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Spiders of the Genus *Neoscona* (Araneae: Araneidae) From Punjab, Pakistan

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Abstract.- Spider fauna of the genus *Neoscona* Simon, 1864 was surveyed from 1996 through 1998 and in 2000. The spiders were collected from 48 localities in 28 districts of the Province of Punjab, Pakistan by jerking the plants and hand picking. A total of 380 spiders were captured from 64 different plants, of these, 203 specimens were females, 33 males and 144 specimens were immatures/subadults. In the present study of the genus, 10 species including one new species and one new record to Pakistan are reported, whereas four species are first time reported from Punjab but they have already been reported from other parts of the country. Key to the Pakistani species of the *Neoscona* genus is also presented in this paper.

Key words: Spiders, Araneae, Araneidae, *Neoscona huzaifi* new species, new record.

INTRODUCTION

Neoscona Simon, 1864 was listed by Roewer as a synonym of *Araneus* Clerck, 1757 but accepted as a separate genus by all recent authors. The genus is widely distributed and represented by 93 described species in the world (Platnick, 2012). The genus has been studied in Asia by many workers, from India (Tikader and Bal, 1981; Tikader and Biswas, 1981; Tikader, 1982; Biswas, 1987; Reddy and Patel, 1992; Biswas and Biswas, 1992, 1996, 2003, 2006; Biswas and Majumder, 1995, 2000; Gajbe and Gajbe, 2000; Patel and Vyas, 2001; Bhandari and Gajbe, 2001; Patel, 2003a, b; Gajbe, 2004, 2007; Sebastian and Peter 2009; Sen *et al*., 2011), China (Yin *et al*., 1997; Song *et al*., 1999, 2001; Hu, 2001; Zhang and Zhang, 2011), Philippines (Barrion and Litsinger, 1995; Barrion-Dupo, 2008), Korea (Yoo and Kim, 2002; Kim and Kim, 2002; Namkung, 2002, 2003) and from Japan (Tanikawa, 1998, 2007, 2009). Recently, the spider fauna of the genus *Neoscona* has been studied by some other workers in the various parts of the world (Levi, 2002; Dondale *et al*., 2003; Almquist, 2005; Levy, 2007; Ledoux, 2008; Dierkens and Charlat, 2011; Álvarez-Padilla and Hormiga, 2011).

From Pakistan, few workers studied the genus only from localized areas. Simon (1907) recorded one species from Karachi, Sindh. Dyal (1935), Arshad *et al*. (1984), and Khatoon (1986) recorded three species of the genus *Neoscona* from Pakistan and placed them in genus *Araneus* which were later on transferred to genus *Neoscona*. Qadir (1997), Ghafoor (2002), Parveen (2003) and Butt and Siraj (2006) also repoted the genus from Punjab, Pakistan. Razzaq (2002) reported the genus from Northern Areas of Pakistan.

MATERIALS AND METHODS

Spider fauna of the genus *Neoscona* was surveyed from 1996 through 1998 and in 2000. Sampling was done from 48 localities in 28 districts of the province of Punjab including federal capital, Islamabad. The longitudes and latitudes of the localities of the study area are given in Table I. The spiders were mostly collected by jerking the plants on a cloth sheet; some specimens were also collected by hand from the webs in the morning or other suitable time. The specimens were transferred into a container having 70% ethyl alcohol, before being brought to the laboratory. As the author did all the collection, so to avoid the repetition the collector's name is not mentioned in the material examined. Collected specimens were washed with xylene and each specimen was preserved in a separate vial in 95% ethyl alcohol with little glycerine.

Permanent slides of the genitalia were prepared. Epigyne and male palpi were removed by

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using insect needle. Epigynes were cleared by using KOH pellets for variable time (depending on the degree of sclerotization), dehydrated with ethyl alcohol, then placed in clove oil, xylene and finally mounted in canada balsam. Male palpi were washed with xylene and mounted in canada balsam.

Table I.- Localities of the study area with their Latitudes (N) and Longitudes (E).

Locality	District	Coordinates	
		Lat. (N)	Lon. (E)
Attock	Attock	33º54´	72º14´
Bahawalpur	Bahawalpur	29º23´	71º39´
Bhakkar	Bhakkar	31º37´	71º03´
Chak Jhumra	Faisalabad	31°34´	73°10´
Chakwal	Chakwal	32º56´	72º52´
Changa Manga	Kasur	31º05´	73º59´
Chiniot	Chiniot	31º43´	72º59´
DG Khan	DG Khan	30º03´	70º38´
Faisalabad	Faisalabad	31º25´	73º07´
Fazilpur	Rajanpur	29°18´	70°29´
Fort Munro	DG Khan	29º54´	69º59´
Gojra	TT Singh	31º09´	72º41´
Gujranwala	Gujranwala	32º09´	74º12´
Gujrat	Gujrat	32º34´	74º04´
Hafizabad	Hafizabad	32º04´	73º41´
Harappa	Sahiwal	30º37´	72º52´
Islamabad	Islamabad	33º43´	73º04´
Jaranwala	Faisalabad	31°15´	73°26
Jehlum	Jehlum	32º57´	73º44´
Jhang	Jhang	31º16´	72º19´
Joharabad	Khushab	32º17´	72º21´
Kallar Kahar	Chakwal	32º47´	72º43´
Kharaian	Gujrat	32° 46´	74° 16´
Kufri (Soan Valley)	Khushab	32°34´	72°11´
Kundian	Mianwali	32º27´	71º29´
Lal Sohanra	Bahawalpur	29º21´	71º58´
Layyah	Layyah	30º57´	70º57´
Maharanawala	Mianwali	32º53´	71º83´
Mailsi	Vehari	29º42´	72º12´
Margalla Hills	Islamabad	33º48´	73º10´
Mianwali	Mianwali	32º13´	71º33´
Multan	Multan	30º11´	71º26´
Murree	Rawalpindi	33º54´	73º22´
Muzaffargarh	Muzaffargarh	30º04´	71º12´
Okara	Okara	30º48´	73º27´
Pakpattan	Pakpattan	30°25´	73°27´
Pattoki	Kasur	31.02´	73.85´
Rawal dam	Islamabad	33º40´	73º06´
Rawalpindi	Rawalpindi	33º36´	73º03´
Samundri	Faisalabad	31º04´	72º58´
Sargodha	Sargodha	32º04´	72º41´
Sheikhupura	Sheikhupura	31º43´	73º59´
Shorkot City	Jhang	30º50´	72º04´
Shorkot Plantation	Jhang	30º45´	72º12´
Sialkot	Sialkot	32º30´	74º32´

Identification was done on the basis of morphometric characters of various body parts and genitalia. The help was mainly taken from the literature mentioned in the introduction and other relevant literature.

The new species was selected for detailed studies. Measurements (mm) of various body parts of the specimens were taken with the help of ocular micrometer. The legs measurements are given in the following sequence: total (femur, patella + tibia, metatarsus, tarsus). The spination on the legs is presented in this sequence: dorsal, ventral, prolateral, and retrolateral. Scientific drawings of important body parts were drawn with the help of ocular grid. Comprehensive description of only new species is given. However, the already known species are provided with previous locality record (with emphasis on Pakistan and India). Key to the Pakistani species of the genus *Neoscona* is developed on the basis of morphological characters.

All the specimens were labeled with family, scientific name, plant on which found, date of collection, locality and collector's name. At the completion of study, all the specimens and slides were housed in the Museum, Department of Zoology and Fisheries, University of Agriculture, Faisalabad, Punjab, Pakistan.

The abbreviations used in this paper are given here: AER, anterior eye row; AL, abdomen length; AME, anterior median eyes; AW, abdomen width; CL, carapace length; CRH, canal rest house; CRS, cotton research station; CW, carapace width; DG Khan, Dera Ghazi Khan; FC, forest colony; FH, fish hatchery; FP, forest plantation; GC, Government College; GMC, Government Marry College; GPGC = Government Post Graduate College; GSS, Government Secondary School; GZScC, Government Zamindara Science College; Imm, immature; KPK, Khyber Pakhtoon Kha Province; LE, lateral eyes; LL, leg lengths; MOQ, median ocular quadrangle, NP, National Park, ODOAE, Office of District Officer Agricultural Extension; PE, posterior eyes; PER, posterior eye row; PME, posterior median eyes; PLE, posterior lateral eyes; TL, total Length; UAF, University of Agriculture Faisalabad; Univ., University.

RESULTS AND DISCUSSION

In the present study of the genus, survey was carried out from a large area of the Punjab. A total of 380 spiders were captured from 64 different plants, of these, 203 specimens were females, 33 males and 144 specimens were immatures/subadults. This paper presents 10 species, including one new species and one new record to Pakistan, whereas four species are first time reported from Punjab but they have already been reported from other parts of the country.

Genus *NEOSCONA* Simon, 1864

1864. *Neoscona* Simon, *Hist. Nat. Araign.*, **1**: 261.
1924. *Chinestela* Chamberlin, *Proc. U.S. Natn. Mus.*, **63**: 20.
1926. *Cubanella* Franganillo, *Bol. Soc. Entom. España*, **9**: 69.
1940. *Neoscona* Comstock, *The Spider Book*: 509.
1951. *Afraranea* Archer, *Am. Mus. Novit.* **1487:** 1-52.
1960. *Neoscona* Yaginuma, *Spiders of Japan in Color*: 56.

Diagnosis

Presence of longitudinal thoracic groove in females separates *Neoscona* from the members of *Araneus*. MOQ forming a trapezium, slightly longer than wide. AME largest or sub equal to PME, LE close to each other and not born on prominent tubercles, PLE smallest, both ER recurved. Coxa I of male with a ventral hook in distal rim. Tibia II with strong prolateral spines. Abdomen variable in shape *i.e.* ovoid, sub ovoid, triangular, or sub triangular. Epigyne simple and tongue like, scape completely fused to base and bears one or two pairs of lateral lobes; epigynal opening underneath scape. Pedipalp in male with two long and curved spines on patella, cymbium broad.

Type species

Neoscona arabesca (Walckenaer, 1841)

Distribution

Cosmopolitan.

KEY TO THE SPECIES OF GENUS *NEOSCONA SIMON* FROM PAKISTAN

1. Abdomen triangular; epigynal scape short, broad and triangular ..... *N. nautica* (L. Koch)
- Abdomen sub triangular; epigynal scape neither short nor broad 2
2. Epigynal scape without constriction at bending point .. 3
- Epigynal scape with constriction either at bending point or middle of scape 4
3. Epigynal scape right angle to base; lateral lobes inconspicuous ..... *N. bengalensis* Tikader and Bal
- Epigynal scape not at right angle to base; lateral lobes conspicuous and rounded .... *N. chrysanthusi* Tikader and Bal
4. MOQ as long as wide; abdomen as long as wide ..... *N. huzaifi* new species
- MOQ longer than wide; abdomen longer than wide 5
5. Cephalic region with conspicuous dark brown 'V' shaped patch; epigynal scape with deep constriction..... ..... *N. mukerjei* Tikader
- Cephalic region without 'V' shaped patch; epigynal scape without deep constirtuion 6
6. Thoracic region uniformly dark brown; lateral lobes of epigyne very distinct, horn like.. *N. vigilans* (Blackwall)
- Thoracic region otherwise; lateral lobes of epigyne distinct or indistinct, blunt, not horn like 7
7. Epigynal scape with one pair of lateral lobes 8
Epigynal scape with two pairs of lateral lobes 9
8. Sternum uniformly black; epigynal scape with prominent wide rim, without constriction..... ..... *N. sinhagadensis* (Tikader)
- Sternum dark brown with longitudinal white band; epigynal scape with no prominent rim, constriction behind lateral lobes ..... *N. theisi* (Walckenaer)
9. Carapace with one median and two lateral longitudinal brown patches; abdomen dorsum with mid longitudinal pale patch; first pair of lateral epigynal lobe conspicuous ..... *N. shillongensis* (Tikader and Bal)
- Carapace with 'V' shaped brown mark; abdomen dorsum without mid longitudinal pale patch; lateral lobes of epigyne inconspicuous..... *N. pavida* (Simon)

Neoscona nautica (L. Koch, 1875)

1875. *Eperia nautica* L. Koch, *Aegypt. Abyssin. Arachn. Jickeli*: 17.
1877. *Eperia pullata* Thorell, *Ann. Mus. Civ. Stor. Nat.* Genova, **10***:* 385.
1885. *Eperia volucripes* Keyserling, *Verh. Zool. Bot. Ges. Wein*, Vienna, **34**: 528.
1900. *Araneus nauticus* Pocock, *Fauna of British India: Arachnida*: 228.
1904. *Neoscona volucripes* F.O.P.-Cambridge, *Biologia Centrali- Americana, Araneidea* **2**: 473.
1907. *Araneus nauticus* Simon, *Ann. Mus. Civ. Stor. Nat.* Genova, **3**: 290.
1930. *Neoscona nautica* Petrunkevitch, *Trans. Conn. Acad. Arts Sci.*, **30**: 320.

Previously, Simon (1907) reported its distribution in Karachi, Sindh. Later on, Arshad *et al*. (1984) recorded this species from Swabi, KPK. It is first time reported from Punjab in this study.

Material examined

3 ♀♀, 1 ♂, 2 Imm, *Sorghum bicolor*, 28 July 1998, Chak 145/9L, Harappa, Sahiwal.

Previous locality record

Cosmotropical. Pakistan: Karachi, Sindh; Swabi, KPK. India: Poona, East Khandesh, Maharashtra; Darjeeling, West Bengal, Rajkot, Gujarat; Rilbong, Shillong, Meghalaya.

Neoscona bengalensis Tikader and Bal, 1981

1981. *Neoscona bengalensis* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, **24**: 15.

This species was reported from Sialkot, Punjab (Qadir 1997), from Faisalabad (Ghafoor, 2002) and Kaghan, Northern Areas (Razzaq, 2002). During present work, it is recorded from a number of plants from Southern, Central and Northern Punjab.

Material examined

2 ♀♀, *Berberis lycium*, 5 September 1996, FP Murree, Rawalpindi;1 ♀, *Zizyphus Jujuba*, 6 September 1996, NP Margalla Hills, Islamabad; 1 ♂, *Rosa webbiana*, 29 July 1997, Murree, Rawalpindi; Imm, *Zea mays*, 5 September 1997, Maharanwala, Mianwali;1 ♀, *Mangifera indica*, 28 July 1998, Chak 145/9L, Harappa, Sahiwal; 2 ♀♀, *Eucalyptus* spp., 25 September 1998, FP Machu, Layyah; 2 ♀♀, *Datura indica*, 26 September 1998, FP Inayat, Layyah; 2 ♀♀, *Sesbania seban*, 2 October 1998, GPGC Chakwal; 2 ♀♀, 1 Imm, *Justicia adhatoda*, 2 October 1998, Kallar Kahar, Chakwal; 1 ♀, 1 Imm, *Callistemon lanceolatus*, 3 October 1998, GC Joharabad, Khushab; 5 ♀♀, 3 Imm, *Prunus armeniaca*, 4 October 1998, Kufri, Soan Valley, Khushab; 5 ♀♀, 4 Imm, *Prunus domestica*, 9.10.98, Fort Munro, DG Khan; 2 ♀♀, *Psidium guajava*, 14 October 1998, ODOAE Attock; 6 ♀♀, 2 Imm, *Cupressus sempervirens*, 15 October 1998, GC Jehlum; 4 Imm, *Morus alba*, 15 October 1998, GZScC Gujrat; 1 ♀, *Hibiscus rosa-sinensis*, 16 October 1998, GMC Sialkot;1 ♀, 1 Imm, *Zizyphus mauritiana*, 17 October 1998, GC Gujranwala;1 ♀, 1 Imm, *Arundo donax*, 24 October 1998, Univ. Sargodha; 8 ♀♀, 6 Imm, *Pongamia glabra*, 29 October 1998, GC Okara; 3 ♀♀, *Bambusa hamiltoni*, 30 October 1998, Pattoki, Kasur; 6 ♀♀, 10 Imm, *Dalbergia sisso*, 31 October 1998, FP Changa Manga Chunian, Kasur; 5 ♀♀, 8 Imm, *Populus* spp., 25 June 2000, Shorkot City, Jhang.

Previous locality record

Pakistan: Kaghan, Northern Areas; Sialkot, Punjab. India: Jadavpur, Calcutta, West Bengal; Shillong, Meghalaya.

Neoscona chrysanthusi Tikader and Bal, 1981

1981. *Neoscona chrysanthusi* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, **24**: 13.

There is no previous record of this species from Pakistan. Now it is reported from Gujranwala.

Material examined

1 ♀, *Cestrum diurnum*, 17 October 1998, GC Gujranwala.

Previous locality record

India: Mangan, Singhik. Bhutan.

Neoscona huzaifi, new species
(Fig. 1)

Description

Female: TL 12.2, CL 4.9, CW 4.1, AL 7.7, AW 7.7. LL: I = 16.2 (4.8 + 6.3 + 3.6 + 1.5), II = 16.0 (4.6 + 6.1 + 3.6 + 1.7), III = 10.5 (3.5 + 3.5 + 2.2 + 1.3), IV = 14.8 (4.5 + 5.5 + 3.5 + 1.3). Male: TL 4.7, CL 2.3, CW 2.0, AL 2.6, AW, 2.6.

Cephalothorax longer than wide, narrower in front, clothed with hairs; cephalic region slightly elevated, orange brown; thoracic region separated by 'V' shaped groove, orange dark brown, with longitudinal groove. Ocular area with few yellow erect setae. Eyes with dark brown rings; AME largest, LE close and situated on small tubercles,

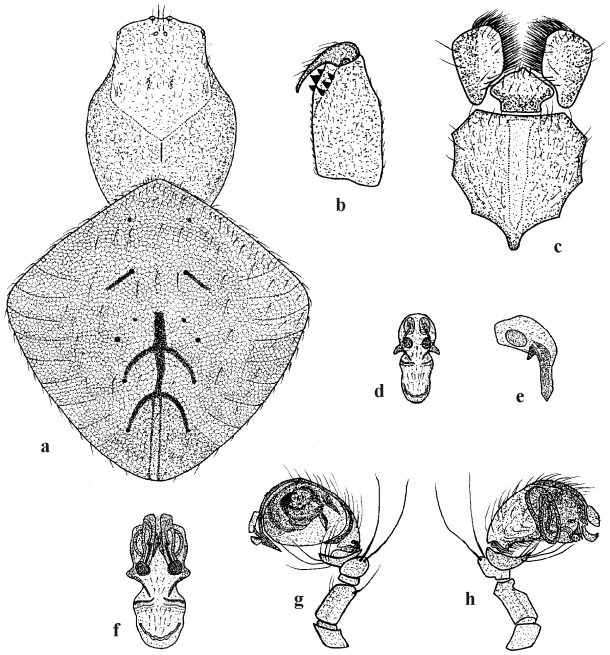

Fig. 1. *Neoscona huzaifi*, new. species. a, body dorsal view 9x; b, chelicera ventrolateral view 12x; c, labium, maxillae and sternum ventral view 12x; d-e, epigyne external and lateral views 18x. f, Epigyne internal (dorsal) view 50x. g-h, left male palp dorsolateral and ventrolateral, views 30x.

PLE smallest. AER strongly recurved, medians close to each other than laterals. PER slightly recurved. Medians close to each other than laterals. MOQ as long as wide, wider in front than behind. Clypeus height, more than AME diameter. Chelicerae strong, stout, orange brown, clothed with hairs, broad basally, gradually narrow anteriorly; both margins with three dissimilar teeth, promargin with middle tooth larger and retromargin with lower tooth larger; fangs moderately long, strongly curved, dark brown. Labium light brown basally and pale yellow apically, distinctly wider than long, with few brown and dark brown erect setae, pointed anteriorly, widest medially, truncate and narrow posteriorly. Maxillae with outer lateral side light brown and inner side pale yellow, distinctly longer than wide, with scattered brown erect setae and distinct black scopulae on whole inner side. Sternum yellowish brown with median longitudinal chalk white band, clothed with yellowish hairs, heart shaped, slightly depressed and broader anteriorly, gradually tapering posteriorly. Male palp yellowish brown with tegulum dark brown; cymbium longer than wide, with long yellowish hairs. Tegulum with three apophyses: terminal apophysis short, slightly curved directed upward; sub terminal apophysis short, blunt, straight, directed downward; median apophysis with broad base and a mid dorsal spine like spur. Embolus long and coiled, conductor tube like with round tip; paracymbium small hook like; femur with short dorsodistal spine; patella with two long dorsodistal spines; tibia on lateral side of paracymbium, cup shaped, with long hairs. Legs long, yellowish except yellowish brown femora and dark brown tarsi, other segments with transverse yellowish brown distal bands. Spination on legs: femora I = 4 – 5 – 6 – 3, II = 4 – 9 – 7 – 3, III = 3 – 10 – 3 – 3, IV = 4 – 4 – 3 – 3; tibiae I = 3 – 12–4– 4, II = 5 – 10 – 5 – 4, III = 2 – 6 – 3 – 3, IV = 2 – 9 – 5 – 3. Tarsi three clawed. Leg formula 1243.

Abdomen sub triangular, as long as wide, overlapping on carapace, much wider before mid point, gradually narrows at both ends, clothed with both fine and spine like hairs. Dorsum decorated with minute chalk brown spots having dark brown partitions; six pairs of mid longitudinally arranged dark brown sigella; second pair of sigella with diagonal dark brown lines; median narrow longitudinal dark brown band with two pairs of lateral arms, start from level of third pair of sigella, lateral arms meet with last two pairs of sigella; few brown lines originate from lateral margins. Ventral side with broad median longitudinal calk white patch between epigastric furrow and spinnerets, five pairs of dark brown sigella on patch, lateral sides concolour with dorsum. Spinnerets brown with dark brown apical segment, converging, anteriors close, posteriors separated, lateral sides with two pairs of chalk white patches. Epigynal scape moderately long and slightly narrow, constricted near base, broadest medially, slightly wide and rounded apically, bent at right angle to base of epigyne, with a pair of conspicuous horn like lateral lobes; spermathecal sacs elongated; spermathecal ducts long; epigynal orifices conspicuous, posteriolateral.

Etymology

Name is given after the name of my beloved son Ahmad Huzaifa Khalid.

Type material

Holotype ♀, *Hibiscus rosa-sinensis***,** 30 August 1997, CRH Nanuwana, Hafizabad, deposited in the Meuseum, Department of Zoology, University of Agriculture, Faisalabad; 5 Imm, same data as holotype; paratype ♂, *Tamarix aphylla*, 5 August 1996, GC Shorkot, Jhang, deposited in the Meuseum, Department of Zoology, University of Agriculture, Faisalabad; 6 Imm, same data as paratype; 3 Imm, *Jasminum* spp., 14 October 1998, ODAEO Attock.

Diagnosis

Neoscona huzaifi new species is somewhat similar to *Neoscona bengalensis* Tikader and Bal but can be distinguished from it on the basis of these characters. MOQ as long as wide; labium distinctly wider than long. Abdomen as long as wide, widest near mid length, tapering at both ends. Dorsum with six pairs of dark brown sigella; a median narrow longitudinal dark brown band with two pairs of lateral arms, starts near mid length (at level of third pair of sigella). Ventral side of abdomen with broad median longitudinal chalk white patch between epigastric furrow and spinnerets, five pairs of dark brown sigella on this patch. Epigynal scape moderately long and slightly narrow constricted near base, lateral lobes conspicuous horn like.

Neoscona mukerjei Tikader, 1980

1980. *Neoscona mukerjei* Tikader, *Proc. Indian Acad. Sci*., **89**: 247.

Previously this species was recorded from Sialkot, Punjab (Qadir 1997). In this study it is reported on many plants from large area of the Punjab.

Material examined

3 ♀♀, *Punica granatum*, 24 July 1996, Shorkot City, Jhang; 4 ♀♀, *Dalbergia sisso*, 25 July 1996, FP Shorkot, Jhang; 8 ♀♀, 1 ♂, *Tamarix aphylla*, 5 August 1996, GC Shorkot City, Jhang; 3 ♀♀, 2 Imm, *Lantana* spp., 4 September 1996, FP Shakarparian, Islamabad; 2 ♀♀, *Gardenia florida*, 20 July 1997, UAF, Faisalabad; 3 ♀♀, 2 Imm, *Nerium* spp., 1 August 1997, Rawal Dam, Islamabad;1 ♀, *Hibiscus rosa-sinensis*, 30 August 1997, CRH Nanuwana, Hafizabad; 2 ♀♀, *Dalbergia sisso*, 31 August 1997, CRH Jora, Chiniot; 2 ♀♀, 1 ♂, *Zea mays*, 5 September 1997, Mianwali; 2 ♀♀, *Aerva javanica*, 19 December 1997, Desert Canal Bank, NP Lal Sohanra, Bahawalpur; 1 ♂, 2 Imm, *Acacia nilotica*, 30 August 1997, FP Pabbi, Kharian, Gujrat; 1 ♂, *Gossypium hirsutum*, 25 September 1998, Layyah; 2 ♀♀, 1 Imm, *Nerium* spp., 26 September 1998, FP Inayat, Layyah; 2 ♀♀, 2 Imm, *Cyamopsis tetragonoloba*, 27 September 1998, Khanpur Bagga Sher, Muzaffargarh; 2 ♀♀, 1 ♂, *Prosopis cineraria*, 27 September 1998, FP Khanpur Bagga Sher, Muzaffargarh;1 ♀, *Albizia* spp., 28 September 1998, FP Machu, Layyah;1 ♀, 2 Imm, *Jasminum* spp., 2 October 1998, GPGC Chakwal; 4 ♀♀, *Prunus persica*, 4 October 1998, Kufri, Soan Valley, Khushab; 2 ♀♀, *Zizyphus nummularia*, 4 October 1998, Kufri, Soan Valley, Khushab; 3 ♀♀, *Mangifera indica*, 8 October 1998, Fazilpur, Rajanpur;1 ♀, *Grewia asiatica*, 8 October 1998, FC, DG Khan; 2 Imm, *Pyrus communis*, 10 October 1998, Fort Munro, DG Khan;1 ♀, 22 Imm, *Morus alba*, 11 October 1998, ODAEO Attock; 5 ♀♀, 1 ♂, 4 Imm, *Eucalyptus* spp., 15 October 1998, GC Jehlum; 3 ♀♀, 2 Imm, *M. alb*a, 15 October 1998, GZScC Gujrat; 3 ♀♀, 2 Imm, *Broussonetia papyrifera*, 17 October 1998, GC Gujranwala; 3 Imm, *Pennisetum typhoides*, 23 October 1998, Bhakkar;1 ♀, *D. Sisso*, 24 October 1998, Uni. Sargodha; 2 ♀♀, *G. florida*, 29 October 1998, GC Okara; 2 ♀♀, *Dendrocalamus strictus*, 30 October 1998, Pattoki, Kasur ; 2 ♀♀, *Populus* spp., 25 June 2000, Shorkot City, Jhang.

Previous locality record

Pakistan: Sialkot, Punjab. India: Poona, Maharashtra, West Bengal; Sikkim; Meghalaya; Tripura; Gujarat.

Neoscona vigilans (Blackwall, 1865)

1865. *Epeira vigilans* Blackwall, *Ann. Mag. Nat. Hist.*, **16**: 342.
1878. *Araneus rumpfi* Thorell, *Ann. Mus. Civ. Stor. Nat.* Genova, **13**, 296.
1884. *Epeira rufo-femorata* Simon, *Ann. Mus. Civ. Stor. Nat.* Genova, **20**: 348.
1981. *Neoscona rumpfi* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, **24**: 18.

1984. *Araneus alternidens* Hu, *The Chinese Spiders collected from the Fields and the Forests*: 88.
1986. *Neoscona vigilans* Grasshoff, *Zool. Wetensch.*, **250**: 95.

This species was previously reported from Karachi, Sindh (Simon, 1884), and Peshawar, KPK (Arshad *et al*., 1984). It is first time recorded from the Punjab province in the present study.

Material examined

1 ♂, 3 Imm, *Dalbergia sisso*, 26 September 1998, FP Inayat, Layyah.

Previous locality record

Africa to Philippines. New Guinea. Pakistan: Karachi, Sindh; Peshawar, KPK. India: Chingleput, Ootacamund, Tamil Nadu; Banglore, Karnataka, Wager karour; Andhra Pradesh; Poona, Maharashtra; Orissa. China: Qinghai-Tibet Plateau and other areas.

Neoscona sinhagadensis (Tikader, 1975)

1975. *Araneus sinhagadensis* Tikader, *Proc. Indian Acad. Sci.*, **81**: 146.
1981. *Neoscona sinhagadensis* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, **24**: 30.

Previous record of the species from Pakistan was only from Sialkot, Punjab (Qadir 1997). Now this species is recorded from Rawalpindi, Sheikhupura, Kasur, Faisalabad, Jhang, Multan, Layyah and Mianwali from diverse vegetation including vegetables, crops and trees.

Material examined

2 ♀♀, 1 Imm, *Capsicum annum*, 22 July 1996, Shorkot City, Jhang;1 ♀, ♂, *Abelmoschus esculentus*, 22 July 1996, Shorkot City, Jhang; 1 ♂, 2 Imm, *Desmostachya bipinnata*, 5 August 1996, GC Shorkot, Jhang; 2 ♀♀, 1 ♂, 2 Imm, *Myrsine africanus*, 5 September 1996, FP Murree, Rawalpindi; 4 ♀♀, 1 ♂, 2 Imm, *Ervatamia coronaria*, 29 July 1997, UAF; 2 ♀♀, 1 ♂, 1 Imm, *Jasminum* spp., 30 July 1997, Botanical Garden, UAF; 3 Imm, *Cestrum nocturnum*, 23 August 1997, CRH Chimbranwali, Jhang; 5 ♀♀, *Sorghum bicolor*, 23 August 1997, CRH Muradwala, Jhang; 3 Imm, *Oryza sativa*, 30 August 1997, CRH Mud Baloochan, Sheikhupura; 2 ♀♀, *S. bicolor*, 5 September 1997, Mianwali; 3 ♀♀, *Gossypium hirsutum*, 6 September 1998, CRS Multan;1 ♀, 1 ♂, *Albizia* spp., 25 September 1998, FP Machu, Layyah; 3 ♀♀, 3 Imm, *Dalbergia sisso*, 31 October 1998, FP Changa Manga, Chunian, Kasur; 2 ♀♀, 1 Imm, *Populus* spp., 25 June 2000, Shorkot City, Jhang.

Previous locality record

Pakistan: Sialkot, Punjab. India: Sinhagad Fort, Poona, Maharashtra. China: Qinghai-Tibet Plateau, Xizang etc.

Neoscona theisi (Walckenaer, 1841)

1841. *Epeira theis* Walckenaer, *Hist. Nat. Ins. Apt.*, **2**: 53.
1847. *Epeira mangareva* Walckenaer, *Hist. Nat. Ins. Apt.*, **4**: 469.
1869. *Epeira braminica* Stoliczka, *J. Asiat. Soc. Beng.*, **38**: 238.
1877. *Epeira theisii* Thorell, *Ann. Mus. Civ. Stor. Nat.* Genova, **10**: 390.
1897. *Epeira obscura* Rainbow, *Mem. Aust. Mus.*, **3**: 116.
1904. *Neoscona theisi* F.O.P.-Cambridge, *Biol. Cen.-Amer. Zool.*, **2**: 470.

N. theisi was already reported from Sialkot, Punjab (Qadir, 1997), Lahore, Punjab (Butt and Siraj, 2006) and Kaghan, Northern Areas (Razzaq, 2002). This study reports its occurrence from large area of Punjab in good numbers on a variety of plants including vegetables, crops, fruit trees, ornamental and wild plants.

Material examined

2 ♀♀, 2 Imm, *Cucumis* spp., 29 July 1996, Shorkot City, Jhang; 2 ♀♀, 3 Imm, *Abelmoschus esculentus*, 23 July 1996, Shorkot City, Jhang;1 ♀, 1 Imm, *Colocasia esculenta*, 23 July 1996, Shorkot City, Jhang; 2 Imm, *Suaeda fruticosa*, 25 July 1996, FP Shorkot, Jhang; 1 ♂, *Mangifera indica*, 2 August 1996, Shorkot City, Jhang; 3 ♀♀, 2 ♂♂, 2 Imm, *Zizyphus spina-cristae*, 4 August 1996, Shorkot City, Jhang; 2 Imm, *Tamarix aphylla*, 5 August 1996, GC Shorkot City, Jhang; 2 Imm, *Tamarix aphylla*, 5 August 1996, Murree, Rawalpindi; 2 Imm, *Carissa opaca*, 6 September 1996, NP Margalla Hills Islamabad; 2 ♀♀, 2 Imm, *Ervatamia coronaria*, 26 July 1997, UAF; 2 ♀♀, *Thuja orientalis*, 29 July 1997, FH Rawalpindi;1 ♀, 1 ♂,

Myrsine africanus, 29 July 1997, Murree, Rawalpindi; 2 ♀♀, 2 ♂♂, *Pennisetum typhoides*, 23 August 1997, CRH Muradwala, Jhang; 5 Imm, *Saccharum officinarum*, 24 August 1997, CRH Khanuwana, Faisalabad;1 ♀, 1 ♂, *Dalbergia sisso*, 24 August 1997, CRH Burala, Jaranwala, Faisalabad; 2 ♀♀, *Callistemon lanceolatus*, 24 August 1997, CRH Tirkhani, Samundri, Faisalabad; 2 ♀♀, 3 ♂♂, 3 Imm, *Citrus aurantium*, 24 August 1997, CRH Dhamma, Gojra, TT Sing; 2 Imm; *Citrus limonia*, 30 August 1997, CRH Salarwala, Chak Jhumra, Faisalabad;1 ♀, 1 ♂, *Gossypium hirsutum*, 5 September 1998, Fadda, Mailsi, Vehari;1 ♀, 1 ♂, *Zea mays*, 6 September 1998, CRS Multan; 6 ♀♀, 5 Imm, *Oryza sativa*, 24 September 1998, Shorkot City, Jhang; 2 Imm, *G. hirsutum*, 27 September 1998, Khanpur Bagga Sher, Muzaffargarh; 1 ♂, *Saccharum munja*, 27 September 1998, FP Khanpur Bagga Sher Muzaffargarh; 2 ♀♀, *P. Typhoides*, 25 September 1998, N/B FP Inayat, Layyah; 4 ♀♀, 3 Imm, *S. munja*, 25 September 1998, FP Machu, Layyah; 2 ♀♀, 1 Imm, *D. sisso*, 26 September 1998, FP Inayat, 2 ♀♀, 1 ♂, *Cordia dichotoma*, 3 October 1998, GC Joharabad, Khushab;1 ♀, 1 ♂, *P. typhoides*, 4 October 1998, Kufri. Soan Valley, Khushab; 3 ♀♀, 1 ♂, *Z. mays*, 8 October 1998, Fazilpur, Rajanpur; 2 ♀♀, *Morus alba*, 16 October 1998, GMC Sialkot; 3 ♀♀, *Acacia nilotica*, 23 October 1998, FP Kundian, Mianwali; 2 ♀♀, *S. officinarum*, 23 October 1998, Muradwala, Mianwali; 2 ♀♀, *Lagistomia* spp., 29 October 1998, GSS Pakpattan; 4 ♀♀, *Lagistomia* spp., 30 October 1998, GC Okara; 3 ♀♀, *Populus* spp., 25 June 2000, Shorkot City Jhang.

Previous locality record

India, China to Pacific Is. Pakistan: Kaghan, Northern Areas, Sialkot, Punjab. India: Poona, Maharashtra; Orissa; Gujarat, West Bengal. China: Qinghai-Tibet Plateau, Hebei etc.

Neoscona shillongensis Tikader and Bal, 1981

1981. *Neoscona shillongensis* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, 24: 34.

This species was previously recorded from Kaghan, Northern Areas by Razzaq (2002). It is first time recorded from Punjab during the present study.

Material examined

2 ♀♀, 3 Imm, *Aesculus hippocastanum*, 29 July 1997, Murree, Rawalpindi.

Previous locality record

Pakistan: Kaghan, Northern Areas. India: Shillong, Meghalaya. China: Xizang, Qinghai-Tibet Plateau etc.

Neoscona pavida (Simon, 1906)

1906. *Araneus pavidus* Simon, *Ann. Soc. Ent. France*, 75: 309.
1981. *Neoscona pavida* Tikader and Bal, *Rec. Zool. Surv. India, Occ. Pap.*, 24: 38.

N. pavida (Simon) was recorded from Lahore by Dyal (1935), and Khatoon (1986). In this survey it is collected from Bahawalpur.

Material examined

2 ♀♀, 2 Imm, *Tamarix dioica*, 21 December 1997, FP Bahawalpur.

Previous locality record

Pakistan: Rawalpindi, Lahore, Punjab. India: Darjeeling, Pashok, West Bengal. China: Qighai-Tibet Plateau, Xizang etc.

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