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## Taxonomical and distributional notes on Oriental Silphidae, with description of *Nicrophorus sausai* sp. n. (Insecta: Coleoptera)

With 1 table and 7 figures

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**A b s t r a c t.** *Nicrophorus sausai* sp. n. from Laos and India: Meghalaya is described, illustrated and compared with related species from the *Nicrophorus nepalensis* HOPE, 1831 species group. It differs from related species mainly by presence of long setation on pronotum and dorsum of elytra, triangular female clypeal membrane and truncate spatula on female tergum X. *Necrodes brevicollis* ARROW, 1909 is treated as a junior objective synonym of *Necrodes nigricornis* HAROLD, 1875; lectotype and paralectotypes for *N. brevicollis* are designated. First records of *Nicrophorus nepalensis* HOPE, 1831 from Laos and India: Meghalaya, *Deutosilpha rufithorax* (WIEDEMANN, 1832) and *Calosilpha cyaniventris* (MOTSCHULSKY, 1870) from Thailand and *Diamesus osculans* (VIGORS, 1825) from Myanmar and Laos are given.

### Introduction

Carrian beetles are a small group of ca. 200 species world-wide (NEWTON, 1991). However, taxonomy and distribution of many Oriental taxa is only poorly known (e. g., PORTEVIN, 1926; SCHAWALLER, 1982).

In the recent paper we provide the description of a new species, recently collected by the Slovak and Czech entomologists in the Bolikhamsai province in central Laos and in Meghalaya state of northern India. Further taxonomical and distributional notes on Oriental carrian beetles are also presented.

### Material and methods

The following abbreviations of collections are used throughout the text: BMNH – The Natural History Museum, London (M. J. D. Brendell); JHAC – collection of J. Háva, Praha; JRUC – coll. J. Růžička, Praha; JSCC – coll. J. Schneider, Praha; JZIC – coll. J. Zídek, Praha; NMPC – Národní muzeum, Praha (J. Jelínek); SMTD – Staatliches Museum für Tierkunde, Dresden (D. Ahrens).

Exact label data are cited only for type material. Authors' remarks and complementation are found in square brackets; [p] - preceding data within quotation are printed; [h] – the same but hand-written. Separate lines on labels are indicated by slash ("/"), separate labels by double slash ("//").

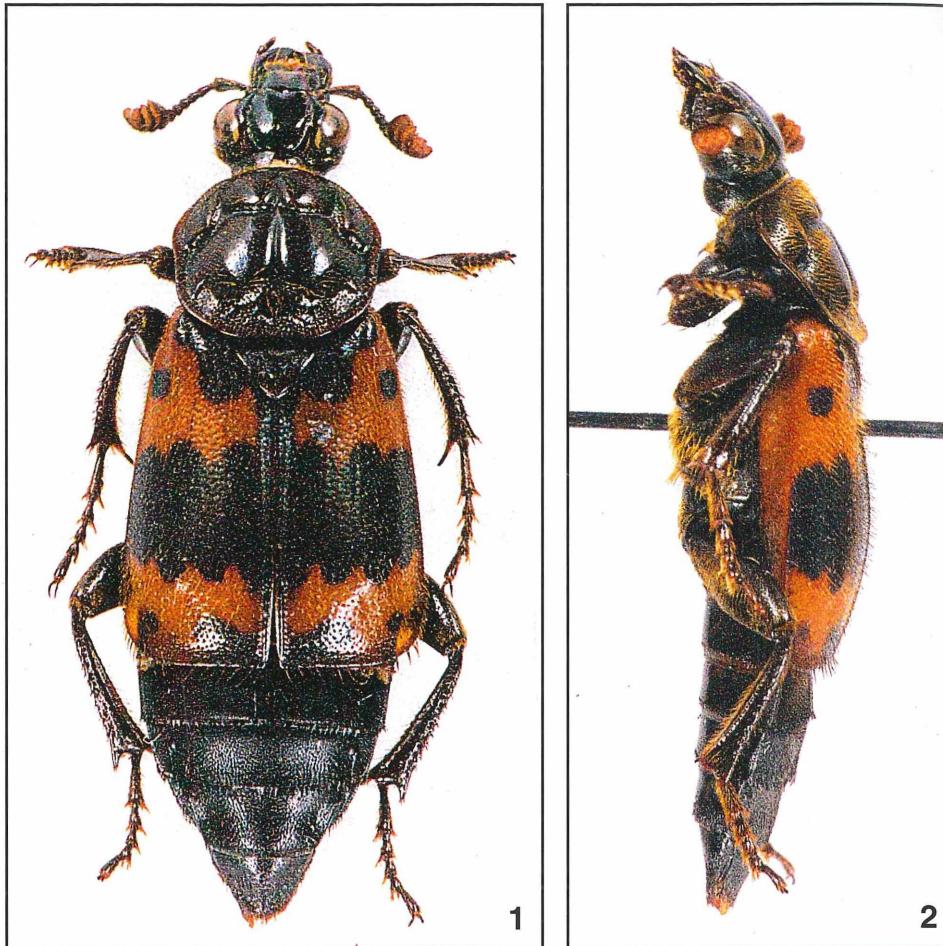
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Figs 1, 2: *Nicrophorus sausai* sp. n., holotype female: 1 – habitus dorsally, 2 – habitus laterally. Body length 18.2 mm.

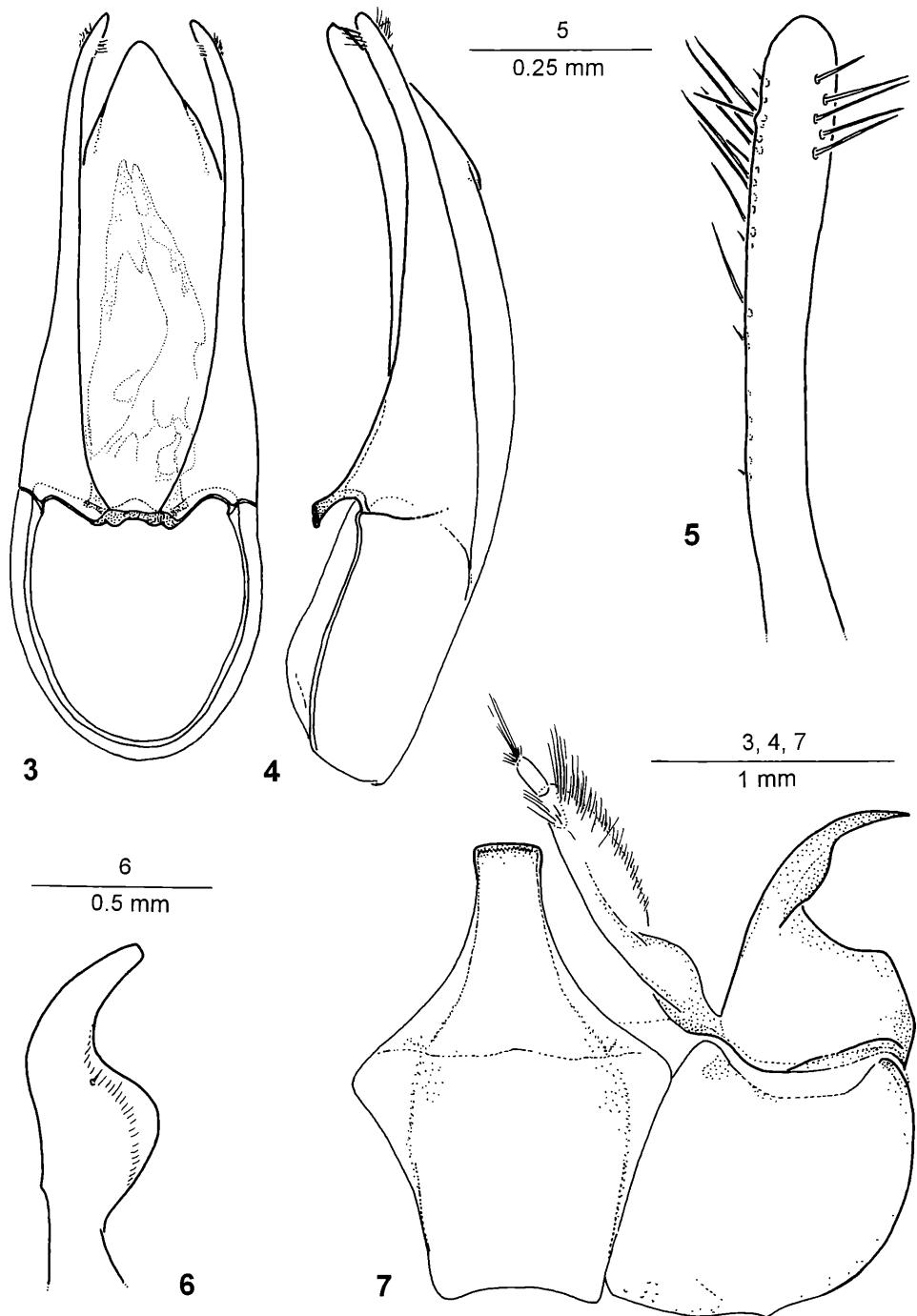
All type material is bearing with a red, printed label with the text as follows: "HOLOTYPE [or ALLOTYPUS, PARATYPUS, respectively] [male symbol] or [female symbol] / *Nicrophorus sausai* sp. n. / Jan Růžička, Jiří Háva & Jan Schneider det. 1999". Female genitalia were studied according to ARNETT (1944).

#### *Nicrophorus sausai* sp. n. (Figs 1–7)

**Type material.** Holotype (female), labelled "LAOS c. Bolikhamsai prov. / BAN NAPE - Kaew Nua Pass / 18.iv.-1.v.1998, alt. 600 m / N 18° 22.3' E 105° 09.1' GPS / Ě. Jendek & O. Šauša lgt.". Allotype (male), paratypes (1 male, 2 females): the same data as holotype. Paratype (female), labelled "NE INDIA; MEGHALAYA; 1400 m; / Nokrek N.P.; 3 km S Daribokgirt; / 25°27' N 90°19' E; 26.iv.1999; / Zd. Košťál lgt.". Holotype is deposited in SMTD, allotype and 1 female paratype in JHAC; 1 male and 1 female paratypes in JSCC and 1 female paratype in JRUC.

#### Description.

**Female.** Body length 14.3–19.8 mm (18.2 mm in the holotype), maximum body width 6.8–7.6 mm (7.5 mm in the holotype), maximum pronotal width 4.6–5.4 mm (5.2 mm in the holotype).



Figs 3–7: *Nicrophorus sausai* sp. n., allotype male (3–5), paratype female (6) and holotype female (7): 3 – aedeagus ventrally, 4 – aedeagus laterally, 5 – apex of paramere laterally, 6 – apex of valvifer with lobe laterally; 7 – female genitalia dorsally.

Body stout, with relatively short appendages. Head black with orange clypeal membrane and part of labrum; pronotum and ventral side of body black; elytra orange with two transverse black bands; legs brown to black; antennal club with basal antennomere black, apical three antennomeres orange (Figs 1, 2).

Head: 1.30–1.36 times as wide as long; surface lustrous, with sparse punctation; posteriorly covered with short, semierect, golden setation. Frons black, orange spot absent. Frontoclypeal suture with 2–4 golden setae bilaterally. Clypeal membrane triangular. Mandible with internal margin straight, without dentation; internal base of right mandible with a small, shallow notch. Dorsum of neck with non-punctate band medially.

Antenna: 0.67–0.74 times as long as maximum pronotal width; antennomeres of antennal club deeply emarginate; antennal club abrupt, basal antennomere black, weakly transverse, not cup-like and transverse; apical three antennomeres orange.

Pronotum: 0.93–1.15 times as wide as long medially, 1.44–1.51 times as wide as head; cordate, widest anteriorly; disc black; surface bearing three pairs of prominent bumps; surface with fine, transverse microsculpture; large punctures separated by a distance larger than their diameter, with inserted very fine punctures; whole surface regularly covered by erect, short, golden setae except medial anterior and posterior bumps (Figs 1, 2).

Scutellum: surface densely punctate antero-medially, laterally and in posterior half punctation becoming sparser.

Elytra: 1.19–1.26 times as long as wide, 1.37–1.47 times as wide and 1.61–2.00 times as long as pronotum; orange, with two transverse black bands. Anterior black band reduced, laterally not reaching elytral epipleuron, complete medially; posterior black band wide, complete medially, margins undulate; both bands connected by narrow longitudinal black stripe along elytral suture. Antero-lateral part of elytron with large black spot at humerus; small spot present also postero-laterally; another larger, oblique spot verges postero-medial margin (Fig. 1). Elytral epipleuron entirely orange (Fig. 2). Dorsal surface with transverse microsculpture; punctures of similar size as on pronotum, separated by ca. 2–3 times their diameter; covered by long, erect, golden setae (dark brown to black on posterior black band, Fig. 2). Epipleural ridge short, reaching to the tip of scutellum; with a row of long preapical setae.

Ventral side of body: Mesepimeral margin bare, without setae; metasternum with short and fine golden setae posterior of mesocoxae, becoming long and erected posteriorly and laterally; posterior margin with a long row of setae and short glabrous border; metepimeron constricted anteriorly, metepimeral lobe with long, golden setae.

Abdomen: Black; terga covered with long, semierect, dark brown setae; ventrites covered with short, dark brown setae, in addition to longer dark brown setae on posterior margin; ultimate segment with long, golden setae on posterior margin; stridulatory files on tergite V parallel, separated by 2–3 times their widths, touching posterior margin; first abdominal spiracle lobed.

Legs: Anterior aspect of procoxa with short black setae on basal half; metacoxa with anterior line complete for less than half of width, without white microsetae on posterior margin; metafemur stocky; mesotibia with outer margin straight; meso- and metatibia apical angle produced into a lobe; metatibia straight, with mid of outer margin not swollen; inner margin almost straight; protarsomere simple, tarsal empodium bisetose.

Genitalia (Fig. 7): Tergum IX apically glabrous, without process. Tergum X strongly lobed, not bifurcate, with a wide, glabrous, truncate apical spatula; posterior angles sharply angled; base of tergum X simple, not emarginate; medial part with dorsal, transverse ridge. Valvifer lobed, without setae; valvifer claw lobe roundly lobed in lateral view, sometimes with a single, small seta (Fig. 6). Coxite produced basally; inner margin not emarginate laterally; terminal claw absent.

**Male.** Body length 13.8 and 16.6 mm (allotype), maximum body width 6.0 and 6.5 mm (allotype), maximum pronotal width 4.2 and 5.0 mm (allotype); head: 1.20 and 1.33 times as long as width; antenna 0.77 times as long as maximum pronotal width; pronotum 1.12 and 1.16 times as wide as long medially, 1.37 and 1.38 times as wide as head; elytra 1.24 and 1.33 times as long as wide, 1.29 and 1.41 times as wide and 1.97 and 1.99 times as long as pronotum.

species / character	long setation on pronotum and dorsum of elytra	orange spot on frons	female clypeal membrane	spatula on female tergum X	valvifer claw lobe
<i>N. nepalensis</i>	absent	present (rarely absent)	rectangular	rounded	dentate
<i>N. quadripunctatus</i>	absent	present	rectangular	rounded	dentate
<i>N. maculifrons</i>	absent	present	rectangular	rounded	rounded
<i>N. montivagus</i>	absent	absent (rarely present)	rectangular	subtruncate	dentate
<i>N. podagricus</i>	absent	absent	rectangular	rounded	dentate
<i>N. heurni</i>	absent	absent	rectangular, medially campanulate	rounded	rounded
<i>N. sausai</i> sp. n.	present (Fig. 2)	absent (Fig. 1)	triangular (Fig. 1)	truncate (Fig. 7)	rounded (Fig. 6)

Table 1. Review of selected characters within the taxa of *Nicrophorus nepalensis* species group (species with maculate elytra).

Similar to female, except for the following characters: Clypeus campanulate; post-ocular bulge slightly larger than in females; metatrochanter with short spur; protarsomeres weakly widened. Genitalia (Figs 3, 4): Aedeagus large, stout; apex with wide tip; internal sac with several sclerotized areas, covered by homogenous, small teeth. Paramere evenly curved, equally thick along length, not constricted; apex regularly rounded; with a group of 4–5 ventro-medial setae and a second group of about 13 dorso-lateral setae, overlaps with ventro-medial group of setae. Setae not reaching apex of paramere, not placed on flange.

**Variation** The female paratype from India: Meghalaya is larger (body length 19.8 mm) and its pronotum is more elongate (0.93 times as wide as long); specimens from Laos are smaller (body length 13.8–18.2 mm), with wider pronotum (1.11–1.16 times as wide as long).

**Differential diagnosis** Several species groups are recognized within the genus *Nicrophorus* FABRICIUS, 1775, as in the papers of HATCH (1927) and PECK & ANDERSON (1985). However, some eastern Palaearctic and Oriental species are not yet classified in any of the existing groups; the genus is presently under revision by D. S. SIKES (in prep.). *Nicrophorus sausai* sp. n. belongs to the *N. nepalensis* species group, judging from the maculate elytra. The new species can be separated from the species of this group with maculate elytra (containing *N. nepalensis* HOPE, 1831, *N. quadripunctatus* KRAATZ, 1877, *N. maculifrons* KRAATZ, 1877, *N. montivagus* LEWIS, 1887, *N. podagricus* PORTEVIN, 1920 and *N. heurni* PORTEVIN, 1926) by the characters treated in Table 1.

**Collection circumstances** The specimens from Laos were collected using pitfall trap on border between pasture and coniferous forest (with dominant *Picea* spp.) in altitude ca. 600 m, together with *Nicrophorus nepalensis*. The specimen from India was collected using pitfall trap in deciduous primary forest.

**Name derivation** Named after Dr. Ondrej Šauša from Bratislava (Slovakia), one of the collectors of the new species.

*Necrodes nigricornis* HAROLD, 1875

*Necrodes nigricornis* HAROLD, 1875: 286.

*Necrodes brevicollis* ARROW, 1909: 190, **syn. n.**

**T**ype material examined. Lectotype (male, here designated) (BMNH), labelled "SYN- / TYPE [p, round label, light blue margin] // Type [p, round label, red margin] // India. // Bowring. / 63.47\* [p] // *Necrodes brevicollis*. / Type [male symbol] Arrow [h] // LECTOTYPE / *Necrodes brevicollis* Arrow, 1909 / Jan Růžička des. 1995 [h, yellow paper] // *Necrodes* [male symbol] / *nigricornis* Harold, 1875 / Jan Růžička det. 1995 [h]"

Paralectotypes (4 females) (all BMNH): one female, labelled "SYN- / TYPE [p, round label, light blue margin] // Type [p, round label, red margin] // India. // Bowring. / 63.47\* [p] // *Necrodes brevicollis*. / Type [female symbol] Arrow [h] // PARALECTOTYPE / *Necrodes brevicollis* Arrow, 1909 / Jan Růžička des. 1995 [h, yellow paper] // *Necrodes* [female symbol] / *nigricornis* Harold, 1875 / Jan Růžička det. 1995 [h]"

one female, labelled "SYN- / TYPE [p, round label, light blue margin] // India. // Bowring. / 63.47\* [p] // PARALECTOTYPE / *Necrodes brevicollis* Arrow, 1909 / Jan Růžička des. 1995 [h, yellow paper] // *Necrodes* [female symbol] / *nigricornis* Harold, 1875 / Jan Růžička det. 1995 [h]"

one female, labelled "SYN- / TYPE [p, round label, light blue margin] // N. / India [round label] / 128/122 [h, written from bottom] // PARALECTOTYPE / *Necrodes brevicollis* Arrow, 1909 / Jan Růžička des. 1995 [h, yellow paper] // *Necrodes* [female symbol] / *nigricornis* Harold, 1875 / Jan Růžička det. 1995 [h]"

one female, labelled "SYN- / TYPE [p, round label, light blue margin] // Penang [p] // Bowring. / 63.47\* [p] // PARALECTOTYPE / *Necrodes brevicollis* Arrow, 1909 / Jan Růžička des. 1995 [h, yellow paper] // *Necrodes* [female symbol] / *nigricornis* Harold, 1875 / Jan Růžička det. 1995 [h]"

**A**dditional material examined JAPAN: Hiyoto, 1912, 2 males (NMPC, coll. Brýdl); JAPAN: Unzen, Shimabara, 2 males, 1 female (NMPC); JAPAN: Ichinotani, Suma, Setsu, 9.vi.1932, [ex coll.] Reitter, 1 male (NMPC, coll. Hlinský); JAPAN: Kamikochi, northern Alps, [ex coll.] Reitter, 1 male (NMPC, coll. Hlinský); JAPAN: Osaka Pr., Takatsuki Co., Karasaki, Riv. Yodo-gawa, 20.viii.-3.ix.1989, K. Harusawa lgt., 4 males, 4 females (JHAC) and 2 males, 1 female (JRUC); CHINA: Sze-tschanw [Sichuan prov.], 1 male, 1 female (NMPC, coll. Kouřil); INDIA: Assam, Dibrugarh-Saikova Wildlife Sanctuary, 20 km N of Tinsukia, alt. 120 m, 27°35'N 90°22'E, 1.-5.xii.1997, V. Siniaev, V. & S. & M. Murzin lgt., 2 males (JSHC).

*Necrodes nigricornis* was described by HAROLD (1875) from Japan. Later, ARROW (1909) described *N. brevicollis* from northern India. Study of the type material of *N. brevicollis* in BMNH by the senior author revealed no differences between both species. The same was also suggested in an unpublished manuscript of R. B. MADGE (A. F. NEWTON, Jr., pers. comm.). Consequently, *Necrodes brevicollis* ARROW, 1909 is considered as a junior objective synonym of *Necrodes nigricornis* HAROLD, 1875. Known distribution: India, "Bengal", China (incl. Taiwan) and Japan (PORTEVIN, 1926).

*Nicrophorus nepalensis* HOPE, 1831

**M**aterial examined. LAOS centr., Bolikhamsai prov., Ban Nape – Kaew Nua Pass, alt. 600 m, 18°22.3'N 105°09.1'E (GPS), 18.iv.-1.v.1998, E. Jendek & O. Šauša lgt., 2 males (JHAC) and 1 female (JRUC); INDIA: Meghalaya, Mawphlang, 25.vi.1995, C. Werner lgt., 2 females (JSCC).

Widely distributed from Pakistan to Indonesia (EMETZ & SCHAWALLER, 1975; SCHAWALLER, 1982; RŮŽIČKA & SCHNEIDER, 1996), first records from Laos and India: Meghalaya.

*Deutostilpha rufithorax* (WIEDEMANN, 1832)

**M**aterial examined THAILAND bor., Mae Hong Son, alt. 1000 m, 16.-23.vi.1993, J. Schneider lgt., ca. 50 spec. (JHAC, JRUC, JSCC, JZIC and NMPC).

Known from India and Nepal (PORTEVIN, 1926; SCHAWALLER, 1982), first record from Thailand.

*Calosilpha cyaniventris* (MOTSCHULSKY, 1870)

Material examined. THAILAND, Doi Pui, alt. 1400 m, 18.49°N 98.54°E, 2.-3.vi.1995, V. Kubáň lgt., 1 male and 1 female (JSCC); THAILAND bor., Nan prov., Doi, Phu Kha Nat. Park, Heada, 19°13'N 101°07'E, 22.-26.iv.1999, D. Hauck lgt., 5 males, 4 females (JSCC), 1 male, 1 female (JHAC) and 1 male, 1 female (JRUC).

Known from northern India, Nepal, Myanmar and northern Vietnam (PORTEVIN, 1926; SCHAWALLER, 1982), first record from Thailand.

*Diamesus osculans* (VIGORS, 1825)

Material examined. MYANMAR bor. (Burma), 40 km N of Myitkyina, Chanc Kand vill., alt. 235 m, 23.-24.iv.1998, S. Murzin & V. Siniav lgt., 2 males (JSCC); LAOS bor., 20 km NW of Louang Nantha, alt. 900 m (± 100 m), 21°09.2'N 101°18.7'E, 5.-11.v.1997, E. Jendek & O. Šauša lgt., 1 female (JSCC) and 1 female (JHAC); LAOS bor., Louang Phrabang prov., 5 km W of Ban Song Cha, alt. ca. 1200 m, 20°33'-34'N 102°14'E, 24.iv.-16.v.1999, V. Kubáň lgt., 1 male and 1 female (JSCC); ditto, C. Holzschuh lgt., 3 males and 5 females (JSCC).

Known from India, Sri Lanka, Bhutan, Vietnam, Malaysia, Indonesia, New Guinea, New Zealand and Australia (PORTEVIN, 1926; ARNETT, 1950), first record from Myanmar and Laos.

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