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A new species of *Syngenes* Kolbe, 1897 from Somalia (Neuroptera: Myrmeleontidae: Acanthaclisini)

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Abstract. The authors describe a new species of Acanthaclisini (Neuroptera: Myrmeleontidae) from Somalia: *Syngenes carfii*.

Riassunto. *Una nuova specie di* Syngenes *Kolbe, 1897 della Somalia (Neuroptera: Myrmeleontidae: Acanthaclisini).* Gli autori descrivono *Syngenes carfii*, nuova specie di Acanthaclisini (Neuroptera: Myrmeleontidae) per la Somalia.

Key words. Acanthaclisini, *Syngenes*, Somalia.

Introduction

During the study of Neuroptera specimens from Somalia, collected by Prof. A. Simonetta in 1978 and preserved in Insom's collection, we focused on some specimens belonging to genus *Syngenes* Kolbe 1897. We found, by comparison with the original descriptions, that some of these specimens are different from known species of *Syngenes* for Africa and Saudi Arabia.
According to STANGE (2004) this genus consists of eight species, two of which are from India while the remaining are from Africa [*S. longicornis* (Rambur, 1842), *S. inquinatus* (Gerstaecker, 1885), *S. debilis* (Gerstaecker, 1888), *S. maritimus* Needham, 1913, *S. dolichocercus* Navás, 1914] and one from Saudi Arabia [*S. arabicus* Kimmins, 1954]. A sixth african species, *S. alluaudi* (van der Weele, 1909), has been recently transferred to this genus by ÁBRAHÁM & DOBOSZ (2011).

Material and methods

The pictures of wings and body were made with a Nikon Coolpix P510 digital camera with zoom set to 105 mm focal length. The details were photographed with Optikam B5 connected to a stereomicroscope MBS-10 or connected to a Koristka microscope with Photar 1:4/50 photographic lens. The pictures were elaborated with GIMP v.2.8.18 and stacked with Combine ZP programs. The tip of abdomen was removed from the specimens, rehydrated by NH_4OH 10% and cleared by KOH 10% for a few minutes at 50°C. The terminalia were rinsed in acetic acid and distilled water and stored into microvials with glicerin.

Description of the new species

***Syngenes carfii* n. sp.** (Figs 1-17)

Type material. All specimens are from Somalia (Federal Republic of Somalia): Afgooye (2°06' N - 45°07' E; WGS84), 20.V.1978, legit A. Simonetta. Specimens were collected at light about halfway through the main rainy season. The area is characterized by consolidated dunes with dense, degraded bush, on red sand.

Holotype ♂: Somalia: Afgooye (2°06' N - 45°07' E), 20.V.1978, legit A. Simonetta. [Length of antennae (LA): 8.3 mm, length of body (LB): 29.0 mm (without ectoprocts), length of ectoproct: 3.2 mm, length of fore wing (LfW): 31.5 mm, width of fore wing (WfW): 8.8 mm, length of hind wing (LhW): 28.8 mm, width of hind wing (WhW): 7.2 mm, length of abdomen (LAbm): 21.0 mm, length of ectoprocts (LEct): 2.5 mm].

Paratypes: 1♀ ("allotype") *ibidem*, 20.V.1978, [LA: 8.5 mm; LB: 30.9 mm; LfW: 34.3 mm; WfW: 9.0 mm; LhW: 31.7 mm; WhW: 7.1 mm; LAbm: 22.4 mm] *ibidem*, 2♂♂ e 3♀♀ 10.V.1978; 3♂♂ e 2♀♀ 20.V.1978; 1♀ 1.VI.1978, [♂♂: LA: 7.1-8.5 mm, LB: 27.7-30.9 mm, LfW: 30.0-32.7 mm, WfW: 8.5-8.7 mm, LhW: 27.8-29.3 mm, WhW: 7.0-7.2 mm, LAbm: 20.2- 22.0 mm, LEct: 2.4-3.0 mm; ♀♀: LA: 7.6-10.0 mm, LB: 25.8-31.3 mm, LfW: 30.5-35.5 mm, WfW: 8.6-9.5. mm, LhW: 27.5-32.0 mm, WhW: 7.0-8.0. mm, LAbm: 18.0-23.0 mm]. The holotype and the paratype used for the description of female ("allotype") have been deposited in the entomological collection of the Museo di Storia Naturale dell'Università degli Studi di Firenze, and the other paratypes are in the E. Insom's collection (Florence).

Ethymology. This species is dedicated to the memory of the Prof. S. Carfì, a very close friend of us with whom one of us (Insom E.) began the study of Neuroptera.

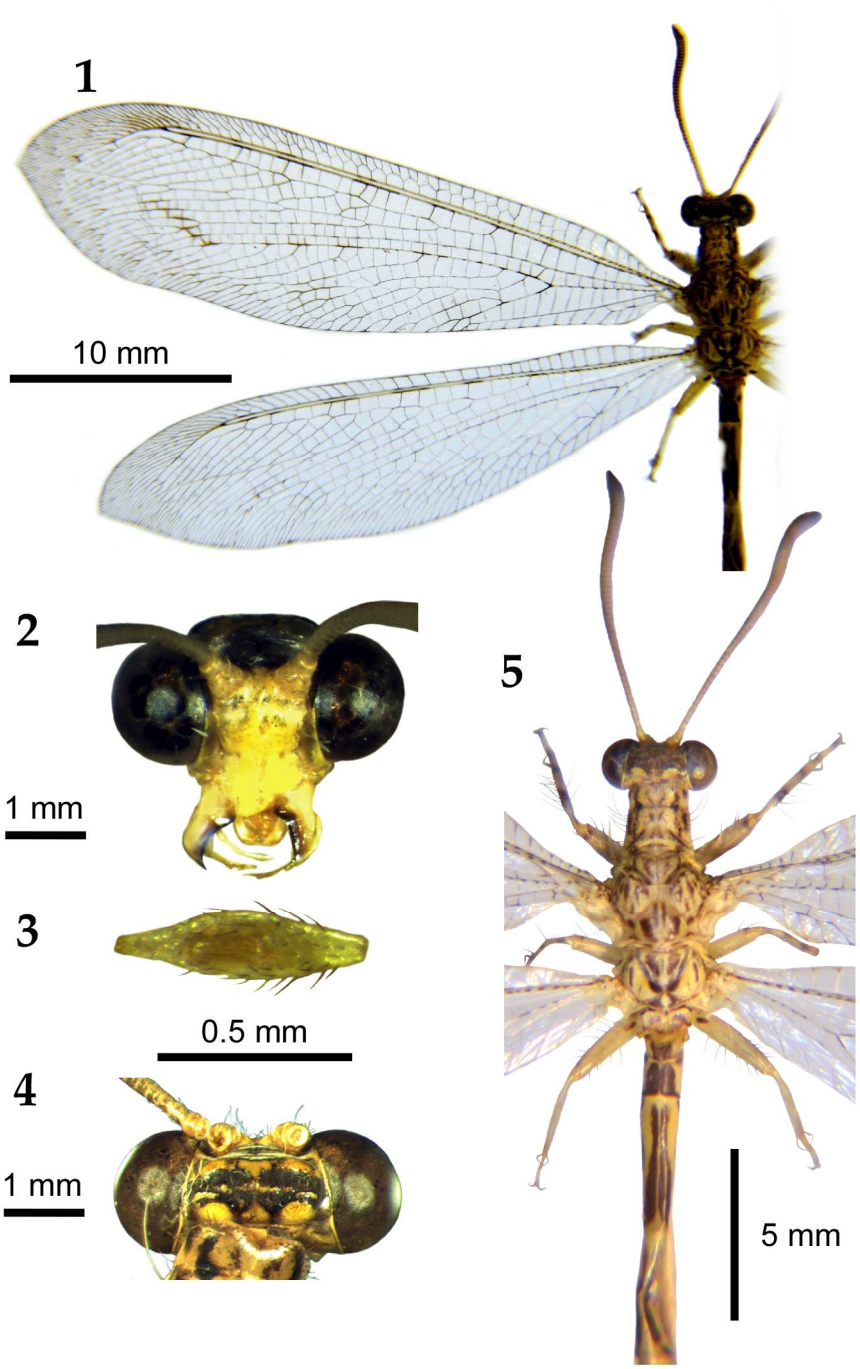
Description of male (Holotypus)

Head (Fig. 2). Frons, clypeus, labrum and gene yellow. Antennae (length = 8.5 mm) with yellow scapes and pedicels, flagellum yellow with each segment with a brown ring on the distal edge that is complete by about 1/3 from the pedicel. Basal segments with short yellowish hairs, darker towards the antennal apex. Vertex black from scapes to occiput, dorsally with three yellow spots: the three spots on the front are larger than the lateral ones, while the three on the rear are smaller and of equal size (Fig. 4). Labial palp fusiform, with the apical part elongated, yellow with sensory pore (Fig. 3).

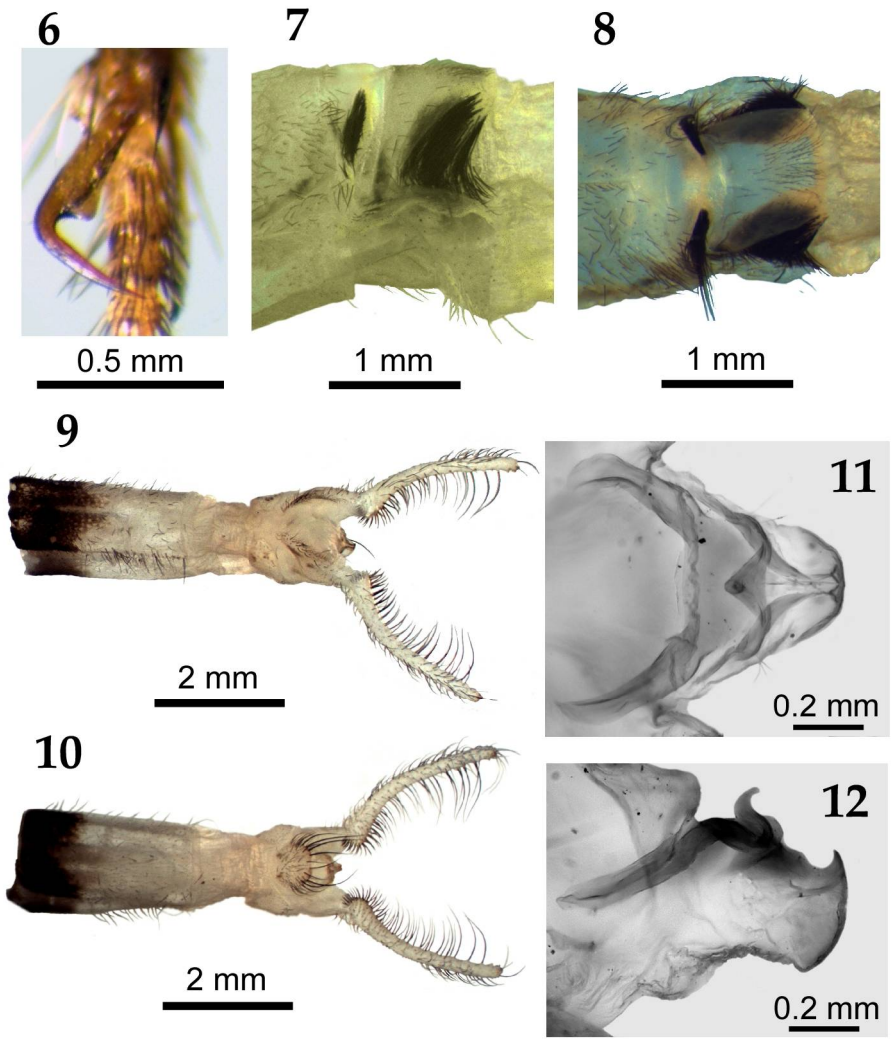
Thorax (Fig. 5). Pronotum yellow, trapezoidal, in appearance a bit longer than wide, with two anterior stripes, parenthesis-like in shape, from fore margin to *sulcum tranversum* and posteriorly with two oblique stripes that reach the hind margin; the central part of the pronotum is marked with small dark spots; dorsally with sparse, long, white and blacks hairs. Mesonotum yellow with dark marks of irregular shape, side with dark streaks; sparse, long and black hairs are mainly present on the sides. Metanotum yellow, with two large central brown spots on the prescutum, two oblique black lines ending in two large black spots on the central part of metascutum; metascutellum with two brown marks (which in paratypes are reduced into two angled stripes) divided by a yellow rhomboidal stain; sparse, short and yellowish hairs on the sides. Thorax yellow ventrally and laterally, with some brown stripes beneath the attachment of the wings.

Wings (Fig. 1). Typical *Syngenes* profile. Membrane hyaline with brownish marks; longitudinal veins with alternate brown and yellow segments; pterostigma proximally brownish and distally yellow-pink in the fore wing and light yellow in the hind wing. Fore wing: costal field occupied for about ¾ of its length by cross veins bifurcated before pterostigma, internal radial field with eight presectoral crossveins (ps.cv) before radial sector (Rs) (among male paratypes: 8-9 ps.cv). Hind wing: costal field without forked crossveins; internal radial field with six presectoral crossveins before radial sector (Rs) (among male paratypes: 5-7 ps.cv).

Legs. Background yellow. Fore leg: femur brownish outside and covered with long white hairs mixed with strong black bristles, yellow internally with two elongate sensory hairs near the base; tibia with a dark half-ring, wider externally, about half of its length; tibial spurs (Fig. 6) bent at right angle with strong flange, as long as the first three tarsal articles; tarsal segments yellows (t1-t5): t1= t2+t3; t2, t3 and t5 distally dark. Middle leg: the outside of the femur is covered with shorter and sparser white hairs than fore femur and with one sensory hair on the internal side near the base; tibia with the same pattern of the foreleg although much reduced; tarsus as in the foreleg. Hind leg: wholly yellow, femur without sensory hair and with significantly reduced white hairiness; tarsus as in the foreleg.



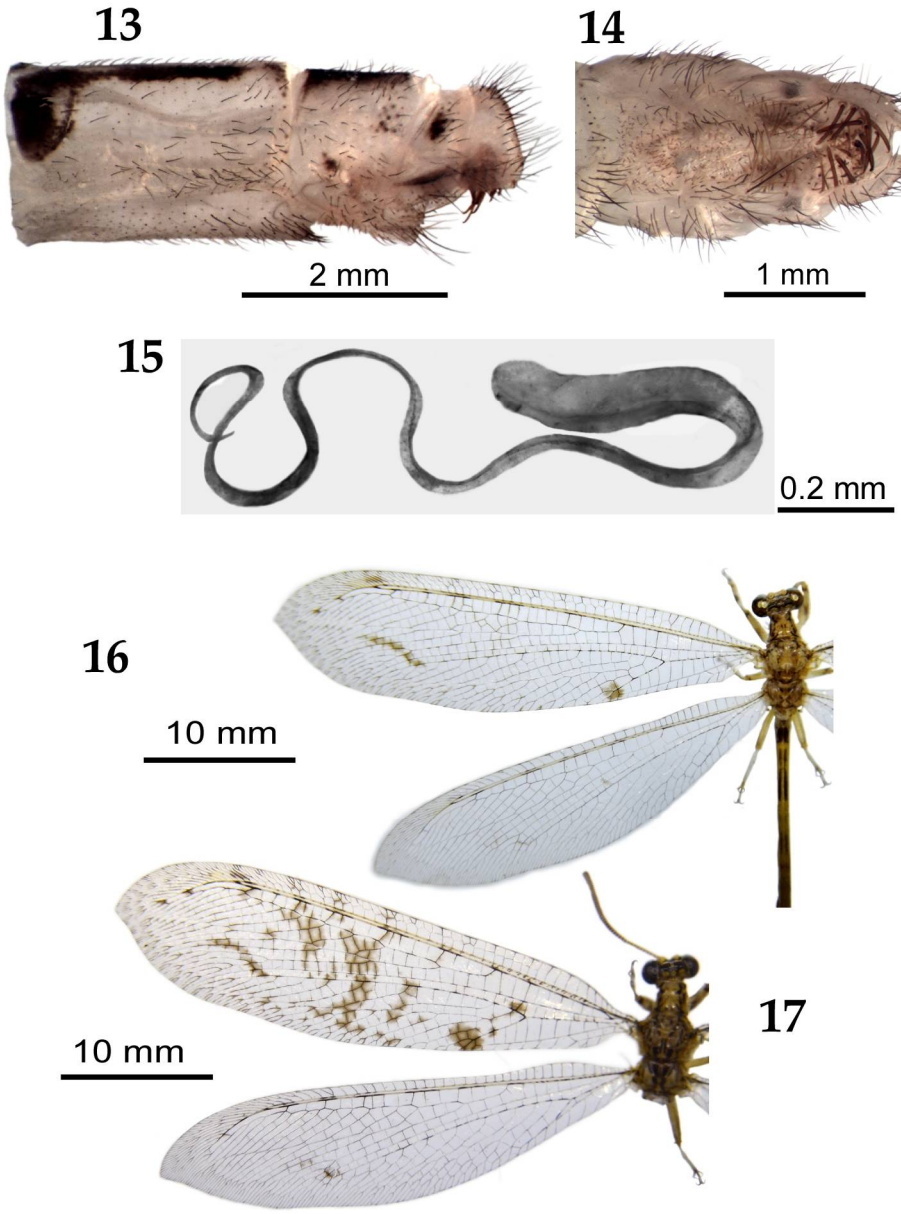
Figs 1-5. *Syngenes carfii* n. sp. (Holotypus ♂). 1. Forewing and hindwing; 2. Head (frontal view); 3. Labial palp whit sensory pore; 4. Vertex (dorsal view); 5. Vertex, thorax, and I-II-III abdominal segments (dorsal view).



Figs 6-12. *Syngenes carfii* n. sp. (Holotypus ♂). 6. Spur of forewing; 7. VI-VII abdominal segment (lateral view); 8. VI-VII abdominal segment (dorsal view); 9. Terminalia (dorsal view); 10. Id. (ventral view); 11. Gonarcus-parameres complex (dorsal view); 12. Id. (lateral view).

Abdomen. Segments with brown pattern on a light yellow background; hairiness predominantly dark becoming thicker towards the abdominal apex. Tergites (T): T.1 with a central dark spot; T.2 with two black dots on the sides of the fore edge and a central bell-shaped brown spot which is engraved anteriorly for a short distance and posteriorly for about half of its length [in some paratypes the spot is whole or clearly separated by a yellow line], the side edges bordered by a thin brown streak; T.3 - T.4 have two longitudinal dorsal stripes, which are wider posteriorly and separated by a thin yellow stripe, at the lateral margins of tergites there is a brown line that originates from an anterior triangular spot, centrally, leaning against the line there is a dark elongated spot; T.5 - T.6 yellow with a lateral dark fleck at the hind edge of the segments, laterally the pattern is similar to that of T.3 and T.4, although less defined; T.6 with pleuritocave. The seventh segment (about one third of the third segment in length) with pleuritocave and tergite (T.7) squamiform (Figs 7-8), covered by short dark

hairs, posterior edge rounded. The eighth segment is yellow with a brown front ring that continues dorso-posteriorly in two brown slightly defined stripes and not reaching the posterior margin of the tergite. T.9 yellow. Sternites (S) yellow excepted for S.8 whose third front is brown; S.9 (subgenital



Figs 13-17. *Syngenes carfii* n. sp. Figs 13-15. *Syngenes carfii* n. sp.: paratype used for the description of female. 13. Terminalia (lateral view); 14. Id. (ventral view); 15. Spermatheca. Figs 16-17. *Syngenes carfii* n. sp.: paratypi. 16. Forewing and hindwing (♂); 17. Id. (♀).

plate) yellow with some brown dots proximally. Ectoprocts yellow, as long as the eighth segment, curved, with long and thin sparse dark bristles (Figs 9-10). Gonarcus-parameres complex: the gonarcus is clearly developed and sclerotized (Fig. 11); the mediuncus is very large and has a showy prominence with the apex directed backward (Fig. 12); the parameres in dorsal view have a horizontal trend and ending with a vertical gaudy processes; *lamina subterminalis* (INSOM & CARFÌ, 1992) delimits caudally the apical part of the pseudoaedegus, without any protuberance.

Description of female

The paratype ("allotype") used for the description of female is deposited together with the holotype in the entomological collection of the Museo di Storia Naturale dell'Università degli Studi di Firenze.

Head and thorax as in the male.

Wings. Hyaline, venations and pterostigma as in the male. Internal radial field: 8 presectorial veins in the fore wing (among female paratypes: 8-9 pr.cv) and 6 presectorial veins in hind wing (among female paratypes: 5-7 pr.cv).

Legs. Yellow as in male, the pattern is more defined in fore and middle leg than in posterior leg; tarsal segments of the fore and middle legs are dark.

Abdomen. The pattern is like in the male, but the design on the T.3 is repeated over the following tergites. T.7 not scale-like. S.3 is dark, towards the rear edge turned lighter. Since S.4 the sternites are yellowish. Terminalia as Figs 13-14, a deep notch V-shaped ventrally on the 8th segment and gonapophyses posteriorly conical and slightly curved medially.

Variability. The species is characterized by poor variability of pattern in both males and females. In both sexes on a yellow base colour, the spots may be more or less dark brown. The other differences are highlighted in the descriptions. The brown spots on the wings range from very faded to very evident. This variability of wing spots is represented by specimens referred to Fig. 16 (male) and Fig. 17 (female). On the front wing, at the end Cua2, there is a little brown spot: this spot is more or less evident.

Comparative notes

The genus *Syngenes*, as we pointed out in the introduction, includes species from the following regions: Africa (5 species), Arabian Peninsula (1 species), and India (2 species) (STANGE, 2004; OSWALD, 2015).
The description of the new species is based on the comparison with the original descriptions of the species from Africa and the Arabian Peninsula, although such descriptions are often lacking of drawings or photographs; in these descriptions wings and body patterns are privileged, but there are only few morphological characters. Moreover, the holotypes in three cases are represented by females, whose body patterns may differ from the male, the latter being not always known. Despite that, we tried to make both a comparison between species and a possible key to the species excluding the indian one. These comparisons have shown that the species of the genus *Syngenes* can be grouped into two groups according to the length of the wings (front < 40 mm, rear ≤ 35 mm and front ≥ 40 mm, rear > 35 mm).
The new taxon belongs to the small size group, together with *S. inquinatus* from Democratic Republic of the Congo (= ex Belgian Congo) and *S. debilis* from sub-Saharan West Africa [considered by PROST (1998) as only present in West Africa, although KOLBE (1897) cited it from Tanzania (= Deutsch-Ostafrika)] and Cape Verde Islands (HOELZEL & OHM, 1991); *S. carfii* has yellow face and tibial spurs bent at right angle with strong flange while *S. inquinatus* has a brown face and tibial spurs with a distinctly downward-curved tip, but neither bent nor extended [see GERSTAECKER (1885): "Fussenklauen und Schiensporen röthlich braun, letztere zwar mit deutlich abwärts gekrümmter Spitzenhälfte, aber weder geknickt, noch unterhalb erweitert"].
Syngenes carfii is distinguished from the taxa belonging to the second group for the following reasons: from *S. dolichocercus* by a very different abdominal pattern although that of pronotum is

similar; from *S. alluaudi*, known from Madagascar, by the abdomen with a black back and yellow lateral lines and clear pronotum with a central black line; from *S. arabicus* [mountain species in western Saudi Arabia (HÖLZEL, 1988)], by the dark brown pronotum with V-shaped yellow spot; from *S. longicornis* by the reddish face, pronotum brown finely variegated of yellow and tibial spurs curved at an obtuse angle (see RAMBUR, 1842), and from *S. maritimus* by pronotum grayish and tibial spurs gently curved (see NEEDHAM, 1913).
However, we give a tentative identification key based on the original descriptions and we agree with ÁBRAHÁM & DOBOSZ (2011: 114) on the need for a revision of the African species of the genus *Syngenes* Kolbe, 1897 because, as these authors pointed out, the validity of some species remains dubious.

Below we give a possible identification key to the species of *Syngenes*.

1. Fore wing length < 40 mm, hind wing length ≤ 35 mm 2
- Fore wing length ≥ 40 mm, hind wing length > 35 mm 4

2. Pronotum reddish with brown speckles forming two longitudinal lateral lines; tibial spurs with a distinctly downward-curved tip, but neither bent nor extended ..... *inquinatus*
- Pronotum yellow with two brown longitudinal lines 3

3. Fore tibiae are ringed with brown; tibial spurs curved ..... *debilis*
- Fore and middle tibiae are ringed with brown; tibial spurs abruptly bent at a right angle ... *carfii*

4. Pronotum light 5
- Pronotum of a different colour 6

5. Pronotum with a black mid-line and two short black front lines; abdomen black: dorsally with two yellow longitudinal stripes and ventrally with a yellow mid-line; tibiae with dark rings; tibial spurs bent at nearly right angle ..... *alluaudi*
- Pronotum yellow with two dark longitudinal lines; abdomen yellow, the back half of each tergite from T3 onwards with a wide cross-brown stripe, sternites yellow; strongly bent tibial spurs ..... *dolichocercus*

6. Pronotum grayish above with minute fuscous dots, that can form three pairs of dark dashes; tibial spurs gently curved ..... *maritimus*
- Pronotum brown 7

7. Pronotum finely variegated yellow; tibial spurs curved at an obtuse angle ..... *longicornis*
- Pronotum with yellow spot V-shaped; tibial spurs curved ..... *arabicus*

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