

## Nine New Taxa of the Genera *Odontotrypes* and *Phelotrupes* (Coleoptera, Geotrupidae) from China

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**Abstract** Eight new species of the family Geotrupidae are described from China as follows: *Odontotrypes* (*Thorectomimus*) *yangi* sp. nov., *O. (T.) schoolmeestersi* sp. nov., *O. (T.) weiwei* sp. nov., *Phelotrupes* (*Chromogeotrupes*) *semibicolor* sp. nov., *P. (Eogeotrupes) caii* sp. nov., *P. (P.) beuteli* sp. nov., *P. (P.) semidenticalatus* sp. nov., and *P. (P.) reni* sp. nov. In addition, a new subspecies of *P. (P.) reni* is also described: *P. (P.) reni gansuensis* ssp. nov.

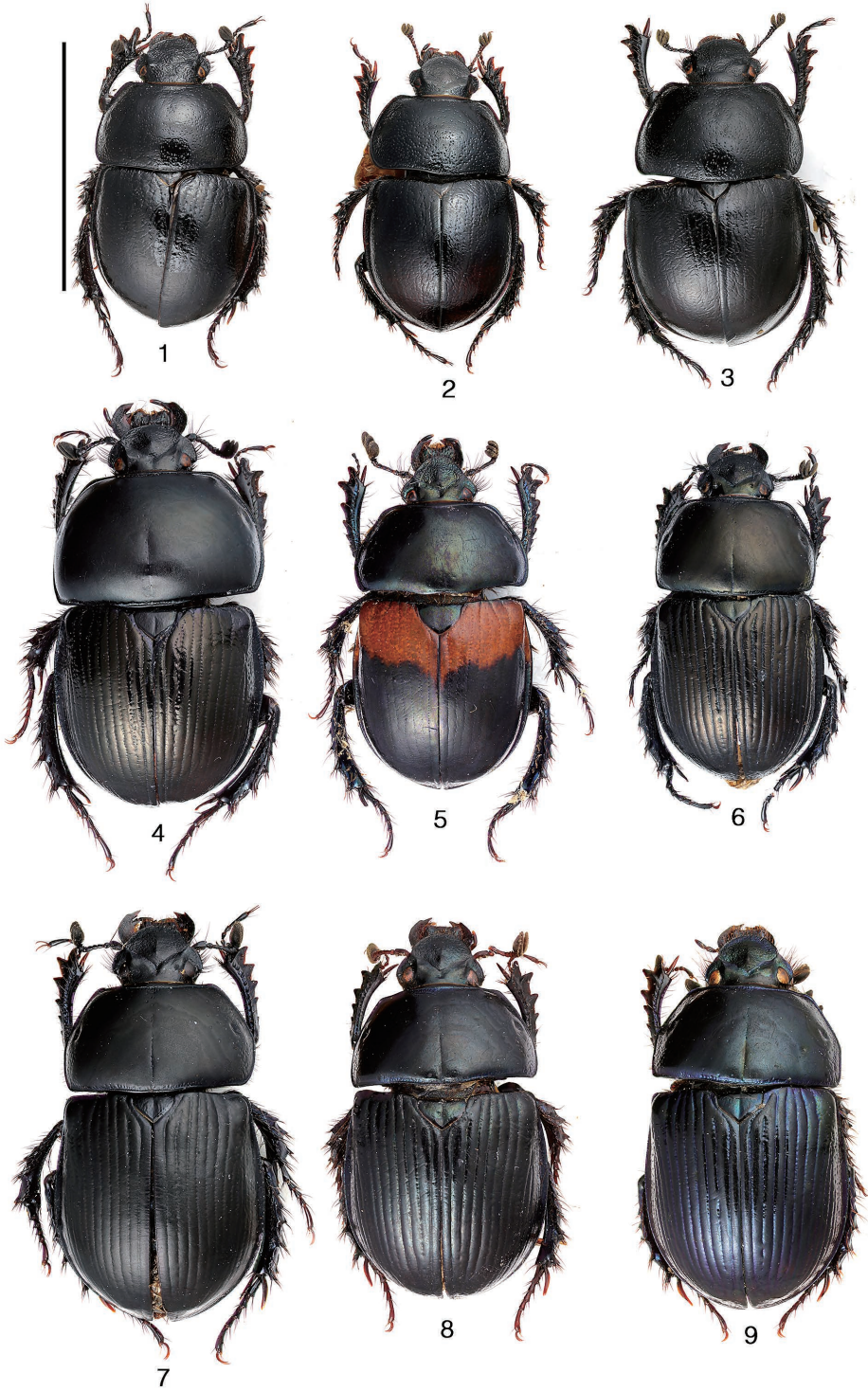
### Introduction

The geotrupid genera *Odontotrypes* and *Phelotrupes* include about 70 and 50 described species, respectively, and are distributed in the Palaearctic and Oriental Regions (SCHOOLMEESTERS, 2016). Major portions of the known diversities for these genera have been recorded in China, which harbors more than 60 species of *Odontotrypes* and more than 40 of *Phelotrupes* (KRÁL *et al.*, 2001; NIKOLAJEV *et al.*, 2016; OCHI *et al.*, 2017).

We have examined *Odontotrypes* and *Phelotrupes* specimens in the first author's collection together with those provided by several collaborators. After close examination especially on the male genitalia, we found several undescribed forms from China among them. Thus, we describe three new *Odontotrypes* species and five new *Phelotrupes* species from China. In addition, we also describe a new subspecies for one of the present new species of *Phelotrupes*.

### Materials and Methods

We herewith define some terms used in the following descriptions of the male genitalia as follows (see also Figs. 36–39 for terms other than defined below): — 1) ventral lobes: a pair of apical portions of phallobase (visible in ventral view), which are separated by markedly wide and deep incision (Fig. 37d, f; this term is after ZUNINO (1984)); 2) sagittary ventral suture: a longitudinal suture situated at the middle of ventral side of phallobase (Fig. 37e; this term is also after ZUNINO (1984)); 3) ventral apico-median area: an area situated at apico-median portion of parameres (visible in ventral view), which is usually sclerotized (applied to *Odontotrypes*, *Phelotrupes* (*P.*) and *P. (Eogeotrupes)*) (Figs. 37g, 39l); 4) inner oblique stick: an oblique stick-like projection, which is branched from the intero-basal portion of left paramere (visible in dorsal view), which is usually directed obliquely inward, and mostly more or less sharp at apex (applied to *Odontotrypes* only) (Fig. 36c); 5) outer broader lobe; a strongly prolonged outer lobe of left paramere (visible in dorsal view), which is separated from the inner oblique stick by median deep notch, gently incurved, mostly more or less tumid at apex, and often with a slight thin membrane at inner side of apex (applied to *Odontotrypes* only) (Fig. 36b); 6) inner thin stick: an elongate thin stick-like protrusion of left paramere (visible in dorsal



view), which is situated at inner side of left paramere, and separated from the spatula of left paramere by the median deep notch (applied to *Phelotrupes* (*P.*) only) (Fig. 38i); 7) left spatula: a strongly elongate outer lobe of left paramere, which is situated at the outer-most portion of left paramere, along with the prolonged left lobe of phallobase, and spatulate at apex (applied to *Odontotrypes* and *Phelotrupes* (*P.*)) (Fig. 38j); 8) right spatula: a strongly elongate lobe of right paramere with spatulate apex, which exhibits species-specific form at apex in right lateral view (applied to *Phelotrupes* (*P.*) only) (Fig. 38h).

The abbreviations for measurements are as follows: — Pl, pronotal length along the midline; Pw, pronotal width at the widest place; El, elytral length from the level of humeri to the apices of elytra; Ew, elytral width at the widest place; Mwl, metathoracic wing length; Al, aedeagus length in dorsal view; Phl, phallobase length; Phw, phallobase width; Prl, paramere length in dorsal view.

## Taxonomy

### *Odontotrypes* (*Thorectomimus*) *yangi* sp. nov.

(Figs. 1, 10–11, 14–15)

*Description of holotype.* Length: 12.2 mm (excluding mandibles).

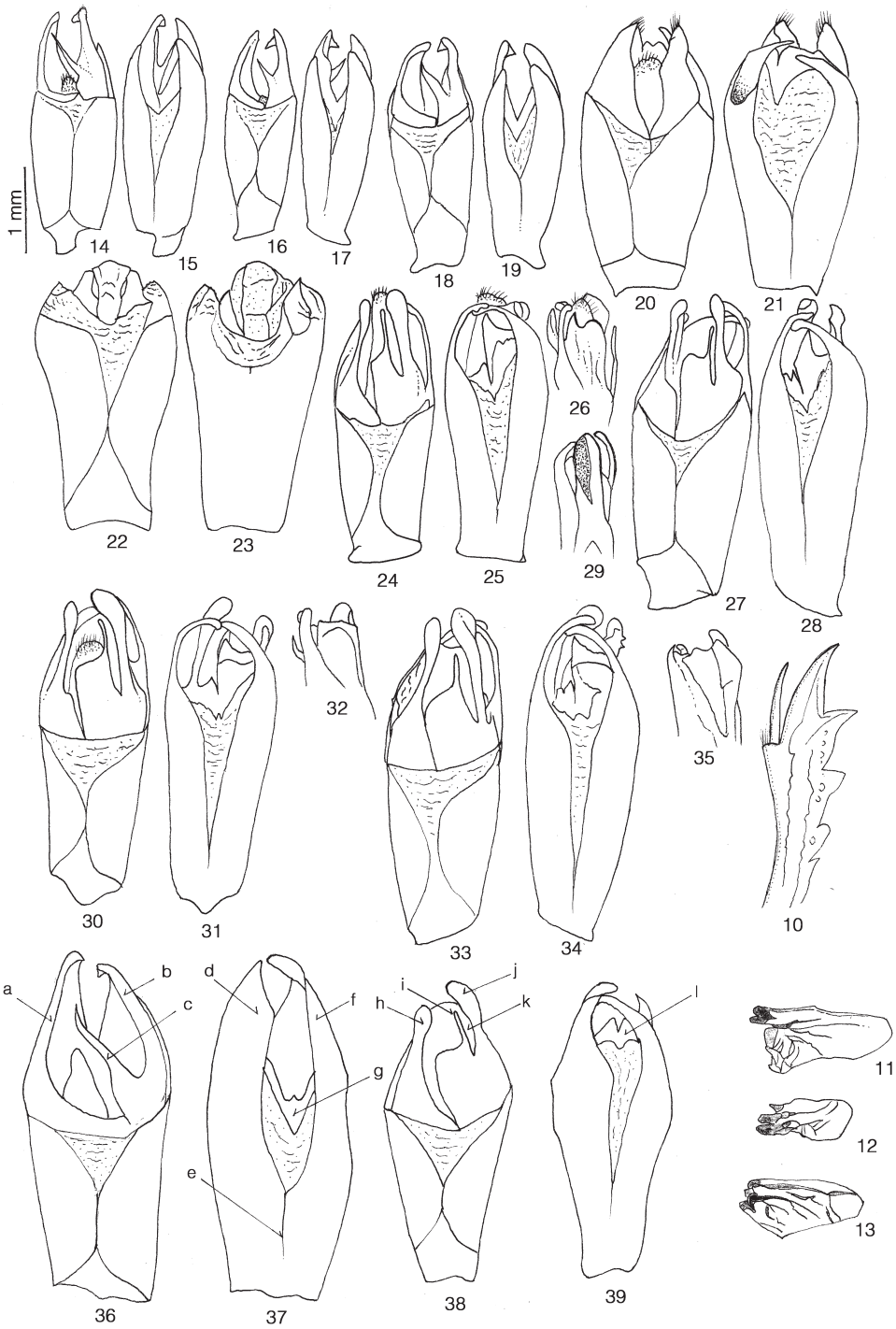
*Male.* Body small-sized for this genus, oblong-oval, strongly convex dorsally. Dorsal side shining and glabrous; ventral side sub-opaque except for slightly lustrous legs, and distinctly clothed with blackish brown hairs. Color monochromatically black; dorsal and ventral surfaces without metallic tinge; mouth parts, palpi and legs somewhat brownish; terminal spurs and claws distinctly brown; antennae slightly brownish.

Head transverse, less strongly produced forward; labrum distinctly broad and not strongly rounded on either corner, scarcely emarginate in the middle; clypeus moderately strongly produced forward, broadly and transversely elliptical in outline, with marginal line fine; clypeal median portion weakly raised; median longitudinal keel and tubercle not developed, the former entirely reduced and the latter vague; clypeal suture finely defined as shining and smooth line; T-shaped suture finely depressed; eye-tubercles weakly produced upward, rather low; eye-canthus with external margin obtusely angled in front, slightly curved in the middle, and strongly narrowed behind; surface semi-shining and rather uneven, with clypeus somewhat finely wrinkled, and very densely and somewhat irregularly covered with strong but small punctures, the punctures becoming slightly larger and partly confluent or continuous toward vertex which bears almost impunctate smooth area at the middle, eye-canthus irregularly sculptured.

Pronotum transverse, evenly and strongly convex, simply formed, about 1.7 times as wide as long (Pl : Pw = 3.8 : 6.3), widest at a little behind the middle; median longitudinal groove entirely effaced; anterior margin emarginate and thickly membraneous in median 4/7, with marginal line thick, slightly elevated medially and thin laterad; lateral margins smooth and not crenulate, gently rounded

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Figs. 1–9. Habitus, in dorsal view, scale 10 mm. — 1, *Odontotrypes* (*Thorectomimus*) *yangi* sp. nov., male (holotype); 2, *O. (T.) schoolmeestersi* sp. nov., male (holotype); 3, *O. (T.) weiweii* sp. nov., male (holotype); 4, *Phelotrupes* (*Eogeotrupes*) *caii* sp. nov., male (holotype); 5, *P. (Chromogeotrupes) semibicolor* sp. nov., male (holotype); 6, *P. (Phelotrupes) beuteli* sp. nov., male (holotype); 7, *P. (P.) semidenticulatus* sp. nov., male (holotype); 8, *P. (P.) reni* sp. nov., male (holotype); 9, *P. (P.) reni gansuensis* ssp. nov., male (holotype).





from base to basal 3/7, very gently rounded and narrowed toward apex in apical 4/7, with marginal line thin in apical 4/7 and distinctly thick in basal 3/7; anterior angles weakly produced forward and rounded, posterior ones obtuse; basal margin weakly rounded, thinly but almost completely bordered except for either very briefly un-bordered lateral portion; disc scarcely transversely grooved behind anterior margin, without posteromedial fovea; lateral fovea weak, barely visible; surface somewhat shining, even in the middle and wrinkled on either side, and covered with two kinds of strong or fine punctuations, the former irregularly scattered, sparse medially and very dense laterad, and the latter almost regularly and densely so. Scutellum broadly triangular in outline, shining, almost smooth except for several basal punctures.

Elytra strongly convex, about 1.1 times as wide as long (El : Ew = 6.1 : 6.9), slightly wider than pronotum in maximum width and widest at basal 1/3, with a humeral callus very weak, though barely perceptible, and with either lateral portion somewhat narrowly flattened along lateral margin; disc strongly convex, with irregular striae, which are almost reduced and forming zigzag lines, and very often effaced partly; striae punctures indefinite, sometimes bearing oblique or transverse irregular wrinkles; intervals moderately convex, slightly uneven, somewhat shining but only slightly micro-granulose, partly transversely and irregularly wrinkled, the wrinkles especially noticeable toward lateral portion. Micropterous, metathoracic wing heavily atrophied, about 1.8 mm in maximum length.

Femora weakly shining; metafemora each with ventral side bearing two indented transverse ridges between anterior and posterior margins, the 1st ridge located at about apical 1/6, and the 2nd one located at about basal 2/6. Protibiae ordinary, incurved, strongly broadened toward apex, with five external teeth, which are gradually decreasing in size from apex to base, the 1st tooth markedly larger and more elongate than in the congeners; ventral side armed with five sharp teeth in a longitudinal row on the ventromedial edge, of which the largest one is located at a little behind the middle; terminal spur fairly slender and slightly incurved.

Aedeagus somewhat narrow and elongate. Phallobase slightly asymmetrical, Phl about 2.5 mm and Phw about 0.9 mm in ventral view; ventral side slightly asymmetrical, with sagittary ventral suture distinct, antero-median portion much deeply and broadly incised and separated into two ventral lobes, right ventral lobe slightly broader and longer than the left one, strongly incurved, and simply constricted toward apex, left ventral lobe also simply formed. Parameres markedly asymmetrical, Prl about 1.0 mm in dorsal view; left paramere in dorsal view broad basally and forked at inner basal 1/3, inner oblique stick strongly prolonged and fairly slender, very sharp apicad, outer broader lobe almost evenly prolonged and tumid internally toward apex which bears small thin inner membrane; right

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Figs. 10–39. Various parts of the genera *Odontotrypes* and *Phelotrupes*, in dorsal view, scale 1 mm. — 10, Right proribia of *Odontotrypes* (*Thorectomimus*) *yangi* sp. nov., male, in dorsal view. — 11–13, Right metathoracic wing, in dorsal view; *O. (T.) yangi* sp. nov. (11); *O. (T.) schoolmeestersii* sp. nov. (12); *O. (T.) weiweii* sp. nov. (13). — 14–35, Male genitalia, in dorsal view for 14, 16, 18, 20, 22, 24, 27, 30, 33; in ventral view for 15, 17, 19, 21, 23, 25, 28, 31, 34; in right lateral view for 26, 29, 32, 35: *O. (T.) yangi* sp. nov. (14–15); *O. (T.) schoolmeestersii* sp. nov. (16–17); *O. (T.) weiweii* sp. nov. (18–19); *Phelotrupes* (*Eogeotrupes*) *caii* sp. nov. (20–21); *P. (Chromogeotrupes)* *semibicolor* sp. nov. (22–23); *P. (Phelotrupes)* *beuteli* sp. nov. (24–26); *P. (P.) semidenticulatus* sp. nov. (27–29); *P. (P.) reni* sp. nov. (30–32); *P. (P.) reni gansuensis* ssp. nov. (33–35). — 36–39, Schematic illustration of male genitalia, in dorsal view (36, 38; note that the left parts of male genitalia are shown on the right sides of these figures), in ventral view (37, 39), arrows indicating: a) right paramere; b) outer broader lobe of left paramere; c) inner oblique stick; d) left ventral lobe; e) ventral sagittary suture; f) right ventral lobe; g) ventral apico-median area; h) right spatula; i) inner thin stick; j) left spatula; k) median notch; l) ventral apico-median area.

paramere simply prolonged along right lobe of phallobase and gently incurved, slightly and longitudinally tumid toward apex; ventral apico-median area defined in roughly V-shape.

Variation. Length: 12.2–13.5 mm; width: 6.9–7.3 mm. Female. Head with clypeal margin more broadly transverse, T-shaped suture indistinct; clypeal surface distinctly flat, superficial punctures slightly weaker and sparser than in male, vertexal portion more sparsely punctate, and smooth impunctate area markedly broader; eye-tubercles weaker than those of male. Pronotum with anterior marginal line thicker in the middle; lateral margins more obviously straight in front. Elytra with either lateral portion more broadly flattened along lateral margin. Protibiae a little broader than in male, with 1st tooth distinctly shorter than in male. Metafemora with the 2nd indented transverse ridge incomplete, intermittently interrupted.

*Type series.* Holotype: ♂, China, Sichuan, Kanding r., 30 km West of Jajiang, 4,100 m alt., 17.VII.2013. Paratype: 1 ♀, the same data as the holotype.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Sichuan).

*Etymology.* The species is named in honor of Prof. Xing-Ke YANG, the leader of Group of Morphology and Evolution of Coleoptera, the Institute of Zoology, Chinese Academy of Science, Beijing, China.

*Notes.* The present new species is closely related to *Odontotrypes (Thorectomimus) kabaki* NIKOLAJEV, 2005 from China (Sichuan), but can be distinguished from the latter by the following characteristics: 1) meththoracic wing less heavily atrophied than in *O. kabaki*, about 1.8 mm in length (Mwl : Pw = 1.8 : 6.3) and distinctly differently shaped, whereas in *O. kabaki*, it is clearly shorter and about 1.3 mm in length (Mwl : Pw = 1.3 : 6.1); 2) labrum with anterior portion distinctly broad and scarcely emarginate in the middle, whereas in *O. kabaki*, it is distinctly narrow and strongly rounded on either anterior corner, and strongly emarginate in the middle; 3) pronotum with basal margin more distinctly bordered and more briefly interrupted on either side, whereas in *O. kabaki*, it is more broadly interrupted on either side; 4) in male, pronotum with lateral margins gently rounded in apical 4/7 instead of being almost straight in apical 4/7 in the latter; 5) in male genitalia, parameres with outer broader lobe obviously wide basally, apex somewhat sharp, whereas in *O. kabaki*, the outer broader lobe is narrower basally and rounded at apex.

*Specimen compared.* *Odontotrypes kabaki*: ♂, Sichuan, NW. Danba, S Biar (3,919 m), 30°58'45"N, 101°32'19"E, I. BELOUSOV & I. KABAK, "Paratype *Odontotrypes kabaki* 2005, NIKOLAJEV (in red label)". Measured data: body length about 11.0 mm, pronotum (Pl : Pw = 3.7 : 6.1), elytra (El : Ew = 5.5 : 6.4), male genitalia, Phl about 2.3 mm, Phw about 0.8 mm, Prl about 0.9 mm.

### *Odontotrypes (Thorectomimus) schoolmeestersi* sp. nov.

(Figs. 2, 12, 16–17)

*Description of holotype.* Length: 11.5 mm (excluding mandibles).

Male. Body small-sized, oblong-oval, strongly convex above. Dorsal side shining and entirely glabrous; ventral side sub-opaque except for shining legs, and clothed with blackish brown hairs.

Color monochromatically black; dorsal and ventral surfaces without metallic tinge; mouth parts, palpi and legs a little brownish; terminal spurs and claws distinctly brown; antennae brownish, with club segments fairly brownish.

Head obviously transverse, weakly produced forward; labrum distinctly narrow and strongly rounded on either corner, strongly emarginate in the middle; clypeus fairly transversely elliptical in

outline, with marginal line fine; clypeal median portion obtusely raised, with median longitudinal keel and tubercle almost effaced; clypeal suture finely and sharply defined as shining and smooth line; T-shaped suture entirely effaced; eye-tubercles weakly raised and fairly low; eye-canthus with external margin obtusely angled in front, distinctly curved in the middle, and strongly narrowed behind; surface shining and rather uneven, with clypeus somewhat finely wrinkled, very densely and irregularly covered with strong, uneven, and small punctures, the punctures becoming clearly sparser and very fine at middle of clypeus, both tubercles and median portion of vertex; eye-canthus irregularly sculptured.

Pronotum transverse, evenly and moderately convex, simply formed, about 1.7 times as wide as long (Pl : Pw = 3.5 : 5.8), widest at about basal 2/5; median longitudinal groove weakly grooved in basal 2/5; anterior margin emarginate and thickly membranous in median 4/7, with marginal line thick and scarcely elevated medially, and thin laterad; lateral margins smooth and not crenulate, gently rounded from base to basal 3/7, then very gently rounded or almost straight and narrowed toward apex in apical 4/7, with marginal line thin in apical 4/7 and distinctly thick in basal 3/7; anterior angles rounded and weakly produced forward, posterior ones obtuse; basal margin weakly rounded, thinly but almost completely bordered; disc simply formed, scarcely transversely grooved behind anterior margin, lacking posteromedial fovea; lateral fovea very weak, barely visible; surface shining, even in the middle and wrinkled along either lateral margin, and covered with two kinds of strong or fine punctuations, the former irregularly scattered, sparse in the middle and very dense and fairly coarse laterad, and the latter almost regularly and densely scattered. Scutellum broadly triangular in outline, shining, somewhat smooth.

Elytra strongly convex, about 1.1 times as wide as long (El : Ew = 5.9 : 6.4), slightly wider than pronotum in maximum width and widest at basal 1/3, with a humeral callus completely effaced and flat, and either lateral portion broadly flattened along lateral margin; disc strongly convex, with irregular striae, which are almost reduced and forming zigzag lines, and very often effaced partly; striae punctures indefinite, sometimes bearing oblique or transverse irregular wrinkles; intervals not strongly convex, slightly uneven, somewhat shining, transversely and irregularly wrinkled in part, the wrinkles remarkable toward either lateral portion. Micropterous, metathoracic wing heavily atrophied, about 1.3 mm in maximum length.

Femora slightly shining; metafemur with ventral side bearing only one indented transverse ridge between anterior and posterior margins, which is located at about apical 1/6. Protibiae ordinary, incurved, strongly broadened toward apex, with five external teeth; the 1st tooth moderate-sized; ventral side armed with six to seven small teeth in a longitudinal row on the ventromedial edge, which are almost the same in size; terminal spur slender and a little incurved.

Aedeagus relatively narrow and elongate. Phallobase slightly asymmetrical, Phl about 2.1 mm and Phw about 0.8 mm in ventral view; ventral side slightly asymmetrical, with sagittary ventral suture distinct; antero-median portion much deeply and broadly incised and separated into two ventral lobes; right ventral lobe slightly broader and as long as the left one, rather incurved, and simply constricted toward apex, left ventral lobe also simply formed and pointed apicad. Parameres markedly asymmetrical; left paramere about 0.8 mm in length in dorsal view, distinctly longer than the right one, slightly broad basally and forked at basal inner half; inner oblique stick somewhat prolonged and relatively short though very sharp at apex; outer broader lobe nearly straightly prolonged and tumid at apex which bears a small inner thin membrane; right paramere simply prolonged along right lobe of phallobase and weakly incurved, slightly and longitudinally tumid toward apex; ventral apico-median area narrow, defined in roughly V-shape.

Variation. Length: 11.0–11.5 mm; width: 5.9–6.4 mm. F e m a l e. Head with clypeal margin

only slightly produced forward than in male, and the outline very slightly asymmetrical; T-shaped suture entirely effaced; eye-tubercles obviously weaker than those of male. Pronotum with superficial punctuations stronger and denser, especially so on either lateral portion. Metafemora with two indented transverse ridges, the 2nd ridge intermittently interrupted. Protibiae a little broader than in male; terminal spur slightly shorter and broader.

*Type series.* Holotype: ♂, China, N. W. Sichuan, 40 km North of Luhuo, 4,100 m alt., VI.1990. Paratypes: ♀, the same data as the holotype; 17 ♂♂, 10 ♀♀, ditto, 12.VI.2011.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Sichuan).

*Etymology.* The present new species is dedicated to Mr. Paul SCHOOLMEESTERS, who has been giving us invaluable information for this study.

*Notes.* The present new species is closely related to the preceding species, *Odontotrypes (Thorectomimus) yangi* sp. nov., from China (Sichuan), but can be distinguished from the latter by the following characteristics: 1) metathoracic wing more heavily atrophied, about 1.3 mm in length (Mwl : Pw = 1.3 : 5.8) and distinctly differently shaped, whereas in *O. yangi*, it is clearly larger and about 1.8 mm in length (Mwl : Pw = 1.8 : 6.3); 2) elytron with humeral callus completely effaced, whereas in *O. yangi*, it is barely perceptible; 3) head especially on clypeus less densely and less strongly punctate than in *O. yangi*, and some almost impunctate smooth areas noticeable; 4) head in male with eye-tubercle very weak and not so raised, whereas in *O. yangi*, it is distinct and raised; 5) in male genitalia, left paramere narrower in basal half with inner oblique stick short and sharp, whereas in *O. yangi*, the left paramere distinctly broader at base with the inner oblique stick strongly prolonged, fairly elongate and sharp at apex.

The present new species is also similar to *O. (O.) meyomintang* KRÁL, *et al.*, from Sichuan, but can be easily distinguished from it by the ventral lobes of phallobase fairly differently shaped; those of *O. meyomintang* are entirely broad and rounded at apex in ventral view.

### *Odontotrypes (Thorectomimus) weiweii* sp. nov.

(Figs. 3, 13, 18–19)

*Description of holotype.* Length: 12.9 mm (excluding mandibles).

*Male.* Body small-sized, oblong-oval, strongly convex dorsally. Dorsum somewhat shining and entirely glabrous; venter sub-opaque except for shining legs, and clothed with blackish brown hairs. Color monochromatically black; dorsal and ventral surfaces without metallic tinge; mouth parts, palpi and legs a little brownish; terminal spurs and claws distinctly brown; antennae brownish.

Head distinctly transverse; labrum emarginate in front; clypeus fairly transversely elliptical in outline, and almost flat, with marginal line fine; clypeal median portion scarcely raised, with median longitudinal keel and tubercle almost effaced; clypeal suture finely defined as shining and smooth line; T-shaped suture indistinct; eye-tubercles weakly raised and rather low; eye-canthus with external margin roundly angled in front, distinctly curved in the middle, and strongly narrowed behind; surface shining and slightly uneven, with clypeus somewhat finely wrinkled, and very densely and somewhat irregularly covered with strong, uneven, and small punctures, the punctures becoming slightly sparser and stronger behind clypeal suture, and rudimental on the posterior-most portion; eye-canthus irregularly sculptured.

Pronotum transverse, moderately strongly convex above, simply formed, about 1.6 times as wide as long (Pl : Pw = 4.3 : 6.8), widest at basal 3/8; median longitudinal groove weakly defined in basal



1/3, well visible from dorso-oblique view in naked eyes; anterior margin emarginate and thickly membranous in median 1/2, with marginal line thick and weakly raised medially, and thin laterad; lateral margins smooth and not crenulate, gently rounded from base to basal 3/8, then almost straight and narrowed toward apex in apical 5/8, with marginal line thin in apical 5/8 and distinctly thick in basal 3/8; anterior angles rounded and weakly produced forward, posterior ones obtuse; basal margin weakly rounded, thinly bordered in the middle and scarcely bordered on either side; disc simply formed, at most finely grooved behind anterior margin, devoid of posteromedial fovea; lateral fovea weak, barely perceptible; surface rather shining, even in the middle, strongly wrinkled and uneven along either lateral margin, and irregularly covered with strong punctures, which become sparser in the middle, larger and denser on either side, the interspaces among punctures punctulate. Scutellum broadly triangular in outline, shining, scarcely punctate or wrinkled.

Elytra strongly convex, about 1.0 times as wide as long (El : Ew = 7.2 : 7.5), slightly wider than pronotum in maximum width and widest at basal 1/3, with a humeral callus almost effaced, and flat, and either lateral portion broadly flattened along lateral margin; disc strongly convex, with striae very weak, indefinite and almost reduced; strial punctures also reduced and partly barely visible; intervals not convex, though slightly uneven, somewhat micro-granulose, sparsely irregularly wrinkled, the wrinkles remarkable toward lateral portion. Micropterous, metathoracic wing heavily atrophied, about 1.5 mm in maximum length.

Femora strongly shining; metafemora each with ventral side bearing only one indented transverse ridge, located at about apical 1/6. Protibiae ordinary, incurved, strongly broadened toward apex, with five external teeth; the 1st tooth moderate-sized; ventral side armed with six to seven small teeth in a longitudinal row on the ventromedial edge, the largest tooth located at near the middle; terminal spur slender and a little incurved.

Aedeagus relatively narrow and elongate. Phallobase slightly asymmetrical, Phl about 2.3 mm and Phw about 0.9 mm in dorsal view; ventral side slightly asymmetrical, with sagittary ventral suture distinct; antero-median portion much deeply and broadly incised and separated into two lobes; right lobe of them slightly broader and as long as the left one, rather incurved, and rounded at apex, left one also simply formed and slightly narrowed apicad. Parameres markedly asymmetrical, Prl about 1.1 mm in length in dorsal view; left paramere in dorsal view slightly longer than the right one, not obviously broad basally and forked at basal inner 1/2; inner oblique stick somewhat prolonged, rather broad basally, and sharp at apex, outer broader lobe nearly evenly prolonged and tumid at apex which bears small thin inner membrane; right paramere simply prolonged along right lobe of phallobase and weakly incurved, distinctly tumid inward at apex; ventral apico-median area slightly broad, defined in roughly V-shape.

Variation. Length: 12.1–13.8 mm; width: 6.9–7.7 mm (n = 7). Color usually monochromatically black, though pronotum with weak bluish luster on either side in one specimen. Head with T-shaped suture mostly indistinct and almost effaced, barely perceptible in only one specimen. Pronotum with median longitudinal groove mostly developed though fine and short. Female. Head with clypeal margin more slightly produced forward than in male; T-shaped suture very weak; eye-tubercles not so weaker than those of male. Pronotum with superficial punctuations stronger and denser. Metafemora with an indented transverse ridge. Protibiae a little broader than in male.

*Type series.* Holotype: ♂, China, Sichuan, Pass between Seyta and Luhuo, 4,200 m alt., VI.2015. Paratypes: 4 ♂♂, 4 ♀♀, the same data as the holotype; 1 ♀, China, Sichuan, Kanding r., 30 km West of Jajiang, 4,100 m alt., 17.VII.2013.

*Type depositary.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Sichuan).

*Etymology.* The present new species is named in honor of Mr. Weiwei ZHANG, the Institute of Zoology, Chinese Academy of Sciences, Beijing, China, and the Three Gorges Entomological Museum, Chongqing, China.

*Notes.* The present new species is closely related to *Odontotrypes (T.) kabaki* NIKOLAJEV, from China (Sichuan), but can be distinguished from the latter by the following characteristics: 1) meththoracic wing less heavily atrophied than in *O. kabaki*, about 1.5 mm in length (Mwl : Pw = 1.5 : 6.8) and distinctly differently shaped, whereas in *O. kabaki*, it is clearly shorter and about 1.3 mm in length (Mwl : Pw= 1.3 : 6.1); 2) pronotum especially on either lateral portion more strongly and more densely punctate; 3) elytron with lateral margin much broadly flattened, whereas in *O. kabaki*, it is more narrowly flattened; 4) elytron with intervals more strongly micro-granulose instead of being very slightly so in the latter; 5) parameres in male genitalia large, with left paramere bearing inner oblique stick prolonged, broad basally and sharp at apex, and right paramere distinctly tumid inward at apex, whereas in *O. kabaki*, parameres relatively smaller, the inner oblique stick is rather short, not so broad basally and very sharp, the right paramere is a little tumid at apex.

The present new species is also similar to *O. yangi* sp. nov. but can be distinguished from the latter in the following characteristics: clypeus wrinkled, and very densely and somewhat irregularly covered with strong, uneven, and small punctures, elytral intervals slightly uneven, somewhat micro-granulose.

***Phelotrupes (Eogeotrupes) caii* sp. nov.**

(Figs. 4, 20–21)

*Description of holotype.* Length: 17.2 mm (excluding mouth parts).

*Male.* Body moderate-sized, oblong-oval, strongly convex dorsally. Dorsal side with head and elytra shining, pronotum distinctly opaque, entirely glabrous; ventral side distinctly clothed with blackish brown hairs, opaque except for slightly shining legs. Color black, dorsal surface distinctly tinged with dark greenish luster on head and pronotum, and with dark aeneous luster on elytra; ventral surface tinged with dark greenish to dark bluish luster; mouth parts, palpi and legs dark brown; antennae with foot-stalk dark brown, and club segments blackish brown.

Head distinctly transverse, with labrum rather deeply and broadly emarginate in front; clypeus fairly transversely elliptical in outline, with margin thinly bordered; median portion of clypeus slightly prominent as a small tubercle, and with a short obtuse keel developed anteriorly; clypeal suture finely depressed in front and somewhat vague behind; T-shaped suture very finely defined; eye-tubercle weak, weakly raised; eye canthus with external margin broadly rounded in apical 5/7, and then suddenly narrowed toward base; surface lustrous, with clypeus somewhat uneven, transversely rugose, and irregularly densely punctate, frons to vertex smooth, very sparsely punctate anteriorly; eye-canthus irregularly and somewhat finely sculptured.

Pronotum markedly larger than elytra, remarkably strongly convex above, simply formed, about 1.6 times as wide as long (Pl : Pw = 5.6 : 8.7), widest near the middle, with weak fine median longitudinal groove in basal 1/2; anterior margin emarginate and thickly membraneous in median 1/3, with marginal line thick almost throughout; lateral margins entirely smooth, gently rounded in basal half, then narrowed toward apex in nearly straight line, with marginal line slightly thick in basal 1/2 and thin in apical 1/2; anterior angles weakly produced forward and rounded, posterior one obtuse; basal margin bi-sinuate, thickly and briefly bordered at ante-scutellar portion and almost un-bordered on either side; lateral fovea small; surface very finely micro-granulose except for weakly shining lateral margins, extremely sparsely and finely punctate in the middle except for sparsely punctate median

longitudinal groove, and irregularly, somewhat densely and slightly rugosely covered with strong punctures on either lateral portion, without posteromedial fovea. Scutellum broadly triangular, smooth and shining, with a fine median longitudinal fovea.

Elytra strongly convex, slightly broader than pronotum, about 1.1 times as wide as long (El : Ew = 8.3 : 8.8), widest near the middle, with a distinct humeral callus; lateral margins strongly flattened and broad; disc strongly convex, each elytron with 14 striae, inner seven of which are obviously and strongly grooved, situated between suture and humeral callus, outer seven somewhat shallowly and weakly grooved than inner seven striae; 8th stria branched into two punctate striae in the middle and seemingly forming another supplementary stria; strial punctures mostly distinct, becoming stronger toward lateral margin, those of 2nd stria very irregularly scattered; intervals somewhat convex, almost smooth and shining, punctulate all over. Metathoracic wing not reduced, macropterous, about 13.6 mm.

Profemora not armed on anterior edge, though remarkably sharply ridged, the ridge occupying in median half; ventral side defined by a distinct indented transverse ridge at basal 1/3; ventral surface obliquely wrinkled in inner half. Mesofemora with ventral side also defined by a indented transverse ridge at about apical 1/5 and about basal 2/5, respectively. Metafemora armed with a strongly projected sharp tooth situated at basal 2/7 on posterior edge; ventral side defined by a indented transverse ridges at apical 1/6, and also at basal 2/6, respectively; ventral surface distinctly wrinkled in outer half. Metatrochanter strongly projected backward as a rounded tooth, which is slightly shorter than sharp tooth of metafemur. Protibiae somewhat strongly dilated apicad, fairly strongly incurved, with five external teeth; inner distal end a little expanded ventrally and slightly concaved; ventral side armed with one fairly strong sharp tooth a little behind the middle of ventromedial edge. Abdomen with ventrites micro-granulose, somewhat irregularly punctate.

Aedeagus. Phallobase asymmetrical, Phl about 3.2 mm and Phw about 1.6 mm in ventral view; ventral side with sagittary ventral suture distinct, antero-median portion much widely and deeply incised, and separated into two ventral lobes; of which right ventral lobe is distinctly incurved, a little broadened at apex, left one fairly prolonged and strongly incurved as a thin process, which is markedly excavated at the base of outer side. Parameres asymmetrical, Prl about 1.5 mm in dorsal view; left paramere in dorsal view distinctly broad in basal half, then slightly curved outward and narrowed apicad; right paramere in dorsal view also broad in basal half, then strongly narrowed apicad; apices of both parameres fringed with dense hairs; ventral side of parameres deeply and very narrowly notched at the left side, and slightly and sharply projected at the right side of the notch, the round portion of the notch longitudinally sclerotized.

Variation. Length: 16.5–18.3 mm; width: 8.4–9.7 mm (n = 4). Dorsum distinctly bi-colored in large males and not distinctly so in smaller males and females. In smaller males, pronotum becoming smaller and ordinary for this genus in relative size, and shining (The holotype specimen appears a quite large individual for this species, so the pronotum is seemingly disproportionately developed). Female. Dorsal surface, especially on head and pronotum, more strongly opaque than in male. Head with clypeus more slightly produced forward than in male; surface strongly micro-sculptured, obviously wrinkled, very densely covered with strong but indefinite puncture-like sculptures. Pronotum more weakly convex than in male; anterior margin especially at the tip of anterior angle, with marginal border fairly thickened; surface fairly strongly micro-granulose. Elytra with intervals very strongly micro-granulose except for shining lateral margin. Protibiae obviously broader, with external teeth distinctly stronger; ventral side with 7–8 small teeth on the ventromedial edge.

*Type series.* Holotype: ♂, China, Sichuan, Xichang C., 1,600 m alt., 10.VII.1998. Paratypes: 5 ♂♂, 3 ♀♀, the same data as the holotype; 1 ♂, ditto, 1.VII.2001; 1 ♂, S. Sichuan, 60 km S., Lichang, Luo-

jishan Mts., 25.VII,1998.

*Type depositary.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Sichuan).

*Etymology.* The specific name is dedicated to Mr. Yong CAI, who has provided invaluable materials to the last author.

*Notes.* The present new species is somewhat related to *Phelotrupes (Eogeotrupes) tenuistriatus* (FAIRMAIRE, 1887) from China (Yunnan), but can be distinguished from the latter by the following characteristics: 1) body distinctly larger, about 16.5–18.3 mm; 2) antenna with club segments blackish brown, whereas in *P. tenuistriatus*, it is distinctly pale brown; 3) in large male, elytra markedly small when compared with pronotum, whereas in *P. tenuistriatus*, it is ordinary in relative size; 4) in male genitalia, phallobase short and distinctly broad dorsally, whereas in *P. tenuistriatus*, it is elongate and not distinctly broad; 5) phallobase in male genitalia with ventral side bearing left lobe fairly prolonged and markedly excavated at the base of outer side instead of being not excavated there in the latter.

***Phelotrupes (Chromogeotrupes) semibicolor* sp. nov.**

(Figs. 5, 22–23)

*Description of holotype.* Length: 13.6 mm (excluding mouth parts).

*Male.* Body moderate-sized, a little elongate-oval, rather depressed and not so strongly convex. Dorsal side weakly shining, entirely glabrous; ventral side sub-opaque except for shining legs, and distinctly clothed with blackish brown hairs. Color bi-colored; head and pronotum black, elytra yellowish brown in basal 1/3 and black in apical 2/3, and all the black areas with very slight greenish or bluish luster; ventral surface black, with distinct bluish luster, which is strong on ventral sides of legs except for almost blackish brown protibiae; mouth parts and palpi somewhat brownish and partly with weak bluish luster; dorsal surface of legs blackish brown and with weak bluish luster; terminal spurs dark brown and claws pale brown; antennae slightly brownish, with club segments blackish brown.

Head strongly produced forward, with labrum somewhat deeply and broadly emarginate in front; clypeus fairly strongly produced and forming a parabolic line, with margin thinly bordered; median portion of clypeus slightly and rather vaguely prominent as a small longitudinal tubercle though not developed as distinct keel in front; clypeal suture finely depressed throughout; T-shaped suture finely defined; eye-tubercles scarcely developed, weak and scarcely raised; eye-canthus with external margin almost straight and narrowed apically in apical 2/3, and roundly narrowed toward base in basal 1/3; surface weakly shining, with clypeus somewhat uneven, transversely rugose, and irregularly densely punctate; frons to vertex broadly impunctate except for irregularly punctate grooved areas behind sutures; eye-canthus irregularly and somewhat finely sculptured.

Pronotum rather depressed and moderately convex above, simply formed, about 1.8 times as wide as long (Pl : Pw = 4.0 : 7.0), widest at basal 3/7, with very weak median longitudinal groove in basal 1/3; anterior margin emarginate and thickly membranous in median 1/2, with marginal line fairly thick on either side and the thickest at the middle; lateral margins entirely smooth, gently rounded in basal 1/2 and then nearly evenly narrowed toward apex, with marginal line obviously thick in basal 1/2 and thin in apical 1/2; anterior angles scarcely produced forward and rounded, posterior one obtuse; basal margin bi-sinuate, obtusely bordered at the middle and almost un-bordered laterally; lateral fovea small; surface very slightly micro-granulose and almost impunctate except for narrow strongly punctate lateral portions, lacking posteromedial fovea. Scutellum sub-pentagonal, sinuate ba-

sally, smooth and shining, almost impunctate.

Elytra moderately convex though somewhat depressed, slightly broader than pronotum, about 1.0 times as long as wide (El : Ew = 7.6 : 7.4), widest near the middle, with a distinct humeral callus; lateral margins strongly flattened and rather broad; each elytron with 14 striae, which are weakly and very finely grooved, and interrupted or effaced in part; strial punctures rather fine though mostly distinct, and becoming a little stronger toward lateral margin; intervals flat, weakly shining and finely micro-granulose, almost impunctate. Metathoracic wing not reduced, macropterous, about 13.6 mm.

Profemora not armed on anterior edge; ventral side with a transverse row of strong punctures at basal 2/3, without distinct indented transverse ridge. Mesofemora with ventral side defined by two indented transverse ridges, respectively at about apical 1/5 and at about basal 2/5, the former incomplete. Metafemora armed with a very slightly produced tooth situated at basal 1/3 on posterior edge; ventral side defined by two indented transverse ridges at about apical 1/7, and also at about basal 3/7. Metatrochanter scarcely projected. Protibiae somewhat strongly dilated apicad, weakly incurved, with seven external teeth; ventral side armed with four to five small teeth on the ventromedial edge. Abdominal ventrites micro-granulose, somewhat irregularly punctate.

Aedeagus. Phallobase almost symmetrical, Phl about 2.9 mm and Phw about 1.5 mm in ventral view; either sclerotized apico-lateral portion roundly incised, and separated into two apices; the dorsal one slender and the ventral one briefly decurved and sharply toothed, then membranous sub-triangular short point produced; ventral side with sagittary ventral suture indistinct; antero-median portion deeply and roundly incised, and separated on either side; apico-median portion with a very small tooth at the middle; the membranous sides almost symmetrical and with a few short rough irregular wrinkles. Parameres symmetrical; Prl about 0.7 mm in dorsal view; both parameres in dorsal view relatively long, slightly produced, with somewhat pointed at apices.

Variation. Length: 13.6–15.5 mm; width: 7.4–8.3 mm (n = 3). Female. Dorsal surface more distinctly micro-granulose than in male. Head with clypeus less produced forward; clypeal margin more broadly parabolic; surface less uneven, less wrinkled, and more sparsely punctate; frons to vertex smooth, almost impunctate. Pronotum depressed and more weakly convex; anterior margin with marginal border thicker, especially at the tip of anterior angle; surface more strongly micro-granulose. Elytra with striae distinct, more strongly and broadly grooved; intervals distinctly convex, with micro-granules stronger. Protibiae markedly broader, shorter, with external teeth obviously stronger; ventral side with five to six small teeth on the ventromedial edge.

*Type series.* Holotype: ♂, China, Sichuan, Xichang C., 2400 m alt., 15.VI.2004. Paratypes: 2 ♀♀, same data as the holotype.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Sichuan).

*Etymology.* The specific name means 'resembling *bicolor*'.

*Notes.* The present new species is somewhat related to *Phelotrupes (Chromogeotrupes) bicolor* (FAIRMAIRE, 1888) from China, Yunnan, but can be distinguished from the latter by the following characteristics: 1) body less convex above and somewhat elongate-oval in outline, especially noticeably so in female, whereas in *P. bicolor*, it is strongly convex and oblong-oval in both sexes; 2) elytron with striae finely but distinctly grooved in male and strongly grooved in female, whereas in *P. bicolor*, these are very weak, almost reduced and hardly traceable in both sexes; 3) clypeus in male more strongly produced forward instead of being more broadly rounded at apex; 4) in male genitalia, ventral side of phallobase with apico-median portion bearing a very small tooth at the middle, whereas in *P. bicolor*, it bears distinctly larger bi-dentate projection.



***Phelotrupes (Phelotrupes) beuteli* sp. nov.**

(Figs. 6, 24–26)

*Description of holotype.* Length: 13.4 mm (excluding mouth parts).

**M a l e.** Body rather small-sized, elongate-oval, strongly convex above. Dorsal side opaque, smooth and entirely glabrous; ventral side almost opaque except for shining legs, and distinctly clothed with blackish brown hairs. Color black, dorsal surface distinctly tinged with dark aeneous luster; ventral surface tinged with dark bluish luster; mouth parts, palpi and legs blackish brown; antenna with foot-stalk dark brown, club segments blackish brown.

Head somewhat strongly produced forward, with labrum shallowly emarginate in front; clypeus transversely elliptical in outline, with anterior margin slightly reflexed; median portion of clypeus prominent as a small vague tubercle which is slightly raised in lateral view, with short keel scarcely developed in front; clypeal suture finely depressed; T-shaped suture distinct; eye-tubercles weak, weakly raised; eye-canthus with external margin obtusely angled at apical 1/4, then gently rounded and broadened posteriad; the external margin distinctly carinate; surface weakly shining, with clypeus slightly uneven, transversely rugose, and densely covered with strong punctures; frons to vertex sparsely punctate in front and almost impunctate behind; eye-canthus irregularly and somewhat finely sculptured.

Pronotum strongly convex above, simply formed, about 1.6 times as wide as long (Pl : Pw = 4.1 : 6.5), widest at basal 3/7, with strong fine median longitudinal groove in basal 1/2; anterior margin shallowly emarginate, with marginal line fairly thick and broadly membraneous in median 1/2, and somewhat thin on either side; posterior edge of the marginal line slightly raised; lateral margins almost parallel-sided in basal 1/2 and almost evenly narrowed toward apex in apical 1/2, with marginal line distinctly thin throughout; anterior angles scarcely produced forward and rounded, posterior one obtuse; basal margin bi-sinuate, thinly and briefly bordered at ante-scutellar portion and almost un-bordered on either side; disc with transverse shallow groove behind anterior margin; lateral fovea distinctly grooved; surface finely micro-granulose and opaque, punctulate all over, with median portion almost impunctate except for sparsely punctate midline, lacking posteromedial fovea; either lateral portion irregularly sparsely and strongly punctate, and anterior transverse groove densely and strongly so. Scutellum broadly triangular, smooth and very slightly micro-granulose, with weak median longitudinal fovea.

Elytra slightly wider than pronotum, about 1.1 times as wide as long (El : Ew = 6.5 : 7.0), widest at about basal 3/7, with a distinct humeral callus; disc strongly convex, each elytron with 14 striae; inner seven of which are strongly and deeply grooved, situated between suture and humeral callus; outer seven more shallowly grooved than inner seven, and sometimes interrupted or reduced partly; striae punctures weak and indefinite on inner seven striae, though partly appeared as independent round vague punctures on outer seven ones; intervals strongly convex, slightly micro-granulose, vaguely punctulate, and partly and sparsely wrinkled. Metathoracic wing not reduced, macropterous.

Profemora not armed on anterior edge; ventral side defined by a rather regularly indented transverse ridge at basal 1/3. Mesofemora with ventral side also defined by two rather regularly indented transverse ridges, respectively at about apical 1/5 and about basal 2/5. Metafemora armed with a sharply projected tooth situated at basal 4/9 on posterior edge, then slightly serrulately lobed outward; ventral side defined by two indented transverse ridges; the 1st ridge, complete, situated at apical 1/6, and the 2nd one incomplete, situated at basal 2/6. Metatrochanter projected backward as a rounded tooth. Protibiae strongly dilated apicad, somewhat incurved, with six external teeth; ventral side armed with a fairly strong sharp tooth a little behind the middle of ventromedial edge. Abdominal

ventrites micro-granulose, rather irregularly punctate.

Aedeagus. Phallobase asymmetrical, Phl about 3.0 mm and Phw about 1.1 mm in ventral view; ventral side with sagittary ventral suture distinct and situated almost near base, antero-median portion much widely and deeply incised and separated into two ventral lobes; right ventral lobe slightly broader than the left one, distinctly constricted and incurved near apex; left ventral lobe rather broad in basal 1/3, then suddenly strongly constricted and incurved toward apex, which is slightly and roundly tumid. Parameres markedly asymmetrical, Prl about 1.6 mm in dorsal view; left paramere in dorsal view with median notch narrow; inner thin stick elongate; left spatula broader, strongly prolonged, and slightly longer than the right one; right paramere in dorsal view broad in basal 2/5, then strongly narrowed apicad and developed as right spatula, which is distinctly incised at apex in right lateral view; parameres in ventral view with ventral apico-median area a little complicatedly shaped, and produced forward as asymmetrical sub-triangular process at the middle.

Variation. Length: 13.2–13.8 mm; width: 6.8–7.3 mm (n = 4). Color slightly variable, dorsal surface weakly tinged with dark bluish luster in one specimen. Head: eye-canthus with external margin broadly rounded and not angled in front in one specimen. F e m a l e. Pronotum rather depressed and less strongly convex than in male; surface more strongly opaque, more distinctly punctulate in front, and more distinctly punctate along midline. Protibiae broader and relatively short, with external teeth stronger; ventral side with five small teeth on the ventromedial edge.

*Type series.* Holotype: ♂, China, Yunnan, Dequen P., Mianzimu Peak, Dekerla pass, 4,200 m alt., 2.VII.2011. Paratypes: 3 ♂♂, 3 ♀♀, the same data as the holotype.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Yunnan).

*Etymology.* This species is named in honor of Prof. Rolf BEUTEL, Institut für Spezielle Zoologie und Evolutionbiologie mit Phyletischem Museum, Friedrich-Schiller-Universität Jena, Germany. Notes. The present new species is somewhat related to *Phelotrupes (Phelotrupes) denticulatus* (BOUCOMONT, 1905) from China (Sichuan), but can be distinguished from the latter by the following characteristics: 1) pronotum with median longitudinal groove very distinct and strongly impressed in basal half, whereas in *P. denticulatus*, it is weak or vague; 2) elytron with intervals strongly convex instead of being slightly convex in the latter; 3) male metatrochanter ordinary, slightly produced and rounded at apex, whereas in *P. denticulatus*, it is markedly prominent; 4) pronotum in female with anterior groove just behind anterior margin stronger and slightly deeper; 5) right parameres of male genitalia distinctly incised at apex in right lateral view, whereas in *P. denticulatus*, it is not incised at all, and strongly and roundly swollen in right lateral view.

### *Phelotrupes (Phelotrupes) semidenticulatus* sp. nov.

(Figs. 7, 27–29)

*Description of holotype.* Length: 16.4 mm (excluding mouth parts).

M a l e. Body moderate-sized, rather elongate-oval, strongly convex dorsally. Dorsal side markedly opaque and entirely glabrous; ventral side almost opaque including legs, and distinctly clothed with blackish brown hairs. Color monochromatically black without distinct metallic luster except for slightly greenish head and scutellum, and slightly bluish legs; ventral surface blackish brown, partly tinged with very weak purplish luster; antenna with foot-stalk blackish brown, club segments almost black.

Head strongly produced forward with labrum shallowly emarginate in front; clypeus with clypeal

margin clearly forming semicircular outline, slightly reflexed and thinly bordered; median portion of clypeus weakly raised, longitudinally and vaguely keeled in front, and the keel terminate as low obtuse tubercle posteriorly; clypeal suture finely defined as weakly shining smooth line; T-shaped suture distinct, obviously depressed; eye-tubercles weakly produced upward; eye-canthus with external margin obtusely angled in front, then expanded posteriad in almost straight line, and strongly narrowed basad; surface strongly micro-granulose, with clypeus slightly uneven and wrinkled, sparsely and evenly covered with small indefinite shallow punctures; frons to vertex slightly lustrous, irregularly sparsely punctate; eye-canthus irregularly sculptured.

Pronotum strongly convex, simply formed, about 1.7 times as wide as long ( $P_l : P_w = 4.7 : 8.1$ ), widest at basal  $4/9$ , with distinct fine median longitudinal groove in basal  $2/3$ ; anterior margin shallowly emarginate, with marginal line fairly thick and broadly membranous in median  $1/2$ , and thin on either side except for broadly bordered anterior angle; posterior edge of the marginal line slightly raised; lateral margins almost straight and slightly broadened apicad in basal  $4/9$ , and then obtusely angled, and again almost evenly narrowed toward apex, with marginal line distinctly thin throughout; anterior angles distinctly produced forward and slightly projected inward at rounded apex, posterior one obtuse; basal margin bi-sinuate, thinly bordered at ante-scutellar portion and almost un-bordered on either side; disc with transverse shallow groove behind anterior margin, without posteromedial fovea; lateral fovea distinct; surface strongly micro-granulose and opaque, vaguely punctulate, with median portion almost impunctate except for sparsely punctate median longitudinal groove, either lateral portion irregularly sparsely covered with weak small punctures; and anterior transverse groove densely and strongly punctate. Scutellum broadly triangular, micro-granulose, with weak median longitudinal fovea in apical half.

Elytra slightly wider than pronotum, about 1.0 times as long as wide ( $E_l : E_w = 9.0 : 8.8$ ), widest at basal  $4/9$ , with a distinct, well swollen humeral callus; disc strongly convex, each elytron with 14 striae, inner seven of which are weakly but almost completely grooved, situated between suture and humeral callus; outer seven more shallowly and weakly grooved than inner seven ones, and sometimes interrupted or reduced in part; striae punctures indistinct on inner seven striae, which are partly appeared as independent coarse vague punctures on outer seven ones; intervals slightly convex, fairly strongly micro-granulose, almost impunctate, slightly wrinkled along striae in part. Metathoracic wing not reduced, macropterous.

Profemora not armed on anterior edge; ventral side defined by a regularly indented transverse ridge at basal  $1/3$ . Mesofemora with ventral side also defined by two regularly indented transverse ridges, respectively at about apical  $1/5$  and about basal  $2/5$ . Metafemora armed with a sharply projected tooth situated at basal  $4/9$  on posterior edge, then slightly serrulately lobed outward; ventral side defined by two indented transverse ridges, the 1st ridge complete, situated at apical  $1/6$ , and the 2nd one incomplete, situated at basal  $2/6$ . Metatrochanter projected backward as a sharp tooth. Either ventral surface of all femora strongly micro-granulose except for markedly shining jointed area. Protibiae dilated apicad, strongly incurved, with seven external teeth; ventral side armed with a fairly strong sharp tooth a little behind the middle of ventromedial edge. Abdominal ventrites strongly micro-granulose, rather irregularly and unevenly punctate.

Aedeagus. Phallobase asymmetrical,  $Ph_l$  about 3.5 mm and  $Ph_w$  about 1.4 mm in ventral view; ventral side with sagittary ventral suture distinct and situated near base; antero-median portion much widely and deeply incised and separated into two ventral lobes; right ventral lobe broader than the left one, strongly incurved, fairly prolonged, and extended to apex of left one; left lobe suddenly strongly constricted and incurved a little prior to apex, which is slightly and roundly tumid. Parameres markedly asymmetrical,  $Prl$  of left one about 1.8 mm in dorsal view; left paramere in dorsal view with medi-

an notch very narrow; inner thin stick elongate; left spatula broader and strongly prolonged, and almost the same length as right spatula; right paramere in dorsal view broad in basal 3/7, then strongly attenuating toward apex of right spatula which bears an oblique short groove on the dorsal surface; and in right lateral view the apex of right spatula weakly but simply swollen; ventral apico-median area produced forward as an asymmetrical sharp process at the middle in ventral view.

Holotype: ♂, China, NW. Yunnan, Zhongdian City, 3,400 m alt., 5.VII.2005.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Yunnan).

*Etymology.* The specific name means 'resembling *denticulatus*'.

*Notes.* The present new species is somewhat related to *Phelotrupes (Phelotrupes) denticulatus* (BOUCOMONT, 1905) from China (Sichuan), but can be distinguished from the latter by the following characteristics: 1) body strongly and entirely opaque; 2) elytron weakly but distinctly grooved; 3) in male, ventral surface of femora strongly micro-granulose and opaque; 4) in male genitalia, parameres with right one simply swollen at apex in right lateral view. In contrast, *P. denticulatus* possesses the body moderately shining, the elytron strongly grooved, the ventral surface of femora weakly to scarcely micro-granulose, the right paramere more strongly swollen and somewhat complicatedly shaped at apex in right lateral view.

***Phelotrupes (Phelotrupes) reni* sp. nov.**

(Figs. 8, 30–32)

*Description of holotype.* Length: 15.4 mm (excluding mouth parts).

*Male.* Body moderate-sized, oblong-oval, strongly convex. Dorsal side faintly shining, smooth and entirely glabrous; ventral side almost opaque except for shining legs, and obviously clothed with blackish brown hairs. Color black, dorsal surface slightly tinged with dark aeneous, partly with bluish luster; ventral surface with tinged with dark bluish luster; mouth parts, palpi and legs blackish brown; antenna with foot-stalk brown, club segments dark brown.

Head somewhat strongly produced forward, with labrum truncate at apex; clypeus slightly transversely elliptic in outline; clypeal margin thinly bordered; median portion obtusely raised as a tubercle behind, then developed as a short obtuse keel apicad; clypeal suture finely defined in middle; T-shaped suture distinct; eye-tubercles weak, not so strongly raised; eye-canthus with external margin almost broadly rounded; surface shining, with clypeus slightly uneven, transversely and rather weakly rugose, and densely covered with strong punctures, which are partly indefinite, frons to vertex densely punctate in front, smooth and almost impunctate behind; eye-canthus irregularly and somewhat finely sculptured.

Pronotum rather wide, strongly convex, simply formed, about 1.7 times as wide as long (Pl : Pw = 4.6 : 7.6), widest at basal 3/8, with fine median longitudinal groove almost throughout, the groove distinct in basal 1/2 and very weak in apical 1/2; anterior margin shallowly emarginate, with marginal line thick in the middle and slightly thinner on either side, posterior edge of marginal line slightly raised; lateral margin gently rounded in basal 1/2, then almost straightly narrowed toward apex, with marginal line thinly bordered throughout; anterior angles slightly produced forward and rounded at apex, posterior one obtuse; basal margin distinctly bi-sinuate, thinly bordered in median 1/3 and almost un-bordered laterally; lateral fovea distinct; surface faintly shining and very finely micro-granulose, without posteromedial fovea, and with median portion apparently impunctate though vaguely punctulate, either lateral portion irregularly scattered with strong punctures along lateral margin.

Scutellum broadly triangular in outline, only slightly micro-granulose, with a median fovea in apical half.

Elytra slightly wider than pronotum, about 1.0 times as wide as long (El : Ew = 8.3 : 8.5), widest at basal 1/3, with a distinct humeral callus; disc strongly convex, each elytron with 14 striae; inner seven of which are strongly grooved, situated between suture and humeral callus; outer seven somewhat shallowly and weakly grooved than the inner seven ones, and often interrupted in part; striae punctures indistinct on inner seven ones, the punctures partly becoming more distinct on outer seven ones; intervals somewhat convex, almost smooth and weakly shining, apparently impunctate though in reality extremely punctulate all over, and partly sparsely wrinkled. Macropterous.

Profemora smooth and not armed on anterior edge; ventral side defined by a rather regularly indented transverse ridge at apical 1/3. Mesofemora with ventral side also defined by two indented transverse ridges, respectively at about apical 1/5 and about basal 2/5, the former incomplete and vanished halfway, and the latter complete. Metafemora armed with a little projected triangular tooth, situated at basal 4/9 on posterior edge, and then irregularly lobed outward; ventral side defined by two indented transverse ridges, respectively at apical 1/6 and basal 2/6. Metatrochanter strongly projected backward as a rounded tooth. Protibiae strongly dilated toward apex, incurved, with seven external teeth; ventral side armed with a fairly strong sharp tooth a little behind the middle of ventromedial edge. Abdomen with ventrites micro-granulose, irregularly punctate.

Aedeagus. Phallobase asymmetrical, Phl about 3.5 mm and Phw about 1.3 mm in ventral view; ventral side with sagittary ventral suture distinct, situated at near base, antero-median portion much widely and deeply incised and separated into two fairly elongate ventral lobes near either apex; right ventral lobe strongly incurved and slightly tumid at apex; left ventral lobe strongly incurved, and touched apically. Parameres markedly asymmetrical, Prl about 1.6 mm in dorsal view; left paramere in dorsal view with median notch rather broad; inner thin stick slender; left spatula strongly prolonged developed as fairly broad process, and slightly longer than the right spatula; right paramere in dorsal view broad in basal 1/3, then strongly constricted apicad, and strongly prolonged as right spatula; ventral antero-median area very narrowly notched at the middle, with asymmetrical sub-triangular projection at the right side of the notch.

Variation. Length: 15.4–17.8 mm; width: 8.5–9.5 mm (n = 9). Female. Head with clypeus more strongly produced forward than in male; surface especially on marginal portion of clypeus more strongly rugose. Mesofemora with ventral side bearing two indented transverse ridges, though the 1st ridge sometimes almost effaced on outer half. Protibiae obviously broader and weakly incurved, with external teeth distinctly stronger; ventral side with five to six small and weakly produced teeth on the ventromedial edge.

*Type series.* Holotype: ♂, China, Shaanxi, Taibaishan, 2,000 m alt., VII.2005. Paratypes: 2 ♂♂, 8 ♀♀, same data as the holotype.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Shaanxi).

*Etymology.* This species is named in honor of Prof. Dong REN, Capital Normal University, Beijing, China.

*Notes.* The present new species is similar to *Phelotrupes (Phelotrupes) weiweii* OCHI, KON et BAI, 2016 from China (Shaanxi) at a glance, but can be distinguished from the latter by the following characters: 1) metafemur with two indented transverse ridges on the ventral side, whereas in *P. weiweii*, it bears only single distinct indented transverse ridge on the ventral side; 2) pronotum with shallow but distinct transverse groove just behind anterior margin in both sexes, whereas in *P. weiweii*, it



is scarcely grooved in male and very weakly so in female; 3) clypeus strongly produced forward instead of being weakly produced and strongly transverse clypeus in the latter; 4) pronotum with basal margin thinly bordered in the middle, whereas in *P. weiweii*, it is distinctly thickly and briefly bordered in the middle; 5) in male genitalia, differently shaped, especially apex of right paramere short and strongly swollen in right lateral view, whereas in *P. weiweii*, it is elongate and somewhat sharp in right lateral view.

***Phelotrupes (Phelotrupes) reni gansuensis* ssp. nov.**

(Figs. 9, 33–35)

*Description of holotype.* Length: 15.3 mm (excluding mouth parts).

*Male.* Body moderate-sized, with dorsal side somewhat shining, smooth. Color black, dorsal and ventral surfaces distinctly tinged with dark bluish luster except for purplish legs; mouth parts, palpi and legs blackish brown; antennae with foot-stalk brown, club segments dark brown. Head with clypeus strongly produced forward and rather distinctly narrowed apicad. Pronotum fairly wide, strongly convex, simply formed, about 1.8 times as wide as long ( $Pl : Pw = 4.5 : 7.9$ ), widest at basal 1/2, with fine median longitudinal groove almost throughout. Scutellum with a median fovea occupied in full length. Elytra slightly wider than pronotum, about 1.0 times as wide as long ( $El : Ew = 8.5 : 8.3$ ), widest at a little behind the middle. Ventral side almost the same as the nominotypical subspecies. Aedeagus. Phallobase asymmetrical;  $Phl$  about 3.5 mm and  $Phw$  about 1.3 mm in ventral view; ventral side almost the same as the nominotypical one. Parameres asymmetrical,  $Prl$  about 1.9 mm in dorsal view; right paramere in dorsal view broad in basal third and then narrowed apicad; in right lateral view, right spatula not distinctly separated into two lobes but slightly seemingly weakly incised at apex. Variation. Length: 15.3–18.8 mm; width: 8.3–9.2 mm ( $n = 15$ ). Dorsal surface with bluish tinge slightly stronger than in the nominotypical subspecies.

*Type series.* Holotype: ♂, China, S. Gansu, Minshan Mts., 2,700 m alt., 25.VII.2000. Paratypes: 6 ♂♂, 10 ♀♀, the same data as the holotype.

*Type depository.* The holotype will be deposited in the collection of the Institute of Zoology, Chinese Academy of Sciences, People's Republic of China.

*Distribution.* China (Gansu).

*Etymology.* The subspecific name is named after Gansu, the type locality.

*Notes.* The present new subspecies is different from the nominotypical subspecies by the following points: 1) clypeus more strongly produced forward and more distinctly narrowed toward apex; 2) elytra mostly a little longer and pronotum mostly slightly shorter; 3) dorsal surface with bluish luster stronger; 4) in male genitalia, right spatula not distinctly separated into two lobes but slightly incised in right lateral view.

### Acknowledgments

We express our hearty thanks to Mr. S. KAKIZOE for taking photographs. Thanks are also due to Mr. P. SCHOOLMEESTERS for invaluable information.

### 要 約

越智輝雄・近 雅博・白 明：中国からセンチコガネムシ科(鞘翅目)に属する *Odontotrypes* 属及び *Phelo-*

*trupes* 属 8 新種の記載。 —— *Odontotrypes* 属 3 新種, *Odontotrypes (Thorectomimus) yangi* sp. nov., *O. (T.) schoolmeestersi* sp. nov., *O. (T.) weiweii* sp. nov., 及び *Phelotrupes* 属 5 新種, *Phelotrupes (Chromogeotrupes) semibicolor* sp. nov., *P. (Eogeotrupes) caii* sp. nov., *P. (Phelotrupes) beuteli* sp. nov., *P. (P.) semidenticulatus* sp. nov., *P. (P.) reni* sp. nov. さらに *P. (P.) reni* の亜種を甘肅省から *P. (P.) reni gansuensis* ssp. nov. として記載した。

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Manuscript received 28 February 2017;  
revised and accepted 10 May 2017.