



RESEARCH ARTICLE - ANTS

Discovery of Remarkable New Ant Species of the Genus *Pseudolasius* Emery (Hymenoptera: Formicidae) From Western Ghats of India

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Abstract

Pseudolasius zamrood sp. n., is described based upon the worker and the sexual caste. The new species marks the first record of the genus from South India and represents only the seventh species of the genus to be reported from India. The species appears distinct with its extremely reduced eyes. The new species is closest to *P. typhlos* Wheeler, 1912 from Philippines. However the new species has truncated anterior clypeal margin at the middle lobe, scapes relatively short and propodeum has relatively narrow dorsum in lateral view.

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Introduction

The genus *Pseudolasius* Emery, 1887 is distributed in Australasia, Indomalayan, Palearctic regions and it is currently represented by 49 species and 15 subspecies (Bolton, 2017). From India the genus is represented by six species (Bharti et al., 2016). Global taxonomic revision still eludes the genus, however recent significant contributions to the genus include those of Wu and Wang (1995), Xu (1997), Zhou (2001), LaPolla (2004), LaPolla et al. (2010), Bharti et al. (2012), Wachkoo and Bharti (2014).

Here we present description of the new species *Pseudolasius zamrood* sp. n., collected from Thanikkudy region of Periyar Tiger Reserve. This also confirms the first report of the genus from South India. The species appears to be distinct among regional species of the genus, with its extremely reduced eyes size both in major and minor workers. This character state is also exhibited by some *Pseudolasius* species from Afrotropical and Indo-Australian regions. These species represent rare hypogaecic evolutionary lineages and are quite different

from the more common, larger, presumably epigaeic species (LaPolla, 2004). The species is the first of its kind among the Indian species of the genus and easily diagnosed from the other known similar hypogaecic species by its truncate anterior clypeal margin at the middle lobe, relatively short scapes and propodeum with relatively narrow dorsum in lateral view.

Materials and methods

The specimens were collected by hand picking method. Taxonomic analysis was conducted using Nikon SMZ 1500 stereo zoom microscope. For digital images, an MP evolution digital camera was used on the same microscope with Auto-Montage (Syncroscopy, Division of Synoptics, Ltd.) software. Later, the images were cleaned as per requirement with Adobe Photoshop CS6. Holotype and 13 paratypes of the new species have been deposited in PUAC, Punjabi University Ant Collection, Patiala. Four paratypes will be deposited in BMNH, Natural History Museum, London, United Kingdom. Morphological terminology for measurements (in millimeters)



and indices are as follows: **TL**: Total out stretched length of the specimen, measured along lateral view, from mandibular apex to the tip of the abdomen. **HL**: Maximum length of head in full-face view, measured in straight line from the anteriormost point of the median clypeal margin to a line drawn across the posterior margin from its highest points (to accommodate the concave posterior margin). **HW**: Maximum width of head in full-face view (excluding the portion of eyes that extends past the lateral margins of the head). **SL**: Maximum length of the scape excluding the basal neck and condyle. **PW**: Maximum width of the pronotum in dorsal view. **WL**: Weber's length measured from the anterior surface of the pronotum proper (excluding the collar) to the posteriormost point of the propodeal lobes. **GL**: Maximum length of the gaster in lateral view from the anteriormost point of first gastral segment to the posteriormost point of the last segment. **PrFL**: Maximum length of the profemur from its margin with the trochanter to its margin with the tibia. **PrFW**: Maximum width of the profemur. **CI**: Cephalic index: $HW/HL \times 100$. **SI**: Scape index: $SL/HW \times 100$.

Results

Description of new species

Pseudolasius zamrood sp. n. (Figures 1-10)

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Type material

Holotype (major worker): India: Kerala, Periyar tiger reserve, Thanikkudy, 9° 30' N, 77° 16' E, 1003m, 15 Oct 2011, hand picking (coll. Shahid A. Akbar). Paratypes: 12 workers (5 major and 7 minor workers), 1 gyne and 4 males (one with damaged abdomen), with same data as holotype. Holotype and 13 paratypes deposited in PUAC, 4 paratypes will be deposited in BMNH.

Diagnosis. Workers (majors and minors) Body with profuse pilosity; numerous erect hairs on head, scape, mesosoma, and legs, with appressed pubescence underneath; extremely reduced eyes; short scapes; anterior clypeal margin truncate medially; mandibles with four distinct teeth; gyne with sub-quadrate head having broadly emarginate posterior margin; males with oval head; parameres paddle shaped with rounded tips; long and tubular cusps; weakly anvil shaped digitus.

Worker measurements (Holotype in brackets): HL (0.81) 0.71-0.83; HW (0.77) 0.69-0.77; SL (0.50) 0.50-0.55; PW (0.51) 0.42-0.55; PrFL (0.67) 0.59-0.71; PrFW (0.17) 0.14-0.20; WL (1.25) 0.77-1.31; GL (1.13) 1.01-2.04; TL (3.18) 2.49-4.18. Indices: CI (95) 92.77-97.18; SI (64) 71.42-72.46 (n=10).

Roughly rectangular head with strongly emarginate posterior margin in the middle; rounded postero-lateral corners; lateral sides sub-parallel and gently converging anteriorly; frontal carinae, nearly parallel with lateral sides of head;



Figures 1-3. *Pseudolasius zamrood* sp. n.: Holotype worker (major): 1. Head in full-face view; 2. Body in profile view; 3. Body in dorsal view.

almost rectangular clypeus, protruding in the middle; bluntly toothed anterolateral corner; antennae 12-segmented; short scape, reaching $3/4^{\text{th}}$ of occipital margin of head; mandibles with four distinct teeth, extremely reduced eyes, rudimentary represented by small pigmented dots both in major and in minor workers.

In lateral view, relatively flat promesonotum; strongly developed metanotal groove; distinct metanotal area, well developed and depressed; slightly elevated propodeum, convex and narrow dorsal face, with sides diverging basally; declivity steep, about two times as long as dorsal face; spiracle rounded propodeal; low scale like petiole, with longer posterior face than anterior face, transverse dorsum, ventral projection prominent and inclined forward; first gastral segment with transverse anterior face.

Body covered with abundant pilosity throughout; head and gaster with abundant appressed pubescence, mesosomal dorsum with several, erect hairs sparsely throughout; mandible with 4-5 short curved setae near masticatory border; anterior clypeal margin with 3-5 erect setae, anteriorly directed; fringe of short 1-2 setae also present towards mandibular base; gaster with erect hairs throughout the surface.

Body with a prominent yellow opaque cuticle with micro-reticulate, superficial sculpture.

Body uniformly dark yellowish brown in colour.

Minor workers similar to major workers with the following differences; subquadrate head with posterior margin having less distinct strongly emargination in the middle; longer antennal scapes reaching $4/5^{\text{th}}$ of occipital margin of the head; in lateral view, convex promesonotum. Although entire next series of the new species was collected under the stone, without any further specimens available at that time, there is still possibility that maximum sized major workers may still be discovered. The larger available specimens collected are here treated as major workers. The distinction of castes among worker specimens in the genus is difficult to make with blending of the major and minor castes (LaPolla, 2004).

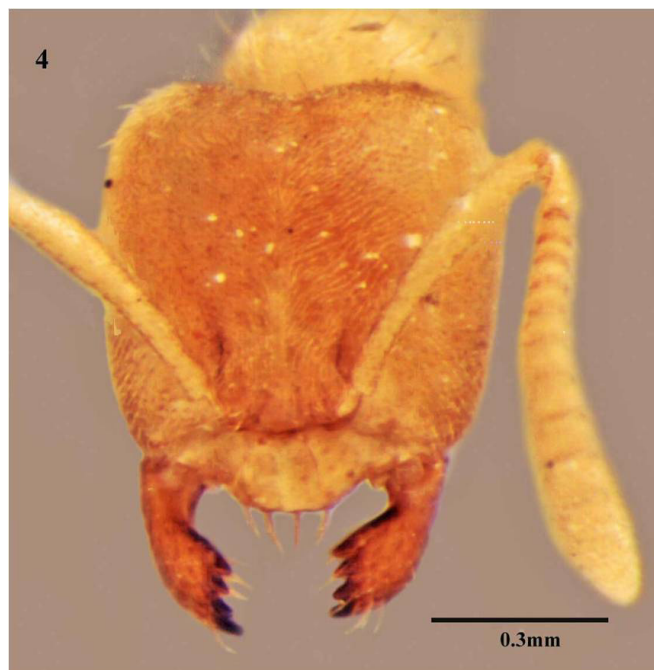
Gyne measurements: HL 1.36, HW 1.24, SL 0.77, EL 0.22, PW 1.37, PrFL 1.07, PrFW 0.20, WL 1.88. Indices: CI 91; SI 62 (n=1).

Gyne similar to worker with usual differences for the caste, including three ocelli, complete thoracic structure and wings; sub-quadrate head with broadly emarginate posterior margin; anterior clypeal margin transverse; scape surpass posterior occipital margin by about $1/5^{\text{th}}$ its length; indistinct propodeum; feebler body sculpture than in worker; darker colouration; pubescence abundant on all the body; gyne damaged without abdomen.

Male measurements: HL 0.58-0.61, HW 0.55-0.58, SL 0.44-0.46, EL 0.19, PnW 0.63-0.65, PFL 0.58-0.61, PFW 0.13-0.15, GL 1.21-1.25, WL 1.01-1.20, TL 2.08. Indices: CI 98.21-100; SI 79.31-80.00 (n=3).

Oval head, as long as wide excluding large compound eyes; sub-globulose eyes, bulging, projecting well beyond

head outline in full-face view; three prominent ocelli present; transverse anterior clypeal margin; antennae 13-segmented, filiform; long scape, surpass posterior occipital margin by about three-tenths their length; slender mandible; reduced dentition, with prominent apical and apico-basal teeth and 1-2 denticles in-between.

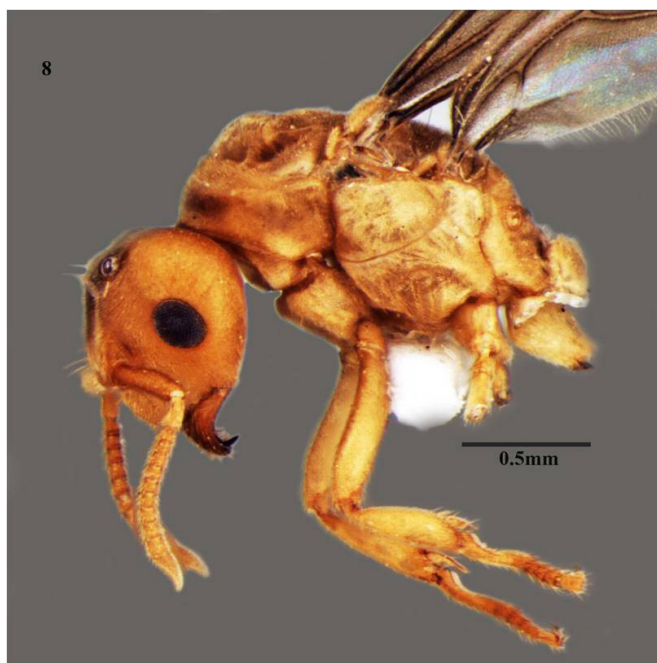
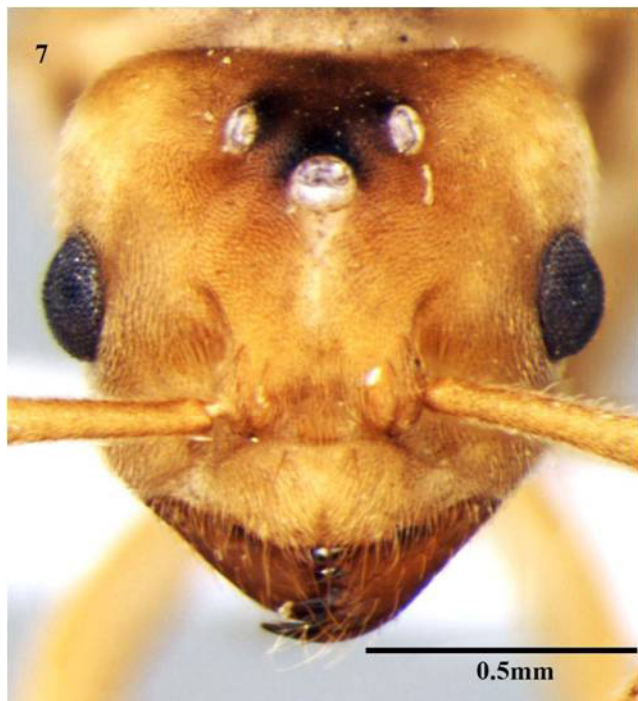


Figures 4–6. *Pseudolasius zamrood* sp. n.: minor worker: **4.** Head in full-face view; **5.** Body in profile view; **6.** Body in dorsal view.

Broad mesosoma; in lateral view, strongly convex mesoscutum while the mesoscutellum is weakly convex; distinct propodeum; petiole as in worker; elongate gaster; parameres paddle-shaped with rounded tips, turning slightly inwards toward midline of body posteriorly; long setae extending off parameres; long and tubular cuspis, bent toward digitus; weakly anvil-shaped digitus; curved outward and covered with short peg-like teeth; penis valves projecting forward.

Body mostly smooth and shiny; erect setae shorter and sparse.

Colour light yellow, head mostly brownish.



Figures 7–8. *Pseudolasius zamrood* sp. n. (gyne): 7. Head in full-face view; 8. Body in profile.

Ecology

The specimens of this rare species were handpicked from Thanikkudy region of Periyar tiger reserve; a primary, undisturbed tropical moist evergreen forest. The specimens were collected by dislodging a big stone near a river side. The area is situated at 1003 meters elevation. It is a shady place with little sunlight penetration.

Etymology

The species epithet is Arabic for ‘precious stone’ in reference to habitat of the new species.

Remarks

The genus *Pseudolasius* is represented by 22 species from South and East Asia. These include; (*P. bidenticypeus* Xu, 1997; *P. binghami* Emery, 1911; *P. butteli* Forel, 1913; *P. cibdelus* Wu & Wang, 1992; *P. diversus* Wachkoo and Bharti, 2014; *P. emeryi* Forel, 1911; *P. familiaris* (Smith, 1860); *P. hummeli* Stitz, 1934; *P. isabellae* Forel, 1908; *P. lasioides* Wheeler, 1927; *P. longiscapus* Wang & Zhao, 2009; *P. machhediensis* Bharti, Gul & Sharma, 2012; *P. martini* Forel, 1911; *P. polymorphicus* Wachkoo and Bharti, 2014; *P. pygmaeus* Forel, 1913; *P. risii* Forel, 1894; *P. salvazai* Santschi, 1920; *P. sauteri* Forel, 1913; *P. silvestrii* Wheeler, 1927; *P. similis* Zhou, 2001; *P. streesemanni* Viehmeyer, 1914; *P. typhlops* Wheeler, 1935. From India the genus is represented by six species. These include; *P. binghami*; *P. diversus*; *P. emeryi*; *P. familiaris*; *P. machhediensis* and *P. polymorphicus*). Among the known species of the genus from South and East Asia *Pseudolasius zamrood* n. sp. is closest to *P. typhlos* Wheeler, 1912 from Philippines, both have strongly reduced eyes. However, the new species has truncated anterior clypeal margin at the middle lobe, relatively short scapes just reaching to 3/4th of occipital margin of head, lighter body coloration and propodeum has relatively narrow dorsum in lateral view.

Key to species of genus *Pseudolasius* of India based on major worker caste

- 1 Eyes reduced, rudimentary represented by small dots without any distinct ommatidia.....***P. zamrood* n. sp.**
- Eyes distinct consisting of prominent ommatidia.....**2**
- 2 Cephalic dorsum with an inverted “Y” shaped brown spot ***P. emeryi* Forel**
- Cephalic dorsum without an inverted “Y” shaped brown spot.....**3**
- 3 Antennal segments 3-9 longer than wide; frontal carinae parallel.....**4**
- Antennal segments 3-9 wider than long; frontal carinae divergent posteriorly.....***P. polymorphicus* Wachkoo and Bharti**



Figures 9-10. *Pseudolasius zamrood* sp. n. (male): **9.** Head in full-face view; **10.** Body in profile.

4 Scapes easily surpass the posterior margin of head**5**
 - Scapes never surpass the posterior margin of head.....
 *P. diversus* Wachkoo and Bharti

5 Posterior margin of head strongly emarginate in the middle;
 mandibles with basal two teeth.....**6**
 - Posterior margin of head weakly emarginate in the middle;
 mandibles without basal two teeth combined....*P. binghami*
Emery

6 Mandibles armed with 8 teeth..... *P. familiaris* (Smith, F.)
 - Mandibles armed with 6 teeth.....
*P. machhediensis* Bharti, Gul & Sharma, 2012

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