

A Short Review on Kleptoparasitism in Spider's

Abstract

Kleptoparasitism is a type of parasitic behavior in which one animal steal food material from other animal or other species. Many animals uses these type of foraging strategies for capturing there food items. These type of behavior easily shown in spiders, they play an integral part of globe biodiversity. Spiders are the largest group of class arachnida comprising more than 46,211 species distributed worldwide. The density and diversity of spiders has been closely tied to the structural complexity of the local environment.

Keywords: Kleptoparasite, Foraging-Behavior, Arachnides, Spider.

Introduction

Spiders play very significant role in ecology by being exclusively predatory and thereby maintaining ecological equilibrium as they are one of the major predators in regulating the pest of different crops and feed on insects like houseflies and mosquitoes, which are vectors of human diseases.

Kleptoparasitism or cleptoparasitism (literally, parasitism by theft) is a form of feeding in which one animal takes prey or other food from another that has caught, collected, or otherwise prepared the food, including stored food. The term is also used to describe the stealing of nest material or other inanimate objects from one animal by another.

Kleptoparasitism is a form of direct competition in which organisms steal food from other organisms. Both conspecifics and members of distantly related taxas [Brockmann & Barnard, 1979].

Kleptoparasitism is a term that refers to a reciprocal interaction in which one individual takes advantage from the foraging investments of another (Iyengar, 2008).

Giraldeau and Caraco (2000) sustain that there are three different kinds of kleptoparasitism.

1. Aggressive, if it is accomplished with threat or aggression;
2. Scramble, if the food item is simultaneously exploited by the host and one or more kleptoparasites with little or no aggressive behavior, and
3. Stealth, when the kleptoparasite take the food away avoiding to be perceived by the host.

Aim of the Study

This is a review article which show's stealing behavior of different animals specially spiders. These arachnids play a vital role in balancing the ecosystem. They are friend of farmer, but Their role in pest control and crop protection has not been utilized properly in India. Problem is, very less work has been carried out on behavior and life cycles of all these species.

Review of Literature

Nearly all of the > 200 species in the spider subfamily Argyrodinae (Araneae: Theridiidae) live in association with other spiders: as predators, solitary kleptoparasites, or group-living kleptoparasites. About 20 out of 238 argyrodine species are group-living in the webs of their hosts. In these species, multiple individuals forage in one host web and show strong conspecific tolerance, especially when they share prey items directly with hosts, (Deborah Smith, Yong-Chao Su, P 049)

Spiders in the genus Argyrodes conduct nearly all of their activities in the webs of other spiders rather than building webs of their own (Exline and Levi 1962; Gertsch 1979).

Argyrodes can exist in a variety of relationships with their host spiders (as commensals, kleptoparasites, predators) depending on factors such Relative size of host and Argyrodes, morphology of host web, and host feeding rate (Wise 1982; Lareher and Wise 1985).

The kleptoparasitic spiders Argyrodes etevatus consume and assimilate web material from the Host spider Nephilaelatripts.

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They demonstrated quantitatively that the amount of web material consumed by the kleptoparasite is equivalent to the amount of insect material consumed when host vigilance is low, as expected when foraging conditions are very good. *Argyrodes* vary in their impact on their hosts, as they may steal large prey, small prey, or silk. [linden E. Higgins* and Ruth E. Buskirk, *Behavio.Ecol.Vol.9 No. 4: 584-387 (1998)*].

Argyrodes is a large, cosmopolitan genus of theridiid spiders which has attracted much attention because of its unconventional foraging strategies. For instance, *Argyrodes* is generally regarded as being kleptoparasitic because many species congregate on the webs of other, usually larger, spiders and routinely pilfer food at the host's expense [Kullmann 1959; Vollrath 1976, 19 79a, b; Smith Trail 1980; Rypstra 1981; Wise 1982; Larcher & Wise 1985].

Genus *Argyrodes* are kleptoparasites that steal prey from other web spiders [Tadashi Miyashita *et al* ,2003] They are well known to live in close association with large web-weaving spiders, and they exploit the resources on the webs by a wide range of foraging strategies [TeckHuiKoh and Daiqin Li, 2002]

Argyrodes use a mixture of seven key foraging behaviors:-

1. moving onto host's web and consuming its silk;
2. gleaning insects off the host's web that have been ignored by the host;
3. stealing food bundles wrapped by the host;
4. feeding off a food bundle that the host is feeding on;
5. attacking and consuming a host while it is vulnerable during moulting;
6. attacking hosts or their offspring by lunging at them;
7. catching hosts by throwing a thread of silk with large glue droplets over the host [kleptoparasitism by Marie Elisabeth Herbertstein,2011]

The kleptoparasitic spiders *Argyrodes etevatus* consume and assimilate web material from the host spider *Nephila elatris*. They demonstrated quantitatively that the amount of web material consumed by the kleptoparasite is equivalent to the amount of insect material consumed when host vigilance is low, as expected when foraging conditions are very good.

Argyrodes vary in their impact on their hosts, as they may steal large prey, small prey, or silk. This host-kleptoparasite interaction is there for an ideal system for experimentally examining a variable producer-consumer interaction [linden E. Higgins, *et al* 1998]

Test the relative importance of patch size versus isolation in explaining patch occupancy and abundance of inhabitants. They find that (1) web size is the better predictor of patch occupancy and abundance. (2) Web size is overall positively correlated with abundance, but predicts it most precisely among interconnected webs and not at all among the most isolated webs. Hence, patch occupancy and inhabitant abundance is explained by a rather complex interplay between patch size and isolation [IngiAgnarsson, 2010]

The foraging behaviours of *Argyrodes antipodiana* (O.P.Cambridge) were observed in the laboratory and in nature. *A. antipodiana* is a kleptoparasitic spider primarily dependent on one host, an orb web-building spider; *A. antipodiana* builds a support web on which it relies heavily. The support web is attached to the host's web and enables *A. antipodiana*, without being detected, to swing to safety with stolen food bundles, remove gleaned insects, and feed with the host [Mary E. A. Whitehouse, 1986]

The results suggest that the finer silk of smaller hosts may be at least partially responsible for their higher percentage orb loss. While prey stealing by other *Argyrodes* species greatly affects the foraging gain of hosts [I.MIN TSO *et al*, 1997]

Most members of the large, cosmopolitan genus *Argyrodes* live in the webs of other spiders. Most species usually feed on small insects that have gone unnoticed by the host (Whitehouse, 1986) or on prey stolen from the host (Robinson and Olazarri, 1971). These unusual foraging strategies have earned them the name 'kleptoparasites' and have generated substantial interest in their ecology (alexander m. Kerr* and a. Sergio quenga, 2004)

High feeding frequencies (up to 90% spiders feeding simultaneously during peak activity) were observed in field population's of certain larger-sized orb weavers (*Araneidae*) that rebuild (recycle) their webs daily (Nyffeler 1982). The high feeding frequencies indicate that the web is a very efficient prey capturing device. Large orb weavers often kill prey in excess of their energy requirements (M. NYFFELER *et al*, 1994)

The first comprehensive study of group-living behavior in kleptoparasitic *Argyrodinae*, and the first species level molecular phylogenetic analysis of the *Argyrodinae* (*Araneae: Theridiidae*) the first empirical study of co-operative kleptoparasitism in *Argyrodes miniaceus*. The results showed that, at least at the level of foraging, group-living behavior has adaptive function of co-operation. Using a game theory model, the pay-off of being co-operator in a group is greater than the payoff of being solitary (Yong-Chao Su, 2012)

Most *Argyrodes* species inhabit webs of other species. The long appendages and highly sensitive vibration organs enable them to move stealthily in the web effectively detect trapped prey and accurately orient toward it (vollrath, 1979, foelix, 1996)

Conclusion

Kleptoparasitism is special type of foraging behavior in which an organism steal food from other species or stealing prepared food item from other species. This behavior is a type of parasitism or commensalism, it may found in many organism.

Spiders play very significant role in ecology by being exclusively predatory and thereby maintaining ecological equilibrium as they are one of the major predators in regulating the pest of different crops and feed on insects like houseflies and mosquitoes, which are vectors of human diseases. Their role in pest control and crop protection has not been utilized properly in India. Problem is, very less

work has been carried out on behavior and life cycles of all these species.

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