

**A NEW SPECIES AND A KEY TO
SPECIES OF *POLYRHACHIS* SMITH
(HYMENOPTERA: FORMICIDAE)
FROM INDIA**

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ABSTRACT

A new species of *Polyrhachis* Smith, viz *P.narendrani* sp nov from Kerala is described and illustrated. The affinities of this species with its closest relatives are discussed and a key to Indian species is also provided.

Key words: Formicidae, *Polyrhachis narendrani*, new species, India.

INTRODUCTION

The genus *Polyrhachis* comes under the subfamily Formicinae. It is found to be the third largest group in the subfamily with 477 species all over the world. [BOLTON 1995]. So far 48 species and 13 sub species has been reported from India and 13 species and 10 subspecies from Kerala. This genus was erected by Smith (1857) based on the type species *Formica bihamata*. Gerstaecker (1858) erected another genus *Hopolomyrmus* with the type species *Hoploschistanceus*. Later Mayr (1863) synonymised this series with *Polyrhachis*. Now there are 14 subgenera in *Polyrhachis* including the nominal genus. In this paper, A new species is described from Kerala and a key to species is provided. The new species is named in honour of Prof. T.C Narendran for his significant contribution to

the study of Taxonomy of Oriental Insects. The holotype is deposited in the DZCU for the time being, but eventually will be transferred to the ZSIC.

MATERIALS AND METHODS

Ants were mostly collected by hand picking with fine zero point brush and with help of aspirator. They were also collected by sweeping method.

Specimens were preserved in 70% alcohol in plastic vials. Observations were made in field where ants were found making nests on the twigs, soil surface and foliage.

ABBREVIATIONS: F - Funicular segments ; W - Worker ; TL - Total length - Total length of specimen from apex of mandible to apex of gaster ; HL - Head length - Length of head proper excluding mandibles ; HW - Head width - Maximum width of head in full face view ; CI - Cephalic index ie. $(HW \times 100)/HL$; SL - Scape length ; SI - Scape Index ie. $(SL \times 100)/HW$; ED - Eye diameter ; PW - Pronotal width - Maximum width of pronotum in dorsal view ; $F_1 - F_{11}$ - Funicular segments ; AL - Alitrunk length ; DZCU - Department of Zoology, Calicut University; ZSIC - Zoological survey of India, Calicut.

RESULTS AND DISCUSSION

Polyrhachis (Myrma) narendrani sp. nov.

(Figs. 1-2)

Worker. TL = 6.2 mm; HL = 1.8 mm; HW = 1.4 mm; CI = 77 mm; SL = 1.6 mm; SI = 114.28 mm; ED = 0.2 mm; PW = 2.4 mm; AL = 2.2 mm.

Colour. Head, thorax, node of pedicel, gaster black; legs more or less castaneous red; silky silvery hairs; pubescence white; tibial spines reddish yellow; tarsal spur reddish brown.

Sculpture and Hair pattern: Head, thorax and abdomen shining; head and thorax minutely rugulose; abdomen more minutely rugulose than head and thorax; pubescence adpressed, sparse on body, dense on antennae and on thorax laterally; silky silvery erect hairs scattered on head, thorax and gaster, more abundant on apex of gaster underneath.

Head: Very convex in front and at the sides, tending to be more convergent in front of the eyes, rounded posteriorly; mandibles sublinear, 5-toothed; clypeus carinate, tectiform, its anterior margin arcuate with a shallow median lobe; frontal lobes small, subparallel; frontal carinae prominent; parallel; antennal carinae distinct; scrobe indistinct, torulus rounded, horizontal; antennal insertion separated from posterior clypeal margin by a distinct gap, antennae short, slender, 12 jointed; antennal scape extending little beyond the top of head; all segments of funiculus longer than broad, 1st funicular segment longer than remaining segments, last segment thickened and club shaped. Relative measurements of length of antennal segments: Scape = 1.6 mm; F_1 = 0.9 mm; F_2 = 0.35 mm; F_3 = 0.2 mm; F_4 = 0.2 mm; F_5 = 0.2 mm; F_6 = 0.2 mm; F_7 = 0.2 mm; F_8 = 0.15 mm; F_9 = 0.2 mm; F_{10} = 0.2 mm; Club (F_{11}) = 0.3 mm; Eyes moderately large placed, more towards the posterior end, slightly above the lateral sides.

Thorax: More or less flat above; sides margined along their whole length; pronotum broad posteriorly, narrower anteriorly, two strong long erect spines on anterolateral angles of pronotum, pointing forwards; pro-mesonotal suture very distinct; meso-metanotal impressions present, but no distinct suture; metanotal groove indistinct; metanotum unarmed; propodeum anteriorly margined and anterior corners projecting upwards, thorax deeply emarginate at pro-meso and meso-metanotal sutures; propodeum situated at a level below the pro-mesonotum, emarginate, the dorsum very oblique and sloping into the vertical and weakly concave declivity, ends with a carina; legs slender, elongate; tibiae cylindrical with a spine beneath; tarsi with tarsal spurs.

Abdomen: In front view the sides of petiole diverge from the base, pass through the rounded angle and then converge dorsally to the base of a pair of curved spines; petiolar node rhomboidal, biconvex slightly arched at middle, bearing two long spines on dorsolateral edges guarded by two small teeth on sides; long spines slightly curved backwards at their tips. Gaster globose, with four visible segments, first gastral segment larger, covering more than half of its length, apex of last gastral segment with circular anal orifice guarded by guard hairs.

Holotype: Worker. INDIA: Kerala, Thiruvananthapuram - Palode, Karmaly. K.A., 10.iii-2000. [DZCU].

Etymology: Named in honour of Prof. T. C. Narendran.

Distribution : INDIA : [Kerala: Thiruvananthapuram].

Bioogy: Unknown.

Habitat: Disturbed with small plants and trees.

Discussion: This new species resembles *Polyrhachis convexa* Roger in the following features: 1. Antennae 12 jointed; 2 Clypeus tectiform; 3. Thorax flat above, sides margined along their whole length. However this new species differs from *Polyrhachis convexa* Roger in having: 1. Pronotal spine long (in *Polyrhachis convexa* pronotal spine short); 2. Legs with spines and erect hairs (in *Polyrhachis convexa* legs devoid of spines and erect hairs); 3. Petiolar node rhomboidal, biconvex with two long spines on dorsolateral edges guarded by two small teeth on sides (in *Polyrhachis convexa* petiolar node broad, biconvex with four short subequal spines, equidistant from each other).

KEY TO INDIAN SPECIES OF *POLYRHACHIS* F. SMITH
[Based on Workers]

1. Thorax armed with spines or teeth [Fig.3] 2
- Thorax unarmed [Fig. 4] 60
2. Thorax rounded above, sides not margined along their whole length 3
- Thorax flat above, sides margined along their whole length 37
3. Mesonotum armed with spines 4
- Mesonotum unarmed 6
4. Petiole spines parallel, not divergent from base [Fig.5] 5
- Petiole spines not parallel, but divergent from base [Fig.6]
..... *P. ypsilon* Emery.
5. Pronotal spines pointing outwards and curved laterally backwards, forming hooks [Fig.7]..... *P. bihamata* [Drury]
- Pronotal spines pointing outwards and downwards, not curved, not forming hooks [Fig.8] *P. bellicosa* Smith

6.	Metanotum armed with spines [Fig.9]	7
-	Metanotum unarmed [Fig.10]	33
7.	Pubescence soft erect and abundant	8
-	Pubescence silky, short and recumbent, or sparse and erect, or entirely wanting	10
8.	Spines on petiole forming hooks [Fig.11] [Kerala] <i>P. furcata</i> Smith	
-	Spines on petiole not forming hooks [Fig.12]	9
9.	Head smooth, shining, not punctured..... <i>P. graciliori</i> Forel [= <i>weberi</i> Donisthorpe]	
-	Head not smooth, not shining, but coarsely punctured..... <i>P. rufipes</i> F. Smith [= <i>phipsoni</i> Forel]	
10.	Spines on metanotum forming hooks [Fig.13]	11
-	Spines on metanotum not forming hooks [Fig.14]	13
11.	Abdomen clothed with golden hairs <i>P. rupicapra</i> Roger	
-	Abdomen not clothed with hairs	12
12.	Head and abdomen opaque; thorax finely punctured <i>P. hodgsoni</i> Forel	
-	Head and abdomen not opaque, shining; thorax coarsely punctured..... <i>P. arachne</i> Emery	
13.	Basal portion of metanotum without margin laterally	14
-	Basal portion of metanotum with margin laterally	27
14.	Pubescence sparse or entirely wanting	15
-	Pubescence dense, silky and recumbent	23
15.	Spines on petiole wide-spread encircling front of abdomen	16
-	Spines on petiole not wide-spread, and not encircling abdomen	18
16.	Head with a tubercle on either side behind the eyes	
 <i>P. tubericeps</i> Forel	

- Head without a tubercle on either side behind the eyes.....17
- 17. Propodeal spines slightly curved [Kerala]
.....*P. lacteipennis* Smith [in part]
- Propodeal spines not curved*P. thompsoni* Bingham
- 18. Head, thorax and abdomen shining; metallic blue or purple
.....*P. venus* Forel
- Head, thorax and abdomen not shining, black; abdomen
sometimes red19
- 19. Head, thorax and petiole node coarsely punctured.....20
- Head, thorax and petiole node finely punctured.....21
- 20. Abdomen black; petiole node cubical*P. armata* Le Guillou
- Abdomen ferruginous; petiole node arcuate with acute spines
.....*P. fortis* Emery
- 21. Petiolar node with two median vertical short acute spines
between spines on upper lateral angles of node [Fig.15]
.....*P. hauxwelli* Bingham
- Petiolar node without median spines between spines on upper
lateral angles of node [Fig. 16]22
- 22. Metanotal spines erect, slightly bent outwards [Kerala]
.....*P. lacteipennis* F. Smith [= *simplex* Mayr]
- Metanotal spines not erect, strongly curved inwards
.....*P. menelas* Forel
- 23. Abdomen red*P. bicolor* Smith
- Abdomen black24
- 24. Pubescence golden or bronzy yellow 25
- Pubescence silvery [Kerala].....*P. tibialis tibialis* Smith
- 25. Two small teeth between spines on upper lateral angles of
petiolar node26
- Three small teeth between spines on upper lateral angles of
petiolar node*P. vicina* Smith
- 26. Head short and broad*P. dives dives* Smith
- Head long and broad *P. dives belli* Forel

27. Spines on pronotum and metanotum subequal.....28
 – Spines on pronotum and metanotum not subequal30
28. Petiolar node longer than wide29
 – Petiolar node not longer than wide, but cubical.....
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29. Abdomen red; length 7 mm - 9 mm*P. hector* Smith
 [= *abdominalis* Smith
 = *mutatus* Smith
 = *mutata* Smith. r. *ajax* Forel]
 – Abdomen bronze green; length 6 mm - 7 mm
*P. aedipus* Forel
30. Pronotal spines short, stout and straight [Kerala]
*P. binghamii* Forel
 – Pronotal spines long, acute, pointing divergent or straightly
 pointing forwards..... 31
31. Basal portion of metanotum posteriorly transversely margined
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 – Thorax more gibbous*P. aculeata gibbosa* Forel
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34. Abdomen, legs reddish yellow; antennae and front of head
 reddish..... *P. laevissima dichroa* Forel
 – Abdomen, antennae and front of head black; legs blood red
*P. laevissima laevissima* Smith
35. Abdomen very convex above, not depressed..... 36
 – Abdomen slightly convex above, strongly depressed
*P. wroughtoni* Forel
36. Abdomen red, smooth and shining*P. laevigata* Smith

- Abdomen black, feebly reticulate, punctate and slightly shining
.....*P. hippomanes ceylonensis* Emery
- 37. Pronotum, mesonotum and metanotum with spines
..... *P. craddocki* Bingham
- Pronotum with spine, mesonotum and metanotum with or
without spines, teeth or tubercles38
- 38. Pronotum always with a spine; mesonotum and metanotum
with triangular lamina*P. horni* Emery
- Pronotum with or without spines; mesonotum unarmed;
metanotum with teeth or lamina or spine or tubercle
..... 39
- 39. Pronotum with long or short spine 40
- Pronotum without spine57
- 40. Pronotum with long spines [Fig.17]41
- Pronotum with short spines or teeth [Fig.9]51
- 41. Petiole node with two long spines on upper angles, and two
short lateral spines or teeth.....42
- Petiole node with four short sub equal spines49
- 42. Lateral spines or teeth truncate or bimucronate at apex.... 43
- Lateral spines or teeth pointed, not truncate nor bimucronate
at apex44
- 43. Very dense pubescence on body hiding the sculpture
.....*P. proxima proxima* Roger
- Very sparse pubescence on body not hiding the sculpture
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48. Meso-metanotal suture very distinct; legs densely covered with long erect hairs*P. sumatrensis hamulata* Emery
 - Meso-metanotal suture not very distinct; legs not covered with long erect hairs, smooth*P. yerburyi* Forel
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50. Pronotal spine short*P. convexa* Roger
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*P. punctillata punctillata* Roger
 - Clypeus posteriorly carinate
*P. punctillata smythiesi* Forel
55. Antennal carinae divergent posteriorly.....56

- Antennal carinae not divergent posteriorly
.....*P. frauenfeldi* Mayr
- 56. Node of pedicel longer than wide [Kerala]
.....*P. thrinax thrinax* Roger
- Node of pedicel as long as wide
.....*P. thrimax* var. *lancearius* Forel
- 57. Metanotal spines vertical, very small [Fig.20] [Kerala]
.....*P. halidayi* Emery
- Metanotal spines broad, triangular, pointing backwards
[Fig.21] 58
- 58. Head and thorax punctured, not striate59
- Head and thorax not punctured, but striate [Kerala]
.....*P. exercita rastrata* Emery
- 59. Petiolar node quadrispinous, equidistant from one another
[Fig.90] [Kerala]..... *P. exercita exercita* [Walker]
[= *P. clypeata clypeata* Mayr]
- Petiolar node quadrispinous, not equidistant from one another
..... *P. exercita obtusisquama* Forel
- 60. Viewed from side thorax very convex, strongly arched and
gibbous anteriorly*P. rastellata rastellata* [Latreille]
- Viewed from side thorax nearly as convex, rounded anteriorly
.....*P. rastellata pagana* Santschi

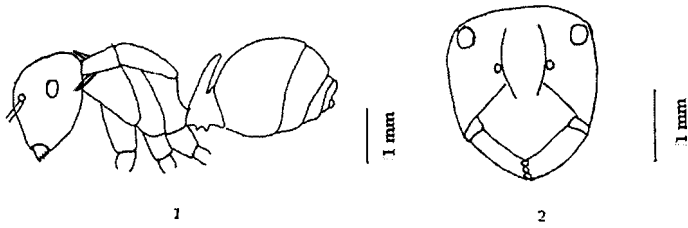
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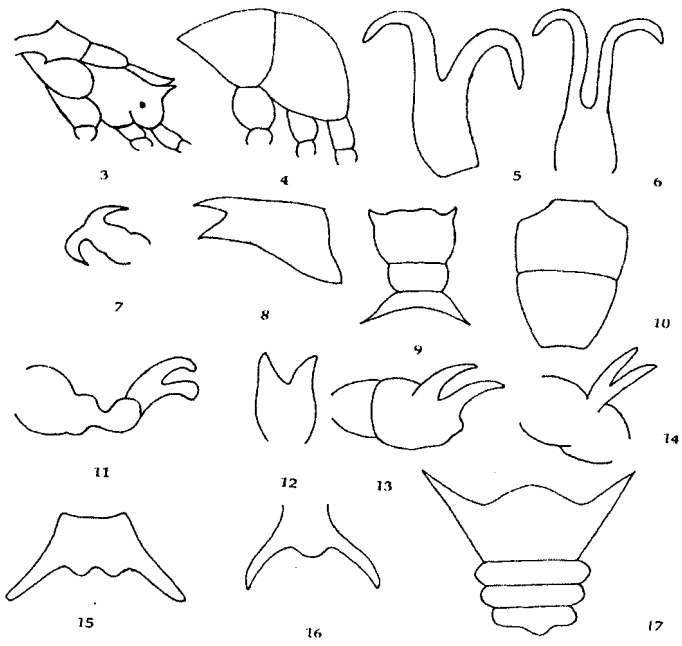
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Figs. 1 & 2 *Polyrhachis narendrani* sp.nov 1. Body Profile 2. Head - front view



Figs. 3 & 4. Thorax 3. *Polyrhachis thrinax thrinax* Roger 4. *P. rastellata rastellata* (Latreille) 5 & 6. **Petiole spine** 5. *P. bighamata* Drury 6. *P. ypsilon* Emery 7 & 8. **Pronotal spines** 7. *P. bighamata* Drury 8. *P. bellicose* Smith 9 & 10. **Metanotum** 9. *P. tibialis tibialis* Smith 10. *P. hastellata hastellata* (Latreille) 11 & 12. **Petiolar spines** 11. *P. furcata* Smith 12. *P. punctillata punctillata* Roger 13 & 14. **Metanotal spines** 13. *P. archane* Emery 14. *P. venus* Smith 15 & 16. **Petiole** 15. *P. wroughtonii* Forel 16. *P. tibialis tibialis* Smith 17. **Pronotal spine** - *P. narendrani* sp. nov.