First record of the species *Pheidole parva decanica* Forel, 1902 (Hymenoptera: Formicidae) from Kerala (India), with redescription

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ABSTRACT

*Pheidole* Westwood is generally known as big headed ants and the largest of all genera of plants and animals (Wilson, 2003). *Pheidole parva decanica* Forel, 1902 is recorded for the first time from Kerala. Detailed redescription of the species is provided. In addition distribution of the species is provided.

Key Words: *Pheidole parva decanica*, redescription, distribution, Kerala.

INTRODUCTION

Formicidae are the largest family under the order Hymenoptera. They act as ecological indicators, ecosystem engineers and one of the most diverse groups of insects. The genus *Pheidole* is one of the most specious diverse ant genera especially in tropical/subtropical regions (Wilson 2003). Due to its size and distribution, *Pheidole* is a very difficult genus and has been a challenge to myrmecologists taxonomically as well as biologically (Naves 1985). Kerala is one of the most species diverse states in India. It is rich in flora and fauna. But there is only a little information about the diversity, taxonomy, and distribution of *Pheidole* species. Surveys were carried out during 2010-2013. The species *Pheidole parva decanica* Forel are redescribed here. The species was also compared with the closely resembled species.

MATERIAL AND METHODS

The specimens were collected by hand, food bait and by brush method from different localities of Kerala, which include hilly areas, marshy area, coastal regions, mid lands, wet lands, kid-arid to semi-arid regions and forests. Species were analyzed using Leica MZ6 stereozoom microscope. Multi-focused montage images were produced using Leica DFC 295 camera attached to a Leica S8 APO Stereozoom trinocular microscope. Later, images were processed as per requirement with Adobe Photoshop CS3. Description format and morphological terminology for measurements and
indices follow Longino (2009) and Fischer (2013) and include: HL = Head length; maximum distance from the mid-point of the anterior clypeal margin to the mid-point of the posterior margin of the head, measured in full-face view; in majors from midpoint of tangent between anterior most positions of clypeus to midpoint of tangent between posterior most projections of the vertex; SL = Scape length; maximum scape length, excluding basal condyle and neck; MDL = Mandible length; maximum length of mandible measured in oblique fronto-lateral view, from apex to lateral base; EL = Eye diameter; maximum diameter of compound eye measured in oblique lateral view; PW = Pronotal width; maximum width of pronotum measured in dorsal view; WL = Webers length; Diagonal length of compound eye measured from apex to lateral base; MDL = Mandible length; maximum length of mandible measured in oblique fronto-lateral view, from apex to lateral base; EL = Eye diameter; maximum diameter of compound eye measured in oblique lateral view; PW = Pronotal width; maximum width of pronotum measured in dorsal view; MDS = Maximum petiolar node width, measured in dorsal view from the anterior point of the petiolar node and excluding the neck, to the posterior ventral margin of the propodeum; PSL = Propodeal spine length; measured from apex to lateral base; PPW = Post petiole width; maximum width of post petiole measured in dorsal view from the visible anterior and posterior margin; PPL = Post petiole length; maximum length of post petiole in dorsal view, crossing the second axis at the base of the measured spine, and the latter connecting the base with the centre of the propodeal concavity; PTH = Petiole height; maximum height of petiolar node measured in dorsal view from the highest (median) point of the node, orthogonally, to the ventral outline of the node; PTW = Petiolar node width; maximum petiolar node width, measured in dorsal view; PPH= Post petiole height; maximum height of petiolar node measured in dorsal view from the highest (median) point of the node, orthogonally, to the ventral outline of the node; PPW = Post petiole width; maximum width of post petiole measured in dorsal view between its visible anterior and posterior margin; PPW = Post petiole width; maximum width of post petiole from above/ in its dorsal view; CI = Cephalic index; HW / HL * 100; EI = Eye index; EL / HW x 100; SI = Scape index; SL / HW x100; MDI = Mandible index; MDL / HW x 100; PSLI = Propodeal spine index; PSL / HW x 100. All specimens are at SXC and will eventually transfer to ZSIWGRC.

Acronyms of depositories

MCZC = Museum of Comparative Zoology, Cambridge.
MHNW = Naturhistorisches Museum, Wien, Austria.
SXC = St. Xavier’s College for Women, Aluva, Kerala, India.
ZSIWGRC = Zoological Survey of India Western Ghats Regional centre, Calicut, Kerala, India.

TAXONOMIC DESCRIPTION

_Pheidole parva decanica_ Forel

Figs. 1a-f

_Pheidole parva var. decanica_ Forel, 1902c: 175, India (MHNG)
_Pheidole bugi_ Wheeler W. M., 1919F: 66. Borneo (MCZC) [Synonomised by Eguchi, 2008]
_Pheidole rinae_ var. _malae_ Forel, 1911a: 205 Java (MHNG) [Eguchi 2001b: 39] MHNG
_Pheidole rinae_ r. _tipuna_ Forel, 1912a: 68 Taiwan (MHNG) [Synonomised by Eguchi, 2001b]
_Pheidole sauteri_ Wheeler W. M., 1909b: 334 Taiwan (MCZC) [Synonomised by Eguchi, 2001b]


Redescription

Major worker

Measurements and Indices (mm):

HW = 0.830, HL = 0.969, SL = 0.426, MDL = 0.433, EL = 0.126, WL = 0.765, PSL = 0.102, PPH = 0.217, PTH = 0.169, PTW = 0.205, PPL = 0.201, PWI = 0.429, CI = 85.655, EI = 15.180, SI = 51.325, MDI = 052.168, PSLI = 12.289, PWH = 51.686, PpW = 128.402, PeI = 39.393, PfI = 50.938.

Head: Distinctly longer (1.2x) than broad, rectangular, lateral sides parallel; occipital emargination deep (Fig 1: b), wide (0.419 mm); vertex transversely impressed (Fig 1: a); frontal carina short (0.435 mm), divergent posteriorly (0.461 mm); frontal lobe inconspicuous (Fig 1: b); antennal scrobe broad, shallow (Fig 1: b); clypeus acarinate, not emarginated anteriorly, concave, anterio- medially incised; antennal groove distinct;
Fig. 1. *Pheidole parva decanica* Forel Major: a) Body profile; b) Head dorsal view; c) Mesosoma dorsal view. Minor: d) Body profile; e) Head dorsal view, f) Mesosoma dorsal view.

scape short (0.426 mm), slender, cylindrical reaching up to half from its insertion to the top of head (Fig 1: b). F1 longer than all funicular segments (F1 = 0.090 mm, F2 = 0.037 mm, F3 = 0.036 mm, F4 = 0.031 mm, F5 = 0.029 mm, F6 = 0.053 mm, F7 = 0.027 mm, F8 = 0.028 mm). CL3 1.3x shorter than CL1 + CL2 (CL1 = 0.087 mm, CL2 = 0.089 mm, CL3 = 0.140 mm). Eyes small (0.126 mm), antero-laterally located, seven ommatidia along longitudinal axis; malar space 1.7x longer than eye diameter; mandibles broad (0.433 mm), massive with two blunt teeth at apex.

Mesosoma and pedicel: Pronotum and mesonotum forming one convexity (Fig 1: a), pronotum attenuated anteriorly, dorsally tuberculate; promesonotal dome with weak prominence posteriorly; humeral area conspicuous, laterally
acute cones; promesonotal groove absent; mesometanotum groove shallow, equals with the height of first node of pedicel laterally (0.167 mm); basal, apical portion of metanotum sub-equal; metanotal spines acute (Fig 1: a), erect, short (0.102 mm); first node of pedicel without appendix beneath, raised medially, not emarginated anteriorly, above transverse, squamiform, 1.01x higher than second node laterally; second node of pedicel square, as long as broad (Fig 1: c), laterally rounded, 1.05x broader than first node dorsally.

**Gaster:** Longer than broad (0.8x), oval (Fig 1: c), opaque.

**Sculpture:** Head anteriorly, vertex, gena longitudinally striated (Fig 1: b); head posteriorly, laterally, occiput reticulated; mandibles smooth, polished, shining; mesosoma foveo-reticulate; katepistenum medially smooth, polished, shining; nodes of pedicel rugose; gaster anteriorly recticulo-punctate.

**Vestiture:** Sparse, short; head semi-erect hairs; gaster decumbent; scattered erect hairs on mesosoma; antennae, legs pubescent.

**Colour:** Head, mesosoma, pedicel bright chestnut red; gaster brown; legs brownish yellow; antennae darker than legs; pilosity reddish yellow.

**Minor Worker**

Measurements and Indices (mm):

HW = 0.458, HL = 0.478, SL = 0.392, MDL = 0.133, EL = 0.078, WL = 0.554, PSL = 0.06, PPH = 0.101, PTH = 0.126, PTW = 0.070, PPW = 0.130, PW = 0.229, CI = 95.815, EI = 17.030, SI = 85.589, MDI = 29.039, PSLI = 13.100, PWI = 50.00, PpWI = 185.714.

**Head:** Square (Fig 1: e), lateral sides parallel; occipital emargination distinct (Fig 1: e), wide (0.204 mm); occipital collar absent; vertex without transverse impression (Fig 1: d); frontal carina short (0.192 mm), parallel; frontal lobe inconspicuous not covering antennal groove; antennal groove distinct; scape long (0.392 mm), stout, cylindrical reaching up to the occipital emargination (Fig 1: e). F2 longer than all funicular segments (F1 = 0.036 mm, F2 = 0.039 mm, F3 = 0.038 mm, F4 = 0.019 mm, F5 = 0.021 mm, F6 = 0.023 mm, F7 = 0.017 mm, F8 = 0.026 mm). CL3 1.1x shorter than CL1 + CL2 (CL1 = 0.083 mm, CL2 = 0.081 mm, CL3 = 0.145 mm). Clypeus acarinate (Fig 1: e), medially emarginated; fronto-clypeal suture carinate; eyes small (0.078 mm), antero-medially located, 9- 10 ommatidia along longitudinal axis; malar space 1.08x longer than eye diameter; mandibles short (0.133mm), elongate; masticatory margin dentate.

**Mesosoma and pedicel:** Pronotum and mesonotum forming two different convexities (Fig 1: d), attenuated anteriorly; mesonotum forms a little dome (Fig 1: e) in its posterior declivity (Fig 1: f); humeral area inconspicuous; promesometanotum groove absent; mesometanotum groove shallow (0.117 mm), wide; apical and basal portion of metanotum sub-equal; spines short (0.060 mm) stout, erect; first node of pedicel without appendix beneath, squamiform, transverse above, 1.04x higher than second node laterally; second node rounded (Fig 1: f), 1.9x broader than first node dorsally.

**Gaster:** 1.02x broader than long. Oval, opaque.

**Sculpture:** Head, mesosoma foveolate (Fig 1: e); nodes of pedicel punctate; gaster anteriorly reticulate; clypeus, mandibles and gaster posteriorly smooth (Fig 1: f), polished and shining.

**Vestiture:** Abundant, short; head laterally and gaster fully with decumbent hairs; erect hairs on mesosoma; head anteriorly with semi-erect hairs.

**Colour:** Head, mesosoma, pedicel reddish brown; gaster brown; legs, antennae; pilosity yellow.

**Distribution:** Myanmar, Sri Lanka, India [Meghalaya, West Khasi hills, Western India, Kerala (Malappuram, Calicut, Kollam, Trivandrum, Thrissur, Pathananthitta)].

**Ecology:** Nests behind leaf litter.


However *P. parva decanica* differs from *P. templaria* in having 1. Clypeus acarinate (in *P. templaria* clypeus carinated in middle); 2. Pronotum foveolate (in *P. templaria* pronotum smooth) 3. First node of pedicel squamiform (in *P. templaria* first node of pedicel triangular).

The minor worker of *P. parva decanica* closely resembles *P. templaria* in having 1. Scape not extending beyond the top; 2. Pronotum and mesonotum forming one convexity; 3. Gaster broadly oval, smooth.

However the minor worker of *P. parva decanica* differs from *P. templaria* in having 1. Posterior margin of head emarginate (in *P. templaria* posterior margin of head rounded); 2. Mesonotum entirely foveolate (in *P. templaria* mesonotum entirely not foveolate); Occipital collar absent (in *P. templaria* occipital collar present).
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