

## Review of species of the genus *Mokrzeckia* Mokrzecki, 1934 (Hymenoptera: Pteromalidae) from the Russian Far East

## Обзор видов рода *Mokrzeckia* Mokrzecki, 1934 (Hymenoptera: Pteromalidae) с Дальнего Востока России

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A review of species of the genus *Mokrzeckia* Mokrzecki, 1934 from the Russian Far East is provided. *Mokrzeckia lazoensis* sp. nov. is described. *M. abietis* Kamijo, 1982 is recorded for the first time for Russia, and *M. pini* (Hartig, 1838) for the Russian Far East. A key to six known species of *Mokrzeckia* is provided.

Даётся обзор видов рода *Mokrzeckia* Mokrzecki, 1934 с Дальнего Востока России. Описан новый вид *Mokrzeckia lazoensis* sp. nov., *M. abietis* Камидо, 1982 впервые указывается для фауны России и *M. pini* (Hartig, 1838) – для российского Дальнего Востока. Приведена определительная таблица для шести известных видов рода *Mokrzeckia*.

**Key words:** Russian Far East, primary parasitoids, secondary parasitoids, new records, Hymenoptera, Pteromalidae, *Mokrzeckia*, new species

**Ключевые слова:** Дальний Восток России, первичные паразитоиды, вторичные паразитоиды, новые находки, Hymenoptera, Pteromalidae, *Mokrzeckia*, новый вид

### INTRODUCTION

The pteromalid genus *Mokrzeckia* Mokrzecki, 1934 (type species *Pteromalus pini* Hartig, 1838) belongs to the subfamily Pteromalinae. Later, the genus *Beierina* Delucchi, 1958 was described with the same type species *Pteromalus pini* (Delucchi, 1958), and it was synonymised with *Mokrzeckia* by Bouček (1961). Up to now, *Mokrzeckia* comprises six species: *M. abietis* Kamijo, 1982, *M. halidayana* (Ratzeburg, 1848), *M. menzeli* Subba Rao, 1981, *M. obscura* Graham, 1969, *M. orientalis* Subba Rao, 1973, and *M. pini* (Hartig, 1838) (Noyes, 2012). However, several authors (Kurdjumov, 1913; Bouček, 1961; Graham, 1969) considered *Mokrzeckia halidayana* (Ratzeburg, 1848) (whose holotype is probably lost) as a possible synonym of *M. pini* (Hartig, 1838) based on the fact that the

brief original description and the given host of the species well correspond to those of *M. pini*. I agree with this opinion.

Species of *Mokrzeckia* are known as primary parasitoids of the different lepidopteran taxa from the families Pieridae, Tortricidae, Pyralidae, Plutellidae, Notodontidae, Lasiocampidae, Lymantriidae, Hyblaeidae, Noctuidae, and Sphingidae, as well as hymenopteran family Tenthredinidae. They are also known as secondary parasitoids of Braconidae and Ichneumonidae (Noyes, 2012).

Three species of the genus *Mokrzeckia* are known from the Palaearctic Region. *Mokrzeckia obscura* occurs exclusively in the Europe (Graham, 1969; Bouček & Graham, 1978; Dzhanokmen, 1978; Noyes, 2012). *Mokrzeckia pini* was recorded in the Europe, North Africa, Asian part of Russia (Siberia), China (Jilin), North Korea, and

Hokkaido Island of Japan (Hartig, 1838; Ratzeburg, 1848; Ferrière & Faure, 1925; Thompson, 1958; Bouček, 1958, 1961; Graham, 1969; Herting 1976, 1977; Dzhanokmen, 1978; Kamijo, 1982, 1983; Kalina, 1989; Vidal, 2001; Xiao et al., 2001; Vago, 2006; Tselikh, 2011; Noyes, 2012), and *M. abietis* was described from Hokkaido Island of Japan (Kamijo, 1982; Noyes, 2012). Only two species of the genus are known from the Oriental Region: *M. menzeli* from India (Subba Rao, 1981; Farooqi & Subba Rao, 1986; Sureshan, 2003, 2007; Sureshan & Narendran, 2003; Noyes, 2012) and *M. orientalis* from India, Sri Lanka, Thailand, Malaysia, and Indonesia (Subba Rao, 1973, 1981; Ooi, 1979; Farooqi & Subba Rao, 1986; Sureshan, 2003; Sureshan & Narendran, 2003; Noyes, 2012).

During my study of the genus *Mokrzeckia* that included material from the collection of Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia, ZIN), the holotype of *M. orientalis* from the Natural History Museum (London, U.K., BMNH), and the paratypes of *M. abietis* from the Hokkaido University (Japan, EIHU), several specimens were found as belonging to a new species described below. In addition, *M. abietis* is recorded for the first time for the fauna of Russia, and *M. pini* for the first time for the fauna of the Russian Far East.

## MATERIAL AND METHODS

This study is mainly based on the material from ZIN. Holotype (female) of *M. orientalis* and two paratypes (female and male) of *M. abietis* were borrowed from BMNH and EIHU, respectively.

Observations were made under stereomicroscopes MC-2 ZOOM and Micromed 3. Illustrations were prepared using a stereomicroscopes Micromed 3 and a digital camera DCM 510.

Morphological terminology, including sculpture and wing venation nomenclature, follows Graham (1969) and Gibson et al. (1998). The following abbreviations are

used: POL – posterior ocellar line, the minimum distance between the posterior ocelli; OOL – ocellocular line, the minimum distance between posterior ocellus and compound eye.

## TAXONOMIC PART

### Order HYMENOPTERA

### Family PTEROMALIDAE

### Subfamily PTEROMALINAE

### Genus *Mokrzeckia* Mokrzecki, 1934

*Mokrzeckia* Mokrzecki, 1934: 143 (type species *Pteromalus pini* Hartig, 1838, by monotypy)  
*Beierina* Delucchi, 1958: 271 (type species *Pteromalus pini* Hartig, 1838)

### *Mokrzeckia pini* (Hartig, 1838) (Fig. 13)

*Pteromalus pini* Hartig, 1838: 253.

*Mokrzeckia pini* – Mokrzecki, 1934: 143.

*Pteromalus halidayanus* Ratzeburg 1848: 207.

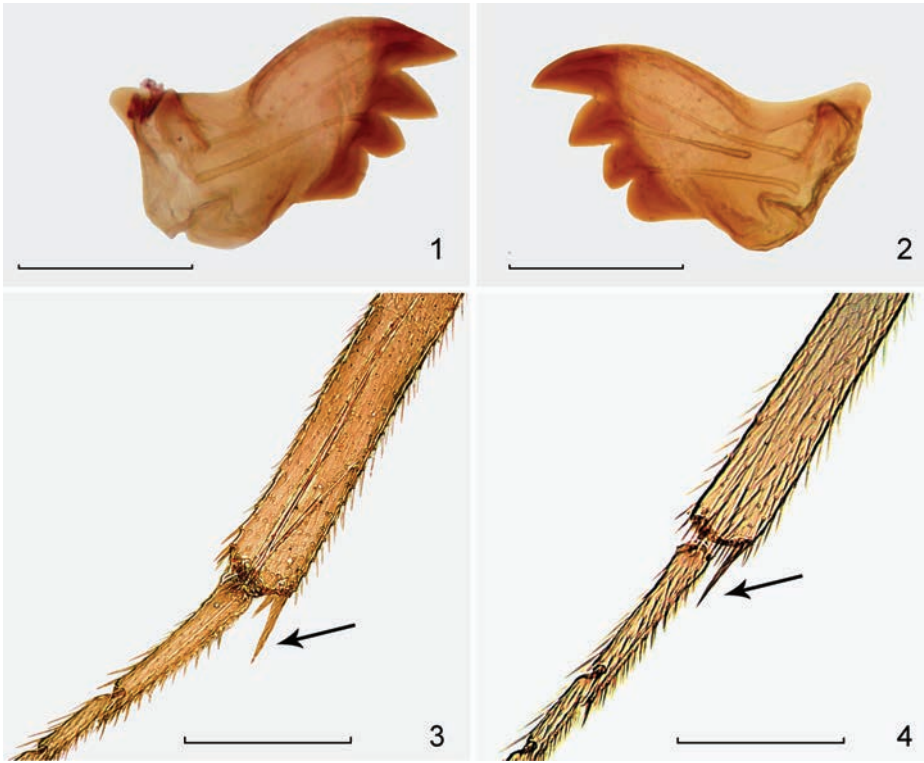
*Pteromalus halidayanus* – Kurdjumov, 1913: 23  
(as synonym of *Pteromalus pini*).

*Schizonotus pailoti* Ferrière et Faure, 1925: 229.

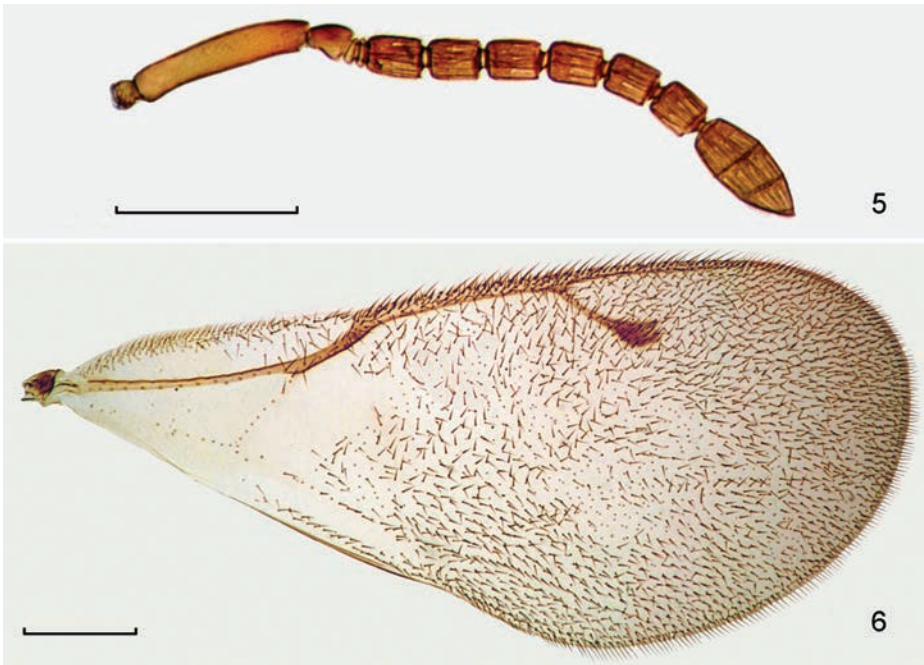
*Beierina pini* – Delucchi, 1958: 271 (as synonym of *Pteromalus pini*); Bouček, 1961: 74.

*Material examined.* **Russia:** Tomsk Prov., Tomsk, July 1963, coll. N.G. Kolomiets, 1 female (ZIN); Primorskiy Terr., Spassk-Dal'niy, 17 Aug. 1993, coll. S.A. Belokobylskij, 2 females (ZIN).

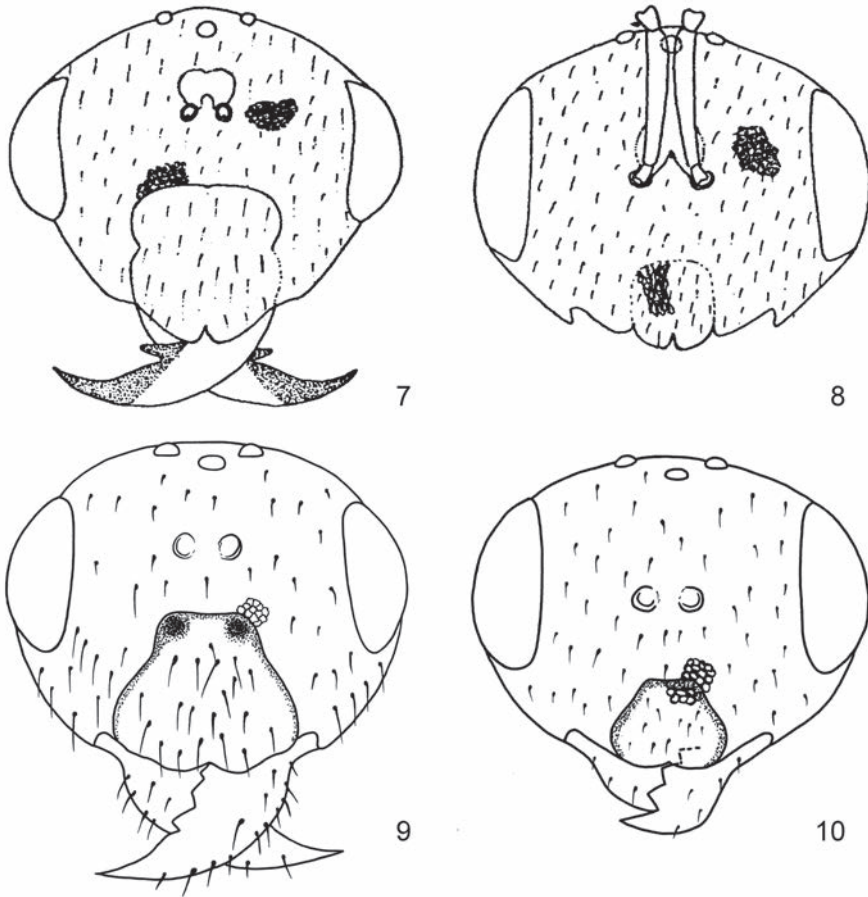
*Biology.* Primary parasitoid of lepidopteran *Aporia crataegi* (Linnaeus, 1758) (Pieridae), *Cerura vinula* (Linnaeus, 1758) (Notodontidae), *Choristoneura murinana* (Hübner, 1799) (Tortricidae), *Dendrolimus pini* (Linnaeus, 1758), *D. superans* (Butler, 1877) (Lasiocampidae), *Lymantria dispar* (Linnaeus, 1758) (Lymantriidae), *Smerinthus planus* Walker, 1856 (Sphingidae) and hymenopteran *Pristiphora abietina* (Christ, 1791) (Tenthredinidae). Secondary parasitoid of hymenopteran *Cotesia affinis* (Nees, 1834), *C. glomerata* (Linnaeus, 1758), *C. ordinaria* (Ratzeburg, 1844), *Protapanteles liparidis* (Bouché, 1834) (Braconidae) and *Hyposoter ebeninus* (Gravenhorst, 1829) (Ichneumonidae).



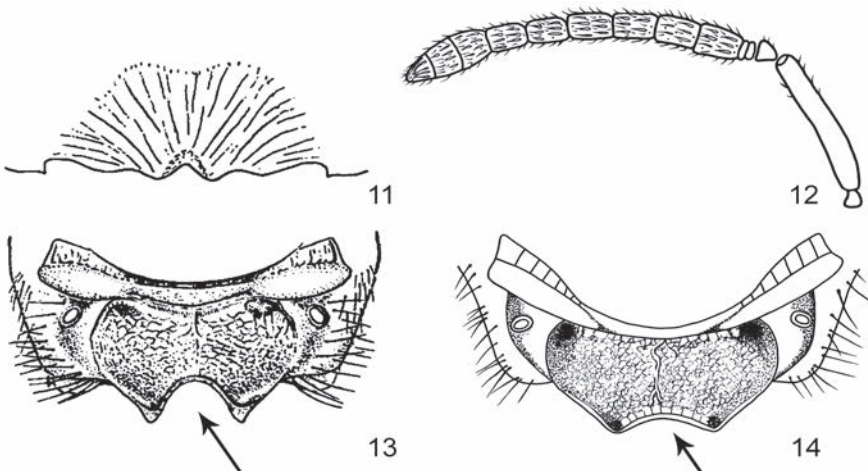
**Figs 1–4.** *Mokrzeckia lazoensis* sp. nov. paratype, female. **1, 2**, left and right mandible; **3, 4**, hind tibia. Scale bars: 0.2 mm (1, 2), 0.3 mm (3, 4).



**Figs 5, 6.** *Mokrzeckia lazoensis* sp. nov. paratype, female. **5**, antennae; **6**, fore wing. Scale bars: 0.3 mm.



**Figs 7–10.** 7, 8 *Mokrzeckia orientalis* (7, male; 8, female) (after Subba Rao, 1973); 9, 10, *M. lazoensis* sp. nov. (9, male, paratype; 10, female, holotype). 7–10, head (front view).



**Figs 11–14.** 11, *M. abietis* holotype, female (after Kamijo, 1982); 12, *M. orientalis* (holotype), female; 13, *M. pini* lectotype, female (after Graham, 1969); 14, *M. abietis* (paratype), female. 11, clypeus; 12, antenna; 13, 14, propodeum, dorsal view.

**Distribution.** Trans-Palaeartic species: Europe, North Africa, Russia (West Siberia, south of Far East), northeast China (Jilin), North Korea, Japan (Hokkaido).

***Mokrzeckia abietis* Kamijo, 1982**  
(Figs 11, 14)

*Mokrzeckia abietis* Kamijo, 1982: 70.

*Mokrzeckia abietis* – Noyes, 2012.

**Material examined.** **Japan:** Hokkaido, Asahigawa, July 1968, coll. K. Kamijo, reared from *Macrocentrus resinellae*, 1 female, 1 male (paratypes from EIHU). **Russia:** Primorskiy Terr., Anisimovka, 28 Aug. 2001, coll. S.A. Belokobylskij, 1 female (ZIN).

**Biology.** Primary parasitoid of *Archips abiephaga* (Yasuda, 1975), *A. oporamus* (Linnaeus, 1758) and *A. pulcher* (Butler, 1879) (Lepidoptera: Tortricidae). Secondary parasitoid of *Macrocentrus resinellae* (Linnaeus, 1758) (Hymenoptera: Braconidae).

**Distribution.** South of the Russian Far East (Primorskiy Terr.) (first record), Japan (Hokkaido).

**Remarks.** Kamijo (1982) considered this species to be similar to *M. obscura*. According to their original descriptions, both these species have hind tibia with a single spur. I have examined paratypes (female and male) and single non-type specimen of this species and found that all these specimens have two tibial spurs. In dry specimens and sometimes in slides of this and other species of *Mokrzeckia* the tibial spurs often stick together and seem to be a single spur (as in Fig. 4).

*Mokrzeckia abietis* is the most close species to *M. pini* as having the clypeus not depressed and radiately strigose, with the lower margin deeply emarginated, the fore wing with marginal vein 1.7–2.1 times as long as stigmal vein, and the hind tibia with two spurs.

***Mokrzeckia lazoensis* sp. nov.**  
(Figs 1–6, 9, 10)

**Holotype.** **Russia,** Primorskiy Terr., Lazo Natural Reserve, 18 km SE Lazo, 22–29 Aug. 2006, coll. S.A. Belokobylskij, 1 female (ZIN).

**Paratypes.** 6 specimens, **Russia,** Primorskiy Terr., Anisimovka, 4 Sept. 1988, coll. S.A. Belokobylskij, 1 female; 18 km NW Artyom, 6–7 Sept. 1988, coll. S.A. Belokobylskij, 1 female; 20 km SE Spassk-Dal'nij, Evseevka, 17 July 2006, coll. S.A. Belokobylskij, 1 female; Novokachalinsk, Khanka Lake, oak forest, 4–7 Aug. 2006, coll. S.A. Belokobylskij, 1 female; Lazo Natural Reserve, 18 km SE Lazo, 22–29 Aug. 2006, coll. S.A. Belokobylskij, 2 male (all in ZIN)

**Description**

Female. Body length 2.8–3.0 mm; fore wing length 2.6–2.7 mm.

Head twice as broad as its length in dorsal view, 1.3–1.4 times as broad as mesoscutum; POL about 0.7 times as long as OOL. Head (front view), 1.30–1.36 times as broad as high. Maximum diameter of eye 2.2 times as long as malar space. Clypeus wider in its lower margin than in upper margin (Fig. 10), its lower margin distinctly emarginated medially. Both mandibles with four teeth (Figs 1, 2). Antennal scrobe moderately deep. Distance between antennal toruli and lower margin of clypeus 1.3 times as long as distance between antennal toruli and median ocellus.

Antenna (Fig. 5). Scape 0.8 times as long as height of eye, 1.1 times as long as transverse diameter of eye, and 4.0–5.0 times as long as pedicel. Pedicel 1.3–1.5 times as long as broad and 0.7–0.8 times as long as first funicular segment. Combined length of pedicel and flagellum subequal to breadth of head. Flagellum almost filiform; all funicle segments 1.2–1.4 times as long as broad. Clava 2.1 times as long as broad and 1.3 times as long as combined length of fifth and sixth funicle segments.

Mesosoma 1.3 times as long as broad. Pronotal collar medially about 0.06 times as long as mesoscutum, its front margin strongly abrupted. Mesoscutum 1.9–2.0 times as broad as long. Scutellum convex, hardly elongate, with noticeable frenal line. Propodeum medially 0.3–0.4 times as long as scutellum; median carina fine; nucha absent and hind margin of propodeum deeply

emarginated; spiracle elongate, separated from metanotum by distance shorter than maximum diameter of spiracle.

Wings. Fore wing 2.7 times as long as its maximum width. Upper surface of costal cell with numerous short cilia. Basal cell bare or with few cilia. Basal vein with nine or eleven cilia. Speculum closed below. Marginal vein 1.1–1.2 times as long as post-marginal vein, 1.8–2.1 times as long as stigmal vein. Height of stigma 3.0 times as long as width of stigmal vein (Fig. 6).

Legs slender; hind tibia with two spurs (Fig. 3).

Metasoma ovate, 1.6–1.8 times as long as broad and 1.2 times as long as mesosoma. Ovipositor sheath slightly projecting beyond apex of metasoma.

Sculpture. Head, clypeus, mesoscutum and scutellum finely reticulate. Median area of propodeum very shallowly reticulate. Tergites 1–9 of metasoma smooth.

Colour. Body green with golden reflections. Antenna with scape yellowish brown, pedicel and flagellum blackish. Ovipositor sheath blackish. Legs yellow, hind coxa green. Metasoma green with golden reflections. Wings faintly infuscate.

Male. Differs from female as follows. Body length 2.5–2.8 mm. Clypeus strongly enlarged and smooth. Distance between antennal toruli and lower margin of clypeus 3.0–3.2 times as long as distance between antennal toruli and median ocellus. Scape 5.5–5.7 times as long as pedicel. Mandible very large (Fig. 9).

**Diagnosis.** The new species is similar to *M. orientalis* in having the long distance between antennal toruli and lower margin of clypeus (both sexes), depressed into the capsule of head and finely reticulate clypeus (females), strongly enlarged and smooth clypeus, and very large mandible (males). *M. lazoensis* **sp. nov.** differs from *M. orientalis* by the head 1.3–1.4 times as broad as mesoscutum, lower margin of clypeus wider than its upper margin, scape 4.0–5.0 times as long as pedicel, pedicel 1.3–1.5 times as long as broad, metasoma green with golden

reflections, distance between the lower margin of clypeus of male 3.1 times larger than distance between toruli and median ocellus.

**Remarks.** The mandibles of female and male of the new species are with four teeth (Figs 1, 2, 9, 10). According to the original description of *M. orientalis* (Subba Rao, 1973), a male of this species has the mandible with two teeth (Fig. 7), but in another paper of the same author (Subba Rao, 1981: Fig. 17) a male mandible is figured with three teeth. Unfortunately the male paratype of *M. orientalis* was not available for examination because it was not found in the BMNH collection (G. Broad, pers. comm.). However, the male of *M. orientalis* probably has the mandible with four teeth because the mandible of *M. orientalis* is similar to that of *M. lazoensis* **sp. nov.** Earlier (Tselikh, 2011), specimens of *M. lazoensis* **sp. nov.** was erroneously identified as *M. pini*.

**Etymology.** Named after the type locality, Lazo.

**Distribution.** South of the Russian Far East: Primorskiy Krai.

#### Key to World species of *Mokrzeckia*

Subba Rao (1981) listed males and females for *M. menzeli* in the Material section of the paper, but the description was given only for the male; as a result, a couplet for female *M. menzeli* is absent from the following key.

1. Female ..... 2
  - Male (unknown for *M. obscura*) ..... 6
2. Hind tibia with single spur. Lower margin of clypeus shallowly emarginated. Fore wing with marginal vein 1.5 times as long as stigmal vein. [Europe] ..... ***M. obscura***
  - Hind tibia with two spurs (Fig. 3). Lower margin of clypeus deeply emarginated. Fore wing with marginal vein 1.7–2.1 times as long as stigmal vein ..... 3
3. Clypeus depressed into capsule of head and finely reticulate (Figs 8, 10) ..... 4
  - Clypeus not depressed into capsule of head and radiately strigose (Fig. 11) ..... 5
4. Head (dorsal view) 1.2 times as broad as mesoscutum. Lower margin of clypeus not wider than its upper margin (Fig. 8). Scape of antenna 7.0 times as long as pedicel; pedicel 0.8

- times as long as broad (Fig. 12). Metasoma brown. [Oriental region] . . . . . ***M. orientalis***
- Head (dorsal view) 1.3–1.4 times as broad as mesoscutum. Lower margin of clypeus wider than its upper margin (Fig. 10). Scape of antenna 4.0–5.0 times as long as pedicel; pedicel 1.3–1.5 times as long as broad (Fig. 5). Metasoma green . . . . . ***M. lazoensis* sp. nov.**
  - 5. Hind margin of propodeum (dorsal view) deeply emarginated (Fig. 13). Height of stigma 3.0 times as long as width of stigmal vein. Fore and often mid coxae yellow, hind coxa green . . . . . ***M. pini***
  - Hind margin of propodeum (dorsal view) weakly emarginated (Fig. 14). Height of stigma twice as long as width of stigmal vein. All coxae green . . . . . ***M. abietis***
  - 6. Distance between antennal toruli and lower margin of clypeus 2.3–3.2 times as long as distance between antennal toruli and median ocellus. Clypeus smooth and strongly enlarged (Figs 7, 9). Mandible very large (Figs 7, 9) . . . . . 7
  - Distance between antennal toruli and lower margin of clypeus 1.3–1.4 times as long as distance between antennal toruli and median ocellus. Clypeus finely reticulate or radiately strigose, less strongly enlarged. Mandible normal size . . . . . 8
  - 7. Distance between antennal toruli and lower margin of clypeus 2.3 times as long as distance between antennal toruli and median ocellus. Lower margin of clypeus not wider than its upper margin (Fig. 7) . . . . . ***M. orientalis***
  - Distance between antennal toruli and lower margin of clypeus 3.0–3.2 times as long as distance between antennal toruli and median ocellus. Lower margin of clypeus wider than its upper margin (Fig. 9) . . . . . ***M. lazoensis* sp. nov.**
  - 8. Clypeus depressed into head capsule and finely reticulate. Mandible with three teeth.
    - Coxae yellow, basal one-thirds of hind coxa green . . . . . ***M. menzeli***
    - Clypeus not depressed into head capsule and radiately strigose. Mandible with four teeth . . . . . 9
  - 9. Hind margin of propodeum (dorsal view) deeply emarginated (as in female: Fig. 13). Fore and often mid coxae yellow, hind coxa green . . . . . ***M. pini***
  - Hind margin of propodeum (dorsal view) weakly emarginated (as in female: Fig. 14). All coxae green . . . . . ***M. abietis***

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