



The Indochinese members of the *Onthophagus (Parascatonomus) aurifex* species group (Coleoptera: Scarabaeidae), with the description of a new species

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Abstract

The representatives of *Onthophagus (Parascatonomus) aurifex* species group from Indochina are reviewed and a new species of this group, *O. (Parascatonomus) alexeevi* sp. n., is described. Distribution data for all treated species are provided.

Key words: *Onthophagus*, *Parascatonomus*, Indochina, new species

Introduction

The representatives of the dung beetle genus *Onthophagus* Latreille, 1802 belonging to the *O. aurifex* species group (in the subgenus *Parascatonomus* Paulian, 1932) inhabiting Sundaland (the biogeographic region of Southeastern Asia that comprises the Malay Peninsula and maritime southeast Asian islands of Sumatra, Java, Borneo, with surrounding smaller islands) were recently defined and reviewed by Krikken and Huijbregts (2008). In the Sundaland region this group includes six species, most of which can be reliably distinguished using aedeagal characters. Such subtle limits between species in this group often cause misidentifications. These circumstances induced us to take a closer look at material of the *O. aurifex* species group from the adjacent Indochina region, to which up until now were identified uncritically using the names of Sundaland species. This paper deals with what is defined as the *O. aurifex* species complex of the same named species group. The examination of Indochinese material led to the recognition of one new species and new records for the *O. aurifex* species complex.

Materials and methods

Specimens and collections

The material examined in the present study is kept in the following institutions:

BMNH	The Natural History Museum, London, United Kingdom (M. Kerley & M. Brendell)
RMNH	National Museum of Natural History, Leiden, The Netherlands (J. Krikken & J. Huijbregts)
ZISP	Zoological Institute, St.-Petersburg, Russia (A. Frolov)
ZMUC	Zoological Museum (Natural History Museum of Denmark), University of Copenhagen, Denmark (A. Solodovnikov & O. Martin)
ZMUM	Zoological Museum of Moscow State University, Russia (A. Gusakov)

Microscopy and illustrations

All photos were taken with a digital camera attached to a dissecting microscope (Leica MZ16A ®). Male aedeagi in Figs. 2a–e, g–h, k–m were photographed in glycerin. First, the dissected aedeagus was macerated in 10% solution of KOH for several hours and then rinsed with distilled water. Finally, the aedeagus was placed in glycerin for storage. Male aedeagi in Figs. 2f, j were photographed after they were dried and glued on a mounting triangle for storage.

Discussion of the *O. aurifex* group distribution

The *O. aurifex* species group was recently defined by Krikken and Huijbregts (2008). Here, we tentatively divide this group into two complexes of species based on the coloration of upper side of body: the *O. aurifex* complex and the *O. sarawacus* complex. The species within these complexes can usually only be reliably identified by aedeagal characters. The *O. aurifex* complex has species with upper side of forebody shiny metallic, i.e. their head and pronotum are cupreous and/or shiny green. This species complex includes 4 species: *O. alexeevi* sp. n.; *O. aurifex* Harold, 1877; *O. semiaureus* Lansberge, 1883; and *O. semifex* Krikken & Huijbregts, 2008. The *O. sarawacus* complex includes species with an entirely black upper side of the body: *O. liewi* Ochi & Kon, 2005; *O. muticifrons* Endrödi, 1973, *O. sarawacus* Harold, 1877; and *O. sumawacus* Krikken & Huijbregts, 2008. In this paper we limit our coverage only to the species of *O. aurifex* complex distributed in Indochina. The only species of *O. sarawacus* complex in Indochina is *O. muticifrons* Endrödi, 1973, which is apparently widespread. Its taxonomic status and infraspecific variation, however, would require separate research and are not considered in this paper.

The examination of the Indochinese material revealed that the *O. aurifex* complex beyond Sundaland consists of two different taxa, *O. semifex* and *O. alexeevi*. The record of *O. aurifex* from West Thailand (Kabakov & Napolov 1999) is erroneous. We have reexamined the material (deposited at ZISP) on which that record is based and concluded that it belongs to the new species, *O. alexeevi*, described below. Although we have not studied the material concerned, we suggest that the record of *O. semiaureus* from Central Thailand (Masumoto 2002) is also based on misidentification. We believe that *O. semiaureus* only occurs in Sundaland because we have not found anything like it among the many specimens we examined from Indochina. The records of *O. semiaureus* from Indochina were likely based on misidentified specimens of either *O. alexeevi* or *O. semifex*. The latter was described from mainland North Sumatra and here we provide records (Fig. 3) from the Sumatran West Coast Islands (Sipura), the Malay Peninsula (Singapore and Kuala Lumpur), and South Vietnam (Cat Tien National Park). It is noteworthy that the specimens of the Vietnamese population of *O. semifex* are slightly different in the shape of their aedeagus (Figs. 2d–e) from those known from Sundaland. Thus, herein we tentatively assign the representative of Vietnamese population to the species *O. semifex*. In our view, these differences are too slight to justify the designation of a separate taxon for that population. Based on our observations, all previous records of species hitherto placed in the *O. aurifex* complex from Indochina are erroneous due to misidentifications. Only two species mentioned above, one recently described and one herein described, are found so far in Indochina, indicating how limited is our knowledge of the beetle fauna of this biodiversity hotspot.

The distribution map of all species in the *O. aurifex* complex based on the material available to us is provided in Fig. 3. Species in the *O. aurifex* group can usually only be distinguished by the aedeagal characters, and sometimes populations within one species slightly differ in the shape of aedeagus from each other (Krikken & Huijbregts 2008). This combined with the small distribution range typical of species in this group, might indicate that a relatively short periods of isolation lead to rapid speciation.

***Onthophagus (Parascatonomus) alexeevi* Tarasov, Krikken & Huijbregts sp. n.**

(Figs. 1, 2g–k, l)

Material examined. *Holotype* (ZMUC), male major bearing the following labels:

1. White, printed: S[outh] CAMBODIA Sianoukville h=50–150m 3 carrion traps disturb tropical forest 12–16.05.2008 leg. S. Tarasov

2. Orange, printed: HOLOTYPUS *Onthophagus (Parascatonomus) alexeevi* S. Tarasov, J. Krikken & J. Huijbregts det. 2009

Paratypes: 53 specimens, South Cambodia, Sianoukville h=50–150m, 3 carrion traps disturb tropical forest, 12–16.05.2008 leg. S. Tarasov (ZMUC); 1 ♂ & 1 ♀, Thailand, Umphang river, 16.07N 99.00E, h1000m, 28/4–6/5.91 leg. D. Kral (ZISP); 2 ♂, W Thailand, 300m, Thung Yai Wildlife Sanctuary, 15.28N 98.48E, Tak Province, Umphang District, Song Bae Stream, 18–27.4.1988, M.J.D. Brendell, FIT B (RMNH); 1 ♀, same data and locality, but carrion trap (fish) (BMNH); 1 ♂ & 1 ♀ same locality and date, but evergreen rain forest M.J.D. Brendell, (BMNH); 2 ♂ & 1 ♀, W Thailand, 300m, Thung Yai Wildlife Sanctuary, 15.30N 98.48E, Tak Province, Umphang District, Mae Chan/Mae Klong confluence, 27.4–6.5.1988, M.J.D. Brendell, oak/bamboo forest (BMNH); 1 ♂ same data and locality, but edge of Karen clearing (BMNH).



FIGURES 1. *Onthophagus (Parascatonomus) alexeevi*, dorsal view, holotype.

Description. Head and pronotum cupreous or with greenish metallic luster, elytra black, matt, underside black with metallic cupreous or/and green luster. Length 9.0–11.5 mm.

MALE major (Fig. 1). Head rounded; clypeal margin anteriorly distinctly reflexed, apex with short tooth, tip rounded; frontoclypeal ridge slightly expressed as smooth arcuate strip; clypeus densely, transversely rugulate; vertex simple with slightly protruding plate; eyes completely divided by canthus.

Pronotum convex, with slightly steeper anterior declivity in major specimens; anterior and lateral sides of pronotum marginate, base marginate only laterally and medially angulate; anterolateral pronotal angle slightly obtuse; pronotal disc covered with small, simple, sparse punctures (separated by 1–2 puncture diameters) becoming denser and granulate laterally; anterior part of propleura with ridge reaching prosternal lateral side.

Elytra with short, yellow, fine setae; sparsely covered with small, simple punctures.

Metasternum anteriorly raised, prow-shaped.

Protibia with 4 outer teeth, apico-internal angle with small tooth; apical spur modified in males: small, acuminate, slightly bent downward and inward; mesotibial and metatibial apex bearing short setae.

Aedeagus as in Figs. 2g–k, l (Fig. 2g is of the holotype).

FEMALE. Head and pronotum armature do not differ from those of males.

VARIATION. Slightly expressed in minor specimens by flatter pronotum with slightly denser punctation.

HOLOTYPE. The body coloration and length of the holotype as follows; head and pronotum cupreous with greenish metallic luster, underside black with metallic cupreous and green luster. Length 9.7 mm.

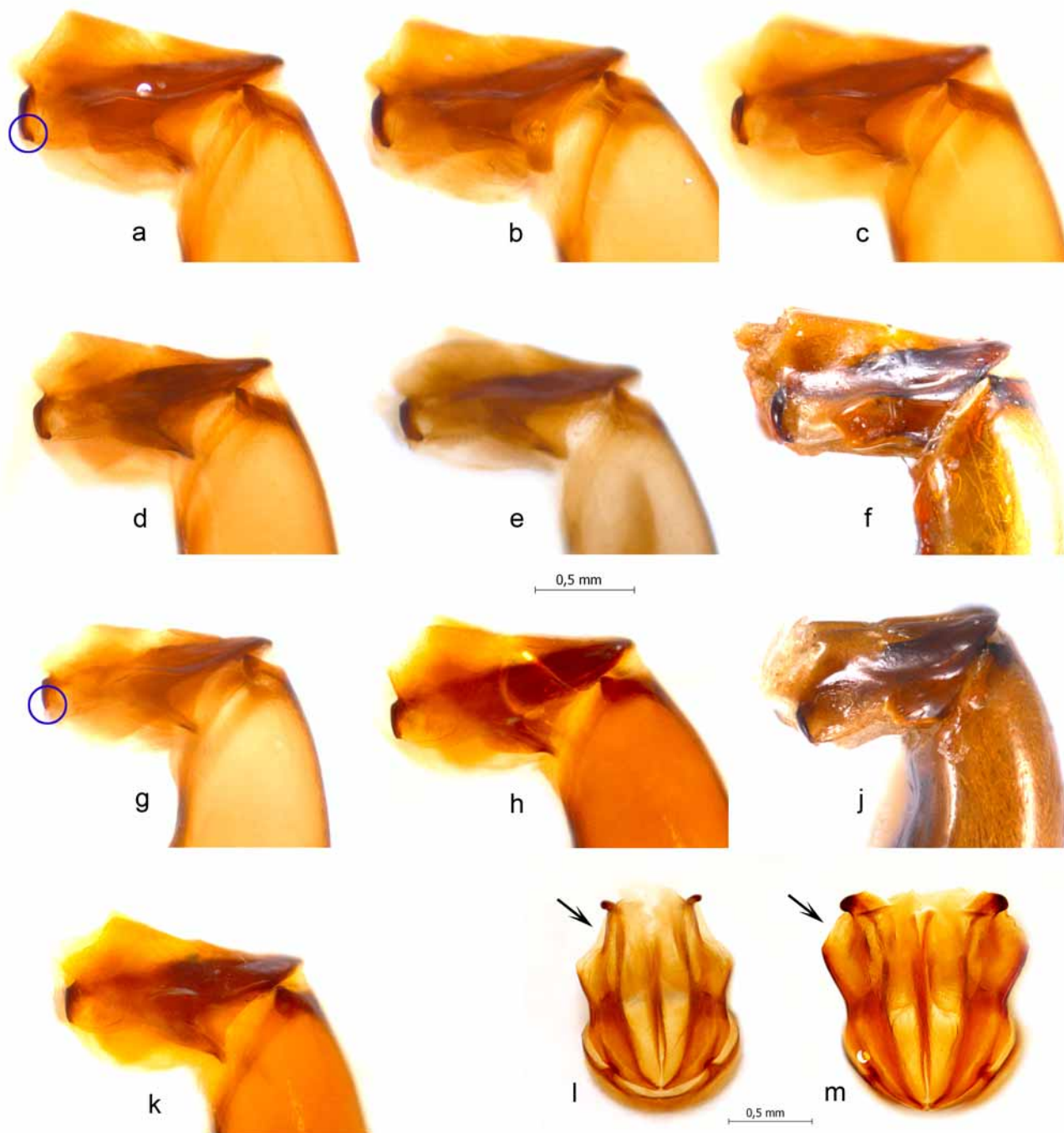


FIGURE 2. Aedeagi of *O. aurifex*-group species. a–f, m — *O. semifex* (a–c, f, m — paratypes, d–e — Vietnam); g–l — *O. alexeevi* (g–j, l — paratypes, k — holotype); a–k — aedeagus lateral view; l–m — aedeagus dorsal view; a–e, g–h, k–m — aedeagus photographed in glycerin; f, g — aedeagus photographed after drying.

Differential diagnosis. The new species is most similar to three other species of *O. aurifex* complex: *O. semifex*, *O. semiaureus* and *O. aurifex*, which also have the upper side of the forebody shiny metallic. This is in contrast to the other species of the *O. aurifex* group belonging to *O. sarawacus* complex, which have an entirely black dorsal surface. The new species can only be reliably separated from these three species using the aedeagus. Among these three species, the aedeagal shape of *O. alexeevi* is most similar to that of *O. semifex* but differs in the sclerotized anterior part of parameral apex, which is thinner and without the lower

tooth-like short appendage (Figs. 2 g–k, in Figs. 2g, j indicated with circle) present in *O. semifex* (Figs. 2a–f, in Figs. 2a, f indicated with circle). *Onthophagus alexeevi* also has the membranous surface of paramere preapically excavated (Fig. 2l indicated with arrow, see also Fig. 2j) while this structure is not excavated in *O. semifex* (Fig. 2m indicated with arrow, see also Fig. 2f). Although the morphological differences between two species are subtle, there is robust evidence of their specific separation. First, the differences in aedeagal shape are stable between two species in the large series of examined material. Second, these two species seems to be sympatric (Fig. 3) and thus the stable differences in aedeagal shape are not a product of geographical variation, which indicated the specific independence of two species. Third, both species are possibly ecologically isolated as they have not been so far collected at the same place (Fig. 3).

The new species differs from *O. semiaureus* and *O. aurifex* by the different shape and location of the sclerotized anterior part of the parameral apex (for details, see also Krikken & Huijbregts 2008).

Etymology. The new species is named after Dr. Sergey Alexeev, Kaluga Regional Biological Center, Russia—thanks to whom, one of us (S.T.) became an entomologist. S.T. is much obliged to Dr. Sergey Alexeev for invaluable support and personal help at the beginning of his career, as well as for an interesting and enjoyable time in both expeditions and laboratory work at the Kaluga Regional Biological Center.

Distribution and ecology. The new species is known only from West Thailand and South Cambodia (Fig. 3), but is probably widespread in Indochina. All Cambodian specimens were collected in disturbed tropical forest by means of pitfall traps baited with dead fish.

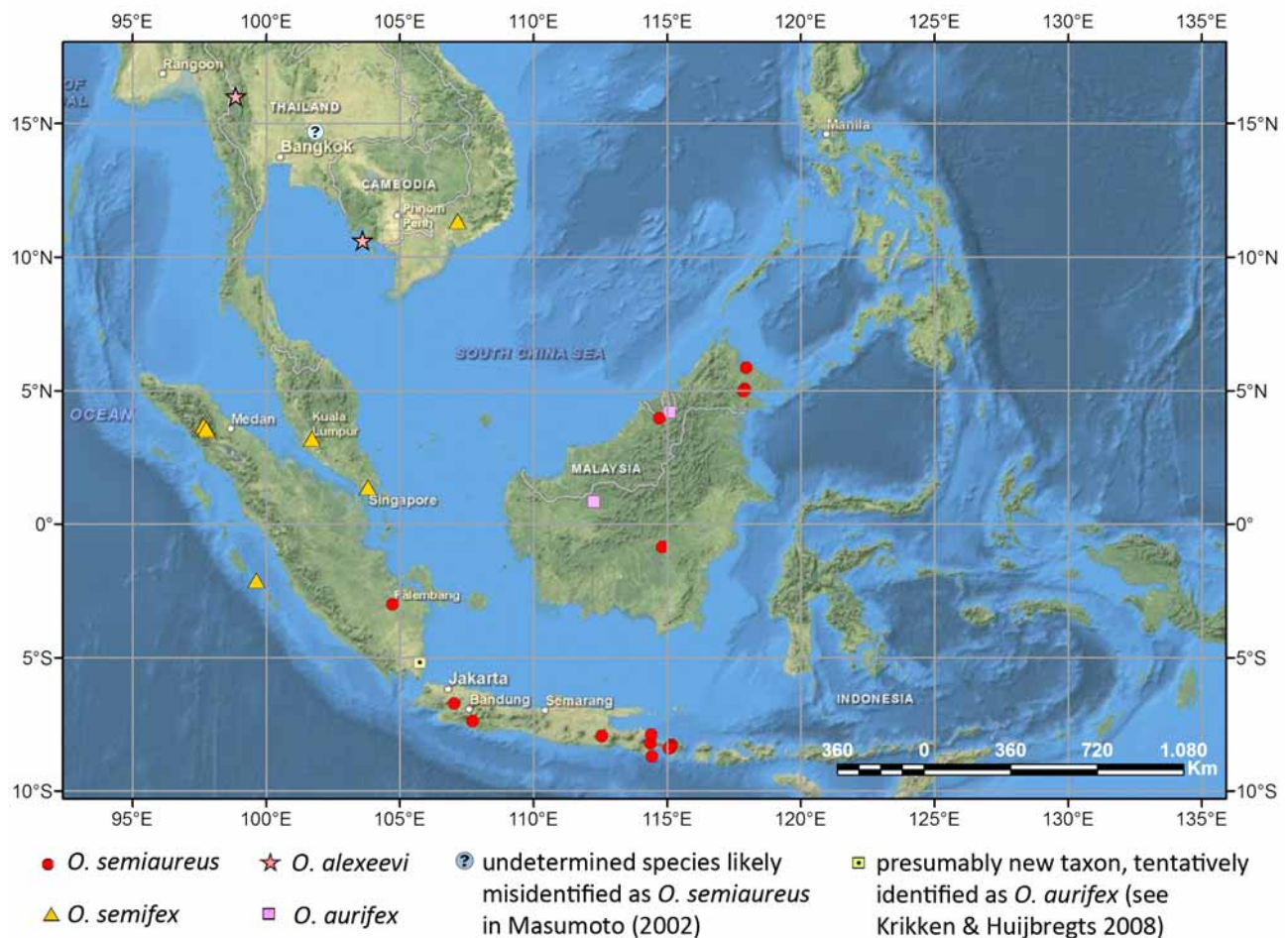


FIGURE 3. Distribution map of the species in the *O. aurifex* complex.

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