



<http://dx.doi.org/10.11646/zootaxa.3795.2.8>

<http://zoobank.org/urn:lsid:zoobank.org:pub:8926D3FF-DE68-4045-B97F-BCDC22771EDB>

## Two new species of *Chelifera* Macquart from China (Diptera: Empididae)

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### Abstract

Two new *Chelifera* species, *C. liuae* **sp. nov.** from Sichuan and *C. tibetensis* **sp. nov.** from Tibet, are described. The genus *Chelifera* is recorded from Tibet for the first time. *Chelifera tibetensis* is assigned to the *C. rhombicercus*-group. An updated key to the species of *Chelifera* from China is provided.

**Key words:** Diptera, Empididae, Hemerodromiinae, *Chelifera*, new species, China, Tibet

### Introduction

The genus *Chelifera* Macquart is characterized by the following features: arista one-segmented, nearly spine-like, shorter than antennal segment 3; scutum without discal setae; laterotergite bare; crossvein bm-cu present, Sc free apically, not reaching C; R<sub>4+5</sub> forked; discal and anal cells present, and anal cell distinctly shorter than basal cell (Yang *et al.* 2005). For detailed description of the genus see Collin (1961) and Yang & Yang (2004). The adults of *Chelifera* occur mainly near running waters on riparian vegetation and stones where they prey on Chironomidae, Mycetophilidae and other small insects, while the larvae live in all sorts of freshwater microhabitats, such as sand, gravel, macrovegetation and mosses where they prey on chironomid and simuliid larvae (Horvat 2002; Ivković *et al.* 2012).

This genus is distributed nearly worldwide except the Afrotropical Region with 77 known species (Yang *et al.* 2007). Seven species were known to occur in China (Yang & Yang 1995, 2004; Horvat 2002; Saigusa & Yang 2002; Yang *et al.* 2005). In the present paper two new species of *Chelifera*, *C. liuae* **sp. nov.** from Sichuan and *C. tibetensis* **sp. nov.** from Tibet, are added to the fauna of China, and this genus is newly recorded from Tibet. An updated key to the species of *Chelifera* from China is provided.

### Material and methods

Types are deposited in the Entomological Museum of China Agricultural University, Beijing (CAU). Morphological terminology follows McAlpine (1981) and Cumming & Wood (2009). The following abbreviations are used: av = anteroventral seta(e), oc = ocellar seta(e), psa = postalar seta(e), pv = posteroventral seta(e), sa = supraalar seta(e), sc = scutellar seta(e), vt = vertical seta(e).

### Key to species (primarily males) of *Chelifera* from China

(modified from Yang *et al.* 2005)

- |   |   |   |
|---|---|---|
| 1 | Thoracic dorsum entirely or mostly black, or brownish yellow with 2 black longitudinal stripes on mesonotum; pterostigma present except <i>C. sheni</i> ..... | 2 |
|---|---|---|

- Thorax uniformly yellowish to dark brownish; pterostigma absent ..... 6
- 2 Mesonotum entirely or mostly black; pterostigma present; male cercus not as below ..... 3
- Mesonotum brownish yellow with 2 black longitudinal stripes; pterostigma absent; male cercus much narrower than epandrium in lateral view (Yang & Yang 2004, fig. 80) ..... *C. sheni* Saigusa & Yang
- 3 Pterostigma short and wide; thorax black, or thorax yellow except dorsum mainly black. .... 4
- Pterostigma long and narrow; thorax black except pleura brownish yellow [male unknown] ..... *C. lateralis* Yang & Yang
- 4 Thorax black except postalar calli dark yellow; male cercus not furcated, or apically furcated with short acute ventral process ..... 5
- Thorax mainly yellow except dorsum mainly black; male cercus apically furcated with short acute dorsal process (Fig. 1) ... *C. liuae* **sp. nov.**
- 5 Fore tarsomere 5 and mid and hind tarsomeres 4–5 blackish to black; male cercus not furcate apically (Yang & Yang 2004, fig. 83) ..... *C. sinensis* Yang & Yang
- All tarsi from tip of tarsomere 3 brown to dark brown onward; male cercus furcate apically with short acute ventral process (Yang & Yang 2004, fig. 77) ..... *C. incisa* Saigusa & Yang
- 6 Only foreleg raptorial; male cercus not as below ..... 7
- Male fore and mid legs raptorial and modified; male cercus nearly straight, with many inner denticles along middle portion (Horvat 2002, figs 8–9) ..... *C. ornamenta* Horvat
- 7 Thorax brownish yellow or dark brownish; male cercus not furcated apically (Fig. 4) ..... 8
- Thorax yellowish; male cercus furcate apically (Horvat 2002, fig. 1) ..... *C. emeishanica* Horvat
- 8 Thorax brownish yellow; male cercus narrowed apically (in dorsal view) and with 4–5 inner denticles on median lobe; epandrium shorter than cercus, apically not long finger-like (in lateral view) (Yang *et al.* 2005, fig. 1) ..... *C. nanlingensis* Yang, Grootaert & Horvat
- Thorax dark brownish; male cercus wide apically (in dorsal view) and with only 2 inner denticles on subapical lobe (Fig. 5); epandrium distinctly longer than cercus, apically long finger-like (in dorsal view) (Fig. 4) ..... *C. tibetensis* **sp. nov.**

***Chelifera liuae* sp. nov.**

Figs 1–3

**Diagnosis.** Thorax yellow except dorsum mainly black. Antenna entirely dark yellow. Pterostigma short and wide, filling apex of cell  $r_1$ . Male cercus apically bifurcated into small acute dorsal process and large obtuse ventral process. Epandrium subtriangular apically. Postgonite long thin with two apical hooks.

**Description.** Male. Body length 4.2–4.6 mm, wing length 4.2–4.3 mm.

Head black with pale gray pollinosity. Setulae on head pale yellow, setae brownish yellow; postocular setae very short and hair-like; 1 long and strong vt; ocellar tubercle weak with 2 long oc and 2 very short posterior setulae. Antenna entirely dark yellow; pedicel with circlet of pale yellow apical setulae; first flagellomere long and conical (1.9 times longer than wide), minutely pubescent; arista spine-like, about 0.33 as long as first flagellomere, bare. Proboscis dark yellow with blackish setulae; palpus dark yellow with short blackish setulae.

Thorax yellow with pale gray pollinosity, except pronotum black with yellow lateral portion; mesoscutum black with yellow lateral portion, black lateral spot just anterior to wing base and posterior margin brownish yellow; scutellum and postnotum black. Setulae on thorax pale yellow, setae brownish yellow; 1 long sa and psa subequal in length; scutellum with 3 pairs of sc (only 2 apical sc long). Legs yellow except fore tarsomeres 4–5, entire mid tarsus, apex of hind tarsomere 3 and hind tarsomeres 4–5 brown. Setulae and setae on legs blackish. Fore femur greatly thickened, 2.4–2.5 times as wide as mid femur, with 2 rows of black ventral denticles and 2 rows of strong outer ventral setae brownish yellow (6–7 av, 5–6 pv, with 1 basalmost pv longest, nearly as long as thickness of fore femur); fore tibia distinctly shorter than fore femur (0.7 times as long as fore femur), with blackish ventral ridge and 1 black strong apicoventral seta. Fore and hind tibiae each with short dense brown ventral setae on apical margin arranged in comb, mid tibia without additional ventral denticles and setae. Wing hyaline, dark brown pterostigma short wide and filling apex of cell  $r_1$ ; veins brownish to brown. Squama yellow with pale yellow setulae. Halter yellow.

Abdomen dark yellow with pale gray pollinosity, except tergites 1–7 dark brown and hypopygium black. Setulae on abdomen pale yellow.

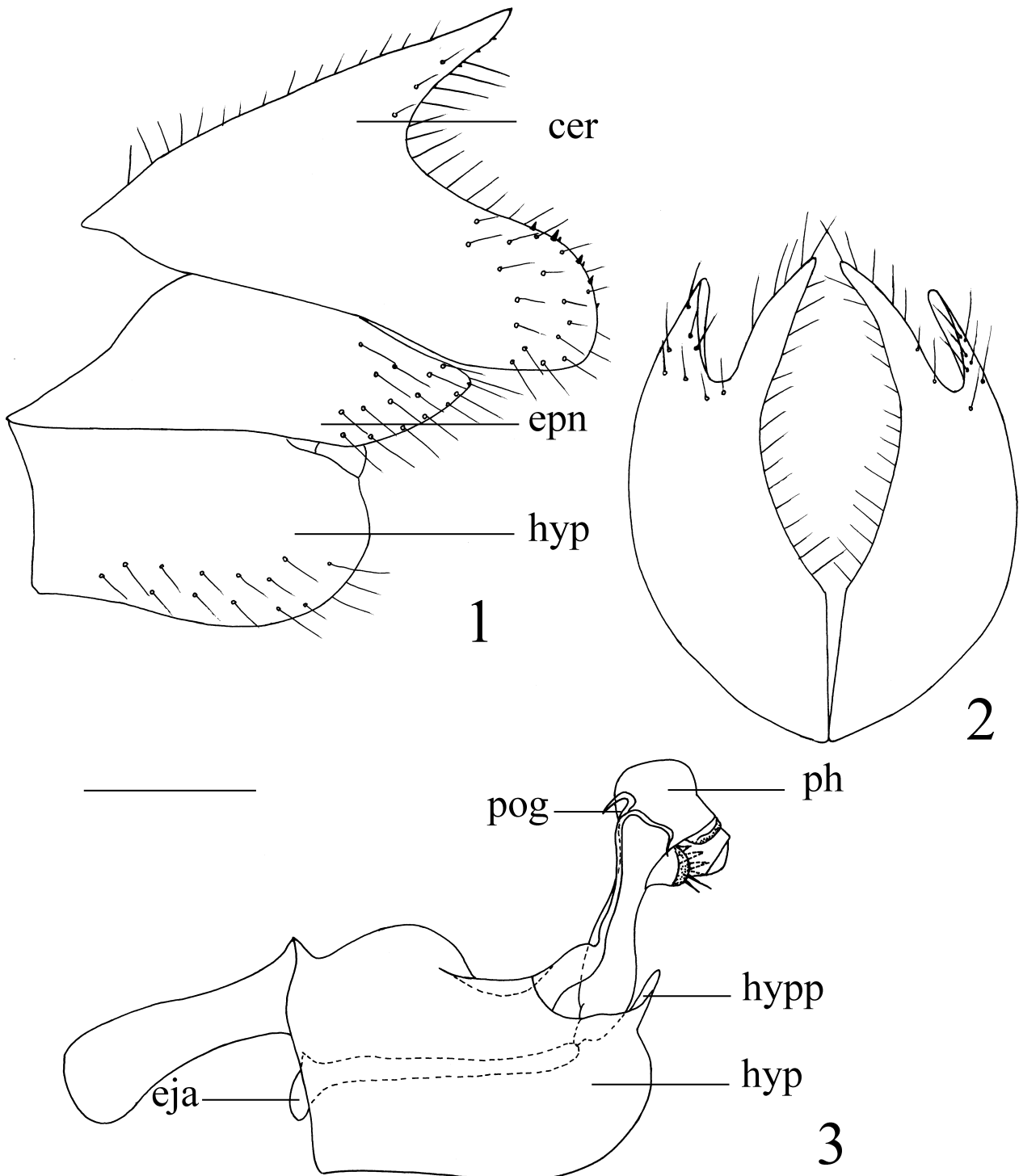
Male genitalia (Figs 1–3): Cercus large and wide, wider than epandrium at widest point in lateral view, apically furcated into small acute dorsal process and large obtuse ventral process. Epandrium slightly shorter than cercus; basally rather narrow, medially wide, apically somewhat narrowed and subtriangular. Hypandrium nearly as wide as epandrium, nearly quadrate in lateral view; hypandrial process short finger-like. Postgonite long and thin with two apical hooks. Phallus strongly curved upwards, with broad apex bearing group of spines.

Female. Unknown.

**Type material.** HOLOTYPE ♂, CHINA, Sichuan, Xiaojin (N31°0'4.67" E102°21'45.41"), Balangshan, 3281 m, 9.VIII.2013, X. Liu (CAU). PARATYPES: 2 ♂, same data as holotype (CAU).

**Distribution.** China (Sichuan).

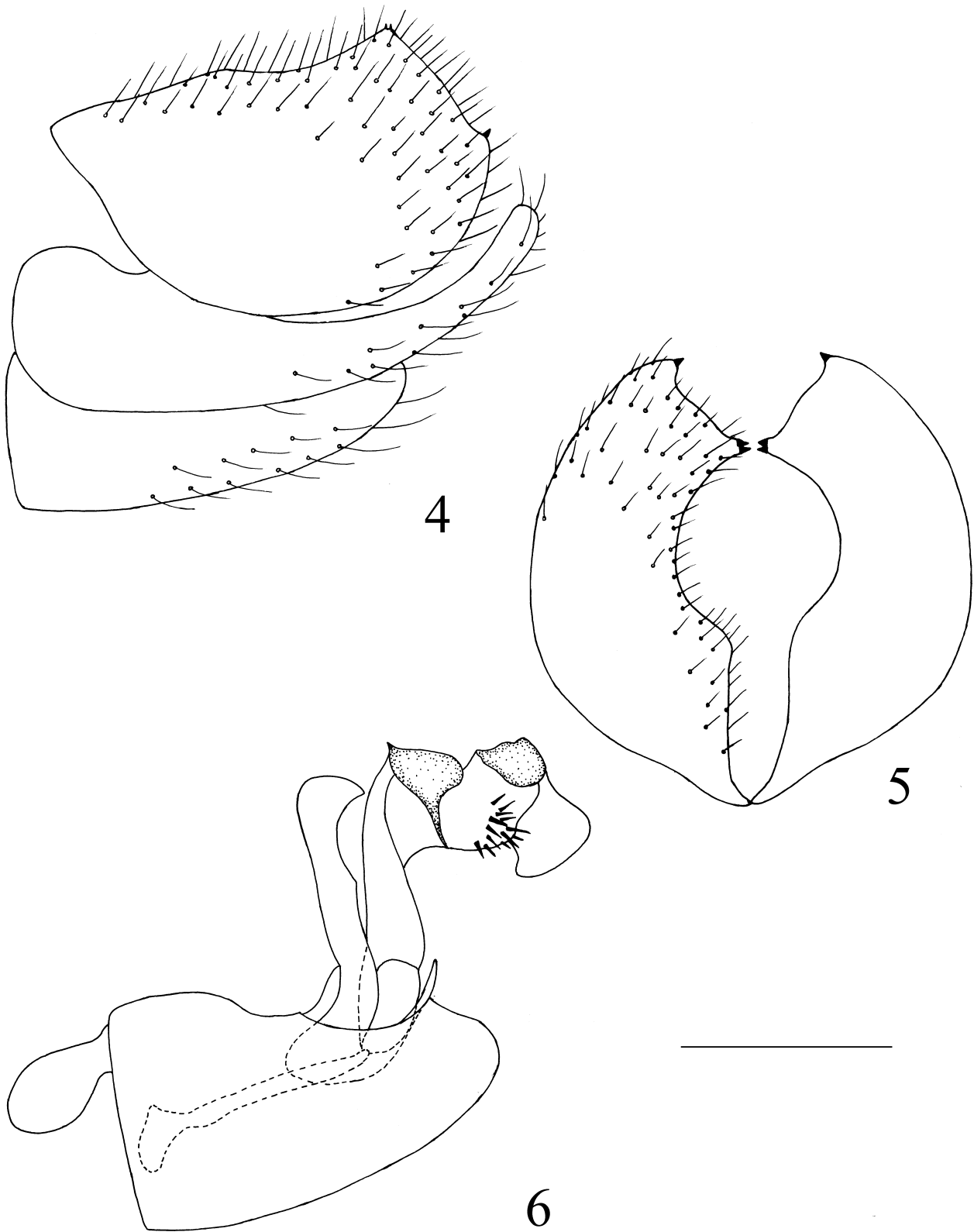
**Etymology.** This specific name refers to collector of the type specimens, Dr. Xiaoyan Liu.



**FIGURES 1–3.** *Chelifera liuae* sp. nov. (male). 1. Genitalia, lateral view; 2. cerci, dorsal view; 3. hypandrium and phallus, lateral view. Abbreviations: cer = cercus; eja = ejaculatory apodeme; epn = epandrium; hyp = hypandrium; hypp = hypandrial process; ph = phallus; pog = postgonite. Scale bar = 0.2 mm.

*Chelifera tibetensis* sp. nov.

Figs 4–6



**FIGURES 4–6.** *Chelifera tibetensis* sp. nov. (male). 4. Genitalia, lateral view; 5. cerci, dorsal view; 6. hypandrium and phallus, lateral view. Scale bar = 0.2 mm.

**Diagnosis.** Antenna entirely dark yellow. Wing entirely hyaline, without pterostigma. Male cercus much wider than epandrium, with wide apical margin nearly truncate in lateral view. Epandrium distinctly longer than cercus, apically long and finger-like. Postgonite long and band-like, with curved apex.

**Description.** Male. Body length 3.3 mm, wing length 4.1 mm.

Head black with pale gray pollinosity. Setulae on head pale yellow, setae brownish yellow; postocular setae very short and hair-like; 1 long and strong vt; ocellar tubercle weak with 2 long oc and 2 very short posterior setulae. Antenna entirely dark yellow; pedicel with circlet of pale yellow apical setulae; first flagellomere long and conical (2 times longer than wide), minutely pubescent; arista spine-like, about 0.33 as long as first flagellomere, bare. Proboscis dark yellow with blackish setulae; palpus dark yellow with short blackish setulae.

Thorax dark brownish with pale gray pollinosity, except postalar calli dark yellow. Setulae on thorax pale yellow, setae brownish yellow; 1 long sa and psa subequal in length; scutellum with 3 pairs of sc (only 2 apical sc long). Legs yellow, except tarsomeres 3–5 brown. Setulae and setae on legs blackish. Fore femur greatly thickened, 2.7 times as thick as mid femur, with 2 rows of black ventral denticles and 2 rows of strong outer ventral setae brownish yellow (6 av, 5 pv, with 1 basalmost pv longest, nearly as long as thickness of fore femur); fore tibia distinctly shorter than fore femur (0.7 times as long as fore femur), with blackish ventral ridge and 1 black strong apicoventral seta. Fore and hind tibiae each with short dense brown ventral setae on apical margin arranged in comb; mid tibia without additional ventral denticles and setae. Wing hyaline, without pterostigma; veins brownish yellow. Squama yellow with pale yellow setulae. Halter yellow.

Abdomen dark brown with pale gray pollinosity, with hypopygium dark yellow except cerci with dark brown margin. Setulae on abdomen pale yellow.

Male genitalia (Figs 4–6): Cercus large and wide, much wider than epandrium at widest point in lateral view, with wide apical margin nearly truncate in lateral view. Epandrium distinctly longer than cercus; basally rather wide, narrowed toward tip, apically long finger-like. Hypandrium slightly wider than epandrium, long subconical in lateral view; hypandrial process short finger-like. Postgonite long band-like with curved apex. Phallus strongly curved upward, with broad apex distinctly curved and bearing group of spines.

Female. Unknown.

**Type material.** HOLOTYPE ♂, CHINA, Tibet, Bomi (N29°51'42.57" E95°46'1.59"), Galonglashan, 1500 m, 13.VII.2013, X. Liu (CAU).

**Distribution.** China (Tibet).

**Etymology.** This specific name refers to the type locality, Tibet.

## Discussion

In the present paper the following two new species of *Chelifera* are added to the fauna of China: *C. liuae* **sp. nov.** from Sichuan and *C. tibetensis* **sp. nov.** from Tibet.

*Chelifera liuae* **sp. nov.** can't be assigned to any species group. It is somewhat similar to *C. emeishanica* Horvat from Sichuan, but may be separated from the latter by the thoracic dorsum mainly black, wing with short, wide pterostigma, male cercus with subtriangular dorsal arm acute apically and ventral arm well projected beyond tip of the epandrium, epandrium basally rather narrow, and postgonite apically with two hooks. In *C. emeishanica*, the thorax is yellowish except the humeral depression brownish yellow, the wing lacks the pterostigma, male cercus has the finger-like dorsal arm not acute apically and ventral arm not distinctly projected beyond tip of the epandrium, the epandrium is rather wide basally, and the postgonite is apically simple with the curved tip (Horvat 2002).

*Chelifera tibetensis* **sp. nov.** is assigned to the *C. rhombicercus*-group. It is similar to *C. rhombicercus* Wagner & Leese from India in the shape of the cercus in dorsal view, but may be separated from the latter by the wing without pterostigma, male cercus very wide apically, and epandrium distinctly longer than the cercus and apically long and finger-like. In *C. rhombicercus*, the wing has a black pterostigma, male cercus is somewhat narrowed apically, and the epandrium is distinctly shorter than the cercus and not prolonged into finger-like process apically (Wagner *et al.* 2004).

## Acknowledgements

We are very grateful to Dr. X.Y. Liu (Wuhang) for collecting the specimens. Two anonymous reviewers are thanked for providing useful comments on an earlier draft of this paper. The research was funded by the National Natural Science Foundation of China (31272354) and the Ministry of Science and Technology of the Republic of China (2005DKA21402, 2011FY120200, MOST Grant 2012FY111100).

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