

DIVERSITY OF SPIDERS (*ARANEAE*) FROM SEMI-ARID HABITAT OF AGRA (INDIA)

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ABSTRACT

Spiders are the highly diverse group of invertebrates and occupy various habitats. Diversity of spiders in areas with crop, non crop and the forest area of Agra region has been focused in this study. The Collections were made during the period of June to August. A Total of 34 species of belonging to 12 families were recorded of which the dominant ones in terms of number of species are from families Salticidae, Oxyopidae, Lycosidae, Araneidae, Pholcidae and the spiders observed were “orb-web builders”, “ground dwellers”, “sheet-web builders” whose occurrence was in the ratio of 5:28:1. Since there is no report of diversity of species in this region, the current data may serve as the base for future studies.

Key words- Spiders diversity, Agra, Araneae.

INTRODUCTION

Agra region falls under semi-arid habitat (26°44'N and 27°55'S and 77°26W and 78°32 E) in the southwest of the State of Uttar Pradesh and forms a part of upper Gangetic plains of North India. The soil is chiefly alluvial besides residual soils which consist of rocks fragments, pebbles, boulders and sand. The climate is markedly periodic due to marked diurnal differences in temperature, high saturation deficit and moderately low rainfall. Mean annual temperature is about 23°65C and annual precipitation is 760.4 mm(Singh and Islam, 2010).

Arthropods comprise of more than 900,000 described insect species and about 43,678 described spiders in the world belong to the order Araneae of class Arachnida (Platnick, 2013). In India , according to Siliwal *et al.* (2005) about 1442 valid species of spiders are known from India and according to Keswani *et al.* (2012), the known spider species from India are 1686. Spiders are one of the diverse and functionally important predators regulating the terrestrial arthropods and possess a unique ability to spin web. Spider catches a special attention of the naturalists because of their different types of web architecture to trap different insects for food (Codrington and Levi, 1991). Most preferred food of spiders is found to be ants, followed by houseflies, mosquitoes, beetles, butterflies, honeybees, etc. Despite their fundamental role in natural ecosystem they have largely been ignored in conservational studies. Since information on spiders of this region is lacking this study aims to provide base line information on spiders of Agra for further studies.

Table-1, Land use in western Uttar Pradesh

	% Land use	
	1996-97	2006-07
Net sown area	74.36	78.44
Agricultural waste land	1.97	1.41
Present fallow land	2.34	3.04
Other fallow land	2.39	1.69
Non agricultural	2.72	1.88
Land use other than agriculture	9.9	11.80
Grassland	0.22	0.22
Gardens and scrubs	0.611	0.69
Forest	5.43	5.39

Source : <http://upgov.up.nic.in/spatrika/graphical/simpleup.html>

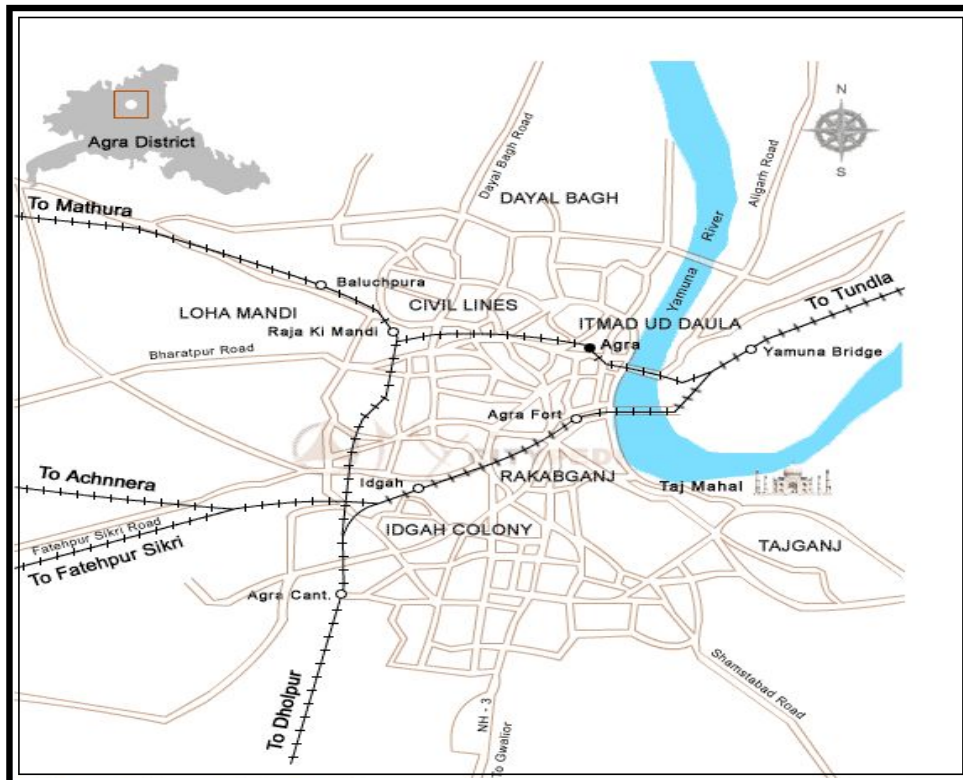


Figure-1, Study area

Table: 2, Spiders recorded from the study site

Family	Species	Number
Araneidae	<i>Argiope aurantia</i>	15
	<i>Argiope anasuja</i>	12
	<i>Cyrtophora citriocola</i>	10
	<i>Cyrtophora cicarosa</i>	21
	<i>Araneus sp.</i>	20
Agelenidae	<i>Tegania domestica</i>	12
Eremobatiidae	<i>Eremobates sp.</i>	1
Gnaphosidae	<i>Drassodes sp.</i>	3
Hersiliidae	<i>Hersilia sp.</i>	18
Lycosidae	<i>Pardosa pseudonnulata</i>	5
	<i>Lycosa pictula</i>	9
	<i>Lycosa tista.</i>	16
	<i>Pardosa birmarica</i>	12
	<i>Pardosa sp.</i>	15
Oxyopidae	<i>Oxyopes sweta</i>	11
	<i>Oxyopes ratanae</i>	18
	<i>Oxyopes indicus</i>	19
	<i>Oxyopes salticus</i>	10
	<i>Oxyopes biranius</i>	9
	<i>Oxyopes sertatus</i>	12
Pholsidae	<i>Artema atlanta</i>	35
	<i>Phlocus phalangiodes</i>	20
Saltisidae	<i>Plexippus paykulli</i>	27
	<i>Phidippus pateli</i>	12
	<i>Selenops sp.</i>	15
	<i>Phidippus yashdharae</i>	5
	<i>Hasarius andersoni</i>	12
	<i>Neoscona sp.</i>	3
	<i>Portia sp.</i>	11
	<i>Phidippus clarus</i>	20
Tetragnathidae	<i>Leucauge decorata</i>	20
Therididae	<i>Achaearanea mundula</i>	9
Thomsidae	<i>Philodromus sp.</i>	3
	<i>Xysticus sp.</i>	14

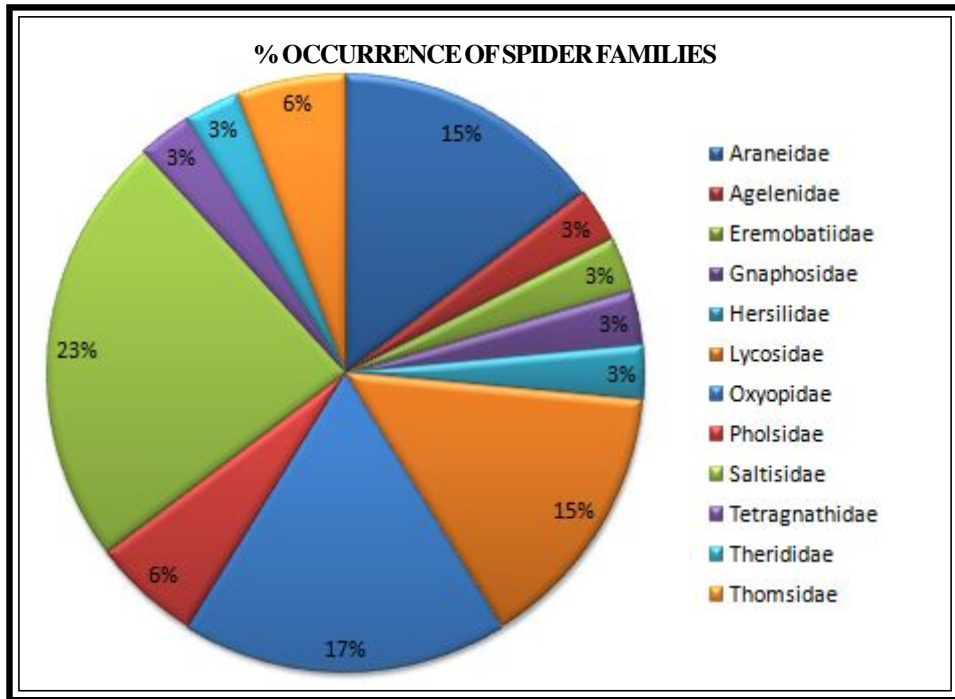


Figure-2, Percent occurrence of spider families

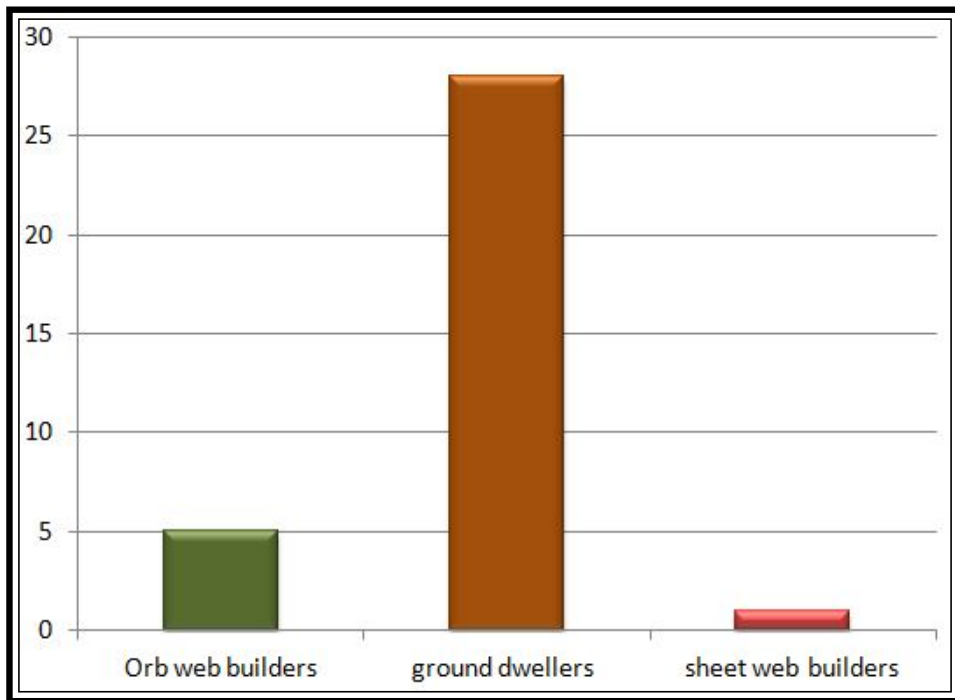
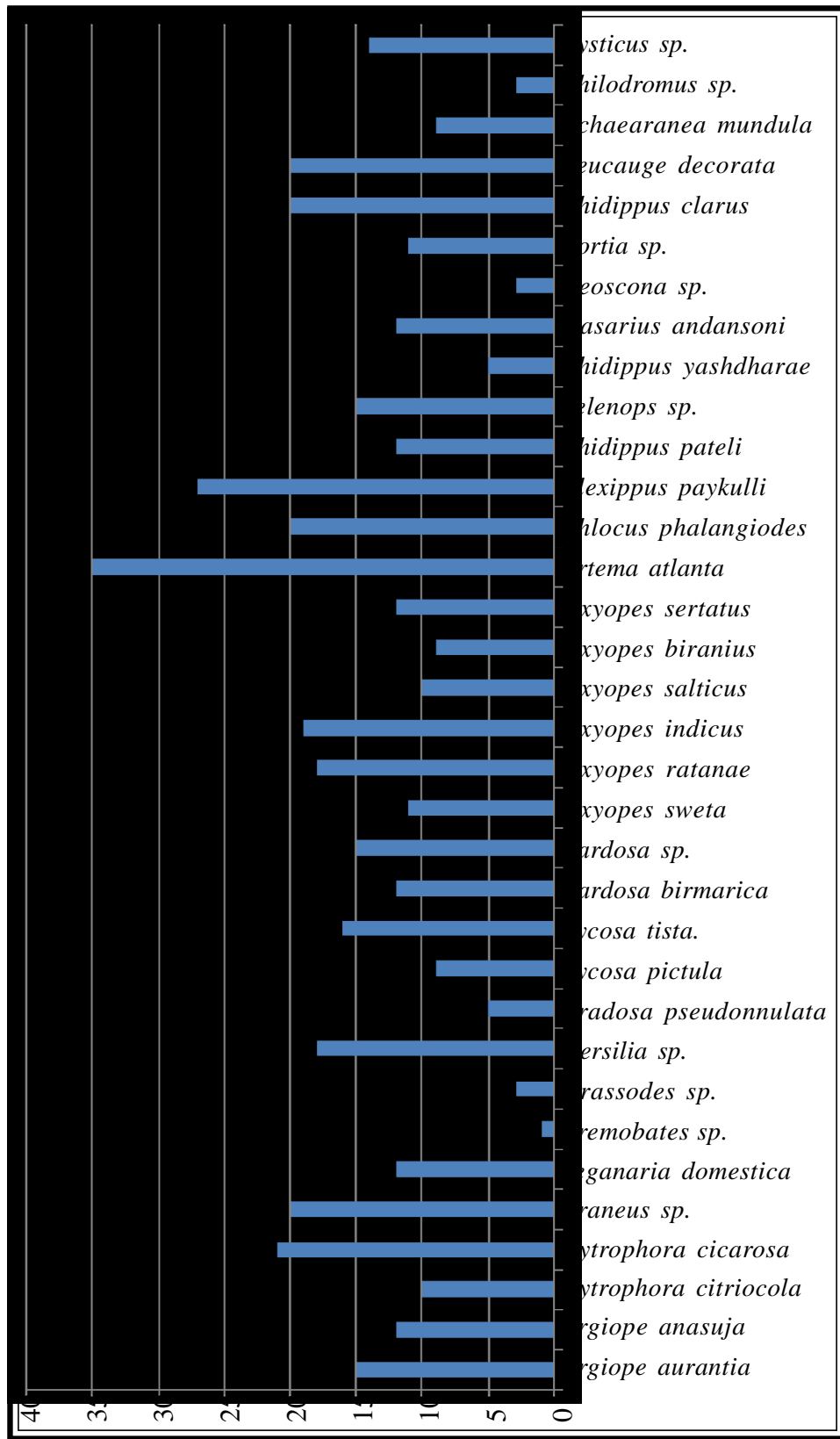


Figure-3, Ratio of orb builders, ground dwellers and sheet web builders



STUDY AREA: Selection of habitat is from the flood plains of Yamuna River because it provides humid condition for spider and also from Crop, non crop and forest habitat. This study area covered 363 km and the collection sites included protected forest area such as Sur Sarover Bird Sanctuary, Forest area around Taj mahal, all on the banks of river Yamuna crop and non crop area around Dayalbagh Fields. Owing to its proximity to the sandy desert of Rajasthan on the west, it witnesses extremes of temperature, which ranges from 45°C in summers to as low as 2 °C in winters.

METHODOLOGY- Line transect method was used to search the spiders in different sampling sites like crop, non-crop and forest areas during the period of June- August. Transects were chosen randomly. Spiders were visually searched under the holes of tree and under rocks ground search were done under leaf litter or fallen herbs and shrubs. Spiders were collected with the help of specimen preservation boxes. The samples were preserved in 70% Ethanol for further identification.

All samples of spiders were identified by following the keys and catalogues of Tikader (1987), Pocock (1900), Platnick (2010), and through expert identification comments on spiders.

RESULTS AND DISCUSSION

The spiders fauna of India is represented by 1520 species of spiders belonging to 377 genera and 60 families (Sebastian and peter 2009). In this present study a total 12 families, 34 species of and 22 genera of spiders were recorded from Agra region of India. The maximum density of spider species was in the extreme summer (June to august) where the temperature fluctuates between 35 to 50 °C the species were pooled from the ruins of heritage sites on the bank of rivers. A variety of spiders have been observed (Table.2). Maximum diversity of spiders species Salticidae (8 sp.), Oxyopidae (6 sp.), Lycopsidae (5 sp.) , Araneidae (5 sp.), Pholcidae (2 sp.) were also documented (Fig.2). Species abundance in this region is shown in Figure-4. The maximum richness was observed with respect to species, *Artema atlanta*, *Plexippus paykulli*, *Cyrtophora cicarosa*, *Araneus* sp., *Pholcus phalangioides*, *Phidippus clarus*, *Leucage decorata*, *Oxyopes* sp., *Hersillia* sp., *Lycosa* sp. and *Xysticus* sp.. The ratio of orb web builders, ground dwellers and sheet web builders were in 5:28:1(Fig.3).

The study of spiders is not completely known in this region. There is a lack of information on taxonomy of spiders in this region. Thus this study serves as a baseline information to the ecology and the importance of spiders of this area. The habitat of Agra being of semi-arid nature and also strategically placed on the bank of river Yamuna (Fig.1), it provides an ideal location for the growth and diversity of spiders in this region. Total land area (Table.1) and agricultural land therein also indicate the good diversity of spiders in this habitat.

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