

***Odontotrypes (Odontotrypes) fryntai* sp. nov. (Coleoptera: Geotrupidae) from Himachal Pradesh, India**

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Abstract. The work provides a description of a new micropterous species *Odontotrypes (Odontotrypes) fryntai* sp. nov. from the Indian state of Himachal Pradesh. The new species is compared with the morphologically similar species *O. (O.) gogona* Král, Malý et Schneider, 2001 from Bhutan and *O. (O.) lassallei* Král, Malý et Schneider, 2001 from Sichuan. The new species differs from them in the colouring of the dorsal surface and the sculpture of the pronotum and elytra. Diagnostic characters including male external genitalia are depicted. Also attached is the Check-list of so far known species of the subgenus *Odontotrypes* Boucomont, 1905.

Key words. Taxonomy, new species, check-list, Coleoptera, Scarabaeoidea, Geotrupidae, Himalaya, Palearctic Region.

INTRODUCTION

The genus *Odontotrypes* Fairmaire, 1887 is currently represented by 97 species and eight subspecies restricted to the transient zone between the Palearctic and Oriental zoogeographical regions (Král et al. 2020, Ochi et al. 2021, Schoolmeesters 2023). It is classified to three subgenera, *Odontotrypes* Boucomont, 1905, *Thorectomimus* Nikolaev, 2009 and the nominotypical one (see e.g., Nikolaev 2009, Nikolajev et al. 2016). The comprehensive revision of this genus has been published relatively recently by Král et al. (2001). Since then, descriptions of a number of additional species have been published, most of them classified into the nominotypical subgenus (see e.g., Nikolajev et al. 2016, Schoolmeesters 2023). The species are mostly collected in the mountainous areas (in the range of about 1500 to 5000 m a. s. l.). Most of them possess not functional wings. Because of this fact, their distribution is often endemic or very local (a single mountain valley only; e.g., Král et al. 2001, Nikolaev 2009, 2013).

When studying material in the collection of Radek Červenka stored in the National Museum, Prague collection (NMPC), I have discovered one further undescribed species of this genus. Its formal description is provided in this paper. Until now, no information has been reported on the occurrence of any *Odontotrypes* in Himachal Pradesh. In addition, the record presented here represents approximately the westernmost occurrence of the genus to date.

MATERIAL AND METHODS

Material was examined with an Olympus SZ61 stereomicroscope and a Nikon SMZ 745 stereomicroscope, measurements were taken with an ocular grid. The habitus photographs were taken using a Canon EF-S 60mm f/2.8 Macro USM lens attached to a Canon EOS 70D camera. Partially focused images of each specimen were combined using Zerene Stacker (Zerene Systems LLC, Richland, USA). All pictures were digitally enhanced using Adobe Photoshop CC.

Specimens of the newly described species are provided with one red printed label “*Odontotrypes (Odontotrupes) | fryntai sp. nov. | HOLOTYPUS ♂, [or] PARATYPUS ♂ | David Král det. 2023*”. Verbatim label data are cited for the type material, individual lines of every label are separated by a vertical bar (“|”), individual labels by a double vertical bar (“||”). Information in quotation marks (“”) indicates the original spelling. Our remarks and additional comments are found in brackets (“[]”), [p] – preceding data within quotation marks are printed.

Holotype and all paratypes are deposited in the National Museum, Prague, Czech Republic (NMPC) and originally come from the collection of Radek Červenka.

Morphological terminology used in the description of adults mainly follows Král et al. (2001).

TAXONOMY

Odontotrypes (Odontotrupes) fryntai sp. nov.

(Fig. 1)

TYPE LOCALITY. India, Himachal Pradesh, Manali [district], above Marhi [32°20'56"N 77°13'04"E], 3300 m.

TYPE MATERIAL. **India, Himachal Pradesh:** Holotype, ♂ (NMPC) and 3 paratypes, ♂♂ (NMPC), “Ind., H. P. | 24.VII. [20]06 | Manali | above Marhi 3300 m” || ex coll. Radek Červenka.

DESCRIPTION OF HOLOTYPE (♂). Body length 17 mm (HT – 17 mm, AT – 19 mm). Oblong, convex; whole surface black, femora brownish; claws brownish, setation black; dorsal surface, not microsculptured, moderately shiny; habitus as in Fig. 1A.

Male. Head (Figs. 1A, C, D). Labrum truncate anteriorly. Anterior clypeal margin broadly rounded with rounded apex, feebly upturned; clypeal disc slightly elevated, very low, but indicates. Area of frontoclypeal junction slightly depressed, T-shaped suture distinct. Eye tubercle prominent, subacute, in lateral aspect obtusely angular; eye canthus with lateral margin almost straight and slightly divergent posteriad, anterolateral angle obtusely angular. Clypeal surface and vertex moderately rugopunctate, canthus finely rugose.

Pronotum (Figs. 1A–C) transversal, broadest posteriad of middle, entirely bordered (very finely so anterolaterally), lateral margin very slightly crenulate, anterior marginal carina slightly elevated and widened especially in middle section, anterior angles broadly rounded, sides straight in two anterior thirds and divergent posteriad to obtusely angular posterior angles, basal margin broadly, evenly arcuate; anterior concavities slightly indicated, lateral fovea distinctly impressed, alutaceous, impunctate, posteromedial fovea lacking, longitudinal midline present in posterior half, coarsely punctate. punctation simple, consisting of irregularly arranged groups of considerable coarse (not cavernous) punctures discally; coarse punctation becoming confluent to rugose laterally and anteriorly in area of concavities; fine punctation missing

Scutellum (Fig. 1A) broadly triangular, except for basal margin slightly bordered, impunctate, or with several shallow punctures.

Elytra (Figs. 1A, B) with slightly prominent humeral umbone, base distinctly narrower than pronotum. Surface substrate; except for sutural interval finely irregularly rugose; sutural interval glabrous, slightly convex, narrowed apically.

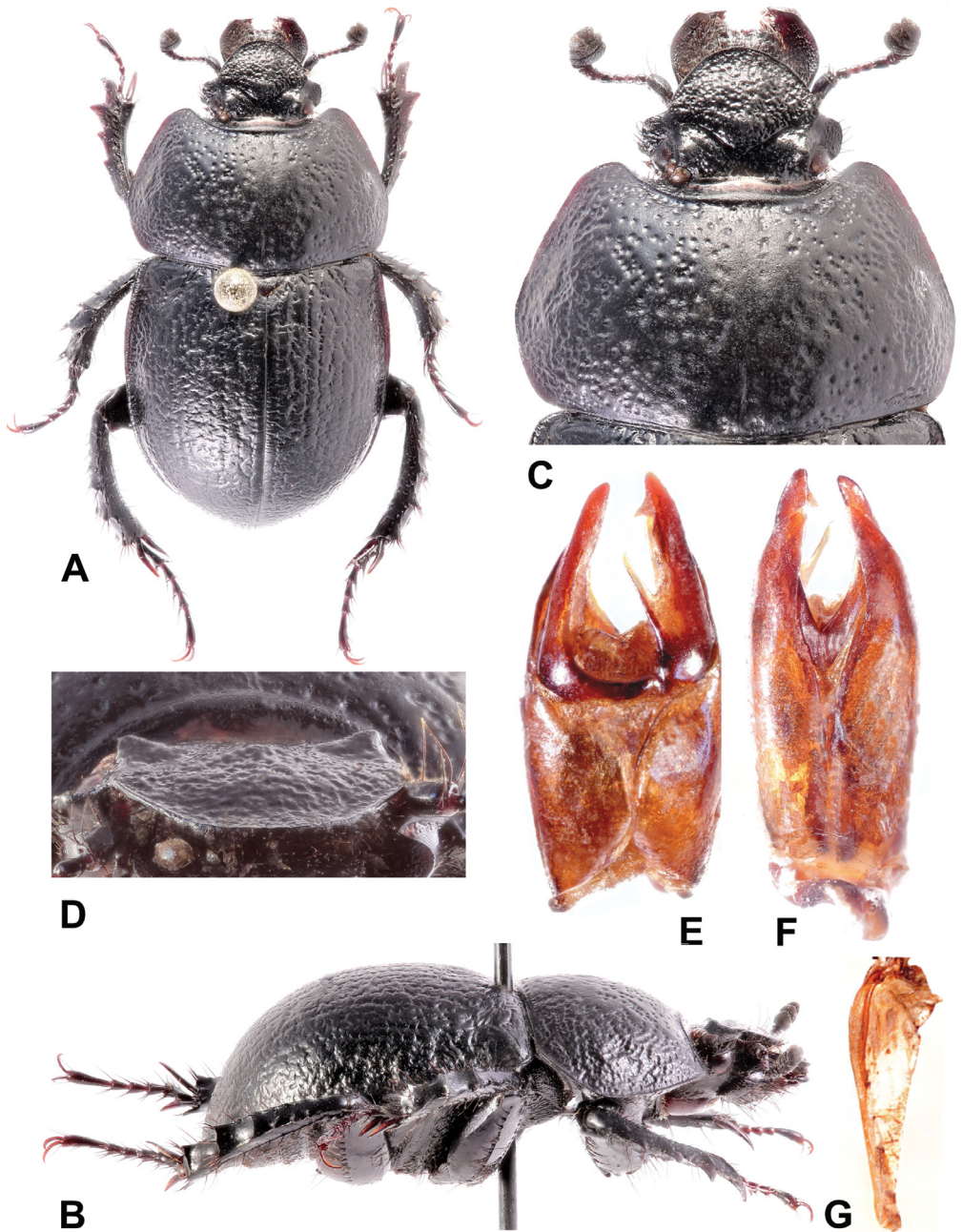
Micropterous, wing narrow (Fig. 1G).

Femora (Fig. 1B) moderately shiny, impunctate. Ventromedial edge of protibia with 4–5 denticles situated in approximately two basal thirds of length of protibia, denticle 4 indistinctly more developed than rest.

Abdominal ventrites scabrous, coarsely and densely punctate, with short, pale, recumbent setation.

Parameres as in Figs. 1E–F.

SEXUAL DIMORPHISM. Female unknown.



Figs. 1. *Odontotrupes (Odontotrupes) fryntai* sp. nov., holotype, ♂. A – habitus, dorsal view; B – habitus, right lateral view; C – head and pronotum, dorsal view; D – head, frontal view; E – parameres, dorsal view; F – parameres, ventral view; G – left metathoracic wing, dorsal view (length: 2.8 mm). Not to scale.

Table 1. Character matrix for separation of *Odontotrypes (Odontotrupes) gogona* Král, Malý et Schneider, 2001, *O. (O.) fryntai* sp. nov. and *O. (O.) lassallei* Král, Malý et Schneider, 2001 from each other

species character	<i>O. (O.) gogona</i>	<i>O. (O.) fryntai</i> sp. nov.	<i>O. (O.) lassallei</i>
shape of clypeal tubercle	almost lacking (Král et al. 2001: Fig. 204)	very low, but indicates (Fig. 1D)	almost lacking (Král et al. 2001: Fig. 205)
eye canthus shape	lateral margin almost straight and slightly divergent posteriad; anterolateral angle obtusely angular (Král et al. 2001: Fig. 204)	lateral margin straight, parallel; anterolateral angle rectangular (Fig. 1C)	lateral margin almost straight and slightly divergent posteriad; anterolateral angle obtusely angular (Král et al. 2001: Fig. 205)
pronotal surface	punctuation double, consisting of irregularly arranged groups of conspicuously cavernous punctures discally, intermixed with very fine, almost evenly, sparsely distributed ones; cavernous punctuation becoming confluent to rugose laterally and anteriorly in area of concavities (Král et al. 2001: Fig. 204)	punctuation simple, consisting of irregularly arranged groups of considerable coarse (not cavernous) punctures discally; coarse punctuation becoming confluent to rugose laterally and anteriorly in area of concavities; fine punctuation missing (Fig. 1B–C)	punctuation of double, consisting of coarse, irregularly distributed punctures, intermixed with fine, almost evenly, densely distributed ones; coarse punctuation becoming confluent laterally and anteriorly in area of concavities (Král et al. 2001: Fig. 205)
elytral surface	nonstriate; substrate only apically and lateroapically; except for sutural interval markedly irregularly rugose (Král et al. 2001: Fig. 204)	substrate; except for sutural interval finely irregularly rugose (Fig. 1A–B)	substrate; except for sutural interval moderately almost regularly rugose (Král et al. 2001: Fig. 205)
wing	micropterous, wing narrow (Král et al. 2001: Fig. 263)	micropterous, wing narrow (Fig. 1G)	micropterous, wing squamiform (Král et al. 2001: Fig. 293)
geographic distribution	Bhutan	India: Himachal Pradesh	China: Sichuan

MEASUREMENTS. Total body length: 15.0–19.0 mm (holotype 16.3 mm).

VARIABILITY. Type series show slight individual variations in size, shape and situation of pronotal punctures and shape of elytral sculpture.

DIFFERENTIAL DIAGNOSIS. *Odontotrypes fryntai* sp. nov. is classified to the subgenus *Odontotrupes* by possessing labrum truncate anteriorly; anterior clypeal margin broadly arcuate (Figs. 1A, C, D)); parameres relatively short and broad, dorsal lobe of right paramere with short internal appendix situated subapically (Figs. 1E, F; for details see also Král et al. 2001 and Nikolaev 2009). In the key to the *Odontotrypes (Odontotrupes)* species (Král et al. 2001: 8, there still mentioned as *O. biconiferus* (Fairmaire, 1887) species aggregate), *O. (O.) fryntai* sp. nov. will key to the couplet with *O. (O.) gogona* (Král, Malý et Schneider, 2001) and *O. (O.) lassallei* (Král, Malý et Schneider, 2001). For differentiation of the species from each other, see Table 1. Recently described species *O. (O.) balangensis* Ochi, Kon et Bai, 2019 and *O. (O.) tawangensis* Gupta, Chandra et Hillert, 2016, both differs from the new species in having dorsal surface cuprous-purple coloured and striate elytra (while the new species possess black coloured dorsal surface and substrate elytra (see Ochi et al. 2019 and Gupta et al. 2016, respectively). Moreover, both species show

a completely different geographic distribution than the new species described here. *Odontotrupes* (*Odontotrupes*) *balangensis* is known from Sichuan (Balang pass) and *O.* (*O.*) *twangensis* from Arunachal Pradesh (Tawang district).

COLLECTING EVENTS. Unknown.

ETYMOLOGY. Patronymic; named in honour of my long-time friend Daniel Frynta (Charles University, Prague, Czech Republic), a distinguished zoologist, on the occasion of his 60th birthday.

GEOGRAPHIC DISTRIBUTION. So far known only from the type locality situated in the Himachal Pradesh, India.

Check-list of so far known species of the subgenus *Odontotrupes* Boucomont, 1905

Odontotrupes (*Odontotrupes*) *balangensis* Ochi, Kon et Bai, 2019

Odontotrupes (*Odontotrupes*) *balangensis* Ochi, Kon et Bai, 2019: 48, Figs. 1, 3–5.

TYPE LOCALITY. “China, W. Sichuan, Balang-pass Bt[etween] Relong Village (4200 m alt.)”.

DISTRIBUTION. China: Sichuan.

Odontotrupes (*Odontotrupes*) *bhutan* Král, Malý et Schneider, 2001

Odontotrupes bhutan Král, Malý et Schneider, 2001: 61, Figs. 69–70, 202, 261.

TYPE LOCALITY. “Kidiphu Forest, 3800 m, Bhutan”.

DISTRIBUTION. Bhutan.

Odontotrupes (*Odontotrupes*) *biconiferus* (Fairmaire, 1887)

Geotrupes (*Odontotrupes*) *biconiferus* Fairmaire, 1887: 103.

TYPE LOCALITY. “Moupin [= Baoxing]”.

DISTRIBUTION. China: Sichuan.

Odontotrupes (*Odontotrupes*) *gogona* Král, Malý et Schneider, 2001

Odontotrupes gogona Král, Malý et Schneider, 2001: 63, Figs. 73–74, 204, 263.

TYPE LOCALITY. “Pele La, 3450 m, Bhutan”.

DISTRIBUTION. Bhutan.

Odontotrupes (*Odontotrupes*) *lassallei* Král, Malý et Schneider, 2001

Odontotrupes lassallei Král, Malý et Schneider, 2001: 64, Figs. 75–75, 205, 293.

TYPE LOCALITY. “Chine, Sichuan. Col. Miaochan, 3000 m”.

DISTRIBUTION. China: Sichuan.

Odontotrupes (*Odontotrupes*) *orichalceus* (Fairmaire, 1895)

Geotrupes (*Ceratotrupes*) *orichalceus* Fairmaire, 1895: ccv.

TYPE LOCALITY. “Sikkim”.

DISTRIBUTION. India, Sikkim.

Odontotrupes (*Odontotrupes*) *tawangensis* Gupta, Chandra et Hillert, 2016

Odontotrupes (*Odontotrupes*) *tawangensis* Gupta, Chandra et Hillert, 2016: 560, Figs. 1–19.

TYPE LOCALITY. “India, Arunachal Pradesh state, Tawang district, Sela”.

DISTRIBUTION. India: Arunachal Pradesh.

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

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