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Check list of spider (Araneae) fauna of Pakistan: A review

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Abstract

The current study was conducted at the University of Gujrat during 2015. The data concerning “check list of spider (Araneae) fauna of Pakistan” reviewed and compiled as a review paper from published articles of international regarded journals, Annual/Environmental Reports of documented organization. Spiders are diverse group of invertebrates that play vital role in the ecosystem; there is co-evolutionary relationship between spiders and insect pest. They act as biological control in every agri-ecosystem. For efficient sampling of spiders detailed ecological knowledge and information is lacking. This paper highlights the biodiversity of spider fauna in different regions of Pakistan. There is dire need to explore the spider fauna of Pakistan and conservation to save the spiders as they are beneficial creature and play their great role in ecosystem and food chains, insect population regulation.

Keywords: Spider fauna, Araneae, Arthropods, Biological control agents

1. Introduction

Pakistan is situated between latitude 24 and 37 degrees north and longitude 62 and 75 degrees east. Pakistan is an agricultural country, occupy strategic place in its economy and topography of Pakistan extent between subtropical to semi arid climate.

Spiders are ancient and successful group of invertebrate animals ^[1] also called poisonous arthropods ^[2]. Some scientists believed that origin of spider take place in sea. Later spider evolved in two groups, one without and second with extensor leg muscles. 400 million years ago spider originated. Recent spiders have unsegmented abdomen but earliest spider was with segmented body and larger in size. Most ancient type of spiders belonged to the suborder Mesothelae. In New York, USA oldest fossil of Devonian period (410 to 360 million years) was found in rock. The fossil spiders with segmented abdomen were recognized from Carboniferous period (360 to 290 million years). In Mesozoic era (240 to 65 million years) little information about spider is available. Newer spider for catching flying insects developed aerial web in flora and early built web near the ground. Spider evolution correlated to the insect's evolution ^[3].

Spiders belong to class Arachnida, order Araneae and Phylum Arthropoda. They vary in size, shape and behavior. Body divided into cephalothorax, abdomen, have pedipalps, eight legs, no antenna, produce silk. They use the silk to wrap the prey, to hang from and to make egg sacs and nests ^[4, 5]. A single spider may produce more than a half dozen difference kinds of silk ^[6]. They exploit a wide variety of niches in virtually all the earth's biomes and highly species rich Arthropoda. Some species of spiders build webs and trap prey in webs whereas some are webless. Spiders are taxonomically diverse, indicators of environmental change and community level diversity. They show variety of ecological niches ^[7]. Spiders are venomous, 40 species of spiders are potentially deadly to humans. Spiders are voracious predators and carnivorous. The worldwide status of the taxonomy of the spiders has depicted by Platnick ^[8]. Spiders are the group of arachnids comprises more than thirty thousand species, 60 families distributed over worldwide ^[6].

Biological control is the most effective control measures against insect pests. Insect pests have successfully been controlled by using natural predators like spiders and beetles ^[9]. Spiders are natural predators in agro ecosystems ^[10-13]. A spider not only preys on adult insects but also egg, larval etc. stages ^[29]. Spiders are carnivorous feeding on small arachnids, insects that bothers human like mosquitoes and cockroaches etc. During the lifetime of spiders, they may eat hundreds of mosquitoes and reduce their numbers ^[6].

Spiders are clearly an integral part of global biodiversity since they play an important role in ecosystem as predators. They are one of the most common predator group of ecosystem, they are hunters of insects and other small invertebrates and reduced pest animals inside and outside our houses. They are prey for many hunting animals like insectivorous birds and reptiles most spider spend their entire life in one particular habitat because of their ability to produce silk [6].

In Pakistan pesticides are rarely used to control insect pests on fodder crops due to their harmful effects on livestock and dairy. In this case spiders and other natural enemies used to control pest insects without polluting the environment and yield of crop will also be increased [14].

2) Review of Literature

Some arachnologists estimate that only 20% of spider species have been described, meaning that there may be as many as 1,70,000 spider species sharing our planet with us [15]. In the world, 42751 species, 3859 genera and 10 families of spiders are described [8]. Pakistan is rich in spider fauna and has diverse habitats. Mostly area cultivate different types of crops and provide habitat for different kind of invertebrates. In community it is dominant member, but in past researcher call it less important organism due to this less research was done on it [16] but in Pakistan, no consolidated account on spiders still exists. The pioneer works were done by [17, 18] on the systematics of spider fauna of Pakistan.

Some of the most diverse spider families include the familiar hairy, big-eyed “Jumping spiders” (family Salticidae 4,400 species worldwide); the small “Sheet-web spiders” (Linyphiidae, 3,700 species); the “Orb weaving spiders” (Araneidae, 2,600 species); the “Cobweb spiders” (Therididae, 2,200 species); the non-web weaving “Wolf spiders” (Lycosidae, 2,200 species); and the “Crab Spiders” [15]

The present study was designed to prepare the checklist of spiders of different region of Pakistan.

2.1) Khyber Pakhtunkhwa Pakistan

107 specimens were collected from Peshawar; 23 specimens were identified to species level, 2 specimens to generic level, and 74 duplicates and young stages of identified ones; however, they belong to 9 families. The most dominant family among the present research was Lycosidae. However, the least numbers of species were recorded from families Clubionidae, Scytodidae and Sparassidae. These 23 species are distributed into families Lycosidae (10 spp.), Thomisidae (3 spp.), Araneidae (2 spp.), Gnaphosidae (2 spp.), Pholcidae (2 spp.), Salticidae (2 spp.), Clubionidae (1 spp.), Scytodidae (1 spp.) Parveen *et al.*, 2012). 2) Ahmad and their fellows reported 13 species of spiders from Burner District. Species belonged to

Salticidae, Araneidae, Sparassidae, Tetragnathidae, Lycosidae, Pholcidae [19].

2.2) Punjab Pakistan

Ghafoor. A. and Mahmood, survey the district Gujrawanwala and report the araneid fauna. Total collected fauna were 178 which belong to seven families, 10 genera, 22 species recorded. Most abundant species belong to the family Lycosidae [20].

Tahir and coworkers reported 1098 spider fauna from citrus field in 2006 and 2007. This fauna was represented by nine families, 22 genus, and 38 species [21].

Mukhtar and coworker (2012) collected the spider fauna at District Jhang Punjab, Pakistan during November 2009 to April 2010 form Trifolium and Brassica. During 1996 to 1998, the survey of ground and foliage spider fauna was reported from province of Punjab in 21 districts of one federal territory and 43 locations. Total 14743 specimens were collected belonging to 157 species, 58 genera and 21 families [22]. Vetter and his fellows collected spiders belong to 15 families, 26 genera and 16 species in Faisalabad, Punjab Pakistan from March 2011 to April 2013. From central Punjab (Lahore, Skur, Sialkot and Sheikhpura) 27,658 spiders were recorded belonging to 30 genera, 12 families and 44 species in basmati rice crop [23].

2.3) Sindh Pakistan

132 species belonging to 24 families and 73 genera were reported from 16 districts of Sindh Pakistan [24]

2.4) Cholistan Desert Pakistan

The climate of Cholistan desert is harsh, hyper arid with extremes of temperature, dry spells, low rains, low humidity, high evaporation rates, especially during summer extremely hot and winds of high velocity blow across the desert [25, 26]. Sial and his coworkers reported 62 species of spider belonged to 10 families and 32 genera from Cholistan and neighbouring areas; Fort Derawar, Sallu Wali, Taraway Wala Toba, Chah Suleh Wala, Rasool Sar, Shiekh Wali, Cholistan Institute of Desert Studies site, Dakwali Khuli, Date palm farm during January 2001- December 2003 [27].

2.5) Karakoram Pakistan

130 spider species have been recorded from high mountainous landscape of Karakoram to date Caporiacco, 1934; Koke *et al.*, 2004, 2005; Ovtchinnikov and Inayatullah, 2005; Marusik and Ballarian, 2011 a,b. Museo Civico di Storia Naturale of Verona (Italy) collected 8 new spider species [28].

Sr no.	Family	Species	Punjab	Sindh	Khyberpakhtunkhawa	References
2	Araneidae Clerck, 1757	<i>Araneus alboquadratus</i> Dyal, 1935		yes		Ursani and Soomro 2010
3	Araneidae Clerck, 1757	<i>Araneus excelsus</i> Dyal, 1935		yes		Ursani and Soomro 2010
4	Araneidae Clerck, 1757	<i>Araneus formosellu</i> Roewer, 1942		yes		Ursani and Soomro 2010
5	Araneidae	<i>Araneus mitificus</i>	yes			Ghafoor <i>et al.</i> , 2011

	Clerck, 1757					
6	<i>Araneidae</i> Clerck, 1757	<i>Araniella displicata</i> Hentz, 1847		yes		Ursani and Soomro 2010
7	<i>Araneidae</i> Clerck, 1757	<i>araneus pachganiens</i> Tikader, 1982		yes		Ursani and Soomro 2010
8	<i>Araneidae</i> Clerck, 1757	<i>A.kanwali</i> Mukhtar 2004		yes		Ursani and Soomro 2010
9	<i>Araneidae</i> Clerck, 1757	<i>Caesarea</i> Thorell, 1897		yes		Ursani and Soomro 2010
10	<i>Araneidae</i> Clerck, 1757	<i>A.Pulchella</i> Thorell, 1881		yes		Ursani and Soomro 2010
11	<i>Araneidae</i> Clerck, 1757	<i>Aatika</i> Mukhtar 2004		yes		Ursani and Soomro 2010
12	<i>Araneidae</i> Clerck, 1757	<i>Trifasciata (Forsskål,</i> <i>1775)</i>	yes			Ghafoor <i>et al.</i> , 2011
13	<i>Araneidae</i> Clerck, 1757	<i>Cyclosa mohini</i> Dyal, 1935		yes		Ursani and Soomro 2010
14	<i>Araneidae</i> Clerck, 1757	<i>Punjabiensis</i> Ghafoor and Beg, 2002		yes		Ursani and Soomro 2010
15	<i>Araneidae</i> Clerck, 1757	<i>Chichawatniensis</i> Mukhtar and Mushtaq, 2005		yes		Ursani and Soomro 2010
16	<i>Araneidae</i> Clerck, 1757	<i>Confraga (Thorell,</i> <i>1892)</i>	yes			Ghafoor <i>et al.</i> , 2011
17	<i>Araneidae</i> Clerck, 1757	<i>Hexatuberculata</i> Tikader, 1982	Yes			Ghafoor <i>et al.</i> , 2011
18	<i>Araneidae</i> Clerck, 1757	<i>Cyrtophora citricola</i> Dyal, 1935	Yes	yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
19	<i>Araneidae</i> Clerck, 1757	<i>Cicatrosa</i> Stoliczka, 1869		yes		Ursani and Soomro 2010
20	<i>Araneidae</i> Clerck, 1757	<i>Eriovixia excels</i> Dyal, 1935	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
21	<i>Araneidae</i> Clerck, 1757	<i>Anastera</i> Chamberlin, 1924		yes		Ursani and Soomro 2010
22	<i>Araneidae</i> Clerck, 1757	<i>Gea heptagon</i> Hentz, 1850		Yes		Ursani and Soomro 2010
23	<i>Araneidae</i> Clerck, 1757	<i>G. margallai</i> Mukhtar, 2004		Yes		Ursani and Soomro 2010
24	<i>Araneidae</i> Clerck, 1757	<i>G. subarmata</i> Thorell, 1890		Yes		Ursani and Soomro 2010
25	<i>Araneidae</i> Clerck, 1757	<i>G. zaragosa</i> Barrion and Litsinger, 1995	Yes			Ghafoor <i>et al.</i> , 2011
26	<i>Araneidae</i> Clerck, 1757	<i>Larinia directa</i> Hentz, 1847		Yes		Ursani and Soomro 2010
27	<i>Araneidae</i> Clerck, 1757	<i>L. phthisia</i> L. Koch,1871	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
28	<i>Araneidae</i> Clerck, 1757	<i>Neoscona pavida</i> Dyal, 1935		Yes		Ursani and Soomro 2010
29	<i>Araneidae</i> Clerck, 1757	<i>Neoscona theis</i> (Walckenaer, 1841)	Yes		yes	Tahir <i>et al.</i> , 2008; Parveen <i>et al.</i> , 2012
	<i>Araneidae</i> Clerck, 1757	<i>Neoscona mukerjei</i>	Yes			Tahir <i>et al.</i> , 2008
30	<i>Araneidae</i> Clerck, 1757	<i>N. hibiscusatus</i> Mukhtar 2004		Yes		Ursani and Soomro 2010
31	<i>Araneidae</i> Clerck, 1757	<i>N. bengalensis</i> Tikader and Bal, 1981	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
32	<i>Araneidae</i> Clerck, 1757	<i>N. nautical</i> L. Koch, 1875		Yes		Ursani and Soomro 2010
33	<i>Araneidae</i>	<i>N. domiciliorum</i>		Yes		Ursani and Soomro 2010

	Clerck, 1757	Tikader, 1982				
34	<i>Araneidae</i> Clerck, 1757	<i>N. rumpfi</i> Thorell, 1878		Yes		Ursani and Soomro 2010
35	<i>Araneidae</i> Clerck, 1757	<i>N. theis</i> (Walckenaer, 1841)	Yes			Ghafoor <i>et al.</i> , 2011
36	<i>Araneidae</i> Clerck, 1757	<i>N. vigilans</i> (Blackwall, 1865)	Yes			Ghafoor <i>et al.</i> , 2011
37	<i>Araneidae</i> Clerck, 1757	<i>Lipocrea fusiformis</i> (Thorell, 1877)	Yes			Ghafoor <i>et al.</i> , 2011
38	<i>Araneidae</i> Clerck, 1757	<i>Parawixia dehaani</i> (Doleschall, 1859)	Yes			Ghafoor <i>et al.</i> , 2011
40	<i>Corinnidae</i> Karsch, 1880	<i>Oedignatha</i> <i>poonaensis</i> Majumder and Tikader, 1991	Yes			Ghafoor <i>et al.</i> , 2011
42	<i>Clubionidae</i> Wagner, 1887	<i>Clubionia</i> <i>ludhianaensis</i> Tikader, 1976		Yes		Ursani and Soomro 2010
43	<i>Clubionidae</i> Wagner, 1887	<i>C. drassodess</i> Simon, 1914	Yes	Yes	Yes	Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011; Parveen <i>et al.</i> , 2012
44	<i>Clubionidae</i> Wagner, 1887	<i>C. filicata</i> O. P.- Cambridge, 1874 T. M. Khan,	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
45	<i>Clubionidae</i> Wagner, 1887	<i>C. kasurensis</i> Mukhtar and Mushtaq, 2005		Yes		Ursani and Soomro 2010
46	<i>Clubionidae</i> Wagner, 1887	<i>C. pashabhahi</i> Patel and Patel, 1973	Yes			Ghafoor <i>et al.</i> , 2011
47	<i>Clubionidae</i> Wagner, 1887	<i>Cheiracanthium</i> <i>azhari</i> Mukhtar 2004		Yes		Ursani and Soomro 2010
48	<i>Clubionidae</i> Wagner, 1887	<i>C. mukhtari</i> Mukhtar 2004		Yes		Ursani and Soomro 2010
49	<i>Clubionidae</i> Wagner, 1887	<i>C. saccharanalis</i> Mukhtar 2004		Yes		Ursani and Soomro 2010
50	<i>Clubionidae</i> Wagner, 1887	<i>C. warsai</i> Mukhtar 2004		Yes		Ursani and Soomro 2010
51	<i>Clubionidae</i> Wagner, 1887	<i>C. denieli</i> Tikader, 1975		Yes		Ursani and Soomro 2010
52	<i>Clubionidae</i> Wagner, 1887	<i>C. himalayensi</i> Gravely, 1931		Yes		Ursani and Soomro 2010
53	<i>Clubionidae</i> Wagner, 1887	<i>C. pashabhahi</i> Patel and Patel, 1973		Yes		Ursani and Soomro 2010
55	<i>Dysderidae</i> C. L. Koch, 1837	<i>Dysdera laevigata</i> Simon, 1914		Yes		Ursani and Soomro 2010
57	<i>Dictynidae</i> O. P. Cambridge, 1871	<i>Dictyna albida</i> O. P.-Cambridge, 1885		Yes		Ursani and Soomro 2010
59	<i>Eresidae</i> C. L. Ko6162ch, 185063	<i>Stegodyphus pacificus</i> Pocock, 1900		Yes		Ursani and Soomro 2010
61	<i>Filistatidae</i> Ausserer, 1867	<i>Filistata Kukulcania</i> Lehtinen, 1967		Yes		Ursani and Soomro 2010
63	<i>Gnaphosidae</i> Pocock, 1898	<i>Gertschosa eucalyptus</i> Ghafoor and Beg, 2002		Yes	Yes	Ursani and Soomro 2010; Parveen <i>et al.</i> , 2012
64	<i>Gnaphosidae</i> Pocock, 1898	<i>G. harpax</i> Ghafoor and Beg, 2002				Ghafoor <i>et al.</i> , 2011

65	<i>Gnaphosidae</i> Pocock, 1898	<i>Zelotes</i> <i>faisalabadiensis</i> Ghafoor and Beg, 2002		Yes	Yes	Ursani and Soomro 2010; Parveen <i>et al.</i> , 2012
66	<i>Gnaphosidae</i> Pocock, 1898	<i>Z. illustris</i> Butt and Beg, 2004		Yes		Ursani and Soomro 2010; Tahir <i>et al.</i> , 2008
67	<i>Gnaphosidae</i> Pocock, 1898	<i>Z. pakistaniensis</i> Butt and Beg, 2004		yes		Ursani and Soomro 2010
68	<i>Gnaphosidae</i> Pocock, 1898	<i>Drassodes saccatus</i> Emerton, 1890		Yes		Ursani and Soomro 2010
69	<i>Gnaphosidae</i> Pocock, 1898	<i>Gnaphosa scopoides</i> Chamberlin, 1922		Yes		Ursani and Soomro 2010
70	<i>Gnaphosidae</i> Pocock, 1898	<i>G. betpaki</i> Ovtsharenko, Platnick & Song, 1992		Yes		Ursani and Soomro 2010
71	<i>Gnaphosidae</i> Pocock, 1898	<i>G. minosiella</i> Dalmas, 1921		Yes		Ursani and Soomro 2010
72	<i>Gnaphosidae</i> Pocock, 1898	<i>G. zelotus</i> Butt and Beg, 2004		Yes		Ursani and Soomro 2010
73	<i>Gnaphosidae</i> Pocock, 1898	<i>G. jodhpurensis</i> Tikader and Gajbe, 1977	Yes			Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
74	<i>Gnaphosidae</i> Pocock, 1898	<i>Herpyllus lativulvus</i> Denis, 1958		Yes		Ursani and Soomro 2010
75	<i>Gnaphosidae</i> Pocock, 1898	<i>H. paropanisadensis</i> Denis, 1958		Yes		Ursani and Soomro 2010
76	<i>Gnaphosidae</i> Pocock, 1898	<i>H. goaensis</i> Tikader, 1982		Yes		Ursani and Soomro 2010
77	<i>Gnaphosidae</i> Pocock, 1898	<i>Hippasa holmerae</i> Thorell, 1895	Yes			Ghafoor <i>et al.</i> , 2011
78	<i>Gnaphosidae</i> Pocock, 1898	<i>Hippasa</i> <i>madraspata</i> Gravely, 1924	Yes			Ghafoor <i>et al.</i> , 2011
79	<i>Gnaphosidae</i> Pocock, 1898	<i>Scopoides kuljitae</i> (Tikader, 1982)	Yes			Ghafoor <i>et al.</i> , 2011
80	<i>Gnaphosidae</i> Pocock, 1898	<i>Scopoides pritiiae</i> (Tikader, 1982)	Yes			Ghafoor <i>et al.</i> , 2011
81	<i>Gnaphosidae</i> Pocock, 1898	<i>Scotophaeu</i> <i>spoonae</i>	Yes			Ghafoor <i>et al.</i> , 2011
82	<i>Gnaphosidae</i> Pocock, 1898	<i>Poecilochroa sedula</i>	Yes			Ghafoor <i>et al.</i> , 2011
84	<i>Hypochildae</i> Marx, 1888	<i>Hypochildus bonneti</i> Gertsch, 1964		Yes		Ursani and Soomro 2010
86	<i>Linyphidae</i>	<i>Linyphidae</i> sp.				Tahir <i>et al.</i> , 2008
87	<i>Linyphidae</i>	<i>Gnathoarium</i> <i>dentatum</i>				Tahir <i>et al.</i> , 2008
88	<i>Linyphidae</i>	<i>Erigone</i> sp.				Tahir <i>et al.</i> , 2008
90	<i>Lycosidae</i> Sundevall, 1833	<i>Allocosa manmaka</i> Roewer, 1960		Yes		Ursani and Soomro 2010
91	<i>Lycosidae</i> Sundevall, 1833	<i>Arctosa mulani</i> Dyal, 1935			Yes	Parveen <i>et al.</i> , 2012
92	<i>Lycosidae</i> Sundevall, 1833	<i>Arctosa littoralis</i> (Simon 1897)			yes	Parveen <i>et al.</i> , 2012
93	<i>Lycosidae</i> Sundevall, 1833	<i>Gladicosa</i> Sp		Yes		Ursani and Soomro 2010
94	<i>Lycosidae</i> Sundevall, 1833	<i>H. pisaurina</i> Pocock, 1900		Yes		Ursani and Soomro 2010
95	<i>Lycosidae</i>	<i>Hippasa madhuae</i>	Yes			Ghafoor <i>et al.</i> , 2011

	Sundevall, 1833	<i>Tikader and Malhotra, 1980</i>				
96	<i>Lycosidae</i> Sundevall, 1833	<i>H. aglenoides</i> Simon, 1884		Yes		Ursani and Soomro 2010
97	<i>Lycosidae</i> Sundevall, 1833	<i>H. partita</i> Tikadar 1970	Yes		Yes	Ghafoor <i>et al.</i> , 2011; Parveen <i>et al.</i> , 2012
98	<i>Lycosidae</i> Sundevall, 1833	<i>H. madrasptana</i>	Yes			Ghafoor <i>et al.</i> , 2011
99	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa chaperi</i> Simon, 1885		Yes		Ursani and Soomro 2010
100	<i>Lycosidae</i> Sundevall, 1833	<i>L. harishi</i> Dyal, 1935		Yes		Ursani and Soomro 2010
101	<i>Lycosidae</i> Sundevall, 1833	<i>L. nigricans</i> Simon, 1886	Yes	Yes		Ursani and Soomro 2010; Tahir <i>et al.</i> , 2008
102	<i>Lycosidae</i> Sundevall, 1833	<i>L. lahorensis</i> Dyal, 1935		Yes		Ursani and Soomro 2010
103	<i>Lycosidae</i> Sundevall, 1833	<i>L. basiri</i> Dyal, 1935	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
104	<i>Lycosidae</i> Sundevall, 1833	<i>L. mackenziei</i> Gravely, 1924	Yes	Yes		Ursani and Soomro 2010; Ghafoor <i>et al.</i> , 2011
105	<i>Lycosidae</i> Sundevall, 1833	<i>L. maculate</i> Mello-Leitão, 1943	Yes	Yes		Ursani and Soomro 2010; Tahir <i>et al.</i> , 2008
106	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa terristis</i> (Tahir, 2009)	Yes		Yes	Tahir <i>et al.</i> , 2008; Parveen <i>et al.</i> , 2012
107	<i>Lycosidae</i> Sundevall, 1833	<i>L. poonaensis</i> Tikader & Malhotra, 1980	Yes			Ghafoor <i>et al.</i> , 2011
108	<i>Lycosidae</i> Sundevall, 1833	<i>L. madani</i> Pocock, 1901	Yes			Ghafoor <i>et al.</i> , 2011
109	<i>Lycosidae</i> Sundevall, 1833	<i>L. tista</i> Tikader, 1970	Yes			Ghafoor <i>et al.</i> , 2011
110	<i>Lycosidae</i> Sundevall, 1833	<i>L. bistriata</i> Gravely 1924	Yes			Ghafoor <i>et al.</i> , 2011
111	<i>Lycosidae</i> Sundevall, 1833	<i>L. carmichaeli</i> Gravely, 1924	Yes			Ghafoor <i>et al.</i> , 2011
112	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa geotubalis</i> Tikader & Malhotra, 1980	Yes			Ghafoor <i>et al.</i> , 2011
113	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa maculate</i> (Tahir, 2009)	Yes		Yes	Ghafoor <i>et al.</i> , 2011; Parveen <i>et al.</i> , 2012
114	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa mahabaleshwariensis</i> Tikader & Malhotra, 1980	Yes			Ghafoor <i>et al.</i> , 2011
115	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa masteri</i> Pocock, 1901	Yes			Ghafoor <i>et al.</i> , 2011
116	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa moulmeinensis</i> Gravely, 1924	Yes			Ghafoor <i>et al.</i> , 2011
117	<i>Lycosidae</i> Sundevall, 1833	<i>L. kempi</i> Gravely, 1924	Yes			Ghafoor <i>et al.</i> , 2011
118	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa nigrotibialis</i> Simon, 1884	Yes			Ghafoor <i>et al.</i> , 2011
119	<i>Lycosidae</i> Sundevall, 1833	<i>Lycosa pictula</i> Pocock, 1901	Yes			Ghafoor <i>et al.</i> , 2011
120	<i>Lycosidae</i> Sundevall, 1833	<i>Paradosa lahorensis</i> Dyal, 1935 Umerkot,		Yes		Ursani and Soomro 2010
121	<i>Lycosidae</i> Sundevall, 1833	<i>P. mulani</i> Dyal, 1935		Yes		Ursani and Soomro 2010
122	<i>Lycosidae</i>	<i>P. hongia</i> Simon, 1885		Yes		Ursani and Soomro 2010

	Sundevall, 1833				
123	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa birmanica</i> Simon, 1884	Yes		Ghafoor <i>et al.</i> , 2011
124	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa mysorensis</i> (Tikader and Mukerji, 1971)	Yes		Ghafoor <i>et al.</i> , 2011
125	<i>Lycosidae</i> Sundevall, 1833	<i>P. pseudoannulata</i> (Bösenberg and Strand, 1906)	Yes		Ghafoor <i>et al.</i> , 2011
126	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa sumatrana</i> (Thorell, 1890)	Yes		Ghafoor <i>et al.</i> , 2011
127	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa cambasensis</i> Tikader & Malhotra, 1976	Yes		Ghafoor <i>et al.</i> , 2011
128	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa pusiola</i> (Thorell, 1891)	Yes		Ghafoor <i>et al.</i> , 2011
129	<i>Lycosidae</i> Sundevall, 1833	<i>Pardosa shyamae</i> (Tikader, 1970)	Yes		Ghafoor <i>et al.</i> , 2011
130	<i>Lycosidae</i> Sundevall, 1833	<i>P. saxatilis</i> Hentz, 1844		Yes	Ursani and Soomro 2010
131	<i>Lycosidae</i> Sundevall, 1833	<i>Draposa oakleyi</i> Gravely, 1924	Yes		Ghafoor <i>et al.</i> , 2011
132	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa banarensis</i> Tikader & Malhotra, 1980	Yes		Ghafoor <i>et al.</i> , 2011
133	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa solanensis</i> Tikader & Malhotra, 1980	Yes		Ghafoor <i>et al.</i> , 2011
134	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa sp.</i> Simon, 1882	Yes		Ghafoor <i>et al.</i> , 2011
135	<i>Lycosidae</i> Sundevall, 1833	<i>Hogna himalayensis</i> (Gravely, 1924)	Yes		Ghafoor <i>et al.</i> , 2011
136	<i>Lycosidae</i> Sundevall, 1833	<i>Trochosa punctipes</i> Gravely, 1924	Yes		Ghafoor <i>et al.</i> , 2011
137	<i>Lycosidae</i> Sundevall, 1833	<i>Trochosa sp.</i> C. L. Koch, 1847	Yes		Ghafoor <i>et al.</i> , 2011
138	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa shivagi</i> Tikader & Malhotra, 1980	Yes		Ghafoor <i>et al.</i> , 2011
139	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa sohani</i> Tikader & Malhotra, 1980	Yes		Ghafoor <i>et al.</i> , 2011
140	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa praelongipe</i> (O. P.-Cambridge, 1870)	Yes		Ghafoor <i>et al.</i> , 2011
141	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa Rajasthanicus</i> Tikader & Malhotra, 1980	Yes		Ghafoor <i>et al.</i> , 2011
142	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa dellaii</i>	Yes		Ghafoor <i>et al.</i> , 2011
143	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa rubiginosa</i> Simon, 1885	Yes		Ghafoor <i>et al.</i> , 2011
144	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa shakilaii</i>	Yes		Ghafoor <i>et al.</i> , 2011
145	<i>Lycosidae</i> Sundevall, 1833	<i>Evippa rosii</i>	Yes		Ghafoor <i>et al.</i> , 2011
146	<i>Lycosidae</i> Sundevall, 1833	<i>Flanona puellula</i>	Yes		Ghafoor <i>et al.</i> , 2011
147	<i>Lycosidae</i>	<i>Ocyale atlanta</i>	Yes		Ghafoor <i>et al.</i> , 2011

	Sundevall, 1833				
149	<i>Miturgidae</i> Simon, 1886	<i>Cheiracanthium inornatum</i> O. P.- Cambridge, 1874	Yes		Ghafoor <i>et al.</i> , 2011
151	<i>Nicodamidae</i> Simon, 1897	<i>N. dimidiata</i> Simon, 1897		Yes	Ursani and Soomro 2010
153	<i>Tetragnatha</i> Dae Menge, 1866	<i>Guizygiella indica</i> (Tikader & Bal, 1980)	Yes		Ghafoor <i>et al.</i> , 2011
154	<i>Tetragnatha</i> Dae Menge, 1866	<i>Guizygiella melanocrania</i> (Thorell, 1887)	Yes		Ghafoor <i>et al.</i> , 2011
155	<i>Tetragnatha</i> Dae Menge, 1866	<i>Leucauge decorata</i> (Blackwall, 1864)	Yes		Ghafoor <i>et al.</i> , 2011
156	<i>Tetragnatha</i> Dae Menge, 1866	<i>Leucauge dorsotuberculata</i> Tikader, 1982	Yes		Ghafoor <i>et al.</i> , 2011
157	<i>Tetragnatha</i> Dae Menge, 1866	<i>Tetragnatha javana</i> (Thorell, 1890)	Yes		Ghafoor <i>et al.</i> , 2011
158	<i>Tetragnatha</i> Dae Menge, 1866	<i>Tetragnatha virescens</i> Okuma, 1979	Yes		Ghafoor <i>et al.</i> , 2011
160	<i>Oecobiidae</i> Blackwall, 1862	<i>Oecobius putus</i> O. P.- Cambridge, 1876	Yes		Ghafoor <i>et al.</i> , 2011
161	<i>Oecobiidae</i> Blackwall, 1862	<i>O. paivan</i> Blackwall, 1868		Yes	Ursani and Soomro 2010
162	<i>Oecobiidae</i> Blackwall, 1862	<i>U.matthaii</i> Dyal, 1935		Yes	Ursani and Soomro 2010
163	<i>Oecobiidae</i> Blackwall, 1862	<i>O. campii</i> Mushtaq and A.Qadir, 1999		Yes	Ursani and Soomro 2010
165	<i>Oxyopidae</i> Thorell, 1870b	<i>Oxyopes campii</i> Mushtaq and A.Qadir, 1999		Yes	Ursani and Soomro 2010
166	<i>Oxyopidae</i> Thorell, 1870b	<i>O. hindostanicus</i> Pocock, 1901		Yes	Ursani and Soomro 2010
167	<i>Oxyopidae</i> Thorell, 1870b	<i>Oxyopes javanus</i>	Yes		Tahir <i>et al.</i> , 2008
168	<i>Oxyopidae</i> Thorell, 1870b	<i>O.wroughtoni</i> Pocock, 1901		Yes	Ursani and Soomro 2010
169	<i>Oxyopidae</i> Thorell, 1870b	<i>O.oryzae</i> Mushtaq and A.Qadir, 1999		Yes	Ursani and Soomro 2010
170	<i>Oxyopidae</i> Thorell, 1870b	<i>O. ryvesii</i> Pocock, 1901		Yes	Ursani and Soomro 2010
171	<i>Oxyopidae</i> Thorell, 1870b	<i>Oxyopes ratnae</i> Tikader, 1970	Yes		Ghafoor <i>et al.</i> , 2011
172	<i>Oxyopidae</i> Thorell, 1870b	<i>Peucetia pabbii</i> Stoliczka, 1869		Yes	Ursani and Soomro 2010
173	<i>Oxyopidae</i> Thorell, 1870b	<i>Peucetia viridana</i> (Stoliczka, 1869)	Yes		Ghafoor <i>et al.</i> , 2011
175	<i>Philodromidae</i> Thorell, 1870	<i>Philodromus domesticus</i> Tikader, 1962		Yes	Ursani and Soomro 2010
176	<i>Philodromidae</i> Thorell, 1870	<i>Philodromus betrabatai</i> Tikader, 1966	Yes		Ghafoor <i>et al.</i> , 2011
177	<i>Philodromidae</i> Thorell, 1870	<i>Philodromus devhutai</i> Tikader, 1966	Yes		Ghafoor <i>et al.</i> , 2011

179	<i>Pholcidae C. L. Koch, 1850</i>	<i>Artema Doriai Thorell, 1881</i>		Yes		Ursani and Soomro 2010
180	<i>Pholcidae C. L. Koch, 1850</i>	<i>A. Atlanta Walckenaer, 1837</i>	Yes	Yes		Ghafoor <i>et al.</i> , 2011; Ursani and Soomro 2010
181	<i>Pholcidae C. L. Koch, 1850</i>	<i>Artema Atlanta (Simon, 1897)</i>			Yes	Parveen <i>et al.</i> , 2012
182	<i>Pholcidae C. L. Koch, 1850</i>	<i>Crossopriza lyoni Blackwall, 1867</i>		Yes	Yes	Ursani and Soomro 2010; Parveen <i>et al.</i> , 2012
183	<i>Pholcidae C. L. Koch, 1850</i>	<i>Holocnemus spp Simon, 1907</i>		Yes		Ursani and Soomro 2010
185	<i>Salticidae Blackwall, 1841</i>	<i>Rhene decorate Tikader, 1977</i>		Yes		Ursani and Soomro 2010
186	<i>Salticidae Blackwall, 1841</i>	<i>R. indica Tikader, 1973</i>	Yes	Yes		Ghafoor <i>et al.</i> , 2011; Ursani and Soomro 2010
187	<i>Salticidae Blackwall, 1841</i>	<i>Sitticus distinguendus</i>	Yes			Ghafoor <i>et al.</i> , 2011
188	<i>Salticidae Blackwall, 1841</i>	<i>Phlegradha kuriensis</i>	Yes			Ghafoor <i>et al.</i> , 2011
189	<i>Salticidae Blackwall, 1841</i>	<i>Plexipus paykulli Audouin, 1826</i>	Yes		Yes	Tahir <i>et al.</i> , 2008; Parveen <i>et al.</i> , 2012
190	<i>Salticidae Blackwall, 1841</i>	<i>Phidippus punjabensis Tikader, 1973</i>		Yes		Ursani and Soomro 2010
191	<i>Salticidae Blackwall, 1841</i>	<i>P. indicus Tikader, 1973</i>		Yes		Ursani and Soomro 2010
192	<i>Salticidae Blackwall, 1841</i>	<i>Bianor albidimaculatus</i>	Yes			Tahir <i>et al.</i> , 2008
193	<i>Salticidae Blackwall, 1841</i>	<i>Penionos dyali Dyal, 1935</i>		Yes		Ursani and Soomro 2010
194	<i>Salticidae Blackwall, 1841</i>	<i>Metaphidipus fulva Simon, 1868</i>		Yes		Ursani and Soomro 2010
195	<i>Salticidae Blackwall, 1841</i>	<i>Marpissa insignis Butt and Beg, 2000</i>		Yes		Ursani and Soomro 2010
196	<i>Salticidae Blackwall, 1841</i>	<i>M. tenebrosa Butt and Beg, 2000</i>		Yes		Ursani and Soomro 2010
197	<i>Salticidae Blackwall, 1841</i>	<i>M. mirabilis Butt and Beg, 2000</i>		Yes		Ursani and Soomro 2010
198	<i>Salticidae Blackwall, 1841</i>	<i>M. albens Dyal, 1935</i>		Yes		Ursani and Soomro 2010
199	<i>Salticidae Blackwall, 1841</i>	<i>M. rubroclypea Lessert, 1927</i>		Yes		Ursani and Soomro 2010
200	<i>Salticidae Blackwall, 1841</i>	<i>Marpissa decorate Tikader, 1974</i>	Yes			Ghafoor <i>et al.</i> , 2011
201	<i>Salticidae Blackwall, 1841</i>	<i>Marpissa tigrina Tikader, 1965</i>	Yes			Ghafoor <i>et al.</i> , 2011
202	<i>Salticidae Blackwall, 1841</i>	<i>Phlegra swanii Mushtaq et al., 1995</i>		Yes		Ursani and Soomro 2010
203	<i>Salticidae Blackwall, 1841</i>	<i>P. dhakuriensis Mushtaq, Beg and Waris, 1995</i>		Yes		Ursani and Soomro 2010
204	<i>Salticidae Blackwall, 1841</i>	<i>Chalcoscirtus splendid Caporiacco, Bertkau, 1880</i>		Yes		Ursani and Soomro 2010
205	<i>Salticidae Blackwall, 1841</i>	<i>Bellota livida Dyal, 1935</i>		Yes		Ursani and Soomro 2010
206	<i>Salticidae Blackwall, 1841</i>	<i>B. fascialis Dyal, 1935</i>		Yes		Ursani and Soomro 2010
207	<i>Salticidae Blackwall, 1841</i>	<i>Evophrus auricolor Dyal, 1935</i>		Yes		Ursani and Soomro 2010
208	<i>Salticidae</i>	<i>Sitticus zaisanicus</i>		Yes		Ursani and Soomro 2010

	<i>Blackwall, 1841</i>	<i>Logunov, 1998</i>				
209	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>Hentzia peckhami</i> <i>Cockerell, 1893</i>		Yes		Ursani and Soomro 2010
210	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>Chrysilla albens</i> Dyal, 1935		Yes		Ursani and Soomro 2010
211	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>Myrmarachne</i> <i>ramunni</i> Dyal, 1935		Yes		Ursani and Soomro 2010
212	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>M. maratha</i> <i>Tikader, 1973</i>		Yes		Ursani and Soomro 2010
213	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>M. orientales</i> Tikader, 1973		Yes		Ursani and Soomro 2010
214	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>M. laetus</i> Thorell, 1887		Yes		Ursani and Soomro 2010
215	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>Menemerus raji</i> Dyal, 1935		Yes		Ursani and Soomro 2010
216	<i>Salticidae</i> <i>Blackwall, 1841</i>	<i>Thiania aura</i> Dyal, 1935		Yes		Ursani and Soomro 2010
218	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Scytodes propinqua</i> <i>Stoliczka, 1869</i>	Yes	Yes		Ursani and Soomro 2010
219	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Scytodes thoracica</i> (Latreille, 1802)	Yes		Yes	Ghafoor <i>et al.</i> , 2011; Parveen <i>et al.</i> , 2012
221	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Eusparassus</i> <i>fuscimanus</i> Denis, 1958		Yes		Ursani and Soomro 2010
222	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Heteropoda kandiana</i> <i>Pocock, 1899</i>		Yes		Ursani and Soomro 2010
223	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Olios punjabensis</i> <i>Dyal, 1935</i>		Yes		Ursani and Soomro 2010
224	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Olios</i> <i>mahabangkawitus</i> <i>Barrion and Litsinger,</i> 1995	Yes			Ghafoor <i>et al.</i> , 2011
225	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Olios punctipes</i> <i>Simon, 1884</i>	Yes			Ghafoor <i>et al.</i> , 2011
226	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>O. lutescens</i> Thorell, 1894		Yes		Ursani and Soomro 2010
227	<i>Scytodidae</i> <i>Blackwall, 1864</i>	<i>Isopeda tuhogniga</i> <i>Barrion and Litsinger</i> 1995			Yes	Parveen <i>et al.</i> , 2012
229	<i>Tengellidae</i> <i>Dahl, 1908</i>	<i>Socalchemmis kastoni</i> <i>Platnick and Ubick,</i> 2001		Yes		Ursani and Soomro 2010
230	<i>Tengellidae</i> <i>Dahl, 1908</i>	<i>Liocranoides</i> <i>flavescens</i> Chamberlin and Ivie, 1941		Yes		Ursani and Soomro 2010
232	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>Anelosimus chiloensis</i> <i>Levi, 1963</i>		Yes		Ursani and Soomro 2010
233	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>Achaeranea</i> <i>quadripunctata</i> Simon, 1895		Yes		Ursani and Soomro 2010
234	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>Theridion niger</i> <i>Urquhart, 1889</i>	Yes	Yes		Ghafoor <i>et al.</i> , 2011; Ursani and Soomro 2010
235	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>T. aura</i> Blackwall, 1864		Yes		Ursani and Soomro 2010
236	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>Thwaitea diversa</i> O. P.-Cambridge, 1882		Yes		Ursani and Soomro 2010
237	<i>Theridiidae</i> <i>Sundevall, 1833</i>	<i>Trigonobothrys</i> <i>aheneus</i> Dyal, 1935		Yes		Ursani and Soomro 2010

238	<i>Theridiidae</i> Sundevall, 1833	<i>Spintharis argenteus</i> Dyal, 1935		Yes		Ursani and Soomro 2010
240	<i>Tetragnathidae</i>	<i>Tetragnatha javana</i>	Yes			Tahir <i>et al.</i> , 2008
241	<i>Tetragnathidae</i>	<i>Tetragnatha virescens</i>	Yes			Tahir <i>et al.</i> , 2008
243	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus</i> <i>cherapunjeus</i> Tikader, 1966		Yes		Ursani and Soomro 2010
243	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus labefactus</i> Karsch, 1881	Yes			Ghafoor <i>et al.</i> , 2011
244	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus okinawensis</i> Strand, 1907	Yes			Ghafoor <i>et al.</i> , 2011
245	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus pugilis</i> Stoliczka, 1869	Yes		Yes	Tahir <i>et al.</i> , 2008; Parveen <i>et al.</i> , 2012
246	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus spectabilis</i> (Doleschall, 1859)			Yes	Parveen <i>et al.</i> , 2012
247	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisidae sp</i>	Yes			Ghafoor <i>et al.</i> , 2011
248	<i>Thomisidae</i> Sundevall, 1833	<i>Xysticus sp.</i>	Yes			Ghafoor <i>et al.</i> , 2011
249	<i>Thomisidae</i> Sundevall, 1833	<i>Runcinia affinis</i> Simon, 1897	Yes			Tahir <i>et al.</i> , 2008
250	<i>Thomisidae</i> Sundevall, 1833	<i>Diaea evanida</i> (Thorell, 1870)			Yes	Parveen <i>et al.</i> , 2012
251	<i>Thomisidae</i> Sundevall, 1833	<i>Thomisus spectabilis</i> (Doleschall, 1859)			Yes	Parveen <i>et al.</i> , 2012
253	<i>Trochanteriidae</i> Karsch, 1879	<i>Plator himalayaensis</i> Tikader and Gajbe, 1976			Yes	Parveen <i>et al.</i> , 2012
255	<i>Uloboridae</i> Thorell, 1869	<i>Miagrammopes</i> <i>albocinctus</i> Simon, 1892		Yes		Ursani and Soomro 2010
256	<i>Uloboridae</i> Thorell, 1869	<i>Uloborus danolius</i> Tikader, 1969	Yes	Yes		Ghafoor <i>et al.</i> , 2011; Ursani and Soomro 2010
257	<i>Uloboridae</i> Thorell, 1869	<i>Zodarion spp</i> Walckenaer, 1826		Yes		Ursani and Soomro 2010
259	<i>Oonopidae</i> Sundevall, 1833	<i>Hadrobunus grandis</i> Sundevall, 1833			Yes	Parveen <i>et al.</i> , 2012
260	<i>Oonopidae</i> Sundevall, 1833	<i>Halconia insignis</i> Thorell, 1836			Yes	Parveen <i>et al.</i> , 2012
261	<i>Urocteidae</i> Dufour, 1820		Yes		Yes	Ghafoor <i>et al.</i> , 2011; Parveen <i>et al.</i> , 2012
262	<i>Hersilidae</i> Thorell, 1870		Yes			Ghafoor <i>et al.</i> , 2011
263	<i>Linyphiidae</i> Blackwall, 1859		Yes			Ghafoor <i>et al.</i> , 2011
264	<i>Micryphantidae</i> (Bertkau 1872)		Yes			Ghafoor <i>et al.</i> , 2011

3. Conclusion

It is indicated that great varieties of these predators reside in Pakistan. Diversity of spider fauna is due to geographical and ecological difference. It is concluded that in the past spiders are ignored because people had no adequate knowledge about the importance of spiders. Information about the spider's species of Pakistan available but their distribution are scientifically and fragmentary inadequate. In Pakistan few to no keys to spiders exist. Spider fauna are poorly known. It is the need of time to discover more species of spiders and their importance in integrated pest management, agroecosystem,

pest control and maintaining insect population. Proper attention should be given to their presence.

The insufficient information of Pakistan spiders poses difficulties in the analysis of distribution of many Central Asian species.

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