



E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2016; 4(4): 1028-1030
© 2016 JEZS
Received: 11-05-2016
Accepted: 12-06-2016

Imran Bodlah

Laboratory of Biosystematics,
Department of Entomology,
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi, Pakistan.

Muhammad Tariq Rasheed

Laboratory of Biosystematics,
Department of Entomology,
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi, Pakistan.

Ammara Gull-e- Fareen

Laboratory of Biosystematics,
Department of Entomology,
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi, Pakistan.

Muhammad Shoab Ajmal

Laboratory of Biosystematics,
Department of Entomology,
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi, Pakistan.

Muhammad Adnan Bodlah

Department of Entomology,
Nanjing Agricultural University,
Nanjing 210095, China.

Correspondence**Imran Bodlah**

Laboratory of Biosystematics,
Department of Entomology,
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi, Pakistan.

First record of two new species of genus *Tetraponera* (Hymenoptera: Pseudomyrmecinae: Formicidae) from Pakistan

**Imran Bodlah, Muhammad Tariq Rasheed, Ammara Gull-e- Fareen,
Muhammad Shoab Ajmal and Muhammad Adnan Bodlah**

Abstract

Two species of genus *Tetraponera*, *T. allaborans* (Walker, 1859) and *T. nigra* (Jerdon, 1851) have been reported for the first time from Pakistan. These species have been described giving main identification characters supported with micro- photographs, and their distribution range. GPS position of surveyed localities has also been given for both species.

Keywords: *Tetraponera*, Hymenoptera, Pseudomyrmecinae, Pothwar, Pakistan

1. Introduction

Ants are among the successful group of organisms on the globe with 12 500 reported species within 307 genera and 21 subfamilies [10, 8]. Economically, ants role in our agriculture ecosystem has been discussed in various studies as transporter and nutrients pooler in soil [12], dispensers of seeds and microbial propagules, transmitters of N₂-fixing bacteria, predators, ecosystem engineers, fungi growers, waste managers, biotech technologists, pest controllers, soldiers, and reproducers [2, 11, 13, 3, 10]. Additionally in various studies, they have been used in pest management [16].

They are distributed in different habitats and species rich in forest environment, the subfamily Pseudomyrmecinae being one of the more distinctive groups inhabiting this environment [7, 20]. Ants belonging to genus *Tetraponera* F. Smith, 1862 (Hymenoptera: Pseudomyrmecinae: Formicidae) are distributed throughout the Paleotropics with 94 species and 19 subspecies [17, 18, 19, 4]. This genus can be recognized with combination of following main characters: body slender, eyes large, 12 jointed antennae and posterior margins of clypeus not produced between the bases of antennae [1]. Different workers reported various species of this genus from various parts of the world like Oriental and Australian regions by [19], India [5]; Taiwan [14]; Afrotropical region [20, 21]; Europe [6] etc. In Pakistan, research on these entities has been badly ignored excepting the work by [15]. So a survey was conducted which resulted in the exploration of two species of genus *Tetraponera*. Both are new records from Pakistan

2. Materials and Methods

During our surveys (2015-2016) for the collection of ants and aphids, *Tetraponera* specimens were collected in the forest areas of Rawalpindi and Islamabad. Ant's specimens were collected using aspirator. Collected specimens were also preserved in 75% ethanol. Some specimens were mounted on triangular cards. The collected specimens were tagged. After tagging the identification procedure was carried out under Kruss microscope. The specimens were identified up to species level by using revised key for the genus *Tetraponera* by Bharti [5]. Stage and ocular micrometers were used for the measurements of different parts of ants. The Nikon SMZ 1500 microscope was used for the illustration of identified species and then preserved in wooden boxes for future studies. All identified ant specimens have been deposited in laboratory of Biosystematics, Department of Entomology, PMAS-Arid Agriculture University Rawalpindi, Pakistan.

3. Results and Discussion***Tetraponera allaborans* (Walker, 1859)**

Fig. 2(A-C)

1859. *Pseudomyrma allaborans* walker

1863. *Sima compressa* Roger
 1889. *Sima subtilis* Emery
 1903. *Sima allborans*, Bingham
 1921. *Sima (Tetraponera) allaborans*, Emery
 1951. *Tetraponera (Tetraponera) allaborans*, Chapman and Capco,
 1994. *Tetraponera (Tetraponera) allaborans*, Tiwari *et al.*

Identification characters

Large species with body black (Fig. 2C), highly polished, shining ranges from 7 to 8mm. Pilosity very sparse, consisting only of a few scattered pale hair. Thorax and abdomen with only a few scattered punctures. Head without ocelli, rectangular, longer than broad (Fig. 2A). Mandibles longitudinally striate and punctured. Clypeus vertical, its posterior portion slightly produced, anteriorly crenulate. Antennae short and comparatively stout. Eyes longer than broad. Thorax anteriorly flat, compressed. Pronotum nearly square, submargined, contracted anteriorly into a short neck. Mesonotum longitudinally oval. Propodeum inflated and raised. Thorax in profile emerginate at the meso-metanotal suture; metanotum raised, convex, strongly compressed. Petiole longer than higher (Fig. 2B). Legs of moderate length, rather stout. Pedicel with the nodes comparatively large, the 1st oval, petiolate anteriorly, the 2nd broader than the 1st, conical; abdomen elongate, narrowly oval.

Coloration: Whole body black. Mandibles and antennae reddish yellow, Legs reddish brown, the femora fuscus. Petiol, postpetiol and limb appendages in few specimens under different light sources may be lighter in colour.

Measurements (mm) worker: Body length.5-6mm; Eye length and width. 0.28mm and 0.22 mm; Petiol length and height. 0.72mm and 0.28 mm; Head width and length. 0.70 and 0.74 mm

Distribution: India, Srilanka, Burma, Indonesia (Sumarta), Kalimantan, China [22].

Material Examined: 4♂, Forest area, Trail 5 Marghala Hills Islamabad (N33 42.565' E073 01.330'), 1846 ft. elev., 22.iii.2016, leg. Imran Bodlah; 2♀, Forest area, Neela Saand Rawalpindi (N33 39.516' E07323.007'), 2153 ft. elev., 29.iii.2016 leg. Muhammad Tariq Rasheed;

Comments: Ants specimens collected from Pakistan were compared with [1, 5, 19] and found to be similar. This species was collected near water sources in the forest area of Rawalpindi and Islamabad.

Tetraponera nigra (Jerdon, 1851)

Fig. 1(A-C)

1851. *Eciton nigrum* Jerdon
 1852. *Tetraponera atrata* Smith
 1863. *Pseudomyrmacarbonaria* Smith
 1903. *Sima nigra*, Bingham
 1921. *Sima (Tetraponera) nigra*. Emery
 1951. *Tetraponera (Tetraponera) nigra*, Chapman and Capco
 1994. *Tetraponera (Tetraponera) nigra*, Tiwari *et al.*

Identification characters

Body predominantly black (Fig. 1C). Mandibles, antennae and legs with scattered erect brownish hairs, and very sparse and thin pubescence. Head, thorax and abdomen slightly shiny, finely and moderately closely punctured. Head rectangular, a little longer than broad (Fig. 1A). Mandibles broad and linear,

the inner and outer margins parallel. Clypeus narrows, its anterior margin transverse, not medially dentate. Eyes lateral and a little to the front, placed closer to the posterior than to the anterior lateral angles of the head. Thorax proportionately narrower, more compressed, the emargination at the meso-meta-notal suture very much deeper and wider, the metanotum higher, viewed from the side with a rectangular arch from front to back; legs moderately long, slender. Pedicel much lengthened; the nodes low, petiolate in front, the first node from above oval, the petiole long; 2nd node cup-shaped (Fig. 1B), much broader than the 1st, not constricted posteriorly, and with a shorter petiole, the nodes not dentate beneath; abdomen elongate, narrowly oval.

Coloration: Body black. Mandibles, antennae and legs dark castaneous brown.

Measurements (mm) worker: Body length.7-86mm; Eye length and width. 0.36 mm and 0.24 mm; Petiol length and height. 0.96 mm and 0.46 mm; Head width and length. 1.1mm and 1.34 mm.

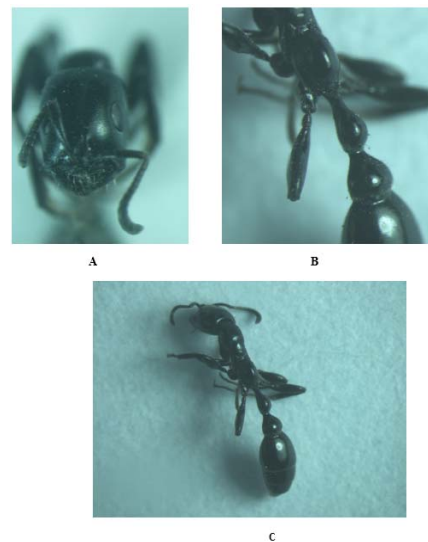
Comments: Ants specimens collected from Pakistan were compared with [1, 5, 19] and found to be similar. This species was collected from different trees in various localities of Rawalpindi and Islamabad. This has already been recorded as a tree ant and forms its nest in hollow thorns around creepers and various trees [1].

Distribution: India: Sikkim, West Bengal, Sri Lanka, Burma and extends into the Malayan sub-region [22].

Material Examined: 6♂, around trees, Arid University Islamabad Rawalpindi (N33 38.612' E073 04.476'), 1733 ft. elev. 22.iv.2016, leg. Ammara Gull-e-Fareen; 2♀, Forest area, Neela Saand Rawalpindi (N33 39.516' E07323.007'), 2153 ft. elev., 29.iv.2015 leg. Muhammad Shoaib Ajmal.

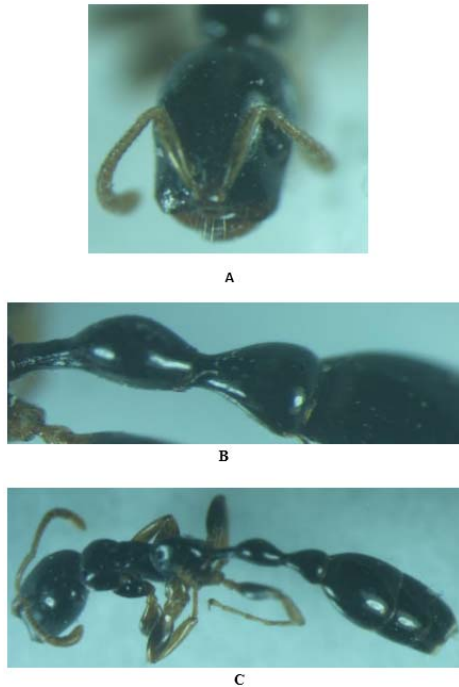
4. Acknowledgements

We are thankful to Seiki Yamane of Japan for confirmation of one species. We are also thankful to Pakistan Science Foundation for providing us funds under the project PSF/NSLP/P-UAAAR (313) for these studies.



A. Dorsal view of head showing antennae and eyes;
 B. Dorsal view of petiol and postpetiol;
 C. Dorsal view of worker

Fig 1(A-C): External morphology of *Tetraponera nigra* (Jerdon, 1851)



A. dorsal view of head showing antennae and eyes;
 B. Dorsal view of petiol and postpetiol;
 C. Dorsal view of worker

Fig 1 (A-C): External morphology of *Tetraponera allaborans* (Walker, 1859)

5. References

1. Bingham CT. The fauna of British India, including Ceylon and Burma. Hymenoptera, Ants and Cuckoo-wasps. London: Taylor and Francis 1903; 2:506.
2. Balasubramani G, Kannaiyan S. Natural spread of *A. caulinodans* in stem nodulating *S. rostrata*, INSURF Net-watch 1991; 1:5-6.
3. Benckiser G. Principles behind order and sustainability in natural successions and agriculture, in: Benckiser G., Schnell S. (Eds.), Biodiversity in agricultural production systems 2007, 349-383.
4. Bolton B. Bolton's Catalogue and Synopsis. Version: 1 January 2013. Downloaded from <http://gap.entclub.org/> on 10 January 2013.
5. Bharti H, Akbar SA. *Tetraponera periyarensis*, a new Pseudomyrmecine ant species (Hymenoptera: Formicidae) from India 2014; 6:43-48.
6. Dlussky GM. The ant subfamilies Ponerinae, Cerapachyinae, and Pseudomyrmecinae (Hymenoptera, Formicidae) in the Late Eocene Ambers of Europe. Paleontological Journal. 2009; 43:1043-1086.
7. Floren A, Linsenmair KE. The importance of primary tropical rain forest for species diversity: an investigation using arboreal ants as an example.- Ecosystems 2005; 8:559-567.
8. Guénard B. An overview of the species and Ecological Diversity of Ants. In: eLS. John Wiley & Sons, Ltd: Chichester, 2013. DOI: 10.1002/9780470015902.a0023598.
9. Hölldobler B, Wilson EO. The superorganism, W. W. Norton & Company, Inc., New York 2009, 522.
10. Hölldobler B, Wilson EO. The Ants. Cambridge, MA: Harvard University Press. 1990, 732.
11. Jouquet P, Dauber J, Lagerlöf J, Lavelle P, Lepage M. Soil invertebrates as ecosystem engineers: Intended and accidental effects on soil and feedback loops, Appl. Soil

- Ecol. 2006; 32:153-164.
12. Mueller UG, Gerardo NM, Aanen DK, Six DL, Schultz DR. The evolution of agriculture in insects, Annu. Rev. Ecol. Syst 2005; 36:563-595.
13. Philpott SM, Uno S, Maldonado J. The importance of ants and high-shade management to coffee pollination and fruit weight in Chiapas, Mexico. Biodiv. Conser 2006; 15:487-501.
14. Terayama M. A Synopsis of the Family Formicidae of Taiwan (Insecta: Hymenoptera). Bull Kanto Gakuen Univ 2009; 17:81-266.
15. Umair M, Zia A, Naeem M, Chaudhry MT. Species Composition of Ants (Hymenoptera: Formicidae) in Potohar plateau of Punjab, Pakistan. Pakistan Journal of Zoology. 2012; 44(3):699-705.
16. Way MJ, Khoo KC. Role of ants in Pest management. Annual review of Entomology 1992; 37:479-503.
17. Ward PS. The ant subfamily Pseudomyrmecinae (Hymenoptera: Formicidae): generic revision and relationship to other formicids. Systematic Entomology 1990; 15:449-489.
18. Ward PS. Phylogenetic analysis of pseudomyrmecine ants associated with domatia-bearing plants. in Huxley, C. R., and D. F. Cutler eds. Ant-plant interactions. Oxford University Press, Oxford 1991, 335-352.
19. Ward PS. Taxonomy, phylogeny and biogeography of the ant genus *Tetraponera* (Hymenoptera: Formicidae) in the Oriental and Australian regions. – Invertebrate Taxonomy 2001; 15:589-665.
20. Ward PS. The ant genus *Tetraponera* in the Afrotropical region: synopsis of species groups and revision of the *T. ambigua*-group (Hymenoptera: Formicidae). Myrmecologische Nachrichten. 2006; 8:119-130.
21. Ward PS. The ant genus *Tetraponera* in the Afrotropical region: the *T. grandidieri* group (Hymenoptera: Formicidae). Journal of Hymenoptera Research. 2009; 18:285-304.
22. Tiwari RN. Taxonomic studies on ants of Southern India: (Insecta: Hymenoptera: Formicidae). Memoirs of the Zoological Survey of India. 1999; 18(4):96.