

Genus *Pullimosina* (Diptera: Sphaeroceridae) in China with description of a new species

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The genus *Pullimosina* Roháček is revised to have four species in China, including a new species, *Pullimosina (Dahlimosina) quadripulata* sp. n. For *Pullimosina (Pullimosina) heteroneura* (Haliday) a new record for Continental China is reported. All males of the four species and the female of the new species are described and illustrated. A key to these species is presented.

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1. Introduction

Pullimosina Roháček, 1983 occurs in all zoogeographic regions of the world and comprises 28 species, the majority of which are from the Holarctic Region (Roháček *et al.* 2001, Hayashi 2006, Marshall *et al.* 2011). Only two species of *Pullimosina* are known from China (Su 2011).

While checking a series of *Pullimosina* specimens in the collections of Liaoning Key Laboratory of Urban Integrated Pest Management and Ecological Security, Shenyang University, Shenyang, Liaoning, China, we found one further undescribed species, which is superficially similar to *Pullimosina (Dahlimosina) yukonensis* Marshall, 1986. The genus *Pullimosina* is here expanded to include two additional species in China: *Pullimosina (Dahlimosina) quadripulata* sp. n. and *Pullimosina (Dahlimosina) heteroneura*.

2. Material and methods

The examined specimens were collected from mixed forests with sweep net and Malaise trap and preserved in alcohol. All studied specimens were preserved in Liaoning Key Laboratory of Urban Integrated Pest Management and Ecological Security, Shenyang University, China. The descriptions and illustrations were prepared from specimens or their dissected parts in ethanol or glycerine.

Morphological terminology follows Smith and Marshall (2004).

3. Taxonomy

3.1. *Pullimosina (Dahlimosina) quadripulata* Su, sp. n. (Figs. 1, 2)

Type material. Holotype ♂: China, Liaoning Province, Benxi City, Yanghugou, 124°39' 48.4"E, 41°13'43.2"N, 13.VII.2008 Jianfeng Wang leg.

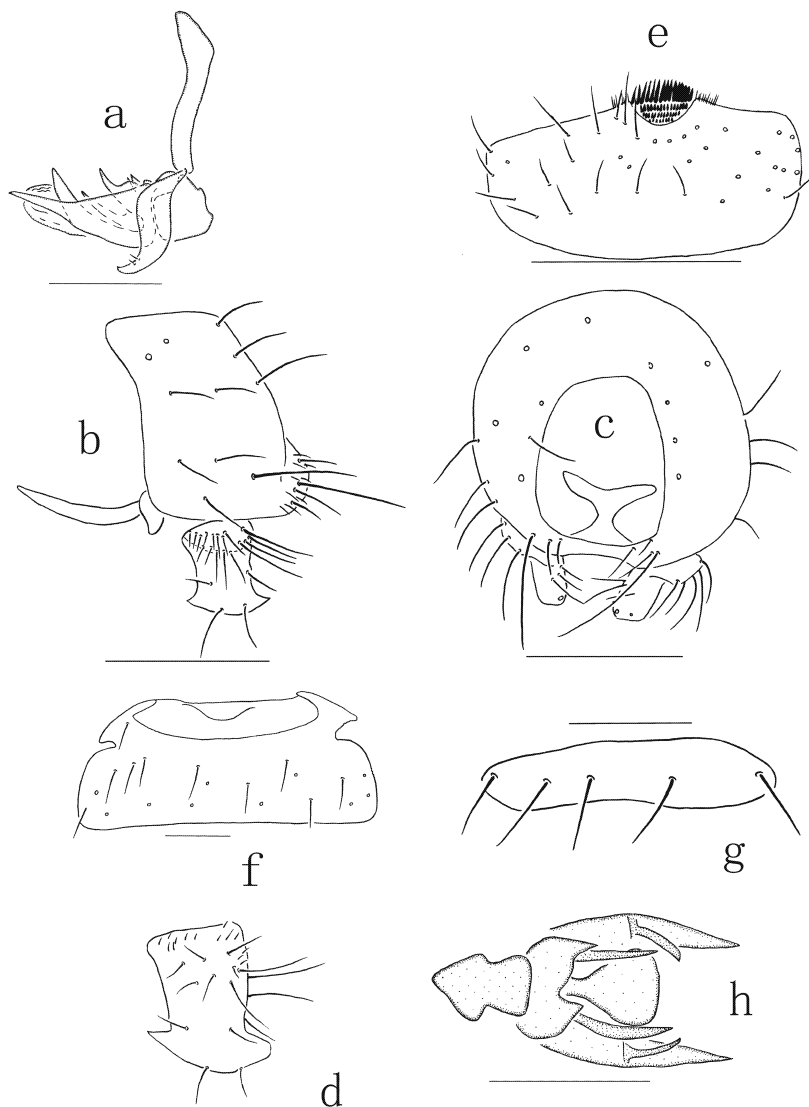


Fig. 1. *Pullimosina* (*Dahlimosina*) *quadripulata* Su, **sp. n.**, holotype male, from Liaoning, China. – a. Aedeagus and associated parts laterally. – b. Genitalia laterally. – c. Genitalia caudally. – d. Surstylus laterally. – e. Sternite 5 ventrally. – f. Syntergite 1+2 ventrally. – g. Synsternite 1+2 ventrally. – h. Aedeagus and associated parts, dorsally. Scale bars 0.1 mm.

Paratypes 1 ♂: China, Liaoning Province, Benxi City, Yanghugou, 124°39'46.5"E, 41°15'41.2"N, 14.VII.2010 Jianfeng Wang leg.; 2 ♂♂, 1 ♀: China, Liaoning Province, Benxi City, Yanghugou, 124°39'48.4"E, 41°13'43.2"N, 13.VII.2008 Jianfeng Wang leg.

Description. Body length 1.4–1.8 mm, wing length 1.3–1.6 mm. General colour shining black, including head; halter with stem pale brown, knob black; legs almost black except for trochanters, apices of femora, basal parts of tibiae and tarsi, darker brown. Head: Only with 1 pair of up-curved setulae behind ocellar triangle. Interfrontal setae in 3 pairs, subequal in length. A min-

ute pair of short setulae below and outside interfrontals also present. Eye height about 2.4 times as long as genal height. Arista hairs twice as long as basal width of arista. Genal seta small, but indistinct, whole gena almost completely covered by small setulae.

Thorax: Thoracic chaetotaxy: 1 long postpronotal seta; 2 dorsocentral setae, anterior very short, almost on the suture, prescutellar dorsocentral seta slightly shorter than scutellar length; acrostichal setulae in 8 rows in front of suture. Katapisternum with 1–2 anterior small setulae to posterior seta. Scutellum with 4 marginal setae, 2–3 small setulae in front of laterobasal scutellar

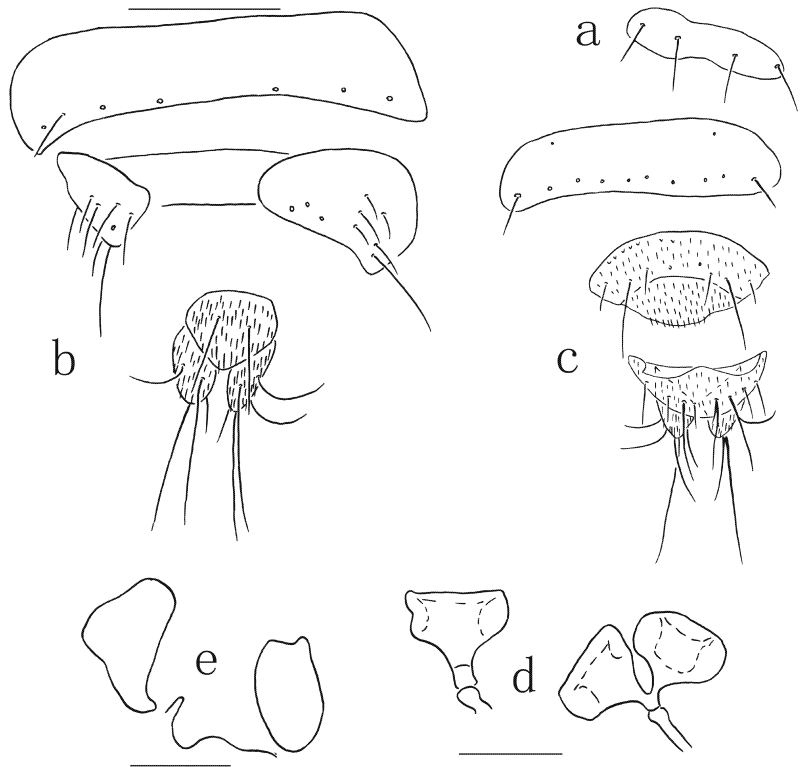


Fig. 2. *Pullimosina* (*Dahlimosina*) *quadriplata* Su, **sp. n.**, paratype female, from Liaoning, China. – a. Synsternite 1+2 ventrally. – b. Genitalia dorsally. – c. Genitalia ventrally. – d. Spermathecae. – e. Spectacles-shaped sclerite. Scale bars 0.1 mm.

seta and 1 small setula between laterobasal and apical scutellar marginal setae. Mid tibia proximally with a short anterodorsal seta and a small anterodorsal seta in front of it, distally with a short anterodorsal and a long dorsal and a short posterodorsal setae, dorsal seta less than twice as long as posterodorsal seta, male without ventral seta except for short ventroapical seta (female with ventral seta below middle). Wing pale brown, veins brown. C extending slightly beyond R 4+5. Second costal sector 0.9 times as long as third, crossveins r-m and dm-cu separated by 2.5 times the length of dm-cu. R 2+3 slightly straight on basal half, but very slightly bent up to C on apical half. R 4+5 slightly straight. Cell dm with appendages of M and CuA₁, but indistinct. Alula small and narrow, apically blunt. Syntergite 1+2 (Fig. 1f) darkly pigmented except for antero-medially pale and membranous, its length half at middle as long as darkly pigmented part; tergite 3 darkly and uniformly pigmented, slightly narrower and subequal in length to syntergite at middle. Synsternite 1+2 (Figs. 1g, 2a) narrow and wide, darkly and uniformly pigmented, with several medium long setae.

Male genitalia. Sternite 5 (Fig. 1e) posteromedial area densely setose, about 5 rows, posterior row of setae long (sometimes posterior row of long setae bent internally); sternite 6 simple. Surstylus (Fig. 1d) rectangular, laterally setulose at base; ventrally with small anterior and posterior processes, their apices slightly pointed (particularly anteroventral process sometimes spine-like). Basiphallus (Fig. 1a) square. Postgonite (Fig. 1a) slightly slender, preapically with 2 setulae. Distiphallus (Fig. 1a, 1h) dorsally with 4 pairs of processes in lateral view, not toothed.

Female genitalia. Tergite 8 (Fig. 2b) dorso-medially membranous, laterally widened and darker. Additional sclerite not visible. Tergite 10 (Fig. 2b) setose and with 2 long setae. Sternite 8 (Fig. 2c) setose and with 2 distinctly long setae, posterior half pale and densely setose. Sternite 10 (Fig. 2c) setose except for 2 anterior parts membranous and bare, with 2 distinctly long setae. Spectacles-shaped sclerite (Fig. 2e) with oval rings. Spermathecae (Fig. 2d) shorter and wider.

Etymology. The specific name is from Latin for quadruplets and refers to 4 paired parts on

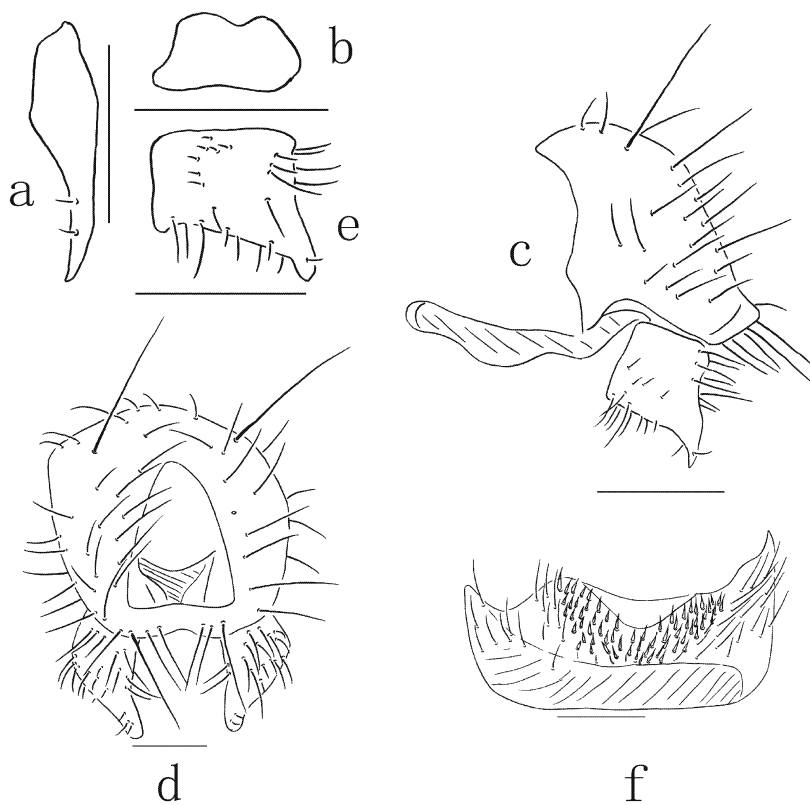


Fig. 3. *Pullimosina* (*P.*) *heteroneura* (Haliday), male, from Jiangxi, China. – a. Postgonite laterally. – b. Basiphallus laterally. – c. Genitalia laterally (left side). – d. Genitalia laterally (right side). – e. Surstylus laterally (right side). – f. Sternite 5 ventrally. Scale bars 0.1 mm.

male distiphallus, forming 4 pairs of processes in lateral view (Fig. 1a, 1h).

Distribution. China: Liaoning Province.

Remarks. The new species resembles *Pullimosina* (*Dahlimosina*) *yukonensis* Marshall, 1986 in the external characters, male and female genitalia. It can be easily distinguished from the latter by body colour shining black; distiphallus with 4 paired parts; surstylus laterally with dense and long setulae, ventrally with an apically pointed, spine-like, anterior process; female tergites 1–5 without a large membranous area; female sternite 8 posterior half membranous and densely setose.

3.2. *Pullimosina* (*Dahlimosina*) *heteroneura* (Haliday, 1836) (Fig. 3)

Limosina heteroneura Haliday, 1836: 331.

Material examined. China: Jiangxi Province, Mt. Guan, Dong River, 114°23'3.4"E, 28°25'9.4"N,

430 m, 31.III.2009 1 ♂ Lingli Yi & Yi Li leg.; Jiangxi Province, Mt. Matou, 117°10'36.4"E, 27°50'3.2"N, 410 m, 10.IV.2009 1 ♂ Malaise trap.

Distribution. Afghanistan, Algeria, Andorra, Argentina, Australia, Austria, Belgium, Bermuda, Bulgaria, Cape Verde Is., Canada, China (Jiangxi), Cyprus, Czech Republic, Ecuador, Denmark, Egypt, Estonia, Finland, France, Greece, Gough I, Hungary, Iceland, Israel, Italy, Japan, Latvia, Lebanon, Lithuania, Macedonia, Malta, Mexico, Morocco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Tajikistan, Taiwan, Tunisia, Uganda, United Arab Emirates, USA.

Remarks. The species is firstly recorded for Continental China. Some characters were found different from the description in Roháček's (1983) European revision as follows: Head: Interfrontal setae in 4 pairs, posterior second longer and cruciate, posterior first and third long and subequal in length, anterior first shortest, or all

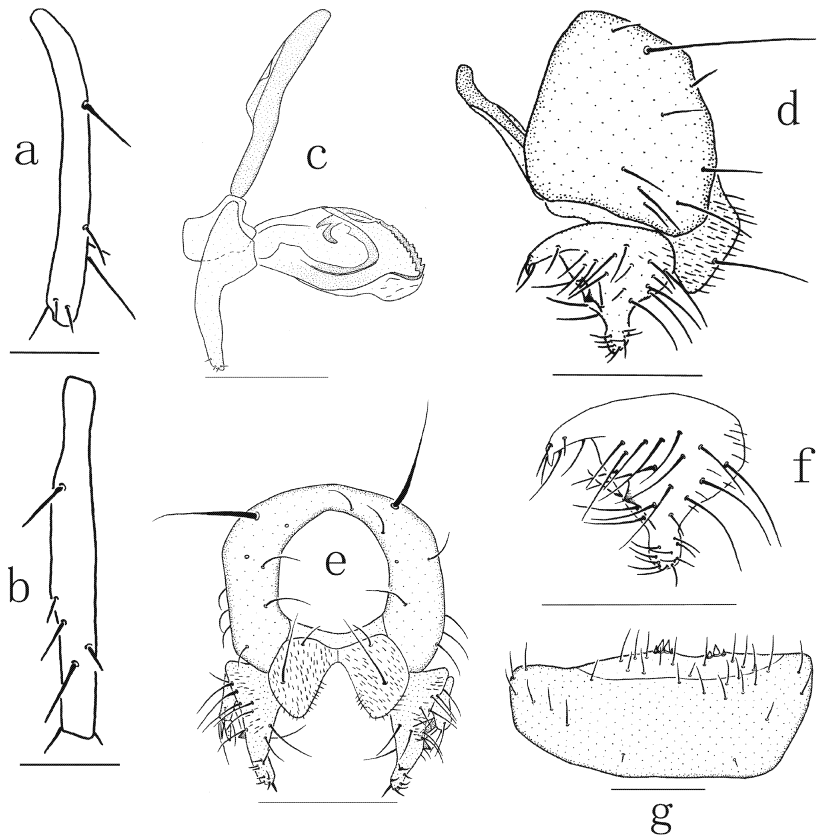


Fig. 4. *Pullimosina (Pullimosina) meta* Su, male, from Yunnan, China. – a. Mid tibia laterally. – b. Mid tibia dorsally. – c. Aedeagus and associated parts, laterally. – d. Genitalia laterally. – e. Genitalia caudally. – f. Surstylus laterally. – g. Sternite 5 ventrally. Scale bars 0.1 mm.

interfrontals subequal in length. Thorax: Acrostichal setulae in 4 rows in front of suture. Male genitalia: Sternite 6 with 2 small processes. Surstylus (Fig. 3c, 3e) usually symmetrical, but sometimes asymmetrical, surstylus in one side with an apically blunt, anteroventral process (usually without anteroventral process).

3.3. *Pullimosina (Pullimosina) meta* Su, 2011 (Fig. 4)

Pullimosina (Pullimosina) meta Su, 2011: 93–94, 197.

The original description is in Chinese, hence given here in English.

Material examined. China: Yunnan Province, Mt. Laifeng, 98°29'14.9"E, 25°0'55.9"N, 7.VIII.2009 1 ♂ Jianfeng Wang & Lixin Su leg.; Jiangxi Province, Mt. Guan, 114°33'6.3"E, 28°29'59"N, 450–470 m, 9.V.2009 1 ♂ Zheping Yu & Lingli Yi leg.

Description. Body length 1.6–1.5 mm, wing

length 1.3–1.4 mm. General colour brownish black to black; head black; halter stem and knob brown; legs almost brownish black except for trochanters, basal parts of tibiae and tarsi, light brown. Head: Postvertical setae small. 3 interfrontal setae, middle one longest and strongly cruciate. Eye large, its height about 3 times as long as genal height. Aristal hairs 1.5–2 times as long as basal width of arista.

Thorax: Throacic chaetotaxy: 1 long postpronotal seta; 2 dorsocentral setae, anterior dorsocentral seta 0.5 times as long as prescutellar dorsocentral seta, prescutellar dorsocentral seta slightly shorter than scutellar length; acrostichal setulae in 6–8 rows in front of suture. Prescutellar acrostichal seta enlarged, but distinctly shorter and thinner than anterior dorsocentral seta. Scutellum with 4 marginal setae, without additional setulae, laterobasal marginal seta 0.6 times as long as apical marginal seta. Fore femur with a distinct row of posteroventral setae, enlarged and elongate in distal half. Mid tibia (Fig. 4a, 4b)

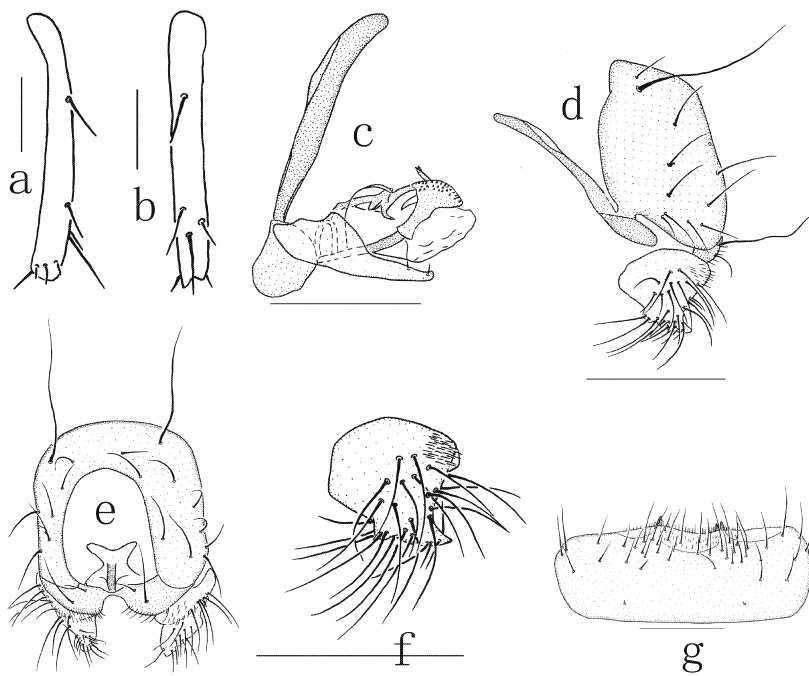


Fig. 5. *Pullimosina (Pullimosina) vulgesta* Roháček, male, from Ningxi, China. – a. Mid tibia laterally. – b. Mid tibia dorsally. – c. Aedeagus and associated parts, laterally. – d. Genitalia laterally. – e. Genitalia caudally. – f. Surstylus laterally. – g. Sternite 5 ventrally. Scale bars 0.1 mm.

proximally with a slightly long anterodorsal seta, distally with a short anterodorsal and a longer dorsal and a short posterodorsal setae, dorsal seta distinctly more than twice as long as posterodorsal seta, male without ventral seta except for short ventroapical seta. Mid femur with a weak row of posteroventral setae. Wing pale brown, veins brown. C extending distinctly beyond R 4+5. Second costal sector 0.8 times as long as the third, crossveins r-m and dm-cu separated by 3.3 times the length of dm-cu. R 2+3 slightly straight on basal half, apically distinctly bent up to C. R 4+5 distinctly bent up to C. Cell dm with appendages of M and CuA₁. Alula small and narrow, apically blunt. Syntergite 1+2 anteromedially lightly pigmented, its length 2/5 at middle as long as darkly pigmented part; tergite 3 darkly and uniformly pigmented, slightly narrower and shorter than syntergite. Synsternite 1+2 light yellow. Sternite 3 shining black except for anteriorly with semicircular area light yellow.

Male genitalia. Sternite 5 (Fig. 4g) posteromedial area membranous, its posteromedial portion with 2–3 spines on right side and 4 spines on left side. Sternite 6 with a small, cone-like process. Epandrium (Fig. 4d, 4e) with long dorso-

lateral setae. Cercus (Fig. 4d, 4e) with a long seta. Surstylus (Fig. 4f) tripartite; lateral part with long setulae, anteromedial margin with a small, cone-like process; anterodorsal margin of lateral part with a slender and long process (the character different from the original description), apically pointed and setulose; ventral margin of lateral part with a thick and short, setulose process. Basiphallus (Fig. 4c) rectangular. Postgonite (Fig. 4c) basal half broadened, apical half slender, its apex with small setulae. Distiphallus (Fig. 4c) distal sclerite toothed.

Female. Unknown.

Distribution. China: Jiangxi Province, Yunnan Province.

Remarks. The species resembles *Pullimosina (Pullimosina) mcalpinei* Marshall, 1986 in face and gena colour, interfrontals, sternite 6, male surstylus. It can be easily differentiated from the latter by prescutellar acrostichal seta distinctly shorter and thinner than anterior dorsocentral seta; male sternite 5 posteromedial area with 2 clusters of spines, including 4 and 2–3 spines respectively; male surstylus anteromedial margin of lateral part with a cone-like process; distiphallus with toothed distal sclerite.

3.4. *Pullimosina (Pullimosina) vulgesta* Roháček, 2001 (Fig. 5)

Pullimosina (Pullimosina) vulgesta Roháček, 2001: 474.

Pullimosina (Pullimosina) moesta: Roháček, 1983: 106–107; Roháček, 1985: 117, 120–121; Su, 2011: 95–96, 198.

Material examined. China: Jilin Province, Mt. Changbai, 128°3'39"E, 42°0'4.8"N, 900–1,100 m, 30.VII.2008 4 ♂♂ Lixin Su leg.; Sichuan Province, Mt. Gongga, 101°52'35.9"E, 29°35'41.9"N, 1,500 m, 2.VIII.2004 2 ♂♂ Guangchun Liu leg.; Yunnan Province, Mt. Laifeng, 98°29'14.9"E, 25°0'55.9"N, 1,750–1,950 m, 70.VIII.2009 2 ♂♂ Lixin Su leg.; Ningxia Province, Mt. Liupan, Guamagou, 106°27'48"E, 35°51'26.1"N, 2,000–2,250 m, 6.VII.2008 1 ♂ Lixin Su leg.; Jiangxi Province, Mt. Guan, 114°23'3.4"E, 28°25'9.4"N, 450–470 m, 9.V.2010 4 ♂♂ Zheping Yu & Lingli Yi leg.; Jiangxi Province, Jian County, Shuangjiang, 114°30'19.3"E, 26°51'43.1"N, 174 m, 17.V.2009 1 ♂ Lingli Yi leg.; Jiangxi Province, Mt. Wuyi, 117°48'50.4"E, 27°59'56.7"N, 1,170 m, 18.VII.2009 2 ♂♂ Malaise trap.

Distribution. Andorra, Austria, Belgium, China (Jiangxi, Jilin, Ningxia, Sichuan, Yunnan), Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Japan, Latvia, Montenegro, Nepal, Netherlands, ?North Korea, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland.

Remarks. Some characters were found different from the description in Roháček's (1983) European revision as follows: Head: Interfrontal setae in 3–4 pairs, middle 1 pair or 2 pairs longest and strongly cruciate. Thorax: Acrostichal setulae in 6–9 rows in front of suture. Syntergite 1+2 anteromedially pale and membranous, V-shaped (specimens from Sichuan Province deep, while specimens from other Provinces slightly shallow). Male genitalia: Sternite 5 (Fig. 5g) posteromedial area with 2–3 spines. Sternite 6 with a small, cone-like process.

3.5. Key to the genus *Pullimosina* Roháček from China

1. Interfrontal setae subequal in length; scutellum also with some additional setulae in addition to the 4 marginal setae; wing with short C extended beyond R 4+5; male sternite 5 (Fig. 1e) posteromedial area setose
P. (D.) quadripulata Su **sp. n.**
- Middle one of interfrontals longest and strongly cruciate; scutellum only with 4 marginal setae; wing with long C extended beyond R 4+5; male sternite 5 posteromedial area with spines or spine-like setae 2
2. Wing distance between r-m and dm-cu shorter than dm-cu; male sternite 5 (Fig. 3f) posteromedial area with numerous spine-like setae
P. (P.) heteroneura (Haliday)
- Wing distance between r-m and dm-cu longer than dm-cu; male sternite 5 posteromedial margin with spines 3
3. Male sternite 5 (Fig. 4g) posteromedial margin with 7 small spines
P. (P.) meta Su
- Male sternite 5 (Fig. 5g) posteromedial margin with 2 or 3 small spines
P. (P.) vulgesta Roháček

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