

## Description of a new *Sinaphodius* species from Laos along with a checklist of the genus (Coleoptera: Scarabaeidae: Aphodiinae: Aphodiini)

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**Abstract.** A new species of the subfamily Aphodiinae, *Sinaphodius natalicius* sp. nov. from Laos, is described and illustrated. Detailed photos of the most similar and probably related, *S. chitwanensis* (Schoolmeesters et Van den Heuvel, 1999), are also presented to make possible comparison of the two species. A checklist of the genus *Sinaphodius* Červenka, 1994 is provided.

**Key words.** Taxonomy, new species, checklist, Coleoptera, Scarabaeidae, Aphodiinae, Aphodiini, *Sinaphodius*, Laos, Oriental Region.

### INTRODUCTION

When studying some material from Laos, the authors of the work presented here encountered specimens which appeared to belong to a new species of the genus *Sinaphodius* Červenka, 1994. The genus was established by Červenka (1994) as a subgenus of *Aphodius* Illiger, 1798 to include the following three species: *Aphodius (Sinaphodius) yunnanus* Červenka, 1994 (type species), *A. (S.) philippinensis* Červenka, 1994 and *A. (S.) sinuatus* Harold, 1860. In 1999, Schoolmeesters & Van den Heuvel, described a further species from Nepal: *Aphodius (Sinaphodius) chitwanensis* Schoolmeesters et Van den Heuvel, 1999. Ochi & Kon (2004), who already considered *Sinaphodius* to be a genus, in agreement with Dellacasa et al. (2001), described *Sinaphodius sulawesensis* Ochi & Kon, 2004 from Sulawesi and thereafter, they published a key to *Sinaphodius* species (Ochi & Kon 2005) and subsequently described a further new species from Java: *Sinaphodius oharai* Ochi et Kon, 2008. Thus, six species of the genus has still been known. The seventh species is added now based on the present study.

### MATERIAL AND METHODS

The specimens as specified in the section Taxonomy below were examined. They are equipped with white printed labels presenting locality data, pale green printed labels specifying numbers related to a photo-documentation system by the first author and red printed labels indicating the identification and type status. The exact label data are cited for the type material only. Individual labels are indicated by double slash “//”, individual lines within every label by a single slash “/”. Information in quotation marks indicates the original spelling. The authors’ remarks and additional comments are found in brackets.

The following acronyms stand for collections, in which the specimens studied here are kept:

DKCP – David Král collection (deposited in National Museum Prague), Czech Republic;  
LMCT – Ladislav Mencl private collection, Týnec nad Labem, Czech Republic;  
MRCD – Miloslav Rakovič private collection, Dobřichovice, Czech Republic;  
MNHN – Muséum national d'Histoire naturelle, Paris, France (Olivier Montreuil);  
NMPC – National Museum, Praha, Czech Republic (Jiří Hájek, Vítězslav Kubáň);  
PSHB – Paul Schoolmeesters private collection, Herent, Belgium;  
VKCB – Vítězslav Kubáň private collection, Brno, Czech Republic.

The MBS-10 and SZP 1120-T stereoscopic microscopes were employed in the observations. The photos published here were taken with the help of the Meopta laboratory microscope and CMOS 5 digital camera with the Helicon Focus programme.

The aedeagus was treated by boiling with a 10% sodium hydroxide solution.

## TAXONOMY

### *Sinaphodius natalicius* sp. nov.

(Figs 1–7, 12–17, 19–25)

TYPE LOCALITY. N Laos, Louang Phrabang province, Thong Khan village, 19° 35' N 101° 58' E, ~750 m [a. s. l.].

TYPE MATERIAL (156 specimens). **Laos, Louang Phrabang prov.:** Holotype (♂), allotype (♀) (both NMPC) and paratypes: 3 ♂♂, 6 ♀♀ (DKCP), 4 ♂♂, 30 ♀♀ (LMCT), 4 ♂♂, 10 ♀♀ (MRCD), 1 ♂, 2 ♀♀ (PSHB), 8 ♂♂, 61 ♀♀ (VKCB), “LAOS-N (Louangphra- / bang), 11.–21.v.2002, / 19°35' N 101°58' E, / THONG KHAN, / ~750 m, Vít. Kubáň leg.”. Paratypes: 1 ♂, 9 ♀♀ (DKCP), “LAOS-N, 24.iv.–16.v.1999, / Louang Phrabang prov., / 20°33–4' N 102°14' E, / Ban Song Cha (5 km W), / ±1200 m, Vít Kubáň leg.”. **Laos, Hou Phan prov.:** Paratypes: 1 ♂ (DKCP), 1 ♂, 1 ♀ (LMCT), 1 ♂ (MRCD), 6 ♂♂, 2 ♀♀ (NMPC), “LAOS-NE, Houa Phan prov., / 20°13'09–19" N 103°59'54"–104°00'03" E, / 1480–1510 m, PHOU PANE Mt., / 1.–16.vi. 2009, Vít. Kubáň leg. // Primary mountain forest / *flight intercept trap* / Laos 2009 Expedition: / NHMB Basel, NMPC Prague”. **Laos, Phongsaly prov.:** Paratypes: 2 ♂♂ (VKCB), “LAO - N, Phongsaly prov., / 20°21' N 102°03' E, / BAN SANO MAI env. / 19.–26.v.2004, ~1150 m, Vít. Kubáň leg.”. **Laos, Xieng Khouang prov.:** Paratypes: 1 ♀ (MRCD), “LAOS-NE, Xieng Khouang prov., / 19°38.20' N 103°20.20' E / Phonsavan (30 km NE): PHOU SANE Mt., / 1420 m, 10.–30.v.2009, / Vít. Kubáň leg. // Primary mountain forest, / *flight intercept trap* / Laos 2009 Expedition: / NHMB Basel, NMPC Prague”.

DESCRIPTION OF HOLOTYPE (♂). Oblong oval, moderately convex, macrosetaceous, punctate and moderately shining, mostly yellowish brown with some darkened parts as mentioned below, relatively medium-sized. Total body length: 5.7 mm.

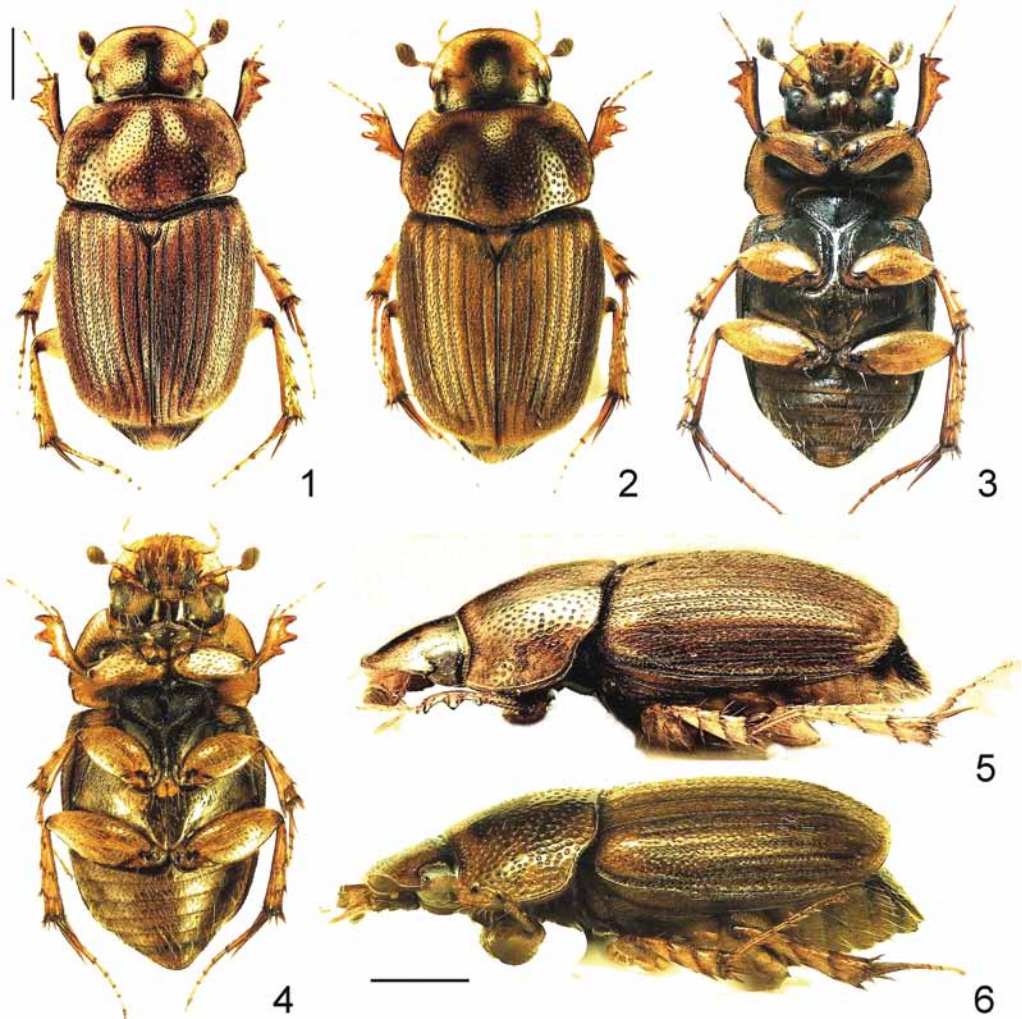
Head (as observed from above, Fig. 1) moderately convex, yellowish brown, with quite narrow and shallow, partially darkened (brown) frontal suture, and with longitudinal, irregular median spot reaching head vertex posteriorly but not reaching anterior clypeus margin. Clypeus essentially semicircular, at most with very slight median emargination, but margined and having upturned anterior margin. Genae rounded, distinctly more protruding than eyes; their anterior margins aligned with clypeus lateral margins, glabrous. Head surface finely punctate; the punctures more distinct and rather evenly distributed in front of frontal suture, less distinct, smaller and sparser behind it; genae essentially impunctate.

Pronotum (Figs 1, 5, 25) convex, areas along anterior, lateral as well as posterior margins yellowish brown, discal area darker (brown). Without anterior margin line, with quite distinct lateral margin lines reaching posterior corners but vanishing toward posterior margin; posterior corners markedly truncate and emarginate; edges of lateral margins and posterior corner margins with pale, rather dense, backward directed macrosetae; posterior margin not bordered, bisinuate, bearing at most few minute, inconspicuous macrosetae. Pronotum surface microreticulate and thus only moderately shining, macrosetaceous in lateral areas (with pale, recumbent, backward

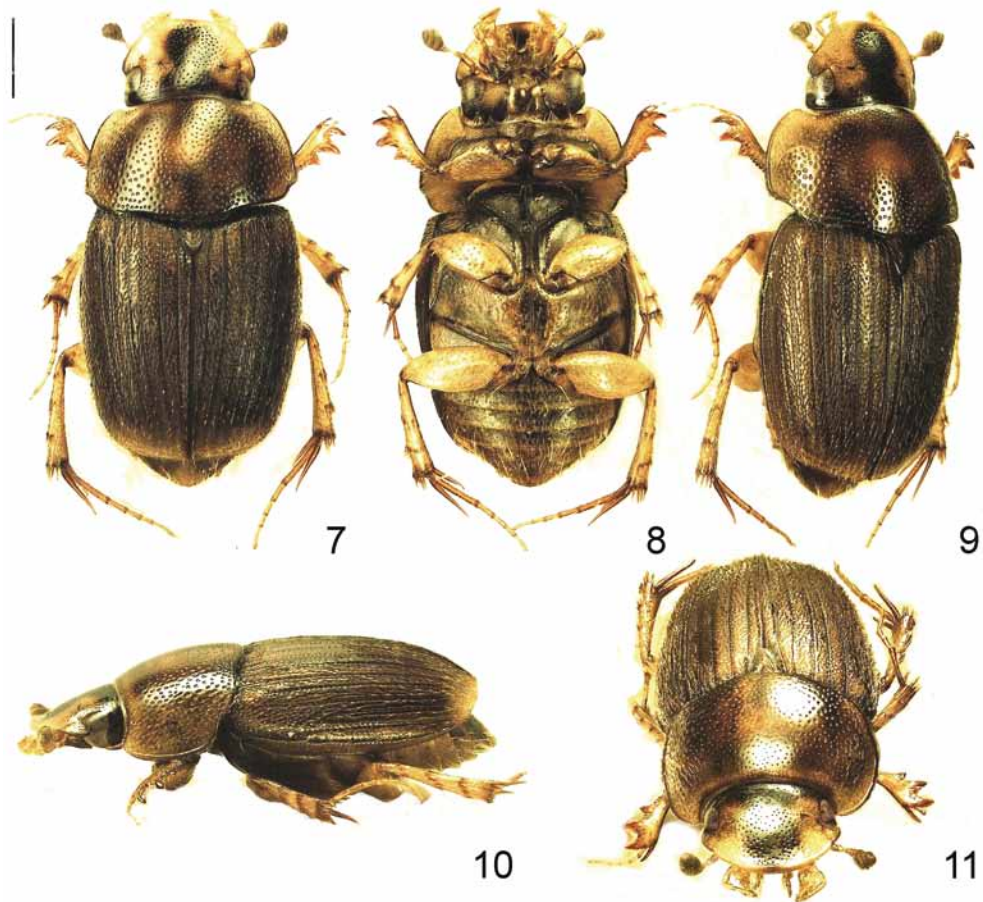
directed macrosetae) bare on disc, punctate (punctures about as fine as those on head anteriorly, medium-sized and fairly evenly distributed on disc, sparser at base, coarser, deeper and denser laterally – particularly above posterior corners).

Scutellum (Fig. 21) triangular (isosceles), punctate in anterior two thirds. Microreticulate, yellowish brown with darker lateral sides.

Elytra (Figs 1, 5, 19–23) moderately convex, oblong but short (pygidium exposed), without humeral denticles, with moderately pronounced humeral calli, with ten striae and ten intervals.



Figs 1–6. *Sinaphodius natalicius* sp. nov. 1 – ♂ (holotype), dorsal aspect, 2 – ♀ (allotype), dorsal aspect, 3 – ♂ (holotype), ventral aspect, 4 – ♀ (allotype), ventral aspect, 5 – ♂ (holotype), lateral aspect, 6 – ♀ (allotype), lateral aspect. Scale line: 1 mm.

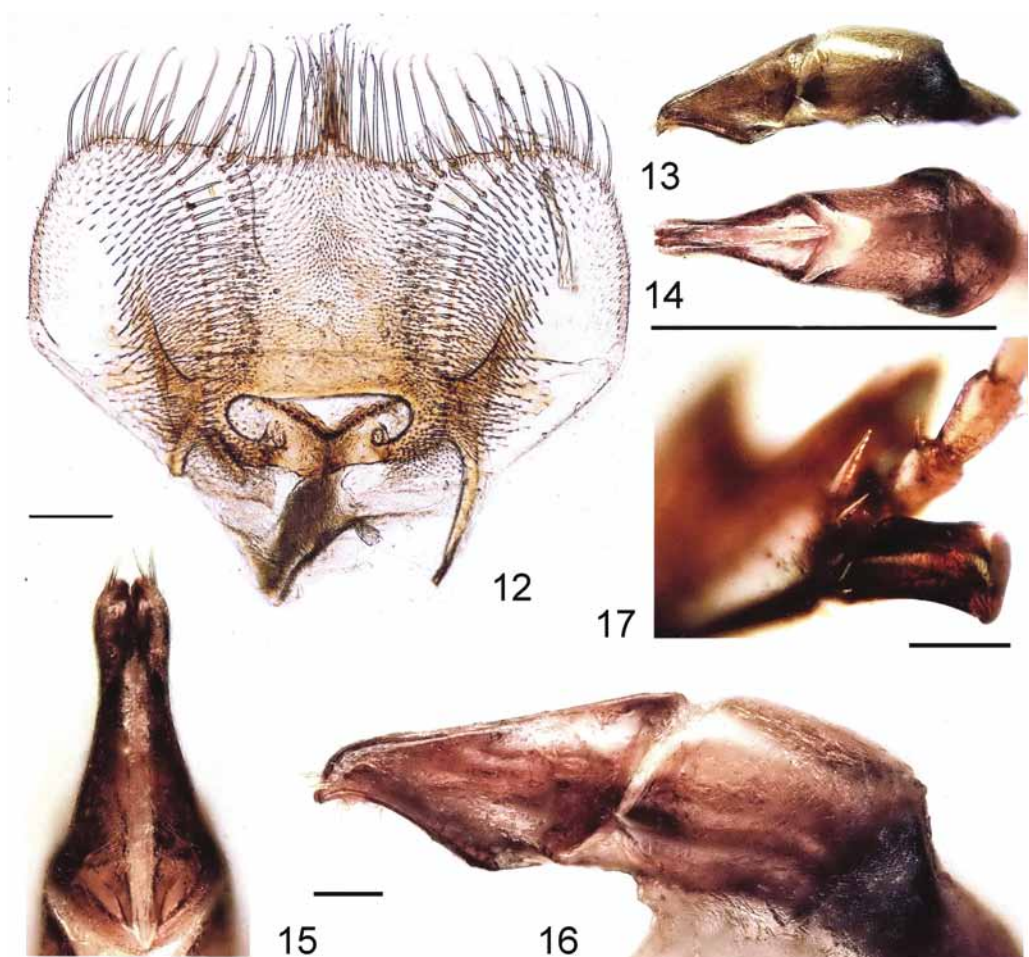


Figs. 7–11. *Sinaphodius chitwanensis* (Schoolmeesters et Van den Heuvel) (♀ paratype, Nepal: Chitwan, PSHC). 7 – dorsal aspect, 8 – ventral aspect, 9 – laterodorsal aspect, 10 – lateral aspect, 11 – anterodorsal aspect. Scale line: 1 mm.

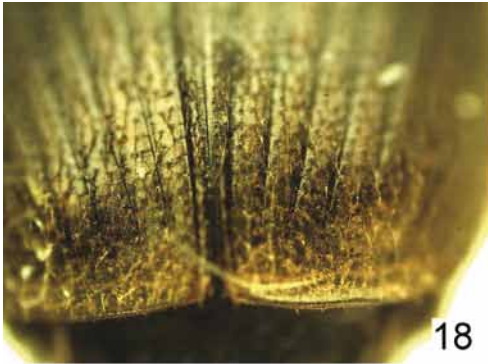
Striae with close punctures transversally crenating intervals, intervals punctate and macrosetaceous, yellowish brown, parts of some intervals being moderately darker. Intervals moderately convex, with fine, but quite distinct macrosetigerous punctures; number of punctures in intervals per interval width varies depending on interval situation (discal or lateral intervals) and distance from base to apex, macrosetae in intervals pale, directed backward, denser and longer in lateral intervals compared to discal ones.

Legs (Figs 1, 3, 17) pale yellowish brown with darkened knees, inside margin of protibia and apical margins and terminal spurs of meso- and metatibia. Protibia moderately curved inward from base to apex, with three large, sideward directed teeth in apical half of outside margin, denticulate along this margin in basal half; protibia anterior margin at right angle to inside margin, equipped with a stout, inward and downward bent terminal spur; protibia upper face with row of fine

but distinct macrosetigerous punctures; few fine macrosetae present at outside margins of large teeth. Mesotibia outer surface with two sharp tough macrosetae close to base, with two oblique ridges (each bearing sharp and tough spinules; mesotibia apex with short superior spur (about  $\frac{1}{3}$  basal mesotarsite length) and considerably longer inferior spur (about  $\frac{2}{3}$  basal mesotarsite length) and fringed with irregularly unequal sharp, tough spinules. Metatibia outer surface similar to that of mesotibia; superior apical spur about as long as basal metatarsite, inferior apical spur reaching about midlength of basal metatarsite; inner margin of apex also fringed with irregularly unequal, sharp, tough spinules. Ventral surfaces (Fig. 3) darker, except for pale yellowish brown underside of femora and lateral area of thorax punctate and macrosetaceous; arrangement of (not



Figs 12–17. *Sinaphodius natalicus* sp. nov., ♂ (holotype). 12 – epipharynx, 13 – aedeagus, lateral aspect, 14 – aedeagus, dorsal aspect, 15 – parameres, dorsal aspect, 16 – aedeagus, lateral aspect, 17 – apex of left protibia. Scale lines: 0.1 mm for Figs 12, 15–17, 1.0 mm for Figs 13 and 14.



very distinct) punctures and macrosetae as in Fig. 3. Metaventral plate with a complete, narrow longitudinal furrow.

Pygidium densely macrosetaceous (Fig. 3).

Aedeagus as in Figs 13–16.

Epipharynx as in Fig. 12.

VARIABILITY IN MALES. Total body length 5.5 to 5.7 mm. Only slightly varying darkened areas on head and pronotum, relatively more variable extent of darkening of some elytral intervals.

FEMALE. Total body length 5.1–5.9 mm. Protibia terminal spur simple (neither stout nor hooked apically). Metaventral plate macrosetaceous throughout in females, bare in middle area in males. Punctures on metafemora arranged in irregular rows in females, quite disarranged in males. Abdominal ventrites equipped with two types of macrosetae (long and short ones): the former type longer in females (as long as 1.5 ventrite length) compared to males.

DIFFERENTIAL DIAGNOSIS. The following combination of characters is typical for the new species described here: Head essentially semicircular, clypeus only very slightly truncate and/or emarginate anteriorly, genae rounded, head surface glabrous, elytral intervals moderately convex.

The new species most closely resembles *Sinaphodius chitwanensis* (Schoolmeesters et Van den Heuvel, 1999). These two species can be differentiated from each other as follows: elytral intervals are flat apically in *S. chitwanensis* (Fig. 18), convex apically in the new species (Fig. 19); setation of elytral intervals is denser in *S. chitwanensis*, the punctation of elytral intervals being thus less distinct (Figs 20, 22), rather sparser in the new species, the punctation of elytral intervals being thus quite distinct (Figs 21, 23); punctures on the pronotum are smaller and shallower in the *S. chitwanensis* (Fig. 24), coarser and deeper in the new species (Fig. 25).

The remaining so far known species of the genus differ from the new species as follows: in *Sinaphodius oharai* Ochi et Kon, 2008, the clypeus is broadly truncate anteriorly; in *S. yunnanus* (Červenka, 1994), *S. philippinensis* (Červenka, 1994) *S. sinuatus* (Harold, 1860) and *S. sulawesensis* Ochi et Kon, 2004, all the dorsal surfaces, including the head surface, are macrosetaceous (the macrosetae are rather inconspicuous on the head of *S. sinuatus*, but some setigerous punctures sparsely occur there).

DISTRIBUTION. Laos: Hou Phan, Louang Phrabang, Phongsaly and Xieng Khouang provinces.

COLLECTING CIRCUMSTANCES. All the type specimens were collected by using flight intercept traps (FIT). At the type locality (2002, Thong Khan) the FIT was placed at the southwest limit of the “Agro-forestry Research Station” area, which is situated southwest of the village Thong Khan. The equipment was exposed for the whole period of time (two weeks: 11.–21.vi.) under conditions of persistent rain. The new species was likely to be found neither in cattle excrements in the station area and beyond the area nor in a human excrement set close to the trap. The immediate vicinity to the trap was covered by a small refuge of residual, probably primary forest with an issuing spring (Fig. 26), surrounded by agricultural, cultivated landscape. The locality is close to a limestone klippe, which is covered by probably primary forest complex (Fig. 27). At other localities, all the FITs were situated immediately close to or directly inside of the natural forest vegetation, but also usually in the close vicinity to the cultivated landscape (pastures or rice and maize fields) (Figs 28–29), where the cattle was present. None specimens were not likely to be found in cattle excrements or in human excrements usually set in immediate vicinity to the FITs. However, it is

←

Figs 18–25. Differences in characters of two related *Sinaphodius* Červenka species (♀♀ paratypes). 18 – *S. chitwanensis* (Schoolmeesters et Van den Heuvel), elytral apex, 19 – *S. natalicius* sp. nov., elytral apex 20 – *S. chitwanensis*, area at elytra base, dorsal aspect, 21 – *S. natalicius* sp. nov., area at elytra base, dorsal aspect, 22 – *S. chitwanensis*, basal and middle parts of elytra, lateral aspect, 23 – *S. natalicius* sp. nov., basal and middle parts of elytra, lateral aspect, 24 – *S. chitwanensis*, pronotum, lateral aspect, 25 – *S. natalicius* sp. nov., pronotum, lateral aspect.

to note that only marginal attention was paid to collecting insects in the cattle excrements at all the localities (V. Kubáň, pers. comm. 2013).

NAME DERIVATION. The species name *natalicius* (= of or in honour of birthday) was chosen on the occasion of the sixtieth birthday of our colleague Vítězslav Kubáň (NMPC), a specialist in Buprestidae, who collected the type specimens.

### Material used for comparison

#### *Sinaphodius chitwanensis* (Schoolmeesters et Van den Heuvel, 1999) (Figs. 7–11, 18, 20, 22, 24)

TYPE MATERIAL EXAMINED. **Nepal**: Paratype: 1 ♀ (PSHB), “Royal Chitwan N. P., Island resort, 17–18. 11. 1998, leg. P. Schoolmeesters”.

NOTE. As mentioned above (see the differential diagnosis of the new species described here), *S. chitwanensis* is morphologically most similar to the new species. That is why we examined its type specimen and took detailed photos to facilitate the comparison of both species.

#### *Sinaphodius oharai* Ochi et Kon, 2008

MATERIAL EXAMINED. **Indonesia, East Java**: 1 ♂ (NMPC), Java Orient. [= East Java], Mt. Ardoeno [Mt. Arjuno].

NOTE. The specimen quoted above represents the only so far known additional material of this species since its original description.



Fig. 26. Type locality of *Sinaphodius natalicius* sp. nov. (N Laos: Louang Phrabang prov., Thong Khan vill. env., ca. 750 m, residual, probably primary forest complex with an issuing spring near the exposed FIT, May 2009, photo by Michal Bednařík).



Fig. 27. Landscape close to the type locality of *Sinaphodius natalicius* sp. nov. (N Laos: Louang Phrabang prov., Thong Khan vill. env., ca 850 m, limestone klippe covered by primary forest complex, May 2009, photo by Michal Bednářik).

### *Sinaphodius philippinensis* (Červenka, 1994)

MATERIAL EXAMINED. **The Philippines, Mindanao:** 2 ♂♂ (DKCP): Mindanao, Lamao, Mumungen, Coll. W. Schulze.

NOTE. The two specimens mentioned above represent the only further material of the species since its original description, in addition originating also from the type locality.

### *Sinaphodius sinuatus* (Harold, 1860)

MATERIAL EXAMINED. **The Philippines, Luzon:** 1 ♂, 2 ♀♀ (MNHN): Luzon, Bilucao, La Laguna, 1875, L. Laglaise.

NOTE. The species, described originally from the “Ins. Philippinae”, is found in the collections only very rarely. The above mentioned three specimens represent the only material with more detailed data seen by the present authors. The occurrence of *S. sinuatus* elsewhere than in the Philippines Islands, i.e. in “Java” and “India”, “British-India” or “Vorderindien” (cf. Balthasar 1943, 1964 and Schmidt 1922) has not yet been confirmed and these records are most likely to concern a different *Sinaphodius* species.

### *Sinaphodius yunnanus* (Červenka, 1994)

TYPE MATERIAL EXAMINED. **China, Yunnan:** Paratypes: 1 ♂, 5 ♀♀ (DKCP), “China, 9.–14.7. / prov. Yunnan mer. / Jinghong 1990 / R. Červenka leg.”, paratype 1 ♀ (MRCD), same data.

NOTE. According to Radek Červenka (2013 pers. comm.) all type specimens (holotype and about 90 paratypes) were collected from cattle dung on flooded orchards and rice fields in an open completely deforested area in the close vicinity of the town of Jinghong, which was considerably different from collecting circumstances in the case of the new species described above.



Fig. 28. Collecting habitat of *Sinaphodius natalicius* sp. nov. (NE Laos: Hou Phan prov., Phou Pane Mt., 1480–1510 m, wiht exposed FIT in primary forest enclave, June 2009, photo by Vítězslav Kubáň).



Fig. 29. Landscape close to the collecting habitat of *Sinaphodius natalicius* sp. nov. (NE Laos: Hou Phan prov., Phou Pane Mt., 1480–1510 m, wiht exposed FIT in primary forest enclave, June 2009, photo by Vítězslav Kubáň).

## Checklist of the genus *Sinaphodius* Červenka, 1994

*Aphodius* (*Sinaphodius*) Červenka, 1994: 111.

TYPE SPECIES. *Aphodius yunnanus* Červenka, 1994, by original designation.

*Sinaphodius* Červenka, 1994: Dellacasa et al. 2001: 272.

***Sinaphodius chitwanensis*** (Schoolmeesters et Van den Heuvel, 1999: 141; figs 1–3) [*Aphodius*]; Ochi & Kon 2005: 82 [*Sinaphodius*].

TYPE LOCALITY. “Nepal, Royal Chitwan N. P., Narayna River, Island resort, 150 m [a. s. l.]”.

DISTRIBUTION. Nepal (Schoolmeesters & Van den Heuvel 1999, Dellacasa & Dellacasa 2006, Ochi & Kon 2005).

***Sinaphodius natalicius* sp. nov.**

TYPE LOCALITY. N Laos, Louang Phrabang province, Thong Khan village, 19°35' N 101°58' E, ~750 m [a. s. l.].

DISTRIBUTION. Laos: Hou Phan, Louang Phrabang, Phongsaly and Xieng Khouang provinces.

***Sinaphodius oharai*** Ochi et Kon, 2008: 131; Figs 1–7.

TYPE LOCALITY. “East Java, Indonesia”.

DISTRIBUTION. Indonesia: East Java prov.

***Sinaphodius philippinensis*** (Červenka, 1994: 112; Figs 4a, b) [*Aphodius*]; Ochi & Kon 2005: 82 [*Sinaphodius*].

TYPE LOCALITY. “Philippines, Mindanao, Momungan”.

DISTRIBUTION. The Philippines: Mindanao (Červenka 1994, Ochi & Kon 2005).

***Sinaphodius sinuatus*** (Harold, 1860: 614) [*Aphodius*]; Schmidt 1913: 136 [*Aphodius* (*Trichaphodius*)]; Balthasar 1943: 109 [*Aphodius* (*Balthasarianus*)]; Červenka 1994: 112 [*Aphodius* (*Sinaphodius*)]; Ochi & Kon 2005: 82 [*Sinaphodius*].

TYPE LOCALITY. “Ins. Philippinae”.

DISTRIBUTION. The Philippines (Harold 1860, 1861, Schmidt 1913, 1922, Balthasar 1943, 1964, Dellacasa 1988, Červenka 1994, Dellacasa & Dellacasa 2006), Philippines: Luzon (Ochi & Kon 2005); Indonesia: Java (Schmidt 1922, Balthasar 1943, 1964, Červenka 1994); “British-India” (Balthasar 1943), “Indien” (Schmidt 1922); “Vorderindien” as doubtful (Balthasar 1964).

***Sinaphodius sulawesiensis*** Ochi et Kon, 2004: 37; Figs 1–5.

TYPE LOCALITY. “Camba, Sulawesi”.

DISTRIBUTION. Indonesia: Sulawesi (Ochi & Kon 2004, 2005).

***Sinaphodius yunnanus*** (Červenka, 1994: 112; Figs 1–3) [*Aphodius*]; Dellacasa et al. 2001: 272; Figs 856, 861–863 [*Sinaphodius*].

TYPE LOCALITY. “China, prov. Yun-nan, Jinghong”.

DISTRIBUTION. China: Yunnan (Červenka 1994, Dellacasa et al. 2001, Ochi & Kon 2004, 2005, Dellacasa & Dellacasa 2006).

### A c k n o w l e d g e m e n t s

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## REFERENCES

- BALTHASAR V. 1943: Revision der Gattung Aphodius Undergattung Trichaphodius A. Schm. (Col.). *Mitteilungen der Münchener Entomologischen Gesellschaft* **33**: 108–136.
- BALTHASAR V. 1964: *Monographie der Scarabaeidae der palaearktischen und orientalischen Region. Band 3*. Prag: Verlag der Tschechoslowakischen Akademien der Wissenschaft, 652 pp.
- ČERVENKA R. 1994: Contribution to the knowledge of Aphodiidae II. New subgenus and two new species of genus Aphodius Illiger. *Folia Heyrovskyana* **2**: 111–115.
- DELLACASA G., BORDAT P. & DELLACASA M. 2001: A revisional essay of world genus-group taxa of Aphodiinae. *Memorie della Società Entomologica Italiana* **79**[2000]: 1–482.
- DELLACASA M. 1988: Contribution to a world-wide catalogue of Aegialiidae, Aphodiidae, Aulonocnemidae, Termitrogidae (Coleoptera: Scarabaeoidea). *Memorie della Società Entomologica Italiana* **66**[1987]: 1–455.
- DELLACASA M. & DELLACASA G. 2006: Tribe Aphodiini Leach, 1815. Pp.: 105–142. In: LÖBL I. & SMETANA A. (eds): *Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea – Scirtoidea – Dasciloidea – Buprestoidea – Byrrhoidea*. Stenstrup: Apollo Books, 690 pp.
- HAROLD E. 1860: Diagnoses de nouvelles espèces d'Aphodius. *Annales de la Société Entomologique de France* **8**: 614–616.
- HAROLD E. 1861: Beiträge zur Kenntniss einiger coprophagen Lamellicornien (Zweites Stück). *Berliner Entomologische Zeitschrift* **5**: 92–115.
- OCHI T., KON M. & 2004: Description of a second species of the genus Sinaphodius (Coleoptera, Scarabaeidae, Aphodiinae) from Sulawesi. *Kogane* **5**: 37–40.
- OCHI T. & KON M. 2005: Notes on Sinaphodius sulawesiensis (Coleoptera, Scarabaeidae, Aphodiinae), with a key to species of Sinaphodius. *Kogane* **6**: 81–82.
- OCHI T. & KON M. 2008: A new species of Sinaphodius (Coleoptera, Scarabaeidae, Aphodiinae) from Java, Indonesia. *Kogane* **9**: 131–134.
- SCHMIDT A. 1913: Erster Versuch einer Einteilung der exotischen Aphodien in Subgenera und als Anhang einige Neubeschreibungen. *Archiv für Naturgeschichte* **A79** **11**: 117–178, 203–212.
- SCHMIDT A. 1922: *Coleoptera Aphodiinae. Das Tierreich. Eine Zusammenstellung und Kennzeichnung der Rezenten Tierformen. 45. Lieferung*. Berlin & Leipzig: W. de Gruyter, 614 pp.
- SCHOOLMEESTERS P. & VAN DEN HEUVEL R. 1999: A new Aphodius species of the subgenus Sinaphodius from Nepal (Coleoptera, Aphodiidae, Aphodiinae). *Phegea* **27**: 141–143.