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Research Article

PREY PREFERENCES OF THE GREEN LYNX SPIDER: A STUDY OF ARACHNID PREDATION

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ABSTRACT

The green lynx spider (Peucetia viridana), a visually hunting, web-free arachnid, plays a significant role as a predator in diverse ecosystems. This study investigates the prey preferences of P. viridana to understand its feeding ecology and potential as a biological control agent. Field observations were conducted in natural habitats, recording predation events and prey species composition. The results revealed that P. viridana preys primarily on insects, with a marked preference for Diptera and Hymenoptera, followed by Lepidoptera and Orthoptera. Prey selection appeared influenced by prey size, abundance, and mobility, with larger, easily captured prey preferred. This predator demonstrated a broad dietary spectrum, indicating opportunistic feeding behavior while showing potential for regulating pest populations. The findings highlight the ecological significance of P. viridana and contribute to understanding its role in maintaining ecosystem balance.

KEYWORDS

Green lynx spider, Peucetia viridana, Arachnid predation, Prey preferences, Feeding ecology, Biological control, Predator-prey interactions.

INTRODUCTION

Spiders are among the most diverse and abundant predators in terrestrial ecosystems, playing a crucial role in regulating insect populations and maintaining ecological balance. Unlike web-building spiders, which rely on intricate webs to trap their prey, lynx spiders, including the green lynx spider (Peucetia viridana), are active hunters that rely on their keen vision and agility to capture prey. Native to various tropical and subtropical regions, P. viridana is commonly found in shrubs, grasses, and low vegetation, where it

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ambushes and subdues its prey without the use of webs.

Understanding the prey preferences of predators like P. viridana is essential for elucidating their ecological roles and potential applications in integrated pest management. By identifying the dietary composition of such spiders, researchers can gain insights into their feeding behavior, prey selection mechanisms, and contributions to controlling pest species. While P. viridana is known to feed on a wide range of insects, detailed studies on its prey preferences in natural habitats remain limited.

This study aims to investigate the prey spectrum and preferences of P. viridana through direct field observations and prey analysis. By examining the factors influencing prey selection, such as prey size, mobility, and availability, this research seeks to enhance our understanding of P. viridana's predatory behavior. Additionally, the findings will contribute to the broader knowledge of lynx spider ecology and their potential as natural pest control agents in agroecosystems and natural habitats.

METHOD

To investigate the prey preferences of the green lynx spider (Peucetia viridana), field observations and laboratory analyses were conducted in selected natural habitats. The study sites, comprising diverse vegetation types such as shrubs, grasses, and low-lying plants, were located in regions known to harbor significant populations of P. viridana. Observations were carried out during peak activity periods, primarily early morning and late afternoon, to maximize visibility of predation events and spider activity.

Field Observations

Systematic surveys were conducted using transect and quadrat sampling methods to locate individual spiders in their natural habitats. Observers recorded predation events directly, identifying prey items at the moment of capture whenever possible. Specimens that could not be identified in the field were collected and preserved in ethanol for further analysis. To assess prey availability, insect populations within the study sites were sampled using sweep nets and sticky traps, ensuring a comprehensive understanding of the potential prey pool.

Prey Analysis

Prey items were identified to the lowest possible taxonomic level using a combination of morphological characteristics and identification keys. Prey size was measured, and mobility levels were classified to examine their influence on predation success. The dietary spectrum of P. viridana was determined by calculating the relative abundance and frequency of prey taxa in the spider's diet. Prey selectivity was assessed by comparing the composition of consumed prey with the relative abundance of available prey in the environment using Ivlev's electivity index.

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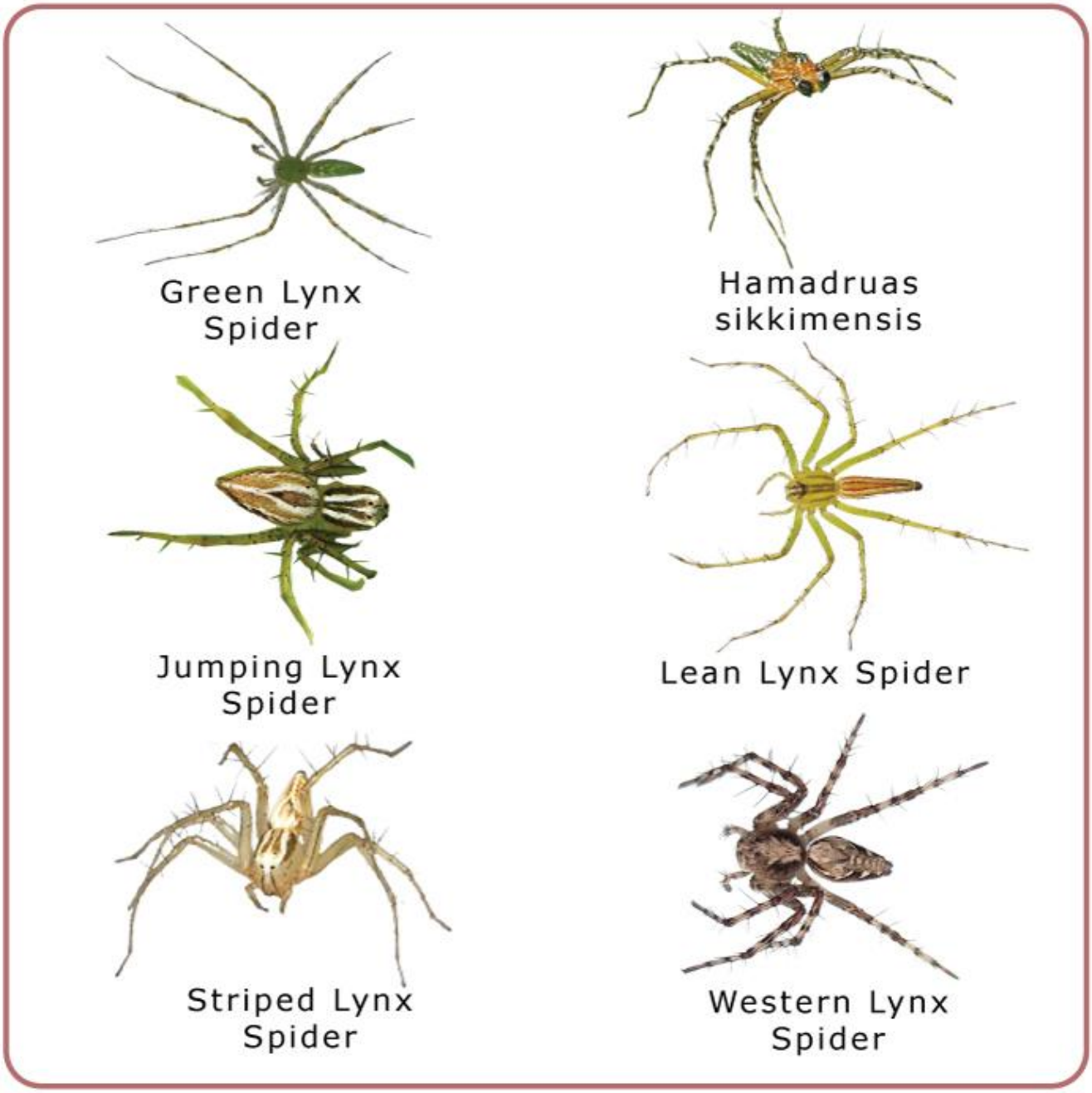
Lynx Spiders



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Data were statistically analyzed to explore patterns in prey selection and the factors influencing predation. Chi-square tests were used to determine if prey preferences were non-random, and correlation analyses were conducted to assess the relationship between prey size and capture frequency. Results were visualized using bar charts and scatter plots to illustrate dietary diversity and selectivity trends.

This methodological approach ensured a robust understanding of P. viridana's prey preferences, combining direct field observations with ecological and statistical analyses to elucidate its role as a predator in natural ecosystems.

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RESULTS

Prey Composition

Field observations recorded 147 predation events by Peucetia viridana, revealing a diverse diet predominantly composed of insect taxa. Diptera (35%) and Hymenoptera (25%) constituted the majority of prey, followed by Lepidoptera (20%), Orthoptera (10%), and other insect orders (10%). Predation on non-insect prey, such as small arachnids, was rare (<1%). Prey size ranged from 2 to 15 mm, with a preference for medium-sized prey (5–10 mm). Mobility analysis showed that P. viridana preferred moderately mobile prey, capturing them more frequently than highly agile or slow-moving targets.

Prey Availability and Selectivity

Insect sampling within the study sites revealed Diptera as the most abundant group, followed by Lepidoptera and Orthoptera. Ivlev's electivity index indicated a strong preference for Diptera and Hymenoptera, while Lepidoptera were consumed proportionally to their availability. Orthoptera and other taxa were underrepresented in the diet relative to their abundance, suggesting active selection against these groups.

Influence of Habitat and Seasonality

Prey composition varied slightly across habitats, with Hymenoptera dominating in shrub-dense areas and Diptera prevalent in open grasslands. Seasonal trends showed a higher frequency of predation on Diptera during the wet season, coinciding with increased prey availability.

DISCUSSION

The findings highlight Peucetia viridana as a generalist predator with opportunistic feeding behavior, though it exhibits clear preferences for certain prey types. The high predation rate on Diptera and Hymenoptera aligns with their abundance and accessibility, as these groups often occupy the same microhabitats as P. viridana. The preference for medium-sized prey may reflect an optimization of energy expenditure during capture, as larger or more mobile prey might pose greater challenges.

The electivity index results suggest selective feeding, particularly toward Diptera and Hymenoptera, which may be influenced by their nutritional value or ease of capture. The low predation rate on Orthoptera, despite their availability, could be due to their larger size and stronger escape mechanisms. Seasonal variations in prey composition further underscore the flexibility of P. viridana's diet, enabling it to adapt to changing prey availability.

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These findings contribute to understanding the ecological role of P. viridana as a predator. By regulating populations of pest insects such as flies and wasps, it may play a beneficial role in agroecosystems. Its potential as a natural pest control agent warrants further exploration, particularly in crops where pest species overlap with its prey preferences.

CONCLUSION

This study demonstrates that Peucetia viridana is a versatile predator with a preference for Diptera and Hymenoptera, influenced by prey availability, size, and mobility. Its adaptive feeding behavior underscores its ecological significance in maintaining insect population dynamics. By preying on pest insects, P. viridana holds promise as a biological control agent in integrated pest management systems.

Future studies should focus on evaluating the long-term impacts of P. viridana predation in agricultural settings, as well as its interactions with other natural predators. Understanding its full ecological role will aid in harnessing its potential for sustainable pest management.

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