THE PALYNOLOGY OF FLOWER PLANT IN CHIANG MAI UNIVERSITY FOR HONEY IDENTIFICATION DATABASE

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ABSTRACT

Honey is produced by bees through the foraging of nectar and pollen from flowers. The pollen content of honey is a key indicator of its variety and identity. In monofloral honey, at least 70% of the pollen must be from a single plant species, while multifloral honey requires a pollen database for accurate identification. In this study, we collected pollen from various types of flowers around Chiang Mai University from July 2024 to January 2025. A total of 84 flower species were sampled, and the palynology was recorded by examining pollen under a microscope, noting features such as size, shape, and color. The comparison of the pollen data with eight honey samples revealed that the predominant pollen in monofloral honey was longan pollen (*Dimocarpus longan*) and lychee pollen (*Litchi chinensis*). In contrast, multifloral honey samples predominantly contained pollen from species such as blackjack (*Bidens pilosa*) and sensitive plant (*Mimosa pudica*). Furthermore, the dominant pollen types were analyzed using a Scanning Electron Microscope (SEM) and have been deposited in a specialized pollen database. This database will serve as a valuable tool for the identification of pollen in Thai honey and will contribute to efforts aimed at improving the quality of Thai honey in the future.

INTRODOCUTION

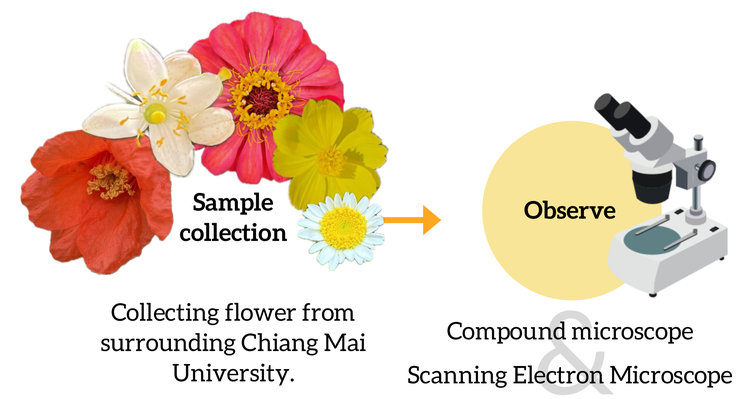
Honey and pollen are closely linked in nature, as bees collect pollen from flowers to produce honey and support their colonies. Pollen analysis, or palynology, helps identify the floral sources of honey, providing valuable information about its origin, quality, and authenticity. A honey identification database compiles this data, aiding researchers, beekeepers, and consumers in verifying honey sources and detecting fraud. This database enhances traceability, promotes sustainable beekeeping, and supports biodiversity conservation.

OBJECTIVES

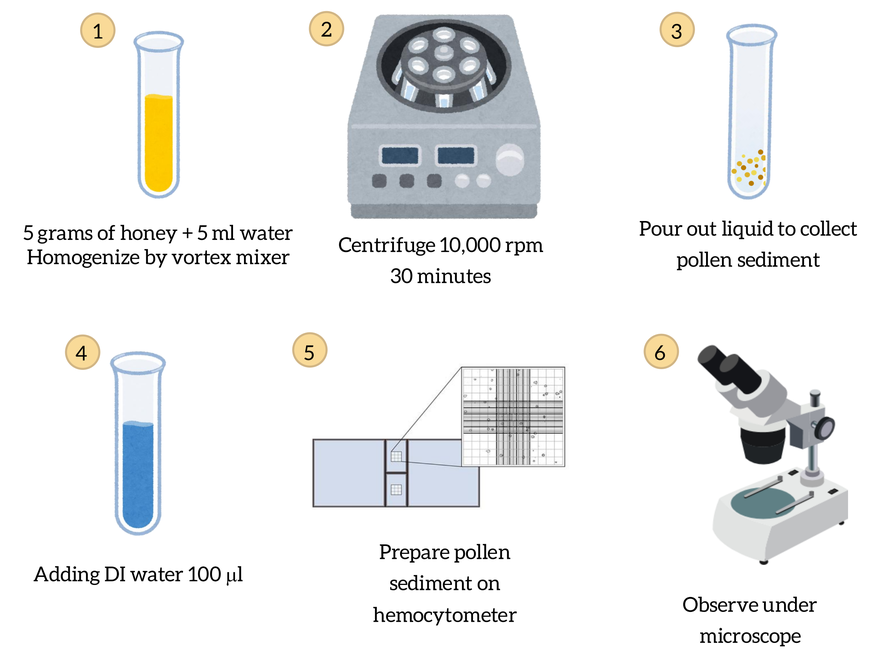
- To study the diversity of food plants for bees in the area surrounding Chiang Mai University and make a database.
- To identify honey samples from the beekeeper in the Smart Bee SDGs research centre.

METHOD

DATABASE MAKING



HONEY POLLEN IDENTIFICATION

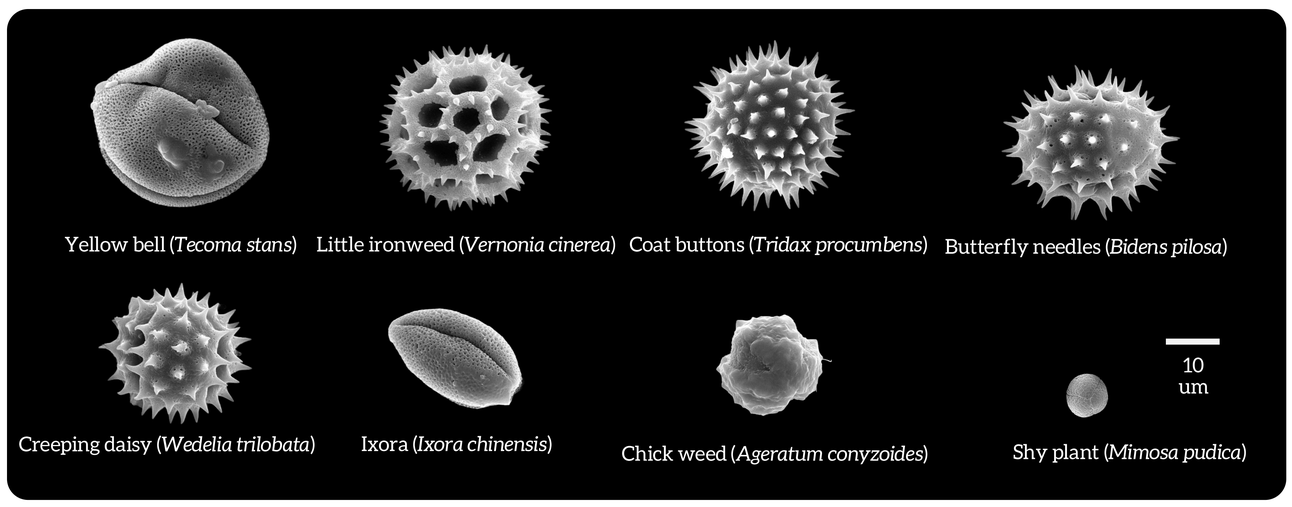


RESULTS

FLOWER POLLEN FOR DATABASE

(1) *Delonix regia* , (2) *Ruellia simplex C. Wright* , (3) *Pseuderanthemum reticulatum* , (4) *Bacopa caroliniana* , (5) *Youngia japonica (L.) DC.* , (6) *Melampodium divaricatum* , (7) *Cestrum diurnum* , (8) *Tabernaemontana divaricata (L.)* , (9) *Clitoria ternatea* , (10) *Plumbago auriculata* , (11) *Thunbergia erecta* , (12) *Bidens pilosa* , (13) *Ixora chinensis Lamk.* , (14) *Lagerstroemia speciosa* , (15)*Plumeria acuminata Aiton* , (16) *Murraya paniculata* , (17) *Antigonon leptopus* , (18) *Hibicus hybrid* , (19) *Cassia siamea Lamk.* , (20) *Globba winitii Gagnep* , (21) *Rosa spp.* , (22) *Clerodendrum thomsoniae* , (23) *Lagerstroemia venusta Wall.* , (24) *Cleome rutidosperma DC.* , (25) *Bougainvillea spp.* , (26) *Arachis pintoi Krapov. & W.C. Greg.* , (27) *Commelina benghalensis* , (28) *Ageratum conyzoides L.* , (29) *Clerodendrum thomsoniae* , (30) *Portulaca grandiflora* , (31) *Coccinia grandis* , (32) *Thunbergia laurifolia* (33) *Portulaca oleracea* , (34) *Petrea volubilis* , (35) *Capsicium frutescens L.* , (36) *Gardenia jasminoides* , (37) *Solanum L.* , (38) *Passiflora foetida.* , (39) *Ardisia polycephala.* , (40) *Areca catechu L.* , (41) *Nelumbo nucifera Gaertn.* , (42) *Torenia fournieri.* , (43) *Xyphidium caeruleum.* , (44) *Jatropha integrerrim.* , (45) *Millingtonia hortensis.* , (46) *Neomarica longifolia (Link & Otto) Sprague.* , (47) *Rivina humilis L.* , (48) *Catharanthus roseus.* , (49) *Bauhinia purpurea.* , (50) *Cucurbita moschata Decne.* , (51) *Tradescantia spathacea.* , (52) *Hydrocotyle umbellata.* , (53) *Asystasia gangetica.* , (54) *Mimosa pudica.* , (55) *Aloe vera (L.) Burm.f.* , (56) *Oxalis corniculata.* , (57) *Ehretia microphylla Lam. ExS.* , (58) *Jatropha podagrica.* , (59) *Lagerstroemia indica.* , (60) *Caesalpinia pulcherrima.* , (61) *Schoutenia glomerata.* , (62) *Bixa orallana* , (63) *Tecoma stans.* , (64) *Centrosema pubescens Benth.* (65) *Tecoma stans (L.) Kunth.* , (66) *Canna.* , (67) *Tamarindus indica L.* , (68) *Helianthus annuus.* , (69) *Eustoma grandiflorum.* , (70) *Lantana Camara.* , (71) *Hibiscus rosa-sinensis.* , (72) *Solandra grandiflora.* , (73) *Mansoa alliacea (Lam) A.H.Gentry.* , (74) *Tridax procumbens.* , (75) *Saraca indica L.* , (76) *Phyrostegia venusta.* , (77) *Gypsophila paniculata L.* , (78) *Saraca indica L.* , (79) *Psuederathemum variabile.* , (80) *Dianthus Chinensis L.* , (81) *Petunia hybrida Vilm.* , (82) *Clerodendrum quadriloculare.* , (83) *Thymophylla tenuiloba (DC.)* , (84) *Cosmos bipinnatus.*

CORE POLLEN SEM



HONEY POLLEN IDENTIFICATION

Honey	Pollen 1	% Pollen of interest	Flower	Pollen 2	% Pollen of interest	Flower	Pollen 3	% Pollen of interest	Flower
HBD02		36.6%	Ardisia (*Ardisia polycephala*)		24.4%	Longan (*Dimocarpus longan*)		22.0%	Starburst bush (*Clerodendrum quadriloculare*)
PHA01		23.8%	Annatto Tree (*Bixa orallana*)		23.8%	Unknown		14.3%	West Indian jasmine (*Ixora chinensis Lamk.*)
JTN01		97.7%	Sensitive plant (*Mimosa pudica*)		1.3%	Little yellow star (*Tecoma stans (L.)Kunth*)			
JRF01		93.9%	Longan (*Dimocarpus longan*)		3.0%	Unknown			
CHP14		59.6%	Longan (*Dimocarpus longan*)		34.6%	Tamarin (*Tamarindus indica L.*)		3.8%	Blackjack (*Bidens pilosa*)
CHP15		76.5%	Longan (*Dimocarpus longan*)		8.8%	Unknown		2.9%	Blackjack (*Bidens pilosa*)
CHP16		66.7%	Sensitive plant (*Mimosa pudica*)		11.1%	Longan (*Dimocarpus longan*)		11.1%	Little yellow star (*Tecoma stans (L.)Kunth*)
CHP17		68.4%	Longan (*Dimocarpus longan*)		28.1%	Unknown			

CONCLUSION

A total of 84 flower species were identified from the flower samples around Chiang Mai University. Main pollens found include Blackjack, West Indian jasmine, and Coat button. These pollens are commonly found in various types of honey. A database is created to simplify pollen identification and comparison in honey. The database can also be used for studying the shape and characteristics of each type of pollen.

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