

Calosoma chlorostictum ivinskisi, a new synonym
of *Calosoma chlorostictum chlorostictum*
(Coleoptera: Carabidae: Carabini)

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Abstract. On the basis of extensive material from the Socotra Island, *Calosoma chlorostictum ivinskisi* Obydov & Saldaitis, 2010, syn. nov., is hereby synonymized with *Calosoma chlorostictum chlorostictum* Dejean, 1831. Specimens from the Socotra Island described as *C. c. ivinskisi* do not differ from those in southern and eastern Africa including Madagascar and southwestern Asia.

Key words. Carabidae, Carabinae, *Calosoma*, new synonymy, Yemen, Socotra

Introduction

Caterpillar hunters of the genus *Calosoma* Weber, 1801 are the second most species-rich genus of the subfamily Carabinae. LORENZ (2005) recognizes 170 species from all zoogeographic areas. Most of them are excellent flyers with extensive distributions, and are known from all continents and many oceanic islands. However, some representatives are secondarily apterous and have only limited distributions (cf. DARLINGTON 1936).

Socotra is an island (3,550 km²) in the Indian Ocean east of the Gulf of Aden. So far, 52 species of ground beetles (Carabidae) have been recorded from the island (FELIX & FARKAČ 2012). *Calosoma chlorostictum* Dejean, 1831, the only species of the genus *Calosoma* known to occur in Socotra, is a widely distributed Afrotropical species reaching also into the southwestern part of the Palearctic region. Recent authors (CULOT 1990, BUSQUET et al. 2003, LORENZ 2005) recognize three subspecies, nominotypical form inhabiting eastern and southern Africa and south-western Asia, and two subspecies endemic to Atlantic islands: *C. c. cognatum* Chaudoir, 1850 from Cape Verde Islands and *C. c. helenae* Hope, 1838 from the Saint Helena Island. With the exception of Madagascar (and apparently also the adjacent Comoros Islands), until recently the species has not been recorded from any other islands in

the Indian Ocean. Colonization of the Indian-Ocean islands has not so far resulted in emergence of a separate taxon, and insular populations have been repeatedly referred to as the nominotypical subspecies. OBYDOV & SALDAITIS (2010) distinguished the Socotran population of *C. chlorostictum* as a subspecies separate from the south Arabian population without looking for differences in specimens from the African continent and Madagascar, and their samples were quite limited. Study of much larger material obtained during Czech expeditions to Socotra in 1999–2010 has shown that the Socotran population of *C. chlorostictum* does not substantially and consistently differ from southern or eastern African and Madagascan populations. The species definitely is a good enough flyer to reach the continent and vice versa. Although it is approximately as far from Socotra to the Arabian Peninsula (Hadramaut, Yemen) as it is to Somalia, the latter destination is easier to reach because of several islands and atolls in between. Studies of distribution of similarly behaving species of *Calosoma* in the Caribbean show that several hundred kilometres of seawater do not pose much of a problem (GIDASPOW 1963).

Material and methods

Material from Socotra Island (lgt. Vladimír Bejček & Karel Šťastný and Jan Farkač, respectively, all of Czech University of Life Sciences, Prague, Czech Republic) was collected during implementation of the Czech project Socotra 2000 between 1999 and 2003, realized within the framework of the bilateral Foreign Developmental Assistance provided by the Czech Republic to the Republic of Yemen. The studied material is deposited in the following collections: Národní muzeum, Prague, Czech Republic (NMPC); Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague, Czech Republic (CULS); Jan Farkač collection, Prague, Czech Republic (JFCP); Martin Häckel collection, Hostivice, Czech Republic (MHCH); Rostislav Ross Sehnal collection, Unhošť, Czech Republic (RSCU).

Following abbreviations are used in the text: EL = maximum length of elytra; EW = maximum width of combined elytrae; HW = maximum width of head (including eyes); PL = maximum length of pronotum; PW = maximum width of pronotum; TL = total body length (including mandibles).

Systematics

Calosoma (Calosoma) chlorostictum chlorostictum Dejean, 1831

Calosoma chlorostictum Dejean, 1831

Carabus rugosus DeGeer, 1778 (junior homonym of *C. rugosus* Fabricius, 1775)

Calosoma crassipes Chaudoir, 1843

Calosoma australe Hope, 1845

Calosoma elegans Géhin, 1885

Calosoma calidum Lapouge, 1924

Calosoma amabile Mandl, 1954

Calosoma hadramautum Mandl, 1954

Calosoma rugosulum Mandl, 1954 (replacement name for *C. rugosum* DeGeer, 1778)

Calosoma kasyi Mandl, 1970

Calosoma (Caminara) chlorostictum ivinskisi Obydov & Saldaitis, 2010, **syn. nov.**

Material examined. YEMEN: SOCOTRA ISLAND (74 specimens): 1 spec., Hadibu env., 12.652 N, 54.024 E, 10 m a.s.l., 6.–24.ix.1999, lgt. V. Bejček & K. Šťastný, det. J. Zidek (JFCP); 1 spec., Ayhaft 12.ii.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP); 4 spec., Hadibu, 12.652 N, 54.024 E, 10 m a.s.l., 11.–23.xi.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP); 2 spec., Ayhaft, 3.xi.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP, CULS); 2 spec., Haghier, 12.575 N, 54.022 E, 1502 m a.s.l., 4.–8.x.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP); 14 spec., Firmihin, 12.474 N, 54.015 E, 530 m a.s.l., x.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP, CULS, MHCH); 1 spec., Lahas, 12.646 N, 54.091 E, 69 m a.s.l., 11.–23.xi.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP); 1 spec., Homhil, 11.–23.xi.2000, lgt. V. Bejček & K. Šťastný, det. J. Farkač (JFCP), 1 spec., Dixam plateau, 25.x.2000, lgt. V. Bejček & K. Šťastný (JFCP); 1 spec., wadi Faar, 3.xii.2002, lgt. V. Bejček & K. Šťastný (RSCU); 1 spec., wadi Ayhaft, 24.–26.xi.2003, lgt. J. Farkač (JFCP); 8 spec., Qalansiyah env., Khayrha mts., N slopes, 9.–10.xii.2003, lgt. J. Farkač (JFCP); 24 spec., Hadiboh, 21.xi.–12.xii.2003, lgt. J. Farkač, det. J. Farkač (JFCP, MHCH, RSCU); 2 ♂♂ 3 ♀♀, Qualentiah env., 4.–5.vi.2010, V. Hula J. & Niedobová lgt. (NMPC); 1 ♀, Al Haghier, wadi Madar, 1180–1230 m, 12.–14.xi.2010, L. Purchart lgt. (NMPC); 1 ♂, Wadi Ayhaft, 200 m, J. Hájek lgt. (NMPC); 1 ♂, Hadiboh, 21.xi.–12.xii.2003, P. Kabátek lgt. (NMPC); 1 ♂ 2 ♀♀, Khayrha, 9.–10.xii.2003, P. Kabátek lgt. (NMPC); 3 ♀♀, Khayrha, 9.–10.xii.2003, D. Král lgt. (NMPC); 1 ♂, Hadiboh, 21.xi.–12.xii.2003, D. Král lgt. (NMPC); 1 ♂ 1 ♀, Wadi Ayhaft, 24.–26.xi.2003, D. Král lgt. (NMPC).

Continental Africa and Madagascar (45 specimens): **ALGERIA:** 1 ♂ (NMPC). **EGYPT:** 2 ♂♂ 3 ♀♀ (NMPC); 1 ♀, Ober Aegypten (NMPC); 2 ♀♀, Luxor (NMPC); 1 ♂, Luxor, v.1900 (NMPC). **ETHIOPIA:** 1 ♂, Abessynia (NMPC); 1 ♂ 1 ♀, Abesinia, Harar (NMPC); 1 ♀, Addis Ababa, viii.2006, D. Gennaro lgt. (RSCU). **KENYA:** 2 ♂♂ 1 ♀, Namanga, 1200 m, 26.i.2001, L. Nadai lgt. (RSCU). **MADAGASCAR:** 1 ♂ 2 ♀♀, Mindongy (NMPC); 1 ♂ 2 ♀♀, Sakaraha, i.1991, spec. coll. T. Taylor (MHCH); 1 ♂ 1 ♀, Moramanga env., 2007, A. Reml & M. Trýzna lgt. (RSCU). **REPUBLIC OF SOUTH AFRICA:** 1 ♀, Africa austr. (NMPC); 1 ♀, Natal (NMPC); 1 ♀, Transvaal, Olifants Nek., 1938, Dr. Baum (NMPC); 3 ♂♂ 1 ♀, Orange riv., S of Phillipolis, 26.xii.2007, M. Snížek lgt. (RSCU); 1 ♂, Eastern Cape, 40 km E Plettenberg Bay, 8.i.2010, J. Halada lgt. (RSCU); 1 ♂, Limpopo, Klaserie, 16.–17.xii.2003, I. Martinů lgt. (RSCU); 1 ♂, Mpumalanga, 45 km after Middelburg to Stollferg, 17.xi.2000, P. Schüle lgt. (RSCU); 1 ♂ 1 ♀, Northwest Prov., Bothaville, Vaal riv., xi.2002, M. Halada lgt. (MHCH); 2 ♂♂ 1 ♀, same data, but M. Snížek lgt. (MHCH); 2 ♀♀, same data, but 22.xii.2007, M. Snížek lgt. (RSCU); 1 ♂, Western Cape, S Swellendam, 28.xi.–1.xii.1997, R. Kmeco lgt. (RSCU); 1 ♂, Western Cape, Greyton env., x.1999, M. Snížek lgt. (JFCP). **TANZANIA:** 1 ♂, Arusha distr., Naberera env., iv.1997, J. Rolčík lgt. (MHCH).

Comments on classification. OBYDOV & SALDAITIS (2010) differentiate their new subspecies from Arabian population described, on the basis of two females, by MANDL (1954) as *C. chlorostictum hadramautum*, but in more recent publications regarded as synonyms of the nominotypical subspecies (CULOT 1990, BOUSQUET et al. 2003). Authors stated that their new subspecies from Socotra differs in size, robustness, width to length ratios of pronotum and elytra, markedness of primary elytral foveoles, convexity of eyes and sculpture of the head. However, study of our extensive material from Socotra and the African continent has shown the differences claimed by OBYDOV & SALDAITIS (2010) to be invalid. The size and body width to length ratios cannot be used to differentiate between populations (see Table 1), there are no differences in surface sculptures or convexity of eyes, and the shape of the aedeagus (cf. OBYDOV & SALDAITIS 2010: fig. 4) is the same as in specimens from the African continent and Madagascar. We therefore consider *C. chlorostictum ivinskisi* a junior subjective synonym of *C. chlorostictum chlorostictum*.

The subgeneric placement of *C. chlorostictum* in the subgenus *Calosoma* follows the recently proposed classification supported by results of DNA analyses (SU et al. 2005).

Collection circumstances. OBYDOV & SALDAITIS (2010) published *C. chlorostictum* only from the upper part of Ayhaft Valley, a habitat dominated by “*Dracaena cinnabari*, *Rhus rhysiflora* [= *thyrsofolia*], *Euryops arabicus*, *Buxus pedicillata*, *Gnidia socotrana*, *Cocculus balourii* [= *balfourii*] and other plant species... Few specimens were light trapped during

Table 1. Measurements of *Calosoma chlorostictum* Dejean, 1831.

	type specimens of <i>C. chlorostictum ivinskisi</i> (OBYDOV & SALDAITIS 2010)		Other material from Socotra Island		Africa and Madagascar	
	male	female	male	female	male	female
TL	23.0–24.6	24.8–26.3	20.0–28.0	20.0–28.0	20.8–28.0	22.0–28.7
EW	9.0–11.5	10.2–12.0	8.2–11.5	8.4–13.0	8.0–11.5	9.1–12.2
PW / HW		1.65*	1.41–1.56	1.37–1.57	1.44–1.58	1.41–1.58
PW / PL		1.75	1.50–1.68	1.46–1.75	1.43–1.78	1.49–1.75
EL / EW		1.50	1.50–1.56	1.43–1.59	1.50–1.66	1.39–1.62
EW / PW		1.53	1.38–1.64	1.43–1.62	1.37–1.66	1.48–1.74

* PW / HW ratio given by OBYDOV & SALDAITIS (2010) is 1.65, but the habitus photos in their work indicate 1.45 for the male holotype and 1.57 for a female paratype.

the night. Another endemic beetle species *Malldon arabicum* (Cerambycidae) was collected at the same time". To the contrary, the new material shows *C. chlorostictum* to be a typical alate nocturnal predator present virtually throughout the island, although most specimens were collected at lights, many at the midst of Hadiboh, the largest town on the island, on the terrace of the Summer Land Hotel. The species is documented in Socotra Island from altitudes 10–1502 m a.s.l.

Distribution. Eastern and southern Africa: Botswana, Djibouti, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Republic of South Africa, Somalia, Southern Sudan, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe; south-western Asia: Iraq, Iran, Oman, Saudi Arabia, Yemen (including Socotra Isl.) (DARLINGTON 1936, MANDL 1954, BOUSQUET et al. 2003).

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