

Opalimosina (Diptera: Sphaeroceridae) from China with descriptions of two new species

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Two new species of the genus *Opalimosina* Roháček, namely *Opalimosina* (*O.*) *differentialis* Su, **sp. n.** and *Opalimosina* (*O.*) *prominentia* Su, **sp. n.**, are described from China. A key to the world species of the subgenus *Opalimosina* is given.

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1. Introduction

Opalimosina Roháček (1983) is reliably identified by the following features: postvertical setae are always present, hind tibiae are with a distinct ventral spine in many species (the subgenus *Opalimosina*), and the basiphallus is with a large epiphallus.

Species of the genus occur in all zoogeographic regions of the world except in the Afrotropical and Antarctic Regions. Presently, it includes thirteen species, ten Palaearctic, six Oriental, one Nearctic, one Neotropical and one Australasian/Oceanian (Roháček *et al.* 2001, Hayashi 2009, Hayashi 2010, Marshall *et al.* 2011). Except for Su's (2011) report of *Opalimosina* (*O.*) *mirabilis* (Collin) and *Opalimosina* (*O.*) *pseudomirabilis* Hayashi from China, little is known of the Chinese species of this genus. Four species are reported from China in this study, of which *Opalimosina* (*O.*) *differentialis* and *Opalimosina* (*O.*) *prominentia* are new to science. A

key to the world species of the subgenus *Opalimosina* is given.

2. Material and methods

The specimens were collected with sweep nets and Malaise traps in coniferous and broad-leaved mixed forests from mountains of Jiangxi Province, Shanxi Province, Sichuan Province and Yunnan Province, China, and preserved in 80% ethyl alcohol in vials. The whole abdomen was detached and left in 10% KOH until semi-transparent, rinsed in water and then the whole abdomen placed into a cavity slide with glycerol for further dissection and examination, finally preserved in capsule with glycerin. The illustrations of genitalia and legs were made using a Leica DM 2000 compound microscope fitted with a drawing tube.

Voucher specimens including types are deposited in the collection of Liaoning Key Laboratory of Urban Integrated Pest Management and

Ecological Security, Shenyang University, Shenyang, Liaoning Province, China. Morphological terminology follows Smith & Marshall (2004).

3. Taxonomy

3.1. *Opalimosina (O.) mirabilis* (Collin, 1902).

Limosina mirabilis Collin, 1902: 59.

Opalimosina (Opalimosina) mirabilis: Su, 2011: 80–82, 188.

Material examined. 2 ♂♂, China: Sichuan, Gonggashan, 101°52 35"E, 29°35 41"N, 1,500 m, 2.VIII.2004, sweep nets, G.-C. Liu leg.

Distribution. Europe, Australia, New Zealand, Hawaii (USA), Canada, USA, Argentina, Brazil, Colombia, Costa Rica, Mexico, China (Sichuan), Cyprus, Iran, Japan, Nepal (?), North Korea, Mongolia, Pakistan, Tunisia, Turkey.

3.2. *Opalimosina (O.) pseudomirabilis* Hayashi, 1989.

Opalimosina (Opalimosina) pseudomirabilis Hayashi, 1989: 63.

Opalimosina (Opalimosina) pseudomirabilis: Su, 2011: 82–83, 189.

Material examined. 1 ♂, China: Jiangxi, Jian, Shuangjiang, 114°59 34"E, 27°6 46"N, 174 m, 1.VI.2009, Malaise traps, L.-L. Yi and Y. Li leg. 2 ♂♂, 1 ♀, China: Yunnan, Tengchong, Guyong, 98°16 39"E, 25°19 13"N, 1,750–1,920 m, 8.VIII.2009, sweep nets, L.-X. Su and J.-F. Wang leg. 1 ♂, China: Jiangxi, Jian, Shuangjiang, 114°59 34"E, 27°6 46"N, 174 m, 10.V.2009, Malaise traps, L.-L. Yi and Y. Li leg.

Distribution. China (Jiangxi, Yunnan), Nepal, Pakistan.

3.3. *Opalimosina (O.) differentialis* Su, sp. n. (Fig. 1)

Type material. Holotype ♂: China: Shanxi, Qinshui, Zhongcun, Xiachuan, 112°00 55.8"E, 35°26 31.3"N, 1,686 m, 19.7.2012, sweep nets, L.-X. Su leg. Paratype ♂: China: Sichuan,

Gonggashan, 101°52 35"E, 29°35 41"N, 1,500 m, 2.VIII.2004, sweep nets, G.-C. Liu leg.

Description. Male. Body length approx. 1.5 mm, wing length approx. 1.1 mm. General color brownish black, including head, thorax, abdomen and legs; antennae also brownish black; halter with stem pale brown, knob brown.

Head. 2 orbital setae, with additional setulae below and inside orbitals. Postvertical setae small and cruciate. Interfrontalia with 3 subequal setae. Eye height 2.6 times as long as genal height. Genal seta small. Arista hairs twice as long as basal width of arista.

Thorax. Thoracic chaetotaxy: 1 long postpronotal seta; 2 dorsocentral setae, the anterior indistinct; 8 rows of acrostichal setulae in front of suture. Katepisternum with small anterodorsal hair and large posterodorsal seta. Scutellum with 2 pairs of marginal setae. Mid tibia (Fig. 1a) proximally with a short anterodorsal seta, distally with a short anterodorsal and a long dorsal and a short posterodorsal seta; posterodorsally with a row of small setulae; ventroapical seta long; with short anteroventral seta below middle. Hind tibia (Fig. 1b) with a curved preapical ventral spine, 0.25 times as long as hind tibia.

Wing pale brown, veins brown. C extending to R₄₊₅, first costal sector basally with the usual 2 setae. Second costal sector 1.2 times as long as the third, crossveins r-m and dm-cu separated by twice the length of dm-cu. R₂₊₃ distinctly sinuate, apically very slightly bent up to C. R₄₊₅ distinctly bent up to C. Discal cell with stump veins of M and CuA₁. Anal vein almost straight and reduced. Alula small and narrow, apically slightly blunt.

Male abdomen. Syntergite 1+2 large, about twice as long as tergite 3 at middle, subequal in width to the latter. Synsternite 1+2 pale, sternites 3–4 uniformly dark. Sternite 5 (Fig. 1g) with a pale and narrow area in the middle, a row of 6 short spine-like setae posterior to the pale area; posteromedially with a deep and narrow incision, each side composed of a row of comb-like spines and a setulose projection, inner row of spines situated above outer setulose projection. Sternite 6 simple. Epandrium (Fig. 1e, d) with short and sparse setulae. Cercus (Fig. 1e) simple. Surstylus (Fig. 1f) with long ventral setae, 2 thick and long posteroventral setae, and small dorsal or lateral setulae; anterior part slightly narrow, with a

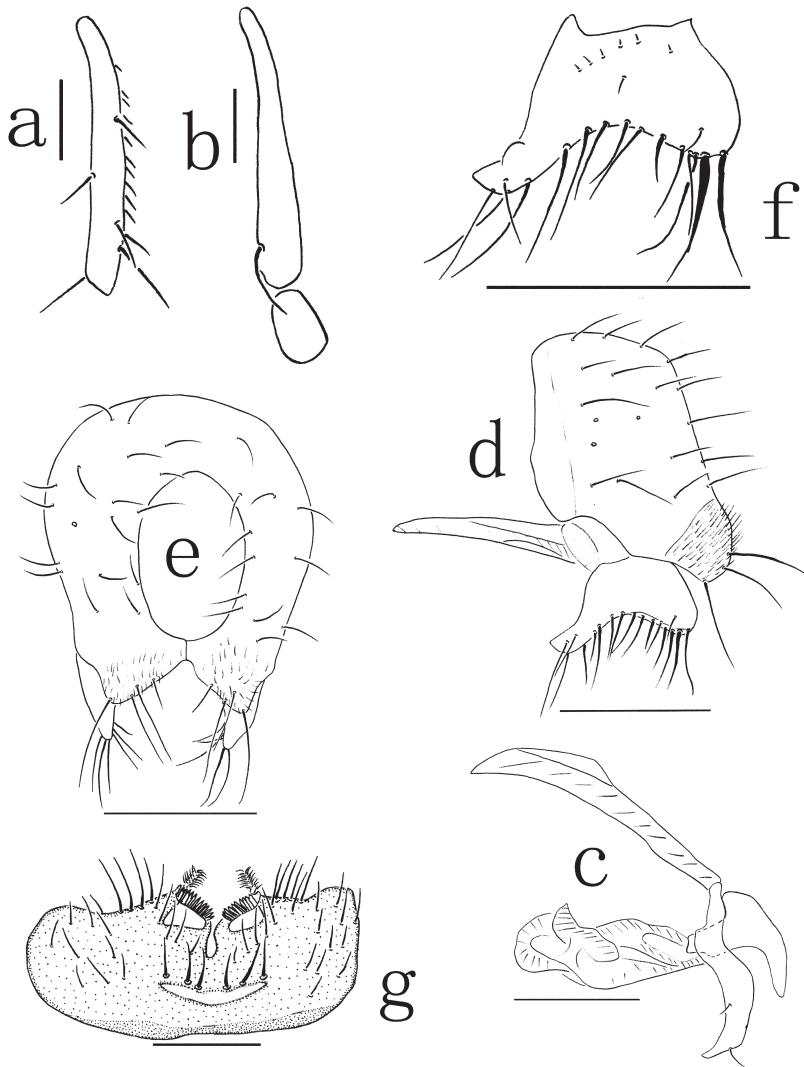


Fig. 1. *Opalimosina differentialis* Su, **sp. n.**, holotype male, from Shanxi, China. – a. Mid tibia, anteriorly. – b. Hind tibia, anteriorly. – c. Aedeagus and associated parts, laterally. – d. Genitalia laterally. – e. Genitalia caudally. – f. Surstylus laterally. – g. Sternite 5 ventrally. Scale bars 0.1 mm.

small, blunt, preapical dorsal convex ridge. Epiphallus (Fig. 1c) straight, short and thick. Postgonite (Fig. 1c) slender, distinctly sinuate, with a slightly long, preapical posterior setula, and a short, anterior setula on apical third. Distiphallus (Fig. 1c) with a pair of dorsal projections.

Female. Unknown.

Distribution. China (Shanxi, Sichuan).

Etymology. The specific name is derived from the characteristic male sternite 5 with 2 paired, differentiated, posteromedial lobes.

Remarks. In Roháček's (1983) key to European species and Hayashi's (2010) key to Japanese species, this new species runs to *Opali-*

mosina (O.) monticola Hayashi. However, male sternite 5 and postgonite are very different. The new species can be easily distinguished from the other members of the genus by the characteristics of sternite 5 described above.

3.4. *Opalimosina (O.) prominentia* Su, **sp. n.** (Fig. 2)

Type material. Holotype ♂: China: Shanxi, Qinshui, Zhongcun, Xiachuan, 112°00' 55.8"E, 35°26' 31.3"N, 1,686 m, sweep nets, 19.VII.2012, L.-X. Su leg.

Description. Male. Body length approx. 1.3

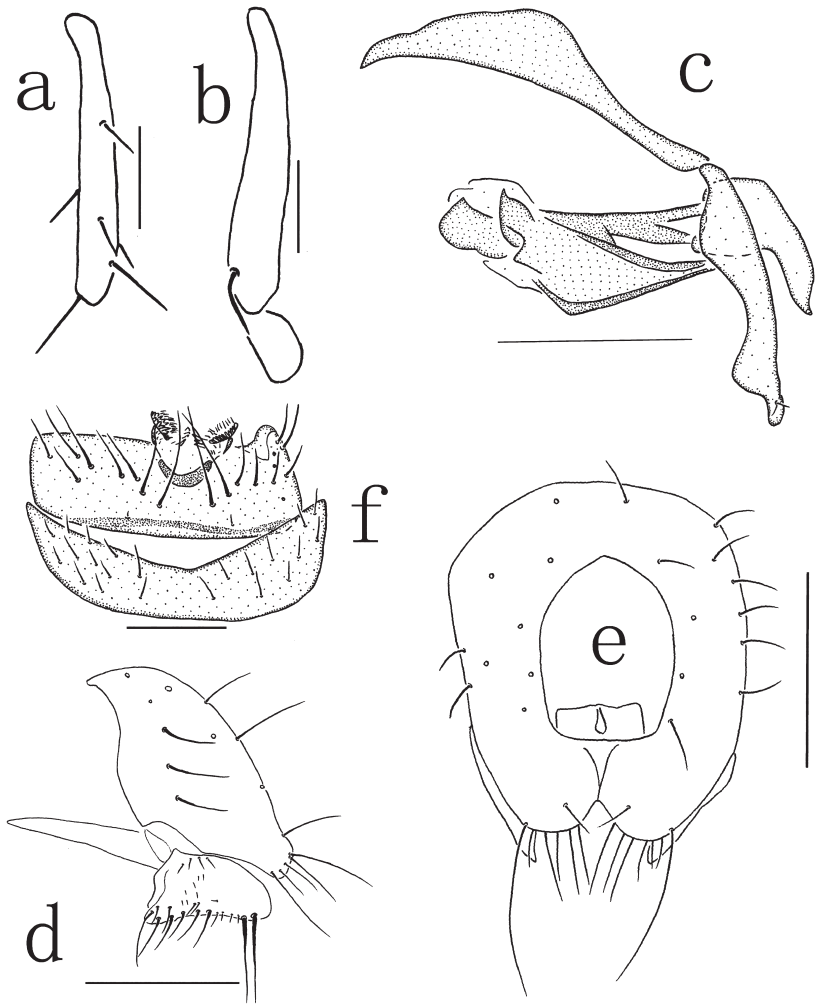


Fig. 2. *Opalimosina prominētia* Su, **sp. n.**, holotype male, from Shanxi, China. – a. Mid tibia, anteriorly. – b. Hind tibia, anteriorly. – c. Aedeagus and associated parts, laterally. – d. Genitalia laterally. – e. Genitalia caudally. – f. Sternites 4 and 5 ventrally. Scale bars 0.1 mm.

mm, wing length approx. 1.0 mm. General color brownish black, including head, thorax, abdomen, legs and antennae; halter with stem and knob brown.

Head. 2 orbital setae, with additional setulae below and inside orbitals. Postvertical setae small and cruciate. Interfrontalia with 3 subequal setae. Eye height twice as long as genal height. Genal seta small. Aristal hairs 1.5 times as long as basal width of arista.

Thorax. Thoracic chaetotaxy: 1 long postpronotal seta; 2 dorsocentral setae, anterior one indistinct; 6 rows of acrostichal setulae in front of suture. Katepisternum with anterodorsal small setula and posterodorsal large seta. Scutellum with 2 pairs of marginal setae. Mid tibia (Fig. 2a) proximally with a short anterodorsal seta (slightly

longer than distal posterodorsal seta, subequal to distal anterodorsal seta), distally with a short anterodorsal and a long dorsal and a short posterodorsal seta; ventroapical seta long; with short anteroventral seta below middle. Hind tibia (Fig. 2b) with a curved, preapical ventral spine, 0.2 times as long as hind tibia.

Wing pale brown, veins brown. C extending to R_{4+5} , first costal sector basally with the usual 2 setae. Second costal sector 1.2 times as long as the third, crossveins r-m and dm-cu separated by 2.8 times the length of dm-cu. R_{2+3} distinctly sinuate, apically very slightly bent up to C. R_{4+5} slightly bent up to C. Discal cell with stump veins of M and CuA_1 . Anal vein almost straight and reduced. Alula small and narrow, apically slightly blunt.

Male abdomen. Syntergite 1+2 large, about

twice as long as tergite 3 at middle, subequal in width to the latter. Synsternite 1+2 anteromedially pale, sternites 3 and 4 uniformly pigmented. Sternite 4 (Fig. 2f) with posterior margin largely wedge-shaped. Sternite 5 (Fig. 2f) with sparse and short setae on posterolateral area and 4 long setae in the middle; a dark, moon-like, posteromedial area, each side on posteromedial margin with a dark, small process connecting to a row of comb-like spines. Sternite 6 simple. Epandrium (Fig. 2e, d) with sparse and short setulae. Cercus (Fig. 2e) simple, not protruded ventrally. Surstylus (Fig. 2d) triangular, with short setulae, 2 long and thick posteroventral setae, 4 short dorsal setulae. Epiphallus (Fig. 2c) short, thick and straight. Postgonite (Fig. 2c) with 2 large anterior broad lobes, a short postero-preapical setula. Distiphallus (Fig. 2c) with a pair of dorsal projections and a pair of apical sclerites.

Female. Unknown.

Distribution. China (Shanxi).

Etymology. The specific epithet refers to the postgonite, which has a sinuate anterior margin including two broad lobes.

Remarks. This new species is most similar with *Opalimosina (O.) calcarifera* (Roháček) and *Opalimosina (O.) spathulata* Hayashi in the preapical ventral spine of hind tibia, wing vein C not extending beyond R_{4+5} , the shape and ventral setae of surstylus. It differs from the latter two by the characteristic male sternite 5, the shape of cercus and anteriorly sinuate postgonite. The male sternite 5 and postgonite are particularly distinctive.

3.5. Key to the world species of the subgenus *Opalimosina*

1. Hind tibia with a small preapical ventral spine or without any long preapical ventral spine 2
 - Hind tibia with a large preapical ventral spine, at least 1/5 as long as hind tibia 4
2. Male sternite 5 (Papp 1991: Fig. 34) without any distinct pale area on disc, with long posterolateral setae and 2 groups of posteromedial setae, posteromedial margin with a process bearing 4 pairs of short setae *stepheni* Papp
 - Male sternite 5 with a pale area on disc, with short lateral and posteromedial setae, posteromedial margin with one or two rows of comb-like short spines and one or two projections on each side 3
3. Male sternite 5 (Roháček 1983: Fig. 1069) with a pale arc-shaped stripe and a wide and deep posteromedial incision; each side of posteromedial margin composed of a row of comb-like short spines and a thin internal projection *collini* (Richards)
 - Male sternite 5 (Roháček 1983: Fig. 1055) with a pale rhomb-like area in the middle, without posteromedial incision, each side of posteromedial margin composed of two rows of comb-like short spines and two thin external projections *simplex* (Richards)
4. Hind tibia with preapical ventral spine at least 1/3 as long as hind tibia 5
 - Hind tibia with preapical ventral spine less than 1/3 as long as hind tibia 6
5. Wing vein C extending to R_{4+5} ; male sternite 5 (Hayashi 1989: Fig. 4) with a pale, narrow, rather deep medial area, with sparse and short setulae on anterior and lateral margins; surstylus (Hayashi 1989: Fig. 5) arc-shaped, posteroventral margin with 2 short and thick setae *pseudomirabilis* (Hayashi)
 - Wing vein C extending beyond R_{4+5} ; male sternite 5 (Roháček 1983: Fig. 1034) with 7 posterior wide and 1 anteromedial very narrow pale areas, lateral area with short setulae and 2 groups of long setulae; surstylus (Roháček 1983: Fig. 1031) triangular, posteroventral margin with 3 long and thick setae *mirabilis* (Collin)
6. Male sternite 5 without a posteromedial incision 7
 - Male sternite 5 with a deep posteromedial incision 8
7. Male sternite 5 (Fig. 2f) with a dark, moon-like posteromedial part and a dark, narrow anterior stripe, 4 long setae in front of dark moon-like part, posterolateral part with sparse and short setae; postgonite (Fig. 2c) with 2 anterior broad lobes *prominentia* Su, **sp. n.**
 - Male sternite 5 (Hayashi 2010: Fig. 30) only with a dark anterior stripe, with sparse and rather short setulae; postgonite (Hayashi 2010: Fig. 32) apically swollen *spathulata* Hayashi

8. *Cercus* (Hayashi 2010: Fig. 16) with a group of long setulae; posterior part of surstylus (Hayashi 2010: Fig. 16) curved perpendicularly, with long and sinuate hairs; epiphallus thin and distinctly sinuate
dolichodasy Hayashi
- *Cercus* only with short setulae; surstylus simple; epiphallus thick and straight or indistinctly sinuate 9
9. Male sternite 5 with posteromedial projection 10
- Male sternite 5 without posteromedial projection 11
10. Male sternite 5 (Fig. 1g) with a pair of thin, setulose posteromedial projections, a pale narrow area in the middle and a row of 6 spine-like short setae posterior to the pale area; postgonite (Fig. 1c) sinuate, apically tapering
differentialis Su, **sp. n.**
- Male sternite 5 (Hayashi 2010: Fig. 23) with a pair of thick, setose posteromedial projections, dark along posteromedial incision, with sparse and short setulae; postgonite (Hayashi 2010: Fig. 25) almost straight, apically boot-shaped
monticola Hayashi
11. Male sternite 5 (Hayashi 2009: Fig. 4) with a pale, large, oval area in the middle; ventral margin of surstylus (Hayashi 2009: Fig. 5) with small setulae; apical half of postgonite (Hayashi 2009: Fig. 6) not swollen; epiphallus (Hayashi 2009: Fig. 6) long and thick, apically tapering
australis Hayashi
- Male sternite 5 (Roháček 1983: Fig. 1041) with a pale, small, semicircular area in the middle; ventral margin of surstylus (Roháček 1983: Fig. 1038) with short setae and 2 thick posterior setae; apical half of postgonite (Roháček 1983: Fig. 1037) swollen; epiphallus (Roháček 1983: Fig. 1037) short and thin, apically pointed
calcarifera (Roháček)

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