

**SPIDER FAUNA FROM NORTH MAHARASHTRA, INDIA**NAYAN R. MAHESHWARI\*, SACHIN R PATIL<sup>1</sup> AND MANOJKUMAR Z. CHOPDA

Department of Zoology,

Moolji Jaitha College, JALGAON-425 002.

<sup>1</sup>Zoological Survey of India (ZSI),

Western Regional Centre, Akurdi, PUNE-411 044

\*Corresponding Author:

nrmaheshwari@gmail.com

**Received** : 08.01.2018; **Revised** : 15.02.2018; **Accepted** : 24.03.2018**ABSTRACT**

Researchers carried out spider fauna in Satpuda hills of Malghat region of Maharashtra, however, no record was found on part of North Maharashtra region situated at the foot of Satpuda range. Hence, here an attempt has been made to find out the fauna of spiders from North Maharashtra of India. Satpuda is a range of hills which holds rich biodiversity with different types of forest. The species were identified by using keys for Indian spiders. A total of 71 species of spiders belonging to 15 families were recorded. Such surveys building neglected spider fauna database. Therefore, this is the first attempt to report the spider fauna from North Maharashtra, India.

Figures : 06

References : 16

Tables : 02

KEY WORDS : Arachnid, Diversity, Maharashtra, Satpuda, Spider

**Introduction**

Spiders are of protein rich food for many animals throughout the year. Out of 46,645 species of spiders present in the world, 1686 are found in India.

Global arthropod species richness is about 5-10 million<sup>8</sup>. The numbers<sup>12</sup> of arthropod species is 2,350,260. Spider is insectivorous arthropod found ubiquitously in world and acts as insectivorous bio-indicators for monitoring biodiversity.

Workers recorded 46,645 species of spider<sup>15</sup>. About 1442 valid spider species are known from India<sup>13</sup> while another worker<sup>6</sup> listed 1686 known spider species from India.

From last three decades enormous work on spider species was conducted by different contributors in India<sup>4</sup>. In last two decades, workers recorded 108 new spider species from India and a collection of 806 spider species from Melghat<sup>16</sup>, Maharashtra (Fig.1) and in 2011, One hundred and seventeen spider species from Toranmal

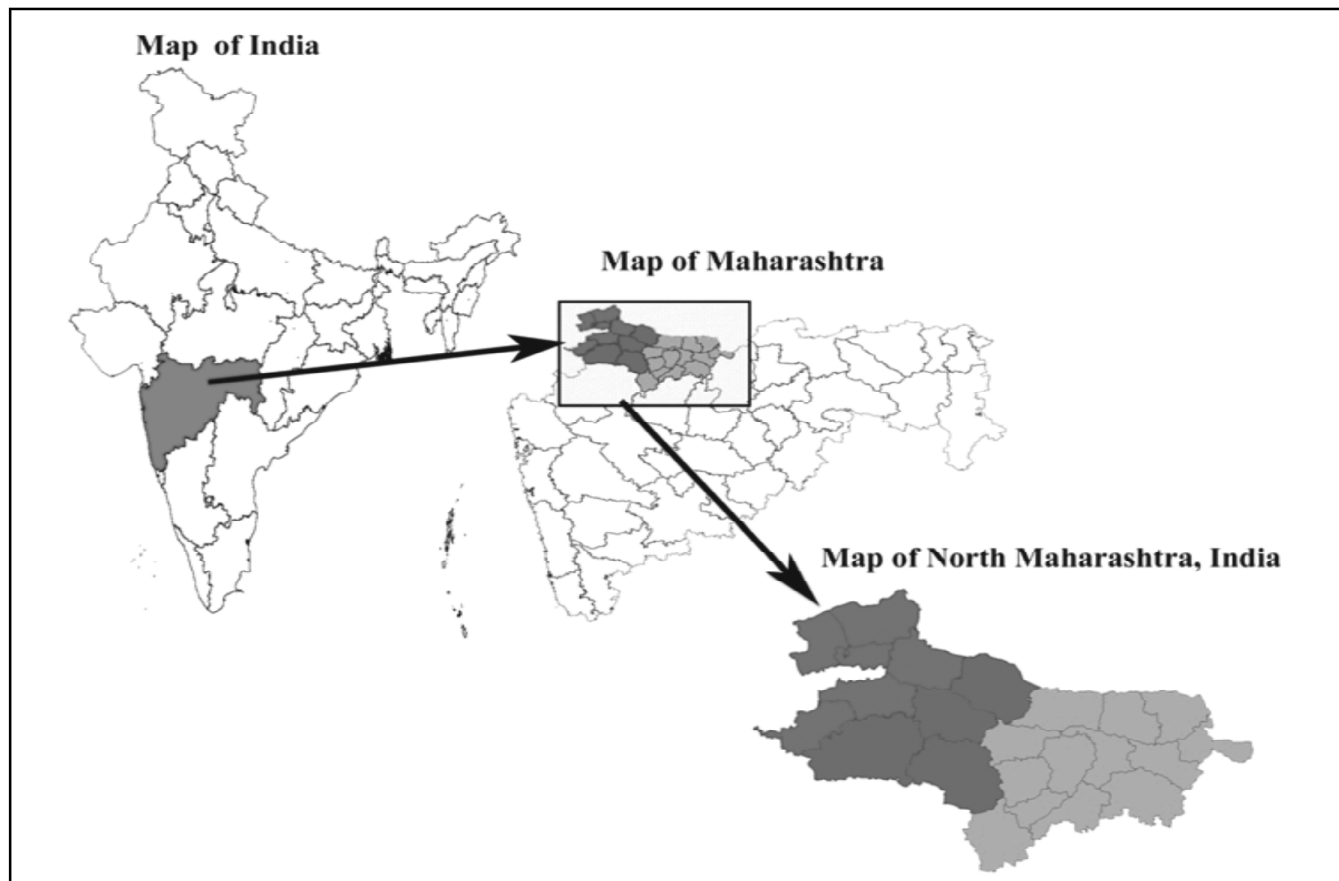
Sanctuary of Maharashtra.

North Maharashtra has diverse flora and fauna in its dry deciduous habitat but scanty information on spider diversity of spiders without documentation. Present study deals with the study of spider diversity of thirteen different sites including residential, agricultural and forest area of North Maharashtra, India.

**Materials and Methods****Study Area**

Maharashtra is the third largest state in India; the study area includes Jalgaon, Dhule and Nandurbar districts of North Maharashtra, located at 20°-21°N and 73°-76° E. It is bounded on the north by Madhya Pradesh, on the east by Buldhana district, on the west by Nasik and Gujarat and on the south by Aurangabad district. It is a part of Deccan Uplands of the Maharashtra State. Weather: Temperature- Maximum 47.8°C, Minimum 11.9°C. Average Rainfall 740.7 mm, Main Crops are banana, cotton, sugarcane, oil seeds and pulses.

**ACKNOWLEDGEMENTS** : The authors are grateful to Principal, Moolji Jaitha College for providing necessary facilities to carry out experiment. The first author is thankful to North Maharashtra University, Jalgaon, Maharashtra, India for granting "Shri. Gyanchand H. Raisonni doctoral fellowship". Author is also grateful to Maharashtra State Biodiversity Board, Nagpur and Principal Chief Conservator of Forests (Wildlife), Maharashtra State, Nagpur for granting permission for access to biological resources for research purpose.



**Fig.1 : Map of North Maharashtra**

### Collection

Spiders were collected by hand picking method from 13<sup>th</sup> different sites of Jalgaon, Dhule and Nandurbar districts of North Maharashtra, India in monsoon, post monsoon and winter season in year 2014-15. The sites are given (Table-1).

The forest of Satpuda ranges is a Tropical dry deciduous forest having Teak, Scrub, Anjan Forests with dry, mixed deciduous forests habitat<sup>1,3</sup>. Each site is randomly divided in five sampling sites and each site visited 2-3 times in each season minimally two hours. Searching of spiders was conducted at microhabitats like under stones, under leaves, on bushes, barks and branches of trees, near water bodies upto the height of about two meters from the ground. Collections of common spider species were omitted.

Live spiders were photographed using DSLR Nikon D3100, 18-55mm lens and then collected and transferred in 70% alcohol for further identification in Laboratory using observed under USB digital microscope with micro-measure software. After identification the spiders were labeled and individually kept in small Polypropylene vials filled with 70% ethyl alcohol. All mature specimens were deposited in museum of Department of Zoology, Moolji Jaitha College, Jalgaon and 18 species belonging to *Salticidae* family were deposited in the Zoological Survey

of India (ZSI), Regional station, Pune.

### Identification:

Identification of spiders was carried out on the basis of morphometric characters and using the taxonomic keys for Indian spiders<sup>2,5,10,11,14</sup>. One hundred and twelve spider species were collected during the study period for identification.

### Results and Discussion

North Maharashtra region holds rich biodiversity with different types of forest. Active searching at all layers from ground level to tree canopy layer accessible easily for visual surveys. Photograph was taken for identification, during the study, from October to December 2014 and from June to August 2015. The species were identified by using keys for Indian spiders.

The diversity of spider species was studied at Agricultural, Forest and Residential areas. A variety of spiders have been observed. Spider's fauna from North Maharashtra included total 71 species under 42 genera and 15 families (Table-2). Various families of spider are as Araneidae, Clubionidae, Eresidae, Hersiliidae, Linyphiidae, Lycosidae, Miturgidae, Oxyopidae, Pholcidae, Pisauridae, Salticidae, Scytodidae, Tetragnathidae, Theraphosidae and Thomisidae (Table-2) and the photographs (Figs. 2-5).

## Family wise distribution of spider fauna in North Maharashtra

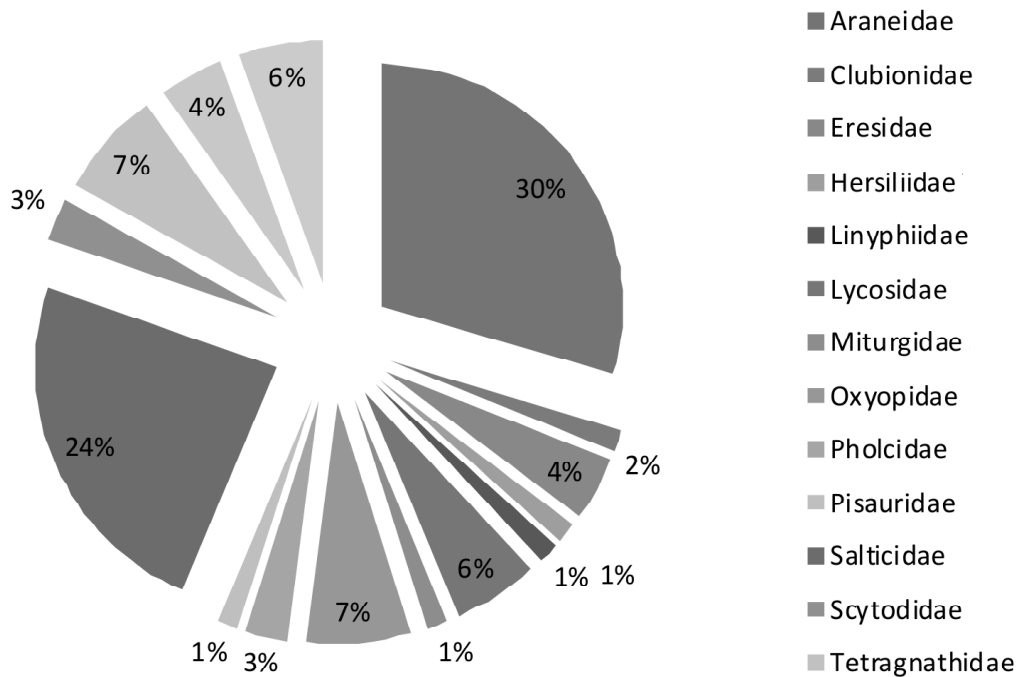
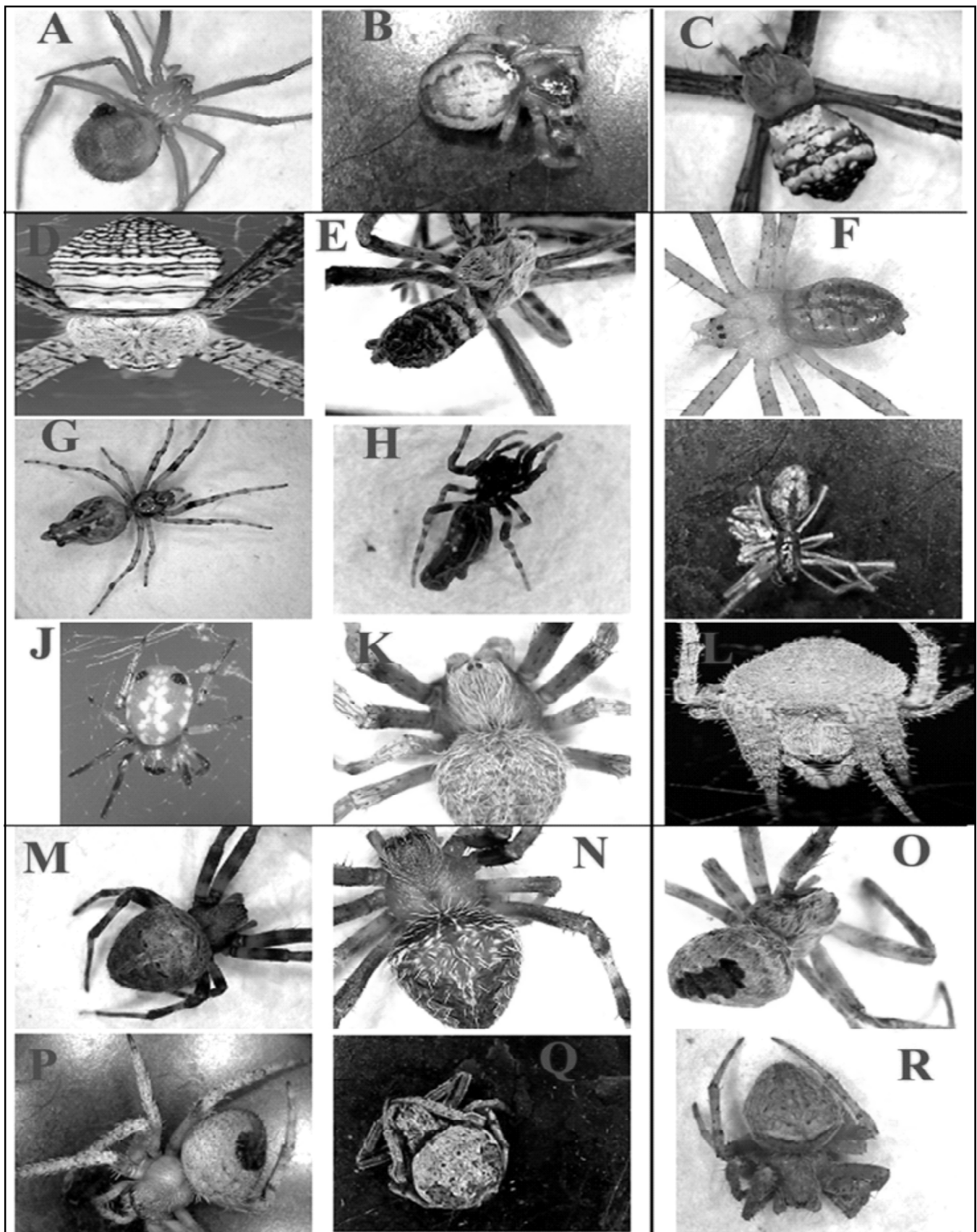


Fig. 2: Family wise distribution of spider fauna in North Maharashtra

TABLE-1: Study area

Sr.No.	Area	Geographic location	District
1	Wadhoda forest and Charthana Village, Muktainagar	21°00'37.17"N 76°22'27.70" E	Jalgaon
2	Pal Forest, Jalgaon	21°21'42.96"N 75°54'05.15"E	
3	Langda amba Forest in Jalgaon	21°22'14.66"N 75°40'10.07"E	
4	Manudevi Temple Adgaon village in Yawal	21°18'33.59"N 75°33' 39.79"E	
5	Unabdev Forest	21°16'1.19"N 75°25'48.48"E	
6	Godari	20°36'18.70"N 75°54'69.95"E	
7	Mehrun lake	20°58'49.00"N 75°33'53.82"E	
8	Hanuman Khore, Jalgaon	21°00'00.11"N 75 °28'51.25"E	
9	Patna Devi temple, Chalisgaon	20°19'44.46"N 74°58'46.57"E	
10	Nageshwar Temple	21°17'58.24"N 75°02'33.57"E	Dhule
11	Laling fort	20°49'09.19"N 74°44'46.61"E	
12	Aner Dam	21°19'23.57"N 75°08'20.97"E	
13	Toranmal Wildlife Sanctuary	21°53'32.83"N 74°25'46.79"E	Nandurbar



**Fig. 3:** The spider species encountered in the present study. A-*Araneus* sp., B-*Araneus* sp., C-*Argiope anasuja*, D-*Argiope aemula*, E-*Argiope catenulate*, F-*Argiope* sp, G-*Cyclosa* sp., H-*Cyclosa* sp., I-*Cyrtophora moluccensis*, J-*Gea subarmata*, K- *Neoscona bengalensis*, L-*Neoscona crucifera*, M-*Neoscona mukerjei*, N-*Neoscona punesis*, O-*Neoscona* sp, P-*Neoscona* sp, Q-*Neoscona* sp, R-*Neoscona* sp



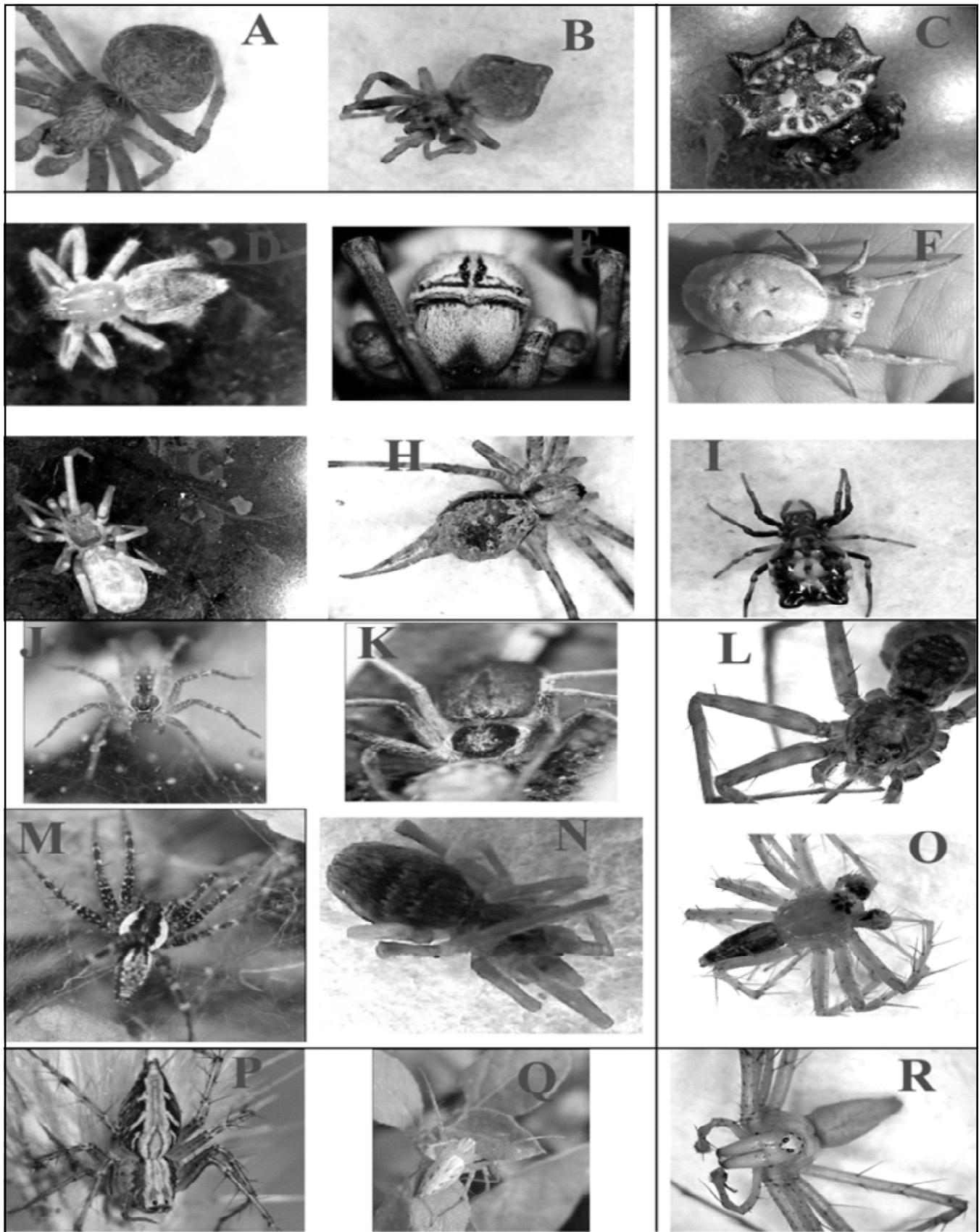
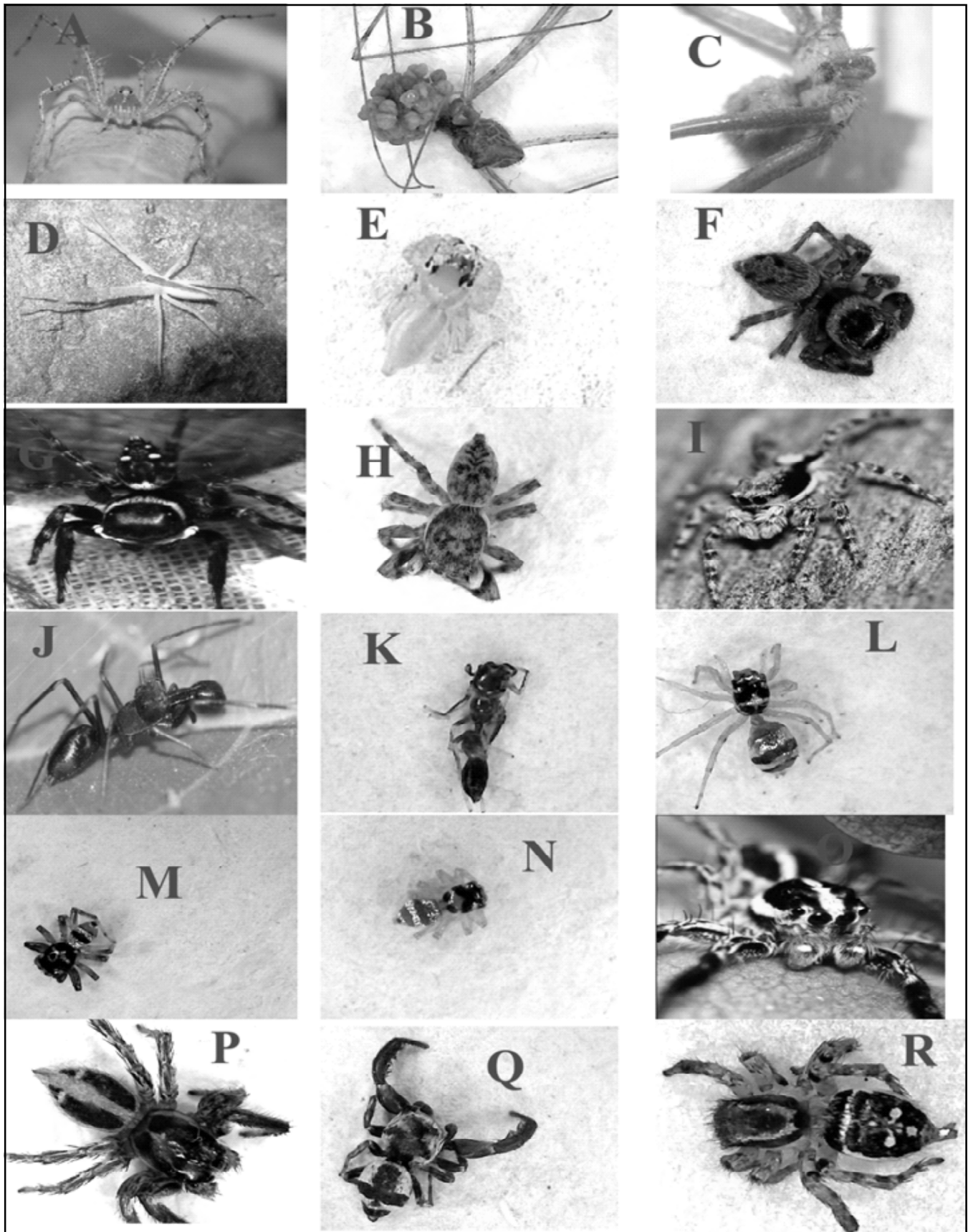


Fig. 4: The spider species encountered in the present study. A-*Neoscona* sp, B-*Parawixia dehaanii*, C-*Thelacantha brevispina*, D-*Clubiona* sp., E-*Stegodyphus* sp., F-*Stegodyphus sarasinorum*, G-*Pritha* sp., H-*Hersilia tibialis*, I-*Neriene sunndaica*, J-*Hippasa agelenoides*, K-*Lycosa mackenziei*, L-*Pardosa pedomannulata*, M-*Pardosa partita*, N-*Cheiracanthium melanostomum*, O-*Oxyopes birmanicus*, P-*Oxyopes javanus*, Q-*Oxyopes pankaji*, R-*Oxyopes* sp.



**Fig. 5:** The spider species encountered in the present study. **A**-*Peucetia viridana*, **B**-*Crossopriza lyoni*, **C**-*Pholcus phalangioides*, **D**-*Perenethis venusta*, **E**-*Asemonea tenuipes*, **F**-*Brettus* sp., **G**-*Hasarius adansoni*, **H**-*Hyllus semicupreus*, **I**-*Menemerus bivittatus*, **J**-*Myrmarachne* sp., **K**- *Myrmarachne* sp., **L**-*Phintella* sp., **M**-*Phintella* sp., **N**-*Phintella vittata*, **O**-*Plexippus paykulli*, **P**-*Plexippus petersi*, **Q**-*Rhene flavigera*, **R**-*Stenaelurillus lesserti*

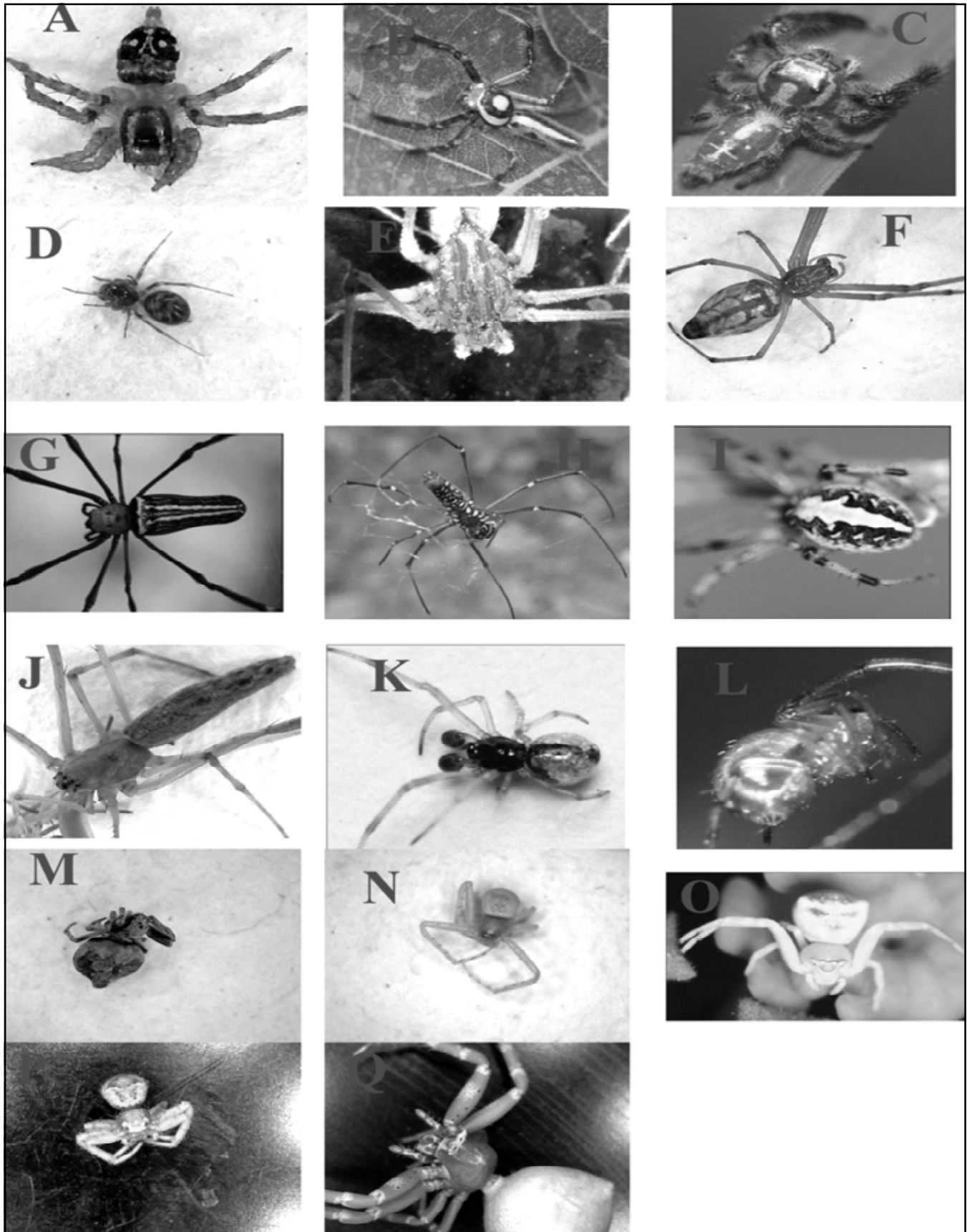


Fig. 6: The spider species encountered in the present study. A-*Stenaelurillus jagannathae*, B-*Telamonia dimidiata*, C-*Thyene imperialis*, D-*Scytoes* sp., E-*Scytodes pallid*, F-*Leucauge decorate*, G-*Nephila clavata*, H-*Nephila pilipes*, I-*Nephilengys malabarensis*, J-*Tetragnatha mandibulata*, K-*Argyrodes argentatus*, L-*Argyrodes andamanensis*, M-*Chrysso* sp., N-*Runcinia affinis*, O-*Thomisus okinawensis*, P-*Thomisus* sp., Q-*Thomisus* sp.

**TABLE- 2: Family wise distribution of number of spider species of North Maharashtra, India**

<b>Family</b>	<b>Genus</b>	<b>Species</b>
<i>Araneidae</i>	<i>Araneus</i>	<i>Araneus</i> sp.
		<i>Araneus</i> sp.
	<i>Argiope</i>	<i>Argiope anasuja</i>
		<i>Argiope aemula</i>
		<i>Argiope catenulate</i>
		<i>Argiope</i> sp
	<i>Cyclosa</i>	<i>Cyclosa</i> sp.
		<i>Cyclosa</i> sp.
	<i>Cyrtophora</i>	<i>Cyrtophora moluccensis</i>
	<i>Gea</i>	<i>Gea subarmata</i>
	<i>Neoscona</i>	<i>Neoscona bengalensis</i>
		<i>Neoscona crucifera</i>
		<i>Neoscona muckerjei</i>
		<i>Neoscona</i> sp.
		<i>Neoscona</i> sp.
		<i>Neoscona</i> sp.
		<i>Neoscona</i> sp.
		<i>Neoscona</i> sp.
	<i>Parawixia</i>	<i>Parawixia dehaanii</i>
	<i>Thelacantha</i>	<i>Thelacantha brevispina</i>
<i>Clubionidae</i>	<i>Clubiona</i>	<i>Clubiona</i> sp.
<i>Eresidae</i>	<i>Stegodyphus</i>	<i>Stegodyphus</i> sp.
		<i>Stegodyphus sarasinorum</i>
	<i>Pritha</i>	<i>Pritha</i> sp.
<i>Hersiliidae</i>	<i>Hersilia</i>	<i>Hersilia tibialis</i>
<i>Linyphiidae</i>	<i>Neriene</i>	<i>Neriene sundaica</i>

<i>Lycosidae</i>	<i>Hippasa</i>	<i>Hippasa agelenoides</i>
	<i>Lycosa</i>	<i>Lycosa mackenziei</i>
	<i>Pardosa</i>	<i>Pardosa pseudoannulata</i>
		<i>Pardosa partita</i>
<i>Miturgidae</i>	<i>Cheiracanthium</i>	<i>Cheiracanthium melanostomum</i>
<i>Oxyopidae</i>	<i>Oxyopes</i>	<i>Oxyopes birmanicus</i>
		<i>Oxyopes javanus</i>
		<i>Oxyopes pankaji</i>
		<i>Oxyopes sp.</i>
	<i>Peucetia</i>	<i>Peucetia viridana</i>
<i>Pholcidae</i>	<i>Crossopriza</i>	<i>Crossopriza lyoni</i>
		<i>Pholcus phalangioides</i>
<i>Pisauridae</i>	<i>Perenethis</i>	<i>Perenethis venusta</i>
<i>Salticidae</i>	<i>Asemonea</i>	<i>Asemonea tenuipes</i>
	<i>Brettus</i>	<i>Brettus sp.</i>
	<i>Hasarius</i>	<i>Hasarius adansonii</i>
	<i>Hyllus</i>	<i>Hyllus semicupreus</i>
	<i>Menemerus</i>	<i>Menemerus bivittatus</i>
	<i>Myrmarachne</i>	<i>Myrmarachne sp.</i>
		<i>Myrmarachne sp.</i>
	<i>Phintella</i>	<i>Phintella sp.</i>
		<i>Phintella sp.</i>
		<i>Phintella vittata</i>
	<i>Plexippus</i>	<i>Plexippus paykulli</i>
		<i>Plexippus petersi</i>
	<i>Rhene</i>	<i>Rhene flavigera</i>
	<i>Stenaelurillus</i>	<i>Stenaelurillus lesserti</i>
		<i>Stenaelurillus jagannathae</i>



	<i>Telamonia</i>	<i>Telamonia dimidiata</i>
	<i>Thyene</i>	<i>Thyene imperialis</i>
<i>Scytodidae</i>	<i>Scytodes</i>	<i>Scytoes sp.</i>
		<i>Scytodes pallida</i>
<i>Tetragnathidae</i>	<i>Leucauge</i>	<i>Leucauge decorata</i>
	<i>Nephila</i>	<i>Nephila clavata</i>
		<i>Nephila pilipes</i>
	<i>Nephilengys</i>	<i>Nephilengys malabarensis</i>
	<i>Tetragnatha</i>	<i>Tetragnatha mandibulata</i>
<i>Theraphosidae</i>	<i>Argyroides</i>	<i>Argyroides argentatus</i>
		<i>Argyroides andamanensis</i>
	<i>Chrysso</i>	<i>Chrysso sp.</i>
<i>Thomisidae</i>	<i>Runcinia</i>	<i>Runcinia affinis</i>
	<i>Thomisus</i>	<i>Thomisus okinawensis</i>
		<i>Thomisus sp.</i>
		<i>Thomisus sp.</i>

Spider of family Araneidae, Salticidae, Eresidae and Pholcidae were found in all study area in large numbers while Oxyopidae, Lycosidae, Hersiliidae, Tetragnathidae, *Pisauridae*, , Thomisidae, Theridiidae are less in numbers in different areas and spiders of Nephilidae family are found in only forest region.

The spider fauna of India is represented by 1686 species of spiders belonging to 438 genera and 60

families<sup>6</sup>. In this present study a total 15 families, 71 species of spiders (Table 2) were recorded from Jalgaon Khandesh, Maharashtra, India.

The result of the present study showed that, great variety of spiders exists in the study area. Therefore, it may conclude that, the spider fauna reported earlier<sup>6</sup> and the data of present study collectively represent the spider diversity of North Maharashtra, India.

## References

1. BAGUL, R.M. (2015) Traditional Ethnoveterinary Practices, Medicinal Plants from Satpuda Forest, East Khandesh, Maharashtra, India. *International Journal of Science and Research* **4** (5) : 2714-2720.
2. BARRION, A. T. AND LITSINGER, J.A. (1995) Riceland spiders of south and Southeast Asia CAB International, Wallingford. UK. 1-700.
3. CHAMPION, H.G. AND SETH, S. K. (1968) A revised survey of the forest types of India Delhi, India : Manager of Publications : 1-404.
4. GAJBE, U.A. (1983) A new Pterotricha spider from India (Araneae: Gnaphosidae). *Bulletin of the Zoological Survey of India*, **5** (1) : 95-97.
5. KASTON, B. J. (1978) How to know the spiders? 3<sup>rd</sup> edition the pictured key nature series, William C. Brown

Company Publishers, Dubuque, Iowa, USA 1-272.

6. KESWANI, S.; P. HADOLE AND A. RAJORIA (2012) Checklist of Spiders ( Arachnida : Araneae ) From India-2012 *Indian Journal of Arachnology* **1** (1): 1-129.
7. MESHRAM, A. (2011) Spiders ( Arachnida : Araneae ) From Toranmal Sanctuary *E-International Scientific Research Journal* **3** (4): 326-334.
8. DEGAARD, F. (2000) How many species of arthropods? Erwin's estimate revised *Biological Journal of the Linnean Society* **71** (4): 583-597.
9. PATEL, B. H. (1973) Some interesting theridiid spiders (Araneae:Theridiidae) from Gujarat India *Bulletin of the British Arachnological Society* **2** (8): 149-152.
10. POCOCK, R. I. (1900) The fauna of British India, including Ceylon and Burma. Arachnida. London: 1-279.
11. SEBASTIAN, P. A. AND K. V. PETER (2009) Spiders of India Universities press Pvt. Ltd. 1-614.
12. SECRETARIAT, G. (2017) Global Biodiversity Information Facility (GBIF) Natural History 29 (March): 1-2.
13. SILIWAL, M.; S. MOLUR AND B. K. BISWAS (2005) Indian Spiders ( Arachnida : Araneae ): Updated Checklist 2005 *Zoos' Print Journal* **20** (10): 1999-2049.
14. TIKADER, B. K. (1987) Handbook on Indian spiders Zoological Survey of India 1-251.
15. WSC (2018) World Spider Catalog Natural History Museum Bernn, online at <http://wsc.nmbe.ch>, version 19.0 accessed on 22/03/2018 10.24436/2.
16. [www.spidersofcentralindia.com](http://www.spidersofcentralindia.com)