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

ZHOU Shan-Yi
(Department of Biology, Guangxi Normal University, Guilin 541004)
ZHENG Zhe-Min
(Institute of Zoology, Shaanxi Normal University, Xi’an 710062)

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. longiscapa 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, 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

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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. aphrasta sp. nov.
Head without impression at sides; rugose throughout; Guangxi; Nanning City, Yulin City; Hongkong ................................. P. honkongensis Wheeler new status
8. Postpetiole much broader and higher than petiole; all parts of Guangxi; all parts of China; all countrys of Asia .......................................................... P. noda Smith
Postpetiole lower than, or at most slightly higher than petiole .......................................................... 9
9. Petiolar node squamiform, anterior face almost parallel to posterior face, the petiolar laterally dentate; Guangxi; Mao’erhan Natural Conservation, Shiwandashan Natural Conservation; Burma .................................................. P. fove 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 aphrasta 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. Petirole trunk, petiole and postpetiole coarsely punctate; pronotum feebly and irregularly rugose. Gaster densely reticulate at the base of the first segment; declivity
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.

Reddish-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 longit-dinally 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.


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 longisca* sp. nov. (Figs. 3-5)

Holotypes major worker and minor worker: TL 5.2, 3.2; HL 1.76, 0.83; HW1.57, 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 vaguepunctures 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-liked 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 petirole and postpetirole feebler; gaster shining. Erect or suberect hairs long, denser on head and gaster, sparser on alitrunk. Brownish-yellow, head and gaster darker.

Holotypes major 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) petirole 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; HW1.25, 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-thirds 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; postpetirole transversely broad, about twice as broad as petirole, angularly produced at the sides. Gaster broadly oval, much small 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; postpetirole 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, postpetirole 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-thirds of its own length. Body translucent,
vaguely rugose, less shining; head sparsely rugose anteriorly, densely reticulate posteriorly, meshes large. Erect hairs denser on head, sparser on alitrunk, moderate on gaster. Pale yellow.


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; 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


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, ShiwanDanDan Natural Conservation of Guangxi.

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