

**New genus *Odontacrossus* for *Aphodius (Acrossus) obenbergeri*,
A. (A.) pseudoobenbergeri and *A. (Paulianellus) trisuliensis*
(Coleoptera: Scarabaeidae: Aphodiinae)**

Giovanni DELLACASA¹⁾, David KRÁL²⁾, Marco DELLACASA³⁾ & Patrice BORDAT⁴⁾

¹⁾ Via Talamone 31/19, I-16127 Genova, Italy; e-mail: dellacasag@alice.it

²⁾ Charles University in Prague, Faculty of Science, Department of Zoology, Viničná 7,
CZ-128 43 Praha 2, Czech Republic; e-mail: kral@natur.cuni.cz

³⁾ Museo di Storia Naturale, Università di Pisa, Via Roma, 79, I-56011 Calci (Pisa), Italy;
e-mail: dellacasa@museo.unipi.it

⁴⁾ Lagasse, F-82300 Saint-Cirq, France; e-mail: patrick.bordat@neuf.fr

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Abstract. A new genus, *Odontacrossus*, is diagnosed and three new combinations are proposed, i.e.: *Aphodius (Acrossus) obenbergeri* Balthasar, 1932, comb. nov., *Aphodius (Acrossus) pseudoobenbergeri* Červenka, 1995, comb. nov. and *Aphodius (Paulianellus) trisuliensis* Stebnicka, 1986, comb. nov. The primary characteristics of *Odontacrossus* gen. nov. are a triangular process protruding from the middle of the clypeal margin of males, an anterior margin of the epipharynx distinctly inwardly sinuate at middle and an obsolete epitorma and corypha. A summary of the distribution of this new genus, which is restricted to the Himalaya and SE parts of the Tibetan Plateau, is presented and a key for identifying the species compiled.

Key words. Systematics, new combinations, key, Coleoptera, Scarabaeoidea, Aphodiinae, Aphodiini, *Odontacrossus* gen. nov., *Aphodius obenbergeri*, *Aphodius pseudoobenbergeri*, *Aphodius trisuliensis*, Palaearctic region.

INTRODUCTION

Among the Aphodiinae collected by Christoph Reuter in Northern India (Arunachal Pradesh) we identified *Aphodius trisuliensis* Stebnicka, 1986. Dissection of several specimens indicates that it is close to *A. obenbergeri* Balthasar, 1932 and *A. pseudoobenbergeri* Červenka, 1995 but not to *A. maderi* Balthasar, 1938, the type species of *Paulianellus* Balthasar, 1938. A new genus, *Odontacrossus*, based on a complex of morpho-anatomic characters of *Aphodius obenbergeri*, *A. pseudoobenbergeri* and *A. trisuliensis*, is described.

MATERIALS AND METHODS

Terminology used to describe morpho-anatomical features follows that of Dellacasa et al. (2001). Material studied is in the following collections:

Bordat P. Collection, Saint-Cirq, France	– PBOC;
Král D. Collection (deposited in NMPC)	– DKCP;
Dellacasa Collection, Genoa, Italy	– DCGI;
Institute of Systematic and Evolution of Animals, Kraków, Poland	– ISEZ;
National Museum, Prague, Czech Republic	– NMPC;
Reuter Ch. Collection, Hamburg, Germany	– RCHG.

SYSTEMATICS

Odontacrossus gen. nov.

TYPE SPECIES. *Aphodius obenbergeri* Balthasar, 1932 (present designation).

DIAGNOSIS. Rather small species (length 4.5–6.5 mm), oval elongate, moderately convex, shiny, almost glabrous. Piceous-black or brownish, sometimes elytral apex more or less reddish, or elytra yellowish.

Head with epistoma feebly convex at centre; clypeal margin semicircular or trapezoidal; genae faintly ciliate, protruding beyond the eyes; frontal suture finely impressed.

Pronotum transverse, convex, dually rather sparsely punctured; lateral margins thickly bordered; hind angles obtusely round; base not bordered.

Scutellum small, triangular, flat.

Elytra oval, moderately convex, faintly denticulate at shoulder, deeply striate; striae more or less strongly crenulate; interstriae flat or feebly convex, laterally and preapically with fine and very short pubescence.

Fore tibiae distally tridentate and proximally not serrulate on outer margin; upper side smooth. Middle and hind tibiae with strong transverse carinae on outer face, apically fimbriate with spinulae elongate and irregularly unequal.

Pygidium alutaceous, subrugosely punctured, with recumbent pubescence; apical margin with few very elongate setae.

Sexual dimorphism in which males have a triangular process protruding from the middle of the clypeal margin. Aedeagus with slender parameres, apically distinctly pubescent.

Middle of anterior margin of epipharynx more or less deeply inwardly sinuate and with widely rounded sides; epitorma and corypha obsolete; the former with a median clump of fine sparse and short setae; pedia shortly pubescent; chaetoparia moderately elongate and moderately dense.

COMPARISONS. This new genus is easily distinguishable from *Acrossus* Mulsant, 1842 by the triangular process protruding from the middle of the clypeal margin in males and by the anterior margin of the epipharynx distinctly inwardly sinuate at middle, which is widely rounded laterally and obsolete epitorma and subobsolete corypha.

Thus the species herein ascribed to the new genus *Odontacrossus* gen. nov. have to be moved respectively from *Acrossus* and *Paulianellus*.

The couplet 147 in the key to genera proposed by Dellacasa et al. (2001) should be modified as follows:

- 147 (146) Clypeus nearly semicircular in both sexes; epipharynx with anterior margin not inwardly sinuate at middle. 148
147' Clypeus, in males, with triangular process protruding from middle of clypeal margin; epipharynx with anterior margin distinctly inwardly sinuate at middle. ***Odontacrossus* gen. nov.**

DISTRIBUTION. Restricted to mountainous regions in the Central and Eastern Himalaya (Nepal; India: West Bengal and Arunachal Pradesh) and eastern and south-eastern parts of the Tibetan plateau (Myanmar: Kachin; China: Gansu, Sichuan, Xizang, and Yunnan).

ETYMOLOGY. The name is a combination of the Greek word ὀδόντος, -οντος [= tooth] and genus name *Acrossus*. The gender is masculine.

Key to species of *Odontacrossus* gen. nov.

- 1 Clypeal margin trapezoidal, laterally distinctly outwardly curved before reaching the genal sutures (Fig. 8). Head and pronotum blackish, sides of latter shadily brownish, elytra more or less dark brown (Fig. 9). Length 5.5–6.5 mm. China (Xizang, Yunnan), Myanmar (Kachin). ***O. pseudoobenbergeri* (Červenka, 1995) comb. nov.**

- Clypeal margin nearly semicircular, gradually arcuate before reaching the genal sutures (Figs 4, 17). 2
- 2 (1)** Head relatively large; pronotum widely transverse (Fig. 4), dually, not closely punctured; elytral interstriae slightly but distinctly convex. Head and pronotum blackish; elytra entirely piceous-black or with rather wide apex dark reddish brown (Figs 3, 4). Length 5.0–6.0 mm. China (Gansu, Sichuan).
O. obenbergeri (Balthasar, 1932) **comb. nov.**
- Head relatively narrow; pronotum moderately transverse (Fig. 17), dually, rather closely punctured; elytral interstriae almost flat. Head and pronotum piceous, latter extensively yellowish laterally towards anterior angles; elytra entirely brownish or yellowish with juxtasutural interstria and lateral margin brownish (Fig. 16). Length 4.5–5.5 mm. Nepal, India (Arunachal Pradesh, West Bengal). *O. trisuliensis* (Stebnicka, 1986) **comb. nov.**

***Odontacrossus obenbergeri* (Balthasar, 1932) comb. nov.**

(Figs 1–6)

Aphodius (Acrossus) obenbergeri Balthasar, 1932a: 209, 1932b: 99, 1932c: 31, 1933: 62, 1964: 127; Mao 1937: 988; Nomura & Nakane 1951: 39; Petrovitz 1961: 443, 1976: 5; Dellacasa M. 1988: 230; Červenka 1995: 90; Dellacasa M. & Dellacasa G. 2006: 106.

Aphodius obenbergeri: Král & Mocek 1998: 13; Li-Zhong 2002: 158; Krajcik 2012: 38.

TYPE LOCALITY. Tatsienlu-Kiulung [= Kangding], Szeschwan, [China] (restricted).

TYPE REPOSITORY. National Museum (Balthasar collection), Prague, Czech Republic (type examined).

TYPE MATERIAL EXAMINED. **China, Sichuan:** Tatsienlu-Kiulung, Reitter, 2 exx. (syntypes, NMPC); Giufu-Shan, 1 ex. (syntype, NMPC).

MATERIAL EXAMINED. **China, Gansu:** 70 km W of Wudu, m 2000–2400, 29.V–10.VI.1997, leg. Shamaev A., 2 exx. (DKCP); **Sichuan:** 14 Km N Lianghe, m 3450, 10.VII.1996, leg. Moretto P., 2 exx. (DCGI); 30 Km W Zhangla, m 3200–3500, 12.VII.2001, leg. Murzin S., 6 exx. (DCGI, PBOC); Col entre Sangarmai et Luhua, m 4300, 13.VII.1996, leg. Moretto P., 2 exx. (DCGI); Col S Barkham, m 4100, 11.VII.1996, leg. Moretto P., 1 ex. (DCGI); env. Kangding, Mogeucuo Nat. Res., m 2900–3300, 25.VII.2004, leg. Murzin S., 1 ex. (DCGI); Kanding, m 1800, 30.VI–08.VII.1999, leg. Beneš V. (rather dry pastures with lots of shrubs), 1 ex. (DCGI); Moxi env., Luding Co., 25–30.V.1993, leg. Beneš, 5 exx. (DCGI); nr. Tatsienlu, 9–11.000' [m 3000–3650], 25.VI.1923, leg. Graham D. C., 10 exx. (topotypes, DCGI); Ta-t sien-Loü, chasseurs Thibétains, 1896, 3 exx. (ex coll. Oberthür, PBOC); Palihan-Shan, m 3250, 09.VII.1996, leg. Moretto P., 21 exx. (DCGI); Rilong, m 3200, 08.VII.1996, leg. Moretto P., 4 exx. (DCGI); road Kanding–Yajiang, Xinduqiao env., m 3500, 29–30.VI.1996, leg. Gallo E., 5 exx. (DCGI); Umg. Kangding, See Mugecuo, m 3600–3800, 11–13.VI.1995, leg. Heinz, 7 exx. (DCGI, DKCP, PBOC); env. Wolong, m 3250, 18–21.VII.2000, leg. Murzin S., 7 exx. (DCGI, PBOC); Xinduqiao, 30°03'N–101°27'E, m 3500, 24–25.VI.2006, leg. Major V., 5 exx. (DCGI); Zheduo Shan, m 4200, 07.VII.1999, leg. Beneš V., 132 exx. (DCGI, PBOC); Gonggashan mts. NE slp., 29°50'N–102°03'E, m 2500–3500, 08.VII.1994, leg. Král D. & Farkač J., 54 exx. (DCGI, DKCP); Gonggashan mts. NNE sl., 29°53'N–102°01'E, ca m 4000, 9–11.VII.1994, leg. Farkač J. & Král D., 3 exx. (PBOC); Shuajingsi, m 3800 ca, 03–04.VII.1991, leg. Kaláb J., 3 exx. (DCGI, DKCP); Barkam, pass SE Barkam, pass between Zhuokeji and Lianghekou, m 4100, 10–30.VI.2004, leg. Fabbri R. (alpine zone), 1 ex. (DCGI); W Kangding, Zheduo Shan, m 4300–4500, 12–22.VI.2004, leg. Fabbri R. (alpine region with Rhododendron), 2 exx. (DCGI); Erlang Shan, m 2500, 30.V.1997, leg. Beneš V., 2 exx. (PBOC); Paumashan Mts., 29°55'N 102°02'E, m 4200–4900, 12–14.VII.1994, leg. Král D. & Farkač J., 93 exx. (DKCP); Temple 35 km N Sabdê, 29°40'N 101°20'E, m 3500–4300, 13–14.VII.1998, leg. Král D., 44 exx. (DKCP).

REDESCRIPTION. Length 5.0–6.0 mm; oval-elongate, moderately convex, shiny, almost glabrous, elytra laterally and preapically sparsely covered with short hairs. Head and pronotum blackish, elytra entirely piceous-black (Fig. 2) or with rather wide dark reddish-brown apex (Fig. 3); legs piceous, antennal club black.

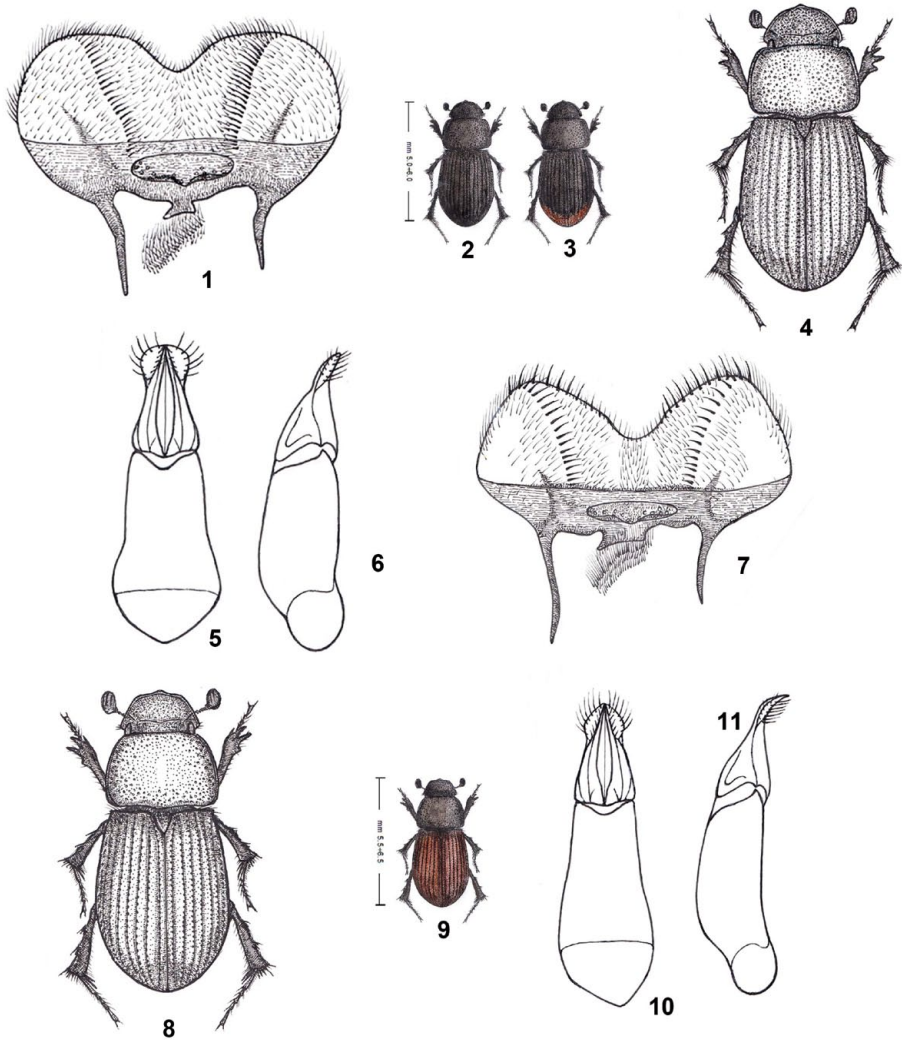
Head with epistoma feebly convex at middle, superficially alutaceous, sparsely, finely, almost evenly punctured, punctation somewhat confused distally; clypeus semicircular, rather thickly bordered, edge glabrous; genae almost rectangular and sparsely covered with short cilia, protruding beyond the eyes; frontal suture mutic, only distinctly impressed medially; front almost evenly distinctly punctured, punctation coarser than on epistoma.

Pronotum widely transverse, convex, dually punctured, with an impunctate median longitudinal areola; large punctures, two or three times larger than small punctures and almost absent ante-

riorly on disc, denser on sides and towards base; small punctures rather irregularly and sparsely distributed throughout; lateral margins feebly arcuate, very thickly bordered, edge glabrous; hind angles obtusely rounded; base feebly bisinuate, not bordered.

Scutellum sparsely and irregularly punctured.

Elytra ovally elongate, faintly denticulate at shoulder, moderately convex, deeply striate; striae fine, rather closely punctured, crenulate; interstriae very slightly but distinctly convex, mainly



Figs 1–11. 1–6: *Odontacrossus obenbergeri* (Balthasar) (env. Moxi, Luding co., Sichuan, China, DCGI). 1 – epipharynx, 2–4 – habitus (length ideogram, colour variations and morphological details), 5–6 – aedeagus (dorsal and lateral views). 7–11: *Odontacrossus pseudoobenbergeri* (Červenka) (Baimaxueshan pass, Yunnan, China – paratype, DCGI). 7 – epipharynx, 8–9 – habitus (length ideogram and morphological details), 10–11 – aedeagus (dorsal and lateral views).

on disc, finely sparsely and irregularly punctured, laterally and subapically covered with short hairs.

Hind tibial superior spur slightly shorter than first tarsal segment; latter somewhat longer than following three segments combined.

Male: triangular process protruding from middle of clypeal margin; genae almost rectangular, strongly protruding beyond the eyes; pronotum relatively more transverse, less convex and more sparsely punctured; aedeagus Figs 5–6.

Female: clypeal margin lacks median protruding process; genae angulose, moderately protruding beyond the eyes; pronotum relatively narrow, more convex and more densely punctured.

DISTRIBUTION. China (Gansu, Sichuan).

BIONOMICS. Late spring and summer species, and possibly a generalist dung feeder in open pastures.

***Odontacrossus pseudoobenbergeri* (Červenka, 1995) comb. nov.**
(Figs 7–11)

Aphodius (? *Acrossus*) *pseudoobenbergeri* Červenka, 1995: 89.

Aphodius (*Acrossus*) *pseudoobenbergeri*: Dellacasa M. & Dellacasa G. 2006: 106.

Aphodius pseudoobenbergeri: Krajcik 2012: 39.

TYPE LOCALITY. Baimaxueshan pass, m 4900, Yunnan prov., China.

TYPE REPOSITORY. Červenka collection, Prague, Czech Republic.

TYPE MATERIAL EXAMINED. Baimaxueshan pass, m 4900, 8–10.VI.1993, leg. Červenka R., 24 exx. (paratypes, DCGI, DKCP).

MATERIAL EXAMINED. **China, Xizang:** Zayu Co., Salween – Irawaddy divide, No La & Tsema La passes env., 28°28–38'N 98°12–17'E, 15–19.VI.1999, leg. L. & R. Businský, 9 exx. (DKCP); Zayu Co., Salween – Irawaddy divide and Taron river (Iraw.), E branch valley, 28°27–35'N 98°00–15'E, m 3400–4300, 18–21.VI.1999, leg. L. & R. Businský, 11 exx. (DKCP); Zay Co., upper basins of the W & E branch of Taron river (Irawaddy), 28°35–43'N 97°40–58'E, 22–29.VI.1999, leg. L. & R. Businský, 18 exx. (DKCP); **Yunnan:** Deqen Co., Mekong side of Hengduan Shan, S of Meilixue Shan, 28°15–16'N 98°43–44'E, m 3500–4300, 3–5.VI.1999, leg. L. & R. Businský, 42 exx. (DKCP); Deqin Co., Baima Shan, E side of pass 12 km SE Deqin, 28°23.06'N, 98°59.04'E, m 4085–4200, 10.VI.2005, leg. Wrase D., 1 ex. (DKCP); Yanmen, 13–23.VI.2005, leg. Kučera E., 3 exx. (DKCP); S. Deqen, m 4500, Baymaxue Mts., 1.V.2000, leg. Murzin S., 11 exx. (DCGI); *ibid.*, 31.V.2000, 9 exx. (PBOC); Dequin Pass, Dequin South, m 4600, 09–11.VI.2006, leg. Major V., 6 exx. (DCGI); Zhongdian, 20 km S, m 3200, 14.VI.2006, leg. Major V., 1 ex. (DCGI); Zhongdian region, pass near Sanba village, m 3800, 16.VII.2009, leg. Gorodinski A., 1 ex. (DCGI); Yanmen, 13–23.VI.2005, leg. Kučera E., 2 exx. (PBOC). **Myanmar, Kachin:** Putao env., m ca. 3500, VI.2010, 4 exx. (DKCP).

REDESCRIPTION. Length 5.5–6.5 mm; oval-elongate, moderately convex, shiny but elytral apex alutaceous, almost glabrous, elytra laterally and subapically with short pale hairs. Head and pronotum black, latter shadely brownish laterally; elytra more or less dark brownish; legs brownish, antennal club piceous.

Head with epistoma feebly gibbous at middle, finely and evenly sparsely punctured; clypeus rather thinly bordered, edge glabrous; genae almost glabrous, protruding beyond the eyes; frontal suture mutic, V-shaped, only distinctly impressed medially; front more coarsely punctured than epistoma.

Pronotum transverse, convex, dually punctured but with median longitudinal areola impunctate; large punctures, twice as large as the small ones, anteriorly almost lacking on disc, not closely scattered on sides and toward the base; small fine punctures somewhat irregularly sparse throughout; lateral margins feebly curved, broadly bordered, edge glabrous; hind angles obtusely rounded; base faintly bisinuate, not bordered.

Scutellum almost flat, finely punctured on basal third.

Elytra oval elongate, moderately convex, with small humeral denticle and distinct epipleural margin, rather deeply striate; striae narrow, densely coarsely punctured, crenulate; interstriae sparsely finely punctured on disc, punctation coarser laterally and apically.

Superior spur of hind tibiae shorter than first tarsal segment; latter somewhat longer than following three segments combined.

Male: head relatively large, nearly trapezoidal, with a distinct median triangular process protruding from the clypeal margin, straight laterally towards genae; latter almost rectangular, strongly protruding beyond the eyes; pronotum relatively more transverse, less convex and less coarsely punctured; elytral interstriae flat; aedeagus Figs 10–11.

Female: head relatively small; clypeal margin almost semicircular without median protruding process; genae angulose, moderately protruding beyond the eyes; pronotum relatively narrow, more convex and more coarsely punctured; elytral interstriae slightly but distinctly convex.

DISTRIBUTION. China (Xizang, Yunnan), Myanmar (Kachin).

BIONOMICS. Late spring and summer species, and possibly a generalist dung feeder.

Odontacrossus trisuliensis (Stebnicka, 1986) comb. nov.

(Figs 12–17)

Aphodius (*Paulianellus*) *trisuliensis* Stebnicka, 1986: 28; Dellacasa M. 1988: 355; Stebnicka 1989: 5; 1990: 6; Mcnamara 1993: 24; Dellacasa M. & Dellacasa G. 2006: 133.

Aphodius trisuliensis: Schawaller 1994: 32; Krajčik 2012: 41.

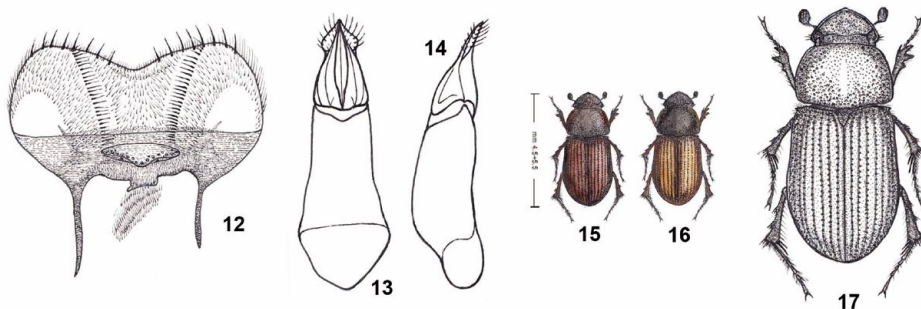
TYPE LOCALITY. Vicinity of Trisuli Bazár, m 3600, 27°56'N–85°00'E, East Nepal.

TYPE REPOSITORY. Biosystematic Research Institute, Ottawa, Canada.

TYPE MATERIAL EXAMINED. **Nepal**: vicinity of Trisuli Bazár, m 3600, 27°56'N–85°00'E, 23.V.1967, Can. Nep. Exp., 2 exx. (paratypes, ISEZ).

MATERIAL EXAMINED. **India, Arunachal Pradesh**: ca. 20 Km W Sela Pass, m 3400, ca 27°30'N–92°03'E, 24.VI.2008, leg. Reuter Ch., 18 exx. (DCGI, RCHG); **West Bengal**: Shingalila National Park, Shirikhola, m 2600, 18–28.V.1999, leg. Kučera E., 6 exx. (DCGI, DKCP); Tonglu, 17–19.VI.2003, leg. Kučera E., 4 exx. (DKCP). **Nepal**: Sankhus Sabha Distr., Thudam, mixed forest mainly *Betula/Rhododendron*, m 3550–3650, 25–27.V.1988, leg. Martens J. & Schawaller W., 3 exx. (det. Z. Stebnicka, DKCP, PBOC).

REDESCRIPTION. Length 4.5–5.5 mm; ovally elongate, moderately convex, shiny, almost glabrous, elytra laterally and preapically sparsely covered with short hairs. Head and pronotum piceous;



Figs 12–17. *Odontacrossus trisuliensis* (Stebnicka) (Vicinity of Trisuli Bazár, Nepal – paratype, ISEZ). 12 – epipharynx, 13–14 – aedeagus (dorsal and lateral views), 15–17 – habitus (length ideogram, colour variations and morphological details).

latter extensively yellowish laterally towards anterior angles; elytra entirely brownish (Fig. 15) or yellowish with juxtasutural interstria and lateral margins brownish (Fig. 16); legs brownish, antennal club blackish.

Head with epistoma slightly convex medially, mostly distally alutaceous, finely but not closely punctured; clypeal margin rather finely bordered, edge moderately reflexed, glabrous; genae scarcely ciliate, distinctly protruding beyond the eyes; frontal suture mutic, only finely impressed medially; front finely sparsely punctured.

Pronotum moderately transverse, convex, dually, not closely punctured and with median longitudinal areola impunctate; large punctures, two or three times larger than small ones, some closer together on sides and towards the base; small punctures rather irregularly scattered throughout; lateral margins feebly arcuate, very thickly bordered, edge glabrous; hind angles obtusely rounded; base faintly bisinuate, not bordered.

Scutellum somewhat concave, sparsely and irregularly punctured.

Elytra oblong oval, moderately convex, slightly wider posteriorly; shoulder with a very small but distinct denticle; striae moderately deep, rather closely punctured, feebly crenulate; interstriae faintly convex, finely, sparsely and irregularly punctured.

Superior spur of hind tibiae nearly as long as first tarsal segment; latter as long as following three segments combined.

Male: has a median triangular process more or less protruding from the clypeal margin; genae almost rectangular, strongly protruding beyond the eyes; pronotum relatively more transverse, less convex and more sparsely and finely punctured; aedeagus Figs 13–14.

Female: lacks a median process protruding from the clypeal margin; genae angulose, moderately protruding beyond the eyes; pronotum relatively narrow, more convex and more coarsely punctured.

DISTRIBUTION. Nepal, India (Arunachal Pradesh, West Bengal).

BIONOMICS. Spring species and possibly a generalist dung feeder.

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