTURES ASSOCIATED WITH THE BOTANICAL ORIGIN OF HONEY FROM HUILA, COLOMBIA

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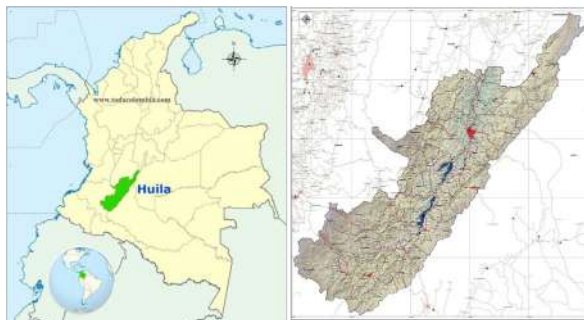


REMARKS

Honey is a natural and nutritious product produced by honeybees from floral nectar and plant secretions, containing sugars, acids, enzymes, pollen grains, and minor solid particles that contribute to its nutritional and functional value. Studies on honey, especially those examining its botanical origin, are important for evaluating quality and authenticity, as well as for identifying the floral resources used by bees during foraging. Melissopalynology, which allows the differentiation of pollen grains in honey, provides valuable information on both its botanical and geographical origin.



The Department of Huila, located in southeastern Colombia, is among the country's leading honey-producing regions, ranking fifth over the past four years. It encompasses a diverse range of ecosystems, including Andean highlands, dry forests, and the Magdalena River valley. This ecological diversity sustains a rich array of nectar- and pollen-producing plant species, making the region particularly favorable for apiculture.



The present study aimed to identify the pollen types present in honey samples from Huila and to contribute to the melissopalynological knowledge of Colombia. Nine honey samples from *Apis mellifera* L., collected from seven different locations, were analyzed palynologically. The samples were processed using the standard acetolysis technique, and counts of at least 500 pollen grains were conducted to determine the frequencies of the pollen types.



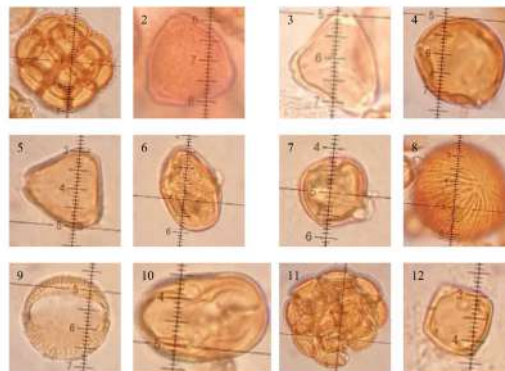
Melissopalynological process: The melissopalynological analysis was carried out through the following steps: (i) preparation of an aqueous honey solution, (ii) application of the Erdtman acetolysis method (1960), (iii) slide preparation following the procedures of Louveaux et al. (1978) and Jones & Bryant Jr. (2004), and (iv) identification of pollen types and quantification of their frequencies.

RESULTS AND DISCUSSION

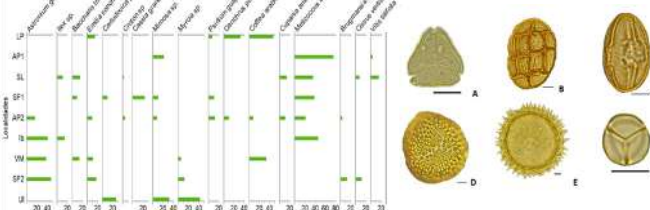
Beekeepers in Huila rely on this floral diversity to maintain sustainable, year-round honey production. The flavor, color, aroma, nutritional content, medicinal properties (linked to plant-derived compounds), and market classification (monofloral vs. multifloral) all contribute to the high quality and commercial value of honey produced in the region.



A total of 36 pollen types corresponding to 25 botanical families were identified. The families Sapindaceae, Leguminosae, and Anacardiaceae showed the highest representation of pollen types (17.1; 9.98, and 9.81%, respectively). The greatest pollen diversity was observed in the sample from Alto Piravante 2, which contained eleven pollen types. Furthermore, some pollen types appeared in the majority of samples and were highly frequent in others, with a representation exceeding 50%—notably *Melicoccus bijugatus* and *Cecropia peltata*—highlighting the importance of these plant species for apiculture in the department.

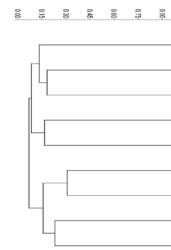


1 *Anadenanthera peregrina* (L.) Speg. 2 *Calycolpus moritzianus* (O.Berg) Burret. 3 *Psidium guajava* L. 4 *Vitis tilifolia* Humb. & Bonpl. ex Schult. 5 *Psidium guajava* L. 6 *Adenaria floribunda* Kunth. 7 *Euphorbia hirta* L. 8 *Brugmansia* sp. 9 *Ageratum conyzoides* (L.) L. 10 *Cassia grandis* L.f. 11 *Pithecellobium dulce* (Roxb.) Benth. 12 *Ageratum conyzoides* (L.) L.



Huila. Representative types of pollen: A *Myrcia* sp. B *Pithecellobium dulce*. C *Triumfetta bogotensis*. D *Croton* sp. E *Sida* sp. F *Mimosa pudica*. Scale bar: 10 µm.

The Jaccard index analysis revealed low similarity among the samples analyzed. Other pollen types, such as *Astronium graveolens* and *Mimosa* sp., showed high occurrence in the samples and are also considered important food resources for bees in the country. The pollen diversity characterizes the honey samples analyzed as multifloral and confirms the importance of certain botanical families Sapindaceae and Leguminosae in honey production.



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Honey production is an activity that utilizes vegetation without any direct negative impact, generating economic income for beekeepers. Studies on honey are of great importance, especially those related to its botanical origin, as they allow us to understand its quality and identify the plants that bees visit during the foraging process. The Huila department, in the southeast of Colombia, is one of the departments with the highest honey production in the country, ranking fifth over the past four years. In this context, the aim of this study was to identify the pollen types present in honey samples from this department and contribute to the mellisopalynological study of the country. Nine samples of *Apis mellifera* L. honey from seven different localities were palynologically analyzed. The samples were treated using the standard acetolysis technique, and counts of at least 500 pollen grains were made to establish the frequencies of the pollen types. In total, 36 pollen types from 25 botanical families were identified. Sapindaceae, Leguminosae, and Anacardiaceae were the families with the highest representation of pollen types (17.05%, 9.98%, and 9.81%, respectively). The highest pollen diversity was found in the sample from the Alto Piravante 2 locality, with eleven pollen types. Additionally, some pollen types were present in most samples and were very frequent in others—*Melicoccus bijugatus* and *Cecropia peltata*—highlighting the importance of plants from these species for beekeeping in the department. Other pollen types, such as *Astronium graveolens* and *Mimosa* sp., were also found with high frequency in the samples. The pollen diversity characterizes the analyzed honey samples as multifloral and reaffirms the importance of certain botanical families—Sapindaceae and Leguminosae—in honey production.