

Palynological Investigation and Quality Determination of Honeys from Some Apiaries in Northern Nigeria

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Abstract : Honey bees exhibit preferences in their foraging behaviour on pollen and nectar for food and honey production, respectively. Melissopalynology is the study of pollen in honey and other honey products. Several work have been conducted on the palynological studies of honeys from the southern parts of Nigeria but with relatively scant records from the Northern region of the country. This present study aimed at revealing the favourably visited plants by honey bees, *Apis mellifera* var. *adansonii*, at some apiaries in Northern Nigeria, as well as determining the quality of honeys produced. Honeys were harvested and collected from four apiaries of the region, namely: Sarkin Dawa missionary bee farm, Taraba State; Eleeshuwa Bee Farm, Keffi, Nassarawa State, Bulus Beekeeper Apiaries, Kagarko, Kaduna State and Mai Gwava Bee Farm, Kano State. These honeys were acetolysed for palynological microscopic analysis and subjected to standard treatment methods for the determination of their proximate composition and sugar profiling. Fresh anthers of two dominantly represented plants in the honeys were then collected for the quantification of their pollen protein contents, using the micro-kjeldhal procedure. A total of 30 pollen types were identified in the four honeys, and some of them were common to the honeys. A classification method for expressing pollen frequency class was employed: *Senna* cf. *siamea*, *Terminalia* cf. *catappa*, *Mangifera indica*, *Parinari curatelifolia*, *Vitellaria paradoxa*, *Elaeis guineensis*, *Parkia biglobosa*, *Phyllanthus muellerianus* and *Berlina Grandiflora*, as "Frequent" (16-45%); while the others are either Rare (3-15%) or Sporadic (less than 3 %). Pollen protein levels of the two abundantly represented plants, *Senna siamea* (15.90mg/ml) and *Terminalia catappa* (17.33mg/ml) were found to be considerably lower. The biochemical analyses revealed varying amounts of proximate composition, non-reducing sugar and total sugar levels in the honeys. The results of this study indicate that pollen and nectar of the "Frequent" plants were preferentially foraged by honeybees in the apiaries. The estimated pollen protein contents of *Senna* same and *Terminalia catappa* were considerably lower and not likely to have influenced their favourable visitation by honeybees. However, a relatively higher representation of *Senna* cf. *siamea* in the pollen spectrum might have resulted from its characteristic brightly coloured and well scented flowers, aiding greater entomophily. *Terminalia catappa*, *Mangifera indica*, *Elaeis guineensis*, *Vitellaria paradoxa*, and *Parkia biglobosa* are typical food crops; hence they probably attracted the honeybees owing to the rich nutritional values of their fruits and seeds. Another possible reason for a greater entomophily of the favourably visited plants are certain nutritional constituents of their pollen and nectar, which were not investigated in this study. The nutritional composition of the honeys was observed to fall within the safe limits of international norms, as prescribed by Codex Alimentarius Commission, thus they are good honeys for human consumption. It is therefore imperative to adopt strategic conservation steps in ensuring that these favourably visited plants are protected from indiscriminate anthropogenic activities and also encourage apiarists in the country to establish their bee farms more proximally to the plants for optimal honey yield.

Keywords : honeybees, melissopalynology, preferentially foraged, nutritional, bee farms, proximally

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