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Second Revisionary Studies on Genus *Camponotus* Mayr of China (Hymenoptera: Formicidae)

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ABSTRACT Five new species of the genus *Camponotus* Mayr: *Camponotus lasiselene* n. sp., *C. humerus* n. sp., *C. cornis* n. sp., *C. minus n. sp. and C. yiningensis* n. sp. from China are described. *Camponotus nipponicus* Wheeler is recorded for the first time from China. A key to the Chinese ants of *Camponotus* is provided.

Introduction

The genus *Camponotus* was named by Mayr in 1861. Since then, more than 1000 species, subspecies and varieties have been described in the world. The large number of species, wide distribution, geological variation and polymorphism of worker make it especially difficult for the appropriate taxonomy. Most of the work on the ant fauna of China had been done during 1920s to 1940s. The most valuable work on *Camponotus* can be seen in Forel (1910, 1912(a, b), 1914), Wheeler (1909, 1921, 1927(a, b), 1929, 1930—31), Viehmeyer (1922), Santschi (1925, 1928), Donisthorpe (1933) and Stitz (1935). In the " A list of known Chinese ants" provided by Wheeler (1930—1931), 5 speciess, 7 subspecies and 8 varieties of *Camponotus* were recorded. Among them, 3 forms were recognized as synonyms by Yasumatsu & Brown (1951). Unfortunately, this list was not accurate: 1) It did not include the Taiwan species; 2) Some species were obsoleted. Since 1940s, there had been a long period of gap in the work on Chinese fauna of ants. Collingwood (1962) and Tang et al. (1985) recorded two new record species. In 1989, We gave the first revisional studies of the genus (Wang et al., 1989), in which 10 new species were described, 4 species were recorded for the first time from China and 4 subspecies were raised to species. By 1989, 48 species (subspecies and varieties) are recorded from China.

For the unavailibitity of the type specimens, obscure and simple original descriptions, it was extreme difficult to itentify the species appropriately. Therefore, we must be very cautious on the taxonomy of Chinese ants. During the last 4 years,

some interesting specimens were found in our collection. 5 pecies are identified as new to science, 1 species is recorded for the time from China. A key containing 30 species of Chinese *Camponotus* is provided in this paper.

Standard measurments are as defined by Bolton (1983), and PI is 100 × PW/HW, ED is the maximum diameter of eye. Type specimens are kept in the Insect Collection, Chinese Adademy of Forestry.

***Camponotus lasiselene* n. sp. (Figure 3)**

Holotype (worker): TL 4.4, HL 1.00, HW 1.12, HI 112, SL 0.92,SI 82, PW 1.14, PI 102, ED 0.24, WL 1.57.

Head almost as long as broad. Posterior border of head convex. Scape of antennae surpassing the occipital border by 1/5 of its length. Clypeus medially crinated, with straight anterior border. Mandibles with 5 teeth. Alitrunk short, broad and dorsally margined. Pronotum 2.6 times wide than long, with acute anterior margin. Pronotal angles obtuse. Mesonotum widest at the middle part, forming a pair of obtuse lateral angles. Meso-propodeal suture deep, behind which the propodeum raised. Base of the propodeum flat, with two large sickle shaped thick spines which pointed up of the propodeum. Apex of the spines pier shaped, directed convergedly. Declivity of the propodeum strongly concave, overhanged by the two pliers shaped spines. Petiole very thick, the frontal surface slightly convex, posterior surface flat, upper surface with a transverse shallow furrow. Gaster cylindrical, large and broad.

Body black. Mandibles, antennae and tarsus of legs brownish red. Tibiae of legs blckish brown.

Body opaque, Mandibles slightly shining, with minute punctures. Head, alitrunk and petiole very coarsely punctured. Gaster less coarsely punctured. Declivity of the alitrunk smooth and shining.

The whole body furnished with short extreme abundant whitish hairs. Pubescence dilutē.

Holotype worker: Menglun of Jinghong Co., Yunnan Prov. 1981 — IV — 19, Yang Jikun leg.

This new species is very close to *C. selene* in the color, shape and sculpture. But the new species furnished with extreme abundant erect hairs, whereas, hairs of the latter dilute.

Camponotus humerus **n. sp. (Figures** 5,12)

Worker minor (Holotype cited first): TL 3.3, 4.0, 4.1; HL0.81, 0.94, 0.96; HW 0.78, 0.89, 0.90; HI 96, 94, 94; SL 0.80,0.90, 0.82; SI 103, 101, 91; PW 0.66, 0.79, 0.78; ED 0.22, 0.22,0.24; PI 85, 89, 87; WL 1.10, 1.04, 1.20.

Head slightly longer than broad. Sides of head and occipital boader slightly convex. Clypeus convex, without medial crina. Anterior boader transverse or slightly emarginate. Protonum very broad, 1.8—2.0 times of the length. Anterior border of pronotum margined. Pronotal angles forming two obtuse teeth, slightly pointed to the up of the pronotum. Meso—propodeal suture obsolete. Propodeum narrow. The posterior part of the base of propodeum declive. Declivity of the propodeum almost vertical. Petiole broad, cuneate, the apex transverse. Gaster broad and large.

Body shining. Punctures at front of the head minute and reticulated. Posterior part of the head more or less delicately wrinkled. Alitrunk and petiole delicately wrinkled. Gaster smooth.

Pilosity dilute. Pubescense can be seen only in certain light. Alitrunk and petiole each with 6 hairs. Pronotum without hairs. Mesonotum without hair or with 2 hairs.

Head, alitrunk and petiole brownish red. Gaster black.

Holotype worker: Fenyi Co., Jiangxi Prov. 1989—V—27, Wang Changlu leg.. Paratypes: one worker with same data as the holotype; one worker, Guan Co., Sichuan Prov., Wang Minsheng and Wang Changlu legs..

Variation: The worker collected in Jiangxi Province with the mesonotum, propodeum and gaster brownish black.

The new species is similar to *C. tokioensis* with the following differences: In the new species, pronotal anglels with obtuse teeth; anterior border of pronotum margined; pronotum much broader than mesonotum and propodeum; color of head, alitrunk and petiole brownish red to brownish black. While in *C. tokioensis* Ito, pronotal angles obsolete; anterior border of pronotum round, without a margin; pronotum slightly broader than mesonotum and propodeum; color of head, mesonotum, propodeum and petiole black or with a tint of brown.

Camponotus cornis **n. sp. (Figures** 1, 14)

Holotype worker: TL 4.2, HL 1.11, HW 1.08, HI 97, SL 1.06, SI 98, ED

0.32, PW 0.77, PI 71, WL 1.47.

Head almost as long as broad. Sides of head straight, occipital border round. Mandible with 5 teeth. Clypeus convex, medially crinated, Median lobe not produced. Anterior border of the clypeus round. Pro-mesonotum arched. Meso-propodeal suture deep and concave. Metanotal spiracles situated at the dorsal surface of the alitrunk. Base of the propodeum slightly convex, the posterior border raised abruptly, forming an angle. Declivity of propodeum concave. Petiole cunneate, thick, apex of the petiole round.

Body subopaque, densely and delicately punctured.

The whole body furnished with very abundant greyish hairs and pubescence.

Body black. Mandibles, clypeus antennae and legs brownish black.

Holotype worker: Jinghong Co., Yunnan Prov., 1987—XI—5, Wu Jian and Wang Changlu legs..

The new species is related to Indian species of *C. confucii Forel*. But it can be easily distinguished from the latter in the following characters: In *C. cornis* n. sp., clypeus convex; propodeum raised to an obtuse angle; apex of petiole round. In *C. confucii*, clypeus depressed; propodeum convex, gibbous; apex of petiole slightly concave.

***Camponotus minus* n. sp. (Figures 2, 7, 11)**

Holotype worker: TL 4.0, HL 1.03, HW 0.93, HI 90, SL 0.97, SI 104, PW 0.71, PI 76, ED 0.27, WL 1.40

Head longer than broad. The occipital border round. Sides of head straight. Clypeus weakly crinated. Anterior margin round. Mandiles narrow. Antennae projecting beyond the occipital border by 2/5 of its length. Antennal crinae weak, short and diverging. Pronotum 1.4 times as broad as long, 1.9 times broad as mesonotum. Propodeum as broad as mesonotum, which is distinctly narrower than the pronotum. Pro-mesonotal suture obsolete. Mesonotum strongly sloped backward. In lateral view, meso-propodeal suture very concave. Metanotal spiracles situated at dorsal surface of the alitrunk. Alitrunk raised behind the meso-propodeal suture. Base of propodeum inclined forward, declivity concave, forming an almost right angle with the base. Petiole thin, scale shape. Apex slightly concave. Gaster oval.

Body shining. Alitrunk delicately wrinkled.

The whole body furnished with abundant yellowish white long hairs. Pubescence

abscent.

Head, alitrunk, petiole and base of the first tegument of gaster brownish red. Scape and legs brown. Gaster black.

Holotype worker: Dianbai Co., Guangdong Prov., 1986—III—7, Wang Minsheng leg.

The new species is related to *C. confucii* Forel, but can be easily distinguished from the latter in the color, shape of alitrunk and petiole.

***Camponotus yiningensis* n. sp. (Figures 6, 13)**

Holotype worker: TL 5.7, HL 1.27, HW 1.22, HI 96, SL 1.22, SI 100, PW 1.01, PI 83, ED 0.35, WL 1.99

Head square shaped, slightly broader posteriorly. Occipital border round. Sides of head straight. Clypeus convex, without medial crina. Anterior border of clypeus straight. Mandibles broad, with 5 teeth. Scape of antennae surpassing the occipital border by 2/5 of its length. In lateral view, pronoum and mesonotum weak arched. Meso-propodeal suture deep. Pronotum broad, 1.4 times as broad as long. In dorsal view, the alitrunk narrowed distinctly postward. Base of propodeum flat, weakly margined. Declivity almost vertical. The front and hind surface of petiole straight. Apex round. Gaster oval.

Body moderately shining. Head and alitrunk reticulate punctured. Gaster delicately punctured.

Pilosity abundant, white and erect, abscent on scape of antennae. Few hairs present on legs. Pubescence dilute.

Head, alitrunk and petiole deep red. Gaster black.

Holotype worker: Yining Co., Xinjiang Yuger Autonomous Administrative Region, 1982—VIII—15, Yang Xiuyuan and Xiao Gangrou legs..

The new species is close to *C. sericeus* Fabr.. But in *C. yiningensis* n. sp., head, alitrunk, petiole and legs deep red; pilosity abundant, pubescence dilute; propodeum very weakly margined. In *C. sericeus* Fabr., head, alitrunk, petiole and legs black; pilosity sparse; pubescence very abundant; propodeum distinctly margined.

***Camponotus nipponicus* Wheeler new record (Figure 4)**

Distribution: Leshan city, Sichuan Prov.; Japan.

Key to the genus *Camponotus* Mayr of China

Workers

1 Head of worker major cylindrical, anterior part of the head abruptly bent forward, truncate, forming an angle with the posterior part of the head (Fig. 4). Legs short and thick. Gaster broard and long ··· *C. nipponicus* Wheeler new record

Without the combination of the above characters ····· 2

2(1) In lateral view, arch of the dorsal surface of alitrunk interrupted by raised propodeum after meso-propodeal suture; or the declivity of propodeum nearly vertical. Part of the the alitrunk margined ····· 3

In lateral view, dorsal surface of alitrunk continously arched, or the declivity of propodeum very steep, almost vertical or concave. No part of the alitrunk margined ····· 9

3(2) Alitrunk slender, Pronotum round. Propodeum very convex, gibbous ·····
····· *C. singularis* (Smith)

Alitrunk moderately strong, more or less marginded, or the pronotum with anteri-or-lateral angles. Otherwise, the propodeum raised into an angle. Base of propodeum flat, declivity concave or very steep ····· 4

4(3) Alitrunk dorsally margined. Pronotum with acute margins. Propodeum furnished with two pliers shaped spines (Fig. 8) ····· 5

Alitrunk not margined, or only the pronotum or base of the propodeum margined. Pronotal angles obtuse or obsolete. Propodeum without spines ····· 6

5(4) Pilosity very sparse ····· *C. selene* Emery

Pilosity abundant ····· *C. lasiselene* n. sp.

6(4)Pronotum broad, margined, with obtuse pronotal angles. Meso-propodeal suture indistinct. Declivity of propodeum almost vertical ····· C. humerus n. sp,

Pronotum not margined or angled. Meso-propodeal suture deep. Base of propodeum flat or slightly raised, declivity concave ····· 7

7(6)Black. Propodeum abruptly raised, forming an angle (Fig. 14) ……
…… *C. cornis* n. sp.

Head, alitrunk and petiole brownish red. Propodeum not in the above shape … 8

8(7)Pilosity on scapes of antennae and legs abundant. Meso-propodeal suture concave. Propodeum raised, as broad as mesonotum. Base of Propodeum inclined forward, declivity inclined backward (Fig. 7) …… *C. minus* n. sp.

Pilosity on scape of antennae abscent; legs furnished with sparse hairs. Meso-propodeal suture distinct, but not concave. Propodeum not raised, narrower than mesonotum. Base of propodeum flat, declivity vertical (Fig. 13) ……
…… *C. yiningensis* n. sp.

9(2)Anterior border of clypeus concave or narrowly emargined …… 10

Anterior border of clypeus straight or round …… 11

10(9)Large species. Gaster yellowish …… *C. helvus* Xiao et Wang

Middle and small species. Gaster black, first and second tergites with two yellow spots; sometimes the spots converged …… *C. quadrinotatus* Forel

11(9)Sides of head almost parallel. Clypeus without produced median lobes. Anterior part of worker major often truncate. Middle species, body length normally less than 8 mm …… 12

Sides of head convex. Median lobe of clypeus produced. Anterior part of the head not truncate. Large species, body length normally more than 8 mm …… 14

12(11)Pronotum convex. Pronotal angles round. Propodeum slightly narrower than the mesonotum. Pilosity on alitrunk and petiole abscent ……
…… *C. anningensis* Wu et Wang

Pronotum nearly flat, with obtuse margins at pronotal angles. Propodeum distinctly narrower than mesonotum. Alitrunk and petiole furnished with more than 10 hairs …… 13

13(12)Alitrunk concolorous. In lateral view, pronotum and mesonotum nearly flat. Declivity of propodeum almost vertical (Fig. 9) …… *C. itoi* Forel

Color of pronotum usually paler than mesonotum and propodeum. In lateral view, pronotum and mesonotum curved. Declivity of propodeum concave, inclined backward (Fig. 10)…… *C. tokioensis* Ito

14(11)Clypeus distinctly crinated and median lobe produced. Head of worker major longer than broad. Occipital border often concave. Mandible with 6 or 7 teeth
…… 15

Clypeus not crinated. Median lobe short or obsolete. Head of worker major as long

as broad or broader than long. Mandible with 4 or 5 teeth ····· 25

15(14) Pubescence very dense, so that punctures of the gaster indistinct ····· 16

Pubescence sparse, if abundant, not so dense as the above ····· 17

16(15)Pilosity abundant, pronotum with 30—40 hairs. Pubesence long. Legs except coxae without dense pubescence ····· *C. pseudolendus* Wu et Wang

Pilosity sparse, pronotum with only 2 — 6 hairs. Pubescence short, dense on legs ····· *C. dolendus* Forel

17(16)Declivity of propodeum steep, almost vertical or slightly concave ····· *C. friedae* Forel

Declivity of propodeum inclined backward ····· 18

18(17)First two tergites of gaster furnished with two pairs of yellow or yellowish brown spots, sometimes the pair of spots converged into one large spot ····· 19

Without the above characters ····· 20

19 (18) Head black; pronotum paler, brownish red; mesonotum and propodeum brownish black. Petiole black ····· *C. chongqingensis* Wu et Wang

Head brown to pale red. Alitrunk pale red. Petiole red ····· *C. albosparsus* Forel

20(18)First two tergites of gaster paler than the other tergites ····· *C. nicobarensis* Mayr

Gaster tergites concolorous, at most the 1st tergite paler than the others ····· 21

21(20)Pilosity sparse; 2nd gaster tergite with no more than 10 hairs ····· 22

Pilosity abundant; 2nd gaster tergite with more than 20 hairs ····· 23

22(21)Worker major blackish brown. Head longer than broad. Clypeus nearly as long as broad. Scape of antennae surpassing the occipital border ····· *C. rubidus* Xiao et Wang

Worker major black or brownish black, alitrunk brownish red. Head nearly as broad as long. Clypeus broader than long. Scape of antennae not attains the occipital border ····· *C. largiceps* Wu et Wang

23(21) Longest hairs on pronotum 0. 74—0. 83 mm in length. Body reddish brown ····· *C. jianghuaensis* Xiao et Wang

Longest hairs on pronotum 0. 58—0. 66mm in length. Head and gaster blackish brown; Alitrunk and legs reddish brown to yellowish brown ····· 24

24(23) Scape of antennae of worker major long; SI > 115. Pronotum narrow; PI < 58 ····· *C. pseudoirritans* Xiao et Wang

Scape of antennae in worker major short; SI < 110. Pronotum wide, PI > 60 ··· ····· *C. mitis* (Smith)

25(14) The whole body furnished with extreme abundant silky pilosity; alitrunk with more than 30 hairs ····· *C. paria* Emery

Pilosity dilute to rather abundant; alitrunk with much less than 30 hairs; ····· 26

26(25) Pubescence abundant on gaster ····· 27

Pubescence abscent on gaster ····· 29

27(26)Pilosity distinctly golden or reddish brown ····· *C. tonkinus* Santschi

Pilosity paler, yellow or pale yellow ····· 28

28(27)Body black; sometimes the anterior part of cheeks, clypeus, mandibles and legs red. Median lobe of clypeus long ····· *C. japonicus* Mayr

Color variable; head and gaster black, alitrunk and legs more or less red; sometimes the alitrunk and legs black; petiole red. Median lobe of clypeus short ··· ····· *C. herculeanus* (L.)

29(26) Pilosity sparse, Alitrunk of worker major with 6—13 hairs. Legs black. Mandible with 5 teeth ····· *C. spanis* Xiao et Wang

Pilosity abundant, alitrunk of worker major with more than 40 hairs. Legs brownish red. Mandible with 6 teeth ····· *C. fuscivillosus* Xiao et Wang

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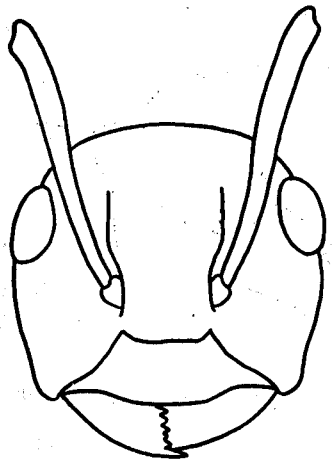

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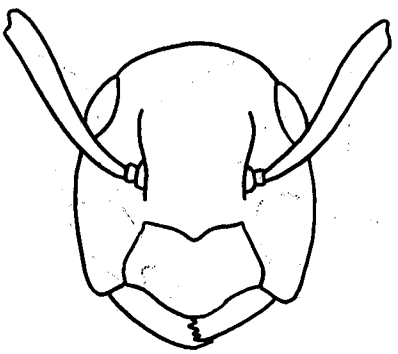

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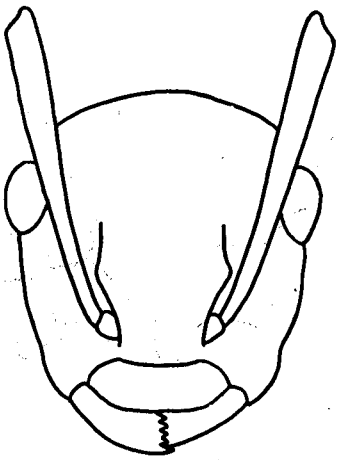

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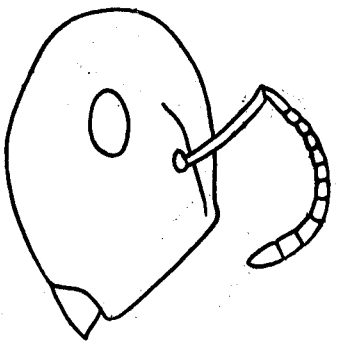

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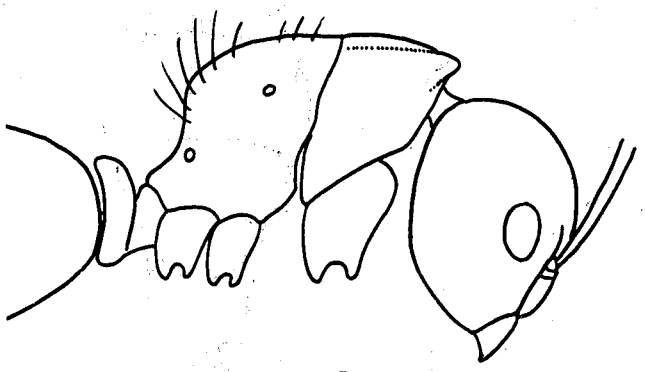

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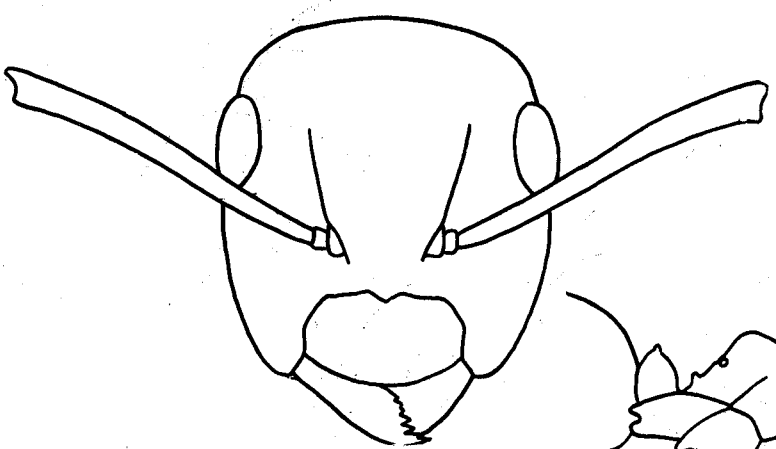

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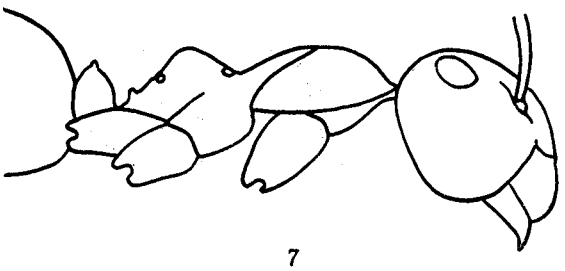

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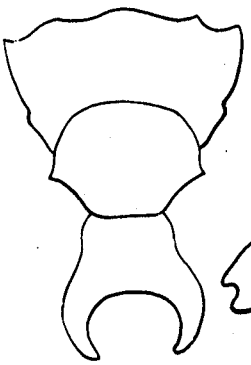

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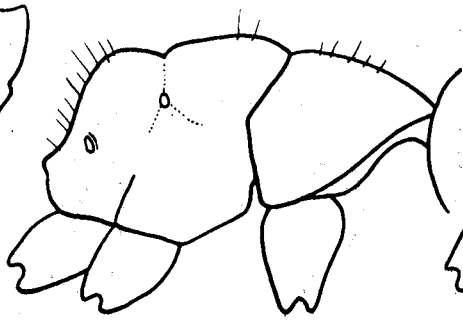

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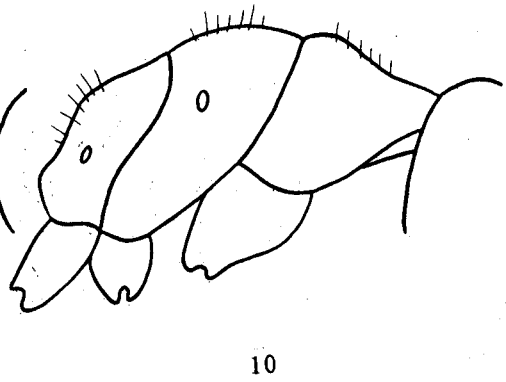

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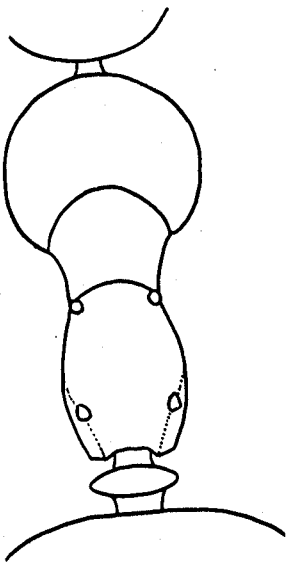

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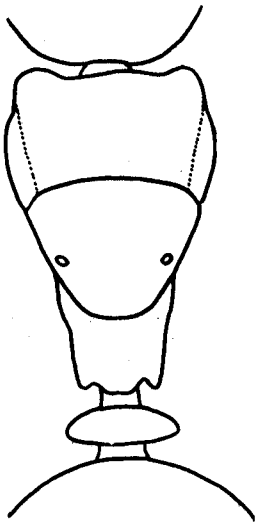

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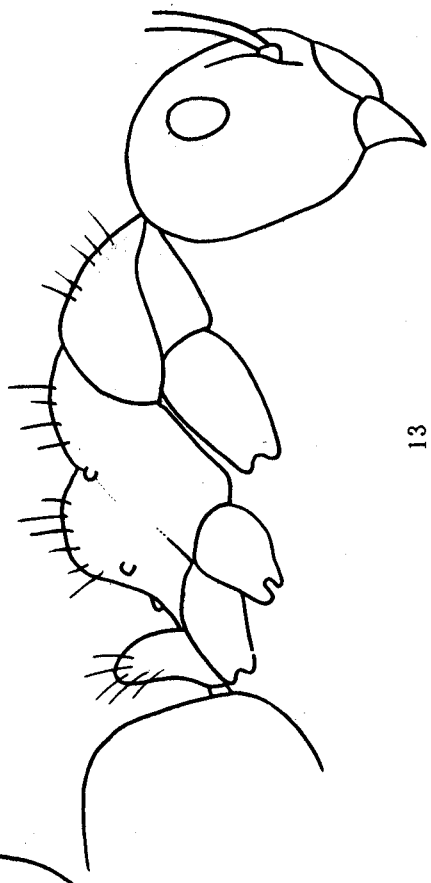

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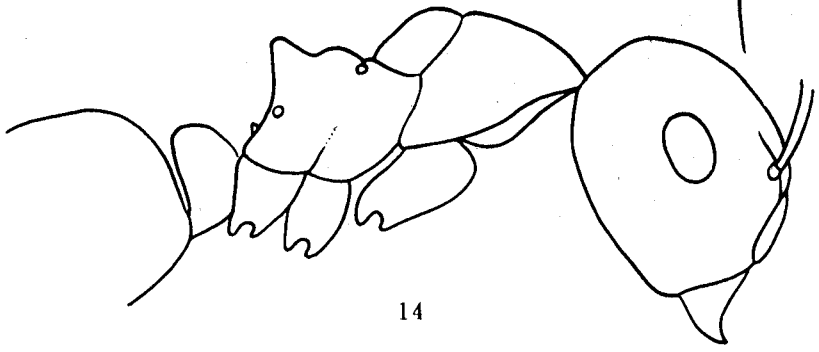

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