

POLLEN ANALYSIS OF HONEY FROM SUNDERBANS (W. BENGAL)

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ABSTRACT

Present paper deals with the qualitative and quantitative pollen analysis of six honey samples from Sunderbans, W. Bengal. This gives a picture of pollen of different species present in honey and their frequency. Pollen of Rhizophoraceae are dominant in the samples, but *Bruguiera* and *Phoenix* are dominant genera so far percentage is concerned.

Sunderbans, comprising of small islands, is situated at the estuary of river Hoogly, in W. Bengal. Floristically it is very rich and well known for its mangrove vegetation. Melittopalynology or the pollen analysis of honey and sugar content estimation can evaluate the quality of honey produced in different plant community and in different season. It also provides an idea of relative floristic composition of the area.

INTRODUCTION

Melittopalynology, deals with the qualitative and quantitative analysis of honey for pollen grains. The presence of pollen grains of different plant species in honey, their frequency and seasonal variation are factors which determine flora of the locality, seasonal flowering spectrum, bee preferred species, etc. Such informations can be utilized in improving methodology and its right application.

MATERIAL AND METHOD

In the present text following six honey samples received from the Field Director, Sunderbans Tiger Reserve, Goshaba (24-Parganas) have been analysed for pollen content. Samples were collected in April—May, 1977 from Bagmara, Goshaba and Kona regions.

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|---------------------------------------|---------------------------------|
| 1. Pure Goran (sample no. 7) | 4. Pure Kankara (sample no. 10) |
| 2. Pure Garjan (sample no. 8) | 5. Pure Keora (sample no. 11) |
| 3. Kankra-Garjan mixed (sample no. 9) | 6. Pure Khalsi (sample no. 12) |

Pollen slides for each sample was prepared by acetolysis (ERDTMAN, 1952) after diluting 1 cc. honey with 4 cc. distilled water. Photomicrographs are enlarged to $\times 1000$. Detailed pollen morphology of most of the species are similar as discussed elsewhere (MITRA, 1978). Pollen grains are identified and counted for each sample and a percentage composition determination gives the pollen spectrum of the honey sample.

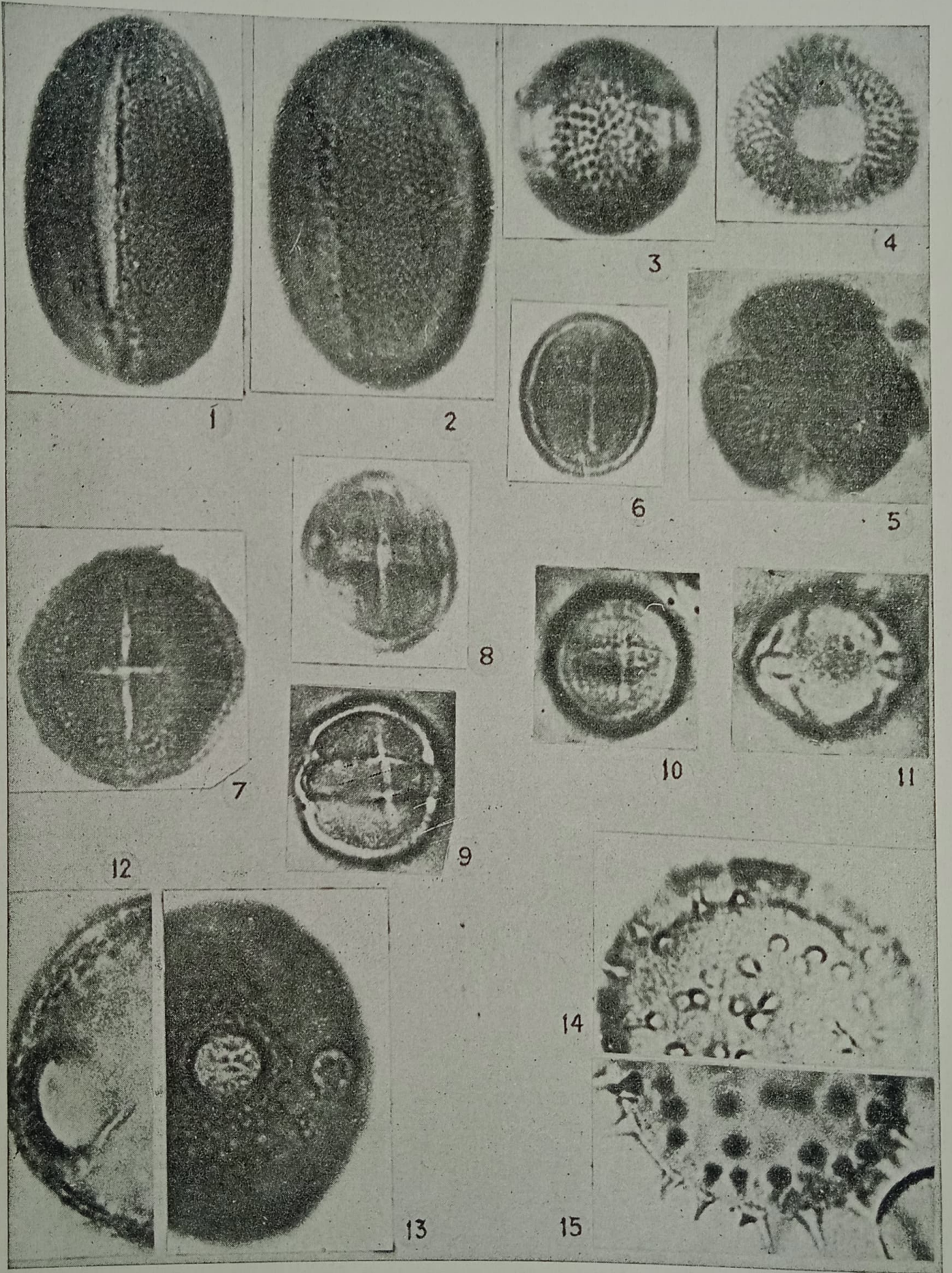
OBSERVATION AND DISCUSSION

Table 1 presents pollen spectrum of different honey samples. It is apparent from the table that the six honey samples can be grouped under heads,

- I. Pollen common to all samples (nos. 7, 8, 9, 10, 11 & 12)
e.g., *Aegiceras*, *Bruguiera*, *Phoenix* & *Sonneratia*
- II. Pollen common in 4 samples (nos. 7, 9, 10 & 11).
e.g., *Avicennia*, *Ceriops* & *Rhizophora*
- III. Pollen common in 3 samples (nos. 7, 9 & 10).
e.g., *Acanthus*, *Chenopodiaceae* & *Xylocarpus*

Table 1—Pollen percentages of different species in honey samples.

Family, species & loc. name	Name of honey & sample number					
	Pure Goran S-7	Pure Garjan S-8	Kankra Garjan S-9	Pure Kankra S-10	Pure Keora S-11	Pure Khalsi S-12
Fam. Meliaceae						
<i>Xylocarpus granatum</i> Koenig. (Dhundol)	0.22	..	0.21	0.86	..	..
Fam. Burseraceae						
<i>Canarium</i> sp.	0.07	..	..	..	..	..
Fam. Rhizophoraceae						
<i>Braguiera gymnorhiza</i> Lamk. (Kankra)	32.38	42.55	8.28	4.09	2.0	22.90
<i>Ceriops roxburghiana</i> Arn. (Goran) ..	6.91	6.38	0.21	4.09	..	..
<i>Rhizophora mucronata</i> Lamk. (Bara goran)	13.31	..	2.0	0.93	0.88	..
Fam. Myrtaceae						
<i>Eugenia fruticosa</i> Roxb. (Ban jam) ..	0.51	..	..	..	0.08	..
Fam. Lythraceae						
<i>Sonneratia apetala</i> Ham. (Keora) ..	6.10	19.15	11.37	4.80	4.80	18.32
Fam. Compositae						
sp.	0.80	..	..	..	..	..
Fam. Plumbagineae						
<i>Aegialitis rotundifolia</i> Roxb. (Satari) ..	..	..	..	0.07	..	..
Fam. Myrsineae						
<i>Aegiceras majus</i> Gaertn. (Khalsi) ..	0.07	10.63	0.35	7.17	0.08	4.58
Fam. Acanthaceae						
<i>Acanthus ilicifolius</i> Linn. (Hargoza) ..	0.07	..	0.03	0.50	..	..
Fam. Verbenaceae						
<i>Avicennia officinalis</i> Linn. (Baen) ..	3.09	..	0.28	0.14	0.16	..
Fam. Chenopodiaceae						
sp.	2.35	..	0.07	0.07	..	..
Fam. Urticaceae						
<i>Trema orientalis</i> Bl. (Chikun) ..	0.29	Scanty	..	..	..	..
Fam. Palmeae						
<i>Nipa fruticans</i> Thunb. (Golpata) ..	..	..	0.03	0.07	..	..
<i>Phoenix paludosa</i> Roxb. (Hital) ..	32.38	17.02	76.47	73.60	92.42	54.96
Fam. Clusiaceae						
<i>Calophyllum</i> sp.	0.95	..	..	0.35	..	..



IV. Pollen common in 2 samples (no. 9 & 10)
e.g., *Eugenia* & *Nipa*

V. Pollen present in one sample only

Sample no. 7 : *Canarium*, Compositae & unidentified.

” ” 8 : *Pinus* & *Trema*

” ” 9 : Papilionaceae (*Derris* ?)

” ” 10 : *Calophyllum* sp.

Further, it is noted that the percentage of *Bruguiera* and *Phoenix* pollen are higher in different samples followed by *Aegiceras*, *Rhizophora* and *Sonneratia*. Other significant species are *Avicennia*, *Ceriops* and *Xylocarpus*. Presence of *Pinus* pollen indicates that it may be carried down from higher altitude either by wind or by water current. It is observed that *Bruguiera* and *Phoenix* are present in high and low percentages and with decrease in percentage of one pollen type there is a subsequent rise in other pollen type in different honey. Perhaps this indicated flowering period or anthesis of the species concerned.

Honey	Pollen percentages	
	<i>Bruguiera</i>	<i>Phoenix</i>
Pure Keora (S. no. 11)	2.0	92.42
Kankra-Garjan mixed (S. no. 9)	8.28	76.47
Pure Khalsi (S. no. 12)	22.90	54.96
Pure Goran (S. no. 7)	32.38	32.38
Pure Garjan (S. no. 8)	42.55	17.02

Among the different samples, Pure Keora (S. 11) presents more or less unifloral pollen spectrum with 92.4% of *Phoenix* pollen and Pure Khalsi (S. 12) and Pure Garjan (S. 8) represent multifloral pollen spectra, with high pollen % of more than one species. Other samples are intermediate with tendency from unifloral to multifloral pollen spectra or vice versa.

CONCLUSION

Comprising of quite a number of small islands at the estuary of river Hoogly, Sunderbans in W. Bengal constitutes a large and important area. The flora of Sunderbans is very rich with 245 genera and 335 species distributed over 75 families (PRAIN, 1903). Information thus available can be employed to utilize many more plant species for nectar and honey. Pollen analysis of honey thus provides a technique to facilitate a reconstruction of climate and seasonal vegetational history of a locality. Moreover apiculture industries might be encouraged to utilize the rich floristic component of the region.

REFERENCES

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EXPLANATION OF THE PLATE 1

Figs. 1 and 2. *Acanthus ilicifolius* Linn. × 1000 ; Figs. 3, 4 and 5. *Avicennia officinalis* Linn. × 1000 ; Figs. 6. *Ceriops roxburghiana* Arn. × 1000 ; Figs. 7. *Calophyllum* sp. × 1000 ; Figs. 8 & 9. *Rhizophora mucronata* Lamk. × 1000 ; Figs. 10 and 11. *Bruguiera gymnorrhiza* Lamk. × 1,000 ; Figs. 12 and 13. *Sonneratia apetala* Bunch. Ham. × 1000 ; Figs. 14 and 15. *Nipa fruticans* Thunb. × 1000.