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A Comparative Study on Ecology and Diversity of Species of Spider

Megha Shukla[1]

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Abstract:

Spiders plays a significant and vital role in ecosystem as being the controller agent of the biodiversity. The present paper focus on the ecology and diversity of the different species of the spiders which are occurring at the varied range of habitat including the spider families. The different families reflect the varying habitat with that of the widespread and abundant restriction to the single site. It is observed that the different sites have individual and unique species characteristics and its role in the ecosystem by highlighting the species composition in the seasonal patterns as the implications for showing the species diversity. The study focus on the diversity of the spider species and the influencing factor with the varied habitat. The paper focus on the spider assemblage and its role in stimulating the ecological balance as well as diversified species conclusively reporting the structural complexity of the habitat.

Keywords: *Spiders, Biodiversity, Seasonal patterns, Spider Assemblage, Habitat*

Authors:

1. *L.J.D. College, Sahararhat, Kolkata, INDIA*

Introduction

Spiders are considered as one of the different group of invertebrates in diverse ecosystem and also known for being a very sensitive indicator in the change in environment. It is estimated that India has around 1442 species of spiders of almost 39,000 worldwide species (Lone, Dar and Bhat, 2015). Spiders are basically known for the richest insectivorous predators among the terrestrial ecosystem as well as the one of the major diverse arthropod consisting of 30,000 species and showing a wide range of foraging strategies. The diet of spiders are dependent on mainly on insects from numerous taxa and also some of the other spiders (Nyffeler, 2000).

Spider are significantly classified as one of the general predator and shows a major influence on the structure of the community focusing on the food chain and food web. The spiders plays a very vital and significant role in the respect of predator mostly the predators of the insects and also a lot involved for the control and prevention of the population of insects. They are also known for the controller agent of the biodiversity for helping in various insects pests because of their polyphagous characteristics. By observing the major role of the spiders it is conclusively described that the spider are more important for the food chain. They also have their prior role in the agriculture, housing and plantation for the sake of protection from the pest insects and also as the bio indicator for the role of environment change (Koneri and Nangoy, 2017).

The historical background of the spider as a fossils are compared with that of the arthropod and other insects who are not preserved. With the known factor it was concluded that the spiders found in most of the historic ear of time which have the evidential value of the presence of spiders. The one of the name of the oldest spider i.e. Palaeothele which was found to be observed at the back of 300 million years old and symbolize the surviving Mesothelae. There are also some of the fossils spiders in spite of abundance of the insect at the Permain period of the historical time. The end of this period is basically featured by the one of the major extinction on earth with the effect of diversity of spider as well as rareness of the spider fossils of this period. The other period named as Triassic period, including the only category of mesothele spiders as one of the initial evidence for that of the opisthothele spiders. The today ear of time focus on the most of the different and diverse types of terrestrial arthropods that are known to be the significant terrestrial predators. The record and collection of the fossils depends upon the positioning of the very long time record (Herberstein, 2011).

As per as the utilizing the capturing of living prey, the spiders also plays an important role as scavenge on the dead arthropods. The significant example of non-predatory foraging consist from the spiders basically feed and depend upon the plants material most specifically pollen, nectar and honeydew. The honeydew is one of the mixed product i.e. combining with the plant origin and later diverse through the insect before the ingestion by the spider. The web building spider reaches the pollens to the spider indirectly and hence collect the web and simultaneously digest with that of the old web silk but there is also the other different types of spider that feed on the pollens directly as they reach to the flowers (Herberstein, 2011).

General characteristics of Spider

1. Spiders are known as the universal predators in the terrestrial ecosystem and are famous for the basic feeders that kill the insects and also feed on the other arthropods.
2. They are severely focused carnivores that as compare with other taxa of primarily predacious invertebrates like carabid beetles and centipedes.
3. The use of potent nueotoxins which help the spider to kill the prey promptly.
4. The spiders also consist of various adaptations that differentiating them with the other arachnids.
5. The body of spider include the two body region mainly termed as cephalothorax and the abdomen (Viera, Marcelo and Gonzaga, 2017).

The one of the order of Araneae is considered as one of eth diversified group around the world. The presence of spiders found in all the continent as the only exception of Antartica. They are reflected as the seventh largest group of the arthropod group. The only difference between the spiders and others types of other type of arachnids between the abdomen and cephalothorax with the presence spinnerets. It is also focused that all the types of spiders are completely carnivorous and can live without feeding for a long period of time. For the abundance, the spiders are basically the important predators of the food chain and hence can influencing the activity of the detritivorous and funghivorous depending upon the

affection of the decomposing processes. The spider distribution is related with the susceptibility to the abiotic conditions and dependence upon the climatic condition. The number of species termed as euryecious having large distribution and consist of different habitats and the higher geographical areas. Also the consideration of among the abiotic conditions the spider distribution affected by the biotic factors and the competition is not only on the basis of food but the resources as well as nesting sites. Other than that, most of the species can dependent on the use of plants as a sense of substrate and the quantity of the kind of prey consisting the parasitism and predation and the minor climate circumstances.

The type of spider i.e. web spiders weave the incredible diversity of the traps and growing the extreme specialist that helpful in major four types i.e. tangle, funnel web, sheet and orb. The spiders in the basic major families weave orb webs. The name of the largest family of the spider is Aracneidae which later supporting the framework and adding a central catching spiral which is made up of silk consist of many sticky minute droplets. The orb is basically gentle and easily damaged by the effect of wind, struggling prey and rain and hence the related loss of thread of their stickiness. The funnel-web spiders of family Agelenidae form the sheet web and very closely resembles the wolf spiders of family Lycosidae in both the factor of movement and morphology. The wandering spiders are basically helpful and restricting the use of the silk to often trail as protecting the eggs and lining their retreat. The other kind of Crab spiders of the family Thomisidae which later prey in flowers and also on leaves as well as tree trunks.

Primitive spiders

The original and most primitive Suborder of Mygalomorphae consist of large spiders of the Family of Theraphosidae named ‘taantulas’ that trap-door spiders of the family Ctenizidae and other including the few smaller families. The Mygalomorphs are basically consist of presently evolved Araneomorphae including longest and largest living spiders. It is also seen that most of the mygalomorphs are basically known as the ground dwellers which hunt from the subterranean burrows and use tubular and sheet shaped webs near the ground **(Wise, 1995).**

Review Literature

Clausen (1986) deal with the vital role of spiders in the biological monitoring which emphasis on the basic description of biotopes and other monitoring of the pollutants. With the consideration of the fact that the spiders can be available almost each and every places and in abundant manner. Due to the characteristics of being transportable and comparatively short living they are very firmly able to adjust to the quick changes in the environment which is rapid and random as well. The also important fact that the spiders are basically predaceous and hence have the possibility for the biological concentration of the numerous toxic matters like some heavy metals.

Agnew and Smith (1989) stated about the populations of spider which was studied on the peanut fields in the region of Texas West Cross-Timbers through the growing seasons i.e. 1981 and 1982. It is observed that the species of hunting are formed by the approximate of 85.5 and 91.7% fauna of spider. It also focus on the important three of the families of hunting termed as Lycosidae, Thomisidae and Oxyopidae who are dominant including 74.6% from the total of the fauna of spider in the last two years study update. The domination of the species is dependent on the single species of a family like Thomisidae were dominated by the Misumenops i.e. importantly M.celer. It is justified that the abundance of spider increases with the increase in the growing season involving the increased size and structure of plant.

Topping and Lovei (1997) stated about the assemblages of spider by the quantitative sampling in the arable and pasture habitats by the diverse management rules in location of North Island of New Zealand. The diversity of species and density higher with the decrease in the frequency and the disturbance in the intensity form two of the species. The fauna of the spider was conquered by the known species of money spiders of family Linyphiidae. The paper also shows one of the abundant species named as *Lepthyphantes tenuis* of the habitat of British cultivated. The examination done on the basis of comparative samples that represent the structured similarity and majorly as species rich assemblages found similar in that of habitat of England.

Nyffeler (2000) focused on the ecological impact of the predation of spider on the populations of insect by extrapolations. The result shows the spiders who

occurs in large numbers later destroy or kill astronomical quantities of insects. In the paper there is a consideration of Bristowe and Turnbull work where they specifies the estimation of critically analyzed in the present knowledge of ecology of spider. He also once overestimated the prey that kills the spider and the calculation of Turnbull hypothetical study conclusively describe the value of prey kill which dealing with the ecological theory.

Horvath *et al.* (2002) consider the effect of edge on spiders and weevils while testing on the oak forest by the use of sweep net at the location of Sikfokut Project in Hungary. It is focused in the paper about the spider's species who are importantly developed on the forest edge and higher as compare with that of the meadow. The study also discuss about the spider assemblage of the edges which is alike the forest whereas the difference is seen in the species of weevils found more similar to that of the meadow. Conclusively the result depends upon the two groups of invertebrates showing on varied trophic levels resembling the edge effect for studying taxa in the higher species richness.

Venturino *et al.* (2006) discussed about the type of ecosystem where the transportation of ecosystem by the source of wind from that of the vineyards. The paper consider the concept of model by considering the phenomenon of transport deprived of building space explicitly. The evaluation of the dynamic system is done on the basis of its stability also showing the bifurcation. The study also consider the indiscriminate spraying so as to note the control of pest by investigating with use of suitable simulations.

Lone, Dar and Bhat, (2015) stated about the evaluation of the occurrence, distribution and diversity of the community of the spider in the famous Gulmarg Wildlife Sanctuary. It is quoted in the paper regarding the population of spider species in India i.e. from the 110 spider families consisting 59 families and also around 1442 species (described) among the 39,000 worldwide. It is also shows the importance of the documenting of the spider in the manner of present loss rate and degradation of the forest which is termed as the unfavorable effect on most of the invertebrate groups. It is also represented in the present paper which is found in the 18 taxa and discussion of the Araneidae as dominant family continues by Linyphiidae, Salticidae, Sparassidae, Lycosidae and Clubionidae. The paper concluded by the sites of forest that shows higher diversity than meadow sites.

Artigas, Ballester and Corronca (2016) focused on the beta-diversity as the spatial replacement in the composition of species as one of the critical aspect for understanding the way of assemble of the local communities. The changes basically effect on the basis of geographic and environmental factors including geographic distance or both. It is determined that spiders are consider as the good indicators for the environmental quality and they also work as the model taxa for the establishment of the decrease in the similarity community that collectively respond to the geographic distance in Campos and Malezales ecoregion. With the study of the data it is also described in the present paper the influence of alpha diversity and other environmental variables on that of the analysis of the spider communities. There is also the increment in the similarity between the spiders communities failed as geographic distance between sites. The result basically shows the condition of grasslands in the place of Campos and Malezales ecoregion which support the major diversity of species of spider that are different in different sites. The paper also support the heterogeneous habitat with the respect of spider of the grasslands not the homogeneous appearance.

Koneri and Nangoy (2017) discussed about the significant and important role of the spiders in ecosystem. The paper focused on the major characteristics of the spiders and their role in the ecological balance of the ecosystem by considering the spiders as the controller agent of the biodiversity and hence it is important to preserve them. This study is focused on the diversity and distribution of the spider at Sahendaruman Mountain located in the Island of Sangihe, Indonesia. The data concluded after the study include abundance, fullness, diversity and consistency of the spider species between the habitats. They also contributed the resultant of 15 families, 117 morpho-species and above all 812 identified individual species. It is conclusively identified that around 13 families are distributed in all kinds of habitats and 2 families are the only who are inhabit the one type of the habitats. The analysis completed by putting the information the secondary forest contains the highest diversity of the spiders with the comparison of the other type of habitat.

Conclusion

The present study deals with the ecology and diversity of the spider with the respect of the different family of spiders consisting of the species and help in the ecological balance of the ecosystem. The geographical distance matters a lot in the diversity of the spiders and its occurrence and presence in the different region of the world. The study observes that the decrease in the community of the spider doesn't depend on the geographical distance but the climatic features and vegetation complexity plays vital and effect the community of the spider's species. The paper also covers the characteristics of assemblages of the spider of various types of grasslands and the consequence of habitat and others composition of spiders. The study reflect also the review the spider assemblage as the most of the rich species. The paper focused on the spider diversity with the involvement of the general discussion and reviews of varied factors of spiders and its different role in stimulating the ecological environmental balance.

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