ACTA ENTOMOLOGICA MUSEI NATIONALIS PRAGAE
Published 31.xii.2017 Volume 57(supplementum), pp. 101–111 ISSN 0374-1036
http://zoobank.org/urn:lsid:zoobank.org:pub:D831032F-6D38-4EB4-8974-F357F6E5EE5D
https://doi.org/10.1515/aemnp-2017-0111

Bostrichidae (Coleoptera) of Socotra with description of two new subspecies

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Abstract. New data on the occurrence of beetles of the family Bostrichidae on Socotra Island are presented – altogether nine species have been recorded hitherto. Besides faunistic data, the paper contains descriptions of two new subspecies: *Enneadesmus obtusidentatus obscurior* Borowski subsp. nov. and *Enneadesmus forficula socotrensis* Borowski subsp. nov. Both subspecies differ from nomino-typical forms in smaller size and distinctly shorter and less prominent tubercles and denticles on elytral truncation.

Key words. Coleoptera, Bostrichidae, *Enneadesmus*, new subspecies, new records, Socotra, Yemen

Introduction

The family Bostrichidae comprises more than 550 species, grouped into 9 subfamilies, 11 tribes and more than 90 genera (Borowski & Węgrzynowicz 2007). The Palaearctic fauna of Bostrichidae consists of 160 species and subspecies belonging to 46 genera (Borowski 2007). Bostrichids are adapted to inhabit wood, having developed – besides many morphological structures enabling this way of life – symbiosis with bacteria producing cellulose-decopmosing enzymes. So equipped, they live almost exclusively in sap-wood, rich in starch, sugars and proteins. The activity of most species of Bostrichidae is restricted to twilight and night, only some of them – e.g. represantives of the genera *Lyctus* Fabricius, 1792, *Psoa* Herbst, 1797, *Bostrichus* Geoffroy, 1762 or *Xylopertha* Guérin-Méneville, 1845 – may remain active also in the daytime. In the infested part of the tree usually a great number of larvae develop, gnawing longitudinal galleries, tightly filled with sawdust mixed with faeces, often leaving only a thin outer layer enclosing completely disintegrated material – this makes bostrichids among the most dangerous pests of freshly cut or processed wood (Borowski & Węgrzynowicz 2012). Many species, especially in tropical countries, are considered serious and onerous technical

HÁJEK J. & BEZDĚK J. (eds.): Insect biodiversity of the Socotra Archipelago III. *Acta Entomologica Musei Nationalis Pragae* **57(supplementum)**: i–vi + 1–225.

pests – increasing export of wooden articles and containers also increases the frequency of introduction of these beetles to various parts of the world, including those of temperate or cold climate (Borowski & Węgrzynowicz 2007).

The earliest information on the occurrence of representatives of Bostrichidae on Socotra is given by Waterhouse (1881), having described a new species: *Apate nitidipennis* (now in the genus *Phonapate* Lesne, 1895). Subsequently, Taschenberg (1883) mentioned three unidentified species of Bostrichidae from Socotra, while Gahan (1903) supplemented the redescription of *A. nitidipennis* with a record of an unidentified *Bostrichus* and *Rhizopertha pusilla* Fabricius, 1801 (now *Rhyzopertha dominica* Fabricius, 1775). In 1906, famous bostrichid specialist Pierre Lesne (1906) named a further two endemic Socotran species of this family: *Bostrychopsis cristaticeps* Lesne, 1906 and *Dinoderopsis escharipora* Lesne, 1906 (now in the genus *Prostephanus* Lesne, 1897; see Borowski & Węgrzynowicz (2011). Lesne's data were, after more than 100 years, included in the Catalogue of Palaearctic Beetles (Borowski 2007) and World Catalogue of Bostrichidae (Borowski & Węgrzynowicz 2007). Most recently, new records of Bostrichidae from the region were published by Geis (2015) who mentioned seven species from Socotra.

The incentive to this work was the material collected on Socotra received by the authors for study from the Národní muzeum in Prague. The results presented below will contribute to the improved knowledge of the fauna of that extraordinarily interesting island.

Material and methods

The digital photograph of the each species were taken by Canon D60 camera. The automontage were made by Helicon Focus program.

The elytral index (I) is the ratio of the length of elytra to their width at the widest point (dorsal view).

The material examined is deposited in the following collections:

BMNH The Natural History Museum, London, United Kingdom;
JBCW Jerzy Borowski collection, Warszawa, Poland;
NMPC Národní muzeum, Praha, Czech Republic.

Systematics

Lyctinae

Lyctus africanus Lesne, 1907

(Fig. 1)

Published records. Geis (2015): 69 (E. of Hadiboh, near Suq; Qalansiya).
Material examined (2 spec.). **YEMEN: Socotra Island:** Dixam plateau, Firmihin, *Dracaena* woodland, 12°28.6′N 54°01.1′E, 490 m, 14.–15.vi.2012, 1 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Dixam plateau, Wadi Esgego, 12°28.09′N 54°00.36′E, 300 m, 2.–3.xii.2003, 1 spec. P. Kabátek leg. (NMPC).

Geographical element and distribution. Ethiopian element, distributed with transported wood and currently occurring throughout Africa, Madagascar, Arabian Peninsula and further

to Pakistan and northeastern India. It is one of the most frequently introduced representatives of Bostrichidae, and probably reached Socotra also in this way.

Dinoderinae

Rhyzopertha dominica (Fabricius, 1792)

(Fig. 2)

Published records. Gahan (1903): 272 (as *Rhizopertha pusilla*; Jena-agahan).

Geographical element and distribution. A cosmopolitan species, probably of Oriental origin.

Prostephanus (*Dinoderopsis*) *escharipora* (Lesne, 1906)

(Fig. 3)

Published records. Lesne (1906): 401 (original description, as *Dinoderopsis*; Homhil); Borowski & Węgrzynowicz (2007): 65 (catalogue); Borowski & Węgrzynowicz (2012): 377 (catalogue); Geis (2015): 75 (as *Dinoderopsis*; Homhil; wadi Ayhaft; Calanthia; Noged, Mokhar).

Material examined (40 spec.). **YEMEN: Socotra Island:** Aloove area, Aloove vill. env., *Jatropha unicostata* shrubland with *Boswellia elongata* trees, 12°31.2′N 54°07.4′E, 221 m, 19.–20.vi.2012, 34 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC, JBCW); Noged plain, Abataro border of sand dunes and shrubland, 12°22.1′N 54°03.4′E, 20 m, 12.–13.vi.2012, 2 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, 1 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Dixam plateau, Wadi Zerig pools, *Juncus* marsh, *Dracaena* trees, cave, 12°29.6′N 53°59.5′E, 655 m, 13.–14.vi.2012, 1 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, 1 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Ayhaft, 15.iii.2000, 1 spec., V. Bejček & K. Šťastný leg. (JBCW).

Geographical element and distribution. A species endemic to Socotra, original description based on a single specimen from Homhil (deposited in BMNH).

Bostrichinae

Bostrichini

Bostrichoplites cornutus (Olivier, 1790)

(Figs 4–5)

Published records. Geis (2015): 80 (Neet).

Geographical element and distribution. Ethiopian element, commonly occurs in all of Africa south of the Sahara desert.

Bostrychopsis cristaticeps Lesne, 1906

(Figs 6–7)

Published records. Gahan (1903): 272 (as *Bostrychus* sp., Sokotra); Lesne (1906): 403 (original description, Dahamis); Borowski & Węgrzynowicz (2007): 88 (as *Dominikia*; catalogue); Wranik (2003): 355, 449 (without precise data); Geis (2015): 93 (Diksam, Hasaant, Hadiboh, Nogid, Shoab, wadi Ayhaft, Qalansiya, wadi Fa'ar).

Material examined (10 spec.). **YEMEN: Socotra Island:** Kaza Kazihon vill. env., 12°31′13″N 53°55′36″E, 900 m, 5.vi.2012, 3 spec., V. Hula & J. Niedobová leg. (NMPC, JBCW); Aloove area, Aloove vill. env., *Jatropha uni-*

costata 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); Wadi Es Gego, 12°28′18″N 54°00′34″E, 300 m, 13.v.2004, 2 spec., A. Reiter leg. (NMPC); Wadi Dineghen, 12°36′58″N 54°03′48″E, 90 m, 6.vi.2012, 1 spec., V. Hula & J. Niedobová leg. (NMPC); Delisha vill. env., *Jatropha unicostata* shrubland, at light, 12°41.2′N 54°07.7′E, 221 m, 8.vi.2012, 1 spec., J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC); Noged plain, Qaareh (waterfall), 12°20′10″N 53°37′56″E, 57 m, 5.–6.xii.2003, 1 spec., D. Král leg. (JBCW).

Geographical element and distribution. A species endemic to Socotra, original description based on a single specimen from Dahamis (deposited in BMNH).

Xyloperthini

***Enneadesmus obtusidentatus obscurior* Borowski subsp. nov.**

(Figs 8–9)

Published records. Geis (2015): 90 (as *Enneadesmus obtusidentatus* Lesne, 1899; Dixam plateau, Haghier, Noged).
Type material. Holotype: ♂, labelled: 'YEMEN, Socotra Island, Noged plain, Abataro border of sand dunes and shrubland, 12.–13.VI.2012, 12°22.1′N, 54°03.4′E, 20m, Socotra expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg.' (NMPC). Paratypes: 14 spec. (NMPC, JBCW), same data as in holotype; 1 spec., labelled: 'Socotra (YEMEN), Zam Hom, 7.IV.2008, at lamp, leg. A. Carapezza' (NMPC).

Description. Body length 3.2–4.3 mm. Body reddish-brown to dark brown.

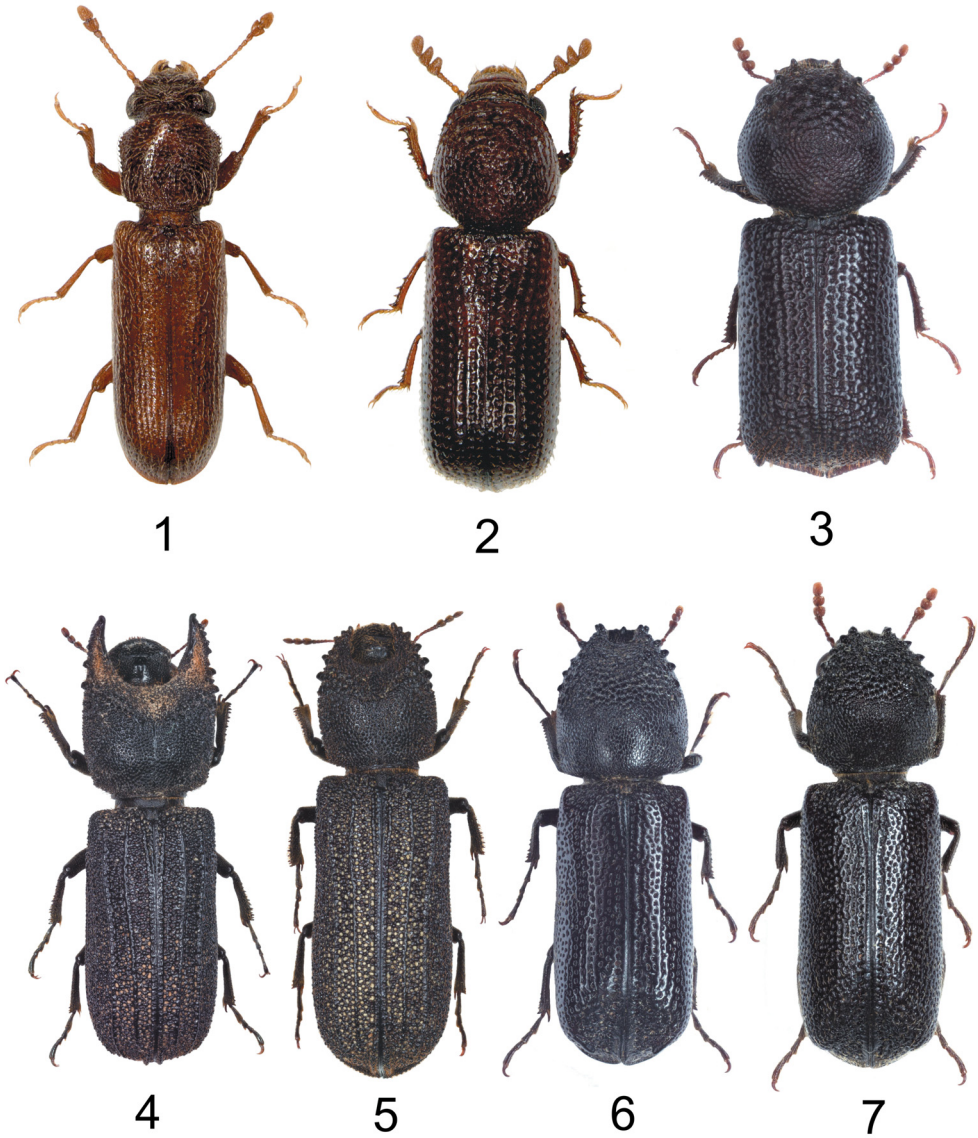
Head. Antennae with nine antennomeres; club formed with three terminal antennomeres. Antennomeres III–VI short, together subequal in length to first antennomere of club (i.e. antennomere VII); second and third antennomere of club (i.e. antennomeres VIII and IX) ca. as long as wide. Labrum narrow, transverse, anterior margin with dense brush of golden setae. Epistome at middle produced anteriad, smooth and lustrous, anterior margin shallowly arcuately emarginated; posterior part paler, brownish-red. Basal and lateral parts of epistome setose, setae directed backwards, towards front. Front finely granular, makes a common uniform surface with vertex, only a girdle of long erect golden-yellow setae marking border between them. Vertex granular anteriorly, becoming finely longitudinally rugose at and posteriorly from middle. Eyes large, strongly protruding from outline of head.

Pronotum somewhat wider than long, sides indistinctly rounded and apically strongly tapering anteriad and without lateral carinae. Anterior part of pronotum wrinkled with 6–8 larger, sharply triangular denticles; behind middle pronotum finely granular, granules (very small papillae) sparsely distributed, surface between them smooth and lustrous. Scutellum rectangular, posterior margin straight.

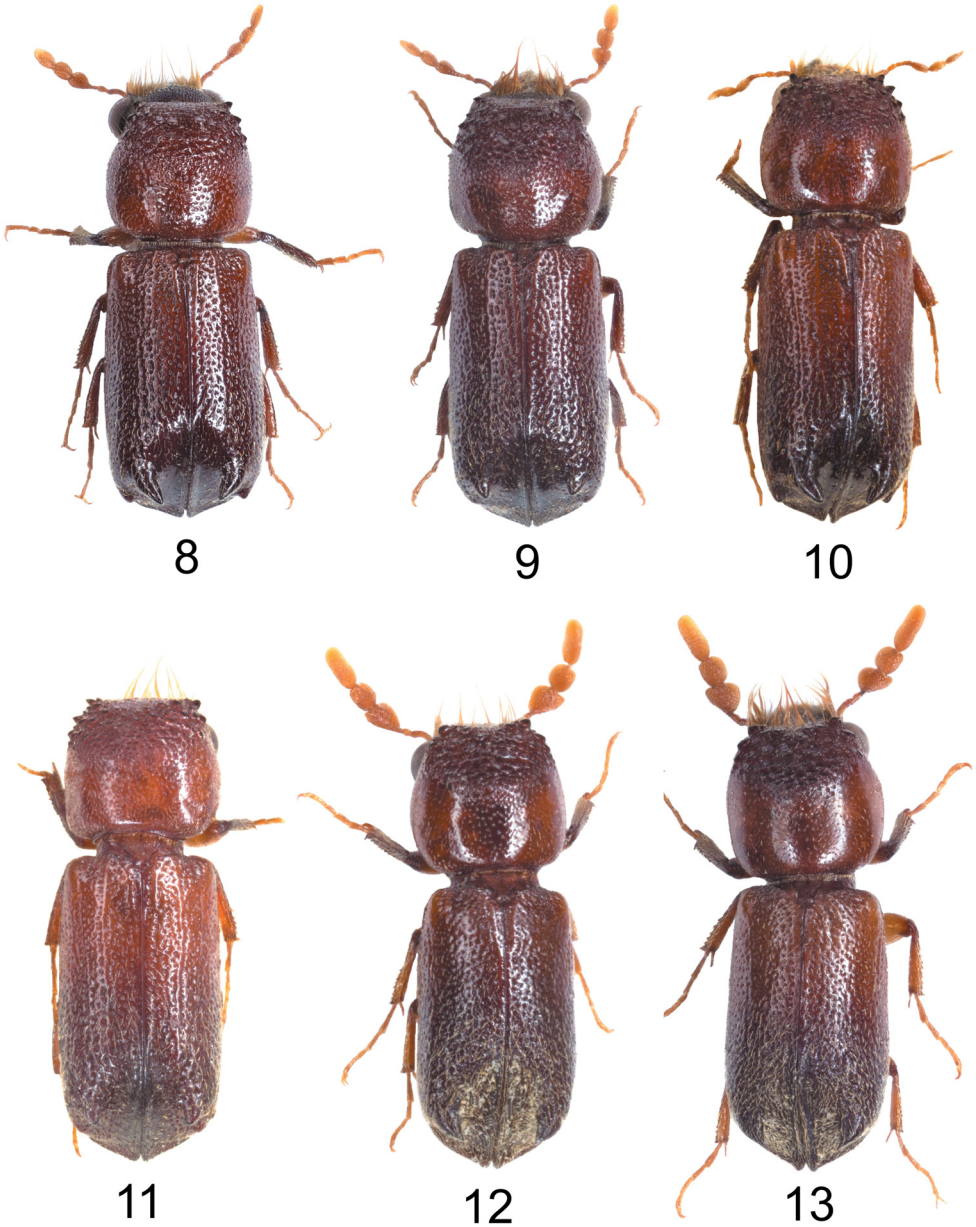
Elytra cylindrical, distinctly truncated posteriorly. Humeral protuberances conspicuous. Elytral punctures in longitudinal rows, laterally and near scutellum confused with additional punctures on intervals. Suture on truncation swollen and elevated above surface. Upper part of truncation with pair of prominent tubercles or denticles, additional tubercle or indistinct, slightly convex transverse crease at middle of sides. Elytral setation yellowish-brown, short, recumbent, somewhat longer and denser posterolaterally.

Coxae, femora and tarsi yellowish-brown, tibiae slightly darker. Outer margins of tibiae with fine denticulation and longer pilosity.

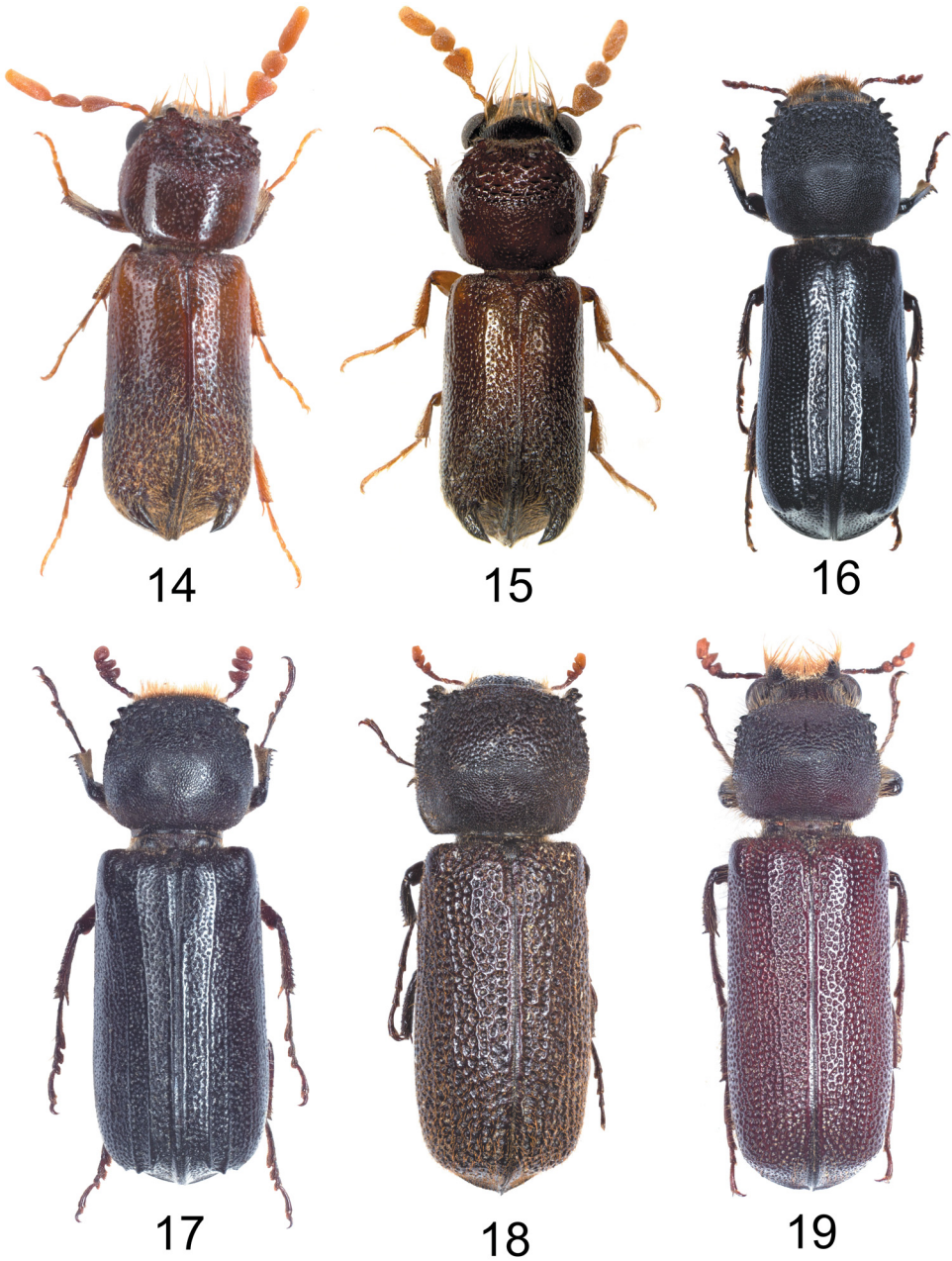
Ventral surface of body brown to dark brown.



Figs 1–7. Habitus in dorsal view. 1 – *Lyctus africanus* Lesne, 1907; 2 – *Rhyzopertha dominica* (Fabricius, 1792); 3 – *Prostephanus* (*Dinoderopsis*) *escharipora* (Lesne, 1906); 4–5 – *Bostrichoplites cornutus* (Olivier, 1790) (4 – male, 5 – female); 6–7 – *Bostrychopsis cristaticeps* Lesne, 1906 (6 – male, 7 – female).



Figs 8–13. Habitus in dorsal view. 8–9 – *Enneadesmus obtusidentatus obscurior* subsp. nov. (8 – male, 9 – female); 10–11 – *E. obtusidentatus obtusidentatus* Lesne, 1899 (10 – male, 11 – female); 12–13 – *E. forficula socotrensis* subsp. nov. (12 – male, 13 – female).



Figs 14–19. Habitus in dorsal view. 14–15 – *Enneadesmus forficula forficula* (Fairmaire, 1883) (14 – male, 15 – female); 16–17 – *Phonapate nitidipennis* (Waterhouse, 1881) (16 – male, 17 – female); 18–19 – *Xylomedes rufocoronata* (Fairmaire, 1892) (18 – male, 19 – female).

Male (Fig. 8). The most characteristic feature differentiating male from female is setation of front: in male long erect setae occur on sides, where they form a distinctive girdle connected on upper and middle part of front; front inside the girdle is filled with short, recumbent setulae directed towards vertex; here surface is smooth and lustrous, finely but rather sparsely granulated. Another important difference make prominent dents and tubercles on elytral truncation: in male in upper part a pair of short, sharply cuneate dents directed backwards and inwards, and on sides of middle part a prominent stump tubercle. Additional male characters are shorter joints of anterior tarsi and lustrous entire surface of truncation.

Female (Fig. 9). In female long erect setae occur as well on sides of front, making there – like in males – a distinctive girdle, as within the girdle; surface of front within the girdle finely but densely granular and apparently rough between granules. Upper part of elytral truncation with pair of short, prominent tubercles bluntly rounded on tips; on sides of middle part transverse, slightly convex crease of indefinite contours. Additionally females differ in having shorter protarsomeres and partly – especially near tubercles and crease – punctured surface of truncation.

Differential diagnosis. Similar to the continental (African and Arabian) *E. obtusidentatus obtusidentatus* Lesne, 1899 (Figs 10–11), but differs in smaller size (3.5–5.0 mm in *E. o. obtusidentatus*), elytral index I=1.6–1.7 (as compared to I=1.8–1.9), and distinctly shorter and less prominent tubercles and denticles on elytral truncation.

Remark. In the genus *Enneadesmus* Mulsant, 1851 the exact size, shape and position of denticles and tubercles on the truncation of the elytra provide (despite repetitive general pattern) distinctive characters of particular taxa.

Etymology. The Latin adjective meaning obscure.

Geographical element and distribution. Palaearctic element, Socotran endemic.

Enneadesmus forficula socotrensis Borowski subsp. nov.

(Figs 12–13)

Type material. Holotype: ♂, labelled: 'YEMEN, Socotra Island, Delisha vill. env., *Jatropha unicostata* shrubland, at light, 8.VI.2012, 12°41.2′N, 54°07.7′E, 36m, Socotra expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg.' (NMPC). Paratypes: 7 spec. (NMPC, JBCW): same data as in holotype; 1 spec., labelled: 'YEMEN, Socotra Island, Halla area, Arher, freshwater spring in sand dune, 9.–10. +15. VI.2012, 12°33.0′N, 54°27.6′E, 5m, Socotra expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg.' (NMPC).

Description. Body length 3.2–4.2 mm. Body cylindrical, slightly lustrous, yellowish- to reddish-brown.

Head. Antennae with nine antennomeres; club formed with three terminal antennomeres. Antennomeres III–VI very short, strongly compressed, together ca. equal in length to subtriangular (widest apically) first antennomere of club (i.e. antennomere VII); second antennomere of club (i.e. antennomere VIII) much narrower, of length subequal to width; terminal antennomere elongate, subparallel-sided, ca. 2.5 times longer than wide. Labrum transverse, yellowish-brown, densely covered with yellowish-golden setulae. Epistome narrow, anteriorly blackish-posteriorly reddish-brown, almost entire surface finely punctulated and setulose. Front blackish- or (rarely) reddish-brown, finely punctulated and densely setulose, surface between

punctures smooth and lustrous. Lateral and posterior margins with long, erect, yellow setae making a distinctive girdle surrounding frontal surface from three sides. Vertex distinctly separated from front, longitudinally rugose. Eyes long, protruding from head outline.

Pronotum somewhat wider than long, sides slightly rounded, anteriorly strongly convergent. No lateral carinae. Anterior margin of pronotum shallowly arcuately emarginated. Anterior and dorsal part wrinkled with six larger denticles laterally, posterior finely, sparsely granular and punctulated, surface in between smooth and lustrous. Pronotal setulation inconspicuous, recumbent, only on sides of larger denticles in anterior part longer and erect. Scutellum trapezoidal, posterior margin shallowly emarginated.

Elytra partly parallel-sided; anterior half paler, yellowish-brown, posterior dark brown. Humeral protuberances distinct. Elytral punctation conspicuous, dense, irregular. Suture on truncation swollen, distinctly elevated above surface level; setulation more distinct on posterior half, short, recumbent, yellow and yellowish-gray. Truncation above distinctly concave on sides of suture. Each side of truncation at middle with conical, arcuately bent backwards and inwards, as long as wide at base, sharply pointed dent. Surface of truncation finely punctulate, smooth and lustrous. Elytral apices swollen, somewhat divergent and turned upwards.

Legs yellowish-brown except somewhat darker protibiae. Inner edges of tibiae with numerous fine denticles and distinct setation, setae of meso- and metatibiae longer and more erect than those of protibiae.

Ventral surface of body yellowish- to reddish-brown, ventrites dark with paler lateral and posterior margins.

Male (Fig. 12). Entire surface of front uniform, distinct depressions on basolateral margin lacking, the girdle of long, yellow, erect setae surrounding front broken behind posterior margin of eyes. Front inside the girdle covered with fine, recumbent, uniform setulation.

Female (Fig. 13). Frontal surface not uniform: laterally near posterior margin with deep but sometimes – because of dense pilosity of margins – inconspicuous foveae. The girdle of long, yellow, erect setae continuous, surrounds front uniformly on all ocular margins, consists of dense long setae bent at tips towards middle of front. Front inside the girdle covered with fine, erect or semierect, usually uniformly distributed setulae.

Differential diagnosis. Resembling the continental *E. forficula forficula* (Fairmaire, 1883) (Figs 14–15), but differing in smaller size (3.5–5.5 mm in *E. f. forficula*), elytral index I=1.6–1.7 (as compared to I=1.9–2.0), and distinctly shorter denticles on the elytral truncation (in the nominotypical form at least twice as long as wide at base).

Etymology. The Latin adjective referring to the country of origin of the new subspecies.

Geographical element and distribution. Palaearctic element, Socotran endemic.

Apatinae

Phonapate nitidipennis (Waterhouse, 1881)

(Figs 16–17)

Published records. Waterhouse (1881): 472 (original description, as *Apate*; Socotra); Taschenberg (1883): 178 (without precise data); Gahan (1903): 270 (Dahamis); Borowski & Węgrzynowicz (2007): 160 (catalogue); Geis (2015): 97 (Diksam, Firmihin, Hasaant, Homhil, Neet, wadi Ayhaft).

Material examined (2 spec.). **YEMEN: Socotra Island:** Aloove area, Aloove vill. env., *Jatropha unicostata* 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).

Geographical element and distribution. Ethiopian element, distributed with transported wood and currently occurring throughout Africa, the Arabian Peninsula, Near East and further through Iraq, Iran to Afghanistan and Pakistan. It is, similar to the representatives of the genus *Xylomedes* Lesne, 1901, an inhabitant of arid, especially semi-desert areas. The occurrence on Socotra is probably a result of a relatively recent introduction with timber from nearby lands where the species is rather common.

Xylomedes rufocoronata (Fairmaire, 1892)

(Figs 18–19)

Published records. Wranik (2003): 355, 449 (without precise data); Geis (2015): 95 (Hadiboh, wadi Ayhaft, Lahas, Nogid, wadi Fa'roh).
Material examined (2 spec.). **YEMEN: Socotra Island:** Wadi Es Gego, 12°28′18″N 54°00′34″E, 300 m, 13.v.2004, 2 spec., A. Reiter leg. (NMPC).

Remark. Two Socotran females have been compared to abundant continental material from Tunisia, Ethiopia, Kenya, Yemen and Oman. The specimens from Socotra showed the greatest resemblance to those from Oman, but differed from all in having distinctly longer and more erect pilosity of the basal part of the pronotum and – to a lesser degree – the elytral truncation.
Geographical element and distribution. Palaearctic element. Inhabitant of semi-desert areas surrounding the northeastern part of the Sahara; occurs from Tunisia through Egypt to Ethiopia and Kenya southward; and Saudi Arabia, Yemen and Oman eastward. Like in the case of *Phonapate nitidipennis*, it was probably introduced to Socotra with timber from nearby lands where – especially in Yemen and Oman – it is relatively common.

Conclusion

Currently the Bostrichidae of Socotra are represented by nine species; two of them – *Bostrychopsis cristaticeps* and *Prostephanus escharipora*, are descendants of the ancient fauna that now inhabit East Africa, Madagascar and Indochina, whereas the remaining ones make a relatively new alien element. Bostrichids can be easily introduced with timber, so we can assume that such species as *E. forficula*, *E. obtusidentatus*, *Lyctus africanus*, *Phonapate nitidipennis* or *Xylomedes rufocoronata* came to the island just this way, aided by humans.

Acknowledgements

The authors wish to express our gratitude to Dr. Jiří Hájek (NMPC) for making available the material on which this paper has been based, as well as to Dr. Jan Bezděk (Mendel University, Brno, Czech Republic) for the stimulation during the elaboration, which enabled us to finish the work in time.

References

BOROWSKI J. 2007: Bostrichidae. Pp. 320–328. In: LÖBL I. & SMETANA A. (eds): *Catalogue of Palearctic Coleoptera. Volume 4. Elateroidea – Derodontoidea – Bostrichoidea – Lymexyloidea – Cleroidea – Cucujoidea*. Apollo Books, Stenstrup, 935 pp.

BOROWSKI J. & WĘGRZYNOWICZ P. 2007: *World Catalogue of Bostrichidae (Coleoptera)*. Mantis, Olsztyn, 247 pp. + 8 pls.

BOROWSKI J. & WĘGRZYNOWICZ P. 2011: Orientoderus a new subgenus of Prostephanus Lesne, 1897, with description of a new species from Thailand and Laos (Coleoptera, Bostrichidae). *Elytra, New Series* **1**: 255–261.

BOROWSKI J. & WĘGRZYNOWICZ P. 2012: *The powderpost beetles of the world (Coleoptera: Bostrichidae): Keys for the identification of species. Volume I*. Mantis, Olsztyn, 461 pp. + 16 pls.

GAHAN C. J. 1903: Insecta: Coleoptera. Pp. 261–292. In: FORBES H. O. (ed.): The natural history of Sokotra and Abd-el-Kuri: Being the report upon the results of the conjoint expedition to these islands in 1898-9. *Special Bulletin of the Liverpool Museums*, xlvii + 598 pp.

GEIS K. 2015: Neue Beiträge zur Fauna der Bostrichidae (Coleoptera) der Arabischen Halbinsel und Sokotras. *Mitteilungen des Internationalen Entomologischen Vereins* **40**: 63–101.

LESNE P. 1906: Bostrychides nouveaux ou peu connus. *Annales de la Société Entomologique de France* **75**: 393–428.

TASCHENBERG O. 1883: Beiträge zur Fauna der Insel Sokotra, vorzüglich nach dem von Herrn Dr. Emil Riebeck aus Halle a. S. gesammelten Materiale zusammengestellt. *Zeitschrift für Naturwissenschaften* **56**: 157–185.

WATERHOUSE C. O. 1881: On the coleopterous insects collected by Prof. I. Bailey Balfour in the island of Socotra. *Proceedings of the Zoological Society of London* **1881**: 469–478 + plate XLIII.

WRANIK W. 2003: *Fauna of the Socotra Archipelago. Field guide.* Universität Rostock, Rostock, 542 pp.