A taxonomic study of the genus Coptacra Stål, 1873
(Orthoptera: Acridoidea: Catantopidae) from China with description of one new species

YIN Xiang-Chu1,2,3,*, YE Bao-Hua3, YIN Zhan3

1. College of Life Sciences, Hebei University, Baoding, Hebei 071002, China;
2. Northwest Plateau Institute of Biology, Chinese Academy of Sciences, Xining 810008, China;
3. College of Plant Protection, Shandong Agricultural University, Tai’an, Shandong 271018, China)

Abstract: This paper deals with a taxonomic study of Coptacra Stål, 1873 from China, with a description of a new species Coptacra xiai sp. nov. The new species is similar to C. yunnanensis Zhang et Yin, 2002, but the frontal ridge contracted under median ocellus; vertical diameter of eye 2.2 times its horizontal diameter; median vein area of tegmen wider than cubital area; upper ovipositor valves narrow, long and smooth. A key to the known species of the genus Coptacra from China is given. The type specimens are deposited in the Museum of Hebei University (MUH), China.

Key words: Orthoptera; Acridoidea; Catantopidae; Coptacra; new species; China

The genus Coptacra was erected by Stål in 1873. It is very similar to Euphymacris Bi, 1984, but it differs from the latter in; cross veins vertical with longitudinal veins on the apical part of tegmen; pronotum without thick granules; antennae slender, far extending beyond the posterior margin of pronotum; prosternal process pointed at apex. We agree with the view point of Bi (1984), that the genus Euphymacris is valid and its type species is Euphymacris lofooshana (Tinkham, 1940) = Coptacra lofooshana Tinkham, 1940 (Type locality: Lofoashan, Guangdong, China). We also agree with the view point of Li et al. (2006), that the species Coptacra tuberculata Ramme, 1941 (Type locality: Lofoashan, Guangdong, China) is a synonym of Euphymacris lofooshana (Tinkham, 1940).

In the present paper, a taxonomic study of the genus Coptacra Stål, 1873 from China is given, including eight species, with the description of a new species from Yunnan, China. A key to the known species of the genus Coptacra from China is given.

The type specimens are deposited in the Museum of Hebei University (MUH), China.

Genus Coptacra Stål, 1873

(Serville, 1839; Walker, 1870; Bolivar, 1902; Rehn, 1902; Willemsen, 1939; Tinkham, 1940; Ramme, 1941; Bei-Bienko, 1968; Balderson et Yin, 1987; Yin et al., 1996; Zhang et Yin, 2002; Wei et Zheng, 2005; Eades et al., 2009

distributed in Costa Rica, Japan, Indonesia, Malaya, Viet Nam, Cambodia, Burma, India, Nepal and China, among which 8 species are found in China (including a new species).

Key to the species of Coptacra Stål, 1873 from China

1 Frons slightly concave inward at the middle in profile view ................................................................. 2
   - Frons relatively straight, not concave inward at the middle in profile view ........................................ 3

2 Antennae brown, apical four segments yellowish; inner side of hind femur red, tegmina extending over the apex of hind femur slightly ........................................... C. hainanensis Tinkham, 1940
   - Antennae all brown; inner side of hind femur black, tegmina reaching far behind the apex of hind femur .......................................................... C. nigrifemura Wei et Zheng, 2005

3 Body smaller and robust, median carina of pronotum relatively elevated, surface of vertex relatively depressed ................................................................. 4
   - Body larger and slender, median carina of pronotum relatively low, surface of vertex flat and not depressed .............................................................. 5

4 Body slightly larger, median carina of pronotum distinctly elevated. Head larger, vertex distinctly elevated .............................................................. C. formosana Tinkham, 1940
   - Body slightly smaller, median carina of pronotum flatter. Head smaller, vertex not distinctly elevated • C. foedata (Serville, 1838)

5 Metazona equal to prozona in length. Fore transverse sulcus of pronotum only slightly cut median carina. Frons making nearly rectangle with vertex ................................................ C. tonkinensis Willemsen, 1939
   - Metazona longer than prozona. Fore transverse sulcus of pronotum deeply cut median carina. Frons slightly sloping backward, making acute angle with vertex .................................. 6

6 Length of tegmen 4 times that of pronotum, apex of tegmen rounded, without a distinct oblique truncation ................................................................. C. taiwanaensis Zhang et Yin, 2002
   - Length of tegmen 3.8 times that of pronotum, apex of tegmen rounded, without a distinct oblique truncation ................................................................. 7

7 Frontal ridge parallel. Vertical diameter of eye 1.8 times its horizontal diameter. Medial area of tegmen equal to cubital area in width. Upper ovipositor valves short and wide at base, with smaller teeth ........................................... C. yunnanensis Zhang et Yin, 2002
   - Frontal ridge contracted in the middle. Vertical diameter of eye 2.2 times its horizontal diameter. Medial area of tegmen wider than cubital area. Upper ovipositor valves narrow and long, smooth ................................................ C. xai sp. nov.

1 Coptacra hainanensis Tinkham, 1940

Measurements: Length of body: $\delta$ 21.0 - 23.0 mm, $\varphi$ 33.0 mm. Length of pronotum: $\delta$ 5.3 - 5.9 mm, $\varphi$ 7.3 mm. Length of tegmina: $\delta$ 22.5 - 24.0 mm, $\varphi$ 31.5 mm. Length of hind femur: $\delta$ 15.0 - 17.0 mm, $\varphi$ 19.0 mm.

Distribution: China (Hainan, Guangdong, Guizhou).
Location of type: International Concrete Repair Institute (ICRI) Zhongshan (Holotype female) and Shanghai Natural History Museum (Allotype male).

2 Coptacra nigrifemura Wei et Zheng, 2005

Distribution: China (Guangxi, Yizhou).
Measurements: Length of body: $\varphi$ 32.0 - 33.0 mm. Length of tegmina: $\varphi$ 29.0 - 30.0 mm. Length of hind femur: $\varphi$ 18.0 - 19.0 mm.
Location of type: Institute of Zoology, Shannxi Normal University (Holotype female and paratype female) and male unknown.

3 Coptacra formosana Tinkham, 1940

Measurements: Without description in the original paper of Tinkham, 1940 and the fauna of Li et al. (2006).

Distribution: China (Taiwan).
Location of type: Unknown.

4 Coptacra foedata (Serville, 1838)

Acridium foedatum Serville, 1838, Ins. Orth., p. 662. n. 23.

Measurements: Length of body: $\delta$ 19.0 mm, $\varphi$ 27.0 - 29.0 mm. Length of pronotum: $\delta$ 4.0 - 5.0 mm, $\varphi$ 7.0 - 8.0 mm. Length of tegmina: $\delta$ 18.0 mm, $\varphi$ 24.0 - 25.0 mm. Length of hind femur: $\delta$ 12.0 mm, $\varphi$ 16.0 - 17.0 mm.

Distribution: China (Guangdong, Hong Kong, Taiwan); Japan, Vietnam, Cambodia, Indonesia (Jawa), Malaya, Burma.
Kind of type: Unspecified primary type.
5 Coptacra tonkinensis Willemse, 1939


Measurements: Length of body: δ 24.5 – 25.5 mm, Ø 35.0 mm. Length of pronotum: δ 5.4 – 5.8 mm, Ø 8.0 mm. Length of tegmina: δ 22.5 – 24.0 mm, Ø 30.0 mm. Length of hind femur: δ 13.8 – 14.5 mm, Ø 18.5 mm.

Distribution: China (Yunnan, Guangxi); Indo-China, Viet Nam, Tonkin.


6 Coptacra taiwannensis Zhang et Yin, 2002


Measurements: Length of body: δ 22.1 mm, Ø 32.2 mm. Length of pronotum: δ 5.1 mm, Ø 7.3 mm. Length of tegmina: δ 18.2 mm, Ø 28.5 mm. Length of hind femur: δ 13.4 mm, Ø 18.2 mm.

Distribution: China (Taiwan).

Location of type: Museum of Hebei University (Holotype male and paratype female).

7 Coptacra yunnanensis Zhang et Yin, 2002


Measurements: Length of body: Ø 32.1 mm. Length of pronotum: Ø 7.3 mm. Length of tegmina: Ø 30.4 mm. Length of hind femur: Ø 18.1 mm.

Distribution: China (Ø Yunnan, δ unknown).

Location of type: Museum of Hebei University, MHU (Holotype female).

8 Coptacra xiai sp. nov. (Fig. 1)

Type materials: Holotype, Ø, China; Xishuangbanna, Yunnan province, 21°08’N, 99°56’E, 22-August-2009, leg. YE Bao-Hua and CAI Long-Jian (MHU). Paratypes: 4 δ, 1 Ø, with same data as holotype.

Descriptions: Female (Fig. 1; B – F). Body relatively large. Head short and high, shorter than pronotum. Frons nearly oblong in frontal view, slightly sloping backward, in lateral view making acute angle with vertex. Frontal ridge contracted under median ocellus. Eyes long oval, longitudinal diameter about 2.2 times as long as horizontal diameter. Antennae filiform, 26 segmented, extending far beyond the posterior margin of pronotum, length of a middle segment 3 times as long as width. Median carina of pronotum low, lateral carinae absent, the length of metazona about 1.3 times as long as that of prozona, anterior margin straight, posterior margin angulated. Prosternal process conical, apex pointed. Interspace of mesosternal lobes nearly tetragonal, length as long as 1.2 times width. Tegmina extending far beyond the end of hind femur, cross veins vertical with longitudinal veins and with a distinct oblique truncation at apical part, medial vein area wider than cubital area. Hind femur slender, length about 5 times as long as width, upper median keel of hind femur serrated, tip of lower lateral genicular lobe rounded. Hind tibiae with 10 spines on inner side and 9 spines on outer side, outer apical spine absent. Arolium larger, extending over the middle of claw. Typanal organ developed. Epiproct long, with a median longitudinal broad sulcus in full length. Subgenital plate oblong, posterior margin with angulated projection in the middle. Cercus conical, not reaching the end of epiproct. Ovipositor valves narrow and long, hooked at apex, outer margin of valves smooth.

Male (Fig. 1; A). Body smaller than female in size. Eyes long oval, longitudinal diameter about 2.0 times as long as horizontal diameter. The length of prozona about 1.4 times as long as that of metazona. Length of interspace of mesosternal lobes about 1.25 times its width. Cercus conical, curved inward. Subgenital plate short, extending over the end of epiproct slightly, apex rounded.


Measurements: Length of body: δ 19.7 – 22.1 mm, Ø 32.9 – 33.2 mm. Length of pronotum: δ 5.2 – 5.9 mm, Ø 7.9 – 8.1 mm. Length of tegmina: δ 20.7 – 23.6 mm, Ø 31.5 – 32.3 mm. Length of hind femur: δ 13.5 – 14.8 mm, Ø 18.8 – 19.0 mm.

Diagnosis: The new species is similar to C. yunnanensis Zhang et Yin, 2002, but it differs from the latter in four characters (Table 1).

Etymology: The specific epithet is derived from the last name of Prof. XIA Kai-Ling for his contribution to entomology.

ACKNOWLEDGEMENTS This study is financially supported by the grants of National Natural Sciences Foundation of China (No. 30770263) and the Chinese Academy of Sciences (No. KSCX2-YW-Z). We are grateful to Mr. CAI Long-Jian for collecting the type specimens.
Fig. 1 Photographs of Coptacra xiai sp. nov.
A: Male, lateral view; B: Female, head lateral view; C: Female, medial vein (M) area and cubital (Cu) area;
D: Female, dorsal view; E: Female, head frontal view; F: Ovipositor valves.

Table 1  Comparison of Coptacra xiai sp. nov. and C. yunnanensis Zhang et Yin, 2002

<table>
<thead>
<tr>
<th></th>
<th>Coptacra xiai sp. nov.</th>
<th>C. yunnanensis Zhang et Yin, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal ridge</td>
<td>Contracted under median ocellus</td>
<td>Parallel on both sides</td>
</tr>
<tr>
<td>Eyes</td>
<td>Vertical diameter 2.2 times horizontal diameter</td>
<td>Vertical diameter 1.8 times horizontal diameter</td>
</tr>
<tr>
<td>Tegmina</td>
<td>Medial vein area wider than cubital area in width</td>
<td>Medial vein area equal to cubital area in width</td>
</tr>
<tr>
<td>Ovipositor valves</td>
<td>Upper valves narrow and long, smooth.</td>
<td>Upper valves short and wide at base, with smaller teeth</td>
</tr>
</tbody>
</table>

Only females are compared, since the male of C. yunnanensis Zhang et Yin, 2002 is unknown.
中国切翅蝗属分类研究及一新种记述
（直翅目：蝗总科：斑腿蝗科）

印象初1,2,3,*，叶保华3，印展3

（1. 河北大学医学科学学院，河北保定 071002；2. 中国科学院西北高原生物研究所，西宁 810008；
3. 山东农业大学植物保护学院，山东泰安 270108）

摘要：本文对中国切翅蝗属 Coptacra Stål, 1873 进行了系统的分类研究，附一新种记述，即夏氏切翅蝗 Coptacra xiai
sp. nov. (图 1A～F). 新种同云南切翅蝗 C. yunnanensis Zhang et Yin, 2002 近似，不同之处为复眼间距在中
部收缩，复眼纵径为横径的 2.2 倍，前翅中脉域宽于肩脉域，产卵瓣细长，光滑。文中并给出该属所有已知种的检索表。

关键词：直翅目；蝗总科；斑腿蝗科；切翅蝗属；新种；中国

中国分类号：Q699 文献标识码：A 文章编号：0545-6296(2011)02-0179-05

附录：新种简述

夏氏切翅蝗，新种 Coptacra xiai sp. nov. (图 1A～F)

体长：♂19.7～22.1 mm，♀32.9～33.2 mm。前胸背板长：♂5.2～5.9 mm，♀7.9～8.1 mm。前翅长：♂20.7～23.6
mm，♀31.5～32.3 mm。后足股节长：♂13.5～14.8 mm，♀18.8～19.0 mm。

正模♂，副模♀4♂，♀1♀。云南，西双版纳，21°08′N，99°56′E，22-8-2009，叶保华、蔡龙建采。

词源：新种以夏凯龄教授的姓为名，对他在昆虫学上的突出贡献表示敬意！

（责任编辑：袁德成）