DOI:10.24394/NatSom.2016.28.65 | Natura Somogyiensis | 28 | 65-74 | Kaposvár, 2016

Neuroleon tarimensis sp. n. – a new ant-lion from Taklamakan desert, China (Neuroptera: Myrmeleontidae)

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Ábrahám, L.: *Neuroleon tarimensis sp. n. – a new ant-lion from Taklamakan desert, China (Neuroptera: Myrmeleontidae).*

Abstract: *Neuroleon tarimensis* sp. n. is described from China and compared to Asiatic *Neuroleon* species: *Neuroleon erato* Hölzel, 1972, *Neuroleon zakharenkoi* Krivokhatsky, 1996, *Neuroleon marcopolo* Hölzel, 1970, *Neuroleon fanaticus* (McLachlan, 1875), *Neuroleon nemausiensis* (Borkhausen, 1791), *Neuroleon nigriventris* (Navás, 1913), *Neuroleon dianae* Hölzel, 1972, *Neuroleon punjabensis* Iqbal & Yousuf 1997, *Neuroleon unpunctatus* Ghosh, 1981, *Neuroleon apicalis* Navás, 1915 and *Neuroleon roscidus* (Navás, 1937).

Keywords: new species, ant-lion, Myrmeleontidae, Taklamakan desert, China

Introduction

The high species richness of ant-lion species is largest in arid areas of the Earth. The ant-lion fauna of the larger deserts and semi-deserts situated in the Asiatic Palearctic or in its border area have already been studied (Saudi Arabian Peninsula: Hölzel 1982, 1983, 1988, 1998, 2002, Ábrahám and van Harten 2014; Iran, Afghanistan: Hölzel 1968, 1972; Middle Asia: Krivokhatsky 1990, 1992, 1994, 1998, 2011; India, Rajasthan: Ghosh 1977; Inner Mongolia: Hölzel 1970a,b, Krivokhatsky et al. 1996, Ao et al. 2009, Zhan et al. 2012a,b).

However, there is no published data at all on the fauna of the Taklamakan desert (Tarim basin, Inner Asia).

In 2013, a zoological expedition was organised by Lithuanian entomologists to the Taklamakan desert to study the local Lepidoptera fauna. During night samplings about 50 specimens of ant-lion were collected, which belong to six species (*Acanthaclisis pallida* (McLachlan, 1887), *Nohoveus simplicis* (Krivokhatsky, 1992), *Aspoeckiana uralensis* Hölzel, 1969, *Lopezus fedtschenkoi* (in Fedtschenko McLachlan, 1875), *Myrmeleon semigriseus* Krivokhatsky, 1991). The sixth collected species proved to be a new species for the science.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Material and methods

The habitus photos were taken by Canon EOS 400 digital camera equipped with flash light system (Sigma EM140 DM). The other photos were taken using SZX9 Olympus stereo microscope equipped with a ScopeTek DCM 800 digital camera. The layers of photos were processed with Combine ZP imagine stacking and Adobe Photoshop software.

According to traditional and well known methods, the dissection of the genital organs specified in the relevant literature was performed. The caudal part of the abdomen was removed, treated with a 10% KOH solution and heated during 15 minutes. After getting cold it was rinsed in distilled water. Finally, each genitalia was transferred into glycerine in a microvial for further examination and preservation.

Results and discussion

Neuroleon tarimensis sp. n. (Fig. 1)

Material examined:
Holotype male: CHINA, Xinjiang, W Taklamakan desert, Yarkan He river valley, Tugay forest 1140m, N39º21.963'; E078º11.639', 09-12. vi. 2013 leg. Floriani
Paratypes 2 females as holotype, 1 female: CHINA, Xinjiang, W Taklamakan desert, SW from Kashi, Terambazar 1200m, N39º10.564'; E 077º04.039', 07. vi. 2013 leg. Floriani
Deposited: Entomological Collection of Rippl-Rónai Museum, Kaposvár (Hungary).

Head: Vertex strongly arched, yellow with continuous dark brown transversal band on top of vertex. Frons yellow with two smaller separated indistinct dark brown spots right below scapes and dark brown transversal band above scapes, too (Fig. 2). Gena, clypeus and labrum yellow. Mandible dominantly yellow basally, brown to black apically. Maxillary palp yellow with short black hairs at joint of segments. Labial palp yellow with oval-shaped brown sensory pit. It as long as widest part of last segment of labial palp. Eye large and shiny brown. Antenna 5.5 mm long. Scape and pedicel yellow, flagellar segments and club yellow with narrow dark brown basal rings. Yellow and dark brown rings alternate. Flagellar segments with short white and black setose.

Thorax: Pronotum 1.5 longer than wide, lateral margins parallel, dominantly yellow with dark brown as in Fig. 3. Lateral margins with sparse stiff white bristles. Short sparse white hairs cover pronotum. Mesonotum and metanotum also dominantly yellow with dark brown pattern and with short sparse and white pubescence. Side dark yellow with brown spots and sparse white hairs.

Legs: Fore coxa yellow with white hairs and with a row of dorsal white bristles. Black dots where white bristles originate. Femur yellow and black dotted covered with dense white hairs and two rows of stiff black bristles ventrally. Femur shorter than tibia. Tibia yellow with black dotted, distal part black, with dense black hairs and bristles. Tibial spurs as long as tarsal segments 1-3 combined. Tarsal segment 1 as long as segments 1-2 together. Tarsal segment 5 as long as tibial spurs. Segments yellow proximally black distally covered with black hairs. Middle coxa yellow with white hairs. Femur yellow and only dorsal side black dotted covered with white hairs and bristles. Femur shorter than tibia. Tibia yellow with black dotted, distal part black with black and white hairs and bristles. Tibial spurs somewhat longer than tarsal segments 1-2 combined. Otherwise

Fig. 1: Fore and hind wings of *Neuroleon tarimensis* sp. n.

Fig. 2: Head in frontal view

Fig. 3: Pronotum in dorsal view

Fig. 4: Abdomen in lateral view

length, color and pubescence of tarsal segments like on fore leg. Hind leg like middle leg but tibial spurs somewhat longer tarsal segment 1. Tibial spurs and claws shiny reddish brown.

Wings: Fore wing: 23 mm long, 5.5 mm wide. Hind wing: 22 mm long, 4.5 mm wide. Apices subacute, anal area obtuse. Base of costal area tapering. Apical area with cross-veins, 7 radial cross-veins before origin of Rs. 8 braches in Rs. Membrane transparent only with small indistinct brownish shadows at cubital mark as well as both side of gradate cross-veins on forewing as in Fig. 1. C yellow, other longitudinal veins yellow interrupted with brown at intersections of cross veins except distal part of R where brown only every second cross-vein. Pterostigma indistinct yellowish white with 7 cross-veins.

Hind wing without any shadows. Pterostigma small indistinct white with 4 cross-veins.

Abdomen: 23-24 mm long, Tergites dark brown with wide yellow lateral bands (Fig. 4) and with short dense white hairs. Sternites yellow to brown. Pubescence also short dense white.

Fig. 5: Male genitalia in lateral view

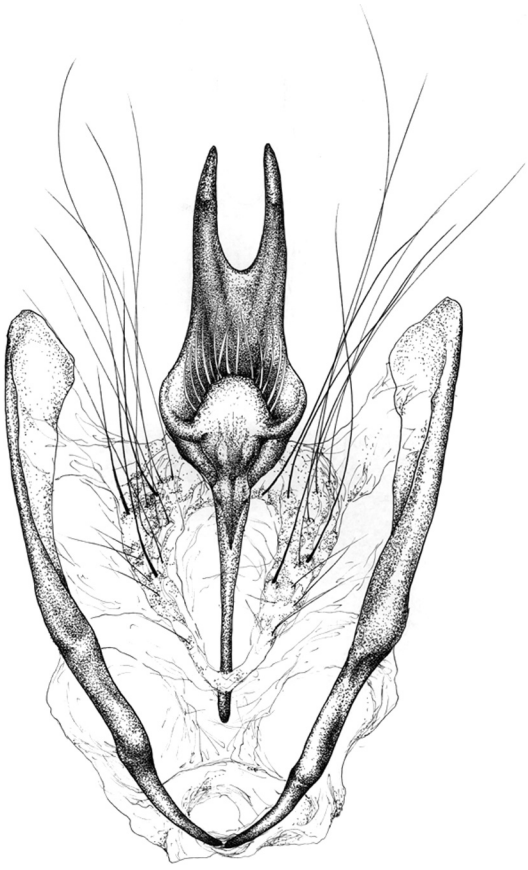

Fig. 6: Male inner genitalia in dorsal view

Genitalia: Male. In lateral view, tergite 9 subrhomboid-shaped dark brown with yellow hind margin. Ectoproct yellow with anterior brown spot and with long black hairs. Sternite 8 lobe-like brown with long black hairs (Fig. 5). Gonarcus and parameres complex in dorsal view as in Fig. 6.

Paratype: Females

Fore wing: 23 mm long, 5.5 mm wide. Hind wing: 22 mm long, 4.5 mm wide.

Genitalia in lateral view as in Fig 7 and in ventral view as in Fig 8.

Sometimes dark brown spots below antenna missing and abdomen without yellow spot. Dark pattern variable on legs. Abdomen shorter than length of wings.

Etymology: tarimensis refers to the name of the Tarim basin situated in China where the Taklamakan desert can be found.

Diagnosis: There are a few *Neuroleon* species in the Middle and Eastern part of Palearctic realm (KRIVOKHATSKY 1998).

The genus *Neuroleon* is traditionally divided into two subgenus *Ganussa* Navás, 1912 and *Neuroleon* Navás, 1909 (KRIVOTHATSKY 1995, STANGE 2004). *Ganussa* is characterised by small size, apical area of fore wing without cross-veins and usually 4-6 cross-

Fig. 7: Female genitalia in lateral view

Fig. 8: Female genitalia in ventral view

veins between R and Rs to the hypostigmatic cells. Only three species, *Neuroleon* (*Ganussa*) *erato* Hölzel, 1972, *Neuroleon* (*Ganussa*) *zakharenkoi* Krivokhatsky, 1996, *Neuroleon* (*Ganussa*) *marcopolo* Hölzel, 1970 are known in the region from the Middle East to Mongolia (KRIVOTHATSKY 1998).

The new species belongs to the subgenus *Neuroleon* of which species are typically larger (19-30 mm) than that of *Ganussa*, apical area with 2 or more cross-veins and 7-10 cross-veins between R and Rs to the hypostigmatic cells.

The genus *Neuroleon* was recently redescribed by MICHEL & AKOUDJIN (2012). In this sense, the new species exhibits features matching that of *Neuroleon* namely the venation of wings, leg and genital morphology.

According to the literatures (KRIVOTHATSKY 1995, STANGE 2004) only one *Neuroleon* species, *Neuroleon nigriventris* (Navás, 1913) lives in the area where the new species has been recorded. Its taxonomical status was revised by KRIVOKHATSKY (2011) and moved it into a new taxon as a subspecies of *Neuroleon nemausiensis* (Borkhausen, 1791). Both taxa are easily distinguished from the new species by the pattern of the pronotum and the abdomen. The abdomen of *Neuroleon nemausiensis* and *Neuroleon nigriventris* is dark brown with oval yellow spots but that of the new species has continuous lateral yellow bands on brown tergites.

Neuroleon fanaticus (McLachlan, 1875) was described from the Middle Asia and known from Iran, too, where *Neuroleon daphne* Hölzel, 1968, *Neuroleon alienus* Hölzel, 1972 were also described (HÖLZEL 1972) but later KRIVOTHATSKY (1995) synonymised the latter mentioned two species to *Neuroleon fanaticus*. It is different from the new species by dark brown pronatal pattern and also has dark brown dorso-lateral oval spots on the abdomen (cf. Fig. 4).

Neuroleon dianae Hölzel, 1972 is known from only Iran and Afghanistan and differentiated from the new species by smaller sized (the length of forewing only 19-21 mm), the length of tibial spurs, distinctive pattern on abdomen and forewing (HÖLZEL 1972).

As the type localities of *Neuroleon tarimensis* sp. n. is close to the Oriental realm it has to be compared to four *Neuroleon* species (*Neuroleon punjabensis* Iqbal & Yousuf 1997, *Neuroleon unpunctatus* Ghosh, 1981, *Neuroleon apicalis* Navás, 1915, *Neuroleon roscidus* (Navás, 1937) which were described from Pakistan and India.

The taxonomical status of *Neuroleon punjabensis* is uncertain since the holotype is a female but pronatal and wing patterns (IQBAL & YOUSUF 1997) make it to be clearly distinct from the new species. Actually, the length of tibial spurs is also shorter than that of the new species.

Neuroleon unpunctatus has very narrow wings, pronotum as long as wide and its pattern is also different from that of the new species.

Neuroleon apicalis is similar to the new species in the measurements and wing pattern but it differs from that of the pattern of pronotum and abdomen. Its tarsal segments are entirely yellow and the hind tibia has very long stiff black bristles while that of the new species has bicolour tarsal segments, yellow proximally, black distally and black and white medium long stiff bristles ventrally. Based on checking the type preserved in MNHP - Museum National d'Histoire Naturelle, Paris, France, the redescription and figures published by GHOSH (1984) it seems to be a distinctive species.

Neuroleon roscidus (Navás, 1937) was also checked in MNHP but it is not congeneric to *Neuroleon* needed for further revision because it does not resemble to the new species.

Acknowledgements

I wish to express my grateful thanks to Matthieu Giacomino (France) for providing information on the type material, Prof. Dr. Wang Xinli, Zhan Qingbin (China) for their useful scientific support and Ágnes Nagy (Hungary) for excellent drawings.

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Submitted: 15. 05. 2016
Accepted: 30. 06. 2016
Published: 30. 09. 2016