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Diversity of Food Plants Utilized by Rousettus leschenaultii and Cynopterus sphinx

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Abstract

Fruit bats are important ecological agents that contribute significantly to seed dispersal, pollination, and maintenance of tropical biodiversity. Among the common fruit bat species found in South Asia, Rousettus leschenaultii and Cynopterus sphinx exhibit diverse feeding habits and utilize a wide variety of food plants across natural and semi-urban ecosystems. The present study investigates the diversity of food plants utilized by these two fruit bat species with emphasis on dietary preference, seasonal variation, habitat utilization, and ecological significance. Field observations were conducted in orchards, forest edges, agricultural landscapes, and urban green spaces to document plant species consumed by bats and their feeding frequency. The study revealed that both bat species utilized a broad range of fruit-bearing plants including mango, guava, fig, banana, papaya, jamun, and silk cotton flowers. Rousettus leschenaultii predominantly preferred large canopy fruits such as mango and fig, whereas Cynopterus sphinx utilized smaller understory fruits and nectar resources. Seasonal variations strongly influenced food plant diversity, with maximum plant utilization observed during summer and monsoon seasons due to increased fruit availability. The findings indicate clear dietary overlap as well as resource partitioning between the two species, which reduces feeding competition and promotes coexistence within shared habitats. Fruit bats also contributed significantly to seed dispersal and pollination, thereby supporting forest regeneration and biodiversity conservation. However, habitat fragmentation, urbanization, and reduction in native fruiting plants negatively affected food resource availability and feeding behaviour.

The study emphasizes the ecological importance of conserving diverse fruit-bearing vegetation and roosting habitats to maintain sustainable bat populations and ecosystem stability. Understanding dietary diversity and feeding ecology of fruit bats can contribute to effective conservation and habitat management strategies in tropical ecosystems.

Keywords: Food plant diversity, Feeding ecology, Seed dispersal, Pollination, Tropical ecosystems.

1. Introduction

Fruit bats are among the most ecologically significant mammals inhabiting tropical and subtropical ecosystems. These nocturnal vertebrates play major roles in pollination, seed dispersal, and forest regeneration. Through their feeding activities, fruit bats contribute to

maintenance of plant diversity and ecological balance in both natural and human-modified landscapes. Among the commonly distributed fruit bats in South Asia, Rousettus leschenaultii and Cynopterus sphinx are important frugivorous species exhibiting diverse feeding strategies and habitat utilization patterns.

Food plant diversity is a key factor influencing feeding ecology, nutritional balance, reproductive success, and ecological adaptation of fruit bats. These mammals consume a variety of fruits, flowers, nectar, pollen, and occasionally leaves depending on food availability and habitat characteristics. Fruit selection is generally influenced by nutritional quality, fruit size, sugar concentration, aroma, pulp softness, and seasonal abundance.

Rousettus leschenaultii is a relatively larger fruit bat species commonly associated with caves, orchards, and forest habitats. It is capable of long-distance flight and frequently utilizes large canopy fruits such as mango and fig. In contrast, Cynopterus sphinx is a smaller species often found in gardens, plantations, and urban green spaces where it feeds on small fruits and nectar-producing flowers. Such ecological differentiation reduces feeding competition and promotes coexistence between species occupying similar habitats.

Seasonal changes in fruit availability strongly influence feeding patterns and dietary diversity in fruit bats. During fruiting seasons, bats exploit abundant food resources and increase their feeding activity. In periods of food scarcity, they may shift to alternative food plants or expand their foraging range. Such dietary flexibility enables bats to survive in fragmented and changing environments.

Fruit bats also play a major role in seed dispersal and pollination of numerous tropical plant species. Seeds consumed along with fruits are dispersed through defecation during flight or at feeding roosts, facilitating forest regeneration and ecological succession. Pollination by bats further contributes to reproductive success of night-blooming plants and maintenance of genetic diversity.

Despite their ecological importance, fruit bats face increasing threats from habitat destruction, urbanization, pesticide exposure, and reduction of native fruiting vegetation. Loss of food plant diversity may negatively affect feeding ecology and long-term survival of bat populations.

Understanding diversity of food plants utilized by fruit bats is therefore essential for biodiversity conservation and sustainable habitat management. The present study aims to investigate food plant diversity, feeding preference, and ecological interactions of Rousettus leschenaultii and Cynopterus sphinx in tropical ecosystems.

2. Objectives of the Study

1. To identify food plants utilized by fruit bats.
2. To compare dietary preference between bat species.
3. To analyze seasonal variation in food plant utilization.
4. To evaluate food resource partitioning among fruit bats.
5. To assess ecological significance of feeding behaviour in biodiversity conservation.

3. Methodology

3.1 Study Area

The study was conducted in orchards, semi-evergreen forests, agricultural lands, urban gardens, and fragmented forest habitats.

3.2 Study Species

The study focused on the following fruit bat species:

- Rousettus leschenaultii
- Cynopterus sphinx

3.3 Data Collection

Field observations were carried out during evening and night hours for six months. Feeding behaviour, plant visitation frequency, fruit preference, and habitat utilization were recorded through direct observation and photographic documentation.

3.4 Sampling Techniques

- Transect observation method
- Fruit debris analysis
- Roost monitoring
- Seasonal vegetation survey
- Plant species identification

3.5 Data Analysis

Collected data were analyzed using percentage analysis and graphical representation to evaluate food plant diversity and feeding preference.

4. Results and Discussion

4.1 Diversity of Food Plants Utilized by Fruit Bats

Both fruit bat species utilized a wide range of fruit-bearing plants.

Table 1. Food Plant Diversity Utilized by Fruit Bats

Food Plant Species	Feeding Frequency (%)
Mango	25
Fig	20
Guava	18
Banana	15
Papaya	12
Jamun	10

Mango and fig represented the most preferred food plants because of their high nutritional value and seasonal abundance. Guava and banana also formed important dietary resources.

4.2 Comparative Dietary Preference Between Bat Species

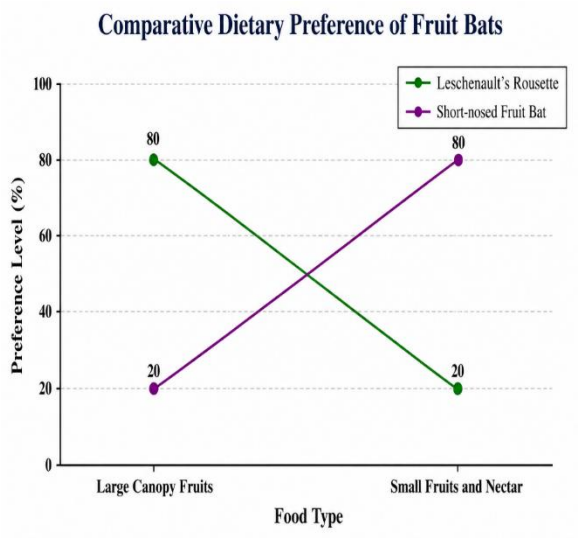
Differences in food utilization patterns were observed between the two species.

Table 2. Comparative Dietary Preference of Fruit Bats

Bat Species	Preferred Food Type
Leschenault's Rousette	Large Canopy Fruits
Short-nosed Fruit Bat	Small Fruits and Nectar

Rousettus leschenaultii preferred large canopy fruits due to its greater body size and flight capacity, whereas Cynopterus sphinx utilized smaller fruits and nectar resources in understory habitats

Graph:1Comparative Dietary Preference of Fruit Bats



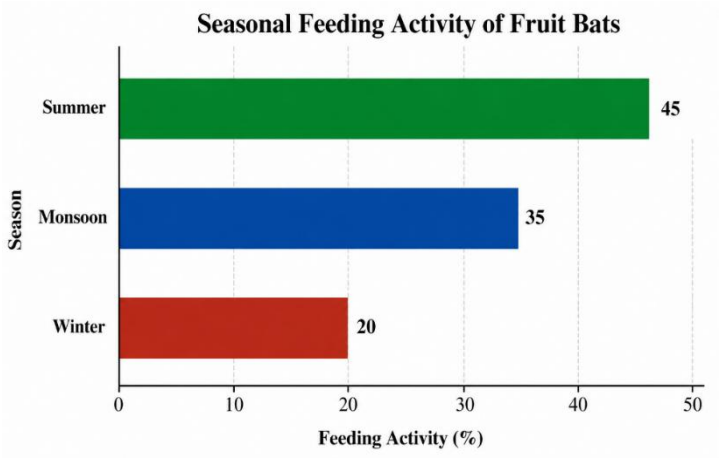
4.3 Seasonal Variation in Food Plant Utilization

Seasonal fruit availability strongly influenced feeding behaviour.

Table 3. Seasonal Food Plant Utilization

Season	Feeding Activity (%)
Summer	45
Monsoon	35
Winter	20

Graph 2:Seasonal Food Plant Utilization by Fruit Bats



Maximum feeding activity occurred during summer due to abundance of ripe fruits. Reduced activity during winter was associated with limited fruit availability.

4.4 Ecological Contributions of Feeding Behaviour

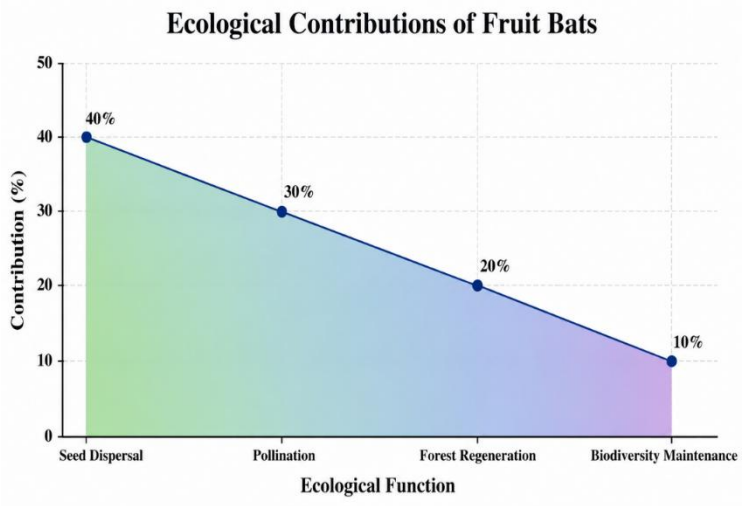
Fruit bats contributed significantly to ecosystem sustainability through feeding interactions.

Table 4. Ecological Contributions of Fruit Bats

Ecological Function	Contribution (%)
Seed Dispersal	40
Pollination	30
Forest Regeneration	20
Biodiversity Maintenance	10

Seed dispersal represented the major ecological contribution of fruit bats. Their feeding behaviour supports regeneration of tropical forests and maintenance of plant diversity.

Graph 3:Ecological Contributions of Fruit Bats



5. Discussion

The present study demonstrates that both fruit bat species utilize a diverse range of food plants in tropical ecosystems. Dietary diversity is influenced by fruit availability, habitat structure, and nutritional quality. Similar feeding patterns have been documented in tropical fruit bat communities where coexistence is facilitated through resource partitioning.

Rousettus leschenaultii primarily exploited canopy-level fruits, whereas Cynopterus sphinx utilized smaller fruits and nectar sources in lower vegetation layers. Such ecological differentiation reduces competition and enhances efficient resource utilization.

Seasonal variations strongly affected feeding intensity and food plant diversity. During periods of fruit abundance, bats exhibited increased feeding activity and wider habitat utilization. Through seed dispersal and pollination, both species contribute significantly to forest regeneration and ecological stability.

However, habitat destruction and reduction in native fruit-bearing vegetation negatively affect food availability and feeding ecology. Conservation of diverse fruiting plants and roosting habitats is therefore essential for sustaining healthy fruit bat populations.

6. Summary and Conclusion

The study highlights the importance of food plant diversity in shaping feeding ecology and ecological adaptation of fruit bats. Both Rousettus leschenaultii and Cynopterus sphinx utilized diverse fruit resources and exhibited resource partitioning strategies that promoted coexistence.

Seasonal fruit availability strongly influenced feeding behaviour and habitat utilization patterns. The findings emphasize that conservation of native fruit-bearing vegetation and ecological corridors is necessary for maintaining biodiversity and ecological stability.

Future studies may focus on nutritional ecology, seed germination success, and long-term monitoring of feeding interactions among fruit bat communities.

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