

ORTHOPTERA AS POLLINATORS:

Assessing Their Role in Pollination Ecology

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Introduction

The Importance of Pollination

- Pollination is vital for biodiversity and food production
- Common pollinators: bees, butterflies, birds
- Declining pollinator populations threaten ecosystems
- Need to explore alternative pollinators





Emerging Focus: Orthoptera as Potential Pollinators

- Orthoptera includes grasshoppers, katydids, and crickets
- Traditionally viewed as herbivores, not pollinators
- Recent observations show flower-visiting behavior
- Could they play a hidden role in pollination?

Study Rationale



Exploring Orthoptera's role can:

- Expand knowledge of pollination ecology
- Identify resilience pathways in agroecosystems

Pollinator decline due to:



Habitat Loss



Pesticide use



Climate change



Study Objectives



- Identify Orthoptera species interacting with flowering plants
- Evaluate their potential role in pollen transfer
- Provide insights on their ecological importance as incidental pollinators



Study Sites and Methodology

- Field observations in multiple floral habitats
- Documentation of Orthoptera feeding and flower visitation
- Species identification
- Behavior recorded: feeding behavior, floral preference, and activity time



Urban gardens



Agro-Forest land



Agricultural land

- Several Orthoptera species observed visiting flowers
- Frequent feeding on nectar and petals
- Active both diurnally and nocturnally
- Indicates Orthoptera as understudied pollinators



Phaneroptera sp.



Tettigonia sp.



Phaneroptera brevis



Results

Pollen Observation

Pollen grains adhered to various body parts

- Mouthparts
- Legs
- Antennae

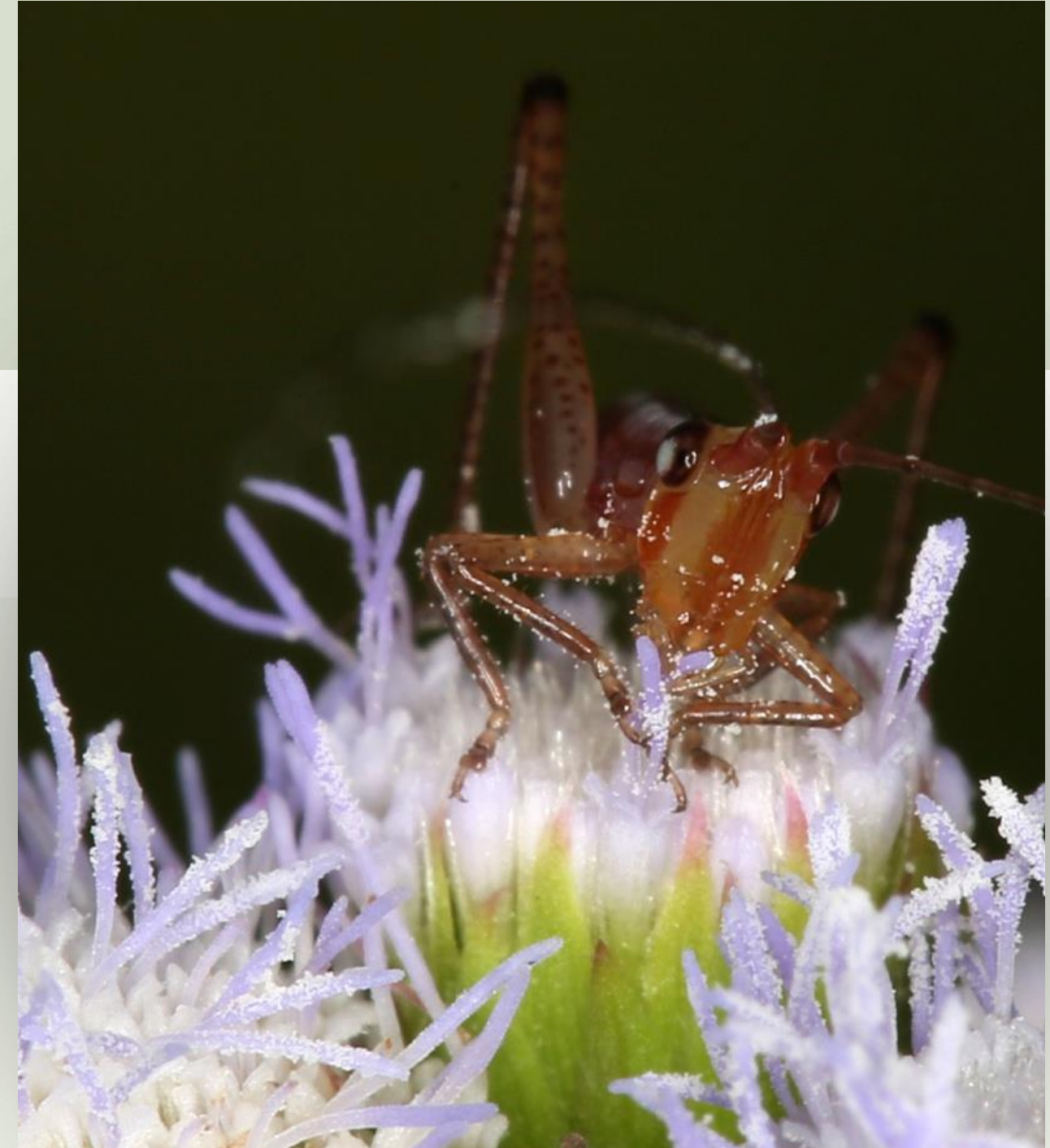


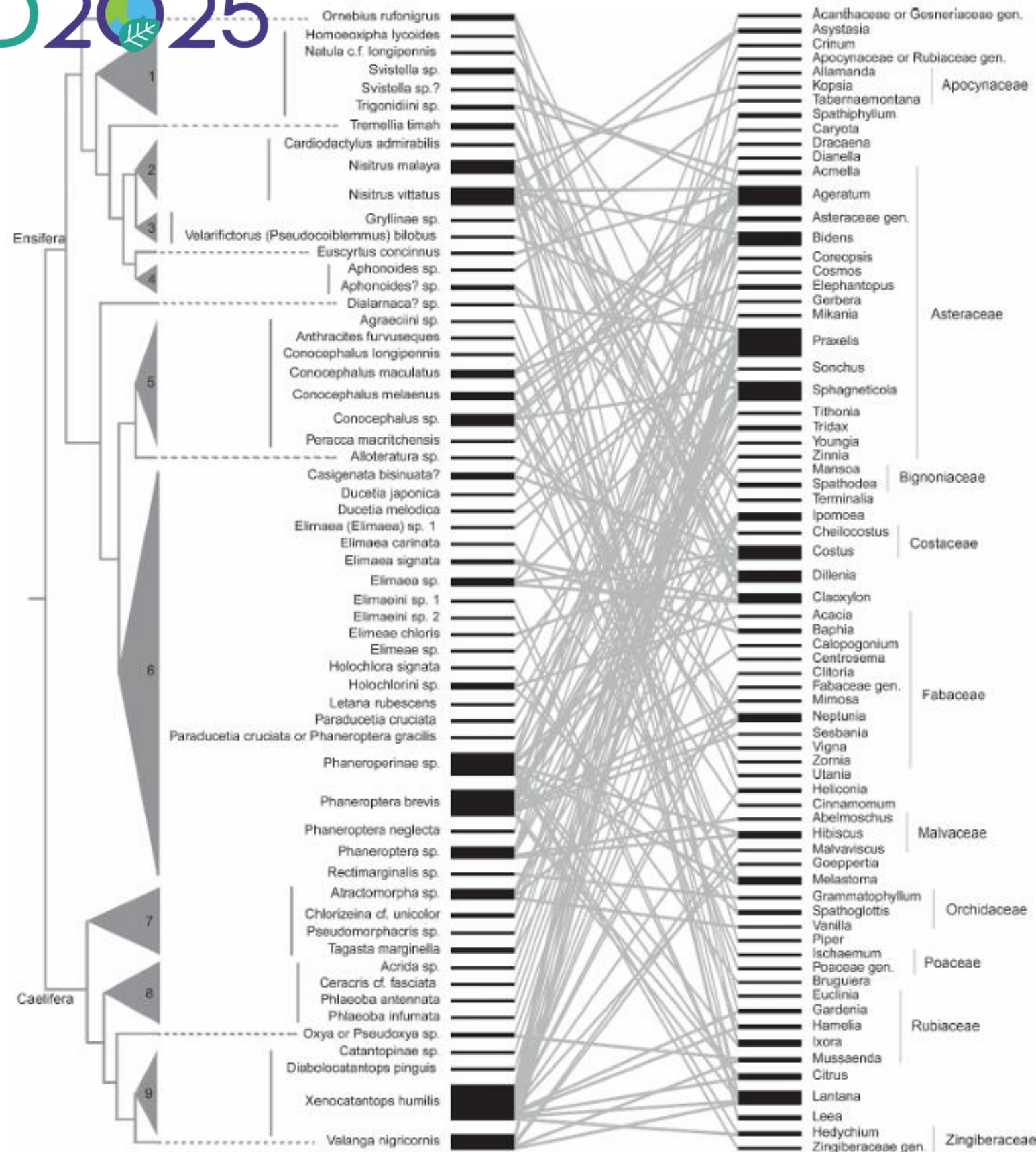
Results



Pollen Observation

- Evidence of passive pollen transfer
- Suggests potential role in incidental pollination



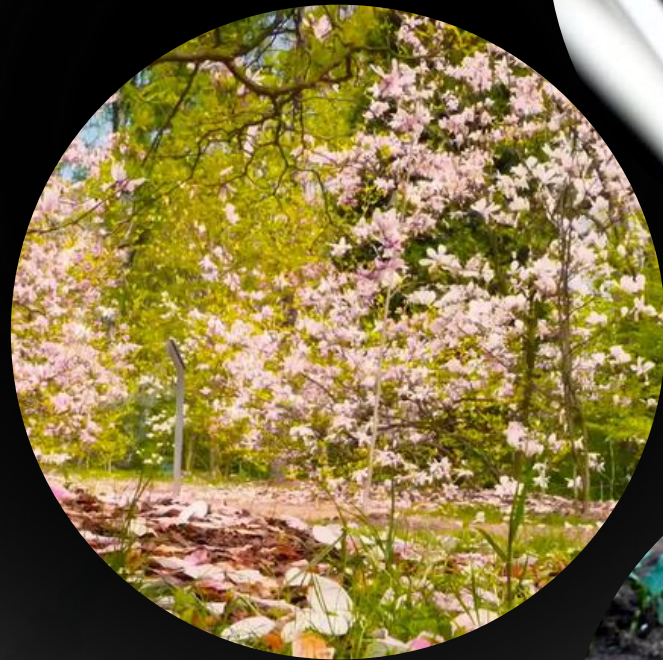


Results ●●●●●

Interaction web between 58 flower-visiting orthopterans (right column) and 71 genera of flowers (left column) in Southeast Asia based on 247 observations.

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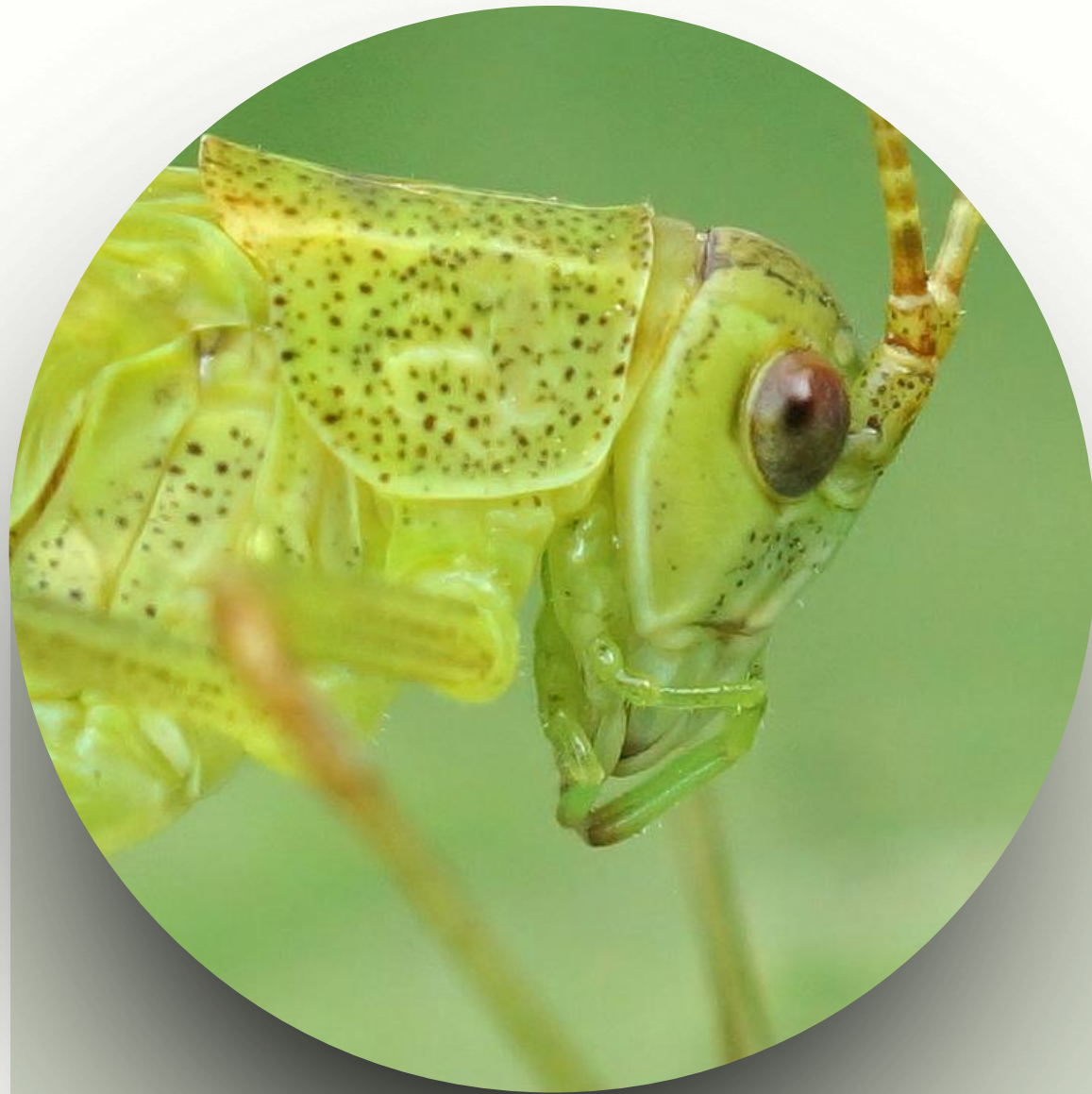


Results



- Orthoptera may contribute to pollination, especially where bees decline
- Though not specialized, their flower interactions promote pollen movement
- Highlights the diversity of pollination networks
- Suggests potential role in sustaining plant reproduction





Conclusion

- Orthoptera serve as incidental and alternative pollinators
- Enhance resilience of pollination systems amid global pollinator decline
- Further research is essential to quantify their ecological contribution

Recommendations



○For Beekeepers & Conservationists:

- Recognize Orthoptera as part of pollinator diversity



○For Land Managers:

- Maintain habitat heterogeneity to support multiple pollinator groups



○For Researchers:

- Quantify Orthoptera's pollination efficiency
- Include them in pollination network models





Future Directions

- Conduct controlled experiments on pollen transfer rates
- DNA barcoding of pollen on Orthoptera
- Explore nocturnal pollination networks
- Integrate findings into pollinator conservation strategies



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Lee Kong Chian
Natural History Museum

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THANK YOU!

The Earth does not belong to us; we belong to the Earth.

