

# TAXONOMIC STUDY OF THE ANT GENUS *PHEIDOLE* WESTWOOD FROM GUANGXI, WITH DESCRIPTIONS OF THREE NEW SPECIES (HYMENOPTERA: FORMICIDAE)

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**Abstract** Thirteen species of the ant genus *Pheidole* from Guangxi, China are treated, among them three are described as new, i. e. *P. aphrasta* sp. nov., *P. longiscafa* sp. nov., *P. flaveria* sp. nov., one species is newly recorded in China, i. e. *P. feae* Emery; one species is raised to new status, i. e. *P. hongkongensis* Wheeler. A key based on major worker caste to the known species of the genus from Guangxi is given.

**Key words** Hymenoptera, Formicidae, *Pheidole*, taxonomy.

The ant genus *Pheidole* was erected by Westwood in 1840, based on the type species *P. providens* (= *Atta providens* Sykes, 1835) from India. This genus is one of the largest genera in the family Formicidae, including 545 species (Bolton, 1995) found in all zoogeographical regions. Twenty-nine species, subspecies and varieties have been recorded in China, some of them have been proved to be synonyms. In this paper, thirteen species from Guangxi, South of China are treated, three species are described as new, one species is newly recorded in China, and one species is raised to new status. A key based on major worker caste to the known species of the genus from Guangxi is given. The holotypes are deposited in the Institute of Zoology, Shaanxi Normal University, and the paratypes and other specimens are deposited in the Department of Biology, Guangxi Normal University. The measurements and indices used in the paper follow Holldobler and Wilson (1990). All the measurements are expressed in millimeters, and the indices are in percentage.

## Key to the known species of *Pheidole* from Guangxi

(based on major worker caste)

- 1. Head rugose or punctate throughout ..... 2  
    Head rugos anteriorly, shining posteriorly at least on occipital corners ..... 12
- 2. Front below vertex flat, on the same plane with clypeus; Guangxi: Quanzhou County, Ziyuan County, Donglan County; Hunan; India, Burma, Java ..... *P. capellinii* Emery  
    Front below vertex not flat, more or less convex and not on the same plane with clypeus ..... 3
- 3. Vertex with transverse impression, though indistinct sometimes, so that occipital corners above the impression being inclined forward ..... 4  
    Vertex without transverse impression, and occipital corners not inclined forward ..... 8
- 4. Gaster longitudinally rugose throughout; all parts of Guangxi, Yunnan, Burma ..... *P. yeensis* Forel

- Gaster shining, or rugose (or punctate) only on the base of the first segment ..... 5
5. Gaster shining, feebly and sparsely punctate ..... 6
- Gaster reticulate on the base of the first segment ..... 7
6. Small species, TL less than 3.0 mm; occipital corners reticulate; Guangxi: Guilin City; Anhui, Shanghai, Hubei, Hunan, Zhejiang, Sichuan; Japan, Korea ..... *P. pieli* Santschi
- Large species, TL more than 4.0 mm; occipital corners transversely rugose; Guangxi: Huaping Natural Conservation; Hunan; South-east Asia ..... *P. sulcaticeps* Roger
7. Head peculiarly shaped, vertex with impression, and sides with oblique impressions; rugae vanishing on the impression; sides without rugae ..... *P. aphраста* sp. nov.
- Head without impression at sides; rugose throughout; Guangxi: Nanning City, Yulin City; Hongkong ..... *P. hongkongensis* Wheeler new status
8. Postpetiole much broader and higher than petiole; all parts of Guangxi; all parts of China; all countries of Asia ..... *P. nada* Smith
- Postpetiole lower than, or at most slightly higher than petiole ..... 9
9. Petiolar node squamiform, anterior face almost parallel to posterior face, the petiole laterally dentate; Guangxi: Mao'ershan Natural Conservation, Shiwandashan Natural Conservation; Burma ..... *P. feae* Emery new record to China
- Petiolar node oblique anteriorly and posteriorly, the petiole not dentate laterally ..... 10
10. Propodeal spines slender and acute, not thick at base; eyes small, less than 0.18 mm in greatest diameter; all parts of Guangxi; Yunnan, Sichuan, Fujian, Hainan; Singapore, Japan ..... *P. fervens* Smith
- Propodeal spines stout, thick at base; eyes larger, more than 0.21 mm in greatest diameter ..... 11
11. Clypeus not carinate; head longitudinally rugose throughout; all parts of Guangxi; Jiangxi, Sichuan, Fujian, Guangdong; India, Burma, Sri Lanka ..... *P. indica* Mayr
- Clypeus carinate; head with area between eyes and frontal carinae reticulate ..... *P. longiscapa* sp. nov.
12. Transverse ridge of the mesonotum indistinct; pronotum shining; mesopleurae and propodeum densely punctate; Guangxi: Tianlin County, Fusui County, Du'an County; Fujian, Guangdong, Taiwan; all tropical zones around the world ..... *P. megacephala* (Fabricius)
- Transverse ridge of the mesonotum distinct; pronotum transversely rugose; mesonotum and propodeum vaguely crease and punctate; pale yellow ..... *P. flaveria* sp. nov.

### 1 *Pheidole aphраста* sp. nov. (Figs. 1-2)

Holotypes major worker and minor worker (the measurements and the indices of the major worker at first, followed by those of the minor worker. So are the following species): TL 5.0, 2.1; HL 1.41, 0.57; HW 1.25, 0.51; CI 88, 89; SL 0.59, 0.53; SI 47, 102; PW 0.62, 0.25; AL 0.94, 0.63; ED 0.15, 0.08.

Major worker. Head with transverse impression on vertex, lateral impressions oblique from anterior sides to vertex; clypeus with its anterior margin transverse, not emarginate; frontal carinae short, reaching anterior level of the eyes; no antennal scrobes; scapes of antennae falling short of the head by about 1.3 times of its own length. Pronotum convex, lateral tubercles distinct, rhombohedral in dorsal; transverse ridge of the mesonotum feebly convex; basal portion of the propodeum slightly shorter than declivity; propodeal spines broad at base, acute, direct upward, slightly diverging. Petiole triangular in profile, bluntly rounded at top, transverse in dorsal, with its upper border entire, not emarginate; postpetiole transversely broad, about twice as broad as petiole, angularly produced at the sides. Gaster broadly oval.

Mandibles shining; clypeus feebly punctate in the middle; head punctate throughout, anteriorly rugose, rugae vanishing on transverse impression; no rugae at the sides; occipital corners reticulate. Alitrunk, petiole and postpetiole coarsely punctate; pronotum feebly and irregularly rugose. Gaster densely reticulate at the base of the first segment; declivity

of propodeum, anterior portion of the petiole and remainder of the gaster shining.

Pilosity pale yellow; erect or suberect hairs denser on head, post-petiole and gaster; sparser on alitrunk; scapes of antennae and hind tibiae with sparse suberect and depressed hairs.

Redish-brown; mandibles and clypeus darker, antennae and legs paler; gaster dark brown and with pale yellow margin.

Minor worker. Head oval, slightly convex posteriorly and with a small notch in the middle of the posterior margin; scapes of antennae extending slightly beyond the occipital margin of the head; mandibles feebly longitudinally striate; clypeus, alitrunk, petiole and postpetiole densely punctate; legs, peduncle and gaster shining; clypeus and head sparsely rugose, rugae on pronotum irregular. Hairs sparse. Brownish yellow.

Holotypes major worker and minor worker, Huaping Natural Conservation (26.6°N, 101.2°E), Guangxi, 8. VII. 1995, collected by ZHOU Shan-Yi. Paratypes 10 minor worker, data as holotypes.

This new species resembles *P. hongkongensis* Wheeler, but differs from the later in rugae on the head, especially in the shape of head which is very peculiar in the genus.

## 2 *Pheidole longiscapa* sp. nov. (Figs. 3-5)

Holotypes major worker and minor worker: TL 5.2, 3.2; HL 1.76, 0.83; HW 1.57, 0.67; CI 89, 80; SL 1.10, 1.10; SI 70, 164; PW 0.62, 0.31; AL 1.47, 1.10; ED 0.23, 0.16.

Major worker. Head distinctly longer than broad, deeply emarginate posteriorly; median sulcus broad and deep, linking with frontal groove; clypeus flat in the middle, distinct carinate, anterior margin emarginate; frontal carinae as long as scape of antennae; antennal scrobes distinct; scapes of antennae reaching about two-thirds of the distance between their insertion and occipital margin of the head. Pronotum convex, lateral tubercles distinct but rounded above; mesonotum with distinct transverse sulcus and ridge; basal portion of the propodeum longer than declivity, emarginate above; propodeal spines acute, broad at base, half as long as the distance between the base of two spines. Petiole with its upper border entire, not emarginate; postpetiole transversely broad, about 1.6 times as broad as petiole, bluntly produced at the sides. Gaster broadly oval.

Mandibles shining; clypeus shining in the middle, feebly rugose laterally; head with longitudinal rugae which curved laterally to occipital corners, sides rugose; the area between eyes and frontal carinae reticulate; antennal scrobes feebly reticulately punctate. Alitrunk transversely rugose above; mesopleurae and propodeum with rugae oblique from anterior border to upper border, punctate in the intervals. Peduncle, petiole and postpetiole punctate. Gaster shining, with feeble and vague punctures at base of the first segment.

Pilosity yellow; erect or suberect hairs long and soft, densely covered the head and whole body, the longest hair on pronotum 0.47 mm; hairs at the sides of the head depressed; suberect hairs moderate on scape of the antennae and on hind tibiae.

Orange red. Mandibles and clypeal margin brownish red; gaster brown at the posterior half.

Minor worker. Large in size. Head oval, with distinct posterior collar-like carina; mandibles with apical and subapical teeth and a row of vague denticles; scapes of anten-

nae extremely long, extending beyond occipital margin of the head by about half of its own length. Alitrunk long, mesonotum with area behind the transverse ridge convex so that pro-mesonotum forming two convexities. Mandibles feebly striate; clypeus with five distinct rugae, coarsely oblique rugose at the sides. Pronotum shining; mesonotum, mesopleurae and propodeum densely punctate; punctures on petiole and postpetiole feebler; gaster shining. Erect or suberect hairs long, denser on head and gaster, sparser on alitrunk. Brownish-yellow, head and gaster darker.

Holotypes major worker and minor worker, Daming Shan Natural Conservation (23.4°N, 108.5°E), Guangxi, 30. X. 1995, collected by ZHOU Shan-Yi. Paratypes: 1 major worker, 14 minor workers, data as holotypes.

This new species is similar to *P. allani* Bingham, but differs from the later in: 1) clypeus carinate; 2) anterior margin of clypeus emarginate; and 3) petiole with its upper border entire, not emarginate. In addition, minor worker of the new species with antennal scapes extremely long, SI 164-167, this character is rare in the genus.

### 3 *Pheidole flaveria* sp. nov. (Figs. 6-8)

Holotypes major worker and minor worker: TL 3.8, 2.3; HL 1.35, 0.62; HW 1.25, 0.53; CI 92, 85; SL 0.72, 0.66; SI 57, 124; PW 0.56, 0.30; AL 1.07, 0.71; ED 0.13, 0.08.

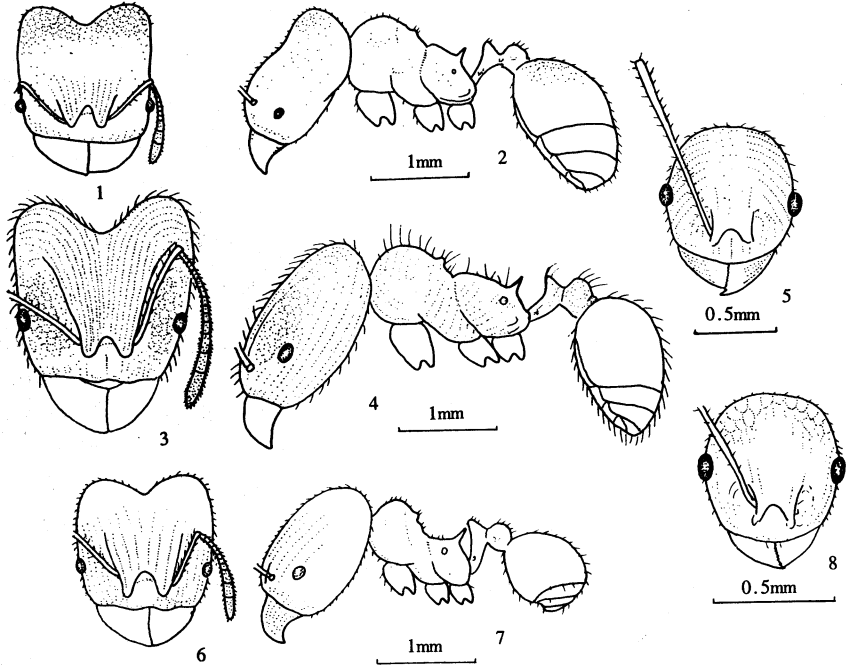
Major worker. Head longer than broad, broader posteriorly than in front, deeply emarginate posteriorly, occipital corner rounded; ventral anterior border with five gular teeth; clypeus with its middle portion slightly impressed, no carina, emarginate anteriorly; frontal carinae reaching about two-thirds of the length of the head; antennal scrobes indistinct. Pronotum convex, lateral tubercles prominent but rounded above; transverse ridge of the mesonotum distinct; propodeum with its basal portion and subequal, impressed above; propodeal spines acute, erect, about one-third of the length of the basal portion, longer than its base and shorter than the distance between the two spines. Petiole simple, triangular in profile, bluntly rounded at the top, upper border slightly emarginate; postpetiole transversely broad, about twice as broad as petiole, angularly produced at the sides. Gaster broadly oval, much smaller than the head. Legs stout, femora and tibiae thickened in the middle.

Shining; mandibles sparsely punctate, external coarsely rugose; clypeus shining in the middle, rugose laterally; head sparsely longitudinally rugose, shining in the intervals; occipital corner shining. Pronotum sparsely and irregularly rugose; mesopleurae and propodeum vaguely creased and punctate. Petiole vaguely punctate; postpetiole shining above. Gaster feebly and vaguely punctate.

Pilosity pale; erect or suberect hairs abundant on whole body; short suberect hairs mixed up with long erect hairs on the head; scapes of the antennae and hind tibiae with abundant suberect hairs.

Pale yellow; mandibles and border of clypeus dark brown and with broadly black margin; scape of the antennae, postpetiole and gaster yellowish-brown.

Minor worker. Head oval; mandibles with apical and subapical teeth, followed by 8 teeth which large ones alternating with small ones; scapes of the antennae extending beyond occipital margin of head by about one-third of its own length. Body translucent,



Figs. 1-8 *Pheidole* major workers and minor workers

1-2 *P. aphраста* sp. nov. 3-5 *P. longiscapa* sp. nov. 6-8 *P. flavaria* sp. nov. 1, 3, 6 head in frontal view (major) 2, 4, 7 body in profile view 5, 8 head in frontal view (minor)

vaguely rugose, less shining; head sparsely rugose anteriorly, densely reticulate posteriorly, meshes large. Erect hairs denser on head, sparser on alitrunk, moderate on gaster. Paleyellow.

Holotypes major worker and minor worker, Huaping Natural Conservation (26.6°N, 101.2°E), Guangxi, 6. VII. 1995, collected by ZHOU Shan-Yi. Paratypes: 2 major workers, 13 minor workers, data as holotypes.

This new species is closely related to *P. funkikoensis* Wheeler, but differs from the later in: 1) major worker with its head longer than broad; 2) clypeus not carinate; and 3) minor worker with its head reticulate posteriorly.

#### 4 *Pheidole hongkongensis* Wheeler, new status

*Pheidole rinae* subsp. *hongkongensis* Wheeler, 1928. *Boll. Lab. Zool. Gen. Agr. Portici*, 22: 11

*Pheidole rinae* subsp. *hongkongensis* Wheeler: Wu, 1941. *Cat. Ins. Sin.*, 6: 155

This species differ from *P. rinae* Emery in: 1) scapes of antennae short, reaching only to middle of sides of head; 2) reticulations of occipital corners with small meshes; and 3) propodeal spines stout, erect, postpetiole more than twice as broad as long. The characters are distinct, so it is appropriate to regard *P. hongkongensis* as a species.

Specimens examined: 18 specimens (3 major workers and 6 minor workers from 3 colonies) from the following localities: Nanning City, Yulin City, Rong'an County of Guangxi.

## 5 *Pheidole feae* Emery

*Pheidole feae* Emery, 1894. *Ann. Mus. Civ. Gen.*, **34**: 469

New record to China.

Specimens examined: 12 specimens (4 major workers and 8 minor workers from 2 colonies) from the following localities: Mao'ershan Natural Conservation, Shiwandashan Natural Conservation of Guangxi.

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## 广西大头蚁属分类研究及三新种记述

(膜翅目: 蚁科)

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### 摘要

记述广西大头蚁属昆虫 13 种, 其中 3 新种, 即奇大头蚁 *P. aphrasta* sp. nov., 长柄大头蚁 *P. longiscapa* sp. nov. 和淡黄大头蚁 *P. flaveria* sp. nov., 中国 1 新纪录种费氏大头蚁 *P. feae* Emery, 提出 1 新地位种香港大头蚁 *P. hongkongensis* Wheeler, new status.

新种奇大头蚁与香港大头蚁近似, 主要不同为头部刻纹, 尤其是头部的奇特形状, 即不仅头顶具横形凹陷, 头侧也具斜形凹陷。

新种长柄大头蚁与阿伦大头蚁 *P. allani* Bingham 相似, 不同之处为: 唇基具中脊; 唇基前缘凹陷; 第 1 结节上缘完整。此外, 小型工蚁触角极长, 柄节比达 164~167, 在同属各种中也是少见的。

新种淡黄大头蚁与兴起湖大头蚁 *P. funkikoensis* Wheeler 相似, 主要区别为大型工蚁头长大于宽; 唇基不具中脊; 小型工蚁后头缘具粗大网状刻纹。后一特征可与同属中大多数种类相区别。

新种正模标本保存于陕西师范大学动物研究所, 副模标本及其余研究标本保存于广西师范大学生物系。

**关键词** 膜翅目, 蚁科, 大头蚁属, 分类.

**中图分类号** Q969. 48