

Bruchinae (Coleoptera: Chrysomelidae) from Socotra Island

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Abstract. First data on seed beetles (Chrysomelidae: Bruchinae) from Socotra Island are presented for seven species: *Bruchidius nalandus* (Pic, 1927), *Callosobruchus rhodesianus* Pic, 1902, *Caryedon gonagra* (Fabricius, 1798), *Caryedon sudanensis* Southgate, 1971, *Caryedon* sp., *Conicobruchus medaniensis* (Decelle, 1982), and *Spermophagus monardi* Decelle, 1975.

Key words. Coleoptera, Chrysomelidae, Bruchinae, new records, Yemen, Socotra

Introduction

So far, no information has been available on seed beetles of Socotra Island, contrary to nearby countries: Somalia and the Arabian Peninsula (ANTON 2010, DECELLE 1979a,b, DELOBEL 2011, JOHNSON et al. 2004, YUS RAMOS 2004). A small collection of Bruchinae was gathered during the recent expeditions conducted by the Mendel University in Brno and supplemented by additional specimens from the National Museum Prague and the Czech University of Life Sciences Prague (Expedition Soqotra 2003). The present data constitute a welcome addition to our knowledge of the East African and Arabian fauna of Bruchinae.

Material and methods

Examination of external structures was carried out under a stereoscopic microscope (Wild MZ8). After dissection, genitalia were heated in hypertonic NaOH solution, and examined under a light microscope (Leitz Laborlux K). To prepare Figs. 1–7, digital photographs of microscope preparations were taken using a hand held Canon Powershot G3 camera, and transferred to a vector graphics editing program. Distribution data are based on available literature and, particularly for mainland Yemen, on ANTON (2010).

Specimens are deposited in the collection of the National Museum, Prague, Czech Republic (NMPC); some duplicates are also in the author's personal collection (CBAD), in the collection of Faculty of Forestry, Czech University of Life Sciences, Prague, Czech Republic (CULS) and in the personal collection of Jan Bezděk, Brno, Czech Republic (JBCB).

Results

Bruchidius nalandus (Pic, 1927)

Material examined (111 spec.). **YEMEN: SOCOTRA ISLAND:** Coastal road, shrubby area, ca. 5 km W of Hadibo, 13.vi.2009, 5 spec., L. Purchart leg. (NMPC); Shrub 5 km E of Hadiboh, 13.vi.2009, 1 spec., V. Hula leg. (NMPC); Elhe nursery, 12°32'39"N 54°04'43"E, 19.vi.2009, 3 spec., V. Hula leg. (NMPC); Shibhon, 12°28'15"N E53°58'31"E, 680 m, 13.vi.2009, 7 spec., L. Purchart leg. (NMPC); Wadi between Firmihim and Shibhon, 23.vi.2009, 1 spec., L. Purchart leg. (NMPC); Di Lishe beach, 20 m, 2.ii.2010, 3 spec., L. Purchart leg. (NMPC); Zemhon area, 12°30'58"N E54°06'39"E, 270–350 m, 3.–4.ii.2010, 15 spec., L. Purchart & J. Vybíral leg. (NMPC); Firmihim, 12°28'27"N E54°0'54"E, 400–500 m, at light, 6.–7.ii.2010, 3 spec., L. Purchart & J. Vybíral leg. (2 spec. in NMPC, 1 spec. in CBAD); Di Hamri, 12°37'59"N 54°15'40"E, 20 m, 27.ii.2010, 4 spec., L. Purchart leg. (NMPC); Dgisfu Valley, 12°28.444'N 54°08.596'E, 2.vi.2010, 1 spec., V. Hula & J. Niedobová leg. (CBAD); Deiqub cave env., 10.vi.2010, 6 spec., V. Hula & J. Niedobová leg. (5 spec. in NMPC, 1 spec. in CBAD); Zemhon area, 12°20'58"N 54°06'39"E, 270–300 m, 16.–17.vi.2010, 9 spec., V. Hula leg. (NMPC); Wadi Ayhafit, 12°36.5'N 53°58.9'E, 200 m, 7.–8.xi.2010, 1 spec., J. Hájek leg. (NMPC); same data, 1 spec., P. Hlaváč leg. (NMPC); same data, 1 spec., J. Batelka leg. (NMPC); same data, 4 spec., J. Bezděk leg. (3 spec. in JBCB, 1 spec. in CBAD); Aloove area, Hasan vill. env., 12°31.2'N 54°07.4'E, 221 m, 9.–10.xi.2010, 1 spec., J. Hájek leg. (NMPC); Noked Plain (sand dunes), Sharet Halma vill. env., 12°21.9'N 54°05.03'E, 20 m, 10.–11.xi.2010, 19 spec., J. Bezděk leg. (16 spec. in JBCB, 3 spec. in CBAD); same data, 1 spec., L. Purchart leg. (NMPC); same data, 2 spec., J. Hájek leg. (NMPC); same data, 3 spec., P. Hlaváč leg. (NMPC); same data, 1 spec., J. Batelka leg. (NMPC); Dixam plateau, Firmihim (*Dracaena* forest), 12°28.6'N 54°01.1'E, 490 m, 15.–16.xi.2010, 2 spec., J. Hájek leg. (NMPC, CBAD); same data, 1 spec., J. Bezděk leg. (JBCB); Aloove area, Aloove vill. env., *Jatropha unicosata* shrubland with *Boswellia elongata* trees, 12°31.2'N 54°07.4'E, 221 m, 19.–20.vi.2012, 2 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Deiqub cave, cave & *Croton socotranus* + *Jatropha unicosata* shrubland, 12°23.1'N 54°00.9'E, 115 m, 12.vi.2012, 11 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Noked plain, Abataro, border of sand dunes and shrubland, 12.–13.vi.2012, 12°22.1'N 54°03.4'E, 20 m, 1 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Sheq vill. env., 8.vi.2012, *Croton socotranus* + *Jatropha unicosata* shrubland, 12°39.7'N 54°03.8'E, 15 m, 2 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC).

Distribution. Congo, India, Indonesia, Iran, Kenya, Republic of South Africa, Sri Lanka, United Arab Emirates, Vietnam. **First record from Socotra Island.**

Comments. Morphology is somewhat variable throughout the range of the species. In particular, specimens from the United Arab Emirates and Socotra are often notably larger than specimens from Southeast Asia. Such differences may be directly related to the nature or amount of larval food. The only unquestionable hosts of *B. nalandus* are seeds of two *Tephrosia* species (Fabaceae: Millettieae), *T. candida* (Roxb.) DC. and *T. purpurea* (L.) Pers. (see ARORA 1977). In Vietnam, it was also reared on seeds of *Crotalaria pallida* Aiton (Fabaceae). There are several species of the genus *Tephrosia* growing in Socotra; at least on the locality Sheq *B. nalandus* was collected from the very common *T. apollinea* (Delile) Link (P. Kment, pers. comm.).

Callosobruchus rhodesianus Pic, 1902

Material examined (5 spec.). **YEMEN: SOCOTRA ISLAND:** Wadi Ayhaft, 12°36'38"N 53°58'49"E, 190 m, 24.–26.xi.2003, 1 spec., D. Král leg. (CBAD); Sirhin area, Dixam Plateau, 12°31'08"N 53°59'09"E, 812 m, 1.–2.xii.2003, 1 spec., P. Kabátek leg. (NMPC); Firmihin, 12°28'27"N 54°0'54"E, 400–500 m, at light, 6.–7.ii.2010, 1 spec., L. Purchart & J. Vybíral leg. (NMPC); Aloove area, Hasan vill. env., 12°31.2'N 54°07.4'E, 221 m, 9.–10.xi.2010, 1 spec., J. Hájek leg. (NMPC); Dixam plateau, Firmihin (*Dracaena* forest), 12°28.6'N 54°01.1'E, 490 m, 15.–16.xi.2010, 1 spec., J. Hájek leg. (NMPC).

Distribution. Angola, Benin, Ivory Coast, Kenya, Senegal, Togo, Yemen, Zimbabwe. **First record from Socotra Island.**

Comments. Socotran specimens differ markedly from those from mainland Africa: prescutellar lobes are much less markedly convex, are covered with dense pale yellowish (instead of pure white) setation, and elytral vestiture is much less contrasted (almost uniformly pale fulvous in some specimens). Such differences in external morphology would possibly justify a separation at species level. Examination of male genitalia however shows that the aedeagus of Socotran specimens is perfectly identical with that of specimens from East Africa. The median pair of dented sclerites in the internal sac is clearly different in specimens from West Africa, so that populations from Socotra appear more closely related with Kenyan than with West African populations.

Callosobruchus rhodesianus is a well-known pest of cowpeas, *Vigna unguiculata* (L.) Walp. (Fabaceae: Phaseoleae: Phaseolinae), both in the field and in stores. According to TUDA et al. (2006), its wild populations favour dry areas with a long dry season, which explains the ability of this species to use dry and hard beans as a food source. It is also recorded from another Phaseolinae, *Nesphostylis holosericea* (Welw. ex Baker) Verdc. (GILLON et al. 1992), but its larvae can also attack members of the subtribe Cajaninae such as *Cajanus cajan* (L.) Millsp. AMEVOIN et al. (2005) showed that *C. rhodesianus* populations are outcompeted by *Callosobruchus maculatus* when both species coexist in the same stored seeds.

Caryedon gonagra (Fabricius, 1798)

Material examined (2 spec.). **YEMEN: SOCOTRA ISLAND:** Wadi Ayhaft, 12°36'38"N 53°58'49"E, 190 m, 24.–26.xi.2003, 1 ♀, P. Kabátek leg. (NMPC); Aloove area, Hasan vill. env., 12°31.2'N 54°07.4'E, 221 m, 9.–10.xi.2010, 1 ♀, L. Purchart leg. (NMPC).

Distribution. From Egypt to Australia, including Iran, Iraq, Israel, Jordan, Kuwait, Oman, Saudi Arabia, United Arab Emirates, Yemen. **First record from Socotra Island.**

Comments. *Caryedon gonagra* used to be confused with the groundnut seed beetle, *Caryedon serratus* (Olivier, 1790) (differentiation in DELOBEL et al. 2003). Its larvae feed on seeds of various Caesalpinioideae, including tamarind (*Tamarindus indica* L.), *Gleditsia triacanthos* L., *Senna didymobotrya* (Fresen.) Irwin & Barneby, and various species of *Cassia* and *Bauhinia*; also reared on seeds of Mimosoideae such as *Acacia farnesiana* (L.) Willd., *A. raddiana* Savi, *Dichrostachys cinerea* Wight & Arn., and possibly also *Prosopis juliflora* (Sw.) DC.

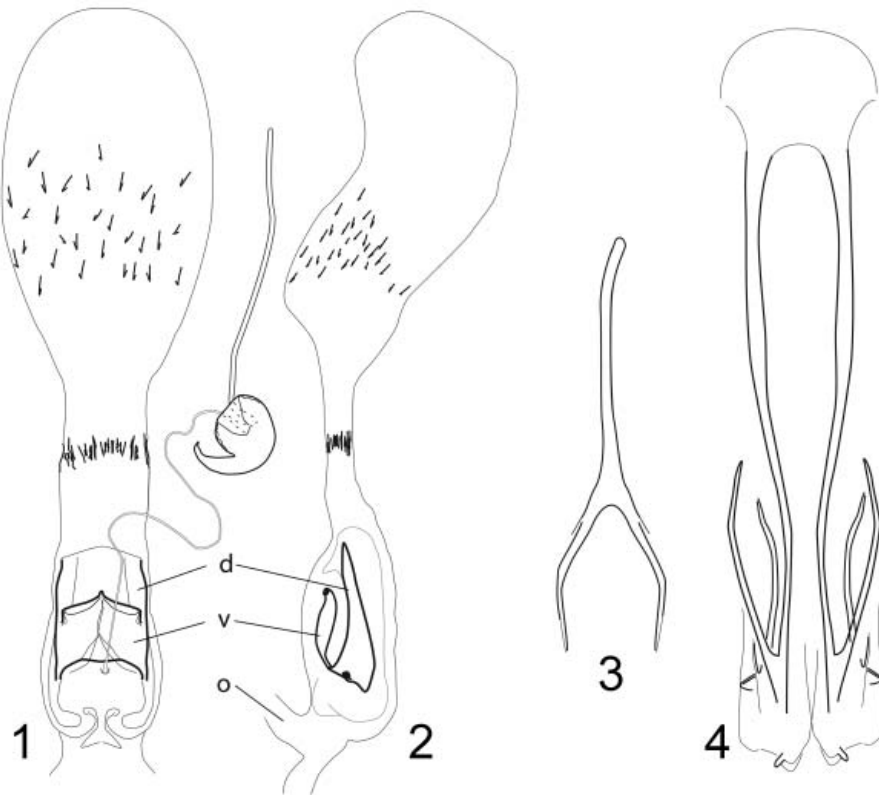
Caryedon sp. pr. *serratus* (Olivier, 1790)

(Figs. 1–4)

Material examined (2 spec.). **YEMEN: SOCOTRA ISLAND:** Zemhon area, 12°30'58"N 54°06'39"E, 270–350 m, 3.–4.ii.2010, 1 ♀, L. Purchart & J. Vybíral leg. (NMPC); same data, 1 ♀, V. Hula leg. (NMPC).

Comments. These two specimens from Zemhon area show some similarity with *C. sudanensis* Southgate, 1971, but are of a darker and more reddish colour; pronotum is clearly less transverse, with lateral margin straight in basal three quarters. They obviously belong to a new species, but description has been postponed until a male specimen becomes available. Body colour is reddish brown, including antennae; anterior and median legs testaceous. Vestiture uniformly pale yellowish. Head with strong and shining median keel. Posterior femora with pecten made of one slightly stronger spine followed by 7–9 smaller spines. Body length 3.5–4.7 mm.

Female genitalia (Figs. 1–4) show strongly defined vaginal plates: dorsal vaginal plate long and narrow, ventral vaginal plate almost square, with posterior side almost straight,



Figs. 1–4. Female genitalia of *Caryedon* sp. pr. *serratus*: 1 – dorsal view; 2 – lateral view, showing dorsal (d) and ventral sclerites of vagina (v), oviduct (o); 3 – spiculum gastrale; 4 – ovipositor.

pointed medially and with marked lateral angles; neck of bursa copulatrix with row of strongly pointed spines.

General female genital structure is similar to *C. gonagra*, *C. angeri* (Semenov, 1896) or *C. serratus* (*C. serratus* species group). Dorsal vaginal plate is shorter and wider in *C. serratus*, posterior side of ventral vaginal plate is regularly rounded in *C. serratus* and *C. gonagra*; spines in anterior half of bursa copulatrix elongated, with narrow base (rounded base in *C. gonagra*). In *C. angeri*, the anterior rim of the ventral vaginal sclerite is deeply emarginated to accommodate the opening of the oviduct (ANTON & DELOBEL 2004), which is not the case here.

On the other hand, because of the lack of maculation of its integument, the new species would fall into *C. acaciae* group in JOHNSON'S et al. (2004) key to the species groups of *Caryedon* Schönherr, 1823. It may be easily confused with dark specimens of *C. sudanensis*, a species with quite unrelated female genitalia (compare with Figs. 5–6).

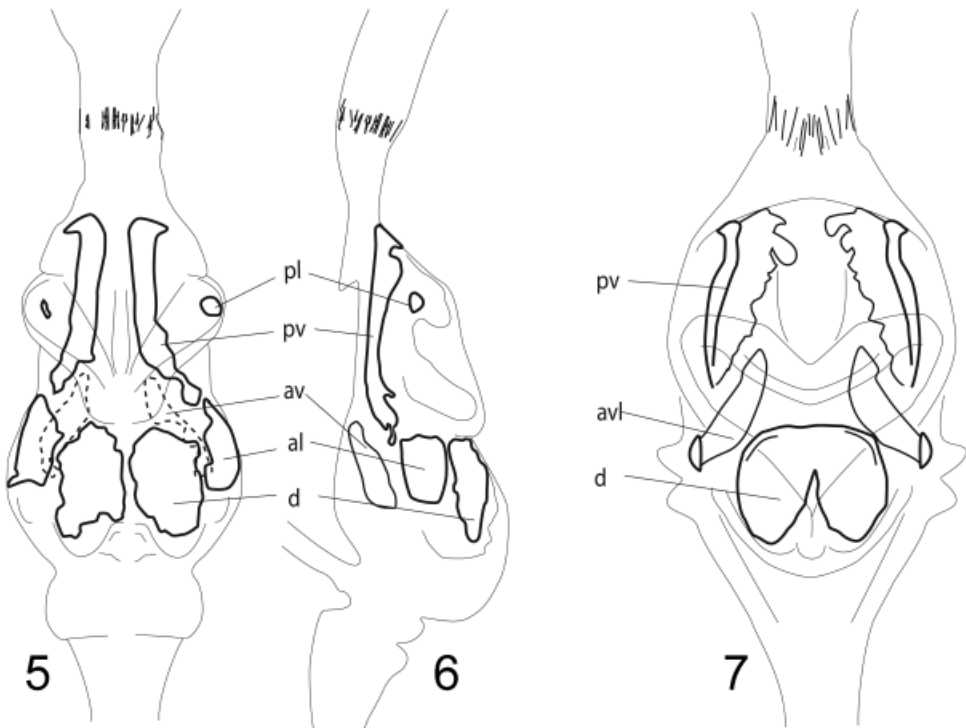
Similar also to *C. furcatus* Anton & Delobel, 2004, a species recorded in Saudi Arabia and mainland Yemen (ANTON 2010), but differs in larger and more transverse pronotum, and distinctive female genital plates.

Caryedon sudanensis Southgate, 1971

(Figs. 5–6)

Material examined (89 spec.). **YEMEN: SOCOTRA ISLAND:** Qaareh waterfall, Noged Plain, 12°20'10"N 53°37'56"E, 57 m, 5.–6.xii.2003, 1 spec., P. Kabátek leg. (NMPC); Homhil Protected Area, 360 m, 12°34'27"N 54°18'32"E, 28.–29.xi.2003, 1 spec., P. Kabátek leg. (NMPC); same data, 4 spec., D. Král leg. (3 spec. in NMPC, 1 spec. in CBAD); same data, 11 spec., J. Farkač leg. (CULS); Dixam plateau, Wadi Esgego, 12°28'09"N 54°00'36"E, 300 m, 2.–3.xii.2003, 5 spec., P. Kabátek leg. (NMPC); Dixam plateau, Wadi Zeeriq, 12°31'08"N 53°59'09"E, 750 m, 3.xii.2003, 1 spec., D. Král leg. (NMPC); Elhe nursery, 12°18'56.7"N 54°43'14.7"E, 90 m, 19.vi.2009, 4 spec., L. Purchart leg. (2 spec. in NMPC, 2 spec. in CBAD); Elhe nursery, 12°32'3969"N 54°04'4385"E, 19.vi.2009, 3 spec., V. Hula leg. (NMPC); Qualentiah env., slopes 5 km SE from Queysoh, 12°39.691'N 53°26.658'E, 4.–5.vi.2010, 1 spec., V. Hula & J. Niedobová leg. (NMPC); Deiqub cave env., 10.vi.2010, 1 spec., V. Hula & J. Niedobová leg. (NMPC); Zemhon, 12°32'17"N 54°04'12"E, 260–320 m, 20.vi.2009, 6 spec., L. Purchart leg. (3 spec. in NMPC, 3 spec. in CBAD); Wadi Ayhaft, 12°36.5'N 53°58.9'E, 200 m, 7.–8.xi.2010, 3 spec., J. Hájek leg. (2 spec. in NMPC, 1 spec. in CBAD); same data, 5 spec., J. Bezděk leg. (JBCB); Aloove area, Hasan vill. env., 12°31.2'N 54°07.4'E, 221 m, 9.–10.xi.2010, 3 spec., J. Hájek leg. (NMPC); same data, 5 spec., J. Bezděk leg. (JBCB); Noged Plain (sand dunes), Sharet Halma vill. env., 12°21.9'N 54°05.03'E, 20 m, 10.–11.xi.2010, 1 spec., J. Bezděk leg. (CBAD); Delisha vill. env., *Jatropha unicostata* shrubland, 12°41.2'N 54°07.7'E, 36 m, at light, 8.vi.2012, 3 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Homhil Protected Area, open woodland with *Boswellia* & *Dracaena* trees, 12°34.5'N 54°18.5'E, 360–500 m, 10.–11.vi.2012, 3 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Homhil Protected area, Ain Tsahrin spring, 12°34.2'N 54°18.5'E, 435 m, 11.vi.2012, 11 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Aloove area, Aloove vill. env., *Jatropha unicostata* shrubland with *Boswellia* elongate trees, 12°31.2'N 54°07.4'E, 221 m, 19.–20.vi.2012, 15 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Dixam plateau, Firmihin, *Dracaena* woodland, 12°28.6'N, 54°01.1'E, 490 m, 14.–15.vi.2012, 2 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC).

Distribution. Restricted to Algeria, Egypt, Erithrea, Somalia, and Sudan. **First record from Socotra Island.** The mention of *C. sudanensis* in the United Arab Emirates (DELOBEL 2011) is erroneous and resulted from confusion with *C. yemenensis* Decelle, 1979. The latter is apparently absent from the African continent and Socotra Island.



Figs. 5–7. 5–6 – Female genitalia of *Caryedon sudanensis* Southgate, 1971: 5 – dorsal view; 6 – lateral view of vagina, showing dorsal (d), anteroventral (av), posteroventral (pv), anterolateral (al), and posterolateral (pl) sclerites. 7 – female genitalia of *Caryedon yemenensis* Decelle, 1979, dorsal view, with dorsal, posteroventral and anterior ventrolateral (avl) sclerites.

Comments. A species long confused with *C. pallidus* (Olivier, 1790). The different vaginal sclerites of *C. sudanensis* are asymmetrical, and highly variable in size and shape, with irregular limits. There are usually four pairs of large sclerites (dorsal, anterolateral, anteroventral, posteroventral, see Figs. 5–6), and a pair of small rounded sclerites in posterolateral position, sometimes absent. A drawing of the vaginal sclerites of *C. yemenensis*, a closely related species, is provided for comparison (Fig. 7). As noted by YUS RAMOS (2010), the number of sclerite pairs in *C. yemenensis* is only three (dorsal, anterior ventrolateral and posteroventral).

Larvae of *C. sudanensis* feed on the seeds of *Senna alexandrina* Mill. (Caesalpinioideae: Cassieae). In Socotra, *Senna holosericea* (Fresen.) Greuter is a common species, occurring on all sampled localities (P. Kment, pers. comm.). Cassieae are common in dry Sahelian areas of Africa and are hosts of several *Caryedon* species, such as *C. cassiae* (Gyllenhal, 1833), *C. gonagra*, and *C. pallidus*.

Conicobruchus medaniensis (Decelle, 1982)

Material examined (4 spec.). **YEMEN: SOCOTRA ISLAND:** Noked plain, Abataro, border of sand dunes and shrubland, 12°22.1'N 54°03.4'E, 20 m, 12.–13.vi.2012, 1 ♂ 3 ♀, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC).

Distribution. Kenya, Saudi Arabia, Sudan, Tanzania, United Arab Emirates, Yemen. **First record from Socotra.**

Comments. In Tanzania, *Conicobruchus medaniensis* was reared from *Indigofera tanga-nykensis* Baker f. (Fabaceae) pods (B. Le Rü, pers. comm. 2012). At the sampled locality, two species of *Indigofera* represent the dominant plant species: *I. oblongifolia* Forssk. and *I. pseudointricata* Gillett (P. Kment, pers. comm.).

Spermophagus monardi Decelle, 1975

Material examined (1 spec.). **YEMEN: SOCOTRA ISLAND:** Hadiboh env., 12°65'02"N 54°02'04"E, ca. 10–100 m, 21.xi.–12.xii.2003, 1 ♂, D. Král leg. (NMPC).

Distribution. Angola, Ethiopia, Sudan, Tanzania, Yemen. **First record from Socotra Island.**

Comments. Members of the genus *Spermophagus* Schönherr, 1833 usually feed on the seeds of various Convolvulaceae and Malvaceae. The larval host plant of *S. monardi* is unknown.

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