

**STATUS AND THE POTENTIAL OF STINGLESS BEES (*APIDAE:*
MELIPONINAE) FOR FOREST CONSERVATION AND INCOME
GENERATION: A CASE STUDY OF KAKAMEGA FOREST**

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ABSTRACT

Stingless beekeeping (meliponiculture) is a unique eco-friendly agro-practice with the potential for environmental amelioration, employment and income generation. Meliponiculture would be ideal for generation of supplementary income to resource-poor farmers around forests, in addition to conservation of stingless bees. Assessment of the knowledge of stingless bees by community around Kakamega forest indicated that most people know stingless bees but they do not undertake any active conservation measures. Results obtained from this study indicated that two genera of stingless bees, *Meliponula* and *Hypotrigona* occur in Kakamega forest. The community around Kakamega forest identifies stingless bees by their morphological features, nesting architecture and taste, smell and colour of their honey. Trials on queen rearing process of *H. gribodoi* indicated that this species rears queens in two ways: (i) using a special queen cell which is bigger than other brood cells (ii) through emergency queen rearing whereby they join two brood cells, destroying one developing larvae. This queen rearing can be used in colony multiplication in stingless bees rearing. Honey from five species (*Hypotrigona gribodoi*, *Meliponula bocandei*, *M. ferruginea* (black), *M. ferruginea* (white), *Plebeina spp*) varied in composition. The quality variables analyzed varied as follows: moisture, Hydroxymethylfurfural (HMF), diastase activity, proline, free acidity and pH. Moisture content was higher than that of *Apis mellifera*. Studies on antimicrobial activity of the stingless bees against 5 strains of bacteria; *Pseudomonas aeruginosa*, *Salmonella typhi*, *Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis*, indicated susceptibility of the bacteria to the honey. *Escherichia coli* and *P. auregnosa* were the most susceptible bacteria. Moreover, honey from *P. hildebrandti* and *M. ferruginea* (b) showed the highest antibacterial effect. This study forms a foundation of involving

farmers around Kakamega forest in stingless bees keeping as incentive for forest conservation and income generation.