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Contribution to the faunistics of antlions (Neuroptera: Myrmeleontidae) of Bulgaria, Macedonia and Greece

Příspěvek k faunistice mravkolvů (Neuroptera: Myrmeleontidae) Bulharska, Makedonie a Řecka

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Faunistics, Neuroptera, Myrmeleontidae, distribution, Bulgaria, Macedonia, Greece

Abstract. New faunistic data on 17 species of the family Myrmeleontidae from Bulgaria, Macedonia and Greece are provided. *Cueta lineosa* (Rambur, 1842) is recorded for the first time for Bulgaria and *Nedroledon anatolicus* Navás (1914) is recorded for the first time for Macedonia. The occurrence of *Nicarinus poecilopterus* (Stein, 1863) in Bulgaria is confirmed and the occurrence of *Macronemurus appendiculatus* (Latreille, 1807) in Greece is confirmed after more than 150 years.

INTRODUCTION

Although the antlions of Southeastern Europe have been studied since the 19th century, and the fauna of many areas of this vast region is relatively well known, the Balkan Peninsula and adjacent islands remain a centre of attention for many European entomologists and the distribution of many species of antlions in Southeastern Europe is little known. Many entomologists from various European countries have studied the antlions of these three countries, including Czech entomologists in Bulgaria. The baseline data on Myrmeleontidae of Bulgaria was provided by František Klapálek (Klapálek 1894), the first chairman of the Czech Entomological Society. Czech entomologist Jiří Zelený (Zelený 1971) published valuable information on the fauna of the area in the second half of the 20th century. The first summary of the antlions of Bulgaria was prepared by Dimitrova (1924).

The Bulgarian antlion fauna is now relatively well known, especially thanks to the systematic work of Bulgarian entomologist Alex Popov (1977a, 1993, 1996) supplemented by smaller papers (e.g. Joost 1973, Papp 1989). The antlions of Greece have been studied for longer than those of Bulgaria (Lucas 1854, Stein 1863) with numerous small papers in European specialist journals (e.g., Pongracz 1911, Navás 1915, Werner 1928, 1934a,b, 1937, 1938, Hynd 1983, Saure 1989) as well as important works on new and rare species (Ohm 1965, Willmann 1977).

Despite the disparate nature of the faunistic data, and the fact that the antlion fauna of many Greek islands is almost completely unknown, the antlion fauna of Greece can still be regarded as relatively well known. The situation in Macedonia is somewhat different. A large study of antlions was included by Doflein (1921) in his book on this country and was followed by additional data from Dimitrowa (1925), but knowledge of the distribution of the Myrmeleontidae in Macedonia remains fragmentary and a strong possibility of new

and interesting finds in this area remains. Frequent changes of state borders in the late 19th century and the first half of the 20th century have further complicated the attribution of old literature records.

MATERIAL AND METHODS

This article presents the results of the author's own field investigations as well as those of many other Czech entomologists, and is based on 404 specimens representing 17 species of antlions. Most specimens were collected at light or a using net during the daytime. Only a small number of specimens were obtained from rearing larvae. All specimens were identified by the author and are deposited in his private collection. Due to their way of life, antlions are mainly found at low altitudes and warm locations. Records at higher elevations are unusual, so with all the findings above 900 m I have stated the specific altitude if provided by the collector or discovered afterwards. The known current distribution of all species mentioned in Southeastern Europe is briefly summarized. Notes on the overall distribution of *Nedroledon anatolicus* Navás, 1914 are included. Names follow the catalogue of Aspöck et al. (2001). The species list sorts locations in different countries from north to south; for Bulgaria following the name of the province, for Macedonia following the municipality and for Greece following the name of the relevant region.

RESULTS

Palpares libelluloides (Linnaeus, 1764)
Material examined. Bulgaria: Burgas province: Sozopol, 8.–22.vii.1985, 1 ♂, K. Poláček lgt.; Primorsko, 8.viii.2007, 1 ♀, A. Kačírek lgt.; Blagoevgrad province: Sandanski, 3.vii.1990, 1 ♂, 1 ♀, J. Máslo lgt. **Greece:** Central Macedonia region: Chalkidiki, Stavros, 20.vii.1995, 1 ♂, O. Černý lgt.; Chalkidiki, Stratoni, 2.vi.2008, 3 ♀♀, M. Fiala lgt.; Epirus region: Igoumenitsa, 10.vi.2011, 4 ♂♂, M. Fiala lgt.; Peloponnese region: Korinthos, 4.–8.vii.1992, 6 ♂♂, 5 ♀♀; dtto, 12.–13.vii.1992, 1 ♀, A. Kačírek lgt.; Lechaion, 9.vii.1992, 3 ♀♀, A. Kačírek lgt.; Akrokorinthos, 6.vii.1992, 2 ♂♂, A. Kačírek lgt.; Mycenae, 10.vii.1992, 1 ♀, A. Kačírek lgt.; Crete region: Bali, 1.vi.2009, 1 ♂, 6.vi.2009, 1 ♂, A. Kačírek lgt.; Agia Pelagia, 25.v.1996, 2 ♂♂, J. Resl lgt.
Distribution in Southeastern Europe. This species is known from all countries of Southeastern Europe, but not recorded in Kosovo (Aspöck et al. 1980, 2001, Devetak 1996).

Acanthaclisis occitanica (Villers, 1789)
Material examined. Bulgaria: Dobrich province: Albena, 16.vii.1968, 1 ♀, V. Kabourek lgt.; Burgas province: Sozopol, Kavacite, 20.vi.1987, 1 ♂, F. Kopeček lgt.; Arkutino, 29.–30.vii.1986, 1 ♀, V. Malý lgt.
Distribution in Southeastern Europe. Romania, Bulgaria and Greece. (Aspöck et al. 2001). Rare in this area, more frequently reported along the coast of the Black Sea (Mandru 1963, Popov 1977a, 1996).

Myrmecaelurus trigrammus (Pallas, 1781)
Material examined. Bulgaria: Blagoevgrad province: Sandanski, 3.vii.1990, 1 ♀, J. Máslo lgt.; dtto, 8.vii.1995, 3 ♀♀, M. Mikát lgt.; Sandanski, valley of Lebnica river, 26.v.1998, 1 ♂, 1 ♀, J. Hájek lgt. **Macedonia:** Prilep municipality: Pletvar, 950 m a.s.l., 22.vii.2009, 1 ♂, 2 ♀♀, L. Traxler lgt.; Pletvar 1050 m a.s.l., 4.vii.2007, 2 ♂♂, L. Traxler lgt.; Ohrid municipality: Galičica Mountains, near Leskoec, 30.vi.2009, 1 ♂, J. Holomek lgt. **Greece**: Central Macedonia region: Chalkidiki, Stavros, 12.–24.vi.1994, 1 ♂, J. Louda lgt.; dtto, 20.vii.1995,

2 ♀♀, O. Černý lgt.; Epirus region: Asfaka near Ioannina, 18.vii.2009, 1 ♀, L. Traxler lgt.; Central Greece region: Amfissa, 2.vi.2008, 1 ♀, L. Traxler lgt.; Peloponnese region: Korinthos, 4.–8.vii.1992, 40 ♂♂, 22 ♀♀, A. Kačírek lgt.; dtto, 12.–13.vii.1992, 11 ♂♂, 8 ♀♀, A. Kačírek lgt.; Lechaion, 9.vii.1992, 11 ♂♂, 2 ♀♀, A. Kačírek lgt.; Mykenes, 10.vii.1992, 2 ♂♂, A. Kačírek lgt.; Olympia, 11.vii.1992, 4 ♂♂, 3 ♀♀, A. Kačírek lgt.; Crete region: Gournia, 19.v.1996 (larvae), 1 ♂, 1 ♀, L. Maršík lgt.; Istro, 22.v.1996 (larva), 1 ♂, L. Maršík lgt.; dtto, 22.v.1996 (larva) 1 ♀, L. Maršík lgt.

Distribution in Southeastern Europe. Croatia, Serbia, Romania, Montenegro, Bulgaria, Albania, Macedonia, Greece, European part of Turkey (Aspöck et al. 1980, Devetak 1992, Popov 1977b).

Cueta lineosa (Rambur, 1842)

Material examined. Bulgaria: Blagoevgrad province: Sandanski env., valley of Lebnica river, 26.v.1998, 1 ♂, J. Hájek lgt. New species for Bulgaria.

Distribution in Southeastern Europe. Albania, Greece (Aspöck et al. 2001). The species is rare in Europe.

Myrmeleon formicarius Linnaeus, 1767

Material examined. **Bulgaria:** Blagoevgrad province: Vlahi near Kresna, 30.iv.–1.v. 2001, 1 ♂, M. Žemlička lgt.; Kresna, valley of Struma river, 21.–29.v.1994, 18 ♂♂, 2 ♀♀, J. Šumpich lgt.; dtto, 24.v.1994, 1 ♀ M. Dvořák lgt. **Macedonia:** Prilep municipality: Pletvar, 950 m a.s.l., 14.vii.2009, 1 ♂, 1 ♀, L. Traxler lgt.; dtto, 26.vi.2011, 1 ♂, L. Traxler lgt.; Veles municipality: Veles, 27.v.2010, 1 ♀, L. Traxler lgt. **Greece:** Central Macedonia region: Akritohori near Kerkini lake, 25.–26.v.1994, 1 ♂, 1 ♀, J. Šumpich lgt.; Strymoniko, 1.vi.2008, 1 ♂, M. Fiala lgt.; West Macedonia region: Agios Germanos, 1800 m a.s.l., 15.vii.2009, 1 ♀, L. Traxler lgt.; Epirus region: Pindos Mountains, (ca. 1500 m a.s.l., J. Holomek, pers. comm.), 10.–12.vii.2007, 1 ♀, J. Holomek lgt.; Central Greece region: Lamia, 31.v.2008, 1 ♂, L. Traxler lgt.

Distribution in Southeastern Europe. This common species is widely distributed in Southeastern Europe, but there are no records from the European part of Turkey (Aspöck et al. 1980, 2001, Devetak 1992, Devetak & Jakšič 2003).

Myrmeleon noacki Ohm, 1965

Material examined. Bulgaria: Blagoevgrad province: Kresna, valley of Struma river, 21.–29.v.1994, 2 ♀♀, J. Šumpich lgt.; Sandanski, 8.vii.1995, 1 ♀, M. Mikát lgt. **Macedonia:** Prilep municipality: Pletvar, 950 m a.s.l., 14.vii.2007, 1 ♂, 2 ♀♀, L. Traxler lgt.; dtto, 22.vii.2009, 3 ♂♂, 5 ♀♀, L. Traxler lgt.; dtto 26.vi.2011, 5 ♂♂, 6 ♀♀, L. Traxler lgt., 6. vii. 2011, 1 ♂, 7 ♀♀, L. Traxler lgt.; Pletvar, 1050 m a.s.l., 3.vii.2007, 1 ♂, 1 ♀, L. Traxler lgt.; dtto, 4.vii.2007, 2 ♀♀, L. Traxler lgt. **Greece:** East Macedonia and Thrace region: Mount Falakro, Pirgoi, 900 m, 17.vii.2009, 1 ♀, L. Traxler lgt.; Mount Pangeo, 1650 m a.s.l., 18.vii.2009, 1 ♀, L. Traxler lgt.; Epirus region: Pindos Mountains (ca. 1500 m a.s.l., J. Holomek, pers. comm.), 10.–12.vii.2007, 1 ♂, J. Holomek lgt.

Distribution in Southeastern Europe. Bulgaria, Macedonia, Greece, Turkey (Aspöck et al. 1980, Ohm 1965).

Remarks. This species has so far been reported at altitudes up to 1200 m (Aspöck et al. 1980).

Euroleon nostras (Geoffroy in Fourcroy, 1785)
Material examined. Bulgaria: Blagoevgrad province: Vlahi near Kresna, 30.iv.–1.v. 2001, 1 ♀, M. Žemlička lgt. **Greece:** Ionian Islands region: Corfu, Gastouri, 8.vii.1998 (larvae) 1 ♂, 1 ♀, A. Kačírek lgt.; Gastouri, Agia Kuriakh, 8.vii.1998 (larvae), 1 ♂, 1 ♀, A. Kačírek lgt.
Distribution in Southeastern Europe. Croatia, Bosnia and Herzegovina, Serbia, Romania, Montenegro, Kosovo, Bulgaria, Albania, Greece (Aspöck et al. 2001, Devetak 1992, Devetak & Jakšič 2003, Devetak et al. 2013).

Macronemurus appendiculatus (Latreille, 1807)
Material examined. Greece: Ionian Islands region: Corfu, Benitses, 2.vii.1998, 1 ♂, 3 ♀♀, A. Kačírek lgt.; dtto, 5.vii. 1998, 2 ♂♂, 2 ♀♀, A. Kačírek lgt. Occurence in Corfu (and Greece) confirmed after more than 150 years.
Distribution in Southeastern Europe. Croatia, Bosnia and Herzegovina, Albania, Greece (Aspöck et al. 2001, Devetak 1997, Devetak et al. 2013, Krivokhatsky 1998, Klapálek 1898).
Remarks. Four specimen of this species from Greece (Corfu, 1844, Erber lgt.) are deposited in the Zoological Institute, St. Petersburg, Russia (Krivokhatsky 1998). Other published findings from Greece from the period before 1868 (e.g. Lucas 1854) are currently attributed to the similar *M. bilineatus* Brauer, 1868 which was described during that year.

Macronemurus bilineatus Brauer, 1868
Material examined. Bulgaria: Blagoevgrad province: Sandanski, 31.v.2008, 1 ♂, M. Fiala lgt.; Sandanski env., valley of Lebnica river, 26.v.1998, 2 ♂♂, J. Hájek lgt.
Distrubution in Southeastern Europe. Romania, Serbia, Montenegro, Kosovo, Bulgaria, Albania, Macedonia, Greece, European part of Turkey (Aspöck et al. 2001, Devetak 1997, Devetak & Jakšič 2003, Popov 1977b, Devetak et al. 2013).

Delfimeus irroratus (Olivier, 1811)
Material examined. Macedonia: Prilep municipality: Pletvar, 950 m a.s.l., 22.vii.2009, 12 ♂♂, 4 ♀♀, L. Traxler lgt. **Greece:** Crete region: Agia Pelagia, 25.v.1996, 1 ♂, J. Resl lgt.; Istro, 22.v.1996, 1 ♂, L. Maršík lgt.
Distribution in Southeastern Europe. Croatia, Bulgaria, Macedonia, Greece (Aspöck et al. 2001, Popov 1996).

Neuroleon arenarius (Navás, 1904)
Material examined. Greece: Peloponnese region: Korinthos, 4.–8.vii.1992, 1 ♂, 4 ♀♀, A. Kačírek lgt.; Lecheo, 9.vii.1992, 1 ♂, A. Kačírek lgt.,
Distribution in Southeastern Europe. Greece, Albania (Aspöck et al. 2001, Devetak et al. 2013). Rare.

Neuroleon assimilis (Navás, 1915)
Material examined. Greece: Peloponnese region:, Mystras, 11.vii.1990, 1 ♂, J. Máslo lgt.
Distribution in Southeastern Europe. Greece (Aspöck et al. 2001). Very local and rare species.

Distoleon tetragrammicus (Fabricius, 1798)
Material examined. Bulgaria: Dobrich province: Šabla, 28.vi.1993, 1 ♀, L. Maršík lgt.; Burgas province: Kiten, 12.–13.vii. 1995, 1 ♀, M. Mikát lgt.; Blagoevgrad province: Kresna, valley of Struma river, 21.–29.v.1994, 1 ♀, J. Šumpich lgt.; Sandanski, 5.viii.1988, 1 ♂, 1 ♀, O. Černý lgt. **Macedonia:** Prilep municipality: Pletvar, 950 m a.s.l., 26.vi.2011, 1 ♀, L. Traxler lgt.; Pletvar 1050 m a.s.l., 3.vii.2007, 1 ♀, L. Traxler lgt.; dtto, 4.vii.2007, 1 ♀, L. Traxler lgt. **Greece:** East Macedonia and Thrace region: Mount Falakro, Pirgoi, 900 m a.s.l., 17.vii.2009, 1 ♀, L. Traxler lgt.; Central Macedonia region: Akritohori near Kerkini lake, 25.–26.v.1994, 1 ♂, J. Šumpich lgt.; Chalkidiki, Stavros, 20.vii.1995, 1 ♀, O. Černý lgt.; Chalkidiki, Olympiada, 2.vi.2008, 1 ♀, M. Fiala lgt.; Leptokaria, 15.–26.vi.1993, 1 ♀, M. Zýka lgt.; dtto, 7.vi.2004, 2 ♀♀, O. Černý lgt.; Ionian Islands region: Corfu, Acharavi, .v. 1997, 1 ♂, M. Mikát lgt.; Peloponnese region: Mount Chelmos, Ano Messoruogi, 1450 m a.s.l., 2.vii.2011, 1 ♂, L. Traxler lgt.; Mystras, 11.vii.1990, 1 ♀, J. Máslo lgt.; Crete region: Gournia, 23.v.1996, 1 ♀, L. Maršík lgt.; Keratocampos, 17.v.1996, 1 ♂, L. Maršík lgt.; Samaria, 12.v.1996 (larva) 1 ♀, L. Maršík lgt.
Distribution in Southeastern Europe. This species is widely distributed in all countries of Southeastern Europe, but with no records from the European part of Turkey (Aspöck et al. 1980, 2001, Devetak 1992, Devetak & Jakšič 2003).
Remarks. This species has so far been reported at altitudes up to 1000 m (Popov 1996).

Nicarinus poecilopterus (Stein, 1863)
Material examined. Bulgaria: Blagoevgrad province: Sandanski, 8.vii.1995, 1 ♀, M. Mikát lgt. Confirmation of the occurrence in Bulgaria. **Greece:** East Macedonia and Thrace region: Mount Falakro, Pirgoi, 900 m a.s.l., 17.vii.2009, 1 ♂, 1 ♀, L. Traxler lgt.
Distribution in Southeastern Europe. Croatia, Kosovo, Bulgaria, Greece (Aspöck et al. 2001, Devetak & Jakšič 2003, Popov 1996). Rare species. From Bulgaria recorded only from the area of Karlovo, where 3 specimens were found between June and August 1968 (Popov 1996).
Remarks. This species has so far been reported at altitudes up to 600 m (Aspöck et al. 1980).

Creoleon plumbeus (Olivier, 1811)
Material examined. Bulgaria: Burgas province: Kiten, 12.–13.vii. 1995, 1 ♀, M. Mikát lgt. **Greece:** Peloponnese region: Korinthos, 4.–8.vii.1992, 13 ♂♂, 13 ♀♀, A. Kačírek lgt.; dtto, 12.–13.vii.1992, 16 ♂♂, 11 ♀♀, A. Kačírek lgt.; Lechaion, 9.vii.1992, 3 ♂♂, 4 ♀♀, A. Kačírek lgt.; Akrokorinthos, 6.vii.1992, 1 ♂, A. Kačírek lgt.; Olympia, 11.vii.1992, 4 ♂♂, 1 ♀, A. Kačírek lgt.; Tolo, 10.vii.1992, 1 ♂, A. Kačírek lgt.; Crete region: Bali, 2.vi.2009, 1 ♂, 5.vi.2009, 1 ♂, A. Kačírek lgt.; Gournia, 19.v.1996, 1 ♂, 3 ♀♀, 23.v.1996, 1 ♀, L. Maršík lgt.; Istro, 22.v.1996, 2 ♂♂, 1 ♀, L. Maršík lgt.
Distrubution in Southeastern Europe. This species is known from all countries of Southeastern Europe, except Kosovo (Aspöck et al. 1980, 2001, Devetak 1992, Klapálek 1898, Popov 1977b).

Nedroledon anatolicus Navás, 1914
Material examined. Macedonia: Prilep municipality: Pletvar, 950 m a.s.l., 22.vii.2009, 2 ♂♂, L. Traxler lgt. New species for Macedonia.

Distribution (a list of locations known so far). Romania: Orsova (Navás 1932, Kis 1964), Bulgaria: Velka Papia in Strandzha Mountains (Popov 1993), Belasica Mountains, 720 m a.s.l. (Popov 1996), Greece: Nordgriechenland, 300 m a. s. l., as per the map the east area of Mount Olympus (Aspöck et al. 1980). Outside of Europe only Turkey: Bursa (Navás 1914), Karatas (Kačírek 1998).
Remarks. Even with the new records, there are still only eight specimens available of this little known and very rare species. It has so far been reported at altitudes up to 720 m.

Megistopus flavicornis (Rossi, 1790)
Material examined. Bulgaria: Burgas province: Sozopol, Kavacite, 20.vi.1987, 1 ♀, F. Kopeček lgt.; Blagoevgrad province: Kresna, valley of Struma river, 21.–29.v.1994, 2 ♂♂, 9 ♀♀, J. Šumpich lgt.; dtto, 24.v.1994, 1 ♀, M. Dvořák lgt.; Sandanski env., valley of Sandanska Bystrica, 7.vii.1998, 1 ♂, J. Hájek lgt. **Macedonia:** Veles municipality: Veles, 27.v.2008, 2 ♂♂, 1 ♀, L. Traxler lgt.; Prilep municipality: Pletvar, 950 m a.s.l., 29.v.2008, 1 ♂, L. Traxler lgt.; Resen municipality: near Stenje, 856 m a.s.l., 5.vi.2008, 1 ♀, M. Fiala lgt. **Greece:** Central Macedonia region: Akritohori near Kerkini lake, 25.–26.v.1994, 1 ♀, J. Šumpich lgt.; Chalkidiki, Stavros, 20.vii.1995, 2 ♀♀, O. Černý lgt.; Epirus region: Pindos Mountains (ca. 1500 m a.s.l., J. Holomek, pers. comm.), 10.–12.vii.2007, 2 ♀♀, J. Holomek lgt.; Preveza, Agios Thomas, 2.vi. 1991, 1 ♀, O. Kapler lgt.; Ionian Islands region: Corfu, Sidari, v.1997, 1 ♀, M. Mikát lgt.
Distribution in Southeastern Europe. Croatia, Serbia, Romania, Bulgaria, Albania, Macedonia, Greece (Aspöck et al. 1980, 2001, Devetak 1992).
Remarks. This species has so far been reported at altitudes up to 1000 m (Aspöck et al. 1980).

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SOUHRN

Práce přináší faunistické údaje o 17 druzích mravkolvů z území tří států jihovýchodní Evropy: Bulharska, Makedonie a Řecka. Podkladový materiál obsahuje celkem 404 jedinců. Z toho *Cueta lineosa* (Rambur, 1842) je uváděna z Bulharska poprvé a *Nedroledon anatolicus* Navás, 1914 je novým druhem pro faunu Makedonie. V případě druhého jmenovaného druhu jde o mimořádný nález velmi málo známého mravkolva, včetně nových údajů bylo dosud nalezeno pouze 8 jedinců. Výskyt *Macronemurus appendiculatus* (Latreille, 1807) v Řecku byl potvrzen po více než 150 letech. Pro *Nicarinus poecilopterus* (Stein, 1863) je uvedena teprve druhá známá lokalita v Bulharsku. Kromě údajů o rozšíření dalších velmi lokálních mravkolvů: *Myrmeleon noacki* Ohm, 1965, *Delfimeus irroratus* (Olivier, 1811), *Neuroleon arenarius* (Navás, 1904) a *Neuroleon assimiliss* (Navás, 1915), jsou uvedena i faunistická data o všech druzích mravkolvů získaných ve sledovaném území. Pro *Myrmeleon noacki* Ohm, 1965, *Distoleon tetragrammicus* (Fabricius, 1798), *Nicarinus poecilopterus* (Stein, 1863), *Nedroledon anatolicus* Navás, 1914 a *Megistopus flavicornis* (Rossi, 1790) jsou uvedeny lokality v nadmořských výškách, které představují horní hranici jejich vertikálního rozšíření v Evropě.