

Taxonomic Notes on the Genus *Coeliodes* SCHOENHERR from Continental China (Coleoptera, Curculionidae)

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Abstract The genus *Coeliodes* SCHOENHERR (Ceutorhynchinae, Ceutorhynchini) of continental China is studied taxonomically. *Coeliodes babai* VOSS et CHŪJŌ and *C. nakanoensis* HUSTACHE are newly recorded from Shaanxi and Heilongjiang Provinces, northeastern China, respectively. *Coeliodes tibetanus* YOSHITAKE et HUANG, a new species, is described from Tibet, with habitus photographs and illustrations of taxonomically important features. A key to *Coeliodes* species occurring in continental China is provided.

Introduction

Coeliodes SCHOENHERR, 1837 constitutes 34 species from the Palearctic and Oriental Regions (COLONNELLI, 2004). Weevils of this genus are characterized mainly by having the scaly bands on elytra, relatively short corbels on fore legs, and wide mesosternal receptacle.

To date, 15 species of this genus have been recorded from the East Palearctic Region, such as Japan and Taiwan (COLONNELLI, 2013). From continental China, however, only one species, *Coeliodes sinensis*, was described by KOROTYAEV (1997). Judging from the vast land area of China, which retains a remarkably high biodiversity, the occurrence of more species of this genus is strongly expected.

This paper is addressed to improve our knowledge of the *Coeliodes* fauna in continental China, with distributional records of two new species for the country and a description of a new species to science.

Material and Methods

Specimens preserved in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS) and the National Institute for Agro-Environmental Sciences, Tsukuba, Japan (NIAES) were examined for this study. The morphological data of *Coeliodes sinensis* provided by KOROTYAEV (1997) is also referred to in this study. All the descriptive work in this study was completed by H. YOSHITAKE and J. HUANG. The holotype of the new species described herein is preserved in IZCAS.

External structures were observed under a Leica M50 stereoscopic microscope. Photographs of dorsal and lateral habitus of a male specimen were taken with a Canon EOS M2 digital camera and Canon MP-E6528M macro-photographic lens. Each final image was assembled from a series of pho-

tographs with different focal planes, using the computer freeware CombineZM (HADLEY, 2008). Measurements of various body parts in dorsal view are coded as follows: LB = length of the body, from the apical margin of pronotum to the apices of closed elytra; LR = length of the rostrum; LP = length of the pronotum; WP = maximum width across the pronotum; LE = length of the elytra, from the level of the basal margins to the apices of the closed elytra. To examine male genitalia, specimens were macerated in hot water and dissected under the stereoscopic microscope. The abdomen was first removed from the body and then cleaned in hot 10 % KOH solution for five minutes. Male terminalia extracted from the abdomen were mounted on slides with glycerol, studied with a Nikon Eclipse Ci optical microscope and drawn in detail through an attached camera lucida. Scale bars were calibrated using a Nikon objective micrometer. Plant nomenclature follows YONEKURA and KAJITA (2003).

Taxonomy

Coeliodes SCHOENHERR, 1837

Coeliodes SCHOENHERR, 1837: 282 (type species: *Curculio quercus* FABRICIUS, 1787 = *Curculio dryados* [GMELIN], 1790). See COLONNELLI (2004) for other synonymy.

Diagnosis. *Coeliodes* is very similar to *Brevicoeliodes* KOROTYAEV, 1997 in having the deep metasternal receptacle, but differs from *Brevicoeliodes* by the scaly bands on elytra, shorter corbels of fore tibiae and wider mesosternal receptacles.

Distribution. Palearctic and Oriental Regions.

Biological note. Weevils of this genus have been known to be associated with Fagaceae trees (e.g., DIECKMANN, 1972; KOROTYAEV, 1997; YOSHITAKE, 1999 a; YOSHITAKE & KOJIMA, 2001 a, b).

Coeliodes babai VOSS et CHÛJÔ, 1960

(Figs. 1, 2)

Coeliodes babai VOSS & CHÛJÔ, 1960, 1 (type locality: "Kurokawa in Niigata Pref."). — MORIMOTO, 1962, 193 (in checklist; Honshu); 1989, 513 (in checklist); 1993, 4 (habitus of the holotype). — HONG *et al.*, 2011, 116 (Korea: South). — COLONNELLI, 2013, 188 (in catalog; Far Eastern Russia, Japan, South Korea).

Coeliodes (Coeliodes) zinovjevi KOROTYAEV, 1997, 617 (Russia: Amurskaya Prov.). — YOSHITAKE, 1999 b, 165 (Japan: Honshu, Shikoku). — HONG *et al.*, 2000, 102 (Korea: South). — KOROTYAEV & HONG, 2004, 157 (in list). — YOSHITAKE & MORIMOTO, 2004, 233 (= *Coeliodes babai*).

Coeliodes brunneus: HONG *et al.*, 1999, 164 (nec HUSTACHE, 1916; Korea: South).

Coeliodes nakanoensis: NAKANE, 1963, 373, pl. 187, fig. 14 (nec HUSTACHE, 1916).

Diagnosis. *Coeliodes babai* shows some resemblance to *C. nakanoensis* HUSTACHE in general appearance, but can be easily distinguished from *C. nakanoensis* in having the following features: meso- and metasterna and venter infusate; mesosternal receptacle V-shaped, terminating at the level between basal margins of hind coxae (male) or U-shaped, projecting over basal margin of ventrite I, and terminating at the level between the middle of hind coxae (female); discal concavity of male ventrite II wider and shallower, lacking scaly maculation; discal concavity of male ventrite V shallower, neither with paired prominences nor tufts of long incurved setae at sides.

Specimen examined. China: Shaanxi. 1 female, Mt. Taibaishan, 1,740 m, 23.VII.1956, Y. ZHOU, IOZ(E) 895811 (IZCAS).

Distribution. Northwestern China (Shaanxi – new record), Russian Far East (Amurskaya), Korea



Figs. 1–6. *Coeliodes* spp. from continental China. — 1, 2, *C. babai*, female; 3, 4, *C. nakanoensis*, male; 5, 6, 7, *C. tibetanus*, holotype male. — 1, 3, 5, Dorsal habitus; 2, 4, 6, lateral habitus; 7, venter.

(South) and Japan (Honshu, Shikoku).

Biological notes. Adults of this species were obtained from *Quercus mongolica* FISCH. ex LEDEB. (Fagaceae) in Amurskaya Province, southeastern Russia (KOROTYAEV, 1997) and South Korea (HONG *et al.*, 2011), respectively. In Japan, this species is abundant on *Quercus dentata* THUNB. and *Q. serrata* MURRAY in spring (YOSHITAKE, unpubl.).

***Coeliodes nakanoensis* HUSTACHE, 1916**

(Figs. 3, 4)

Coeliodes nakanoensis HUSTACHE, 1916, 114 (type locality: “mont. Takao près Hachiôji”). — DALLA TORRE & HUSTACHE, 1930, 13 (in catalog; “Japon”). — MORIMOTO, 1962, 193 (in checklist; Japan: Honshu); 1984, 315, pl. 62, fig. 6 (habitus, diagnosis & biological note; Japan: Honshu, Kyushu); 1989, 513 (in checklist). — NAKANE, 1963, 373, pl. 187, fig. 14 (diagnosis; Honshu). — HONG *et al.*, 1999, 166 (Korea: Central). — COLONNELLI, 2004, 67 (in catalog; Japan). — YOSHITAKE *et al.*, 2004, 101 (in checklist; Japan, Korea, East Siberia). — KOROTYAEV & HONG, 2004, 157 (in list). — HONG *et al.*, 2011, 117 (Korea). — COLONNELLI, 2013, 189 (in catalog; Far Eastern Russia, Japan, South Korea).

Coeliodes (Coeliodes) nakanoensis: KOROTYAEV, 1997, 618 (redescription with lectotype designation; Russia: Primorskii Terr.). — HONG *et al.*, 2000, 102 (in catalog).

Diagnosis. *Coeliodes nakanoensis* shows some resemblance to *C. babai* in general appearance, but clearly differs from *C. nakanoensis* in having the following features: meso- and metasterna and venter entirely black; mesosternal receptacle U-shaped in both sexes, terminating at the level between basal margins of hind coxae (male) or terminating at the level before the middle of hind coxae, faintly projecting over basal margin of ventrite I (female); discal concavity of male ventrite II deeper and narrower, with a yellowish patch of dense scales; discal concavity of male ventrite V deeper, with a pair of prominences at sides, each of which is furnished with a tuft of long incurved setae.

Specimen examined. China: Heilongjiang. 1 male, Dailing, 390 m, 8.V.1957, Z. HE, IOZ(E)895812 (IZCAS).

Distribution. Northeastern China (Heilongjiang – new record), Russian Far East (Primorye), Korea (Central) and Japan (Honshu, Kyushu).

Biological notes. MORIMOTO (1984) noted that *C. nakanoensis* larvae grow in the buds of *Quercus dentata* (Fagaceae) in Japan.

***Coeliodes sinensis* KOROTYAEV, 1997**

Coeliodes (Coeliodes) sinensis KOROTYAEV, 1997, 628 (type locality: China, Sichuan, Kangding Distr., valley of Yala nr. Zhangga vill.).

Coeliodes sinensis: COLONNELLI, 2004, 68 (in catalog; Sichuan: Southeast China); 2013, 189 (in catalog; Sichuan, China).

Diagnosis. *Coeliodes sinensis* is similar to *C. gressitti* KOROTYAEV, 1997 from Taiwan in general appearance, but differs from *C. gressitti* mainly in having the mat, narrower body that is dark brown except paler legs, elytra with irregular scaly bands, and antennae inserted slightly proximal to the middle of rostrum in the male (KOROTYAEV, 1997).

Distribution. Southern China (Sichuan).

Comment. This species is unknown to us.

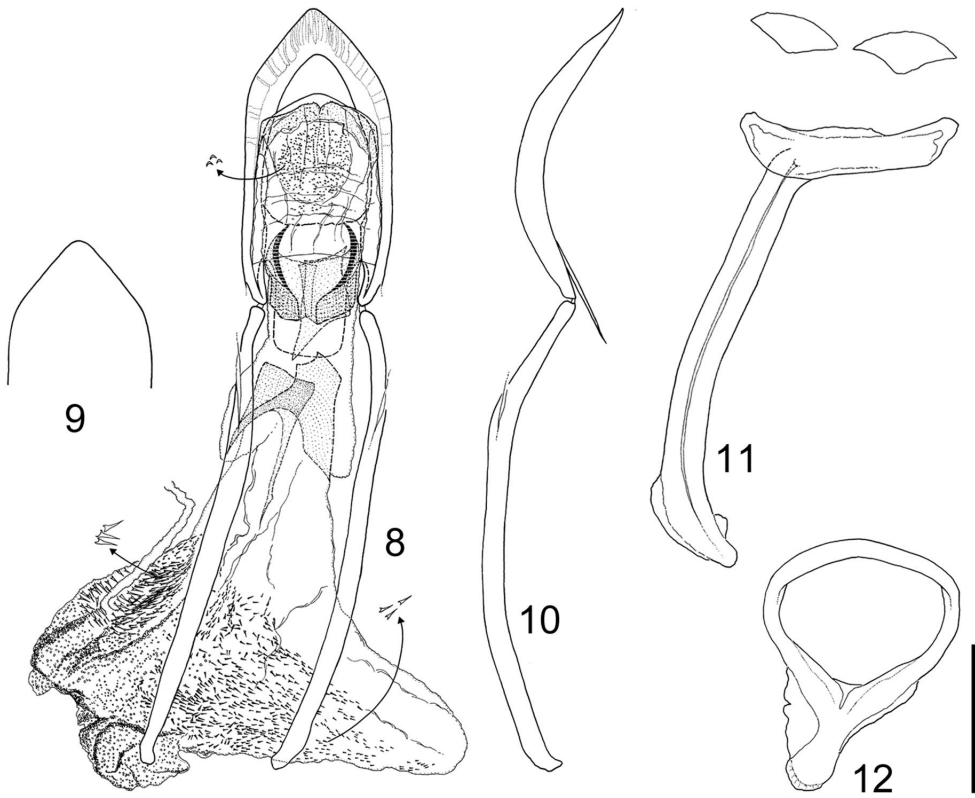
***Coeliodes tibetanus* YOSHITAKE et HUANG, sp. nov.**

(Figs. 5–12)

Diagnosis. *Coeliodes tibetanus* is very similar to *C. sinensis* in general appearance, but differs from *C. sinensis* mainly by the paler body color, thinner and less curved rostrum, and differences in secondary sexual traits of the male.

Description. Male. Dimensions: LB: 2.56 mm, LR: 0.93 mm, LP: 0.93 mm, WP: 1.05 mm, LE: 1.81 mm, WE: 1.58 mm. N = 1 for all measurements. Habitus photographs as shown in Figs. 5 and 6.

Reddish brown in general appearance. Apical half of rostrum, basal margins of pronotum and elytra, coxae, the base of each leg, sterna, basal margin and the middle of apical margin of ventrite I,



Figs. 8–12. Male genitalia of *Coeliodes tibetanus*. — 8, Aedeagus, in dorsal view; 9, apex of aedeagal body, in dorsal view; 10, aedeagus, in lateral view; 11, sternite IX; 12, tegmen. Scale bar: 0.25 mm.

apical margin of ventrite II, ventrites III and IV, and all margins of pygidium tinged with black.

Head densely covered with yellowish-gray to light brown narrow scales, which are weakly dilated apically and truncate at the apex. Rostrum covered with yellowish-gray liner scales in basal 1/3, then sparsely clothed with fine hairs in apical 2/3. Prothorax covered mainly with narrow scales, which are weakly dilated apically and truncate at the apex; dorsum densely covered with short, narrow, yellowish-gray to pale-brown scales, except apical part moderately covered with longer and paler scales; basal margin fringed with white elliptical scales; each side displaying a white stripe of elliptical scales; latero-ventral parts moderately covered with shiny, fine, pale brown scales, mixing with white elliptical scales. Scutellum densely covered with fine white elliptical scales. Elytra moderately covered with shiny, narrow, pale brown scales, mingled with white scales on periphery, with a small postscutellar patch of white lanceolate scales, with an obscure white scaly band in postmedian part; band composed of white narrow scales, mingled with elliptical scales; each interval containing 1–4 rows of scales. Legs moderately covered with narrow to linear pale brown scales, mixing with white scales; tibiae clothed with fine brown hairs in apical half; corbel of each tibia fringed with dark setae. Lateral pieces of meso- and metasterna densely covered with white to dull white elliptical scales, mingled with white scales on periphery. Sterna covered mainly with dull white acicular to lanceolate scales, sparsely mixing with elliptical scales. Venter (Fig. 7) moderately covered with white acicular

to lanceolate scales; ventrite I covered with smaller scales on disc; ventrite II densely covered with dull white scales in median concavity; ventrites III and IV naked in the middle; ventrite V sparsely covered with dull white minute scales in the middle, bearing a tuft of long hairs on each side of median concavity; hairs composing of tufts semierect and incurved. Pygidium moderately covered with shiny white narrow scales.

Head coarsely reticulately punctured; forehead flat, slightly wider than the base of rostrum. Rostrum as long as pronotum, weakly and evenly curved; dorsum finely rugosely punctured, opaque in basal 2/3; punctures becoming minute toward the apex; apical part rather strongly shiny. Antennae inserted at the middle of rostrum; scape moderate in length, nearly as long as funicular segments I–V combined, rounded and furnished with two brown narrow scales at the apex; funicle with segment I longer than II, II slightly longer than III, III and IV subequal in length, V to VII subequal in length, each shorter than IV, VII nearly as long as wide; club subovoid, finely pubescent in apical 1/3.

Prothorax 0.51 times as long and 0.67 times as wide as elytra, 1.14 times wider than long, widest near the base, subparallel-sided in basal 1/3, then rapidly narrowing toward subapical constriction; dorsum finely reticulately punctured, weakly shiny, rather strongly convex, weakly depressed in antiscutellar part, widely depressed in subapical part; basal margin strongly bisinuate. Scutellum narrowly ovate.

Elytra 1.96 times longer and 1.50 times wider than pronotum, 1.15 times longer than wide, widest just behind humeri, subparallel in basal halves, then straightly convergent toward subapical calli; striae moderate in depth; intervals twice to three times wider than striae, densely minutely punctured, shiny, moderately convex; subapical calli weakly rugged with minute squamate granules.

Legs finely moderately punctured, shiny. Femora each armed with a vestigial tooth which is concealed by white semierect scales. Fore tibiae simple at the apex, lacking mucrones; corbels short, slightly dilated outward in apical 1/4. Mid and hind tibiae mucronate apically; corbels longer, extending from apical 1/3 to the apex, scarcely dilated outward. Tarsi with segment V moderate in length; claws minutely toothed.

Sterna densely punctured; mesosternal receptacle U-shaped, terminating at the level between basal margins of hind coxae. Venter as shown in Fig. 7; ventrites I and II strongly shiny and finely moderately punctured; ventrite I widely and rather deeply concave on disc; ventrite II with a deep, small, circular concavity on disc; basal margin of ventrite I slightly emarginate in the middle along concavity of ventrite II; ventrites III–V densely, minutely punctured, opaque; ventrites III and IV polished on disc; ventrite V with a shallow, transverse, semicircular concavity in apical half of the disc.

Pygidium transverse-pentagonal, finely reticulately punctured, weakly shiny. Sternite IX (Fig. 11) diminished to a pair of lunate sclerites; spiculum gastrale moderate in length, 1.60 times longer than aedeagal body, nearly as long as aedeagal apodemes, bent leftward. Tegmen (Fig. 12) with a short apodeme, 0.33 times as long as diameter of tegminal ring, widened apically. Aedeagal body (Figs. 8–10) wide, subparallel-sided in basal 2/3, and then gradually convergent toward the apex and rounded at the apex, relatively thin with a moderate downward curve in profile. Endophallus (Fig. 8) with the following structures: 1) a field of dense, acicular spicules in basal part, 2) a pair of plate-like sclerites in median part, 3) a pair of steric sclerites and a plate-like sclerites in antimedial part, and 4) a field of minute, obtuse spicules near orifice.

F e m a l e. Unknown.

Type material. Holotype, male (IZCAS), China, Tibet, Mangkang, Haitong, 3,250 m, 11. VIII.1982, X. ZHANG, IOZ(E)894832.

Distribution. Southern China (Tibet).

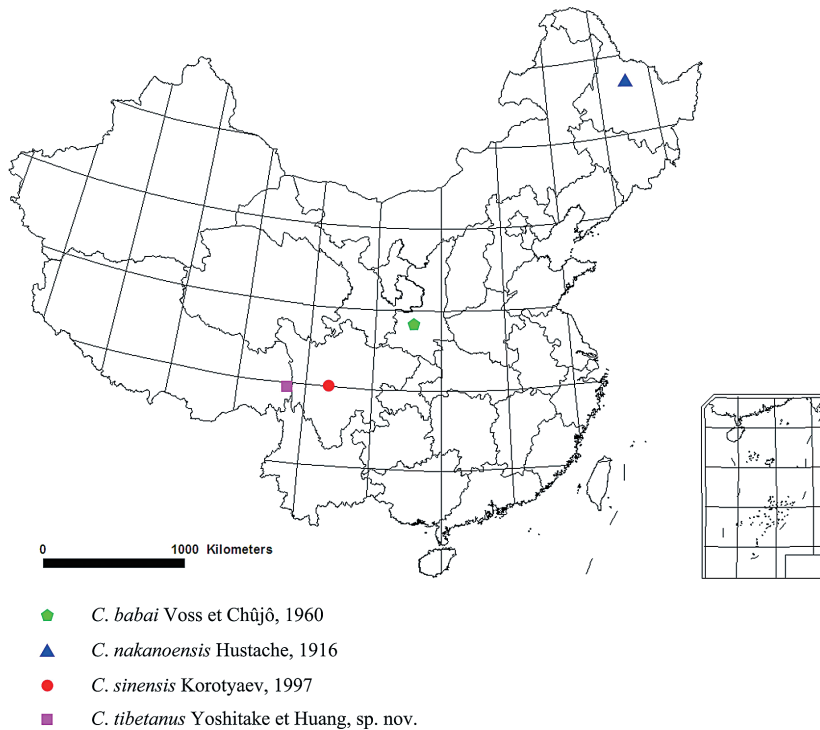


Fig. 13. Geographic distributions of *Coeliodes* spp. from continental China.

Key to *Coeliodes* Species from Continental China

- 1(4) Male rostrum as long as pronotum.
- 2(3) Body dark brown, except legs paler. Rostrum stout, moderately curved. Male ventrite II gently impressed in the middle. Sides of median impression of male ventrite V prominent ventrally. *C. sinensis*
- 3(2) Body reddish brown, except the apex of rostrum black. Rostrum thinner, weakly curved. Median impression on male ventrite II abrupt, deep. Sides of median impression of male ventrite V simple, not prominent. *C. tibetanus*
- 4(1) Male rostrum longer than pronotum.
- 5(6) Elytra with a brown to dark brown transverse band in the middle. Mesosternal receptacle V-shaped, terminating at the level between basal margins of hind coxae (male) or U-shaped, projecting over basal margin of ventrite I, and terminating at the level between the middle of hind coxae (female). *C. babai*
- 6(5) Elytra reddish brown, sometimes with a black, shallowly obtriangular marking in basal part. Mesosternal receptacle U-shaped in both sexes, terminating at the level between basal margins of hind coxae (male) or terminating at the level before the middle of hind coxae, faintly projecting over basal margin of ventrite I (female). *C. nakanoensis*

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要 約

吉武 啓・黄 俊浩・張 潤志・伊藤 元己：中国大陸産オビアカサルゾウムシ属（鞘翅目ゾウムシ科）の分類覚え書。——中国大陸産オビアカサルゾウムシ属の分類学的研究を行った結果，1新種2新記録種を含む以下の4種が認められた。1) ババオビアカサルゾウムシ *Coeliodes babai* VOSS et CHÛJÔ（陝西省－中国新記録種），2) オビアカサルゾウムシ *Coeliodes nakanoensis* HUSTACHE（黒龍江省－中国新記録種），3) チュウゴクオビアカサルゾウムシ *Coeliodes sinensis* KOROTYAEV（四川省），4) チベットオビアカサルゾウムシ *Coeliodes tibetanus* YOSHITAKE et HUANG（チベット－新種）。今回，中国大陸産全既知種の検索表を付したが，チュウゴクオビアカサルゾウムシについては，標本を実検できなかったため，原記載論文（KOROTYAEV, 1997）から形態情報を引用した。

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