

**Annotated check-list of the antlions of Iran (Neuroptera:
Myrmeleontidae)**

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ABSTRACT. Annotated check-list of the antlions of Iran (Neuroptera: Myrmeleontidae).

This review of the antlion fauna of Iran names 97 species in the current list of antlion records, 9 of them are new to the Iranian fauna. Sampling dates and locations in Iran with their geographical coordinates are given. A list of Iranian antlion species deposited in museums or personal collections worldwide is also given.

KEY WORDS: Neuropterida, Neuroptera, Myrmeleontidae, distribution, new records, faunistics, Iran.

INTRODUCTION

Several different provinces of Iran, such as Beluchistan, Fars, Golestan, Hamedan, Hormozgan, Kermanshah, Khorassan, and Kurdistan, were surveyed and antlions (Insecta, Neuroptera, Myrmeleontidae) belonging to different genera were captured. A hand-net was used for catching the specimens. The senior author identified and published a list of 39 species of Neuroptera, collected in different parts of Iran (MIRMOAYEDI 1998a); another list of 16 species was published in 1999 (MIRMOAYEDI *et al.* 1999); finally, a list of 23 species, among them three new species for the fauna of Iran, was published in 2002 (MIRMOAYEDI 2002). The following list is an updated one of the Iranian Myrmeleontidae, to which three species, newly recorded by the senior author in 2007, have been added (MIRMOAYEDI 2007a).

MATERIAL AND METHODS

The genitalia of the male specimens are kept in glycerine in small plastic vials; all the materials collected by the senior author are preserved as pinned dry material in the insect collection of the Department of Plant Protection, Razi University, Kermanshah, Iran. Some of the localities of capture of antlions by the senior author are abbreviated, others fully cited, in the text; altitudes and geographical coordinates have been added.

1 – Kermanshah (Kermanshah prov.) 1320 m , 34°26'N, 46°40'E

2 – Tang Kenesht (Kermanshah prov.) 1300 m, 34°20'N, 47°06'E

3 – Shalinghaleh Mashad (Khorassan Razvi) 966 m, 36°17'N, 59°36'E

4 – Razab Marivan (Kurdistan prov.) 1312 m, 35°31'N, 46°10'E

Another group of records belongs to the identifications of the Iranian collections by co-authors: Victor Krivokhatsky and Roland Dobosz, which are deposited in different museums and can be accessed in the open Internet database at: <http://www.zin.ru/projects/zinsecta/eng/ZInsecta.asp>. Most of the Iranian collection in the Upper Silesian Museum, Bytom, was revised by L. Ábráham.

Other species names included in the list belong to the records of antlions definitively identified and acceptance in systematics. Thus, the present state of the list is far from complete. Our review covers 150 recent taxa of Myrmeleontidae (without intersubspecies, morphotypes and genospecies) inhabiting Iran within its present-day boundaries. Our intention is to intensify research activity into Iranian Neuroptera.

The specimens are deposited at the following institutions:

CAS – Natural History Museum, California Academy of Sciences, San Francisco, USA

HNHM – Hungarian Natural History Museum, Budapest, Hungary

KPC – Kermanshah Plant Protection Insect Collection, Iran

USMB – Upper Silesian Museum, Bytom, Poland

ZIN – Zoological Institute Antlion Collection, St. Petersburg, Russia

♂ = male, ♀ = female.

The classification of Myrmeleontidae according to KRIVOKHATSKY (1998a, 2011) has been employed.

LIST OF SPECIES

Family **Myrmeleontidae** LATREILLE, 1802

Subfamily **Echthromyrmicinae** MARKL, 1954

Genus **Echthromyrmex** McLACHLAN, 1867

1. *Echthromyrmex platypterus* McLACHLAN, 1867

2♀, 01.07.2005, prov. Fars, Jasiqun [Jezin?] 30°01'N/53°09'E, a = 1843 m, leg. L. Ábráham (USMB 5858/468, USMB 5858/475); 1♀, 04.07.2005, prov. Yazd, Mazraehye Taqi 31°34.949'N/53°49.387'E, leg. L. Ábráham (USMB 5858/470).

Iraq, Afganistan (ASPÖCK *et al.* 2001).

New for Iran.

Subfamily **Palparinae** BANKS, 1911

Genus **Palpares** RAMBUR, 1842

2. *Palpares libelluloides* (LINNAEUS, 1764)

MIRMOAYEDI *et al.* 1999; MIRMOAYEDI 2002.

Genus **Parapalpares** INSOM & CARFI, 1988

3. *Parapalpares dispar* (NAVÁS, 1912)

1♂, Kermanshah, 10.08.1992, (ZIN: '*Echthromyrmex platypterus* – Mirmoayedi det'.–

misidentification; '*Palpares dispar* – Krivokhatsky det. 1997) – MIRMOAYEDI 1998a: (erroneously identified as *Echthromyrmex platypterus* nec McLACHLAN).

4. *Parapalpares solidus* (GERSTAECKER, 1893)

MIRMOAYEDI 1998a, 2002; MIRMOAYEDI *et al.* 1999.

1♂, 2♀, 01.07.2005, prov. Fars, Jasiqun [Jezin?] 30°01'N/53°09'E, a = 1843 m, leg. L.

Ábráham (USMB 5858/627, USMB 5858/622, USMB 5858/641).

Subfamily **Pseudimarinae** MARKL, 1954

Tribe **Pseudimarini** MARKL, 1954

Genus ***Pseudimares*** KIMMINS, 1933

5. *Pseudimares iris* KIMMINS, 1933

KIMMINS 1933; ASPÖCK & ASPÖCK 2009.

Subfamily **Acanthaclisinae** NAVÁS, 1912

Genus ***Acanthaclisis*** RAMBUR, 1842

6. *Acanthaclisis obscura* HÖLZEL, 1972

1♀, 01.07.2005, prov. Fars, Jasiqun [Jezin?] 30°00.757'N/53°08.530'E, a = 1843 m, leg. L.

Ábráham (USMB 5858/660).

Afghanistan (OSWALD 2014). New for Iran.

7. *Acanthaclisis occitanica* (VILLERS, 1789) *morpha typica*

HÖLZEL 1972; MIRMOAYEDI 2002.

Including:

8. *Acanthaclisis occitanica morpha nigrilenta* KRIVOKHATSKY, 2005

holotype, 1♀, paratype, 1♂, Nehbandan, Khorasan, E. Iran, 26–30.06.1901 (N. Zarudny)

(ZIN) – KRIVOKHATSKY 2005.

9. *Acanthaclisis pallida* McLACHLAN, 1887

HÖLZEL 1972.

Subfamily **Dendroleontinae** BANKS, 1899

Tribe **Dendroleontini** BANKS, 1899

Genus ***Afghanoleon*** HÖLZEL, 1972

10. *Afghanoleon flavomaculatus* HÖLZEL, 1972

HÖLZEL 1972.

Subfamily **Glenurinae** BANKS, 1927

Tribe **Glenurini** BANKS, 1927

Genus ***Megistopus*** RAMBUR, 1842

11. *Megistopus flavicornis* (ROSSI, 1790)

HÖLZEL 1972.

Genus *Nedroledon* NAVÁS, 191412. *Nedroledon iranensis* HÖLZEL, 1972

HÖLZEL 1972.

- 1 ♀, 26.06.2005, prov. Hamadan, Nehavand 34°02.756'N 48°22.614'E, a = 1851 m, leg. L. Ábrahám (USMB 5858/1014); 1 ♂, 1 ♀, 29.06.2005, prov. Fars, Chesmedye Chenar [Chellegah??] 30°20.505'N 51°57.324'E, a = 2892 m, leg. L. Ábrahám (USMB 5858/1189, USMB 5858/1011); 1 ♂ – 8.07.2005, prov. Mazandaran, between Pel [Pil] and Valiabad 36°13.344'N 51°23.965'E, a = 2523 m, leg. L. Ábrahám (USMB 5858/1174).

13. *Nedroleon striatus* HÖLZEL, 1972.

HÖLZEL 1972; KRIVOKHATSKY 1998a.

- 1 ♂, 14.04.2004, Lár, leg. Juhász I. (USMB 5858/1081); 1 ♀, 30.06.2005, prov. Fars, Ganjegin [Ganjeh Gun] 30°30.133'N 51°42.386'E, a = 2417 m, leg. Ábrahám L. (USMB 5858/1082).

Tribe *Gymnocnemini* NAVÁS, 1912Genus *Gymnocnemia* SCHNEIDER, 184514. *Gymnocnemia variegata* SCHNEIDER, 1845

- 1 ♂, 19.08.2000, Tuyserkar (Hamedan prov.), 34°33'N, 48°27'E (MIRMOAYEDI, KPC).

Subfamily *Nemoleontinae* BANKS, 1911Tribe *Distoleontini* TILLYARD, 1916Genus *Distoleon* BANKS, 191015. *Distoleon annulatus* (KLUG, 1834)

HÖLZEL 1972.

16. *Distoleon formosus* HÖLZEL, 1972

HÖLZEL 1972.

17. *Distoleon kabulensis* HÖLZEL, 1972

HÖLZEL 1972.

- 3 ♂, 02.07.2005, prov. Fars, near spring of Sahlabad 20°17'N 53°44'E, a = 2269 m, leg. Ábrahám L. (USMB 5858/1000; USMB 5858/1115, USMB 5858/1195).

18. *Distoleon tetragrammicus* (FABRICIUS, 1798)

HÖLZEL 1972.

Tribe *Neuroleontini* NAVÁS, 1912Genus *Quinemurus* KIMMINS, 194319. *Quinemurus cinereus* KIMMINS, 1943

HÖLZEL 1972.

Genus *Neuroleon* NAVÁS, 190920. *Neuroleon asirensis* HÖLZEL, 1983

- 1 ♀, 13.04.2004, Hajiabad [Hajjiabad], leg. Hác T. & Benedek B. (USMB 5858/1171). Saudi Arabia, Oman (ASPÖCK *et al.* 2001). New for Iran.

21. *Neuroleon assimilis* (NAVÁS, 1914)
 ASPÖCK *et al.* 1980.
 1♀, 25.06.2005, prov. Kurdystan, Faqih Soleyman [Faq-i-Sulaiman], 35°05.085'N/46°54.118'E,
 leg. L. Ábráham (USMB 5858/1312).
22. *Neuroleon erato* HÖLZEL, 1972
 HÖLZEL 1972.
23. *Neuroleon fanaticus* (McLACHLAN, 1875)
 HÖLZEL 1972; KRIVOKHATSKY 1998b.
 2♀, 26–27.06.2000, prov. Khorasan, 10 km S of Mashad [Mashhad], leg. Rozner Gy. (USMB
 5858/1281, USMB 5858/1321).
24. *Neuroleon diana* HÖLZEL, 1972
 HÖLZEL 1972, MIRMOAYEDI 2002.
 4♀, 02.07.2005, prov. Fars, near spring of Sahlabad 20°17'N 53°44'E, a = 2269 m, leg. Ábráham
 L. (USMB 5858/1249, USMB 5858/1266, USMB 5858/1339, USMB 5858/1342).
25. *Neuroleon demeter* (HÖLZEL, 1972)
 1♂, 06.07.1997, Razab Village, Marivan, (Mirmoayedi, KPC); 1♂, 07.07.2000, p. Esfahan,
 Daran, a = 2300 m, leg. Hác T., Kőszegi G. (USMB 5858/13629); 1♀, 29.06.2005, prov.
 Fars, Chesmedye Chenar [Chellegah??] 30°20.505'N 51°57.324'E, a = 2892 m, leg. L.
 Ábráham (USMB 5858/13621).
 Afghanistan (OSWALD 2014). New for Iran.
26. *Neuroleon jucundus* NAVÁS, 1921
 MIRMOAYEDI *et al.* 1999; STANGE 2004: 204; (KRIVOKHATSKY 1998b): 427, figure 2) for false
 indication of Turkey instead of Turkmenistan.
27. *Neuroleon lukhtanovi* KRIVOKHATSKY, 1996.
 MIRMOAYEDI *et al.* 1999.
 1♂, Heraug [Herau], leg. Juhász I. (USMB 5858/1362); 1♂, 12.04.2004, Quir előtt [before] 15
 km Firuzabad 28–30°N/52–54°E, leg. Hác T. & Benedek B. (USMB 5858/1425).
28. *Neuroleon leptaleus* (NAVÁS, 1912)
 HÖLZEL 1972; KRIVOKHATSKY 1996.
29. *Neuroleon tenellus* (KLUG, 1834);
 KRIVOKHATSKY 1996.
 1♀, 01.07.2005, prov. Fars, Jasiqun [Jezin?] 30°01'N/53°09'E, a = 1843 m, leg. L. Ábráham
 (USMB 5858/1379).

Genus *Noaleon* HÖLZEL, 1972

30. *Noaleon limbatellus* (NAVÁS, 1913)
 HÖLZEL 1972.

Tribe **Macronemurini** ESBEN–PETERSEN, 1919
 Genus *Macronemurus* COSTA, 1855

31. *Macronemurus amoenus* (HÖLZEL, 1972)
 HÖLZEL 1972.
 2♂, 2♀, 1.07.2005, prov. Fars, Jasiqun [Jezin?] 30°01'N/53°09'E, a = 1843 m, leg. L. Ábráham
 (5858/1222, USMB 5858/1284, 5858/1433, 5858/1440).

32. *Macronemurus persicus* (NAVÁS, 1915)

MIRMOAYEDI 2002.

2♂, 1♀, 26–28.06.2000, prov. Khorasan, 10 km S of Mashad [Mashhad], leg. Rozner Gy. (USMB 5858/1220, USMB 5858/1254, USMB 5858/1287); 1♀, 04.07.2005, prov. Yazd, Mazraehye Taqi 31°35'N/53°49'E, a = 2582 m, leg. L. Ábrahám (USMB 5858/1267).

33. *Macronemurus farsensis* ÁBRAHÁM, 2007

ÁBRAHÁM 2007.

Genus *Geyria* ESBEN–PETERSEN, 192034. *Geyria beluchistana* HÖLZEL, 1968

HÖLZEL 1968.

Genus *Mesonemurus* NAVÁS, 191935. *Mesonemurus clarus* (McLACHLAN in FEDCHENKO, 1875)

1♂, 09.07.2005, prov. Mazandaran, Takht Zamin 37°00.905N/55°17.264E, leg. L. Ábrahám (USMB 5858/1233); 1♂, 2♀, 10.07.2005, prov. Khorasan, Robate Esqh 37°23.320N/58°34.705E, leg. L. Ábrahám (USMB 5858/1280, USMB 5858/1395, USMB 5858/1398).

Afghanistan, Turkmenistan (OSWALD 2014). New for Iran.

36. *Mesonemurus harteri* NAVÁS, 1919

HÖLZEL 1972.

37. *Mesonemurus paulus* (McLACHLAN, 1875)

HÖLZEL 1987.

Tribe *Creoleontini* MARKL, 1954Genus *Creoleon* TILLYARD, 1918.38. *Creoleon aegyptiacus* (RAMBUR, 1842)

HÖLZEL 1972.

39. *Creoleon elegans* HÖLZEL, 1968

HÖLZEL 1968, 1972.

40. *Creoleon griseus* (KLUG in EHRENBERG, 1834)

HÖLZEL 1972; MIRMOAYEDI 2002; KRIVOKHATSKY 1997.

41. *Creoleon persicus* HÖLZEL, 1972

HÖLZEL 1972.

42. *Creoleon plumbeus* (OLIVIER, 1811)

HÖLZEL 1972; MIRMOAYEDI 2002.

43. *Creoleon remanei* HÖLZEL, 1972.

2♂, 5♀, 10.09.1998, Kermanshah; 10♂, 15♀, 05.09.2000, Aminabad Isfahan; 2♂, 5♀, 10.08.1999, Islamabad Gharb; 20♂, 15♀, 14.08.1999 Shahinghaleh Machad, (MIRMOAYEDI, KPC).

Tribe **Pseudoformicaleontini** HÖLZEL, 1987
Genus **Ganguilus** NAVÁS, 1912

44. **Ganguilus pallescens** NAVÁS, 1912
HÖLZEL 1972.

Genus **Pseudoformicaleo** VAN der WEELE, 1909

45. **Pseudoformicaleo gracilis** (KLUG, 1834)
HÖLZEL 1972.

Tribe **Delfimeini** KRIVOKHATSKY, 1998
Genus **Delfimeus** NAVÁS, 1912

46. **Delfimeus intricatus** (HÖLZEL, 1972)
HÖLZEL 1972; MIRMOAYEDI *et al.* 1999.

1♂, 1♀, 02.07.2005, prov. Fars, near spring of Sahlabad 20°17'N 53°44'E, a = 2269 m, leg. Ábrahám L. (USMB 5858/1293, USMB 5858/13876); 1♀, 04.07.2005, prov. Yazd, Mazraehye Taqi 31°35'N/53°49'E, a = 2582 m, leg. L. Ábrahám (USMB 5858/1349).

47. **Delfimeus iranensis** (HÖLZEL, 1972)
HÖLZEL 1972.

1♂, 1♀, 22–23.06.2000, prov. Fars, (Mt.) Kūhha- ye Zagros, Safe Abad vill., leg. Rozner Gy. (USMB 5858/1286, USMB 5858/1402); 3♂, 22.06.2005, prov. Mazandaran, between Pel [Pil] and Valiabad, a = 2523 m, leg. L. Ábrahám (USMB 5858/1205, USMB 5858/1263, USMB 5858/1419); 1♂, 2♀, 07.07.2006, prov. Yazd, Aliābād 32°03.436'N/54°12.309'E, a = 1157 m, leg. Ilniczky S. & HácZ T. (USMB 5858/1203, USMB 5858/1273, USMB 5858/1348).

48. **Delfimeus laetus** (HÖLZEL, 1968)
HÖLZEL 1968.

1♂, 03.04.1901, Champ, Bampur, (N. Zarudny, ZIN); 3♂, 25.04.1901, Karvandar v., Bampur, SE Iran (N. Zarudny, ZIN); 1♂, 02.05.1901, Kuasa, Sarhad, Bampur (N. Zarudny, ZIN); 1♂, 03.05.1901, Kuasa, Sarhad, Bampur (N. Zarudny, ZIN); 1♀, 26.04.1901, Nehbandan, Khorasan (N. Zarudny, ZIN); 1♂, 01.05.1901, Noukabad, Sarhad, Bampur (N. Zarudny, ZIN); 1♂, 11.05.1901, Sia-Dzhengal, Bampur, (N. Zarudny, ZIN); 1♂, 29.04.1901, Torosh, Sarhad, Bampur (N. Zarudny, ZIN).

49. **Delfimeus morgani** (NAVÁS, 1912)
HÖLZEL 1972.

1♂, 01.07.2000, prov. Zanjan, Zanjan, a = 2300 m, leg. HácZ T. & Kőszegi G. (USMB 5858/1277); 2♂, 5♀, 24.06.2005, prov. Zanjan, Lar 36°48'N/48°55'E, a = 1021 m, leg. L. Ábrahám (USMB 5858/1291, USMB 5858/1226, USMB 5858/1275, USMB 5858/1289, USMB 5858/1311, USMB 5858/1329, USMB 5858/1375).

Subfamily **Myrmeleontinae** LATREILLE, 1802
Tribe **Myrmeleontini** LATREILLE, 1802
Genus **Euroleon** ESBEN-PETERSEN, 1918

50. **Euroleon parvus** HÖLZEL, 1972
MIRMOAYEDI *et al.* 1999.

Genus *Myrmeleon* LINNAEUS, 1767

We did not include *Myrmeleon formicarius* LINNAEUS, 1767 in our list in spite of 1 ♀, collected in Asalem, 17.07.1968, by Steiner (Aspöck. coll.), having been determined for “Die Neuropteren Vorderasiens” by H. HÖLZEL (1972). Either the species was wrongly identified (*M. formicarius* is a Boreal species, so its occurrence in Iran is improbable) or the information on the specimen label is erroneous.

51. *Myrmeleon hyalinus* OLIVIER, 1811

HÖLZEL 1972.

5♂, 7♀, 08.09.2000, Aminabad Isfahan; 12♂, 1♀, 23.08.1996, Barmashur Shiraz; 5♂, 15♀, Khatounabad Jiruft (MIRMOAYEDI, KPC).

52. *Myrmeleon inconspicus* RAMBUR, 1842

HÖLZEL 1972.

1♂, Alborz Province, Karaj, 2007, leg. A. Mirmoayedi (USMB 5858/772).

53. *Myrmeleon pseudohyalinus* HÖLZEL, 1972

HÖLZEL 1972.

1♂, 12.04.2004, Quir előtt [before] 15 km Firuzabad 28–30°N/52–54°E, leg. Háciz T. & Benedek B. (USMB 5858/829).

Tribe *Gepini* MARKL, 1954Genus *Gepus* NAVÁS, 191254. *Gepus buxtoni* MORTON, 1921

1♀, 23–24.06.2000, prov. Fars, (Mt.) Kühhaye Zagros, Safe Abad vill., leg. Rozner Gy. (USMB 5858/633).

Iraq (OSWALD 2014). New for Iran.

55. *Gepus gibbosus* HÖLZEL, 1968

HÖLZEL 1972.

56. *Gepus invisus* NAVÁS, 1912

HÖLZEL 1972.

Including.

57. *Gepus invisus morpha curvatus* NAVÁS, 1914.

KRIVOKHATSKY 2005.

Genus *Gepella* HÖLZEL, 196858. *Gepella modesta* HÖLZEL, 1968

HÖLZEL 1968.

1♂, 04.07.2005, prov. Yazd, Mazraehye Taqi 31°35'N/53°49'E, a = 2582 m, leg. L. Ábráham (USMB 5858/1038; USMB 5858/1200).

Genus *Solter* NAVÁS, 191259. *Solter felderi* NAVÁS, 1912

HÖLZEL 1972.

60. *Solter gaudryi* NAVÁS, 1914
HÖLZEL 1972.
61. *Solter hardei* HÖLZEL, 1968
HÖLZEL 1968.
62. *Solter iranensis* HÖLZEL, 1967
HÖLZEL 1967a.
63. *Solter ledereri* NAVÁS, 1912
HÖLZEL 1972.
2♂, 1♀, 23.06.2005, prov. Mazandaran, 20 km from Valiaband, 36°13'N/51°24'E, a = 2523 m,
leg. Ábráham (USMB 5858/962, USMB 5858/982, USMB 5858/1018).
64. *Solter resslii* HÖLZEL, 1972
HÖLZEL 1972.
65. *Solter robustus* HÖLZEL, 1972
HÖLZEL 1972.
66. *Solter vartianae* HÖLZEL, 1967
HÖLZEL 1967a.

Subfamily **Myrmecaelurinae** ESBEN-PETERSEN, 1919Tribe **Myrmecaelurini** ESBEN-PETERSEN, 1919Genus **Myrmecaelurus** COSTA, 1855

67. *Myrmecaelurus laetus* (KLUG, 1834)
HÖLZEL 1968, 1972; KRIVOKHATSKY 2013.
1♀, 17.03.1901, seashore, Parag, Makran, SE Persia, N. Zarudny; 3♂, 4♀, 09.03.1901, Lekubal',
Kuche; 3♂, 2♀, 08.03.1901, Kambil', Kuche; 1♂, 22–26.03.1901, Kir river – Ga village,
Ga county; Bampur: 1♂, 24.04.1901, Tangi Duvan canyon, Karvandar, (N. Zarudny, ZIN);
1♀, 12.06.1975, Iran, Robishar lake, (B. Sanford, CAS); 1♀, 05–06.05.2001, prov. Busehr,
5 km S of Delvar, 28°43'04"N /51°02'11"E, a = 20 m, leg. Fábíán Gy. & Vig K. (USMB
5858/652).
68. *Myrmecaelurus major* McLACHLAN, 1875
1♂, 2♀, 01.06.1999, Garmab, prov. Khorassan, 800 m, Mt. W. Kopetdagh, N. 18 (G. Koszegi,
G. Kalman, HNHM).
69. *Myrmecaelurus paghmanus* HÖLZEL, 1969
HÖLZEL 1969.
70. *Myrmecaelurus parvulus* HÖLZEL, 1982
1♂, 04.07.1995, Tang–Kenesht, (MIRMOAYEDI, KPC).
Saudi Arabia, United Arab Emirates (OSWALD 2014). New for Iran.
71. *Myrmecaelurus persicus* (NAVÁS, 1929)
NAVÁS 1929; HÖLZEL 1972; KRIVOKHATSKY 2013.
72. *Myrmecaelurus solaris* KRIVOKHATSKY, 2002
KRIVOKHATSKY 2002.
1♂, 25.06.2005, prov. Kurdystan, Faqih Soleyman [Faq-i-Sulaiman], 35°05.085N/46°54.118E,
leg. L. Ábráham (USMB 5858/625).

73. *Myrmecaelurus trigrammus* (PALLAS, 1771)

Including the form *Myrmecaelurus trigrammus derbendicus* HÖLZEL, 1972, which is an adult maturation stage but not a taxon (KRIVOKHATSKY 2011)

HÖLZEL 1972.

3♂, 02.08.1989, Kermanshah (MIRMOAYEDI, KPC); 3♂, 1♀, 05.07.2005, prov. Esfahan, Kamoo, 33°37'N/51°18'E, a = 2577 m, leg. L. Ábráham (USMB 5858/532; USMB 5858/549; USMB 5858/550; USMB 5858/635).

74. *Myrmecaelurus varians* NAVÁS, 1913

HÖLZEL 1972.

Genus *Aspoeckiana* HÖLZEL, 196975. *Aspoeckiana uralensis curdica* HÖLZEL, 1972

HÖLZEL, 1972; MIRMOAYEDI *et al.* 1999.

Genus *Nohoveus* NAVÁS, 1918

We have not included *Nohoveus atrifrons* HÖLZEL, 1970, which has already been recorded for Iran, 1♀, 26.07.1969, NO – Iran, Täbris, (Vartian leg., coll. Aspöck) in HÖLZEL (1972), because it was an erroneous identification; the correct identification is *N. armenicus* (KRIVOKHATSKY 1993)

76. *Nohoveus armenicus* (KRIVOKHATSKY, 1993)

KRIVOKHATSKY 1993; ASPÖCK *et al.* 2001.

77. *Nohoveus fidelis* HÖLZEL, 1968

HÖLZEL 1968.

78. *Nohoveus palpalis* (KLAPALEK, 1914)

HÖLZEL 1968.

Genus *Holzeus* KRIVOKHATSKY, 199279. *Holzeus compactus* KRIVOKHATSKY, 1992

KRIVOKHATSKY 1992.

Genus *Iranoleon* HÖLZEL, 1968.80. *Iranoleon darius* HÖLZEL, 1972

HÖLZEL 1972.

81. *Iranoleon electus* HÖLZEL, 1968

HÖLZEL 1968, 1972.

1♂, 3♀, 26.05.1999, Persepolis, Mt. Kum, Prov. Fars, 1200 m, N 12, (G. Koszegi, K. Gasko, HNHM); 1♀, 25.05.1999, Saadatabad, Prov. Fars, N 12a (G. Koszegi, HNHM); 1♀, 24.05.1999, Yasuj, Prov. Kuhkiluye ve Buyer Ahmad, 1500 m, N 11, (G. Koszegi, K. Gasko, HNHM); 1♀, 13.04.2004, Hajiabad [Hajjiabad], leg. Hác T. & Benedek B. (USMB 5858/683).

82. *Iranoleon nitidus* HÖLZEL, 1972

HÖLZEL 1972.

83. *Iranoleon septimus* HÖLZEL, 1972
HÖLZEL 1972.
1♀, Persepolis, 26.05.1999 Mt. Kum, Prov. Fars, 1200 m, (G. Koszegi, K. Gasko, HNHM).
84. *Iranoleon solus* HÖLZEL, 1968
HÖLZEL 1968.
85. *Iranoleon tigridis* HÖLZEL, 1972
1♂, 13.04.2004, Heraug [Herau], leg. HácZ T. & Benedek B. (USMB 5858/615).
Iraq (ASPÖCK *et al.* 2001, OSWALD 2014). New for Iran.

Genus *Lopezus* NAVÁS, 1913

86. *Lopezus fedtschenkoi persicus* HÖLZEL, 1972
HÖLZEL 1972.
Including:
87. *Lopezus fedtschenkoi persicus* morpha *maclachlani* KRIVOKHATSKY, 1990
1♀ (paratype), 24.04.1898, south–west of Lake Dakipaturgun, south–east of Khorasan (Zarudny, ZIN) – KRIVOKHATSKY 1990.
The combination of subspecific name and the name of the morpha are used for the first time.

Tribe *Nesoleontini* MARKL, 1954Genus *Cueta* NAVÁS, 1911

88. *Cueta anomala* NAVÁS, 1915
KRIVOKHATSKY 2011.
89. *Cueta clara* HÖLZEL, 1980
MIRMOAYEDI 2007a.
90. *Cueta lineosa* (RAMBUR, 1842)
HÖLZEL 1968, 1972.
1♂, 1♀, 01.06.1999, Garmab, Prov. Khorasan, Kopetdagh (G. Koszegi, G. Kalman, HNHM);
1♂, 28.02.1901, Riku, Bagu, (N. Zarudny, ZIN); 1♂, 1♀, 01.06.1999, Garmab, Prov.
Khorasan, Kopetdagh (G. Koszegi, G. Kalman, HNHM); 1♀, 27.02.1901, Gjazymanzel,
Bagu (N. Zarudny, ZIN); 1♀, 19.06.1961, Ghólhak, 1400 m, b. Tehran, (J. Klapperich,
HNHM); 1♂, 08.03.1901, Kambil', Kuche, Makran, (N. Zarudny, ZIN); 1♀, 05.03.1901,
Mir–Bazar, Kuche, Makran (N. Zarudny, ZIN); 1♂, 06.03.1901, Paristan, Kuche, Makran
(N. Zarudny, ZIN); 1♂, 28.02.1901, Riku, Bagu (N. Zarudny, ZIN); 1♀, 06.06.1914,
Shahrud, 4170 (A. Kiritshenko, ZIN); 1 ex., larvae reared in 2003, Hassanabad Sanandaj
(MIRMOAYEDI, KPC).
91. *Cueta luteola* HÖLZEL, 1972
HÖLZEL 1972.
92. *Cueta modesta* HÖLZEL, 1972
HÖLZEL 1972.
93. *Cueta minervae* HÖLZEL, 1972.
MIRMOAYEDI 1998a.
1♂, 04.07.2005, prov. Yazd, Mazraehye Taqi 31°34.949N/53°49.387E, leg. L. Ábráham
(USMB 5858/566).

94. *Cueta parvula* HÖLZEL, 1968
HÖLZEL 1968.
1♂, 15.09.1998, Iranshahr, (MIRMOAYEDI, KPC).
95. *Cueta striata* KIMMINS, 1943
HÖLZEL 1972.

Tribe **Isoleontini** HÖLZEL, 1969
Genus *Isoleon* ESBEN-PETERSEN, 1930

96. *Isoleon amseli* (HÖLZEL, 1967)
1♂, 26.05.1999, prov. Fars, Persepolis, Mt. Kum, a = 1200 m, leg. Gaskó K. (USMB 5858/620).
Afghanistan, Tajikistan, Turkmenistan, Uzbekistan (OSWALD 2014). New for Iran.

Genus *Subgulina* KRIVOKHATSKY, 1996

97. *Subgulina iranica* (HÖLZEL, 1968)
HÖLZEL 1968; KRIVOKHATSKY 2013.
1♂, 1♀, 05-06.05.2001, Bujer [Bujeh], leg. Fábíán Gy. (USMB 5858/13612; USMB 5858/13606).

DISCUSSION

The antlion fauna of Iran has been studied by many authors, among them, KLAPÁLEK (1906), NAVÁS (1912a, b, c, 1914, 1915, 1919, 1929, etc.), MORTON (1921), KIMMINS (1933), HÖLZEL (1968, 1972, 1982, 1987), ASPÖCK *et al.* (1980, 2001, 2009), ÁBRAHÁM (2007), KRIVOKHATSKY (1996, 1998a, b, 2002, 2003) and MIRMOAYEDI (1998a, b, 1999a, b, 2002, 2003, 2006, 2007a, b, 2008).

It seems that *Bareja persica* (currently *Macronemurus*) was the first antlion species collected from Iran by DORIA in 1862–3 from northern part of the country and described and named by NAVÁS in 1915.

Here we have summarized the material collected by the first author and added to the list specimens from accessible collections. Data from unverified publications, e.g. KLAPÁLEK (1906), have not been included.

Among the authors who have studied the antlions of Iran, HÖLZEL (1925–2008) described 283 species from different regions of the world, among them 116 species of Myrmeleontidae, and recorded 82 species of Myrmeleontidae from Iran, 21 of which were new to science (HÖLZEL 1967a, 1968, 1969, 1972). His work on the Neuropterans of Iran as a whole [Chrysopidae (HÖLZEL 1967b, 1973) Myrmeleontidae (as indicated above) and Nemopteridae (HÖLZEL 1975)] was a great effort to open the eyes of world entomologists to the Neuropteran fauna of Iran and is appreciated by every Iranian entomologist as a huge contribution to the knowledge of Iranian neuropterans. However, when as an entomologist, one thoroughly examines his works about Iran, many questions crop up. First of all, he was not the collector of the specimens from Iran, and the most of the collections were made by collectors or tourists, like Vartian, Ressler, Kasy or Schäuffelle, so the names of many localities cited by them are inaccurate or misspelt and

will have to be corrected in the future: for example, Derband, 25 km north of Tehran, or Vanak, 15 km north of Tehran, both of which are now parts of Metropolitan Tehran, or the names of localities like Kasre-shirin (a city in Kermanshah province in western Iran), the Persian spelling and pronunciation of which is Ghasre-shirin, and not as he wrote in all of his papers. Another example is Jussufabad, 80 km south-east of Tehran; this place name is no longer in use as that area has since been engulfed by the expanding capital city. A more important problem to be pointed out relates to the localities where the holotypes of species were found. These were not indicated in his publications on the Neuroptera of Iran, but they were preserved in his personal collection. Now, after his death in 2008, their whereabouts are not known. It seems that his collection was given to H. Aspöck & U. Aspöck, to be maintained in their personal collection, in Vienna, Austria.

At present, Hölzel's collection of Neuroptera is stored in his house at Eppersdorf, Austria (ASPÖCK 2010). Many private collections were destroyed after the death of their collectors, but we hope that Hölzel's one will be properly examined by Dr. Aspöck. As far as we know, other Iranian specimens mentioned in this paper are safely deposited in Germany (Stuttgart State Museum of Natural History), Hungary (Rippl-Rónai Museum), Poland (Upper Silesian Museum, Bytom) and the USA (National Museum of Natural History, Washington). The only certain location that can be cited for species, especially the Iranian holotypes, is the collection of Myrmeleontidae at the Zoological Institute of St. Petersburg. This collection is catalogued on <http://www.zin.ru/projects/zinsecta/eng/ZInsecta.asp>. This database, in DBF format, includes 1100 records of ant lion taxa from subfamilies to subspecies of the WORLD FAUNA (2013). However, as it was last revised on 10.10.2003, it does not include the latest records. Every record includes data on the unique scientific names of taxa, including synonyms and combinations, and has different information on the use of the name, its synonymy, and the collection data. Some of the genera and species are illustrated with the original depictions of the collected specimens. ZInsecta includes data on 1464 valid species, 201 genera, and 50 families, i.e. approximately 1700 valid scientific names and 1900 synonyms and old combinations of recent Myrmeleontidae with 870 new illustrations, prepared for renewal in Internet.

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STRESZCZENIE

Uzupełniony wykaz mrówkolwów (Neuroptera: Myrmeleontidae) Iranu

Najstarszy okaz mrówkolwa, pochodzący z Iranu, został odłowiony w połowie XIX wieku, natomiast pierwsze doniesienia dotyczące fauny mrówkolwów tego kraju pochodzą z początków XX wieku. W okresie ponad stu lat liczni autorzy zajmowali się opracowywaniem neuropterofauny Iranu. Wiele z tych prac obejmuje obszary większe, a jedynie część zawartych w nich informacji dotyczy Iranu. Największy wkład

w opracowanie mrówkolwów Iranu wniosły prace Hölzela, który opisał 21 nowych dla wiedzy taksonów. Autor ten, wykazał w sumie 82 gatunki z rodziny Myrmeleontidae z Iranu.

Niniejsza publikacja prezentuje kompletny i uzupełniony wykaz 97 gatunków mrówkolwów (Neuroptera: Myrmeleontidae) Iranu wraz z uwagami systematycznymi i nomenklatorycznymi. W pracy odniesiono się również krytycznie do błędnie wykazanych z terytorium Iranu taksonów. W wykazie podano również informacje o gatunkach nowych dla tej fauny: *Echthromyrmex platypterus*, *Acanthaclisis obscura*, *Neuroleon asirensis*, *Neuroleon demeter*, *Mesonemurus clarus*, *Gepus buxtoni*, *Myrmecaelurus parvulus*, *Iranoleon tigridis*, *Isoleon amseli*. W opracowaniu uwzględnione zostały nowe dane dotyczące występowania Myrmeleontidae na obszarze Iranu, na podstawie kolekcji muzealnych i prywatnych. Przy gatunkach nowych dla fauny oraz przy nowych danych podane zostały pełne informacje z etykiet lokalizacyjnych, wraz z krytycznym odniesieniem się do ewentualnych błędów.

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