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PP-553 [Pollination and Bee Flora]

# Melittopalynological investigation of honey from sunderban ecosystem,India: way towards sustainable development

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**Abstract:** The Sunderbans support dense populations of *Apis dorsata* due to abundant floral resources and protective mangrove habitats. This study analyzed nectar sources for honeybees via microscopic examination of 12 honey samples from *A. mellifera* and *A. dorsata* colonies. Six *A. mellifera* samples were unifloral, with *Ceriops decandra* dominant in five and *Aegiceras corniculatum* in one. A total of 37 plant species were identified as forage sources. *Kandelia candel* pollen was found only in *A. dorsata* samples, suggesting species-specific foraging patterns.

**Introduction:** Sunderbans in west Bengal of india is a mangrove forest in the Ganga-Brahmaputra delta and has many islands, some inhabited, mostly covered with mangroves species *Heritiera fomes*, *Excoecaria agallacha*, *Sonneratia apetala*, and *Ceriops decandra*. *Apis dorsata* thrives here due to rich floral sources and protection from thorny mangroves. Honey hunting is a major livelihood for tribal communities of Sunderban. This study investigated melittopalynological investigation of honey from Sunderban.

**Materials and methods:** Periodic surveys were conducted in the Sunderban mangrove forests during 2022–2023, during which 12 honey samples were collected—9 from *Apis mellifera* colonies (April 2022 and 2023) and 3 from wild *A. dorsata* colonies (squeezed honey). All samples were analyzed using standard melittopalynological methods recommended by the International Commission for Bee Botany, with slight modifications. Pollen types were identified using reference slides prepared from anther specimens at the Melittopalynology Laboratory, Central Bee Research and Training Institute, Pune. Quantitative analysis followed the methodology of Deans and Louveaux with minor changes.

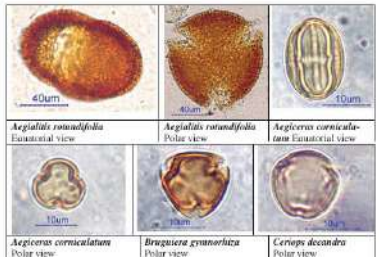
## Results and discussion

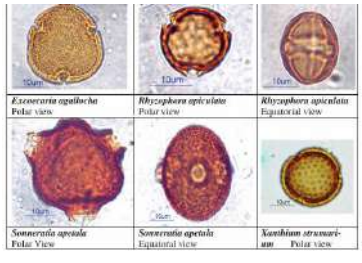
**Table 3** Pollen spectrum of honey samples collected from *A. dorsata* in Sunderbans region

| Taxon | *A. dorsata* | | |
|---|---|---|---|
| | 2/D/10 | 3/D/10 | 5/D/10 |
| *Aegialitis rotundifolia* | 5.19 | 8.83 | – |
| *Aegiceras corniculatum* | | | 5.14 |
| *Albizia* sp. | | | |
| *Avicennia officinalis* | 3.14 | 2.86 | 2.57 |
| *Bignoniaceae* | | | |
| *Bombax ceiba* | 0.65 | | |
| *Borassus flabellifer* | 1.57 | 6.44 | 0.98 |
| *Bruguiera gymnorhiza* | | | |
| *Ceriops decandra* | **50.15** | 32.46 | **61.86** |
| *Chrozophora rottleri* | | | 0.79 |
| *Coriandrum sativum* | 1.73 | | |
| *Helianthus annuus* | 3.62 | 8.35 | 1.97 |
| *Hygrophila* sp. | | | |
| *Kandelia candel* | 31.56 | 35.80 | 24.31 |
| *Osbornia* type | | 5.26 | |
| *Phoenix sylvestris* | | (89.60) | |
| Poaceae | 1.89 | | 2.38 |
| *Xanthium strumarium* | 0.32 | | |

**Apis mellifera honey samples** (9 total):
- Pollen count ranged from 35,000 to 155,600.
- 1 sample in Group III, 8 in Group II (floral honeys).
- 37 total pollen types; 4–12 types per sample.
- Predominant: *Parthenium hysterophorus*, *Phoenix sylvestris*, *Avicennia* sp., *Rhizophora* sp., *Xanthium indicum*.
- *Ceriops decandra* was dominant in one sample.

**Apis dorsata honey samples** (3 total):
- Pollen count ranged from 168,600 to 695,000.
- 2 samples in Group III, 1 in Group IV.
- 2 unifloral, 1 multifloral.
- 14 total pollen types; 8–10 per sample.
- *Ceriops decandra* predominant in 2 samples, secondary in 1.
- *Kandelia candel* was a consistent secondary pollen source.
- *corniculatum*, *Avicennia officinalis*, *Helianthus annuus*, etc.




### Selected References

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•Chakrabarti K (1987). *Sunderbans honey and the mangrove swamps*. J. Bombay Nat. Hist. Soc., 84:133–137.

**Conclusion:** Honey samples from the Sunderbans showed rich floral diversity. *A. mellifera* honey had 37 pollen types, with moderate counts and varied sources. *A. dorsata* honey had higher pollen counts, dominated by *Ceriops decandra* and *Kandelia candel*. The study highlights the Sunderbans mangroves as a vital forage zone for both wild and managed bees and paves the way for sustainable development.

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Sunderbans is thickly populated by the wild honeybee species, Apis dorsata, due to the floral sources and good protection provided by thorny mangroves present in the swamps. In the present study, nectar sources to honeybees were studied based on microscopical analysis of honey samples collected in mangrove forest of Sunderbans, West Bengal, India. In all 12 honey samples were collected, 9 from Apis mellifera colonies and 3 from A. dorsata colonies. Qualitative and quantitative Melittopalynological analysis of the honey samples collected from A. mellifera showed that six samples were unifloral and three samples were multifloral. Ceriops decandra is predominant pollen type in 5 samples and Aegiceras corniculatum in one sample. The secondary pollen types were of Bruguiera gymnorrhiza, Sonneratia apetala and Bunium persicum. A total of 37 plant species served as sources of bee forage to A. mellifera. C. decandrawas predominant pollen type in two samples and as secondary pollen type in one sample of A. dorsata. Kandelia candel pollen is associated as secondary source in all the three samples of A. dorsata It is not found in A. mellifera samples.