A new species of *Macrophya* Dahlbom (Hymenoptera: Tenthredinidae) with a key to species of the *Macrophya sibirica* group from China

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**Abstract:** A new species of the *Macrophya sibirica* group, *Macrophya harbina* Li, Liu & Wei sp. nov. from China is described. This new species is similar to *M. revertana* Wei, 1998, but differs from the latter in the posterior margin of pronotum and center of mesoscutellum white; postocellar area 1.5 times broader than long; mesepisternum not entirely black, center of posterior margin with a small white macula; mesepisternum minutely and densely punctured, not coarse, interspaces between punctures distinct; dorsum of mesoscutellum without carina, with very sparse and shallow punctures; hind femur largely black, base with white macula on dorsal side; posterior margin of abdominal tergum 1 with distinct white maculae; middle serrulae of lancet each with 2 proximal and 9–11 distal teeth. A key to all known species of the *Macrophya sibirica* group from China is provided.

**Key words:** Symphyta; Tenthredinoidea; taxonomy; sawflies

中国钩瓣叶蜂属一新种及 *M. sibirica* group 中国种类检索表（膜翅目：叶蜂科）

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**摘要：**记述采自中国钩瓣叶蜂属 *Macrophya Dahlbom* 直脉钩瓣叶蜂种团 *M. sibirica* group 1 新种：哈尔滨钩瓣叶蜂 *Macrophya harbina* Li, Liu & Wei sp. nov.：简要讨论了 *M. sibirica* group 的主要鉴别特征，编制了 *M. sibirica* group 中国已知种类检索表。该新种与中国分布的反刻钩瓣叶蜂 *M. revertana* Wei, 1998 十分近似，但新种前胸背板后缘、中胸小盾片大部白色；单眼后区宽长比约为 1.5；中胸前侧片不完全黑色，后缘中央具小型白斑；中胸前侧片刻点较细小密集，不粗糙，刻点间光滑间隙明显；中胸小盾片无脊，刻点十分稀疏细弱；后足股节大部黑色，背侧末端具小型白斑；腹部第 1 背板中央后缘横白斑显著；中部锯刃齿式为 2/9–11 等特征，与后者不同。

**关键词：** 广腰亚目；叶蜂总科；分类；叶蜂

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Introduction

Macrophya Dahlbom, 1835, the third largest genus in Tenthredininae and the fourth largest in the family, Tenthredinidae, containing 270 species worldwide (Li & Wei 2013; Li et al. 2013a, b, c, 2014a, b; Liu et al. 2015a, b; Shinohara & Li 2015; Shinohara & Yoshida 2015). In China, 131 Macrophya species have been recorded (Wei et al. 2006, 2013; Taeger et al. 2010; Zhao et al. 2010; Zhao & Wei 2011; Zhu et al. 2012; Li et al. 2012, 2013a, b, c, 2014a, b; Li & Wei 2012, 2013; Wu et al. 2012; Liu et al. 2015a, b).

The Macrophya sibirica group is a large group in Macrophya with 21 species worldwide. In China, there are 14 species in this group: M. carbonaria Smith, 1874 (described in Smith 1874), M. convexina Wei & Li, 2013 (in Li et al. 2013b), M. crassitarsalina Wei & Chen, 2002 (in Wei & Chen 2002), M. maculipennis Wei & Li, 2009 (in Wei & Li 2009), M. maculoepimera Wei & Li, 2013 (in Li et al. 2013b), M. nigrotibia Wei & Huang, 2013 (in Li et al. 2013b), M. potanini Jakovlev, 1891 (in Jakovlev 1891), M. revertana Wei, 1998 (in Wei & Nie 1998), M. shii Wei, 2004 (in Wei & Shi 2004), M. sibirica Forsius, 1918 (in Forsius 1918), M. soror Jakovlev, 1891 (in Jakovlev 1891), M. stigmatalis Wei & Nie, 2002 (in Wei & Nie 2002), M. tripidona Wei & Chen, 2002 (in Wei & Chen 2002), M. typhanoptera Wei & Nie, 1999 (in Wei & Nie 1999). In Europe, there are 6 species of this group: M. albicincta (Schrank, 1776) (in Schrank 1776), M. alboannulata A. Costa, 1859 (in A. Costa 1859), M. carinthiaca (Klug, 1817) (in Klug 1817), M. convexiscutellaris Muche, 1969 (in Muche 1969), M. parvula Konow, 1884 (in Konow 1884), M. ribis (Schrank, 1781) (in Schrank 1781). In Japan, there are 2 species in this group: M. carbonaria and M. timida F. Smith, 1874 (in F. Smith 1874). In Korea, there is one species in this group: M. sibirica. In Syria, there is one species in this group: M. parvula. In Siberia, there is one species in this group: M. sibirica. In Vladivostok, there is one species in this group: M. potanini. In Sakhalin, there is one species in this group: M. carbonaria. They are similar in general morphology, and form a distinct species group. Here, one further new species belonging to this species group from Heilongjiang and Liaoning, China is described. A key to all described species from China in this group is provided.

Material and methods

The specimens were examined with a Motic-SMZ-168 dissection microscope. Adult images were taken with a Nikon D700 digital camera and a series of images montaged using Helicon Focus (©HeliconSoft). All images were further processed with Adobe Photoshop CS11.0.

Morphological descriptions of new species are based on the holotype. The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002). For a few terms (e.g. middle fovea and lateral fovea), we follow Takeuchi (1952).

The specimens examined in this study, including all holotypes and paratypes of the new species, are deposited in the Insect Collection of Central South University of Forestry and Technology, Changsha, Hunan, China.
Taxonomy

Macrophya sibirica species group

Diagnosis. Body mainly black, shortly white, but without metallic tinge; antenna entirely black; apical margin of labrum usually white, clypeus usually largely or entirely black; anterior margin of clypeus slightly clear, usually not deep, lateral lobe short; posterior corner of metepimeron subquadrate, without appendage; abdominal tergum 1 usually with white maculae; anal cell of fore wing usually with a short, erect crossvein, or in some species with a middle petiole, usually not long; ergot of penis valve distinct.

The Macrophya sibirica group comprises a large portion of the Macrophya. It differs from other groups in having the posterior corner of metepimeron subquadrate, without appendages; abdominal tergum 1 usually with white maculae; anal cell of fore wing usually with a short, erect crossvein.

The Macrophya sibirica group includes eleven known species and one new species from China described here. They can be separated using the following key.

Key to adults of the Macrophya sibirica group from China

1. Fore wing clearly with smoky maculae.............................................................. 2
   - Fore wing hyaline, absolutely without smoky macula.................................... 3
2. Smoky maculae vertical in the fore wing; hind trochanter entirely white; hind tibia with distinct white ring at center, half the length of hind tibia; posterior 3/5 of tergum 1 white, basal 2/5 of tergum 1 black; anterior of clypeus shallowly emarginate, lateral lobes short and broad; middle serrulae of lancet each with 1 proximal tooth and 9 to 11 distal teeth, subbasal teeth small, annular spine bands broad, spines dense. China (Henan).............................................................................................................................................. M. typanoptera Wei & Nie
   - Below stigma with subround maculae in the fore wing; hind trochanter and tibia entirely black; posterior of tergum 1 with narrow, white band; anterior of clypeus deeply rounded, lateral lobes narrow and long; middle serrulae of lancet each with 1 proximal tooth and 5 to 6 distal teeth, subbasal tooth large, annular spine bands narrow, spines sparse. China (Shanxi, Hebei, Beijing, Tianjin)........................................................................................................ M. maculipennis Wei & Li
3. Hind tibia entirely black...................................................................................... 4
   - Hind tibia not entirely black, with brown or white maculae dorsally.............. 5
4. Head and thorax distinctly and densely punctured, not rugose; antennae 1.1 times as long as head and thorax together; anterior incision 0.4 times clypeus length, lateral lobes long and narrow; posterior margin of tergum 1 white; hind trochanter white, with a ventral black spot; hind tarsomere 1 slender, hardly enlarged; vein C and pterostigma black brown; middle serrulae of lancet each with 7 to 10 distal teeth. China (Yunnan).................................................................................................................................................. M. nigrotibia Wei & Huang
   - Head and thorax densely and rugosely punctured, without distinct microsculpture; antennae 1.5 times as long as head and thorax together; anterior incision 0.3 times length of clypeus, lateral lobes very short and obtuse; tergum 1 without white macula; hind trochanter entirely black; hind tarsomere 1 distinctly enlarged; vein C and pterostigma yellowish brown; middle serrulae of lancet each with 17 to 21 distal teeth. China (Shanxi, Henan, Hunan)....................................................................................................................... M. crassitaralisina Wei & Chen
5. Hind tarsomeres entirely black........................................................................... 6
   - Hind tarsomeres with distinct white maculae.................................................. 9
6. Mesoscutellum clearly with white maculae...................................................... 7
   - Mesoscutellum entirely black......................................................................... 8
7. Pronotum, tergum 1 and hind femur entirely black; hind tibia with white macula at center, slightly shorter...
than half of the length of hind tibia. China (Heilongjiang, Jilin, Liaoning, Hebei, Tianjin); Siberia; North Korea ................................................................. *M. sibirica* Forsius

- Posterior margin of pronotum with distinct white bands; posterior of tergum 1 with 2 small transverse maculae; dorsal side of hind femur with distinct white maculae apically; hind tibia with white macula at center, as long as half of hind tibia. China (Heilongjiang) ......................................... *M. harbina* Li, Liu & Wei sp. nov.

8. Hind trochanter largely black, some white; pronotum entirely black; hind femur 2.5 times as long as white maculae on the outer side of hind coxa. [Labrum and clypeus of male not entirely black, anterior of labrum white, base of clypeus with 2 small white maculae; outer side of hind coxa with an oval white macula]. China (Gansu, Shaanxi, Shanxi, Henan, Hubei, Anhui, Zhejiang) ........................................ *M. revertana* Wei

- Hind trochanter largely white, some black; posterior of pronotum with distinct, white band; hind femur 2 times as long as white maculae on the outer side of hind coxa. [Male adult labrum entirely and clypeus largely white, base of clypeus black; pronotum entirely black; outer side of hind coxa entirely black]. China (Qinghai, Gansu, Ningxia, Sichuan) ................................................................. *M. shii* Wei

9. An oval white macula on outer side of hind coxa not running along the length of hind coxa; mesopleuron densely and rugosely punctured, interspaces between the punctures narrow .................................. 10

- An oblong white strip on outer side of hind coxa running along the entire length of hind coxa; mesopleuron minutely and sparsely punctured, interspaces between the punctures distinct .............................................. 11

10. Labrum and clypeus entirely white; mesoscutellum clearly elevated, top with clear transverse carina; posterior margin of pronotum with distinct white bands; apical 2/3 of tergum 1 with white maculae narrowing towards each side, lateral corners of terga 2 to 7 with distinct white maculae, posterior margins of all sternums white; fore and middle trochanters entirely white, shortly black; broad ring at center as long as half of hind tibia. China (Gansu, Henan, Hubei) ................................................................. *M. tripidona* Wei & Chen

- Labrum and clypeus not entirely white, shortly black; mesoscutellum slightly elevated, without transverse carina; posterior margin of pronotum with narrow white bands; posterior margins of tergum 1 at center with 2 small transverse and white maculae, others entirely black; fore and middle trochanters largely black, shortly white; white maculae on dorsal side as long as half of hind tibia. China (Shaanxi, Zhejiang, Hunan) ................................................................. *M. convexina* Wei & Li

11. Clypeus entirely, hind tibia and hind tarsomere largely yellowish white; base of antennal flagellum very slender and subapical antennomeres distinctly enlarged; postocellar area 2 times as broad as long, posterior margin hardly carinate; outer side of hind coxa black, without white macula; vein C and pterostigma yellowish brown; serrulae feebly protruding, middle serrulae each with 2 proximal teeth and 6 to 9 distal teeth. China (Shaanxi, Hubei, Henan, Guizhou) ................................................................. *M. stigmatical* Wei & Chen

- Clypeus, hind tibia and hind tarsomere largely black; antennae stout, subapical antennomeres feebly enlarged; postocellar area 2.5 times as broad as long, posterior margin sharply carinate; outer side of hind coxa entirely white; serrulae distinctly protruding, middle serrulae each with 1 to 2 proximal teeth and 5 to 6 distal teeth. China (Shaanxi, Shanxi, Hebei) ................................................................. *M. maculoepimera* Wei & Li

**Macrophya harbina** Li, Liu & Wei sp. nov. (Figs. 1–12)

Female. Body length 9.5 mm. Body black; palp largely pale brown; hind trochanter largely sordid brown to black; following parts white: basal 1/2 of mandibles, a long macula on anterior 1/3 of labrum, small maculae on lateral corners of clypeus, narrow and long maculae on posterior margin of postocellar area, posterior margin of pronotum, outer margin of tegula, center of mesoscutellum, a small macula on posterior margin of mesepisternum, posterior margin of abdominal tergum 1, fore and middle coxae with small maculae on outer side, stripes on apex of fore and middle femur on anterior side, anterior side of fore tibia, anterior side largely of middle tibia, dorsal sides largely of fore and middle tarsus, hind coxa with an
oval macula on outer side, apex on outer side and small maculae on inner side of hind femur, subapical 1/2 of hind tibia on dorsal side. Body hairs silver, setae on sheath pale black brown. Wings hyaline, without smoky macula, stigma and veins largely black brown (Fig. 1).

Dorsum of head less shiny; frons sparsely and shallowly punctured, smooth interspaces between punctures distinct; inner sides of temple with small smooth areas, shiny, without microsculpture; postocellar area with some large and shallow punctures (Fig. 3); labrum and clypeus less shiny, with some large and shallow punctures, surface weakly coriaceous. Mesonotum less shiny, punctures on mesonotum more minute and denser than punctures on head, interspaces between punctures with fine microsculpture; dorsum of mesoscutellum shiny, with some shallow punctures; mesoscutellar appendage and metascutellum less shiny, with some large punctures, microsculpture fine but distinct. Mesepisternum less shiny, densely and coarsely punctured, interspaces between punctures narrow; anepimeron dim, with dense wrinkles; anterior margin of katepimeron smooth and shiny, without punctures or microsculpture; middle area with indistinct punctures, microsculpture fine but distinct; posterior area with some large punctures; metepisternum dull, minutely and densely punctured; metepimeron with shallow and large punctures, microsculpture fine (Fig. 6). All abdominal terga less shiny, lateral sides of abdominal tergum 1 shallowly punctured, center almost smooth; other abdominal terga with some small and shallow punctures. Surface of sheath coriaceous, with indistinct punctures and fine microsculpture. Hind coxa and outer side of hind femur shallowly punctured, microsculpture fine.

Labrum weakly elevated, slightly longer than broad, anterior margin truncate; clypeus weakly elevated, slightly broader than distance between lower corner of eyes; lateral sides distinctly convergent forwards, anterior margin incised to 1/3 length of clypeus, lateral lobes subtriangular, apical margin obtuse (Fig. 4); malar space 0.4 times diameter of middle ocellus; frons distinctly elevated, higher than top of eyes in lateral view; middle fovea shallow but distinct; lateral foveae deep, furrow-like; interocellar furrow distinct, postocellar furrow indistinct; POL : OOL : OCL = 6 : 12 : 10; postocellar area distinctly elevated, 1.5 times broader than long, anterior 1/2 of lateral furrows shallow and narrow, posterior 1/2 of lateral furrows deep and broad, divergent backwards; head narrowed behind eyes in dorsal view, occipital carina complete. Antenna slender, slightly longer than head and thorax together, clearly shorter than abdomen; antennomere 2, 1.2 times longer than broad; antennomere 3, 1.67 times longer than antennomere 4 (5 : 3), 1.2 times as long as antennomeres 4 and 5 together (5 : 6), antennomeres 6–9 weakly compressed (Fig. 5). Mesoscutellum roundly elevated, without carina, as high as top of mesonotum in lateral view; mesoscutellar appendage and metascutellum with short middle carina; dorsal-posterior platform of mesepimeron 1.2 times as broad as diameter of lateral ocellus; posterior corner of metepimeron subquadrate, without appendage; mesopleuron and metapleuron as Fig. 6; distance between cenchri 2.5 times breadth of a cenchrus. Hind inner tibial spur 0.6 times length of hind tarsomere 1 (10 : 17); hind tarsomere 1 slender, 0.9 times longer than following 4 tarsomeres together (34 : 37); claw with inner tooth as long as outer tooth. Ovipositor sheath slightly longer than fore femur (37 : 34), apical sheath slightly longer than basal sheath (21 : 16), apical margin roundish in lateral view (Fig. 7). Fore wing with vein cu-a joining cell M at basal 1/3, vein 2r joining cell 2Rs at apical 1/3, cell 2Rs slightly longer than cell 1Rs; anal cell in fore wing with short cross vein; petiole of anal cell in hind wing as long as 1/2 times
length of vein cu-a. Lancet with 21 serrulae (Fig. 8), serrulae distinctly protruding and slightly oblique, middle serrulae each with 2 proximal and 9 to 11 distal teeth, subbasal teeth small, annular spine bands narrow, with sparse pilosity; the 8th to 10th serrulae at base as Fig. 9.

Male. Body length 9.5 mm (Fig. 2). Body color and structure similar to female; except for following parts white: anterior sides of fore and middle femur and tibia, fore and middle tarsus largely; head of male in anterior view as Fig. 10; subgenital plate longer than broad, apical margin roundish, gonoforceps as Fig. 11; penis valve as Fig. 12.

Holotype. ♀, China, Heilongjiang, Harbin, Botanic Garden, 25-VI-2002, Wei XIAO leg. Paratypes. 4♀, the same data as holotype; 1♂, Liaoning, Shenyang, Beiling, 12-VI-2009, Tao LI leg.

Individual variation. Anterior margin of labrum in females variable in shape.

Etymology. The species epithet “habrina” is derived from the name of the locality at which most specimens were collected: “Harbin” City in Heilongjiang Province of China.

Remarks. The new species is a member of M. sibirica group and is similar to M. revertana Wei, 1998, but differs from the latter in the posterior margin of pronotum and center of mesoscutellum white; the postocellar area 1.5 times broader than long; the mesepisternum not entirely black, center of posterior margin with a small white macula; the mesepisternum minutely and densely punctured, not rugose, interspaces between punctures distinct; dorsum of the mesoscutellum without carina, with very sparse and shallow punctures; the hind femur largely black, bottom with white macula on dorsal side; the posterior margin of abdominal tergum 1 with distinct white maculæ; the middle serrulae of lancet each with 2 proximal and 9 to 11 distal teeth. In M. revertana, the pronotum and mesoscutellum entirely black; the postocellar area 1.8 times broader than long; the mesepisternum entirely black, without white macula; the mesepisternum densely and coarsely punctured, without smooth interspaces between punctures; the posterior margin of mesoscutellum with weak carina, dorsum with distinct punctures; the hind femur entirely black; the posterior margin of abdominal tergum 1 with narrow, white band; the middle serrulae of lancet with 2 to 3 proximal and 7 to 9 distal teeth.

Distribution. China (Heilongjiang, Liaoning).

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