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Description of a new species of *Orphinus* Motschulsky, 1858 in Pakistan, with a key to known Himalayan species (Coleoptera: Dermestidae: Megatominae)

Marcin Kadej^{1,*} and Jiří Háva²

Abstract

Orphinus (s. str.) *pakistanus* Kadej & Háva, **sp. nov.** is described from Pakistan. The habitus, antenna, and genitalia are illustrated and compared with related species. A revised checklist and a key to the known *Orphinus* species from the Himalayan Region are presented.

Key Words: taxonomy; checklist; Himalaya

Resumen

Se describe *Orphinus* (s. str.) *pakistanus* Kadej & Háva, **sp. nov.** de Pakistán. Se ilustran y se comparan el habitus, las antenas y la genitalia con los de especies afines. Se presentan una lista revisada de especies y una clave para las especies de *Orphinus* conocidas de la región del Himalaya.

Palabras Clave: taxonomía; lista de especies; Himalaya

The family Dermestidae (skin and hide beetles) contains approx. 1,480 species worldwide (Háva 2014). Some of them have been recognized as pests of a variety of goods and stored products. They occur in various habitats and can be found in synanthropic (apartments, houses, storage products) as well as natural habitats (in flowers, under bark, inside tree hollows, in nests of birds or mammals, and associated with spider webs). The Dermestidae currently consist of more than 50 genera. Knowledge of Himalayan beetles (including dermestids) has been successfully expanded within the last few years. Information about the biodiversity of this region is gradually being supplemented by the ongoing research (Hartmann & Baumbach 2003; Hartmann & Weipert 2006, 2009). The results of these studies can be found in Veer & Rao (1995), Háva (2003, 2006a,b, 2008, 2009), Háva & Herrmann (2004), and Kadej & Háva (2012). Nearly 60 dermestid species have been found in the Himalayan Region (Háva 2009), representing 9 genera, such as *Dermestes* Linnaeus, *Thorictodes* Reitter, *Attagenus* Latreille, *Anthrenus* Geoffroy, *Evorinea* Beal, *Orphinus* Motschulsky, *Ctesias* Stephens, and *Trogoderma* Dejean. The genus *Orphinus* Motschulsky is one of the most speciose within Dermestidae and currently includes approx. 88 species (Háva 2013).

Representatives of *Orphinus* are distributed mainly in the Afrotropical, Indomalayan and Australasian ecozones (Háva 2013; Kadej & Háva 2013; Zahradník & Háva 2014). *Orphinus* is currently split into 4 subgenera (*Curtorphinus* Pic, *Falsoorphinus* Pic, *Orphinus* s. str., and *Picorphinus* Háva). With regard to the genus *Orphinus* Motschulsky, most of the Himalayan species (8 species, including the 1 described here) have been classified to the nominal subgenus. Only 1 species has been included in subgenus *Falsoorphinus* Pic (see Table 1). Nominal subgenus *Orphinus* s. str. consists of the species that can be distinguished from the rest of the subgenera by the

following morphological features: relatively small, oval, and convex body; elytra with variable color patterns and pubescence; 11-segmented antennae and spherical rather than suboval last antennal club segment in males (Kadej & Kitano 2010; Kadej & Háva 2013). In contrast, subgenus *Falsoorphinus* Pic is defined by the following characters: a long and suboval male antennal terminal segment. In this paper, a new species of *Orphinus* from Pakistan is described.

Materials and Methods

Morphological structures (genitalia, antenna, abdominal segments IX–X, pygidium) were boiled for 3 to 10 min in 10% KOH, and

Table 1. Checklist of Himalayan species of *Orphinus* Motschulsky, 1858.

	Nepal	N. India*	Pakistan	Bhutan
Subgenus: <i>Falsoorphinus</i> Pic				
<i>Orphinus yeti</i> Háva, 2008	*	*		
Subgenus: <i>Orphinus</i> (s. str.)				
<i>Orphinus hartmanni</i> Háva, 2001	*	*		*
<i>Orphinus jucundus</i> Arrow, 1915			*	
<i>Orphinus kresli</i> Háva, 2003	*			
<i>Orphinus nilgirensis</i> Arrow, 1915		*		
<i>Orphinus pakistanus</i> sp. nov.			*	
<i>Orphinus sikkimensis</i> Háva & Herrmann, 2004		*		
<i>Orphinus unifasciatus</i> Háva, 2006		*		

*Defined as a region comprising the provinces: Sikkim, Assam, Uttar Pradesh, Himachal Pradesh, Kashmir.

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placed in distilled water for about 1 h to clean and soften the cuticle. The structures such as genitalia, antenna, abdominal segments IX–X, and pygidium were placed on glycerin mounts. Morphological structures were examined with a Nikon Eclipse E 600® (Tokyo, Japan) phase contrast microscope, and a Nikon SMZ–800® (Tokyo, Japan) binocular microscope. Photographs were taken with a Canon 500D® (Taiwan) and a Nikon D5100® (Tokyo, Japan) camera under a Nikon Eclipse 80i® (Tokyo, Japan) and a Nikon SMZ–800® (Tokyo, Japan) microscope. Image stacks were processed using Combine ZM® (Hadley 2010).

The terminology used in this paper follows Kadej & Kitano (2010) and Kadej & Háva (2013). The distribution and classification used follow the world catalogs of Háva (2013). The following abbreviation denotes the type depository for the specimens of the new species: OUMNH Oxford University Museum of Natural History, Oxford, United Kingdom.

Results

Dermestidae Latreille, 1807

Megatominae Leach, 1815

Megatomini Ganglbauer, 1904

Orphinus Motschulsky, 1858

Orphinus (s. str.) *pakistanus* sp. nov. (Figs. 1–11)

TYPE MATERIAL

HOLOTYPE. Adult male, deposited at OUMNH. Type locality: PAKISTAN, Islamabad, 33°40'56"N, 73°6'44"E, 27-VII-2000, 700 m swept, mixed vegetation, Coll. Mann & McGavin / OUM-2002-013 Pres. Mann & McGavin, Hope Entomol. Coll. The type specimen possesses the following red label: "HOLOTYPE *Orphinus pakistanus* sp. nov. Kadej & Háva det. 2014."

DESCRIPTION

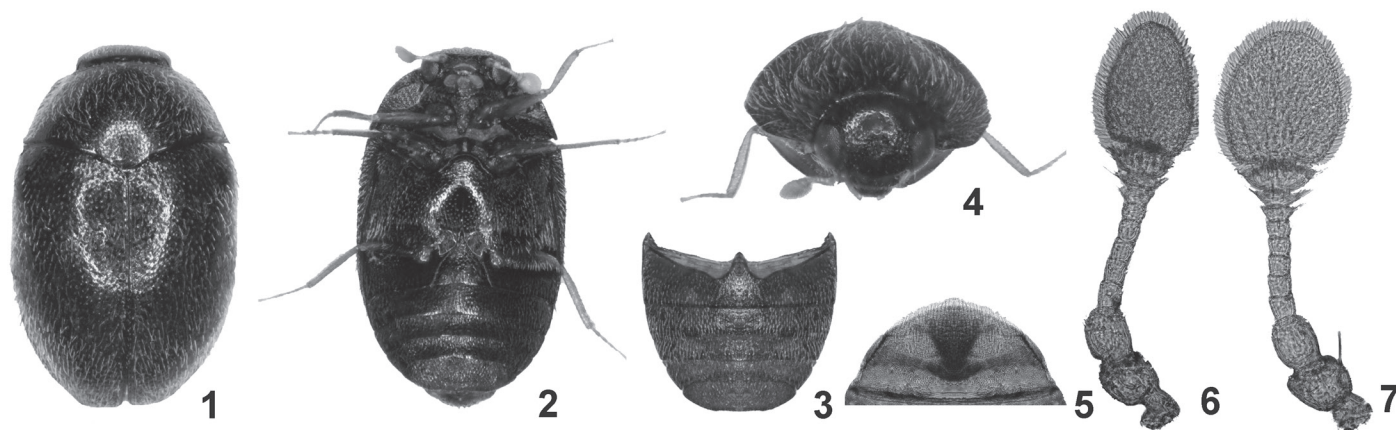
Body oval, strongly convex, densely covered with subrecumbent simple setae, and visible punctuation (Figs. 1–4). Measurements for holotype: length from anterior margin of pronotum to apex of elytron 2.0 mm, median length of pronotum 0.6 mm, maximum width of pronotum 1.05 mm, length of elytron (suture) 1.7 mm, maximum width

across elytra 1.2 mm. Ratio of width (across humeri) to length (of pronotum and elytra combined) 0.6:1. Dorsal and ventral integument dark brown with greyish pubescence (Figs. 1 and 2); antennae (Figs. 6 and 7), tarsi, and tibia light brown (femora brown, darker than tibia, Fig. 2). Distance between punctures on pronotum and elytra approximately the same as their diameter.

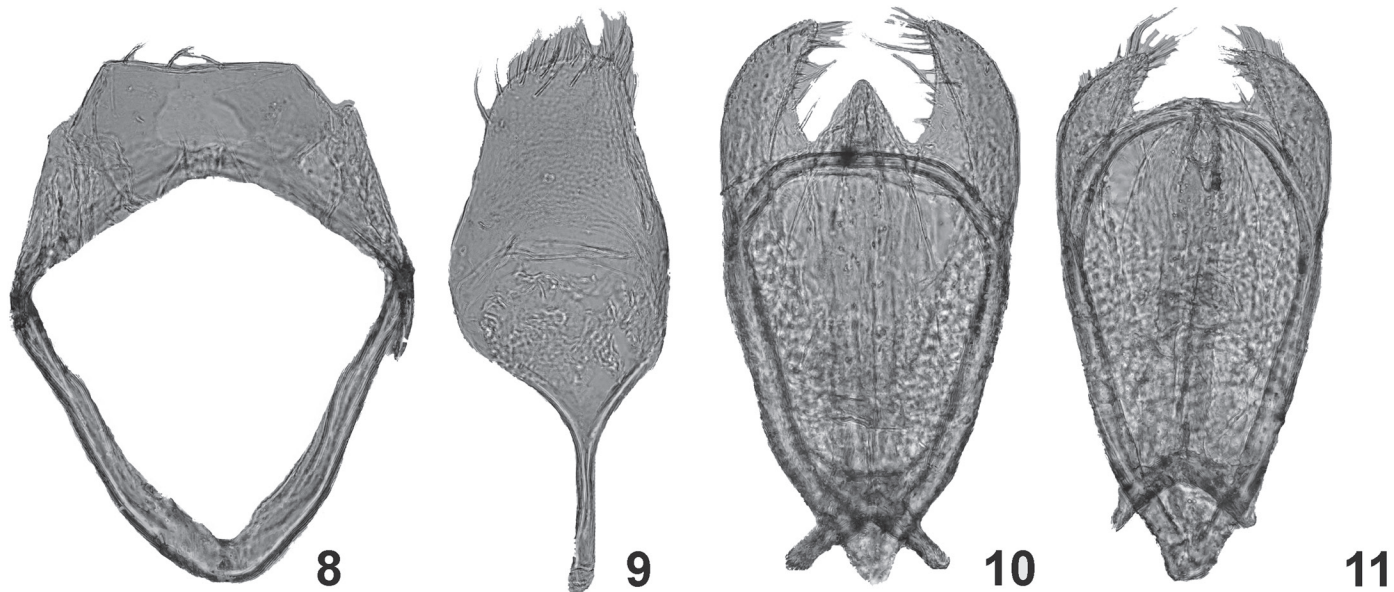
Head with large convex compound eyes, median ocellus distinct and well developed (Fig. 4). Frons with greyish pubescence (Fig. 4) and moderate punctuation (punctures smaller and shallower than those on pronotum and elytra). Antenna light brown, 11-segmented (Figs. 6 and 7). Antennal club of 2 segments: segment 1 short and transverse, segment 2 considerably larger (Figs. 6 and 7). Last segment of antennal club rounded; 5 times as long and nearly twice as wide as first (Fig. 7). Antennal fossa deeply excavated and occupying almost all of hypomeron; surface gently punctate (punctures are shallow and poorly visible), integument between punctures smooth; posterior area closed.

Pronotum punctate with lateral margin faintly visible from above. Posterior angles acute; posterior edge bisinuate, so that median flat-rounded lobe is located between 2 emarginations. Scutellum triangular, dark brown, small but visible (Fig. 1). Elytra parallel-sided, gently tapering at apical 1/3, each elytron densely punctate, those punctures slightly deeper than on pronotum. Elytra covered with greyish pubescence (Fig. 1). Prosternum punctate on disc, without impunctate median line. Metepisternum densely and conspicuously punctate. Abdomen densely punctate, punctures denser on 2nd to 5th visible ventrite, and with sublateral distal carinae on 1st visible ventrite. Posterior margin of 5th abdominal ventrite not impressed, without pair of tubercles or pair of sharp spines. Legs covered with stout setation. Tibiae without distinct teeth (tibial spines). Tarsus with 2 claws.

Male genitalia as in Figs. 10 and 11. Parameres deeply u-shaped, covered with short setae on the lateral margins as well as in the central and inner areas; longer setae present only on apex of parameres. Distal parts of parameres slightly curved inward. Penis (median lobe) with distal end pointing up; in frontal view straight (Figs. 10 and 11). Ninth abdominal segment (Fig. 9) spatula-like [spatuliform]; apex somewhat truncate; setae present on the dorsal and lateral margins, but only in the anterior part. Pygidium in basal part (from margin to 2/3 length of pygidium) with short setae; remaining area with densely located, slightly prominent, but longer setae (Fig. 5). Tenth abdominal segment pentagonal-like with flat apex and 3 prominent setae on dorsal margin in the anterior part (Fig. 8).



Figs. 1–7. *Orphinus* (s. str.) *pakistanus* sp. nov., holotype. 1, Habitus, dorsal; 2, habitus, ventral; 3, abdominal ventrites I–V; 4, head and pronotum, front; 5, pygidium; 6, left antenna, fronto-lateral; 7, left antenna, lateral.



Figs. 8–11. *Orphinus* (s. str.) *pakistanus* sp. nov., holotype. 8, Abdominal sternite X; 9, abdominal segment IX; 10, male genitalia, dorsal; 11, male genitalia, ventral.

Sexual Dimorphism

Female not known.

DISTRIBUTION

Pakistan (Islamabad Capital Territory).

DIFFERENTIAL DIAGNOSIS

By its unicolorous elytral integument and shape of the body, the new species closely resembles *Orphinus* (s. str.) *nilgirensis* Arrow, but differs from it and other species by the following morphological features: in *Orphinus pakistanus* Kadej & Háva, sp. nov., the elytra are without patterns or fasciae and possess uniform greyish setation; in

O. nilgirensis Arrow, 4 spots with whitish setae are present on the elytra: one medial and another near the scutellum.

From cosmopolitan species *O.* (s. str.) *fulvipes* (Guérin-Méneville), the newly described species differs by the dark brown color of dorsal and ventral surfaces covered by greyish pubescence, whereas in *O. fulvipes* the dorsal and ventral surfaces are brown with brownish pubescence; likewise in *O. pakistanus* sp. nov. the ratio of width to length of last antennal segment in males is 0.85:1, in *O. fulvipes* 1:1; in *O. pakistanus* sp. nov. pronotum is convex, in *O. fulvipes* flattened. It also differs from the known Himalayan species by the characteristics mentioned in the key given below.

ETYMOLOGY

The specific epithet “pakistanus,” derived from the country where the species was discovered: Pakistan.

Identification key for the Himalayan¹ species of *Orphinus*

- 1.— Terminal antennomere circular – subgenus *Orphinus* (s. str.) 2
- 1'.— Terminal antennomere elongate-oval – subgenus *Falsoorphinus* (each elytron with large humeral orange spot, not reaching suture and with orange spot in apical part *Orphinus* (F.) *yeti* Háva
- 2.— Elytra unicolorous 3
- 2'.— Elytra bicolorous 4
- 3.— Elytra evenly covered with greyish setation *Orphinus pakistanus* Kadej & Háva, sp. nov.
- 3'.— Elytra covered with 1 median and 1 scutellar spot of whitish setae *Orphinus nilgirensis* Arrow
- 4.— Elytra with orange (or reddish) transverse band and apical spot 5
- 4'.— Elytra with only an orange-reddish transverse band, apical spot absent *Orphinus unifasciatus* Háva
- 5.— Apical spot reaching postero-lateral part of elytron; terminal antennomere of male 2–3 times larger than in female 6
- 5'.— Apical spot isolated, not reaching postero-lateral part of elytron; size of terminal antennomere of both sexes comparable *Orphinus hartmanni* Háva

¹Himalayan, defined as a region comprising following territories: Nepal, Tibet, Sikkim, Bhutan, Uttar Pradesh, Assam, Arunachal Pradesh.

- 6.— Integument of dorsal surface brown; apical spot small, occupying less than 1/3 of each elytron 7
- 6'.— Integument of dorsal surface black; apical spot large, occupying almost 1/3 of each elytron *Orphinus jucundus* Arrow
- 7.— Elytral transverse band broad near lateral margin of elytra, while narrow near suture *Orphinus kresli* Háva
- 7'.— Elytral transverse band evenly broad throughout (from lateral margin of elytra to suture) *Orphinus sikkimensis* Háva & Herrmann

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