

The background of the image is a dark, almost black, field filled with numerous microscopic images of pollen grains. These grains vary significantly in shape and color. Some are spherical, some are triangular, and some are more complex or elongated. Colors range from bright yellow and green to muted purples, greys, and browns. The central focus is a large, bright yellow-green spherical grain with a dense covering of small, sharp, white spines. Other grains show various surface textures, including smooth, reticulated, and porous patterns. The overall composition is a collage of diverse botanical specimens.

# POLLEN ATLAS

DISCOVERING ASIAN HONEY

# Speaker profile

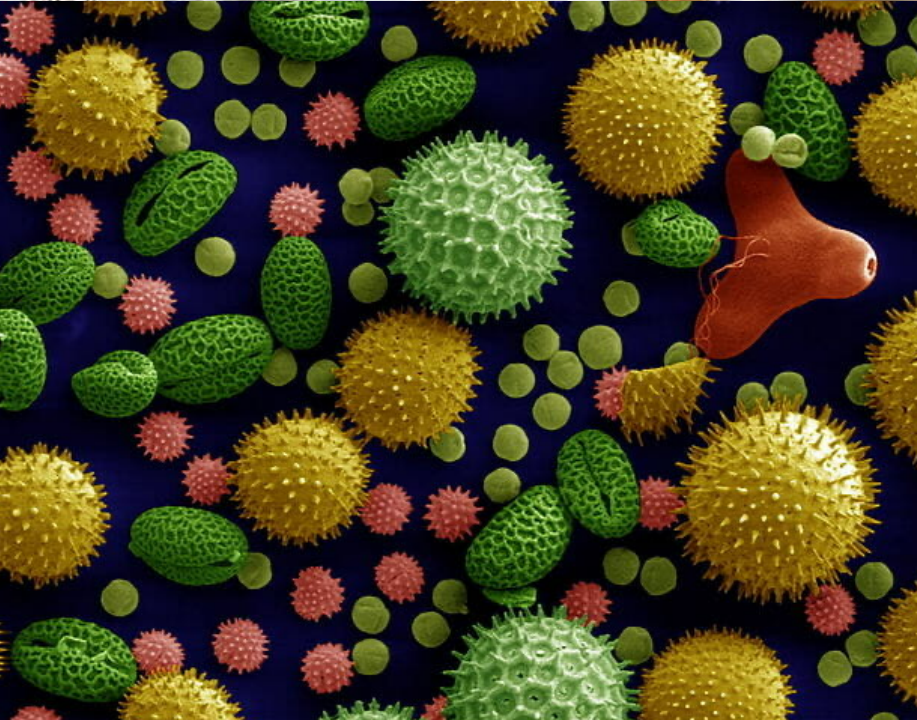
Name : Evert Jan Robberts

- Dutch national
- Did a feasibility study on beekeeping in the Philippines ( 1987 )
- Studied Tropical Beekeeping at Cardiff University
- Consultant Tropical Beekeeping / Pollination
- Specialized in the commercial production of bumble bees
- Happily married to Analou Suan



## Involved in :

- Asian native bees honey analysis and pollen atlas for Madhu Duniya
- Member of Working group on Forest Harvest Collective Mark regarding Apis dorsata honey
- International Honey Commission
  
- Owner Sinacaban Ecofarm / organic farmer / retired / permanent citizen
- Certified on Sustainable Soil Management at Wageningen University .



# CONTENT

- What is a pollen atlas
- Why a pollen atlas
- Madhu Duniya and pollen atlas
- Review of activities so far
- What next

A **pollen atlas** is a reference book or database that provides detailed information and images of different types of pollen grains. It is a tool used in pollen analysis, which is the study of pollen grains to understand plant distribution, vegetation history, and environmental conditions.

It typically includes descriptions of various pollen grains, such as

Shape,  
Size,  
Color,  
Surface patterns.

These descriptions are accompanied by high-quality microscope images,

Includes information about the plant species associated with each type of pollen grain.

This is important because each plant produces unique pollen .

Very specific characteristics, allowing pollen analysts to identify the presence of specific plant species within an environment.

They serve as valuable references for :  
Researchers,  
Palynologists,  
Ecologists, and  
Archaeologists  
who study  
various aspects of plants,  
ecosystems,  
and past environments.

A pollen atlas may also provide supplementary data such as

- Geographical distribution
- Ecological significance
- Information about the flowering period
- Environmental factors that influence pollen production.

# WHY A POLLEN ATLAS ?

- Overall, a pollen atlas helps researchers and practitioners in identifying and classifying pollen grains .
- It enables them to interpret the information obtained from sediment cores, archaeological samples, honey analyses, and other sources.
- It aids in reconstructing past environments, understanding plant-pollinator relationships, and assessing the impact of environmental changes on plant communities.

# Madhu Duniya and pollen atlas



During the last conference in October 2019, the need to establish a pollen atlas for Apis dorsata produced

honey was expressed. This could be extended to all Asian bees

website	location
PALDAT	AUSTRIA
GLOBALPOLLEN PROJECT	ENGLAND
POLLEN TSTEBLER ORG	Switzerland
AUSTRALASIAN POLLEN AND SPORE ATLAS	Australia
DETERMINATOR	Netherlands
ONLINE POLLEN CATALOGUES NETWORK	Brasil
POLLENATLAS.NET	Italy

# What has been done so far

2020

work out  
how to  
approach  
the project

2021

February:  
Internal  
meeting on  
content

Notes on  
action points

2021

Sending out  
letters to  
selected  
websites

50 % positive  
response

2021-  
present

Meeting with  
1) pollenatlas.net  
2) Australian  
Pollen and Spore  
Atlas

email exchange with  
others

Very useful  
advice on  
technical input ,  
financing , timing  
- collaboration

# agenda

## Objectives

1. Raise awareness from General public on Bee Conservation and need for Forest conservation
2. Differentiate *Apis dorsata* from other bees and the honey from the same
3. Increase profile/ promotional value of forest honey for marketing purposes and increase traceability and credibility of forest honey

## Target Audience

1. NGO support groups to forest honey beekeepers/ honey hunters
2. Honey consumers
3. Honey/ Healthy food distributors
4. Potential donors
5. What about forest departments/governments/ policy makers ?



# agenda

## Fields

1. Taxonomy
2. Local Names
3. Distribution
4. Utility
5. Flowering Time/ seasonality
6. Characterize the Pollen (color, shape, size, abundance etc)
7. Source of pollen and nectar (y/n)
8. Organoleptic- taste, aroma, color, texture- this can be said if there is a dominant pollen type (more than 45%) –
9. Pictures (photo or drawing) of the plant, tree, pollen and the description
10. Traditional uses of the plant
11. Cultivated or wild
12. Status – endangered etc

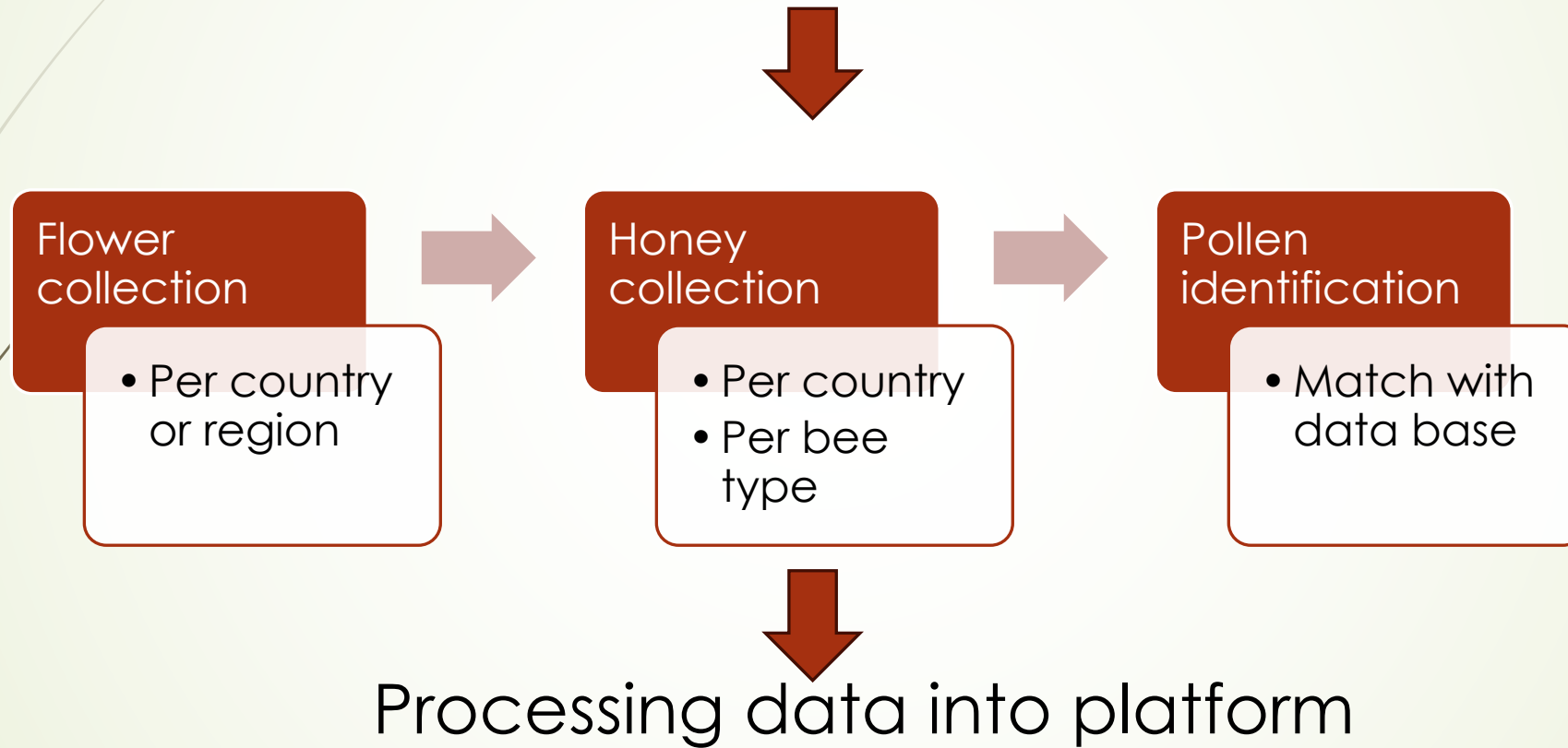
Include a section on the community honey gatherers

## Structure of the atlas

1. Do we structure it by country and then by area/ province?
2. One page per pollen
3. But have an “access pipe” to country
4. Map of all the pollen samples/ distribution (for whole region and close up map per country?)

# Flow of activities for A data base

Network of labs in each country





# Pre research

- 1) What kind of research has been done so far on pollen analysis of A.dorsata honey ?
- 2) What do we know so far and what information is lacking , needs further research ?
- 3) What would we like to achieve with the pollen atlas ?
- 4) Who will benefit from the study ?
- 5) Who will be involved in the study ?



# CONTENT

Subjects that could be included in the study :

- 1) History of honey gathering per region/country
- 2) Description of different bee species
- 3) What are postharvest practices ?
- 4) How is honey being marketed from *A.dorsata* per country / region
- 5) In what countries is Rafter beekeeping being practiced ?
- 6) What floral geographical origin does *A. dorsata* forage on per country and region
- 7) What are major nectar / pollen sources
- 8) Nectar sources per category as to being indigenous , endangered .

# Pre study preparation

- 1) At the source, pictures can be taken of the flower or plant to be identified then by apps like Plantsnap , iNaturalist , Plantnet , Leafsnap , Plantifier
- 2) Once identification of the flower has been confirmed , we scout the pollen references network on the internet for pictures to match. Several books can be consulted as well in order to reconfirm the correct pollen grain matching the source.
- 3) When in doubt or no confirmation can be found via above route, the flower can be send to someone with a microscope to have it identified.

# some links to websites

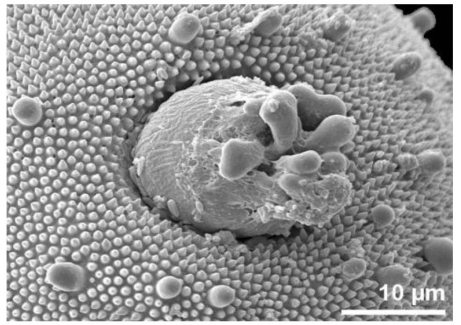


## PalDat - Palynological Database

an online publication on recent pollen

Home Search Data Submit Data Terminology Information How to use PalDat Get Pictures Register

To learn more about this pollen database click here: [about PalDat](#)



*Lomelosia brachiata*

### Latest publications:

*Chelonanthus purpurascens*, *Lomelosia brachiata*, *Callitriche polymorpha*, *Drymis winteri*, *Pterostyrax hispidus*, *Anchusa capensis*, *Coreopsis major*, *Corylopsis spicata*, *Galium verrucosum*, *Passiflora foetida*, *Elephantopus scaber*, *Silphium mohrii*, *Brillantaisia ulugurica*, *Viscum album*, *Tilia cordata*, *Acer campestre*, *Cucurbita maxima*, *Xanthoceras sorbifolium*, *Rehmannia elata*, *Maranta leuconeura*

### The new version "PalDat 3.4" is online!

PONET goes PalDat - with more than 2000 new datasets with high resolution light microscopy micrographs of hydrated pollen

New terms, new input fields - based on the second edition of the pollen book "Illustrated Pollen Terms" (Halbritter et al. 2018)

For more information see: [History of PalDat](#)

### Cite this page as:

PalDat – a palynological database (2000 onwards, [www.palдат.org](http://www.palдат.org))

For more information see: [Copyright and Citation](#)



- Pollenatlas
- Einführung
- Artenliste
- Gattungen
- Familien
- Kategorien
- Pollenanalyse
- Pollenkalender
- Glossar
- Links
- Literatur
- Ausrüstung
- Wartung
- Suche
- Aktuelle Ereignisse
- Letzte Änderungen
- Zufällige Seite
- Kontakt

- Werkzeuge
- Links auf diese Seite
- Änderungen an verlinkten Seiten
- Spezielseiten
- Druckversion
- Permanenter Link
- Seiteninformationen
- Seite zitieren

Seite Diskussion Lesen Quelltext anzeigen Versionsgeschichte Pollen-Wiki durchsuchen

## Pollenatlas:en

Pollenatlas Equipment Abbreviations/Categories Links Impressum

# pollen•wiki



### Pollen-Wiki

#### Collection of Pollen and Spores - a Digital Pollen Atlas and Pollen Database

All images of the published pollen and spores were taken with a light microscope. The collection consists mostly of seed plants (Spermatophyta). In addition, some ferns (Pteridophyta) and a few mosses (Bryophyta) and fungi (Mycophyta) are listed. Pollen classification according to [Beug H.J.](#) "Leitfaden der Pollenbestimmung für Mitteleuropa und angrenzende Gebiete".

Currently 2.489 species, in 229 families, represented by 3.919 pictures of pollen can be found in the Pollen-Wiki.

Contact Pollen-Wiki

<https://www.palдат.org>

<https://pollen.tstebler.ch/MediaWiki/index.php?title=Pollenatlas:en>

Submission Statistics: At present PalDat provides: 35842 pictures, 4494 species, 1791 genera

Last updated: 2023-10-24



Australian National University

Australasian Pollen and Spore Atlas

HOME SAMPLES ABOUT CONTACT Q



## Welcome

The Australasian Pollen and Spore Atlas (APSA) is designed to enable free online access to the largest collection of pollen and spores in the Australasian region. The collection currently holds details on over 15,000 species.

On this site you can [filter](#) or [search all species](#), or [browse by family and genus](#).

<https://apsa.anu.edu.au>

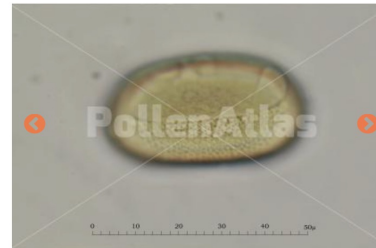
PollenAtlas

WHO WE ARE ATLAS POLLEN & HONEY CREDITS LOG IN



# PollenAtlas

## Pollen gallery



## How it works

Through the menu Atlas > Pollen profile, or Plants profile, you can access the search page and the list of all the pollens or plants present in the atlas.

The search engine works by directly inserting the name of the pollen that you are looking for, or some of its features. The database returns the list of corresponding pollen.

Each sheet shows a slideshow and the characteristics of the selected pollen. For registered users will also available extra content including downloadable PDF file in A4 format suitable for printing and high resolution images.

For all users is available as free example the full special content of the pollen sheet. The words in blue with the "i" icon show an additional description of the meaning, you can view additional information by moving the mouse over the link or by going directly to the glossary. PollenAtlas site is an evolving site, sheets and plants pictures and a section dedicated to the production of honey divided by regions will soon be added to atlas.

## What you can see

The pollens on this website have been prepared by collecting the flowers of the plants just before anthesis. These flowers have been classified by dichotomous key. The pollens have been photographed in their natural state, without having undergone any treatment. High-resolution photographs were taken using an optical microscope with immersion oil (100x objective).

## An example of pollen profile

See [Ajuga reptans](#)

## Join Us

Subscribers users can access additional content.

[Subscribe now](#)

<https://pollenatlas.net>

# The Global Pollen Project

The Open Platform for Pollen Identification

Search by Latin Name

2,340

Species

2,771

Digitised Reference Slides

0

Individual Grains and Spores



A Global Pollen and Spore



Crowdsourced Taxonomic

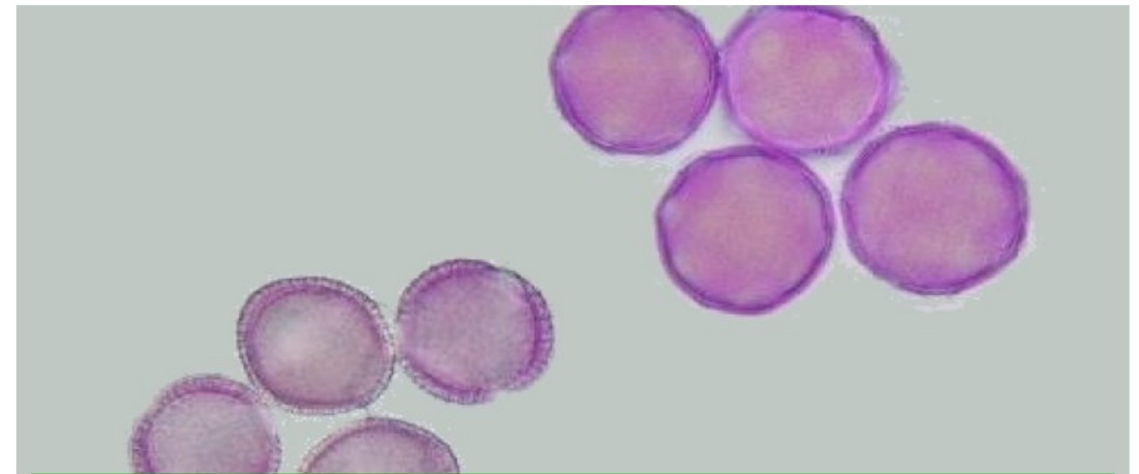


Robust Digitisation Tools

<https://globalpollenproject.org>

Home ▾

Determinator: Pollen module



Product

## Determinator: Pollen module

Down

Down

Return files

<http://www.wur.nl/determinator-pollen>



Review of Palaeobotany and Palynology 199 (2013) 1–135



ELSEVIER

Contents lists available at ScienceDirect

## Review of Palaeobotany and Palynology

journal homepage: [www.elsevier.com/locate/revpalbo](http://www.elsevier.com/locate/revpalbo)



Research paper

### Atlas of the tropical West African pollen flora

William D. Gosling<sup>a,\*</sup>, Charlotte S. Miller<sup>a</sup>, Daniel A. Livingstone<sup>b</sup>

<sup>a</sup> Department of Environment, Earth & Ecosystems, Centre for Earth, Planetary, Space and Astronomical Research (CEPSAR), The Open University, Walton Hall, Milton Keynes MK7 6AA, UK

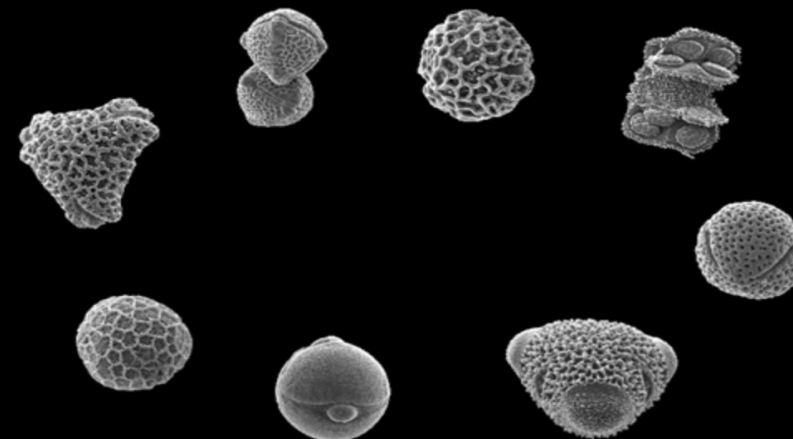
<sup>b</sup> Department of Biology, Duke University, Durham, NC 27708, USA



<https://www.sciencedirect.com>

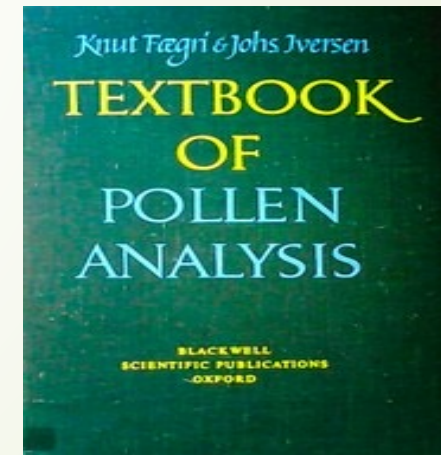
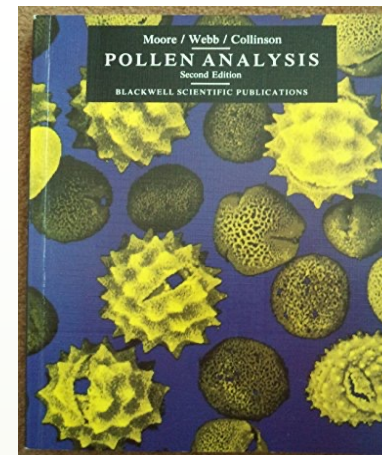
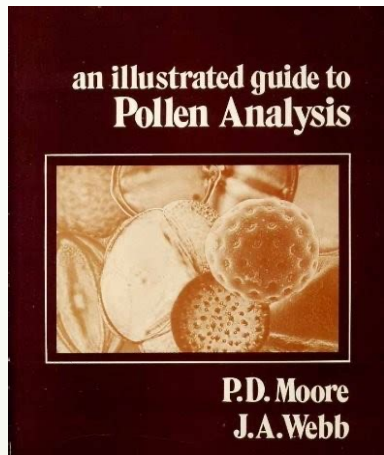
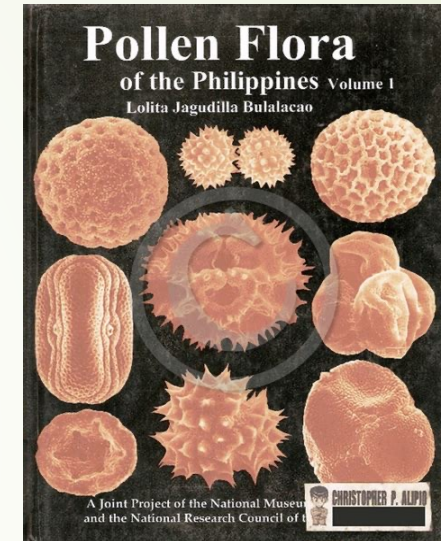
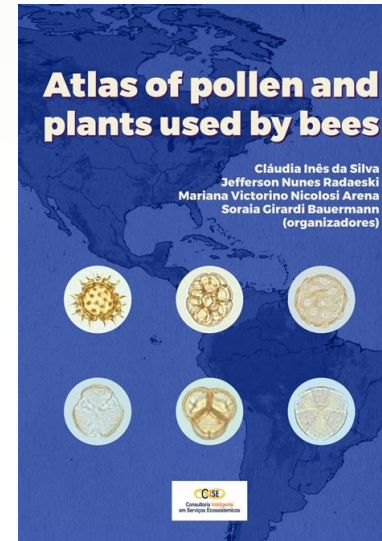
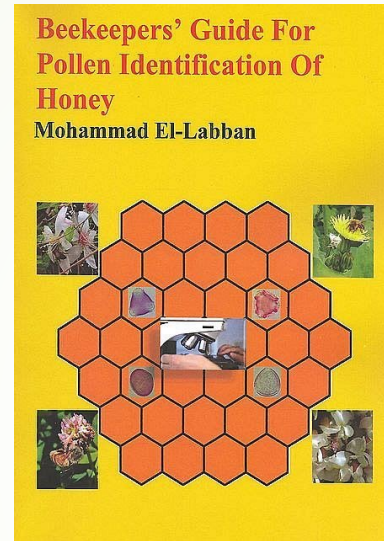
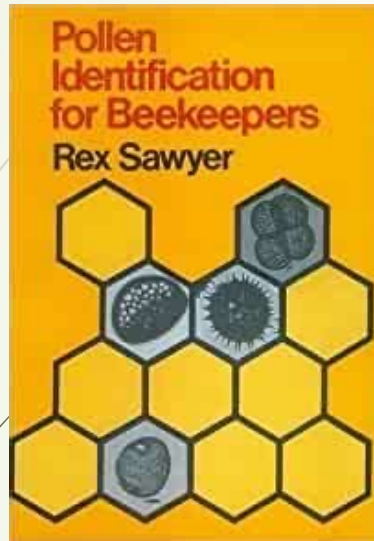
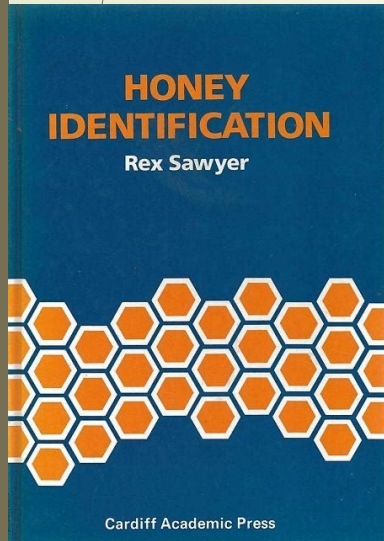
## POLLEN ATLAS OF BAT-POLLINATED PLANTS OF CENTRAL FRENCH GUIANA

Vanessa Hequet  
The New York Botanical Garden



[www.nybg.org/botany\\_pollen\\_atlas](http://www.nybg.org/botany_pollen_atlas)

# SELECTION OF BOOK ON POLLEN IDENTIFICATION



# So I asked AI to summaries studies on dorsata honey

## It came with the following

1. Chemical Composition: Researchers have analyzed the chemical composition of Apis dorsata honey to determine its nutritional and sensory qualities. Studies have found that the honey is rich in sugars, enzymes, amino acids, vitamins, and minerals, which contribute to its nutritional value.

2. Antioxidant and Antibacterial Properties: Apis dorsata honey has been investigated for its antioxidant capacity and antibacterial properties. Studies have demonstrated its ability to scavenge free radicals and inhibit the growth of various pathogens, making it potentially useful in promoting health and combating microbial infections.

3. Medicinal Potential: Some studies have explored the potential medicinal properties of Apis dorsata honey. Research has suggested its effectiveness in wound healing due to its antibacterial activity and ability to stimulate tissue regeneration. It has also shown promise in alleviating coughs and other respiratory ailments.

4. Honeybee Behavior and Nesting Patterns: In addition to honey analysis, research has been conducted on the behavior and nesting patterns of Apis dorsata to better understand its biology and ecology. Studies have focused on aspects such as nest thermoregulation, communication mechanisms, and foraging behavior.

Overall, research on Apis dorsata honey provides insights into its nutritional composition, potential health benefits, and the ecology of the giant honeybee. Such studies contribute to our understanding of this species and may have implications for honey production, health applications, and conservation efforts.

## Honey.AI microscope

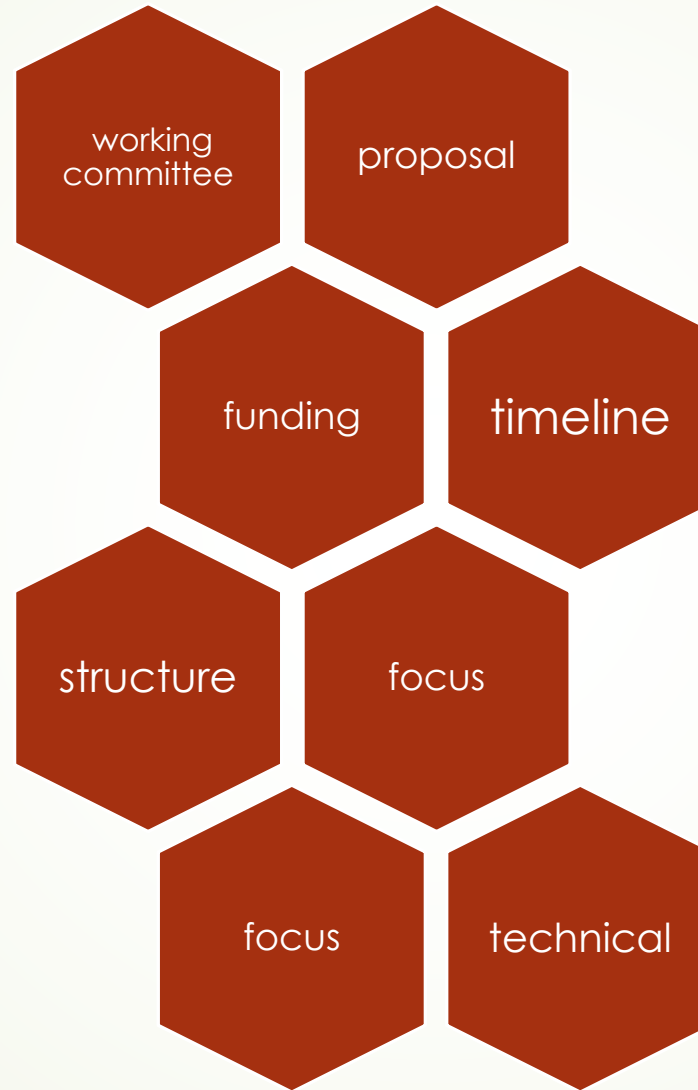
**The first intelligent microscope to perform on-site automated honey quality analysis.**

[Want to know more?](#)

[Make your order!](#)



# WHAT NEXT





សូមអរគុណ

Cảm ơn

ຂອບໃຈ

Salamat  
po

Terima  
kasih

Danke

Dank  
u

Merci

Gracias

Thank  
you

