RESEARCH ARTICLE

PREDATION ON EGGS OF STRIPED LYNX SPIDER *OXYOPES JAVANUS* THORELL, 1887 BY PHARAOH ANT *MONOMORIUM PHARAONIS* (LINNAEUS, 1758): AN ANTAGONISTIC INTERACTION

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Abstract:

This Research Article demonstrates the antagonistic interaction between the eggs of a Striped Lynx spider *Oxyopes javanus* Thorell, 1887 and a Pharaoh Ant *Monomorium pharaonis* (Linnaeus, 1758), where the lynx spider produces many eggs to increase its survival fitness as spiderlings and protects them with its defence strategies. In this study focuses on three defence strategies to protect them from ant species, the Pharaoh ant destroys all its defence strategies and eats all its eggs and damages the entire spider case. In this interaction, all the eggs (spiderlings) of the spider get destroyed and the population of spiders is maintained in the ecosystem. The pharaoh ant is an ovivory (egg predatory) ant that obtains nutrition by consuming the eggs of Striped Lynx spider.

Keywords: *Monomorium pharaonis*, *Oxyopes javanus,* Pharaoh Ant, Ovivory, Predatory, Spider, Defence, Eggs, Survival Fitness.

Introduction:

Predation is a type of interaction found in animals where one animal hunts and kills another animal to obtain nutrition and fulfil its nutrient requirements (Weseloh and Daniel, 2009). Predator - prey interactions between same or different species play an important role in shaping ecological communities, survival of species, and reproductive success in different communities (Power and Shem, 2009). Among spiders are carnivorous, predatory that prey on insects and as well as other animals (Wetzel and Likens, 2000). The Striped Lynx spider, *Oxyopes javanus* Thorell, 1887, is a common cursorial predatory spider found in diverse agro ecosystems across tropical and subtropical regions. Spider also regulate the population of insects by prey on them. Spider produce large numbers of eggs to maintain their representative fitness (Nayak *et al*., 2025e; 2025f).

In contrast, ants are among the most ubiquitous, strength, valuable and influential insect groups in terrestrial ecosystems. The Pharaoh ant, *Monomorium pharaonis* (Linnaeus, 1758), is a small, highly adaptable species that thrives in both natural and human dominated environments (Sudd, 1960). It is notable for its opportunistic foraging behaviour, as well as organized colonies, and broad diet, which includes various insect eggs and adults. Although its impacts as a household and medical pest are widely recognized, its ecological interactions with other predatory arthropods remain insufficiently documented. Understanding such interactions is essential, particularly because M. pharaonis often co-occurs with beneficial predators within agricultural landscapes (Shepard and Gibson, 1972). Egg predation represents a critical but understudied antagonistic interaction that can influence spider reproductive output and population stability. For egg-guarding species like *Oxyopes javanus*, the presence of aggressive and persistent foragers such as *Monomorium pharaonis* poses a significant threat. Ant raids on spider egg sacs may reduce hatching success, disrupt maternal behaviour, and ultimately compromise the spider's ecological role as a natural enemy of crop pests. Despite this, specific observations or quantitative assessments of ant-mediated predation on lynx spider eggs remain scarce.

Documenting such interactions is essential for understanding the complexity of arthropod community dynamics, particularly in ecosystems where both species coexist. Moreover, recognizing antagonistic behaviors between beneficial predators and opportunistic insects can contribute to more comprehensive biological control strategies (Sanders and Platner, 2007). This study reports and characterized the predation of *Oxyopes javanus* egg sacs by *Monomorium pharaonis* (Pharaoh ants), providing insights into the behavioral mechanisms underlying this interaction and its potential ecological implications.

Mohan and Sudhikumar, 2018 described that the Pharaoh ant performs *kleptoparasitism* behavior by stealing food from the colony of *Stegodyphus sarasinorum* spider, which also steals the spider along with the food ants. Striped Lynx Spider, *Oxyopes salticus*, a species of this spider group,It is a predator of Tarnished Plant Bug (*Lygus lineolaris)* Young and Lockley, 1986. Lockley and Young, 1986 recorded many prey insects species of *Oxyopes javanus* in on cotton in the delta area of Mississippi. Until now, it is not known whether pharaoh ants feed on the eggs of lynx-striped spiders. This is the first observation to document this predation interaction.

Materials and Methods:

Study Area

The study was conducted at Majhiguda village of Kalahandi district in Odisha. The site is located at coordinates of Lat. 19.676253° and Long. 82.678783°. In this area the lynx spider population and Pharaoh ant are dominant. The study is carried out in a Karonda plant (*Carissa carandas*) where the spider and ant population are present. The study was observed on September 2025.

Study Species

To study predation between two species, two species were used, including a spider named Oxyopes javanus, which was identified based on its morphology (Biswas and Raychaaudhuri, 2015;

Tikader and Biswas, 1981) and Pharaoh ants *Monomorium pharaonis* (Linnaeus, 1758) (Sudd, 1957; 1960)

Species and Egg Observation

This is an observational study of the predatory interaction between lynx spiders and pharaoh ants. The study continuously observed the changes in the mother spider and her eggs. Ant attacks on spider egg cases and the extent to which the ants damaged the egg cases and consumed all the eggs were also monitored. The study was monitored by visual observation.

Monitoring and Data Collection

Eggs were monitored at a regular interval of morning and evening per day of one week for until hatching or disappearance. For each observation event, the following parameters were recorded: Egg status (intact, hatched, predated, parasitized), Presence/absence of ants on or near the egg, Identity of visiting ants by visually. Ant abundance and foraging activity near plants were assessed by daily observation. Captured ants were identified to species by using standard keys and published literature.

Results:

Lynx spiders build their nests on the ventral surface of leaves, as many predators can easily harm the spiders or their nests. Spiders choose a safe place to incubate themselves and their eggs, where they build their nest. This nest not only helps in incubating the eggs of lynx spiders properly but also protects them in some way. After selecting a good place, the spider releases the egg on the ventral side of a leaf. It produces silk from its body and covers the egg by attaching it to the surface of the leaf from all sides.

The eggs, being covered with spider silk, provide the spiderlings with a good temperature and environment to develop. Many strategies are used to protect the eggs. In first defence strategy all eggs are inside the egg case and covered with silk, which protects them from external environment and obstacles. In the second defence strategy, the eggs are laid on the ventral side of any leaf. This technique protects the eggs from predators that sit or fly on the leaves of the plant and cannot see the eggs. In the third defence strategy, the mother spider herself protects her eggs and spiderlings by sitting within 5-10 cm of her egg case or on the dorsal surface of that same leaf.

Even though the Lynx Spider has kept its eggs under such protection, the insects still eat the eggs and damage their egg cases. The warrior ants keep roaming everywhere to get food or to fulfil some other requirements. When any individual ant in the group comes to know about spider eggs, then it calls the rest of its members through signals or personal communication. If the number of insects is between 1 and 10 then the mother drives them away from there. If their number is more than 10 then the mother lynx spider is unable to drive them away. A swarm of ants makes holes in the entire silk egg case one by one and then enters the case through the same holes. All the ants eat the whole eggs and the entire egg case gets damaged.

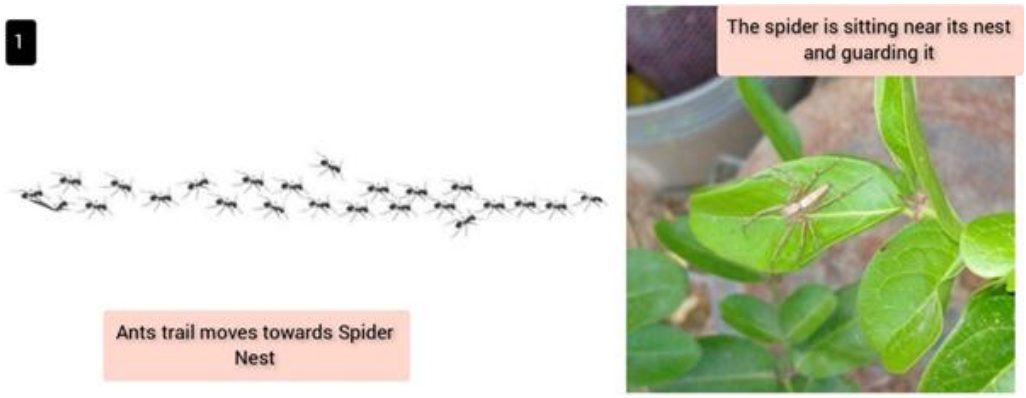

Figure 1: The figure represents that the Pharaoh ants move towards egg case of striped lynx spider on leaf of Karonda plant.

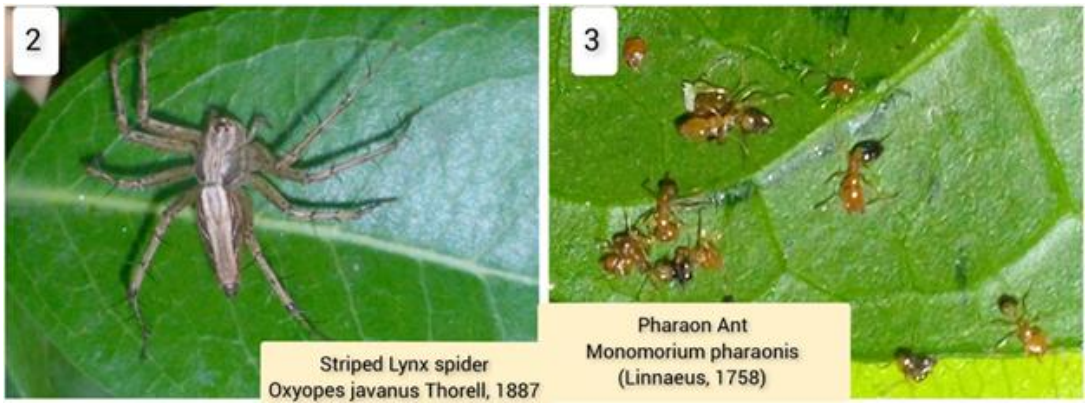

Figure 2 & 3: The figure demonstrates two species (1) *Oxyopes javanus* (Stripped lynx spider), (2) Pharaoh ants *Monomorium pharaonis* on leaf

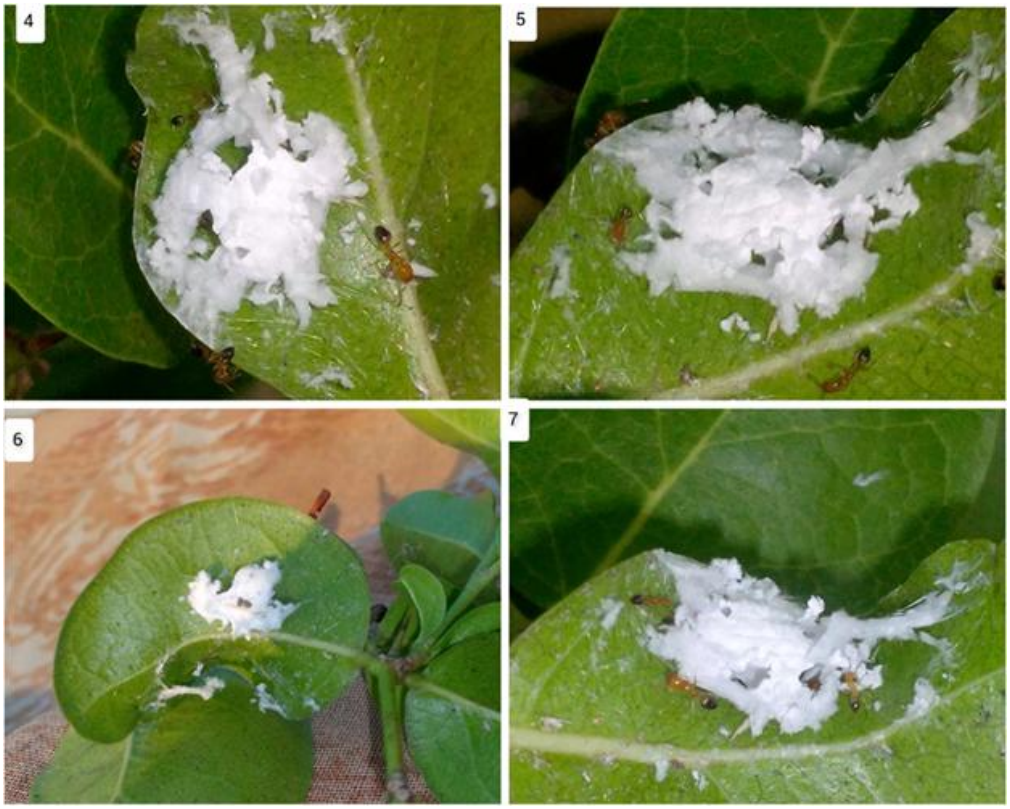

Figure 4-7: Figure represents damaged egg case by Pharaoh ants

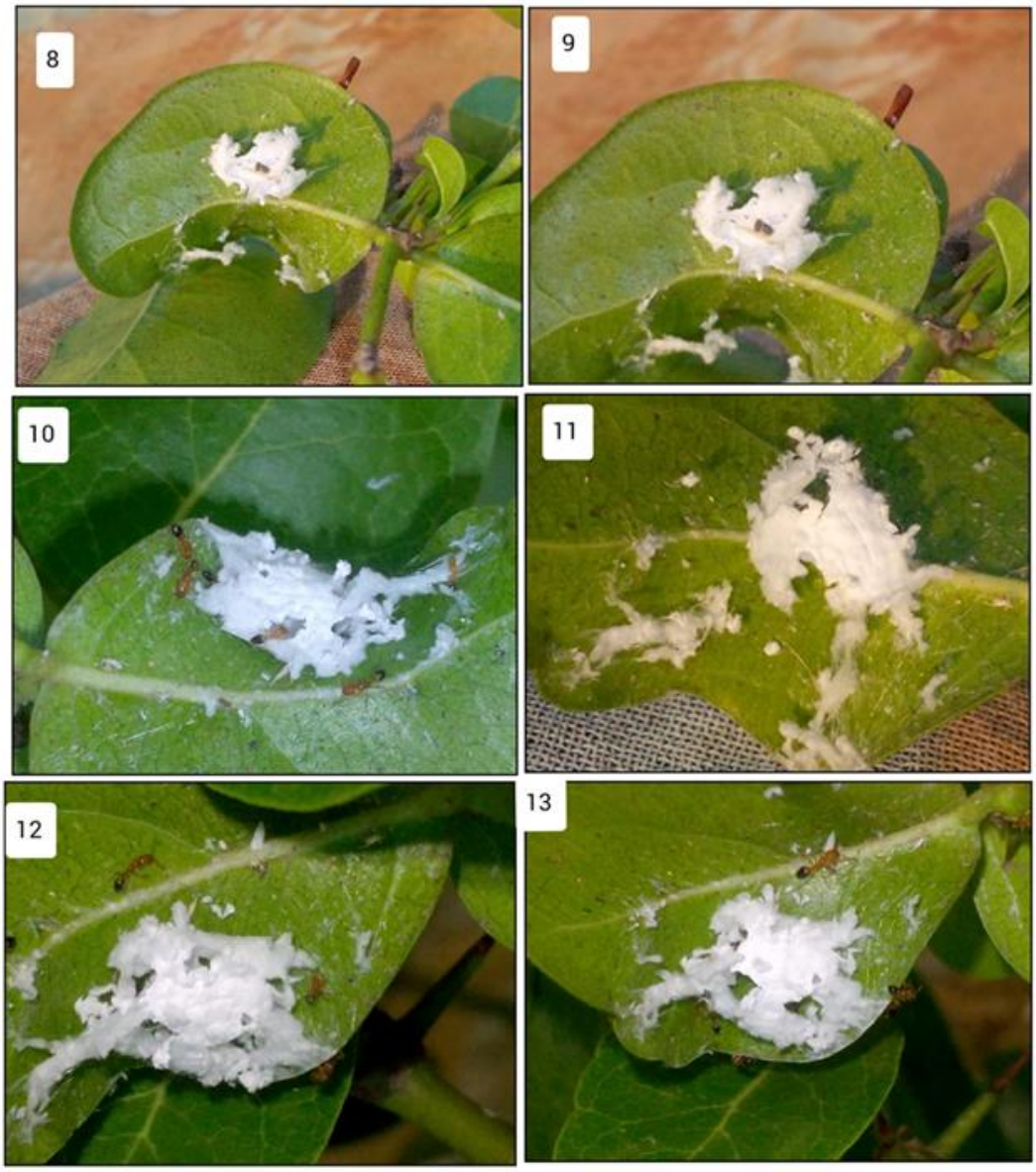

Figure 8-13: Pharaoh ants are eating eggs of spider and completely damaged the egg case on leaf. Fig. 10 Ants breaks silk of spider case by their mouth apparatus.

Fig. 11 Entire egg case have been destroyed by ants.

Table 1: The table links show the spider's defence systems and how it breaks defences of spider by ants

Defence system	Defence strategy prepared by lynx spider	Ants breaks the strategy of defence system of lynx spider
First line defence	Female lynx spider build nest under ventral side of leaves.	Individuals/trail of ants find out the egg case of lynx spider
Second line defence	Eggs are covered with strong silk.	They eventually cut the silk of the egg case with their mandibles to create holes
Third line defence	Female lynx spider show parental care, Care own nest	The group of Ants attacks the Mother Lynx Spider and drives it away from there

Discussion:

Oxyopes javanus (Striped Lynx spider) is a world wide distributed spider and is the most common lynx spider in India. Whereas Pharaoh ant is also very common in India and is found everywhere. An intergenic relationship or interaction is found between Striped lynx spider and Pharaoh Ant which is called predation interaction. In this interaction the spider suffers harm (spiderlings and eggs damage) and the Pharaoh ant benefits in the form of nutrition. The spider uses three defence strategies to protect its eggs but the trail of ants is destroyed and eaten. These spiders lay about 58-140 eggs at a time, which hatch in 13-30 days and turn into spiderlings, due to which their population increases very rapidly. This increasing population is maintained by the Pharaoh ant through ovivory or egg predation.

Conclusion:

The conclusion of this study is that Pharaoh ants (*Monomorium pharaonis*) eat the egg cases of Striped lynx spider (*Oxyopes javanus*). The spider uses various strategies to protect their eggs but still Pharaoh ants eat their egg cases. The spider lay their eggs below the leaves, cover them with thick silk and protect their eggs by staying there, but still Pharaoh ants trail attacks their eggs with their entire population, break the silk of their eggs and eat their eggs. This study shows that Striped lynx spider lay one egg case with numerous eggs and some lay many eggs which give birth to many spiderlings but Pharaoh ants eat these spider eggs due to which many lynx spider babies get damaged and hence their population gets controlled. Pharaoh ants act as a factor in natural selection for spiders, controlling the spider population; otherwise, spider numbers would become so numerous that the population would not be maintained. Here's a species interaction found in nature that shows the egg protection and predation strategy of two species between the Striped lynx spider and pharaoh ant.

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