Checklist of the Solifugae (Arachnida) of Iraq

Контрольный список сольпуг (Arachnida: Solifugae) Ирака

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KEY WORDS: solifuge, camel spider, checklist, literature review, fauna, Iraq.

КЛЮЧЕВЫЕ СЛОВА: сольпуга, контрольный список, обзор литературы, фауна, Ирак.

ABSTRACT. A checklist of all taxa of the order Solifugae from Iraq is presented. The checklist is based on the compilation of data gathered from published records up to now. This list comprises 21 species and 3 subspecies belonging to 11 genera distributed in 4 families, Daesiidae, Galeolidae, Karschiidae and Rhagodidae. It comprises of one endemic genus; Rhagodopus, and four endemic species; Galeodes adamsi (Turk, 1947), G. lawrencei Harvey, 2002 (Galeoldiae), Rhagodixa kurdistanica (Birula, 1936) and Rhagodospus babylonicus (Birula, 1935) (Rhagodidae). Two previously overlooked species, Gluviopsilla discolor (Kraepelin, 1889) (Daesiidae) and Galeodes bacillifer Pocock, 1900 (Galeolidae) are included in the list. Altogether, five species erroneously reported from the country are omitted from the checklist; Galeodes bacilliferoides Roewer, 1934, G. starmuehlneri Roewer, 1952, G. sulfuripes Roewer, 1934, G. taurus (Roewer, 1934) and Gylippus (Gylippus) syriacus (Simon, 1872). This study provides more detailed and comprehensive documentation of solifugids in Iraq.

Introduction

About 1,100 species of solifuges are found throughout the world [Harvey, 2003]. Studies of solifuges in Iraq date back over a century. The first solifugid specimens from Iraq were examined by Butler in 1873. Pocock [1895] described two species from Fao in Iraq. Substantial contributions were made by Kraepelin [1901], Birula [1905a, b] and Hirst [1908]. Later, the publication on Iraqi Solifugae fauna continued with the study of Penther [1913]. He described two species and recorded four species from Iraq. Three years later, one of the diurnal solifugids (Paragaleodes nesterovi Birula, 1916) was described from Wesne, Iraq, by Birula [1916]. The most important contribution to the fauna of Iraq was made by Roewer, who not only added 11 species to the list but also described four new species from Iraq [Roewer, 1933, 1934, 1941, 1952]. Three additional species were described by Birula [1935a, b, 1936]. Solifugid records from Iraq have been scarce after the works of Birula. In the comprehensive catalogue of the Solifugids of the Senckenberg Museum, Zilch [1946] listed four species for Iraq. Next year, Turk [1947] described a galeoid from Habbaniyah. A few years later, Lawrence [1953] recorded four species from several localities in Iraq.

Solifugids of Iraq have not been rather thoroughly collected and studied with new specimens in the last decades [El-Hennawy, 1998; Gromov, 2003]. However, checklists and catalogues help to understand the current distribution patterns of the Solifugae in Iraq. El-Hennawy [1999] provided a synopsis of Solifugae, including a key to family and genera and a checklist of species of all Arabian countries. He listed a total of 13 species of solifugids from Iraq in his checklist. Later, Harvey [2002] detected two homonyms and provided replacement names that were described from Iraq (Galeodes gromovi Harvey, 2002 and G. lawrencei Harvey, 2002). In 2003, Harvey presented a useful catalogue that has compiled all available data about Solifugae, including 20 species and two subspecies from Iraq.
In recent years, there have been no relevant papers on camel spider fauna of Iraq except the works of Hussen, Ahmed [2017] and Al-Khazali [2021]. These are the first scientific papers published on Solifugae by Iraqi researchers.

The aim of the updated checklist is to provide more information to Harvey’s catalogue on Solifugae by adding all published data and bringing together all the scattered literature. Furthermore, this work summarizes the current knowledge about the diversity of Solifugae of Iraq and can serve as a database for future studies.

Methods

The annotated species checklist is based on a thorough review of the literature on the solifuges of Iraq. Families, genera and species are listed alphabetically. Taxonomic arrangement, nomenclature and general distribution are mainly based on Harvey [2003]. The references cited for each species are ordered chronologically, and the literature records are given within brackets. The records are derived from a variety of published sources, excluding all dubious and erroneous data. The endemic species of Iraq are also mentioned in the list. Additional comments are provided for species for which annotations are necessary for the remarks section. A distributional map is given based on the reviewed and revised relevant published data sources (Fig. 1). The originally cited exact localities are shown in Table 1, while some species cited as “Iraq, Mesopotamien, Mesopotamien Iraq and südlichen Kurdistan, etc.” are not listed in the table. Finally, to avoid confusion with given species in the following list, omitted species are listed under “Omissions from the list”.

Table 1. Main distributional data on the species and subspecies of Solifugae present in Iraq. Таблица 1. Данные о распространении видов и подвидов сольпуг в Ираке.

<table>
<thead>
<tr>
<th>Recorded species</th>
<th>Locality (as indicated in literature)</th>
<th>Locality (in actual)</th>
<th>Locality (abbreviation in map, Fig. 1)</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
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</tr>
<tr>
<td><em>Gluviopilla discolor</em> (Kraepelin, 1899)</td>
<td>Assur</td>
<td>Ashur, Ash Sharqat, Salah al-Din Province</td>
<td>A</td>
</tr>
<tr>
<td><em>Gluviopsis rufescens</em> (Pocock, 1897)</td>
<td>Assur</td>
<td>Ashur, Ash Sharqat, Salah al-Din Province</td>
<td>A</td>
</tr>
<tr>
<td><em>Galeodes adamsi</em> (Turk, 1947)</td>
<td>Habbaniya</td>
<td>Al Habbaniyah, Al-Anbar Province</td>
<td>B</td>
</tr>
<tr>
<td><em>Galeodes arbabs C.L. Koch, 1842</em></td>
<td>Baghdad</td>
<td>Baghdad Province</td>
<td>C</td>
</tr>
<tr>
<td><em>Galeodes araneoides</em> (Pallas, 1772)</td>
<td>Baghdad</td>
<td>Baghdad Province</td>
<td>C</td>
</tr>
<tr>
<td><em>Galeodes babylonicus</em> Roewer, 1934</td>
<td>Ruinen von Babylon</td>
<td>Babylon ancient site, Babil Province</td>
<td>F</td>
</tr>
<tr>
<td><em>Galeodes bacillifer</em> Pocock, 1900</td>
<td>Baghdad</td>
<td>Baghdad Province</td>
<td>C</td>
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<tr>
<td><em>Galeodes bogojaevskii</em> Birula, 1906</td>
<td>Necif</td>
<td>Najaf, Al-Nacaf Province</td>
<td>G</td>
</tr>
<tr>
<td><em>Galeodes caspius subfuscus</em> Birula, 1937</td>
<td>Erbil, Arbil Province</td>
<td>Erbil, Arbil Province</td>
<td>H</td>
</tr>
<tr>
<td><em>Galeodes darius</em> Pocock, 1895</td>
<td>Fao</td>
<td>Al-Faw, Al-Basrah Province</td>
<td>I</td>
</tr>
<tr>
<td><em>Galeodes gromovi</em> Harvey, 2002</td>
<td>Baghdad</td>
<td>Baghdad Province</td>
<td>C</td>
</tr>
<tr>
<td><em>Galeodes lacertosus</em> Roewer, 1934</td>
<td>Necif</td>
<td>Najaf, Al-Nacaf Province</td>
<td>G</td>
</tr>
<tr>
<td><em>Galeodes laniator</em> Roewer, 1934</td>
<td>Kerbela</td>
<td>Karbala Province</td>
<td>J</td>
</tr>
<tr>
<td><em>Galeodes lawrencei</em> Harvey, 2002</td>
<td>Basrah</td>
<td>Al-Basrah Province</td>
<td>K</td>
</tr>
<tr>
<td><em>Galeodopsis cyrus</em> (Pocock, 1895)</td>
<td>Fao</td>
<td>Al-Faw, Al-Basrah Province</td>
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Table 1 (continued).
Таблица 1 (продолжение).

<table>
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<tr>
<td></td>
<td></td>
<td><strong>Paragaleodes nesterovi</strong> Birula, 1916</td>
<td>Wesne</td>
<td>V</td>
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<td></td>
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<td></td>
<td>Vasneh Pass is border between Al-Sulaymaniyah Province, Iraq and Azarbayjan-e Gharbi Province, Iran (just north of Kani Rash Pass and the main pass to Alvatan Village, Iran)</td>
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<tr>
<td></td>
<td></td>
<td><strong>Karschia (Karschia) kurdistanica</strong> Birula, 1935</td>
<td>Kaniresch</td>
<td>L</td>
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<td></td>
<td></td>
<td></td>
<td>Kani Rash Pass is border between Al-Sulaymaniyah Province, Iraq, and Azarbayjan-e Gharbi Province, Iran</td>
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<td></td>
<td></td>
<td><strong>Assur</strong></td>
<td>Ashur, Ash Sharqat, Salah al-Din Province</td>
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<td></td>
<td></td>
<td><strong>Bara</strong></td>
<td>Bara is an old village 4.5 km northwest of Samouka, Sinjar, Nineveh Province</td>
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<td></td>
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<td><strong>El’Abid</strong></td>
<td>Al Abid, Nasiriyah, Dhi Qar Province</td>
<td>N</td>
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<td></td>
<td></td>
<td><strong>Gajara</strong></td>
<td>Al Qayyarah, Mosul District, Nineveh Province</td>
<td>O</td>
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<tr>
<td></td>
<td></td>
<td><strong>Charnina</strong></td>
<td>Hawi al Kharminah is located on the right bank of the Tigris River, 25 km north of Tikrit, Salah al-Din Province</td>
<td>T</td>
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<tr>
<td></td>
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<td><strong>Samoidja</strong></td>
<td>Samouka is a village 30 km northwest of Sinjar, Nineveh Province</td>
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<td></td>
<td></td>
<td><strong>Assur</strong></td>
<td>Ashur, Ash Sharqat, Salah al-Din Province</td>
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</tr>
<tr>
<td></td>
<td></td>
<td><strong>Gajara</strong></td>
<td>Al Qayyarah, Mosul District, Nineveh Province</td>
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<td></td>
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<td><strong>Wadi Sefa</strong></td>
<td>Wadi Safa, 14 km southeast of Hatra, Nineveh Province</td>
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<td><strong>Tikrit</strong></td>
<td>Tikrit, Salah al-Din Province</td>
<td>Q</td>
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<tr>
<td></td>
<td></td>
<td><strong>Rhagodixa kurdistanica</strong> (Birula, 1936)</td>
<td>Erbil, Arbil Province</td>
<td>H</td>
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<tr>
<td></td>
<td>Rhagodorta zorab (Birula, 1905)</td>
<td>Tal Afar</td>
<td>Tal Afar, Nineveh Province</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Rhagodospus babylonicus (Birula, 1935)</td>
<td>Ruinen Baksai</td>
<td>Ash Shahabi, Wasit Province</td>
<td>S</td>
</tr>
</tbody>
</table>

**Table 1 (continued).**

**Таблица 1 (продолжение).**

Results

The Solifugae fauna of Iraq is composed of 21 species and three subspecies included in 11 genera and four families. Among the different families of Iraqi solifuges, Galeodidae with 13 species and two subspecies in three genera is the most speciose family, followed by Rhagodidae (five species in five genera) and Daesiidae (two species and one subspecies in two genera). On the other hand, the family Karschiidae is represented by a single species, *Karschia (Karschia) kurDISTANICA*, *Galeodes adamsi*, *Rhagodixa kurDISTANICA* and *Rhagodospus babylonicus* (Rhagodidae) are endemic species of the Solifugae...
fauna of Iraq. Two species reported from Iraq were found to be missing from all previous solifuges catalogues or checklists, including Harvey’s [2003]: *Gluviospilla discolour* (Daesiidae) and *Galeodes bacillifer* (Galeoidae). However, the record of *Galeodes bacilliferoidea*, *G. starmuehlneri*, *G. sulfuripes* and *G. tau-
srus* (Galeoidae) and *Glyippus (Glyippidae) syriacus* (Glyippidae) are removed from the Iraqi solifuges fauna. These species were excluded from the main species list and listed as omitted. They are presented below with remarks about their exclusion.

**List of species**

**Family Daesiidae**

*Gluviospilla discolour* (Kraepelin, 1899)

LITERATURE RECORDS: Zilch [1946]: 128 (Assur). REMARKS: The presence in Iraq was not reported by Harvey [2003], but Zilch [1946] recorded from Assur. Thus, the species was added to the list.

GENERAL DISTRIBUTION: Somalia, Algeria, Greece (Rhodes), Syria, Turkey, and Iran [Harvey, 2003; Hossein-pour et al., 2020].

*Gluviospilla fuscens* (Pocock, 1897)

LITERATURE RECORDS: Pocock [1895]: 81 (Fao, on the Persian Gulf); Kraepelin [1901]: 17 (Persien (Fao)); Hirst [1908]: 241 (Fao, Persia); Roewer [1934]: 547 (Fao); Harvey [2003]: 260 (Iraq). REMARKS: Known only from the type locality and endemic to Iraq.

**Family Galeoidae**

*Galeodes adamsi* (Turk, 1947)

LITERATURE RECORDS: Turk [1947]: 77–80 (Hab-baniya, near Baghdad); El-Hennawy [1999]: 90 (Iraq); Harvey [2003]: 256 (Habbania, near Baghdad, Al Anbar, Iraq). REMARKS: Known only from the type locality and endemic to Iraq.

*Galeodes arabs* C.L. Koch, 1842

LITERATURE RECORDS: Pocock [1895]: 77 (Bagh-dad, Euphrates, Iraq); Penther [1913]: 107 (nordlischen und südlichen Mesopotamien); Roewer [1934]: 532 (Mesopotamien: Mosul, Amara); El-Hennawy [1998]: 18 (Iraq); El-Hennawy [1999]: 84 (Iraq); Harvey [2003]: 257 (Iraq). GENERAL DISTRIBUTION: Algeria, Djibouti, Egypt, Ethiopia, Iran, Iraq, Israel, Kenya, Libya, Morocco, Niger, Oman, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, and Yemen [Harvey, 2003].

*Galeodes arabs arabs* C.L. Koch, 1842

LITERATURE RECORDS: Harvey [2003]: 257 (Iraq).

*Galeodes araneoides* (Pallas, 1772)

LITERATURE RECORDS: Butler [1873]: 418 (Bagh-dad); Penther [1913]: 107 (nordlischen und südlichen Me-
osopotamien); Roewer [1959]: 35 (Mesopotamien); El-Hennawy [1998]: 19 (Iraq); El-Hennawy [1999]: 84 (Iraq); Harvey [2003]: 258 (Iraq). GENERAL DISTRIBUTION: Afghanistan, Armenia, Azerbaijan, Egypt, Iran, Iraq, Israel, Kazakhstan, Russia, Syria, Türkiye, Turkmenistan, and Ukraine [Harvey, 2003].

*Galeodes babylonicus* Roewer, 1934

LITERATURE RECORDS: Roewer [1934]: 524 (Mesopotamien). 532 (Mesopotamien: Ruinen von Babylon); Zilch [1946]: 143 (Mesopotamien: Ruinen v. Babylon); El-Hennawy [1999]: 84 (Iraq); Harvey [2003]: 259 (Babylon (ancient site), Babil, Iraq).

REMARKS: It was first described from Babil in Iraq by Roewer [1934]. Later, the species was recorded from Israel by Levy & Shulov [1964].

*Galeodes bacillifer* Pocock, 1900

LITERATURE RECORDS: Lawrence [1953]: 120 (Bagdad).

REMARKS: *G. bacillifer* is known from Afghanistan, Iran, Pakistan [Harvey, 2003]. The occurrence of this species was reported from Bagdad, Iraq by Lawrence [1953]. So, *G. bacillifer* was included in the list.

*Galeodes bogojavlenskii* Birula, 1906

LITERATURE RECORDS: Lawrence [1953]: 120 (Ne-jif, Iraq); Harvey [2003]: 260 (Iraq).

*Galeodes caspius subfuscus* Birula, 1937


GENERAL DISTRIBUTION: Kazakhstan, Kyrgyzstan [Harvey, 2003], and Iraq [Hussen, Ahmed, 2017].

*Galeodes darius* Pocock, 1895

LITERATURE RECORDS: Pocock [1895]: 81 (Fao, on the Persian Gulf); Kraepelin [1901]: 17 (Persien (Fao)); Birula [1905a]: 260 (Südost-Persien, Fao, on the Persian Gulf); Hirst [1908]: 241 (Fao, Persia); Roewer [1934]: 547 (Fao); Harvey [2003]: 262 (Al Faw (as Fao), Al Basrah, Iraq).

GENERAL DISTRIBUTION: Iraq, and Israel [Harvey, 2003].

*Galeodes gromovi* Harvey, 2002

LITERATURE RECORDS: Roewer [1941]: 162–163 (Mesopotamien: Wilajet Bagdad u. Mossul); El-Hennawy [1999]: 84 (Iraq); Harvey [2002]: 452 (Iraq); Harvey [2003]: 264 (several localities in Iraq).

GENERAL DISTRIBUTION: Azerbaijan, Iraq, and Türkiye [Harvey, 2003].

*Galeodes lacertosus* Roewer, 1934

LITERATURE RECORDS: Lawrence [1953]: 120 (Ne-jif, Iraq); Harvey [2003]: 265 (Iraq).

GENERAL DISTRIBUTION: Iraq, Saudi Arabia, and Yemen [Harvey, 2003].

*Galeodes laniator* Roewer, 1934

LITERATURE RECORDS: Roewer [1934]: 532 (Mesopotamien: Kerbela); Zilch [1946]: 145 (Mesopotamien, Kerbela); El-Hennawy [1999]: 86 (Iraq); Harvey [2003]: 265 (Karbala’ (as Kerbela), Karbala’, Iraq).
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GENERAL DISTRIBUTION: Iraq, and Israel [Harvey, 2003].

Galeodes lawrencei Harvey, 2002
LITERATURE RECORDS: Harvey [2002]: 452 (Basrah, Iraq); Harvey [2003]: 266 (Al Basrah (as Basrah), Al Basrah, Iraq).

REMARKS: Endemic for Iraqi fauna.

Galeodopsis cyrus (Pocock, 1895)
LITERATURE RECORDS: Pocock [1895]: 80 (Fao, on the Persian Gulf); Kräepelin [1901]: 16 (Persien (Fao)); Roewer [1934]: 549 (Fao am pers. Golf); Harvey [2003]: 274 (Al Faw (as Fao), Al Basrah, Iraq).

GENERAL DISTRIBUTION: Iran, Iraq, Pakistan, and Saudi Arabia [Harvey, 2003].

Paragaleodes nestorovii Birula, 1916
LITERATURE RECORDS: Birula [1916]: 74 (Mossul at Wesne); Roewer [1934]: 532 (Mesopotamien: Prov. Mosul: Wesné, Pendshwin, Shenié); El-Hennawy [1999]: 87 (Iraq); Harvey [2003]: 275 (Wesné, Mosul, Ninawa, Iraq).

GENERAL DISTRIBUTION: Azerbaijan, Iraqi, and Türkiye [Birula, 1916; Roewer, 1934; Bird et al., 2015] and Iran [Hosseinipour et al., 2020].

Family Karschiidae

Karschia (Karschia) kurdistanica Birula, 1935
LITERATURE RECORDS: Birula [1935a]: 304 (Gebirgsland Kurdistan (Vorderasien), Umgebung von Kaniresch); Roewer [1941]: 111 (Kurdistan (bei Kaniresch)); El-Hennawy [1999]: 93 (Iraq?); Gromov [2003]: 83 (NE Iraq); Harvey [2003]: 286 (Sulaymaniyah, Iraq).

REMARKS: The species were described from Kani Rash [=Kaniresch] Pass, the border between Sulaymaniyah Prov., Iraq, and Azarbayjan-e Gharbi Prov., Iran, thus, its locality is indicated from both Iraq and Iran.

GENERAL DISTRIBUTION: Iran and Iraq [Harvey, 2003].

Family Rhagodidae

Rhagodia obscurior Penther, 1913
LITERATURE RECORDS: Penther [1913]: 108 (Assur-Kal’at Schergat, Barm, El’Abid, Gajara, Zwischen Samoidja und Charmina); Roewer [1933]: 281 (Mesopotamien (Assur, Charmina)); El-Hennawy [1999]: 96 (Iraq); Harvey [2003]: 297 (Ash Sharqat (as Assur (Kal’at Schergat)), Ninawa, Iraq; El’Abid, Dhi Qar, Iraq; Gajara, Iraq; between Samoidja and Charmina, Iraq).

REMARKS: Penther [1913] recorded this species from Khatuniyah, Syria (as Chatunije), and other authors followed this record as Chatunije (is called variously Chatunia, Katynmja, Khatunieh, Khatuniyeh, Khatuniy, Khatounie). Iraq [El-Hennawy, 1999; Harvey, 2003], since the village is located in Syria, near the border between Syria and Iraq.

GENERAL DISTRIBUTION: Iraq and Türkiye [Harvey, 2003].

Rhagodius caeanaicus Penther, 1913
LITERATURE RECORDS: Penther [1913]: 107 (Assur-Kal’at Schergat, Wadi Sefa, Gajara); Roewer [1933]: 279 (Mesopotamien (Assur, Wadi Sefa, Gajara); Zilch [1946]: 121 (Mesopotamien: Assur); El-Hennawy [1999]: 97 (Iraq); Harvey [2003]: 298 (Ash Sharqat (as Assur (Kal’at Schergat)), Ninawa, Iraq; Wadi Sefa, Iraq; Gajara, Iraq; Al-Khazali [2021]: 475, 476 (Salah al-Din Province, Tikrit District).

GENERAL DISTRIBUTION: Iraq and Israel [Harvey, 2003].

Rhagodia kurdistanica Birula, 1936

REMARKS: R. kurdistanica, which is known only from the type locality Kani-Palanka, Nomadenlager Dar-Dedaban, Iraq [Birula, 1936] and the locality is not seen in the current map and old maps. Regarding “Nomadenlager Dar-Dedaban” (nomad camp door sentry). Nomadenlager is a German word meaning nomad camp and Dar-Dedaban is a Persian word meaning door sentry. So, it is understood from the label that the specimen collector was a nomad camp door sentry. On the other hand, this species is recently reported from northern Iraq [Hussen, Ahmed, 2017], R. kurdistanica is endemic to the fauna of Iraq.

Rhagodorta zorab (Birula, 1905)
LITERATURE RECORDS: Lawrence [1953]: 111 (Tal Afar area, west of Mosul, Iraq); Harvey [2003]: 302 (Iraq).

GENERAL DISTRIBUTION: Iran, Iraq, and Saudi Arabia [Harvey, 2003].

Rhagodopsis babylonicus (Birula, 1935)
LITERATURE RECORDS: Birula [1935b]: 318 (Mesopotamien, Ruinen Baksai, ein wenig östl. on St. Mendeli); Roewer [1941]: 105 (Mesopotamien (Ruinen von Baksai, wenig östl. on St. Mendeli)); El-Hennawy [1999]: 98 (Iraq); Harvey [2003]: 302 (Ash Shahabi (as Ruinen Baksai), Wasit, Iraq).

REMARKS: The genus Rhagodopsis and the species R. babylonicus are known only from the type locality and endemic to Iraq.

Omissions from the list

Family Galeoididae

Galeodes bacilliferoides Roewer, 1934
LITERATURE RECORDS: Roewer [1934]: 529 (Iraq, Ashshemi); El-Hennawy [1999]: 85 (Iraq); Harvey [2003]: 259 (Iraq).

REMARKS: Roewer [1934] discovered that the specimens collected from Iraq-Ashshemi, Dorf Risa-abad, had misidentified as G. bacillifer by Birula [1905b]. And, he described a new species as G. bacilliferoides. This species is known from Iraq, Iran, Pakistan [El-Hennawy, 1999; Harvey, 2003]. Birula [1905b] recorded it from Central-Iran. The type and paratype materials of G. bacilliferoides were collected by Nikolai A. Zarudny in 1904. Sissom and Fet [1998] analyzed Zarudny’s excursions route and were able to trace localities of Birula’s collections. These localities are found between Ahvaz and Esfahan in Iran. During the Ottoman Empire period, this area is also located in the region
called “Irak Acemi” [S. emseddin, 1889]. In this area, the localities are cited as “Iraq-Adjemī” or “Iraq-Adshemi” by Birula. This species is therefore excluded from the present list.

_Galeodes starmuehleri_ Roewer, 1952

LITERATURE RECORDS: Roewer [1952]: 511 (100 km east of Routbah [Iraq]).

REMARKS: Specimens listed by Roewer [1952] also include samples collected from Iraq. This specimen was an immature and he was not able to identify. Therefore, _G. starmuehleri_ is excluded from the list of solifuges in Iraq.

_Galeodes sulfuripes_ Roewer, 1934

LITERATURE RECORDS: Roewer [1934]: 532 (Mesopotamien: west of Mosul); Zilch [1946]: 147 (Kleinasien: Diarbekr (w. Mossul)); El-Hennawy [1999]: 88 (Iraq); Harvey [2003]: 271 (W. Mosul, Ninawa, Iraq). Thus, I accept and follow the restriction of Zilch [1946] and SMF database. Thus, I exclude this species from the checklist, until reliable evidence of its occurrence in Iraq is provided.

_Galeodes taurus_ (Roewer, 1934)

LITERATURE RECORDS: El-Hennawy [1999]: 89 (Iraq).

REMARKS: El-Hennawy [1999] erroneously added _G. taurus_ to the list. This species was described from the specimens collected in Mesopotamien (Taurus, nördl. Diarbekr) [Roewer, 1934]. Zilch [1946] restricted the locality as “Taurus Gebirge: n. Diarbekr” in Turkey when Harvey [2003] restricted the locality as west of Mosul, Ninawa, Iraq and include _G. sulfuripes_ in the list for Iraq. And also, SMF (Forschungsinstitut und Natur-Museum Senckenberg) corrected the locality as Turkey, Diarbekr (westl. Mossul). Thus, I accept and follow the restriction of Zilch [1946] and SMF database. Thus, I exclude this species from the checklist, until reliable evidence of its occurrence in Iraq is provided.

Family Gylippidae

_Gylippus (Gylippus) syriacus_ (Simon, 1872)

LITERATURE RECORDS: Penther [1913]: 107 (Tez Charab); El-Hennawy [1999]: 91 (Iraq); Harvey [2003]: 278 (Iraq).

REMARKS: This species was recorded in “Tez Charab” by Penther [1913] and other authors followed this record [El-Hennawy, 1999; Harvey, 2003]. In old maps, Tez Charab (= kiztepe Köyü) is a village of Mardin Province in Turkey. The village’s old name is also known as “Têzxerab” in the Kurdish language. kiztepe Köyü is located on the border between Turkey and Iraq, 31 km east of Nasuybin, Mardin and lies between 37°6’3.9”E and 41°34’18.8”N longitude and latitude. Therefore, _G. syriacus_ is omitted from the list of solifuges in Iraq.

Discussion

The data from the present study show that there are 21 species and three subspecies of solifuges, which represent approximately 2.2% of all Solifugae species known from the world. It is, therefore, reasonable to assume that the Solifugae fauna in Iraq is underestimated and poorly studied. This lower number of Iraq species could possibly be due to the fact that the majority of the investigations have been restricted to historical places, leaving other areas unexplored and in previous studies “direct hand collecting” was the principal method. On the other hand, most of the previous studies on Solifugae of Iraq have been conducted in the eastern part of the country. Further investigations must be performed in order to collect a more complete knowledge of the solifuges fauna of this country.

Of the 21 species and three subspecies of solifuges species recorded from Iraq, two species in this checklist constitute an addition to the Harvey’ [2003] list: _Gluevipsilla discoulor_ (Daesiidae) and _Galeodes bacillifer_ (Galeodidae). Among these species, only _Galeodes adamsi_ (Caucasusidae), _Rhagodixa kurdistanica_ and _Rhagodopus babylonicus_ (Rhagodidae) can be considered endemic. However, _Rhagoduspus_ genus is known to be endemic to Iraq. Overall, 13 species have a type locality from Iraqi specimens: _Galeodes adamsi_, _G. babylonicus_, _G. darius_, _G. grovöti_, _G. laniator_, _G. lawrencei_, _GaleodOPSIS cyrus_, _Paragaieodes nesterovi_, _Karschia (Karschia) kurdistanica_, _Rhagodixa obscurior_, _Rhagodinina caenacensis_, _Rhagodixan kurdistanica_, and _Rhagoduspus babylonicus_. Many species are only known from a single locality (e.g. endemic species), while others show extremely wide distribution range (e.g. _GaleodOPSIS cyrus_ is distributed in Iraq, Iran, Pakistan, and Arabia and, _Paragaieodes nesterovi_ occurs in Iraq, Azerbaijan, Turkey, and Iran [Hosseinpour et al., 2020]). Although these species are widespread, they have only been found from one locality in Iraq. Additional investigation is required for the species from Iraq that have been recorded from a single locality.

The following four solifuges species previously reported for Iraq are doubtful and are probably inaccurate. While they occur in neighboring regions, their existences have not yet been confirmed in Iraq by the subsequent studies. The species _Galeodes taurus_ was mistakenly reported from Iraq by El-Hennawy [1999]. Checking the original reference [Roewer, 1934] the specimen was from Turkey not from Iraq. Similarly, the presence of _G. bacilliferoides_ in Iraq by Roewer [1934] seems to be erroneous and the actual presence of this species in Iraq remains dubious. These localities may have been within the historical borders of Iraq at the time of species collection. The locality of _G. sulfuripes_ is restricted to Turkey by Zilch [1946] while Harvey [2003] restricted to the north of Iraq. For this reason, the record of this species from Iraq is also questionable. Roewer [1952] listed an immature specimen under the name of _G. starmuehleri_, but he could not determine. The identification of this species thus remains uncertain. _Gylippus (Gylippus) syriacus_ occurs in Cyprus, Israel, Syria, and Turkey [Harvey, 2003].

Galeodids and rhagodids are also taxonomically very diverse and very difficult to identify, especially
for species that are only known by a few specimens and those that are described or identified from a single specimen or sex. Furthermore, most problems regarding their identification are related to the rarity of specimens of rhagodids, gylippids and karschiids. By far, the vast majority of Iraqi solifuges species, according to their activity pattern (diurnal or nocturnal), are nocturnal; only *Paragaleodes nesterovi* is diurnal. The sampling method and sampling different habitats are important for the collection of rare species. Rhagodids and gylippids are short-legged, karschiids are small-sized solifuges, thus, the pitfall trap method and using portable ultraviolet light [Hrušková-Martišová et al., 2008; Gromov, 2000; Koč, 2011] are effective for collecting a great number of solifuges species. Light attraction and pitfall trap sampling are most often used inventory methods for solifuges sampling [Cushing, González-Santillán, 2018]. Additional field trips with these methods will probably lead to new discoveries.

The results of this checklist cover a complete bibliography on Iraqi Solifugae, as well as all the literature that is related to Solifugae studies in Iraq. Despite being a comprehensive bibliographical review, the checklist remains incomplete because previous studies have limited sampling efforts and insufficient taxonomic knowledge of Iraqi solifuges. Only some old references recorded most of the species from Iraq, and some of which have not yet been re-collected in the country. The scarce collections and limited literature using only one sampling method (active sampling or hand collecting) present difficulties in identifying and assessing the distribution patterns of solifuges in Iraq. Therefore, many areas of Iraq should be sampled in order for future research to reveal additional species. This was confirmed by Hussen & Ahmed [2017]. The results in the present study contribute to increase the knowledge on the diversity and distribution of solifuges in Iraq and can serve as a reference for future studies.

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