

# Taxonomy of the ant genus *Pheidole* Westwood (Hymenoptera: Formicidae) from Fujian, China with description of a new species

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**Abstract:** The taxonomy of *Pheidole* Westwood, 1841 from Fujian, China is discussed. A new species, *Pheidole flavigaster* **sp. nov.**, is described. A key to the species of *Pheidole* based on major worker is provided. This new species is small in size, body color is brown and gaster is yellow. *Pheidole flavigaster* **sp. nov.** is similar to *Pheidole schoedli* Eguchi, Hashimoto & Malsch, 2006 from Indonesia, but the propodeal spine is not upward and the hypostoma inner and median teeth are not distinct, making it obvious to distinguish them. The holotype and paratypes are both deposited at the Kunming Natural History Museum of Zoology, Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences, Kunming, Yunnan, China.

**Key words:** Myrmicinae; ants; taxonomy

## 中国福建大头蚁属分类研究及一新种记述（膜翅目：蚁科）

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**摘要：**本文对福建大头蚁属的已知物种进行了分类整理，并提供了大头工蚁分种检索表。记述采自福建省三明市瑞云山1新种：黄腹大头蚁 *Pheidole flavigaster* **sp. nov.**，该新种体型较小，体棕黄色，腹部甚黄。经形态对比在中国已知物种中无一近似，与印尼地区 *P. schoedli* 近似，主要鉴别特征如下：后者大型和小型工蚁并胸腹节刺向上弯曲，前者笔直且大型工蚁咽齿不明显。该新种模式标本均保存于中国科学院昆明动物研究所（KIZ）。

**关键词：**切叶蚁亚科；蚂蚁；分类

## Introduction

Ants arose during the Cretaceous period, somewhat more than one hundred million years ago (Wilson & Hölldobler 2005). *Pheidole* was established by Westwood in 1841, based on the type species *P. providens* Sykes, 1835 (= *Atta providens*). Now it is the largest genus in the subfamily Myrmicinae, containing 1167 valid species and 129 valid subspecies (Bolton 2021). Fujian contains 11 valid species: *P. capellinii* Emery, 1887; *P. fervens* Smith, 1858; *P. fervida* Smith, 1874; *P. indica* Mayr, 1879; *P. megacephala* Fabricius, 1793; *P. meihuashanensis* Li & Chen, 1992; *P. nodus* Smith, 1874; *P. pieli* Santschi, 1925; *P. roberti* Forel, 1902; *P.*

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*sulcaticeps* Roger, 1863; and *P. yeensis* Forel, 1902 (Huang & Zhou 2007; Guénard & Dunn 2012).

In 4 May 2021, the author collected specimens and found a new species, *Pheidole flavigaster* **sp. nov.**, from Fujian, China. It is described and a key to the species of *Pheidole* based on major worker form Fujian, China is provided.

## Material and methods

The ant specimens were soaked in 75% alcohol, pasted on a white piece of paper, measurements were taken and photographs were captured using stereomicroscopy. The photos were uploaded to the computer and copied to Adobe Photoshop® for montage.

Morphological terminology mostly follows those of Bolton (1994) and Eguchi (2001 a, b). The measurements and indices are as follows: TL — Total Length; HL — Head Length; HW — Head Width; CI — Cephalic Index  $HW/HL \times 100$ ; SL — Scape Length; SI — Scape Index =  $SL/HW \times 100$ ; ML — Mesosoma Length; PrW — Pronotum Width; PSL — Propodeal Spine Length; SDL — Spiracle to Declivity Length; PW — Pronotal Width; PPW — Postpetiole Width; EL — Eye Length; EW — Maximum Eye Width; PrW — Pronotum Width; ML — Mesosoma Length; PPL — Postpetiole Length; PPH — Postpetiole Height; ATW — Abdominal Tergum IV Width; ATL — Abdominal Tergum IV Length. All measurements are given in millimeters.

The type specimens are deposited in Kunming Natural History Museum of Zoology, Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences, Yunnan, China.

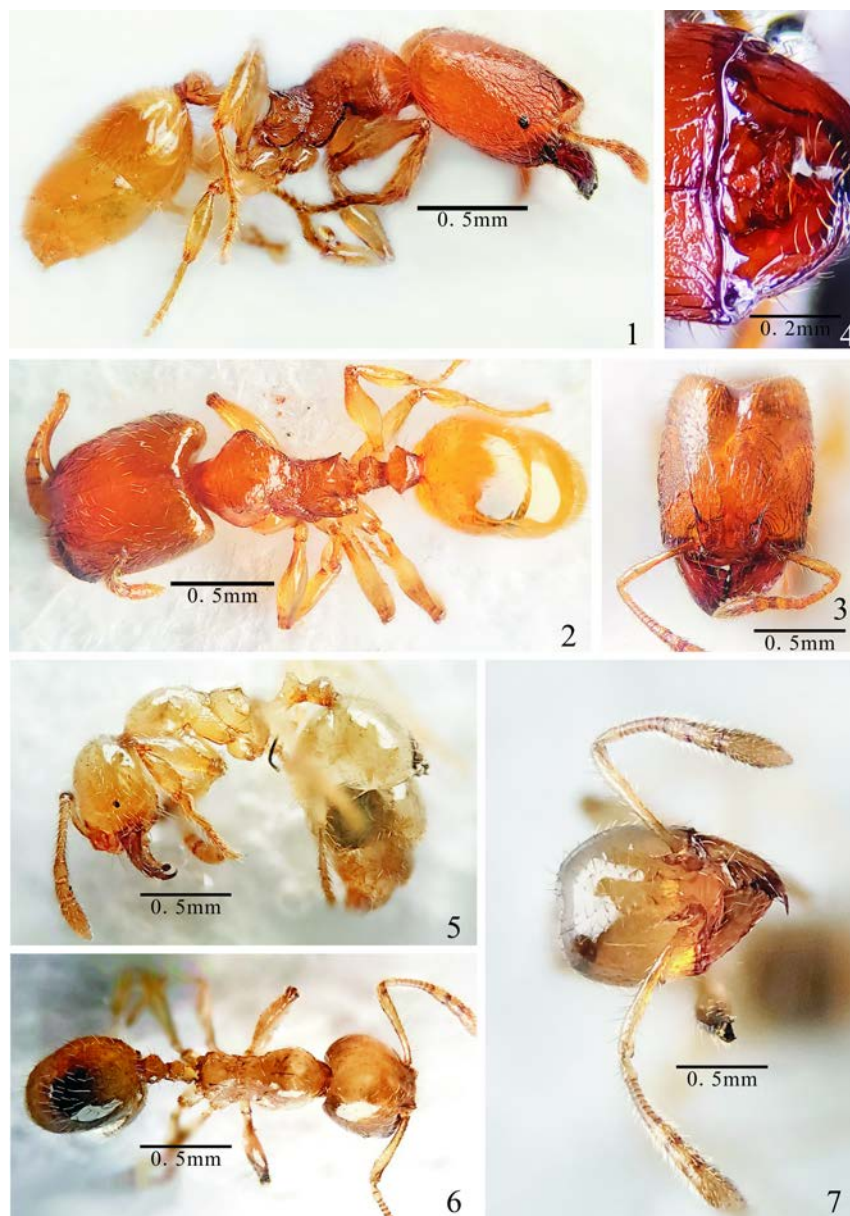
## Taxonomy

### Key to species of *Pheidole* based on the major worker of Fujian, China

1. Antennal club composed of three segments ..... 2
- . Antennal club composed of four segments ..... *P. meihuashanensis*
2. Clypeus in full-face view punctured strongly and densely ..... *P. capellinii*
- . Clypeus in full-face view smooth and shining ..... 3
3. Postpetiole in lateral view massive, petiole usually as long as or shorter than postpetiole ..... *P. nodus*
- . Postpetiole in lateral view not massive, petiole longer than postpetiole ..... 4
4. Vertex in lateral view concave ..... 5
- . Vertex in lateral view convex or flat ..... 8
5. First gastral tergite densely longitudinally rugose ..... *P. yeensis*
- . First gastral tergite smooth entirely ..... 6
6. Occipital lobes in full-face view striate ..... *P. sulcaticeps*
- . Occipital lobes in full-face view with reticulate sculpture ..... 7
7. Propodeal spine in lateral view longer ..... *P. roberti*
- . Propodeal spine in lateral view shorter, odontoid ..... *P. pieli*
8. Promesonotum with protuberance in mesonotal region ..... 9
- . Promesonotum in profile forming a smooth curve ..... *P. megacephala*
9. Head about as wide as long, strongly heart-shaped ..... 10

- Head significantly longer than wide, roughly rectangular ..... *P. flavigaster* **sp. nov.**
- 10. Frontal carinae or antennal scrobe in lateral view shallow, weakly developed ..... *P. fervida*
- Frontal carinae or antennal scrobe in lateral view deep, forming margined channel ..... 11
- 11. Mesopleuron punctured strongly and densely ..... *P. fervens*
- Mesopleuron smooth, with transverse wrinkle ..... *P. indica*

***Pheidole flavigaster* sp. nov.** (Figs 1–7)



Figures 1–7. *Pheidole flavigaster* **sp. nov.** 1–4. Major workers; 5–7. Minor workers. 1, 5. Bodies, lateral views; 2, 6. Bodies, dorsal views; 3, 7. Heads, full-face views; 4. Hypostoma.

Description. Major worker. Measurements and indices ( $n = 1$ ). TL 3.04, HW 0.71, HL 0.85, PrW 0.41, EL 0.05, EW 0.04, SL 0.42, ML 0.71, PSL 0.15, SDL 0.05, PL 0.25, PH 0.15, PW 0.15, PPW 0.25, PPH 0.15, PPL 0.21, ATW 0.55, ATL 1.02, SI 57, CI 82.

Head. In full-face view significantly longer than wide, roughly rectangular; concave posteriorly; ocelli degenerate; vertex and dorsum smooth and shining; clypeus smooth, middle concave; mandible triangular; antennal scapes longer than one-half of the head; antenna twelve-segmented; antenna club three-segmented; frontal carinae weakly developed; antennal scrobe shallow, punctured weakly. In lateral view seven to eight ommatidia present on the eye; hypostomal teeth invisible; antennal scrobe striate; subocular level smooth. In ventral view inner hypostoma teeth indistinct, weakly triangular; outer hypostoma teeth distinct, strongly triangular; outer hypostoma teeth are higher than inner hypostoma teeth. Mesosoma. In dorsal view pronotum smooth and shining or very weakly striate; propodeal spine thicker. In lateral view pronotum convex; mesopleuron and metapleuron weakly and densely punctured; propodeal spine longer, triangular; coxae smooth and shining. Pedicel. In dorsal view postpetiole not distinctly massive; postpetiole a little wider than petiole. In lateral view, petiole a little longer than postpetiole. Gaster. Smooth and shining. Color. Concolored; dark yellow; gaster and legs yellow.

Minor worker. Measurements and indices ( $n = 1$ ): TL 2.03, HW 0.51, HL 0.51, PrW 0.35, EL 0.04, EW 0.02, SL 0.52, ML 0.82, PSL 0.05, SDL 0.07, PL 0.25, PH 0.15, PW 0.11, PPW 0.15, PPH 0.15, PPL 0.22, ATW 0.51, ATL 1.02, SI 100, CI 100.

Head in full-face view about as wide as long, concave posteriorly; clypeus roundly convex; antenna scapes reach or longer than posterior margin of head; mandible triangular; antenna twelve-segmented; antenna club three-segmented. In lateral view spherical; two ommatidia present on the eye. Mesosoma. In dorsal view pronotum smooth and shining; mesonotum indistinct; propodeal spine slight. In lateral view pronotum weakly convex; mesopleuron and metapleuron smooth, weakly punctured; metanotal groove distinct; propodeal spine short, dentate; coxae smooth and shining. Pedicel. In dorsal view postpetiole a little wider than petiole; postpetiole spherical. In lateral view petiole is slightly longer and equal to postpetiole. Gaster. Smooth and shining. Color. Concolored; faint yellow.

Male. Unknown.

**Holotype.** 1 major worker, **China**, Fujian, Sanming, Ruiyun Mountain, 26°22'5"N, 117°39'14"E; elev. 600 m, 04-V-2021, Ying ZHONG leg., KIZ0130281 (KIZ). **Paratypes.** 1 major worker, 2 minor workers and 1 queen, the same data as holotype, KIZ0130282, KIZ0130283, KIZ0130284, KIZ0130285 (KIZ).

**Biology.** Dependent on humid environment, most likely forever living underground, often a single queen or small colony as is found in the colony of *P. nodus*.

**Rearing.** Maintain in a small jar (preferably plastic). Pour a little gypsum into the bottom of the jar to maintain the humidity. Sprinkle some fine soil on top of the gypsum. Make sure the humidity is 80% and the temperature is about 30°C. Can be fed on some arthropods such as *Tenebrio molitor* Linnaeus, 1758.

**Etymology.** The specific epithet is Latin "*flavus*", in reference to the yellow gaster coloration of major workers.

**Diagnosis.** This new species is similar to *P. schoedli* from Indonesia, but can be obviously distinguished from the latter by the following characters: propodeal spine not upward,

hypostoma inner and median tooth not distinct.

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### **References**

- Bolton B. 1994. *Identification Guide to the Ant Genera of the World*. Harvard University Press, Cambridge, Massachusetts, 222 pp.
- Bolton B. 2021. *An Online Catalog of the Ants of the World*. <http://antcat.org> (Accessed 26 July 2021)
- Eguchi K. 2001a. A revision of the Bornean species of the ant genus *Pheidole* (Insecta: Hymenoptera: Formicidae: Myrmicinae). *Tropics Monograph Series*, 2: 1–154.
- Eguchi K. 2001b. A taxonomic study on Asian *Pheidole* (Hymenoptera, Formicidae): new synonymy, rank changes, lectotype designations and redescriptions. *Insecta Koreana*, 18: 1–35.
- Guénard B & Dunn RR. 2012. A checklist of the ants of China. *Zootaxa*, 3358:1–77.
- Huang JH & Zhou SY. 2007. A checklist of family Formicidae of China—Myrmicinae (Part II) (Insecta: Hymenoptera). *Journal of Capital Normal University: Natural Science Edition*, 25(1): 91–99.
- Wilson EO & Hölldobler B. 2005. The rise of the ants: a phylogenetic and ecological explanation. *Proceedings of the National Academy of Sciences of the United States of America*, 102: 7411–7414.