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Further data to the ant-lion fauna (Neuroptera) of Socotra Island (Yemen)

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Ábrahám L.: *Further data to the ant-lion fauna (Neuroptera) of Socotra Island (Yemen).*
Abstract: *Neuroleon fuscus* sp. n. from Socotra Island is described and figured. *Myrmeleon hyalinus isolatus* Ábrahám, 2010 is a new junior synonym of *Myrmeleon pellucidus* Hölzel, 1988. New distribution data, notes on further 6 ant-lion species and zoogeographical remarks are also given.

Keywords: new species, faunistics, Neuroptera, Yemen, Socotra

Introduction

In 2010, seven ant-lions and one owl-fly species were published (Ábrahám 2010) from Socotra, one new ant-lion species and one new subspecies were described. Most of the recoded species were endemic, since Socotra was isolated from the continent 23 million years ago. After publishing this paper, I received further neuropteran material from Socotra sent by Czech and Lithuanian entomologists.

The history of research on neuropteran fauna of Socotra was summarized in my previous paper (Ábrahám 2010) and concluded that a systematic mapping fauna has not been made on the island yet.

Occurrence of further, so far hidden neuropteran species in Socotra is very likely. Some of these species were labelled by Kimmins (1960) and Whittington (2002) as indet. species. This is why so important to publish all available material from the island.

Taxonomical and faunistical part

In 2009-2010, altogether 9 ant-lion species were collected from the island of Socotra by four Czech (154 specimens) and two Lithuanian (35 specimens) entomologists.

Palpares inclemens (Walker, 1853)

Material examined: YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8. xi.2010 1♂

Comment: At the first time the occurrence of this species from Socotra was published by Wranik (1999) under the name as *Palpares angustus* McLachlan, 1898 (Abb. 4.

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109:) but it was a misidentification. *Palpares angustus* McLachlan, 1898 was mentioned from Socotra by Kimmins (1960) but this specimen was not checked. Later, WHITTINGTON (2002) listed *Palpares inclemens* (Walker, 1853) correctly from the island. According to data cited by KOLBE (1897), and NAVÁS (1929) and unpublished data from coll: SCM (Kaposvár) it spreads in South and East Africa.

Centroclisis lineata (Kirby, 1903)

Material examined: YEMEN Socotra Island Noged plain (sand dunes) Sharet Halma vill. env. 12º21.9'N, 54º05.3'E 20 m Jiří Hájek leg. 10-11.xi.2010 3♂ 1♀; YEMEN Socotra Island Aloove area (sand dunes) Hassan vill. env. 12º31.2'N, 54º07.4'E 221 m Jiří Hájek leg. 9-10.xi.2010 1♀; YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8.xi.2010 3♂; YEMEN N. Socotra Island Ayfht valley 22-26.11 2010 leg.: M. Butkevicius 1♀

Comment: It is an endemic species.

Solter virgilii Navás, 1931

Material examined: YEMEN Socotra Island Dixam plateau Firmihin (Dracaena forest) 12º28.6'N, 54º01.1'E 490m J. Bezděk leg. 15-16.xi.2010. 1♂

Comment: This widespread species was listed from Socotra by KIMMINS 1960, WHITTINGTON 2002 and ÁBRAHÁM 2010.

Cueta klugi Hölzel, 1982

Material examined: YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8. xi.2010 5♂ 7♀; YEMEN Socotra Island Dixam plateau Firmihin (Dracaena forest) 12º28.6'N, 54º01.1'E 490 m J. Bezděk leg. 15-16.xi.2010. 1♀

Comment: Cueta species as undetermined material was mentioned from Socotra by WHITTINGTON 2002.

Myrmeleon saldaitisi Ábrahám, 2010

Material examined: YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8. xi.2010 7♂ 8♀; YEMEN Socotra Island Firmihin 400-500 m N12º28'27", E54º0'54" 6-7.ii.2010. at light L. Purchart & L. Vybíral lgt. 3♀; YEMEN Socotra Island Zemhon area 270-350 m N12º30'58", E54º06'39" 3-4. ii.2010. at light L. Purchart & L. Vybíral lgt. 3♂; YEMEN Socotra Island Homhi area 400-510 m N12º34'25", E54º18'53" 9-10.ii.2010. at light L. Purchart & L. Vybíral lgt. 1♀

Comment: It seems to be an endemic and a common species in the island.

Myrmeleon pellucidus Hölzel, 1988

Material examined: YEMEN Socotra Island Aloove area (sand dunes) Hassan vill. env. 12º31.2'N, 54º07.4'E 221 m Jiří Hájek leg. 9-10.xi.2010 1♀; YEMEN Socotra Island Noged plain (sand dunes) Sharet Halma vill. env. 12º21.9'N, 54º05.3'E 20 m Jiří Hájek leg. 10-11.xi.2010 3♂ 12♀; YEMEN Socotra Island Hallah Arhar (spring) 12º33.0'N, 54º27.6'E 15 m J. Bezděk leg. 11.xi.2010. 1♀; YEMEN N. Socotra Island Ayfht valley 22-26.11 2010 leg.: M. Butkevicius 3♂ 11♀

Comment: In 2010, the author described a new subspecies of *Myrmeleon hyalinus* which was named as ssp. *isolatus* Ábrahám, 2010 based on one female specimen. After checking numerous newly recorded specimens, including several male specimens, *Myrmeleon hyalinus isolatus* proved to be a junior synonym of *Myrmeleon pellucidus* Hölzel, 1988.

Myrmeleon hyalinus is a widespread from Western Africa to Central Asia and a very variable species, this is why HÖLZEL (1986) described several subspecies.

The female specimen collected in Socotra was different from this species, therefore I described it as a new subspecies of *Myrmeleon hyalinus*. This species was probably published by WHITTINGTON (2002) as "*Myrmeleon* sp. near *hyalinus* Olivier, 1871".

Myrmeleon hyalinus and *M. pellucidus* are closely related species and can be separated only by male genitalia (HÖLZEL 1988). The molecular biological analysis of these

species should be done, since Socotra was separated from the continent more than 20 million years ago.

Myrmeleon pellucidus was mentioned by HÖLZEL (2002) from the Arabian Peninsula (Oman, Saudi Arabia, Yemen) and I found it in the UAE and also in Kenya. In the entomological collection of SCM (Kaposvár) many specimens of *Myrmeleon hyalinus* from North Africa but no *Myrmeleon pellucidus* occurred.

Neuroleon socotranus (Taschenberg, 1883)

Material examined: YEMEN Socotra Island Noged plain (sand dunes) Sharet Halma vill. env. 12º21.9'N, 54º05.3'E 20 m Jiří Hájek leg. 10-11.xi.2010 2♂ 14♀; YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8.xi.2010 1♂ 8♀; YEMEN Socotra Island Firmihin 400-500 m N12º28'27",E54º0'54" 6-7.ii.2010. at light L. Purchart & L. Vybíral lgt. 3♂ 6♀ 2-; YEMEN Socotra Island Zemhon area 270-350 m N12º30'58", E54º06'39" 3-4.ii.2010. at light L. Purchart & L. Vybíral lgt. 2♂ 2♀; YEMEN N. Socotra Island Ayfht valley 22-26.11 2010 leg.: M. Butkevicius 3♂ 5♀

Comment: It is an endemic species in the island.

Neuroleon fuscus sp. n. (Fig. 1.)

Material examined:

Holotype: ♂ YEMEN Socotra Island Noged plain (sand dunes) Sharet Halma vill. env. 12º21.9'N, 54º05.3'E 20 m Jiří Hájek leg. 10-11.xi.2010

Paratypes: 11♂ 12♀ as holotype

Holotype ♂ and 5♂ 6♀ paratypes were deposited to Department of Entomology, National Museum, Praha (Czech Republic) and 5♂ 5♀ paratypes to Somogy County Museum, Natural History Department, Kaposvár, Hungary, 1♂ 1♀ paratypes to Upper Silesian Museum, Natural History Department, Bytom, Poland

Head: Vertex strongly arched with several bumps in two rows on top of vertex; dark brown with lateral and three rounded yellow spots. Frons yellow with larger dark brown spots fused centrally above antenna and two smaller separated dark brown ones below.

Fig. 1: Habitus of paratype female of *Neuroleon fuscus* sp.n.

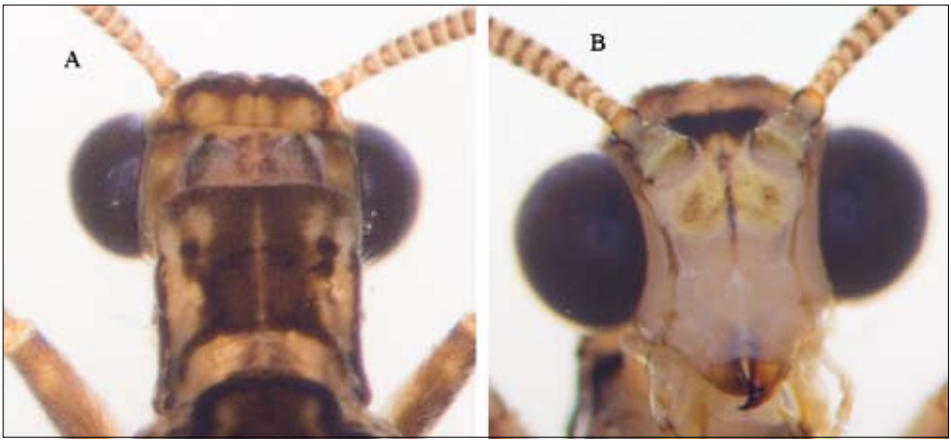

Fig. 2: Pronotum in dorsal view (A) and head in frontal view of *Neuroleon fuscus* sp.n (B)

(Fig. 2. B) Dark brown line between scapes reaches half of frons. Gena, clypeus and labrum yellow. Mandible dominantly brown. Maxillary palp yellow with central brown ring on second segment. Labial palp yellow with ring-shaped brown sensory pit. Eye large and shiny brown. Antenna 4.5 mm long. Scape yellow with dorso-basal dark brown half ring, pedicel yellow ventrally, dark brown dorsally, flagellar segments and club yellow with basal dark brown rings and with dark brown setose. Tip of club dark brown.

Thorax: Pronotum somewhat longer than wide, subromboid-shaped, dark brown with yellow pattern as in Fig. 2. A. Lateral margins of pronotum with short and sparse white hairs and some stiff white bristles. Mesonotum and metanotum dominantly dark brown with a few yellow spots and with sparse white pubescence. Side dark brown with yellow intersegmental membrane and sparse white hairs.

Legs: Coxae dark brown dorsally, yellow ventrally with short sparse and white hairs. Femora somewhat longer than tibiae. Dorsal side of femora dark brown with distal indistinct yellow spot, ventral side yellow with numerous dark brown spots. Pubescence long stiff white and black bristles. Tibiae yellow with proximal brown ring. Pubescence on tibiae short black hairs and long sparse stiff black bristles. Tarsal segment 1 yellow, other segments yellow with distal wide dark brown ring. Tibial spurs on fore and middle legs as long as segment 1-3 and on hind leg as long as segment 1-2 combined. Each segment with black setae. Tibial spurs and claws shiny reddish brown.

Wings: Fore wing: 21-22 mm long, 4.5 mm wide. Hind wing: 20.5-21 mm long, 4 mm wide. Apices acute, apical field with cross-veins, 7 radial cross-veins before origin of Rs. 9-10 braches in Rs. Membrane transparent with some brownish shadows and dots on forewings as in Fig. 1. C yellow, others longitudinal veins yellow interrupted with dark brown at intersections of cross veins. Pterostigma indistinct dark basally, yellowish-white distally with 7 cross-veins. Hind wing with indistinct white pterostigma.

Abdomen: 25-26 mm long, dark brown. Tergite 4 with centro-lateral indistinct yellow spot. Sternites dark brown. Pubescence sparse short black.

Genitalia: Male. In lateral view, tergite 9 subrhomboid-shaped dark brown with yellow hind margin. Ectoproct brown with wide yellow hind margin long black hairs. Sternite 8 lobe-like brown with long black hairs (Fig. 3A). Genitalia as in Fig. 3B in ventral view.

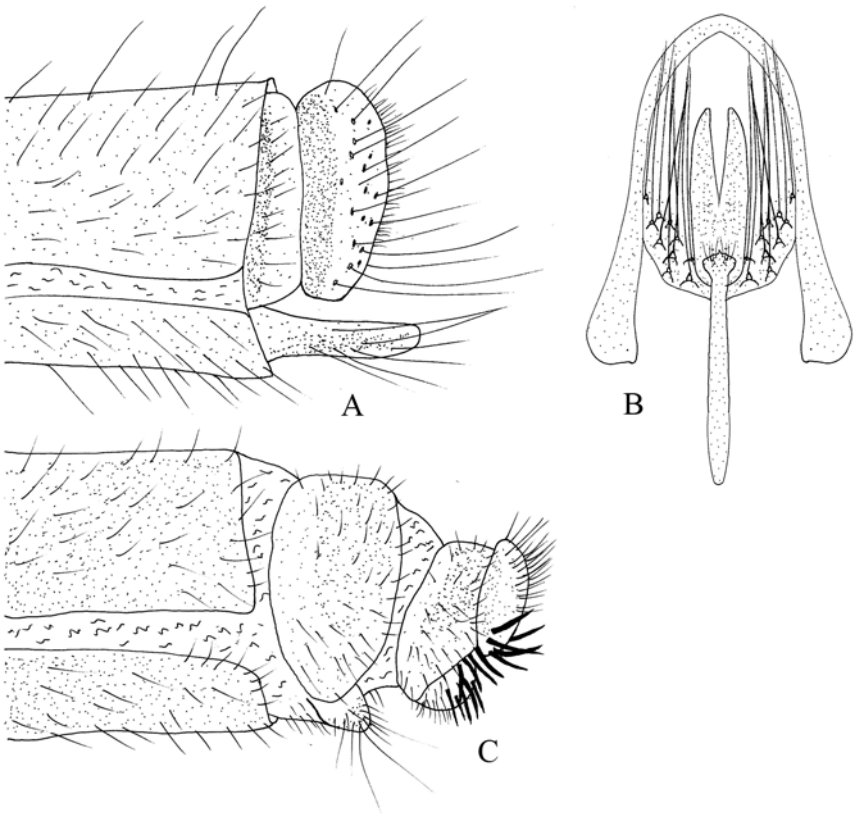

Fig. 3: Male and female genitalia of *Neuroleon fuscus* sp.n.

Paratypes: Sometimes dark brown spots below antenna missing and abdomen without yellow spot. Dark pattern variable on legs. Abdomen of female shorter than length of wings. Female genitalia with digging setae (Fig. 3C).

Diagnosis: Five *Neuroleon* taxa have been reported from Socotra so far. At first, TASCHENBERG (1883) described a very characteristic endemic species, *Neuroleon socotranus* (Taschenberg, 1883) that is easy to identify. Genitalia drawings and a colour photo of this species were published by ÁBRAHÁM (2010).

In addition, KIMMINS (1960) (as *Neleoma* sp. 1 and sp. 2 undetermined material) and WHITTINGTON (2002) (as *Neleoma* spp. undetermined material) listed these specimens from Socotra but Steffan (1971) combined *Neleoma* to *Neuroleon*. According to KIMMINS (1960) the wing pattern of *Neleoma* sp. 1 is similar to *N. pardalice* (Banks, 1911) which has distinctive wing pattern so it can not be the same taxon with the newly described species.

Also ÁBRAHÁM (2010) reported the first record of *Neuroleon sociorum* Hölzel & Ohm, 1983 from the island, which is a widespread species in Sahara and Arabian Peninsula.

The new species was compared to those *Neuroleon* species (12) found in Arabian Peninsula (ASPÖCK et al. 2001), it can be distinguished to each of two or more different characters, such as size, pattern and shape of pronotum, venation and pattern of wings, length of tibial spurs, pattern of abdomen, genitals. *Neuroleon amseli* Hölzel, 1983 closely resembles *N. fuscus* sp. n. but frons and pronotum pattern are different and length of tibial spurs shorter than that of new species.

Further 12 Neuroleon taxa (*N. alexandrei* (Navás, 1912), *N. bronzii* (Navás, 1931), *N. caligatus* (Navás, 1921), *N. dancalica* (Navás, 1931), *N. pulchellus* (Banks, 1911), *N. punctatus* (Navás, 1911), *N. retialis* (Navás, 1931), *N. sansibaricus* (Navás, 1913), *N. signata* (Navás, 1917), *N. striatus* (Navás, 1914), *N. torridus* (Navás, 1914), *N. tristictus* (Navás, 1936) from East Africa (STANGE 2004) were compared to the new species. Based on its size, venation and pattern of wings, branches of radius sector, number of cross-veins before origin of Rs, pattern of abdomen *N. bronzii* (Navás, 1931), *N. retialis* (Navás, 1931), *N. striatus* (Navás, 1914) are closely related species to the new species. Pronotum pattern of *N. bronzii* (Navás, 1931) and *N. retialis* (Navás, 1931) are different from that of the new species. *N. striatus* (Navás, 1914) has longer wings and number of branches of radius sector more than that of the new species.

Creoleon mortifer (Walker, 1853)

Material examined: YEMEN Island C. Sokotra, Haghier Mt Ayhft valley 2009.03.20. Leg. Saldaitis 1♂; YEMEN Island N. Sokotra, Hills near Hadibu 2009.03.21. Leg. Saldaitis 1♂ 1♀; YEMEN Island C. Sokotra, top of Diksam valley 2009.03.22. Leg. Saldaitis 2♂; YEMEN Island C. Sokotra, top of Diksam cayon 2009.03.23. Leg. Saldaitis 1♂; YEMEN Island N. Sokotra, Haghier Mt. Quadab loc. 2009.03.25. Leg. Saldaitis 2♂ 4♀; YEMEN Socotra Island Noged plain (sand dunes) Sharet Halma vill. env. 12º21.9'N, 54º05.3'E 20 m Jiří Hájek leg. 10-11.xi.2010 2♂ 1♀; YEMEN Socotra Island wadi Ayhaft 12º35.5'N, 53º58.9'E 200 m Jiří Hájek leg. 7-8.xi.2010 8♂ 1♀; YEMEN Socotra Island Kesa env. 220-300 m at light Hassan vill. env. 12º39'37"N, 52º26'42"E 28-29.i.2010. L. Purchart lgt. 1♂ 1♀; YEMEN Socotra Island Firmihin 400-500 m N12º28'27", E54º0'54" 6-7.ii.2010. at light L. Purchart & L. Vybíral lgt. 1♀; YEMEN Socotra Island Zemhon area 270-350 m N12º30'58", E54º06'39" 3-4.ii.2010. at light L. Purchart & L. Vybíral lgt. 8♂ 3♀

Comment: It was mentioned from Socotra by KIRBY (1903), KIMMINS (1960) and WHITTINGTON (2002). It is a widespread species from South to East Africa.

Zoogeographical remarks

Socotra needs special attention in zoogeographical view, since found in transition zone between Eathiopian and Palearctic realms and separated from the African continent more than 20 million years ago. So far, 13 Myrmeleontidae and 1 Ascalaphidae and species have been found (KIMMINS 1960, WHITTINGTON 2002, ÁBRAHÁM 2010).

The proportion of the endemic species is high, approximately 40%: (*Echthromyrmex insularis* Kimmins, 1961, *Centroclisis lineata* (Kirby, 1903), *Myrmeleon saldaitisi* Ábrahám, 2010, *Neuroleon socotranus* (Taschenberg, 1883), *Neuroleon fuscus* sp. n.).

The other species are also occurring in Africa. Some of them have wide distribution or their distribution is restricted only to East-Africa. No typical Asian or Arabian species were recorded from Socotra. Although, *Cueta klugi* Hölzel, 1982 and *Myrmeleon pellucidus* Hölzel, 1988 species were described from the Arabian Peninsula, most likely they are also colonised Socotra from the African continent. The only known Aschalaphidae species, *Ascalaphus aethiopicus* (Kimmins, 1949) also confirms the African origin of the fauna of Socotra (ÁBRAHÁM 2010).

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