

Study of Air Quality at Different Time Periods When Butterflies Act as Pollinators in Thung Khai Botanical Garden, Trang Province



Researchers : Miss Tasneem Yehman
Miss Piyathida Muangngam
Miss Anongchita Intam
Education Level : Lower Secondary School

Advisors : Mrs. Kwanjai Kanjanasrimek
Miss Thamonwan Boonchuay
Scientific Advisor : Mr. Kobsak Pennukul
School : Wichienmatu School, Trang Province

Abstract

This study aims to explore the diversity of butterflies that act as pollinators and examine air quality during the periods when butterflies perform their pollination role in Thung Khai Botanical Garden, Trang Province. The research includes measuring temperature, relative humidity, and identifying butterfly species found in the area. The expected findings will help understand the relationship between air quality and butterfly pollination, which may contribute to ecosystem conservation and green space management.

Keywords: Butterflies, Pollination, Air Quality, Thung Khai Botanical Garden

Methodology

Variables

Hypothesis 1 :

Independent Variable : Thung Khai Botanical Garden

Dependent Variable : Diversity of butterfly species found in the garden

Controlled Variable : Study duration

Hypothesis 2 :

Independent Variable : Air quality

Dependent Variable : Butterfly pollination

Controlled Variable : Data collection period

Introduction



Research Questions

- 1) Is there diversity among the butterfly species in Thung Khai Botanical Garden?
- 2) Does air quality affect butterfly pollination in the botanical garden?

Research Hypothesis

- 1) There is diversity in butterfly species in Thung Khai Botanical Garden.
- 2) Air quality influences butterfly pollination in the botanical garden.

Study Area

Location: Thung Khai Botanical Garden, Trang Province
Latitude: 7.468918219686996
Longitude: 99.63836257722336

Equipment

Camera · Notebook · Binoculars · Butterfly net · GPS or map
Sample collection bottles · Video camera with tripod · Thermometer
Hygrometer · Stopwatch · Microscope

Acknowledgments

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Reference documents

GBIF (Global Biodiversity Information Facility) <https://www.gbif.org> The Global Biodiversity Database, which includes information on butterfly species in Thailand and other regions.
Butterfly Conservation Europe <https://www.butterfly-conservation.org> A website that compiles information on research and conservation of butterflies in Europe.
Thai Biodiversity <https://www.thaibiodiversity.org> Thailand Biodiversity Database

Results

Table 1. Results of the study on butterfly species acting as pollinators.

Species	Common name	Local name	Color	Body shape	Wing shape	Flight pattern	Feeding habit	Reproduction
1. Large blue leaf butterfly	Large blue leaf butterfly	Large blue leaf butterfly	Blue and white	Large	Large	Fast	Feeds on large leaves	Lays eggs on large leaves
2. Long-striped leaf-worm butterfly	Long-striped leaf-worm butterfly	Long-striped leaf-worm butterfly	Yellow and black	Long	Long	Slow	Feeds on large leaves	Lays eggs on large leaves
3. Yellow leaf caterpillar butterfly	Yellow leaf caterpillar butterfly	Yellow leaf caterpillar butterfly	Yellow and black	Small	Small	Fast	Feeds on large leaves	Lays eggs on large leaves
4. Blue-leaf caterpillar butterfly	Blue-leaf caterpillar butterfly	Blue-leaf caterpillar butterfly	Blue and black	Small	Small	Fast	Feeds on large leaves	Lays eggs on large leaves
5. Swallowtail butterfly	Swallowtail butterfly	Swallowtail butterfly	Black and white	Large	Large	Fast	Feeds on large leaves	Lays eggs on large leaves
6. Black and white crow butterfly	Black and white crow butterfly	Black and white crow butterfly	Black and white	Small	Small	Fast	Feeds on large leaves	Lays eggs on large leaves
7. Green swallowtail butterfly	Green swallowtail butterfly	Green swallowtail butterfly	Green and black	Large	Large	Fast	Feeds on large leaves	Lays eggs on large leaves
8. Common swallowtail butterfly	Common swallowtail butterfly	Common swallowtail butterfly	Black and white	Large	Large	Fast	Feeds on large leaves	Lays eggs on large leaves

From the table, The study identified eight butterfly species acting as pollinators in the botanical garden: Large Blue Leaf Butterfly, Long-striped leaf-worm butterfly, Yellow leaf caterpillar butterfly, Blue-leaf caterpillar butterfly, Swallowtail butterfly, Black and white crow butterfly, Green Swallowtail Butterfly, Common Swallowtail Butterfly (male)

Table 2 shows the air quality in Thung Khai Botanical Garden.

Date of study	Dry season		Rainy season	
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
1	30	24	30	25
2	32	26	34	26
3	32	27	34	27
Average	32.33	25.67	32.67	26.00

From the table, it was found that the average humidity in the rainy season was 68.67, the temperature was 30.33. In the dry season, the humidity was 66, the temperature was 32.33

Air quality	Air quality	
	Relative humidity	Average humidity
Dry season	66.00	66.00
Wet season	68.67	68.67



Figure 1. Bar chart showing air quality.

Conclusion

The study confirmed the presence of eight butterfly species in Thung Khai Botanical Garden. Additionally, air quality varied across seasons, with higher humidity in the rainy season and higher temperatures in the dry season, which affected butterfly pollination activity.