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## Observations on Chinese *Macropis* (Hymenoptera: Apoidea: Melittidae)

WU YAN-RU<sup>1</sup> AND CHARLES D. MICHENER<sup>2</sup>

**ABSTRACT:** *Macropis immaculata* Wu and *M. omeiensis* Wu are placed in the subgenus *Sinomacropis* along with *M. hedini* Alfken. A key to the species of *Sinomacropis* is given. The subgenus *Paramacropis* is recharacterized and the female of *M. ussuriana* (Popov), the only species of *Paramacropis*, is described for the first time. It is probably the sister group to all other *Macropis*.

This paper consists of two parts, the first dealing with the subgenus *Sinomacropis* and the subgeneric placement of certain species, the second dealing with the subgenus *Paramacropis*. No new information on *Macropis* s. str. is presented here, but it can be noted that the type species should be cited as *Megilla labiata* Fabricius, 1804 (= *Megilla fulvipes* Fabricius, 1804, monobasic). Warncke (1973) found that the lectotype of *M. labiata* is the species known as *M. fulvipes* and named the *M. labiata* of authors as a new species (not merely a new name), *M. europaea*.

In citing specimens we use "Beijing" for the collection of the Institute of Zoology, Academia Sinica, and "Washington" for the National Museum of Natural History. Modern names and spellings are used for localities, with old names or spellings from the labels in parentheses when appropriate.

### Subgenus *Sinomacropis*

*Sinomacropis* Michener, 1981:51.

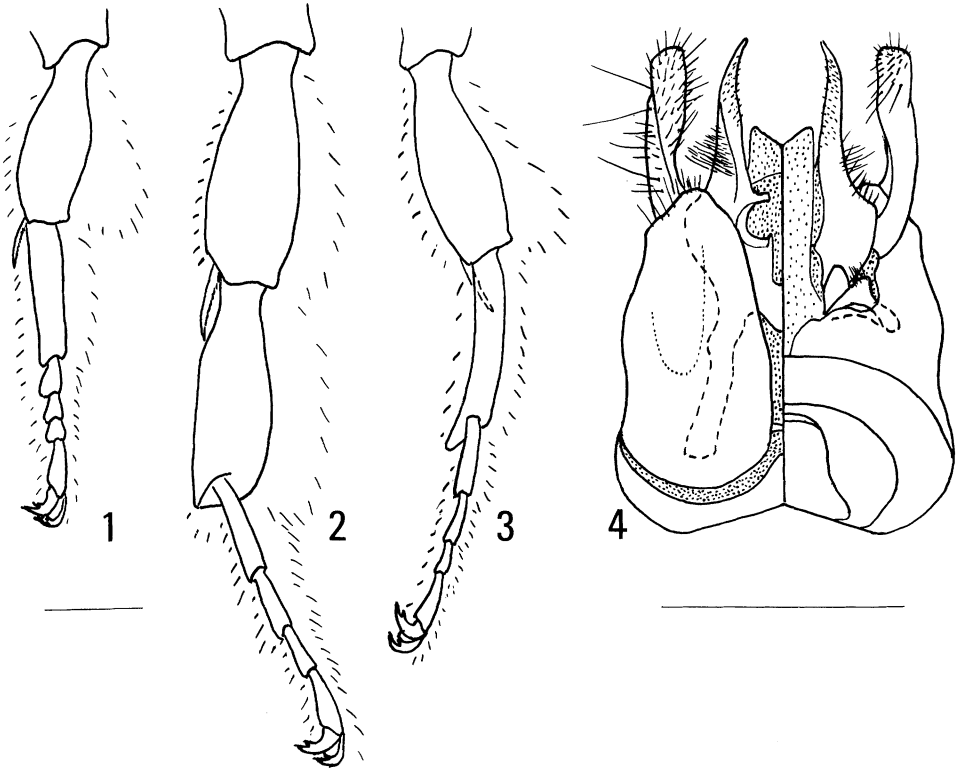
In 1965 one of us (Wu) gave a key to ten palearctic species of *Macropis*, two of which were described as new. It was shown that Popov (1958) had associated the wrong male with females of *M. hedini* Alfken. The proper male of *M. hedini* was described, *M. immaculata* Wu was proposed for Popov's *M. hedini* male and the associated females, and *M. omeiensis* Wu was described as a related species. In 1981 Michener, unaware of Wu's paper, identified *M. hedini* and noted Popov's erroneous association of sexes, but did not name new species. He did, however, place *M. hedini* and unidentified species in a new subgenus, *Sinomacropis*. Re-study of abundant material in Beijing verifies that all three species agree with the characters listed by Michener (1981) for the subgenus, and so far as known all are restricted to China. No other known species of the genus fall in *Sinomacropis*. *Macropis kiangsuensis* Wu (1978) from Jiangsu Province, China (one female, Beijing), as well as previously described species from Japan, eastern Siberia, Europe, and North America are in *Macropis* s. str. The species of *Sinomacropis* are listed below.

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Figs. 1-4. 1-3. Outer views of left middle tibia and tarsus of males of *Macropis* (*Sinomacropis*) *hedini* Alfken, *immaculata* Wu, and *omeiensis* Wu. The tips of the longest hairs show length of vestiture. 4. Genitalia of male *Macropis* (*Paramacropis*) *ussuriana* (Popov), dorsal on left, ventral on right. Scale lines for the legs and genitalia = 1.0 mm.

The middle legs of the males are illustrated (Figs. 1-3) because their unusual characters have not been shown comparatively before. The under surface of the mid basitarsus is smooth, hairless, and concave in males of all three species.

Wu's data (1965) show that at least for the first two species important floral resources are *Lysimachia congestiflora* and *L. trientalioides*. Thus *Sinomacropis*, like *Macropis* s. str., is associated with this plant genus (see Popov, 1958; Vogel, 1976; Cane et al., 1983).

*Macropis* (*Sinomacropis*) *hedini* Alfken

*Macropis hedini* Alfken, 1936:16. Wu, 1965:592. Michener, 1981:51.

Known previously from Sichuan and Zhejiang (=Chekiang) Provinces and from Shanghai (Wu, 1965). New locality records are as listed below. *Sichuan Province*: Suifu, 1000 ft (305 m) altitude, May 10, 1928, and April 30, 2 males, 1 female; Guanxian (=Kuanshien), 3000 ft (915 m) altitude, April 5 to May 8, 1930 (all D. C. Graham) [Washington]. *Hubei Province*: Shennogjia Forest Reg. (Songbai Town), 500 m altitude, June 3, 1981, 2 females and 1660 m altitude, June 21, 1981, 1 female [Beijing]. *Shaanxi Province*: Liuba County, July 1, 1976, 1 male [Beijing].

*Macropis (Sinomacropis) immaculata* Wu

*Macropis hedini*; Popov, 1958:502, male (misidentification).

*Macropis immaculata* Wu, 1965:594.

Known from Sichuan, Yunnan, and Zhejiang Provinces.

*Macropis (Sinomacropis) omeiensis* Wu

*Macropis omeiensis* Wu, 1965:596.

Previously known from Sichuan Province. New locality records, based on specimens collected by G. C. Graham in Sichuan Province [Washington] are as follows: Xichang (=Ningyuenfu), 6000–6200 ft (1830–1891 m) altitude, Aug. 2–4, 1928, 1 male; 6000–10,800 ft (1830–3294 m) altitude, July 24–26 and Aug. 24–26, 1928, 2 males. Wan Nien Si [Mt. Omei], 6000 ft (1830 m) altitude, Aug. 7, 1925, 1 male, 1 female. Shi Kai Si, Mt. Omei, 4400 ft (1342 m) altitude, Aug. 1921, and Aug. 16–20, 1934, 3 females. Suifu, 1000–1500 ft (305–458 m) altitude, June 1–21, 1928, 1 female; April 30 (no year or altitude given), 1 male; no altitude or date, 1 female. Tsi Ten Tang, July 1925, 1 female. Near Baoxing (=Mupin), 2000–8000 ft (610–2440 m) altitude, July 1, 1929, 1 male.

Mt. Omei is of course Omeishan, the type locality of the species.

Variations from the original English description of the male are as follows: basal half of mandible largely yellow; labrum yellow; almost whole outer surface of front tibia yellow in some specimens; apical yellow area of middle tibia sometimes extensive, extending up anterior side to base; apical yellow area of hind tibia sometimes absent; hind basitarsus mostly yellow to mostly brown. Hair color is also variable. In most males the vertex, mesoscutum and scutellum have reddish black hairs, mixed with yellowish hairs mostly around margins. The males taken on July 24–26 and Aug. 24–26 at Xichang, however, have the hairs of these areas largely yellowish with reddish black intermixed. The male from Suifu is intermediate. The extent of black hairs on the metasomal terga is also variable. The original description indicates abundant, long, black hairs on the median part of T7, basal to the yellowish apical brush. The male from Suifu also has dusky hairs as far forward at T3. The male from Xichang, Aug. 2–4, also has the dorsal hairs of T5 and 6 and the apical part of T4 black, while on the specimens from the same locality, July 24–26 and Aug. 24–26, there are only a few blackish hairs in the middle of T7 and an intermixture of dusky hairs among yellowish ones on the discs of T5 and 6. One of us had originally considered these males from Xichang as different species but since there seem to be no morphological differences, there are intermediates, and the specimens are from the same area, we place them together in *M. omeiensis*.

Key to the Species of *Sinomacropis*

- |  |               |
|--|---------------|
| 1. Males .....   | 2             |
| – Females .....  | 4             |
| 2. Small segments of mid tarsus rather ordinary, fourth segment about as broad as long; metasomal sterna 3 and 4 with long, dense, white apical fringes obscuring surfaces behind them ..... | <i>hedini</i> |
| – Small segments of mid tarsus elongate, all much longer than broad; meta-   |               |

- somal sterna 3 and 4 with golden or testaceous apical fringes of well separated hairs that do not hide surfaces behind them ..... 3
3. Hind basitarsus about three times as long as broad, apex tapering; metasomal terga strongly punctate; terga 2–4 strongly depressed basally, roundly elevated medially, apical marginal areas depressed .... *omeiensis*
- Hind basitarsus about twice as long as broad, apex broadly truncate; metasomal terga finely and sparsely punctured, none of them depressed basally and apically ..... *immaculata*
4. Metasomal terga 2–4 densely covered with suberect dull yellowish hair, sparse on basal part of 2; terga 2 and 3 depressed basally ..... *omeiensis*
- Metasomal terga 2–4 with short, sparse hair except for apical pale bands of dense, recumbant hair on 3 and 4; terga not depressed basally ... 5
5. Supraclypeal area with yellow spot; forewing length less than 8 mm . *hedini*
- Supraclypeal area black; forewing length 9 mm ..... *immaculata*

#### Subgenus *Paramacropis*

*Paramacropis* Popov and Guiglia, 1936:287. Michener, 1981:51.

In his study of the classification of the Melittidae, Michener (1981) placed *Paramacropis* entirely on the basis of the literature, no specimens being available. It was the only supraspecific group in the family for which no specimens were studied at that time. The only included species is *Macropis ussuriana* (Popov) described from the male only from maritime Siberia. Specimens of both sexes from northeast China are in the Institute of Zoology, Academia Sinica. The subgeneric characters, using the lettering and description of *Macropis* s. str. by Michener (1981, p. 50), are as follows:

a. Labrum of female with strong, transverse, preapical ridge. b. Maxillary palpus six-segmented (not five-segmented as stated by Popov). c. Propodeal triangle large, hairless, not punctate, basal third dull, with a few minute transverse wrinkles, distal two thirds smooth, shining. d. Basal vein interstitial with cu-v. e. Hind basitarsus of male without comb of stiff bristles. f. Hind basitarsus of male about half as long as tibia, over four times as long as broad, densely hairy on inner and under surface, without ventroapical, or basal projections and without bare areas. g. Sixth sternum of male narrowed preapically, then broadened to truncate apex, hairy on under surface, which is exposed and conspicuous on intact metasoma. h. Eighth sternum of male with body rather narrow, constricted just behind middle, apical process exposed in intact metasoma, enormously broadened (broader than body of sternum), heavily sclerotized and black, hairless on upper surface, with dense brush of long hairs on under surface. i. Gonostylus slender, simple, without lobes or patches of dense long hairs.

Additional characters are: galeal margin with long hairs only at extreme apex; galeal comb of about 11 bristles; posterior margin of vertex in both sexes a sharp preoccipital lamella or carina so that vertex extends well behind ocelli and ocell-occipital distance is about equal to ocellocular and interocellar distances; all basitarsi of male densely hairy on under surfaces; hind basitarsus of female with hairless upper apical process represented by small hairless angular (90 degrees) projection hidden in hairs (variable in *Macropis* s. str.); metasomal sterna 1–5 of male unmodified, without fringes or specialized structures, posterior margin of sternum 5 broadly emarginate, not at all produced medially.

Characters e, f, and especially i, appear to be plesiomorphic relative to all other *Macropis*. The same may be true of the simple sterna 1–5 of the male. Characters g and h, however, are unique and conspicuous autapomorphies. *Paramacropis* appears to be the sister group to all other *Macropis*. The key to subgenera given by Michener (1981) need not be modified for identification of males. The male of *Paramacropis* is the most distinctive of all *Macropis*. The best character that distinguishes females (also males) of *Paramacropis* is the broad vertex behind the ocelli, ending in the sharp preoccipital carina; there is no declivous surface before the concave occiput is reached, as in other *Macropis*. The only other characters that appear to distinguish females of *Paramacropis* from other *Macropis* are the reduced galeal fringe (long hairs only at apex) and galeal comb (about 11 bristles). These are unreliable characters because they have not been examined for all species of *Macropis* s. str. *Paramacropis* is clearly a *Macropis*, agreeing with Michener's (1981) generic description except for characters noted above. This generic placement was not certain from the literature alone because characters g to i of the male are so different from those of other *Macropis*. The vestiture of the legs in the female is like that of other *Macropis*, suggesting that *Paramacropis*, like the others, collects oil from flowers of *Lysimachia*.

*Macropis (Paramacropis) ussuriana* (Popov)

*Ctenoplectra ussuriana* Popov, 1936:78.

*Macropis (Paramacropis) ussuriana*; Popov and Guiglia, 1936:287. Popov, 1958: 504. Michener, 1981:52.

The male is easily recognized from Popov's description and illustrations. For more complete coverage of this interesting species we provide an additional illustration (Fig. 4). The female has not been described.

FEMALE: Length 9–10 mm; forewing length 8 mm. Structure: Except as noted in the subgeneric description and discussion, structure is as in well known species such as *M. (M.) europaea* Warncke (= *M. labiata* of authors) and *M. fulvipes* (Fabricius); note especially the broad vertex ending posteriorly in the sharp preoccipital carina. First flagellar segment twice as long as width at apex; second and third flagellar segments each about twice as broad as long, but the two together longer than broad. Pronotum with horizontal, punctate, dorsal surface not much depressed below level of anterior part of mesoscutum. Punctuation: Similar to that of *M. fulvipes*, but more shining; frons more coarsely punctate and therefore contrasting with rest of head; anterior median part of mesoscutum with punctures coarse but well separated; mesepisternum with punctures smaller and shallower than in *M. fulvipes*; base of propodeal triangle finely granular, not rugose, distal two thirds of triangle smooth and polished; metasomal terga 1–4 with punctures even finer and sparser than in *M. fulvipes*. Coloration: Black, underside of flagellum light red brown, tegula and small segments of tarsi reddish brown. Wings dusky, veins blackish but stigma light brown. Pubescence: On head and thorax dull pale ochraceous, dusky hairs intermixed on anterior clypeal margin, vertex, and scutellum; hairs of mesoscutum except on margins dusky. Metasomal hairs also pale ochraceous, almost absent on dorsa of terga 1 and 2; tergum 3 with dusky hairs on dorsal surface; terga 4–6 with hairs mostly black; sternum 4 with apical fringe of black hairs; sterna 5–6 with hairs black. Terga 2 and 3 with weak

basal bands of white hairs, absent medially especially on 2, the hairs arising from graduli. Terga 3 and 4 with strong apical bands of white hair, interrupted medially, as in *M. fulvipes*. Front and middle legs with hairs of basal segments ochraceous, becoming dusky at apices of femora; tibial and tarsal hairs reddish dusky, palest (ochre) on distitarsi. Hind legs with hairs ochraceous on basal segments, black at apex of femur; tibial hairs ochraceous on lower margin and inner surface (dusky near apex of tibia), grading to white on outer surface and upper margin, a few long dusky hairs intermixed on upper margin, apical fourth of upper margin and apical truncation with hairs all black; basitarsus with hairs on lower margin ochre, grading to black on outer surface and upper margin and to reddish black on inner surface; small segments of tarsus with hairs ochre.

LOCALITIES: USSR. Primorskij Kraj: Krivoj Kljutsh near Nikolsk-Ussurijsk. This is the type locality. Other specimens have been taken near Vladivostok and at Vinogradovka (Popov, 1958). CHINA. Jilin Province: Changbai Mt., July 26–27, 1981, on Leguminosae, 3 females, 1 male; Manjing, July 27, 1955, 1 male.

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