New data on spider fauna from Golestan province, Iran (Arachnida, Araneae)

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Abstract

Spiders are poorly studied in Iran, based on the latest studies the spider fauna of Iran includes 394 species in 126 genera belonging to 36 families. Considering the climatic and geographical variation of Iran, it can be assumed that Iran has a rich spider fauna compared to the adjacent countries. The present study seeks to take a new step in the ongoing active research of Iranian spider fauna. Therefore, the spider fauna of Golestan Province were studied here. The main purpose of this study is to present new data on twenty-five new faunistic records for Golestan Province. According to previous studies 90 spider species were known in Golestan. This study was conducted during a period of two years. Samplings were performed using hand collecting and pitfall traps. As a result, twenty five species were identified as new records for Golestan Province, ten of which are new records for Iran including *Araneus marmoreus* Clerck, 1757, *Cyclosa sierra* Simon, 1870, *Gibbaranea* sp., *Singa semiatra* L. Koch, 1867, *Castianeira arnoldii* Charitonov, 1946, *Drassylus praeficus* (L. Koch, 1866), *Drassodex* sp., *Alopecosa* cf. *albofasciata* (Brullé, 1832), *Metellina* cf. *mengei* (Blackwall, 1870), and *Parasteatoda lunata* (Clerck, 1757). Furthermore, the family Corinnidae and the genus *Castianeira*, were recorded for the first time from Iran.

Keywords: Araneae, Spider, New record, Fauna, Iran, Golestan

Introduction

The order Araneae comprises more than 44000 known species in 3800 genera and 111 families (1). According to Coddington & Levi (2) this order ranks seventh in global diversity after the five largest insect orders (Coleoptra, Hymenoptera, Lepidoptera, Diptera, Hemiptera) and Acari (Arachnida) in terms of the described species, but since the Acari has been considered as several distinct orders (3), the spiders occupy the sixth rank. The first spider collection in Iran was made by Keyserling and Bienert in 1859 and its material is stored in the Zoological Institute, St. Petersburg (ZISP), while the first published record of spiders from Iran was presented by Simon (1874) describing *Eusparassus doriae* from Tehran (4). The first checklist for Iranian spider fauna was published in 2001 and encompassed 144 species in 21 families (5). The Iranian spider checklist was updated in 2006 and enhanced to 244 species in 33 families (6). Moreover, several papers were published on Iranian spiders and according to the available literature, the Iranian spider fauna includes 394 species in 126 genera and 36 families (4, 7-22), in which the Golestan spider fauna consisting 90 species in 63 genera and 21 families. In this study, the spider fauna of Golestan Province was studied. The study area is geographically limited to the north of Iran between the borders of Turkmenistan in the north and the Caspian Sea in the northwest. Previous researches on spiders of Golestan Province were conducted mainly by Ghavami (10, 11) and Ghavami et al. (12, 13). The main objective of this study is to provide new data on twenty-five new faunistic records for Golestan Province.
Materials and methods

The materials used for this study was collected over a two-year period (2010-2011) at 30 localities in Golestan Province (Fig. 1, Table 1). Fieldworks were performed during daytime. The geographic distribution of each species in the study area is shown in Figures 2-6. Specimens were collected by hand collecting method and pitfall traps and were fixed in 96% alcohol, labeled, and transferred to the laboratory for further studies. Species identifications were made following identification keys and other relevant papers such as Marusik (23), Marusik and Mikhailov (24), Levy (25). The specimens were photographed using an OLYMPUS DP-71 digital camera connected to OLYMPUS SZH-10 stereomicroscope. The specimens were housed in the Zoology Museum, Ferdowsi University of Mashhad, Iran (ZMFUM).

Table 1. List of geographic localities in the study area*

<table>
<thead>
<tr>
<th>Map code*</th>
<th>Locality</th>
<th>Longitude</th>
<th>Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agh Ghala</td>
<td>E 54° 28' 9.2''</td>
<td>N 37° 4' 25.8''</td>
</tr>
<tr>
<td>2</td>
<td>Amir Abad</td>
<td>E 54° 25' 36.24''</td>
<td>N 36° 52' 44.58''</td>
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<tr>
<td>3</td>
<td>Anjagland</td>
<td>E 54° 35' 34.32''</td>
<td>N 36° 51' 31.38''</td>
</tr>
<tr>
<td>4</td>
<td>Basir Abad</td>
<td>E 54° 7' 24.1''</td>
<td>N 36° 59' 45''</td>
</tr>
<tr>
<td>5</td>
<td>Bala Jadeh</td>
<td>E 54° 9' 37.3''</td>
<td>N 36° 46' 39.5''</td>
</tr>
<tr>
<td>6</td>
<td>Bandar Gaz</td>
<td>E 53° 5' 1.04''</td>
<td>N 36° 45' 59.76''</td>
</tr>
<tr>
<td>7</td>
<td>Galoogah</td>
<td>E 53° 52' 14.7''</td>
<td>N 36° 44' 24.6''</td>
</tr>
<tr>
<td>8</td>
<td>Ghorogh</td>
<td>E 54° 35' 34.08''</td>
<td>N 36° 52' 32.7''</td>
</tr>
<tr>
<td>9</td>
<td>Gomish Tappeh</td>
<td>E 54° 4' 52.2''</td>
<td>N 36° 56' 48.2''</td>
</tr>
<tr>
<td>10</td>
<td>Gorgan</td>
<td>E 54° 26' 12''</td>
<td>N 36° 50' 17.52''</td>
</tr>
<tr>
<td>11</td>
<td>Heydar Abad</td>
<td>E 54° 17' 22.2''</td>
<td>N 36° 50' 6.8''</td>
</tr>
<tr>
<td>12</td>
<td>Jelin</td>
<td>E 54° 31' 47.34''</td>
<td>N 36° 50' 57.84''</td>
</tr>
<tr>
<td>13</td>
<td>Kafshgiri</td>
<td>E 54° 17' 19.5''</td>
<td>N 36° 47' 30.9''</td>
</tr>
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<td>14</td>
<td>Karim Abad</td>
<td>E 54° 24' 21''</td>
<td>N 36° 53' 21''</td>
</tr>
<tr>
<td>15</td>
<td>Marzan Kalateh</td>
<td>E 54° 35' 54.18''</td>
<td>N 36° 57' 45.84''</td>
</tr>
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<td>16</td>
<td>Mian Dareh</td>
<td>E 54° 17' 19.1''</td>
<td>N 36° 50' 27.6''</td>
</tr>
<tr>
<td>17</td>
<td>Nahar Khoran</td>
<td>E 54° 34' 11.64''</td>
<td>N 36° 46' 6.76''</td>
</tr>
<tr>
<td>18</td>
<td>Nochaman</td>
<td>E 54° 18' 40.4''</td>
<td>N 36° 46' 18.6''</td>
</tr>
<tr>
<td>19</td>
<td>Nokandeh</td>
<td>E 53° 54' 6.84''</td>
<td>N 36° 42' 51.48''</td>
</tr>
<tr>
<td>20</td>
<td>Road side (50km to Gorgan)</td>
<td>E 54° 0' 27.72''</td>
<td>N 37° 6' 44.28''</td>
</tr>
<tr>
<td>21</td>
<td>Road side (32km to Gorgan)</td>
<td>E 54° 28' 45.12''</td>
<td>N 36° 47' 24.36''</td>
</tr>
<tr>
<td>22</td>
<td>Salī Kandeh</td>
<td>E 54° 4' 35.6''</td>
<td>N 36° 46' 33.5''</td>
</tr>
<tr>
<td>23</td>
<td>Seyed Miran</td>
<td>E 54° 16' 24''</td>
<td>N 36° 46' 16.8''</td>
</tr>
<tr>
<td>24</td>
<td>Shamooshak (Jungle)</td>
<td>E 54° 16' 29.5''</td>
<td>N 36° 45' 8.8''</td>
</tr>
<tr>
<td>25</td>
<td>Shamooshak Bala</td>
<td>E 54° 16' 23.88''</td>
<td>N 36° 46' 8.76''</td>
</tr>
<tr>
<td>26</td>
<td>Simin Shahr</td>
<td>E 54° 11' 39.84''</td>
<td>N 36° 46' 8.76''</td>
</tr>
<tr>
<td>27</td>
<td>Ulmagol Lake</td>
<td>E 54° 22' 58.8''</td>
<td>N 37° 21' 5.2''</td>
</tr>
<tr>
<td>28</td>
<td>Varsan</td>
<td>E 54° 19' 38.64''</td>
<td>N 36° 51' 5.76''</td>
</tr>
<tr>
<td>29</td>
<td>Vatna</td>
<td>E 53° 58' 21.72''</td>
<td>N 36° 44' 3.84''</td>
</tr>
<tr>
<td>30</td>
<td>Yesaghi</td>
<td>E 54° 14' 21.84''</td>
<td>N 36° 50' 12.84''</td>
</tr>
</tbody>
</table>

*Map codes correspond to the numbers presented in Figure 1.

Results

A total of 1012 specimens were collected, in which 49 species in 42 genera and 21 families were identified (Table 2). Dorsal and ventral habitus of each species is presented in Figures 7-12.

List of species

Family Agelenidae C. L. Koch, 1837
Agelena labyrinthica (Clerck, 1757)
Material examined
4 ♀, 1 juvenile, Karim Abad, 2.IX.2010 (FZMUM-AR-1121, 1219); 2 ♀, Marzan Kalateh, 13.IX.2010
Family Araneidae Clerck, 1757

Agalenatea redii (Scopoli, 1763)

Material examined
1♀, Nokandeh, 7.IX.2011 (FZMUM-AR-1055); 1♀, Vatna, 7.IX.2011 (FZMUM-AR-1056); 1♀, Nochaman, 11.V.2011 (FZMUM-AR-1057); 2♀, Agh Ghala, 5.V.2011 (FZMUM-AR-1058); 1♀, Shamooshak e Bala forest, 11.V.2011 (FZMUM-AR-1059).

Distribution
West Palaearctic to east Kazakhstan. IRAN: Golestan, Mazandaran.

Araneus angulatus Clerck, 1757

Material examined
8♀, 2♂ subadult, 4♀ subadult, Gorgan, 19.VII.2011 (FZMUM-AR-1033, 1035, 1038); 1♀, Seyed Miran, 16.IX.2011 (FZMUM-AR-1032); 1♀, Nochaman, 11.V.2011 (FZMUM-AR-1036); 1♂, Nahar Khoran, 18.IX.2011 (FZMUM-AR-1037).

Distribution
West Palaearctic. IRAN: Gilan, Golestan, Mazandaran, Semnan.

Araneus marmoreus Clerck, 1757

Material examined
30♀, 4♀ subadult, 1 juvenile, Amir Abad, 25.VIII.2010 (FZMUM-AR-1077, 1023, 1021, 1027); 6♀, Jelin, 7.IX.2010 (FZMUM-AR-1015, 1022); 37♀, Karim Abad, 2.IX.2010 (FZMUM-AR-1016, 1019, 1024); 5♀, Bala Jadeh, 6.V.2011 (FZMUM-AR-1017); 30♀, 7♂ subadult, Mian darch, 6.V.2011 (FZMUM-AR-1018); 3♀, Seyed Miran, 16.IX.2010 (ZFMUM-AR-1020); 6♀, Anjugland, 18.IX.2010 (FZMUM-AR-1025); 10♀, Marzan Kalateh, 18.IX.2010 (FZMUM-AR-1026).

Distribution
Holarctic (first record for Iran).

Araniella cucurbitina (Clerck, 1757)

Material examined
1♀, Gorgan, 10.V.2011 (FZMUM-AR-1039); 1♀, Shamooshak e Bala, 11.V.2011 (FZMUM-AR-1030); 1♀, Nochaman, 11.V.2011 (FZMUM-AR-1028); 4♀, Heydar Abad, 8.V.2011 (FZMUM-AR-1029, 1179).

Distribution
West Palaearctic. IRAN: Gilan, Golestan, Mazandaran.

Argiope bruennichi (Scopoli, 1772)

Material examined
1♂, 3♀ subadult, 1 juvenile, Karim Abad, 5.VI.2010 (FZMUM-AR-1166, 1012, 1120); 7♀, Amir Abad, 25.VIII.2010 (FZMUM-AR-1003, 1004, 1007); 1♀, Karim Abad, 14.IX.2010 (FZMUM-AR-1006); 12♀, 1 juvenile, Marzan Kalateh, 13.IX.2011 (FZMUM-AR-1001, 1009, 1013); 6♀, Jelin, 9.IX.2010 (FZMUM-AR-1002); 4♀, Seyed Miran, 16.IX.2010 (FZMUM-AR-1005); 11♀, 1♀ subadult, Anjugland, 18.IX.2010 (FZMUM-AR-1008); 1♀, Jelin, 7.IX.2010 (FZMUM-AR-1014).

Distribution
Palaeartic. IRAN: Chaharmahal and Bakhtiyari, Fars, Gilan, Golestan, Khorasan Razavi, Mazandaran, Qazvin, Zanjan.

Argiope lobata (Pallas, 1772)

Material examined
1♀, Ulmagol Lake, 5.V.2011 (FZMUM-Ar-1010); 1♀, Karim Abad, 14.IX.2011 (FZMUM-Ar-1011).

Distribution
Old World. IRAN: Ardebil, Fars, Golestan, Kerman, Khorasan Razavi, Khorasan Razavi, Mazandaran, South Khorasan, Tehran, Zanjan.

Cyclosa sierrae Simon, 1870

Material examined
7♀, Nokandeh, 6.V.2011 (FZMUM-Ar-1198).

Distribution
Europe to Iran (first record for Iran).

Cibbaranea sp.

Material examined
1♀, Nokandeh, 6.V.2011 (FZMUM-Ar-1225).

Distribution
This genus is widely distributed in Palaeartic,
Iran. (first record for Iran). Epigyne of our specimen is similar to *G. gibbosa* (Walckenaer, 1802) from Azerbaijan, but, the characteristics of the opisthosoma did not correspond to *G. gibbosa*. In this case, a precise taxonomic decision on the specific status of this species prior to study of more adult male and female specimens is impossible.

**Larinioides cf. cornutus** (Clerck, 1757)

Material examined
1♀, Karim Abad, 14.IX.2011 (FZMUM-Ar-1031).

Distribution
Holarctic. IRAN: Fars, Golestan, Kerman, Khorram-Abad, Mazandaran, West Azerbaycan.

**Mangora acalypha** (Walckenaer, 1802)

Material examined
10♀, 2juvenile, Gorgan, 10.V.2011 (FZMUM-Ar-1070, 1072, 1075); 5♂, Bandar Gaz, 17.V.2010 (FZMUM-AR-1066, 1119); 4♀, 1♂subadult, Shamooshak e Bala, 11.V.2011 (FZMUM-AR-1137, 1064); 14♀, 5juvenile, Nakandeh, 6.V.2011 (FZMUM-AR-1061); 16♀, 8juvenile, Nochaman, 11.V.2011 (FZMUM-AR-1062, 1118); 11♀, 10juvenile, Shamooshak e bala (Jungle), 11.V.2011 (FZMUM-AR-1063); 4♀, 3juvenile, Salikandeh, 6.V.2011 (FZMUM-AR-1065); 6juvenile, Vatna, 6.V.2011 (FZMUM-AR-1067); 1♀, Heydar Abad, 8.V.2011 (FZMUM-AR-1068); 6juvenile, Yesaghi, 6.V.2011 (FZMUM-AR-1069); 12♀, Kafshgiri, 11.V.2011 (FZMUM-AR-1071); 1juvenile, Bala Jadeh, 6.V.2011 (FZMUM-AR-1103).

Distribution
West Palaearctic. IRAN: Ardebil, Esfahan, Gilan, Golestan, Mazandaran, Qazvin.

**Neoscona adianta** (Walckenaer, 1802)

Material examined
10♀, 9♂subadult, Marzan Kalateh, 12.IX.2010 (FZMUM-AR-1114, 1040, 1041); 1juvenile, Salikandeh, 7.IX.2011 (FZMUM-AR-1073); 2♀, Bala Jadeh, 6.V.2011 (FZMUM-AR-1104); 2♀, 2♂, 1juvenile, Shamooshak e Bala, 6.V.2011 (FZMUM-AR-1115, 1168); 1♂subadult, 4juvenile, Nochaman, 11.V.2011 (FZMUM-AR-1116); 1♀, 2♂subadult, 1juvenile, Anjugland, 18.IX.2010 (FZMUM-AR-1047); 3♀, 1♂subadult, Seyed Miran, 16.IX.2010 (FZMUM-AR-1043); 2♀, Yesaghi, 6.V.2011 (FZMUM-AR-1042); 1♀, Gomish Tappeh, 5.V.2011 (FZMUM-AR-1044); 1♂subadult, Vatna, 6.V.2011 (FZMUM-AR-1045); 1juvenile, Heydar Abad, 8.V.2011 (FZMUM-AR-1046). 1♀, 1♂, 1juvenile, Galogogah, 11.V.2011 (FZMUM-AR-1048, 1117). 1♂, Shamooshak e bala (Jungle), 6.V.2011, leg. R. Kashefi, (FZMUM-AR-1169).

Distribution
Palaearctic. IRAN: Ardebil, Esfahan, Gilan, Golestan, Kordestan, Mazandaran, Qazvin.

**Neoscona subfuscus** (C. L. Koch, 1837)

Material examined
1♀, 3♂subadult, 2♂subadult, 5juvenile, Heydar Abad, 8.V.2011 (FZMUM-AR-1049); 1♀, Marzan Kalateh, 18.IX.2011 (FZMUM-AR-1050); 2♀, Karim Abad, 2.IX.2010 (FZMUM-AR-1051, 1052); 2♀, Anjugland, 18.IX.2010 (FZMUM-AR-1053); 1♀, Amir Abad, 25.VIII.2010 (FZMUM-AR-1054).

Distribution
West Palaearctic. IRAN: Kerman, Mazandaran (first record for Golestan).

**Singa semiatra** L. Koch, 1867

Material examined
1♀, ca. 50 km NW of Gorgan, 6.V.2011 (FZMUM-AR-1060); 1♀, Agh Ghala, 5.V.2011 (FZMUM-AR-1076).

Distribution
Mediterranean, Iran (first record for Iran).

**Family Clubionidae** Wagner, 1887

**Clubiona neglecta** O. P.-Cambridge, 1862

Material examined
1♀, Karim Abad, 5.VII.2010 (FZMUM-AR-1167).

Distribution
Palaearctic. IRAN: Ardebil, Golestan, Kordestan.

**Family Corinnidae** Karsch, 1880

**Castianeira arnoldii** Charitonov, 1946

Material examined
Distribution
Turkmenistan, Uzbekistan, Iran (first record for Iran). This is the first record of the family Corinnidae and the genus *Castianeira* from Iran.

**Family Gnaphosidae Pocock, 1898**

*Drassyllus praeficus* (L. Koch, 1866)

**Material examined**
1♀, Shamooshak e bala, 11.V.2011 (FZMUM-AR-1140); 3♀, Nochaman, 11.V.2011 (FZMUM-AR-1142); 12♀, Varsan, 8.V.2011 (FZMUM-AR-1141, 1177).

**Distribution**
Europe, Central Asia, Iran (first record for Iran).

*Drassodex sp.*

**Material examined**
1♀, Gorgan, 12.VII.2011 (FZMUM-AR-1173).

**Distribution**
This genus is distributed in Europe and Turkmenistan and reported for the first time from Iran. According to examination of a single female it is likely to be an undescribed species. Final taxonomic decision is impossible without male specimens.

*Nomisia ripariensis* (O. P.-Cambridge, 1872)

**Material examined**
1♀, Simin Shahr, 6.V.2011 (FZMUM-AR-1160).

**Distribution**
Eastern Europe to Iran. IRAN: Kerman, Mazandaran. (first record for Golestan).

*Zelotes longipes* (L. Koch, 1866)

**Material examined**
1♀, Gomish Tappeh, 5.V.2011 (FZMUM-AR-1220).

**Distribution**

**Family Linyphiidae Blackwall, 1859**

*Frontinellina frutetorum* (C. L. Koch, 1834)

**Material examined**
1♀, Varsan, 8.V.2011 (FZMUM-AR-1203); 8♀, Bala Jadeh, 6.V.2011 (FZMUM-AR-1204); 5♀, 1♂, Baseer Abad, 5.V.2011 (FZMUM-AR-1205); 1♀, Heydar Abad, 8.V.2011 (FZMUM-AR-1206); 16♀, 3♂, 1juvenile, Gorgan, 10.V.2011 (FZMUM-AR-1207, 1209); 16♀, 1♂subadult, Gorgan, 31.VIII.2011 (FZMUM-AR-1208); 2♀, Yesaghi, 6.V.2011 (FZMUM-AR-1210); 4♀, 5♂, Vatna, 6.V.2011 (FZMUM-AR-1211); 4♀, Nokandeh, 6.V.2011 (FZMUM-AR-1212); 8♀, Shamooshak e Bala, 11.V.2011 (FZMUM-AR-1213); 1♀subadult, Karim Abad, 14.IX.2010 (FZMUM-AR-1214); 4♀, 1♂, Kafshgeeri, 11.V.2011 (FZMUM-AR-1215).

**Distribution**
West Palaearctic. IRAN: Gilan, Golestan, Ilam, Mazandaran, North Khorasan, Qazvin, Tehran, Zanjan.

*Arctosa tbilisiensis* Mcheidze, 1946

**Material examined**
1♂ subadult, 15juvenile, Karim Abad, 2.IX.2010 (FZMUM-AR-1113, 1097); 5♀, 1juvenile, Agh Ghala, 5.V.2011 (FZMUM-AR-1098); 1♀subadult, Basir Abad, 5.V.2011 (FZMUM-AR-1096); 2♀, 4juvenile, Nochaman, 11.V.2011 (FZMUM-AR-1100, 1101); 1juvenile, Kafshgiri, 11.V.2011 (FZMUM-AR-1094); 1♀, 1♂, 2♀subadult, 1juvenile, Varsan, 8.V.2011 (FZMUM-AR-1099); 1♀, Karim Abad, 2.IX.2010 (FZMUM-AR-1095).

**Distribution**
Eastern Mediterranean, Central Asia, Iran. IRAN: Ilam (first record for Golestan).

*Pardosa sp.*

**Material examined**
4♀, 1♂, 1juvenile, Karim Abad, 2.IX.2010 (FZMUM-AR-1190); 3♀, 1♂, 3juvenile, Karim Abad, 5.VII.2010 (FZMUM-AR-1191); 4♀, 1♂subadult, 3juvenile, Karim Abad, 14.IX.2010 (FZMUM-AR-1192); 4♀, Anjugland, 18.IX.2010 (FZMUM-AR-1216); 22♀, 65♂, 1juvenile, Agh Ghala, 5.V.2011 (FZMUM-AR-1181, 1182, 1183, 1185); 1♀, Ghorogh Jungle, 17.IX.2010 (FZMUM-AR-1184); 1♀, Salikandeh, 6.V.2011

**Comment:** This species belongs to *Pardosa monticola*-species group, but, species determination requires further examinations.

**Pardosa pontica** (Thorell, 1875)

**Material examined**

4♂, Karim Abad, 5.VII.2010 (FZMUM-AR-1244, 1245).

**Distribution**

East Mediterranean, Caucasus to Turkmenistan, Iran. IRAN: Golestan, Tehran.

**Pirata piraticus** (Clerck, 1757)

**Material examined**

18♀, 1♂ subadult, Ijuvenile, Karim Abad, 5.VII.2010 (FZMUM-AR-1180).

**Distribution**

Holarctic. IRAN: Azerbayjan, Esfahan, Gilan, Golestan, Mazandaran.

**Trochosa sp.**

**Material examined**

1♀, Karim Abad, 5.VII.2010 (FZMUM-AR-1245).

**Distribution**


**Family Nemesiidae Simon, 1889**

**Raveniola niedermeyeri** (Brignoli, 1972)

**Material examined**

Ijuvenile, Gorgan, 12.V.2011 (FZMUM-AR-1222).

**Distribution**

This species is endemic to Iran (Zonstein & Marusik, 2010). IRAN: Esfahan, Golestan, Khorasan Razavi, Mazandaran, Tehran. The specimen was identified following Zonstein & Marusik (2010).

**Family Oxyopidae Thorell, 1870**

**Oxyopes lineatus** Latreille, 1806

**Material examined**

1♀, Karim Abad, 5.VII.2010 (FZMUM-AR-1146); 1♂, Anjugland, 18.IX.2010 (FZMUM-AR-1144); 1♀, Agh Ghala, 5.V.2011 (FZMUM-AR-1143); 1♀, Road Side, ca. 50 km NW of Gorgan, 6.V.2011 (FZMUM-AR-1145).

**Distribution**

Western parts of Palaearctic. IRAN: Azerbayjan, Golestan, Tehran.

**Thanatus cf. vulgaris** Simon, 1870

**Material examined**

1♀, 2♂ subadult, 2♀ subadult, Varsan, 8.V.2011 (FZMUM-AR-1153).

**Distribution**

Holarctic. IRAN: Tehran (first record for Golestan).

**Family Philodromidae Thorell, 1870**

**Tibellus oblongus** (Walckenaer, 1802)

**Material examined**

Ijuvenile, Anjugland, 18.IX.2010 (FZMUM-AR-1139); 1♀, 1♂, 3♂ subadult,7♀ subadult, Karim Abad, 5.VII.2010 (FZMUM-AR-1138).

**Distribution**

Holarctic. IRAN: Ardebil, Gilan, Golestan, Mazandaran, Semnan, Tehran.
Family Pholcidae C. L. Koch, 1850

*Pholcus phalangioides* (Fuesslin, 1775)

Material examined

5♀, 7juvenile, Gorgan, 31.VI.2010 (FZMUM-AR-1107, 1108).

Distribution

Cosmopolitan. IRAN: Gilan, Golestan.

Family Pisauridae Simon, 1890

*Pisaura* sp.

Material examined

2juvenile, Anjugland, 18.IX.2010 (FZMUM-AR-1158, 1176); 1juvenile, Agh Ghala, 5.V.2011 (FZMUM-AR-1159).

Distribution

This genus has wide distribution in Palaearctic. This family is known in Iran with one species, *Pisaura mirabilis* (Clerck, 1757), which has been recorded from Gilan, Ardebil, Semnan, Mazandaran and Fars. This record represents a new family and genus for Golestan Province.

Family Salticidae Blackwall, 1841

*Aelurillus* sp.

Material examined


Distribution


*Cyrba ocellata* (Kroneberg, 1876)

Material examined

1♀, Gorgan, 15.VI.2011 (FZMUM-AR-1162).

Distribution

Somalia, Sudan to China, Central Asia, Australia, Iran. IRAN: Mazandaran, Tehran (first record for Golestan).

*Phlegra fasciata* (Hahn, 1826)

Material examined

1♀, Agh Ghala, 5.V.2011 (FZMUM-AR-1154).

Distribution

Palaearctic. IRAN: Mazandaran (first record for Golestan).

*Plexippus paykulli* (Audouin, 1826)

Material examined

1♀, Amir Abad, 5.IX.2010 (FZMUM-AR-1081); 2♀subadult, Karim Abad, 2.IX.2010 (FZMUM-AR-1080, 1172); 1♀, Jelin, 9.IX.2010 (FZMUM-AR-1082); 1♀, 1♂subadult, 2juvenile, Karim Abad, 14.IX.2010 (FZMUM-AR-1083, 1171); 1♀, Agh Ghala, 5.V.2011 (FZMUM-AR-1084); 1♀, Shamooshak e Bala, 11.V.2011 (FZMUM-AR-1085); 2♀, 1♂subadult, 3♂, 2juveniles, Gorgan, 31.VI.2010 (FZMUM-AR-1086); 5♀, 2♂, 1juvenile, Gorgan, 22.V.2011 (FZMUM-AR-1087); 1♀, 1♂, Gorgan, 10.V.2011 (FZMUM-AR-1088); 2♂subadult, Varsan, 8.V.2011 (FZMUM-AR-1089).

Distribution

Cosmopolitan. IRAN: Esfahan, Golestan, Khoozestan, Mazandaran.

*Thyene imperialis* (Rossi, 1846)

Material examined

1♀subadult, Karim Abad, 2.IX.2010 (FZMUM-AR-1078).

Distribution


Family Scytodidae Blackwall, 1864

*Scytodes thoracica* (Latreille, 1802)

Material examined

1♂, 1♀subadult, 2juveniles, Gorgan, 12.VIII.2011 (FZMUM-AR-1106).
Distribution
Holarctic. IRAN: Gilan, Golestan, Khorasan Razavi, Mazandaran, Zanjan.

Family Sicariidae Keyserling, 1880
Loxosceles sp.
Material examined
1juvenile, Gorgan, 5.VI.2011 (FZMUM-AR-1105).
Comment: This family and genus has been recorded only from Tehran. This is first record of the family and genus in Golestan.

Family Tetragnathidae Menge, 1866
Metellina cf. mengei (Blackwall, 1870)
Material examined
1♀, Salikandeh, 6.V.2011 (FZMUM-AR-1223).
Distribution
Europe to Georgia, Iran (first record for Iran).

Tetragnatha extensa (Linnaeus, 1758)
Material examined
50♀, 1♂, 13♀subadult, 4♂subadult, 22juveniles, Anjugalnd, 18.IX.2010 (FZMUMU-AR-1090, 1092, 1163); 3juveniles, Karim Abad, 5.VII.2010 (FZMUM-AR-1091); 3♀subadult, Seyed Miran, 16.IX.2010 (FZMUM-AR-1093).
Distribution
Holarctic. IRAN: Gilan, Golestan, Mazandaran, Qazvin, West Azerbaycan.

Family Theridiidae Sundevall, 1833
Parasteatoda lunata (Clerck, 1757)
Material examined
2♀, Shamooshak e Bala, 11.V.2011 (FZMUM-AR-1201); 27♀, Nokandeh, 6.V.2011 (FZMUM-AR-1200).
Distribution
Palaearctic (first record for Iran).

Steatoda paykulliana (Walckenaer, 1805)
Material examined
1♀, Karim Abad, 14.IX.2010 (FZMUM-AR-1149); 1♀subadult, Jelin, 15.IX.2010 (FZMUM-AR-1151); 1♂, 1♀, Gorgan, 16.IX.2011 (FZMUM-AR-1148).
Distribution
Mediterranean to Central Asia, Iran. IRAN: Ardebol, Fars, Golestan, Ilam, Khorasan Razavi, Mazandaran, Semnan and Tehran.

Steatoda triangulosa (Walckenaer, 1802)
Material examined
1♀, Karim Abad, 5.VII.2010 (FZMUM-AR-1147); 1♀, Gorgan, 31.VI.2010 (FZMUM-AR-1150).
Distribution
Cosmopolitan. IRAN: Esfahan (first record for Golestan).

Family Thomisidae Sundevall, 1833
Xysticus kochi Thorell, 1872
Material examined
1♀, Yesaghi, 6.V.2011 (FZMUM-AR-1111).
Distribution
Europe, Mediterranean to Central Asia, Iran. IRAN: Azebaycan, Gilan, Golestan, Khorasan Razavi, Mazandaran and Tehran.

Family Titanoeidae Lehtinen, 1967
Nurscia albomaculata (Lucas, 1846)
Material examined
1♀juvenile, Agh Ghala, 5.V.2011 (FZMUM-AR-1132); 3♀juvenile, Kafshgiri, 11.V.2011 (FZMUM-AR-1164); 1♂juvenile, Varsan, 8.V.2011 (FZMUM-AR-1126); 2♂juvenile, Karim Abad, 14.IX.2010 (FZMUM-AR-1129).
Distribution
Europe, Egypt to Central Asia, Iran. IRAN: Mazandaran (first record for Golestan).

Family Uloboridae Thorell, 1869
Ulloborus walckenaerius Latreille, 1806
Material examined
1juvenile, Bandar Gaz, 2.IX.2010 (FZMUM-AR-1132); 1♂, Anjugalnd, 18.IX.2010 (FZMUM-AR-1131); 1juveniles, Agh Ghala, 5.V.2011 (FZMUM-AR-1134); 1juveniles, Gomish Tappeh, 5.V.2011 (FZMUM-AR-1133); 1♀, 1juveniles, Yesaghi, 6.V.2011 (FZMUM-AR-1135); 1♀, ca. 32 km to NW of Gorgan, 5.V.2011 (FZMUM-AR-1130).
Distribution
Palaearctic. IRAN: Khorasan Razavi, Lorestan and Tehran. This is the first record of this family from Golestan Province.
Discussion

A total of 1012 specimens were collected in this study, including 49 species in 42 genera and 21 families. Twenty five species were recorded for the first time from Golestan Province. Moreover, it was revealed that ten species were new to Iran. Families Pisauridae, Sicariidae, Uloboridae and Titanocidae were recorded for the first time from Golestan Province and the family Corinnidae was recorded for the first time from Iran. Notably, Drassodex sp. from the family Gnaphosidae, is likely to be a new species based on the examination of a single adult female, however, due to lacking males its species status could not be determined precisely.

According to available checklists and recently published literature, Golestan Province spider fauna consists of 90 species in 63 genera and 21 families and the spider fauna of Iran comprises 394 species in 126 genera and 36 families (4, 7-9, 14-19, Ghavami, 2006). Furthermore, the genera Gibbaraneae, Castianiera, Drassodex and Metellina are recorded for the first time from Iran. Considering the results of this study spider fauna of Iran is enhanced to 404 species in 130 genera and 37 families and the number of spider species of Golestan Province increased to 115 species in 70 genera and 25 families. The comparison of Golestan spider fauna with the spider fauna of Turkmenistan revealed also high similarity in family (100%), genus (87.14%) and species levels (40%). This finding confirms the importance of the northeastern parts of the Iranian Plateau as a zoogeographic transitional zone between the western Mediterranean/Iran and eastern mountains of Central Asia/Himalayas (15, 26).

The results of this study revealed the high species diversity in the spider fauna of Golestan Province. According to Ghahari & Marusik (15), the diversity of spiders in adjacent countries and results of the present study it seems likely that the real species diversity of spiders in Iran exceeds 900 species in more than 40 families.

Figure 1. Distribution of sampling localities (The numbers correspond to map codes in Table 1).
Figure 2. Geographic distribution of Agelena labyrinthica, Agalenatea redii, Araneus angulatus, A. marmoreus, Araniella cucurbitina, Argiope lobata, A. bruennichi and Cyclosa sierra in the study area.

Figure 3. Geographic distribution of Gibbaranea sp., Larinioides cf. cornutus, Mangora acalypha, Neoscona adianta, N. subfusca, Singa semiatra, Clubiona neglecta, Casianeira arnoldii, Drassyllus praeficus and Drassodex sp. in the study area.

Figure 4. Geographic distribution of Nomisia ripariensis, Zelotes longipes, Frontinellina frutetorum, Alopecosa cf. albofasciata, Arctosa tbilisiensis, Pardosa sp., P. pontica, Pirata piraticus, Trochosa sp., Chieracanthium erraticum and Raveniola neidermeyeri in the study area.
Figure 5. Geographic distribution of Oxyopes lineatus, Thanatus cf. vulgaris, Tibellus oblongus, Pholcus phalangioides, Pisaura sp., Aelurillus sp., Cybra algerina, C. ocellata, Phlegra fasciata and Plexippus paykulli in the study area.

Figure 6. Geographic distribution of Thyene imperialis, Scytodes thoracica, Loxosceles sp., Metellina cf. mengei, Tetragnatha extensa, Parasteatoda lunata, Steatoda paykulliana, S. triangulosa, Xysticus kochi, Nurscia albomaculata and Uloborus walckenaerius in the study area.
Figure 7. Dorsal and Ventral habitus of identified species in this study. (a, b) Agelena labyrinthica, (c, d) Agalenatea redii, (e, f) Araneus angulatus, (g, h) Araneus marmoreus, (i, j) Araniella cucurbitina, (k, l) Argoipe bruennichi, (m, n) Argiope lobata, (o, p) Cyclosa sierrae.

Figure 8. Dorsal and Ventral habitus of identified species in this study. (a, b) Gibbaranea sp., (c, d) Larinioides cf. conutus, (e,f) Mangora acalyphe (g, h) Neoscona adianta, (i, j) Neoscona subfuscus, (k, l) singa semiatra, (m, n) Clubiona neglecta, (o, p) Castianeira arnoldii.
Figure 9. Dorsal and Ventral habitus of identified species in this study. (a, b) Drassodex sp., (c, d) Drassyllus praeficus, (e, f) Nomisia ripariensis, (g, h) Zelotes longipes, (i, j) Frontinellina frutetorum, (k, l) Alopecosa cf. albofasciata, (m, n) Arctosa tbilisiensis, (o, p) Pardosa sp.

Figure 10. Dorsal and Ventral habitus of identified species in this study. (a, b) Pardosa pontica, (c, d) Pirata piraticus, (e, f) Trochosa sp., (g, h) Chieracantium erraticum, (i, j) Raveniola niedermeyeri, (k, l) Oxyopes lineatus, (m, n) Thanatus cf. vulgaris, (o, p) Tibellus oblongus, (q, r) Pholcus phalangioides, (s, t) Pisaura sp.
Figure 11. Dorsal and Ventral habitus of identified species in this study. (a, b) Aelurillus sp., (c, d) Cyrrha algerina, (e, f) Cyrrha ocellata, (g, h) Phlegra fasciata, (i, j) Plexippus paykulli, (k, l) Thyene imperialis, (m, n) Loxosceles sp., (o, p) Scytodes thoracica.

Figure 12. Dorsal and Ventral habitus of identified species in this study. (a, b) Metellina cf. mengei, (c, d) Tetragnatha extensa, (e, f) Parasteatoda lunata, (g, h) Steatoda paykulliana, (i, j) Steatoda triangulosa, (k, l) Xysticus kochi, (m, n) Nurscia albonitula, (o, p) Uloborus walcenaerius.
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References


