



BEHAVIORAL STUDY OF SPIDER (*Argiope anasuja*) IN CUTM CAMPUS, BBSR

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ABSTRACT Spiders are arachnids. *Argiope anasuja* is a species of orb weaver spider. It builds a web with zig-zag manner. The giant cross spider *Argiope anasuja* thorell 1887 is the poorly distributed species in all over the world. It is also called as signature spider. The present study conducted in habit of Khurdha district, Odisha. The region within the CUTM campus, Jatni, Bhubaneswar, Odisha. Spiders weapons are their silk. Spider silk starts out in the silk glands as a watery get of long protein chains which is funneled down a gradually tapering tube. I had observed 4 specimen in the campus for 2-3 weeks. This study revealed that behavioral changes, predated practices, web constructing pattern and other incredible facts.

KEYWORDS : Giant cross, Signature spider, Web, Silk, Behavior, Predator, *Argiope anasuja*, CUTM.

INTRODUCTIONS

Spider belongs to the phylum Arthropoda, class Arachnida, order Araneae. All the spiders are predators. There are more than 45000 known species of spiders, found in all habitats all over the world (Martin Nyffeler 2017). Spiders covers a large variety of morphological forms. spider silk is not only an interesting material in its own right, but it is an integral part of the behavior of all spiders, whether an individual uses it simply as a trailing safety line or participates it into the often complex structure of the famous, and characteristic, spider's web (Shear 1986, Tilqin 1942, Witt et al. 1968). In addition, web geometry is a representation also of the spider's movements and thread manipulations (Vollrath 2000), which together comprise the spider's web building behavior (Fritz Vollrath and Paul Selden, 2014). They range from less than 1.0mm long to tropical tarantula size with leg spread to 25cm. The largest spiders are the hairy mygalomorphs known as tarantulas. Body of spider is divided into 2 parts, one is anterior cephalothorax another is posterior abdomen. The cephalothorax contain the brain, stomach and usually venom glands. The abdomens contains the heart, digestive and reproductive systems, lungs and also silk glands. Spiders don't have antennae. They have 8 legs. Each leg consists of 8 segments. The main eyes are the front are capable of forming images. There are many different types of silk and each type serves a different functions for the spiders.



MATERIALS AND METHODS

The present study conducted in habit of Khurdha district, Odisha. The region within the CUTM campus, Jatni, Bhubaneswar. Firstly the site identification was done, in this the site where the spider and their webs are present are selected to do further study. Spider build webs in shrubs, trees, along rock walls, storage rooms and corners. Many spiders live in retreat area off the web. Burrowing spiders may be found under rocks, logs in debris deep-under plants and sheets of wood or cardboard. the different web patterns are then identified by taking their photographs and comparing with photographs and reports on the

spider's web pattern, which were done earlier. Different activities of spiders are studied which including foraging, egg laying and ecology of the spiders, simultaneously different web patterns are also by taking their pictures and analyzing the previous work has been done on same and different web patterns of spiders are prepared. To know each web pattern and their activities, photograph were taken by super macro lens of Nikon D333 camera.

RESULTS AND DISCUSSIONS

The signature spider (*Argiope anasuja*) is also known as the writing spider and the garden spider. This spider is found all over the world. There are around 75 different types of species are found. The male is smaller than female. Female is about 8-12 mm and male is about 3.5-4.5 mm. After mating the female will kill the male and then lay her eggs onto this companion web and wrap them up into a sac. This sac can hold from 400 to 1400 eggs. These spiders make certain zig-zag pattern web. Their colours vary in between their stripes but they keep the black and yellow stripes. They distribute also Sri Lanka, Maldives, India, and Pakistan. Their habitats are moist deciduous forests in the sunny parts. Signature spiders are able to eat an insect twice its size, and this is all they eat.

The spiders are expert weavers and build orb types of webs. These webs are concentric polygons and straight elastic threads running radially from centre and through the angles, terminating to firm rigid support. They always prefer a plane of shadow in the daylight for the construction of the web. The rain drops have no harmful effect on their webs. The silk threads are water resistant and water soluble.

Web and behavior are so closely linked because of that it is possible to deconstruct the web structure not only to provide a continuous record of the visible steps taken by the spider but also to infer from this visible record the underlying and hidden rules that are guiding these steps (Gotts and Vollrath 1992). A prerequisite for a successful behavioral dissection is a very good understanding of both, web engineering and spider activity (Vollrath et al. 1997).

Inferring fleeting behavior from morphological traits tends to be far from easy at the best of times; and it is rather tricky when the behavior is multifaceted. They provide a window into the evolution of a complex behavior because the extent species already provide an enormous variety of records (web types) with an ecological as well as structural diversity.

The evolution of the web and the emergence of the orb web have the ability to be an example for the evolution of the behavior. The web of the spiders always present in slanting position and spider is an inverted position. The predators get trapped in the web and it becomes turning into prey; the spiders get time to migrate. While feeding, they are erected thus the pray is hold exactly in front of the anterior row of eyes. This type of spiders are commonly seen on flora of Mimosaceae family and sometimes on the human settlements at some feet above the grass. Spiders arranges their legs in loosely X shape and at the time of

attack it remains in an erect X shape. In web, the position of spider is in a crafty act and appreciable since in its orb web; it stays at the centre ensuring that any predator wishing to attack the web host will have to pass through many hurdles. The palps of the spider containing spines which facilitate teasing the prey and holding it. The feeding mechanism of all the spiders are almost same.



Fig. 1 Argiope anasuja



Fig 2. Web of the spider (Argiope anasuja)

CONCLUSION

All the spiders are carnivores. Without spiders, our planet would be in pretty bad shape. It produces a special type of silk. Spiders are found in abundant amount. They are the most important predators of insects. Due to the increase of insect population the crop field would be destroyed. They are useful for controlling insects in various fields.

REFERENCES

- Gajbe, P. (2003) A checklist of spiders (Arachnida:Araneae) of Jabalpur, Madhya Pradesh, *ool.surv.India*:101(part 3-4): 43-47.
- Kumar, C.M., Senthil, Raghupathy, A., (2008) A preliminary report on diversity of spiders in the Coffee plantation of Yercaud, Tamilnadu, India, *Bugs 'R' All* No. 18 July 2008, Pp. 11
- Platnick, N. I., (2011) The world spider catalog, version 11.5. American Museum of Natural History.
- Pocock R.I., (1900a) The Fauna of British India including Ceylon and Burma - ARACHNIDA; Taylor and Francis, London.
- Sebastian t., Peter K.V (2009) Spider of India: University Press. Pp. 1- 614
- Siliwal, M., Sanjay Molur., B.K. Biswal (2005) Indian Spider (Arachnida: Araneae), *Zoos' Print Journal* 20(10): 1999-2049.
- Thulsi Rao, K., S.M. Maqsood Javed., Chemala Srinivasulu (1870) Records of the Zoological Survey of India; Arachnid Fauna of Nallamalai region, Eastern Ghats, Andhra Pradesh, India, Zoological Survey of India, Kolkata: 239
- Trivedi, V., (2009); Diversity of Spiders in Groundnut crop fields of Saurashtra, *J. Bombay Nat. hist. Soc.* 106(2) Pp. 184.
- Bristowe WS., (1975) A family of living fossil spider. *Endeavour* 34:115-17.
- Coddington JA., (1986) The monophyletic origin of the orb web. See Shear, pp. 319-63.
- Coddington JA, Levi HA., (1991) Systematic and evolution of spiders (Araneae), *Annual review of ecology and systematics* Vol. 22, pp. 565-592.
- Decae A.E. (1984) A theory on the origin of spiders and the primitive function of spider silk. *F. Arachnol.* 12:21-28.
- Foelix RF. (1996) *Biology of spiders*. Oxford: Oxford Univ. Press. Viii + 200 pp. 2nd ed.
- Hergenroder R, Barth FG. (1983) Vibratory signals and spider behavior: how do the sensory inputs from the eight legs interact in orientation. *f. Comp. Physiol. A* 152:361-71.
- Martin Nyffeler and Klaus Birkhofer., (2017), An estimated 400-800 million tons of prey and annually killed by the global community, *The science of Nature* 104, Article No. 30.