

**A KEY TO SPECIES OF THE GENUS *CACCOBIUS* THOMSON
(COLEOPTERA: SCARABAEIDAE: SCARABAEINAE) FROM CHINA, WITH
DESCRIPTION OF A NEW SPECIES**

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Abstract.—Diagnosis, description, and illustrations of the head, pronotum, profemur, protibia, pygidium, and aedeagus of *Caccobius (Caccobius) excavatus*, n. sp., are given. A key to the species of *Caccobius* Thomson from China is included.

Key Words: China, *Caccobius*, Scarabaeinae, Scarabaeidae, Coleoptera, new species, key

The genus *Caccobius* (Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini) was established by Thomson in 1863. There are 89 world species (Gillet 1911, Balthasar 1963) and 18 species currently known in China, including one new species described here. Species of *Caccobius* are tunnellers, and their nesting behavior is complex (Halffter and Edmonds 1982, Philips et al. 2004). They can be collected from various animal excrement, such as cow, elephant, gaur, buffalo, pig, and human. The species of this genus are of short compact form and generally of small size, some of them very small. The front angles of the thorax have a deep, sharply defined, hollow beneath. Males may be armed with a single short horn, a pair of horns, or they may be entirely without armature.

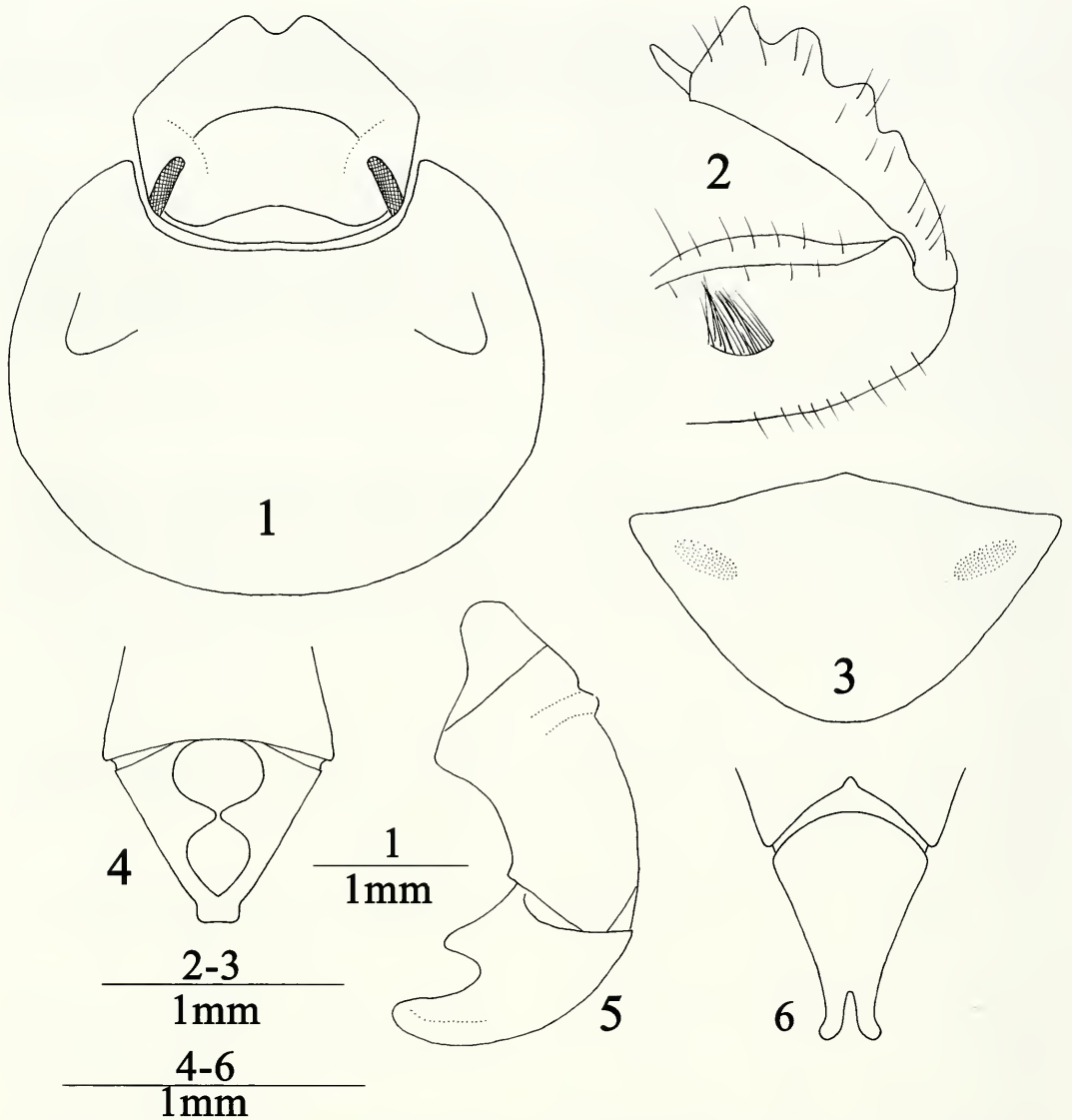
In this paper, 18 species of *Caccobius* from China are treated, among them *Caccobius (Caccobius) excavatus* described as new. A key to the species of China and illustrations of the head,

pronotum, profemur, protibia, pygidium, and aedeagus of *C. excavatus* and *C. jessoensis* are given.

***Caccobius (Caccobius) excavatus* Bai,
Zhang, and Yang, new species
(Figs. 1–6)**

Holotype male.—Length from clypeus to pygidium 6.5 mm; width across humeri 3.5 mm. Shape broadly oval, compact, convex. Color deep dark brown; head and pronotum slightly metallic, elytra brown at base and apex.

Head: Clypeus with front margin deeply notched in middle, finely and closely rugulose. Anterior carina of head short, not close to front margin. *Thorax:* Shape of pronotum parabolic, 1.2 times wider than long. Surface strongly and closely punctate, without median line, completely margined. Anterolateral angles of pronotum acute (Fig. 1). Profemur with strong, dense punctures, meso- and metafemora with fine and sparse punctures. Procoxa with long pubes-



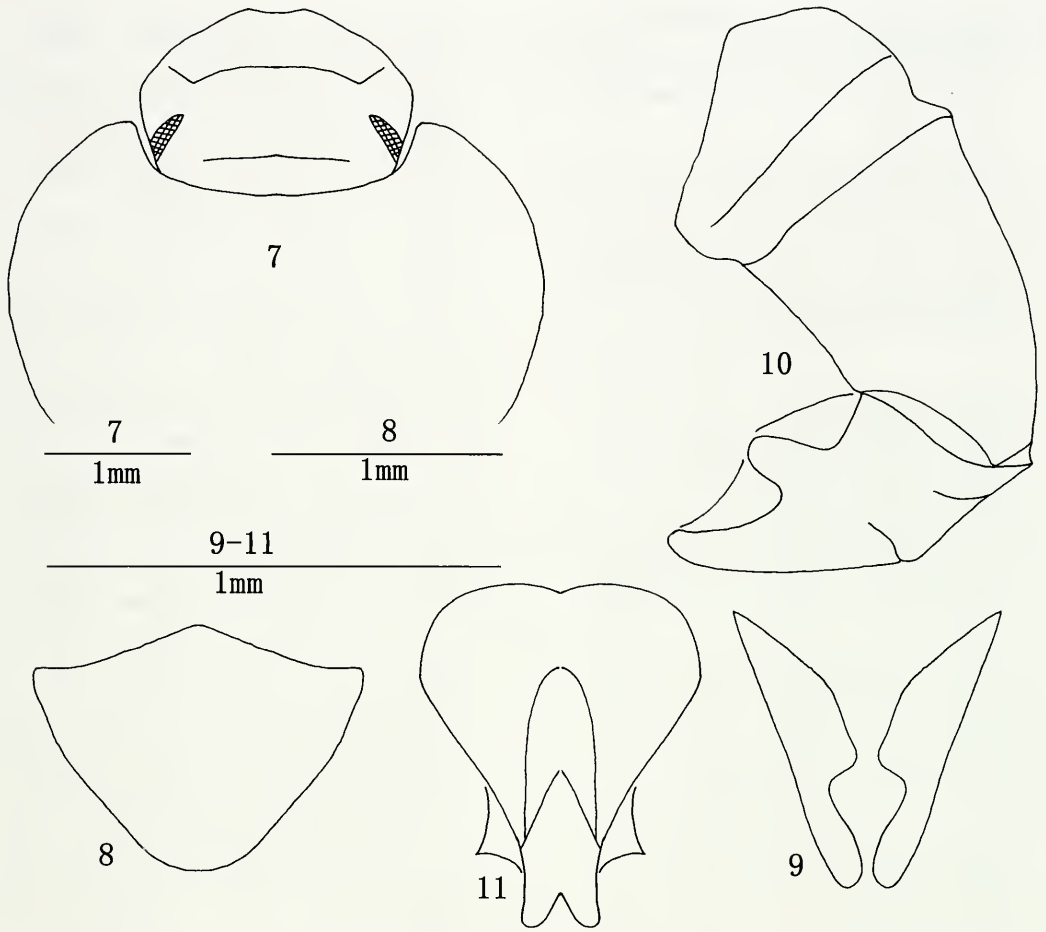
Figs. 1-6. *Caccobius (Caccobius) excavatus*. 1, Dorsal view of head and pronotum. 2, Profemur and protibia. 3, Pygidium. 4, Parameres, ventral view. 5, Aedeagus, lateral view. 6, Parameres, dorsal view.

cence. *Abdomen*: Elytral striae distinct, intervals flat and microscopically punctate. Shape of pygidium parabolic, 1.7 times wider than long. Surface with 2 shallow foveae near front margin (Fig. 3). 1st to 5th segments sparsely and strongly punctate, 6th segment densely and finely punctate. Aedeagus (Figs. 4-6) with basal plate 1.6 times longer than parameres, parameres with 2 broad, deep notches in lateral view.

Female.—Length 7.2 mm; width across humeri 4.1 mm. Similar to male except notch of clypeal front margin shallower and anterior carina of head longer.

Variation in paratypes.—Length from clypeus to pygidium 6.5–7.2 mm; width across humeri 3.5–4.1 mm. Light brown marks on elytra present in some males.

Type material.—Holotype: P. R. CHINA. ♂, Xizang, Jilong, 2800 m, 25 July 1971, Col. Xue-zhong Zhang. Paratypes:



Figs. 7-11. *Caccobius (Caccobius) jessoensis*. 7, Dorsal view of head and pronotum. 8, Pygidium. 9, Parameres, ventral view. 10, Aedeagus, lateral view. 11, Parameres, dorsal view.

P. R. CHINA. 1♂, Same data as holotype; 1♀, Xizang, Chaya, Jitang, 3600 m, 8 July 1976, Col. Yin-heng Han. Type material deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, P. R. China (IZAS).

Distribution.—China (Xizang).

Diagnosis.—The new species is similar to *Caccobius (Caccobius) jessoensis* Harold, 1867 (Figs. 7-11), but differs primarily by the deep notch in the middle of the clypeal front margin (Fig. 1), the acute anterolateral angles of the pronotum (Fig. 1), and the presence of two shallow foveae near the front margin of the pygidium (Fig. 3). *Caccobius (C.) jessoensis* has the front margin of the

clypeus shallowly notched in the middle (Fig. 7), the anterolateral angles of the pronotum blunt (Fig. 7), and the pygidium without foveae near the front margin (Fig. 8).

Etymology.—The name is from Latin and refers to the deep notch on the front margin of the clypeus.

KEY TO ADULTS OF *CACCOBIUS*
FROM CHINA

- 1 Upper surface of head and pronotum smooth, entirely without setae. Prosternum with 2 carinae (subg. *Caccobius*) 2
- Upper surface of head and pronotum setose. Prosternum with 1 carina (subg. *Caccophilus*) 8
- 2 Elytra black or dark brown 3

- Elytra bicolored, at least reddish brown or yellow at apex 5
- 3 Body length over 6.0 mm. Front margin of clypeus notched (Fig. 1). Head and pronotum metallic 4
- Body length 4.5–5.0 mm. Front margin of clypeus not notched. Head and pronotum not metallic (China: Xizang)
 *C. (Caccobius) imitans* Balthasar, 1933
- 4 Front margin of clypeus deeply notched (Fig. 1). Anterior carina of head far from front margin. Anterolateral angles of pronotum acute (China: Xizang)
 *C. (Caccobius) excavatus*, n. sp.
- Front margin of clypeus shallowly notched (Fig. 7). Anterior carina of head close to front margin. Anterolateral angles of pronotum round (China: Beijing, Hebei, Shanxi, Shaanxi, Henan, Guangxi, Sichuan, Yunnan; Japan)
 *C. (Caccobius) jessoensis* Harold, 1867
- 5 Size small, body length not over 3.0 mm. Male pronotum simple, not armed (China: Taiwan)
 *C. (Caccobius) flavolimbatu*s Balthasar, 1942
- Size large, body length at least 5.0 mm. Male pronotum armed 6
- 6 Pronotum not metallic. Elytral interstriae flat and sparsely, deeply punctate, with large punctures (China: Taiwan)
 *C. (Caccobius) chujoi* Paulian, 1942
- Pronotum slightly metallic. Elytral interstriae convex and densely, shallowly punctate, with small punctures 7
- 7 Male with anterior carina of head feeble and straight, female with anterior carina of head curved. Female pronotum feebly armed (China: Hubei, Hunan, Fujian, Taiwan, Sichuan, Yunnan; Vietnam; Laos; India)
 *C. (Caccobius) gonoderus* (Fairmaire, 1888)
- Both sexes with anterior carina of head distinct and somewhat curved. Female pronotum not armed (China: Yunnan; Vietnam)
 *C. (Caccobius) demangei* Boucomont, 1919
- 8 Pronotum armed with 1 tooth. Elytra dark red or brown. Interstriae convex 9
- Pronotum armed with more than 1 tooth or unarmed. Elytra with different colors, not red or brown. Interstriae flat 10
- 9 Upper surface opaque. Male with anterior carina of head absent. Pronotum with simple punctures. Body length 6.0–7.0 mm (China: Sichuan, Yunnan)
 *C. (Caccophilus) boucomonti* Balthasar, 1935
- Upper surface shining. Male with anterior carina of head present. Pronotum with umbilicate punctures. Body length 5.0–6.5 mm (China: Hebei, Shanxi; Russia; Korea)
 *C. (Caccophilus) sordidus* Harold, 1886
- 10 Body length 3.5 mm or less. Male and female pronotum simple, unarmed 11
- Body length 4.5–9.0 mm. Male pronotum armed, female pronotum unarmed 14
- 11 Male head without carina, female head with short carina or without carina (China: Fujian)
 *C. (Caccophilus) scrofa* Balthasar, 1941
- Male and female head with distinct and somewhat curved carinae 12
- 12 Male head without tooth and anterior carina of head arcuate, posterior carina of head curved. (China: Fujian)
 *C. (Caccophilus) pullus* Jekel, 1872
- Male head without anterior carina and with 1 tooth pointing posteriorly, posterior carina of head stright 13
- 13 Pronotum with sparse punctures. Elytral interstriae coarsely punctate. Body length 2.5–3.0 mm (China: Heilongjiang, Jilin, Liaoning, Beijing, Hebei, Shanxi, Hubei, Hunan, Hainan, Sichuan; Vietnam; Philippines; Myanmar; India)
 *C. (Caccophilus) unicornis* (Fabricius, 1789)
- Pronotum with dense punctures. Elytral interstriae with fine rugosity. Body length 3.0–3.5 mm (China: Shanghai, Fujian)
 *C. (Caccophilus) fukiensis* Balthasar, 1941
- 14 Posterior carina of head triangular in male 15
- Posterior carina of head crescent-shaped or simple in male 17
- 15 Front margin of clypeus round in male and female (China: Heilongjiang, Jilin, Liaoning, Henan, Xizang; Russia; Korea)
 *C. (Caccophilus) christophi* Harold, 1879
- Front margin of clypeus of male not round, somewhat notched, front margin of female straight or somewhat notched 16
- 16 Front margin of clypeus slightly notched in male (similar to Fig. 7), front margin clearly round in female. Male pronotum armed, female pronotum simple. Body length 8.0–9.0 mm (China: Gansu, Shaanxi, Henan; Russia)
 *C. (Caccophilus) sibiricus* Balthasar, 1935
- Front margin of clypeus deeply notched in male (similar to Fig. 1), female front margin notched deeper than male. Male and female pronotum simple. Body length 4.6–4.8 mm (China: Yunnan)
 *C. (Caccophilus) yunnanicus* Kabakov, 1994
- 17 Posterior carina of head forming a tooth in male and female. Body length 4.0–5.0 mm (China: Fujian, Guangdong; India; Indo-

- nesia)
 *C. (Caccophilus) tortus* Sharp, 1875
 - Posterior carina of head simple in male and female. Body length 4.5–5.5 mm (China: Heilongjiang, Jilin, Liaoning, Shanxi; Korea; Japan)
 *C. (Caccophilus) brevis* Waterhouse, 1875

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