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NEW RECORDS OF ANTS (INSECTA: HYMENOPTERA: FORMICIDAE) FROM HARYANA, INDIA

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INTRODUCTION

Ants have the most highly organized social life among all the insects. The major factor responsible for their ecological success is division of labour, performing different biological functions. Ants live in highly organized and integrated units the societies or colonies. Bingham's (1903) fauna is the main source of knowledge of ants in India. Chapman and Capco (1951) published a checklist of the ants of Asia. Bharti (2001, 2002, 2003, 2004 & 2012) has published a checklist of ants of North-West India which includes the works from Haryana, also reported 4 new species and Indian ants on ant website. Bolton (1995) has published A New General Catalogue of the Ants of the World and Catalogue of the Ants of the World CD-ROM 2007. Karmaly (2004) has also reported 1 new species and a key to species of *Polyrhachis.* Sheela & Narendran (1997 & 1998) has reported 7 new species of ants. Sheela *et al.* (2000) has redescribed a new myrmicine ant. Sheela (2008) has published a handbook on Formicidae. Distributional record of one species of ant from Haryana is also known from works of Tiwari *et al.* (2003). Tiwari (1994) has reported 2 new species of ants from Kerala. Tiwari (1998) has worked on ants of Southern India; Tiwari & Jonathan (1986) has reported 2 new species of ants of Andaman and Nicobar Islands; Tiwari & Tiwari (2002) has studied the ants of Orissa. Tiwari *et al.* (1998, 2003 & 2004) has worked on the ants of West Bengal, Sikkim and Manipur. Varghese (2003, 2004, 2006 & 2009) has studied the ants of Indian Institute of Science campus, Bangalore; reported a new record from Bangalore, 2 new species and published a Review of Extant Subfamilies, Tribes and Ant Genera in India.

The present studies are based on the material collected by the second author from Pinjore, Haryana. Pinjore, a town in Panchkula district of Haryana state is located close to Chandigarh set over 1,800 feet above the sea level in a valley, overlooking the Sivalik Hills. Panchkula district has a sub tropical continental monsoon climate with hot summer, cool winter, good monsoon rainfall and great variation in temperature (0 °C to 43 °C). The average rainfall of the district is about 1283 mm. Morni hills constitute the highest point of the district as well as of Haryana. The Ghaggar River is the only perennial river. The other important rivers/streams of the district are Sirsa and Kaushalya. Pinjore has a total geographic area of about 288 sq. km. and lies between latitudes 30°47´50´´N and76°55´02´´ East longitudes. It is known for the Asia's best 17th Century Pinjore Garden. Thorny, dry, deciduous forest and thorny shrubs can be found all over the state. Due to good rainfall and elevation Pinjore has rich, abundant and diverse flora and fauna. Tree species generally found are *Eucalyptus camaldulensis, Dalbergia sissoo, Acacia nilotica, Acacia tortilis, Acacia catechu, Mangifera indica* and *Prosopis juliflora*. The major species grown under Agro-forestry are *Eucalyptus camaldulensis* and *Populus deltoides*. The present paper describes

eight species distributed under eight genera of the family Formicidae comprising five subfamilies namely Formicinae with one genera and one species, Ponerinae with two genera and two species, Dolichoderinae with one genera and one species, Pseudomyrmecinae with one genera and one species, Myrmicinae with three genera and three species along with a checklist of ant species from Haryana. Out of eight species seven species are new records from Haryana state. All the eight species of ants (Formicidae) from Haryana state has been deposited and registered in the Identified Register of Invertebrate collection of Desert Regional Centre, ZSI, Jodhpur.

SYSTEMATICS

Order HYMENOPTERA

Family FORMICIDAE LATREILLE, 1809

(i) Subfamily FORMICINAE LEPELETIER, 1809

1. ***Camponotus* (*Tanaemyrmex*) *invidus*** Forel, 1892

(ii) Subfamily PONERINAE LEPELETIER, 1835

2. ***Odontoponera transversa transversa*** (Smith, F. 1857)
3. ***Pachycondyla rufipes rufipes*** (Jerdon, 1851)

(iii) Subfamily DOLICHODERINAE FOREL, 1878

4. ***Tapinoma melanocephalum melanocephalum*** (Fabricius, 1793)

(iv) Subfamily PSEUDOMYRMECINAE SMITH, 1952

5. ***Tetraponera nigra*** (Jerdon, 1851)

(v) Subfamily MYRMICINAE EMERY, 1877

6. ***Monomorium mayri*** Forel, 1902
7. ***Myrmicaria brunnea brunnea*** Saunders, 1842
8. ***Pheidologeton affinis affinis*** (Jerdon, 1851)

Ants are polymorphic social insects having three distinct forms- the perfect and fertile female, the male, and workers (major or minor). The largest forms are soldiers. Identification of ants is mainly based on the worker caste.

IDENTIFICATION KEY IS BASED ON THE WORKER CASTE OF ANTS

(Modified from Bolton, 1994)

Key to the sub-families of family Formicidae

1. Body with a single reduced segment *i.e*. petiole between alitrunk and abdomen ……2

   Body with two reduced segment *i.e*. petiole and post petiole between alitrunk and abdomen. 4

2. Apex of gaster with a semicircular or circular acidopore, usually guarded by setae, sting absent .....*Formicinae*

   Apex of gaster without a semicircular or circular acidopore, sting present..... 3

3. Either pygidium or hypopygidium armed with peg like teeth or short spines.....*Ponerinae*

   Pygidium or hypopygidium unarmed..... ..... *Dolichoderinae*

4. Posterior margin of clypeus not projecting in between antennal sockets, promesonotal suture present, hind tibia with a conspicuous pectinate spur .....*Pseudomyrmecinae*

   Posterior margin of clypeus projecting in between antennal sockets, promesonotal suture absent, hind tibia with only a simple spur... .....*Myrmiciinae*

(i) Subfamily FORMICINAE LEPELETIER, 1809

Genus ***Camponotus*** Mayr, 1861

1. ***Camponotus* (*Tanaemyrmex*) *invidus*** Forel, 1892

Original Combination – *Camponotus invidus* Forel, 1892

1892. *Camponotus* (*Tanacmyrmex*) *invidus* Forel, *J. Bombay nat. Hist. Soc.*, **7**: 225 & 234, fig. 2, Worker, Soldier.

1903. *Camponotus* (*Tanaemyrmex*) *invidus* (Forel), Bingham, *Fauna Brit. India, Hym.*, **2:** 367.

1995. *Camponotus* (*Tanaemyrmex*) *invidus* (Forel), Bolton, B., *A New General Catalogue of the Ants of the World.* : 105.

Material examined: Workers-2 exs., Pinjore, 26.ii.2013, Seema Kumar Coll. (Reg. No. 9077/A).

Diagnostic Characters: Length worker (minor) -5-6 m.m.

Worker: Head, alitrunk and abdomen entirely pale yellow with sparse erect yellowish pubescens. Head more or less elongate, sides of the head straight, not convex. Mandibles with 6 teeth; clypeus comparatively broad. Antennae 12 segmented, comparatively long and thick. Alitrunk convex anteriorly, strongly laterally compressed posteriorly, with the pro-meso and metanotum more strongly curved. Legs stout, tibia cylindrical. Petiole one jointed, node low, convex in front, flat posteriorly, abdomen comparatively long and massive.

Distribution: India: Uttarakhand, Rajasthan, Orissa, Himachal Pradesh, Sikkim, West Bengal, Delhi**,** Uttar Pradesh, Andaman & Nicobar Islands.

Remarks: Reported for the first time from Haryana state.

(ii) Subfamily PONERINAE LEPELETIER, 1835

Key to the genera of sub-family Ponerinae

1. Pronotum with teeth or spines .... ***Odontoponera*** Mayr

   Pronotum without teeth or spines .... ***Pachycondyla*** Smith

Genus ***Odontoponera*** Mayr, 1862

2. ***Odontoponera transversa transversa*** (Smith, F., 1857)

Original Combination – *Ponera transversa* Smith, F., 1857

1857. *Odontoponera transversa* Smith, F., *J. Proc. Linn. Soc. Lond. Zool.* **2**: 68, Worker, (*Ponera*).

1858. *Ponera*, pt., Smith, *Cat.* vi : 86, Worker.

1862. *Odontoponera* Mayr, *Verh. zool. -bot Ges. Wien,* xii: 717, Worker.

1900. *Odontoponera transversa* **(**Smith, F.) Forel, *J. Bombay nat. Hist. Soc.*, **13**: 314, Worker.

1903. *Odontoponera transversa* (Smith, F.,) Bingham, *Fauna Brit. India, Hym.*, **2:** 73.

Material examined: Workers- 4 exs., Pinjore, 26.ii.2013, Seema Kumar Coll. (Reg. No. 9078/A).

Diagnostic Characters: Length worker-9-12 m.m.

Worker: Black, mandibles, antennae and legs dark castaneous, the mandibles and clypeus longitudinally striate, the anterior margin of the latter denticulate, the striae on the thorax and node of the petiole transverse, abdomen smooth but dull, with piligerous points in the smaller form or variety. Head quadrate, the occiput slightly emarginated, the posterior lateral angles rounded, mandibles powerful, subtriangular, strongly dentate. Antennal carinae widened anteriorly, more or less covering base of antennae, antennae 12 jointed, stout, the scape passing by very little beyond the top of the head, the second joint of the flagellum very little longer than 1st or 3rd joint of the flagellum. Alitrunk massive, pronotum convex, anteriorly narrowed into a short collar, the anterior lateral angles with teeth or spines; pro-meso and meso–metanotal sutures distinct above, mesonotum transversely oval, slightly convex, metanotum slightly compressed, the basal portion passing into the apical portion by a gradual slope, the latter boad, flat, with a denticulate ridge on each side dividing it from the sides of the metanotum. Claws not pectinate. Petiole free, with a flexible joint between it and abdomen. Petiole one jointed, node moderately raised, flattened anterioly and posteriorly, its border emarginated. Abdomen short, constriction between the basal two segments distinct.

Distribution: India: Assam, Karnataka, Meghalaya, Sikkim, Tripura, Chandigarh, Himalaya. *Elsewhere*: Myanmar, China, Sumatra, Singapore, Borneo, Java, Philippines, Siam, Annam, Malaya.

Remarks: Reported for the first time from Haryana state.

Genus ***Pachycondyla*** Smith, 1858

3. ***Pachycondyla rufipes rufipes*** (Jerdon, 1851)

Original Combination-*Ponera rufipes* Jerdon, 1851

1851. *Ponera rufipes* Jerdon, *Madras J. Lit. Sci.*, **17**: 102, Worker.

1858. *Pachycondyla rufipes* (Jerdon) Smith, *Cat. Hym. Brit. Mus.*, **4**:106.

1903. *Bothroponera rufipes* (Jerdon) Bingham, *Fauna Brit. India, Hym.*, **2**: 96, Worker.

1911. *Pachycondyla (Bothroponera) rufipes* (Jerdon) Emery, *Genera Insect*, **118**:76-77.

1951. *Bothroponera rufipes* (Jerdon) Chapman and Capco, *Monogr. Inst. Sci. Tech.*, Manila *(Check List Ants Asia)*, **1**: 50.

1984. *Pachycondyla rufipes* (Jerdon), Mathew, *Bull. Zool. Surv. India*, **6**(1-3): 307-308.

1994. *Bothroponera rufipes* (Jerdon), Tiwari *et al., State Fauna Series 3: Fauna of West Bengal*, **8**: 21.

1995. *Pachycondyla rufipes* (Jerdon), Bolton, B., *A New General Catalogue of the Ants of the World.* : 105.

Material examined: Workers: 2 exs., Pinjore, 26.ii.2013; 5 exs., Pinjore, 27.ii.2013; Seema Kumar Coll. (Reg. No. 9079/A & Reg. No. 9080/A).

Diagnostic Characters: Worker: length 13- 15 mm. Dull black, mandibles, antennae and legs castaneous red, the apical two or three abdominal segment bright ferruginous. The whole insect covered with an abundant pale reddish yellow pilosity. Mandibles longitudinally striate without distinct teeth. Eyes small. Posterior margin of clypeus defined by a suture. Middle of front margin of clypeus not produced. Antennal carinae widened anteriorly, more or less covering base of antennae. Antennae 12 jointed, scape of antennae reaching to posterior margin of head, club thick at apex. Alitrunk rounded above, Pronotum without teeth or spines, metanotum unarmed, the apical truncated face of metanotum smooth and shining and strongly margined on the sides and above. Posterior coxae unarmed. Posterior tibia with two spurs, claws simple. Petiole free, with a flexible joint between it and abdomen. The node of petiole about twice as broad as long, convex and rounded above, posteriorly concave, smooth and shining, spinous processes on the posterior margin above irregular. Abdomen very massive, constriction between the basal two segments distinct, sting powerful and exserted, claws simple.

Distribution: India: Andaman & Nicobar Islands, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Orissa, Sikkim, Tripura, Western India (from Kanara to Malabar), West Bengal. *Elsewhere*: Myanmar, Sri Lanka.

Remarks: Reported for the first time from Haryana state.

(iii) Subfamily DOLICHODERINAE FOREL, 1878

Genus ***Tapinoma*** Forster, 1850

4. ***Tapinoma melanocephalum melanocephalum*** (Fabricius, 1793)

Original Combination-*Formica melanocephala*, Fabricius, 1793

1793. *Tapinoma* (*Micromyrma*) *melanocephalum* Fabricius, *Ent. Syst.*, ii: 353, (*Formica melanocephala*).

1793. *Formica*, pt., Fabricius, *Ent. Syst*. ii; 353.

1850. *Tapinoma* Forster, *Hym. Stud.* i: 43, Worker, Female.

1862. *Tapinoma* (*Micromyrma*) *melanocephalum* **(**Fabricius) Mayr, *Verh. k-k zool.-bot Ges. Wien*, xii: 651, Worker.

1928. *Tapinoma* (*Micromyrma*) *melanocephalum* **(**Fabricius), Nouvelles fourmis d Austraelie. *Bull. Soc. Vaudolise Sci. Nat.* **56**: 475.

1903. *Tapinoma* (*Micromyrma*) *melanocephalum* **(**Fabricius) Bingham, *Fauna Brit. India, Hym.*, ii : 304.

Material examined: Workers-20 exs., Pinjore, 26.ii.2013, Seema Kumar Coll. (Reg. No. 9081/A).

Diagnostic characters: Length worker: 1.5 mm.

Worker: Head and thorax dark brown in colour abdomen yellowish white. Head longer than broad. Oval, not emarginate, rounded posteriorly. Mandibles triangular broad with the masticatory margin equal to the outer margin and armed with minute teeth. Clypeus evenly convex, broader than

high, its anterior margin slightly arched. Antennae thick the scape extending beyond the top of the head. The joints of the flagellum longer than broad. Alitrunk viewed from the side not emarginate, the pro-meso and meso-metanotal sutures distinct slightly constricted at the latter suture. Petiole with a distinct node. Base of the abdomen overhanging the pedicel.

Distribution: India: Uttarakhand, Rajasthan, Gujarat, Maharashtra, Meghalaya, Tripura, Chandigarh, Karnataka, Tamil-Nadu, West Bengal, Orissa, Lakshadweep, Andaman & Nicobar Islands, Nagaland. *Elsewhere*: Spread through both the hemispheres, S. America, French Guiana.

Remarks: Reported for the first time from Haryana state.

(iv) Subfamily PSEUDOMYRMECINAE SMITH, 1952

Genus ***Tetraponera*** Smith, F., 1852

5. ***Tetraponera nigra*** (Jerdon, 1851)

Original Combination - *Eciton nigrum* Jerdon, 1851

1851. *Tetraponera* (*Tetraponera*) *nigra* Jerdon *Madras J. Lit. Sci*., xvii : 112 (Worker).

1877. *Tetraponera* (*Tetraponera*) *nigra* (Jerdon) Smith, F., Description of new species of the genera *Pseudomyrma* and *Tetraponera*, belonging to the family Myrmicidae. *Trans. Entomol. Soc. Lond.* **1877**: 68.

1919. *Tetraponera* (*Tetraponera*) *nigra* (Jerdon), Wheeler, W.M. The ants of Borneo. *Bull. Mus. Comp. Zool.* **63**: 63.

1903. *Tetraponera* (*Tetraponera*) *nigra* (Jerdon) Bingham, *Fauna Brit. India, Hym.*, **2**: 110-111.

1995. *Tetraponera* (*Tetraponera*) *nigra* (Jerdon) Bolton, B., *A New General Catalogue of the Ants of the World.* : 418.

Material examined: Worker: 10 exs., Pinjore, 27.ii.2013, Seema Kumar Coll. (Reg. No. 9082/A).

Diagnostic Characters: Worker: length 7- 8 mm. Black, the mandibles, antennae and legs dark with very sparse and thin pubescens. Head rectangular, a little longer than broad, the posterior margin very broad as broad as the front of the head. Lateral angles not prominent, rounded. Mandibles broad and linear. Antennae short and stout. Alitrunk narrower, more compressed, the emargination at the meso-metanotal sutures very much deeper and wider, the metanotum higher viewed from the side with a regular arch from front to back. Petiole anteriorly of first node as long as node itself, with the nodes comparatively large, the 1st node oval, much narrower than 2nd node. 2nd node much broader than the 1st not constricted posteriorly. Abdomen elongate, narrowly oval.

Distribution: India: Haryana, Karnataka, Kerala, Maharashtra, Meghalaya, Punjab, Sikkim, Tamil Nadu, West Bengal, Uttar Pradesh, Andhra Pradesh, Madhya Pradesh. *Elsewhere*: Myanmar, Philippines, Sri Lanka, Malaya, Bangladesh, Borneo, Java, Tennasserim.

Remarks: New distributional record from Pinjore, Haryana. Earlier reported from Rohtak and Panchkula, Haryana (Bharti, 2001).

(v) Subfamily MYRMIICINAE EMERY, 1877

Key to the genera of sub-family Myrmicinae

1. Antennae with less than 12 joints..... 2
   Antennae12 jointed ..... *Monomorium* Mayr
2. Antennae 9 jointed..... *Myrmicaria* Saunders
   Antennae 11 jointed..... *Pheidologeton* Mayr

Genus ***Monomorium*** Mayr, 1855

6. ***Monomorium mayri*** Forel, 1902

Original Combination – *Monomorium gracillumum* var. *mayri* Forel, 1902

1861. *Monomorium gracillumum* **(**Forel) Smith (*Myrmica*), *Jour. Linn. Soc.* vi : 34, Worker.

1902. *Monomorium* (*Parholcomyrmex*) *gracillimum* var. *mayri*, Forel, *Rev. Suisse Zool.*, **10**: 209, (Worker).

1903. *Monomorium* (*Parholcomyrmex*) *gracillimum* var. *mayri* (Forel) Bingham, *Fauna Brit. India, Hym.*, **2**: 210-211.

1995. *Monomorium* (*Parholcomyrmex*) *gracillimum* var. *mayri* (Forel) Bolton, B., *A New General Catalogue of the Ants of the World.* : 264.

Material examined: Workers – 5 exs., Pinjore, 26.ii.2013, (1 exs., female) Seema Kumar Coll. (Reg. No. 9083/A).

Diagnostic characters: Worker: Length 2.5-3 mm. Dark brown with the mandibles, antennae pale yellow in colour. Abdomen with a patch of pale yellow at the base. Head convex a little longer than broad, the posterior lateral angle rounded. Mandibles with the masticatory margin very oblique, armed with four teeth. Antennae short, slender, the scape falling short of the top by one fourth of its length. Alitrunk narrower than the head, emarginate at the meso-metanotal suture, mesonotum convex apical portion obliquely truncate. Petiole 1st node conical rounded above higher than and 2nd node and petiolate anteriorly, 2nd node globose not broader than the 1st node. Abdomen oval.

Distribution: India: Rajasthan, Gujarat, Tamil Nadu, Kerala, Lakshadweep. *Elsewhere*: Sri Lanka, North Africa, Arabia, Myanmar.

Remarks: Reported for the first time from Haryana state.

Genus ***Myrmicaria*** **Saunders,** W.W. 1842

7. ***Myrmicaria brunnea brunnea*** Saunders, 1842

1841. *Myrmicaria brunnea* Saunders, *Trans. Ent. Soc. Lond*, **3**: 57, pl. 5, fig 2, Male.

1903. *Myrmicaria brunnea* (Saunders) Bingham, *Fauna Brit. India, Hym.*, **2**: 118, Male, Female, Worker.

1951. *Myrmicaria brunnea* (Saunders) Chapman and Capco, *Monogr. Inst. Sci. Tech.*, Manila *(Check List Ants Asia)*, **1**: 124.

1995. *Myrmicaria brunnea* (Saunders) Bolton, B., *A New General Catalogue of the Ants of the World.* : 285.

Material examined: Worker: 2 exs., Pinjore, 26.ii.2013; 20 exs., 27.ii.2013, Seema Kumar Coll. (Reg. No. 9084/A & Reg. No. 9085/A).

Diagnostic Characters: Worker: Length 5.5 - 8 mm. Shining, chestnut brown. Head short, more or less rounded, longitudinally striate. Mandibles finely and closely striate, broadening towards the masticatory margin, armed with 4 acute teeth. Antennae 7 jointed, the joints of the flagellum slender much longer than broad with no distinct club. Pronotum convex and round above, the anterior lateral angles marked with distinct tubercles, pro-mesonotal suture obsolete, meso-metanotal suture deep the posterior lateral angles armed with acute spines. The nodes of pedicel conical, subequal, slightly compressed, the 1st node with a long petiole anteriorly and a very short petiole posteriorly. Abdomen oval, smooth and polished.

Distribution: India: Karnataka, Kerala, Meghalaya, Tamil Nadu, West-Bengal. *Elsewhere*: China, Indonesia, Myanmar, Sumatra, Sri Lanka, Indo-China, Vietnam.

Remarks: Reported for the first time from Haryana state.

Genus ***Pheidologeton*** Mayr, 1862

8. ***Pheidologeton affinis affinis*** (Jerdon, 1851)

1851. *Oecodoma*, pt. Jerdon, *Madras J. Lit. Sci*., **17**: 110, Worker, Soldier.

1862. *Pheidologeton*, Mayr, *Verh. zool. -bot Ges. Wien*, xii: 750.

1851. *Pheidologeton affinis* Jerdon, *Madras J. Lit. Sci*., **17**: 110, Worker, Soldier (*Oecodoma*).

1903. *Pheidologeton affinis* (Jerdon) Bingham, *Fauna Brit. India, Hym.*, **2**: 164-165, Male, Female, Worker, Soldier.

1951. *Pheidologeton affinis* (Jerdon) Chapman and Capco, *Monogr. Inst. Sci. Tech.*, Manila *(Check List Ants Asia)*, **1**: 159.

1994. *Pheidologeton affinis* (Jerdon) Tiwari, *et al*., *State Fauna Series 5: Fauna of West Bengal*, **8**: 52.

1995. *Pheidologeton affinis* (Jerdon) Bolton, B., *A New General Catalogue of the Ants of the World.* : 333.

Material examined: Soldiers - 2 exs., Workers – 8 exs., Pinjore, 26.ii.2013; Soldiers-2 exs., Workers – 6 exs., Pinjore, 27.ii.2013, Seema Kumar Coll. (Reg. No. 9086/A & 9087/A).

Diagnostic Characters: Worker-Length 2 – 2.5 mm. Light brownish yellow, polished and shining and the mandibles black, the antennae and legs yellowish red. Sculpture more feeble and the median longitudinal furrow less deeply impressed. Head proportionately much longer and anteriorly stiate. Ocellus absent. Mandibles large, smooth, the masticatory margin with two strong teeth at apex. Antennae 11 jointed, scape

short, club of the antennae formed of 2 apical joints of flagellum. Alitrunk smaller, scutellum prominent and gibbous, the basal portion of the metanotum transversely striate armed with two spines, pronotum anteriorly striate and not armed. Petiole with 1st node narrower, more conical and not emarginate above, the keel below less strongly marked. Abdomen broadly oval.

Distribution: India: Assam, Karnataka, Kerala, Maharashtra, Manipur, Rajasthan, Tamil Nadu, West Bengal, Nagaland, Manipur. *Elsewhere*: Malaysia, Myanmar, Sri Lanka.

Remarks: Reported for the first time from Haryana state.

SUMMARY

The paper deals with 8 species of ants belonging to the family Formicidae reported from Haryana with 7 species recorded for the first time from the Haryana state.

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REFERENCES

Bharti, H. 2001. Checklist of Ants from North West India-I. *Uttar Pradesh J. Zool.,* **21**(2) : 183-187.

Bharti, H. 2001. Two new species of *Pheidole* Westwood (Myrmicinae: Formicidae: Hymenoptera) from India. *J. Entomol. Res.* (New Delhi), **25**(3): 243-247(2001-IX).

Bharti, H. 2002. Checklist of Ants from North West India-II. *J. Bombay nat. Hist. Soc.*, **99**(2): 341-343.

Bharti, H. 2003. *Polyrhachis punjabi* sp.n. (Hymenoptera : Formicidae : Formicinae) from India. *Folia Heyrovskyana* **11**(1): 1-3(2003-VII-31).

Bharti, H. 2004 (2003). A new species of *Pheidole* Westwood, 1839 (Myrmicinae: Formicidae: Hymenoptera) from India. *Russ. Entomol. J.*, **12**(3): 305-306.

Bharti, H. 2012. Indian ants.www.antweb.org

Bingham, C.T. 1903. *The Fauna of British India, including Ceylon and Burma Hymenoptera*, Vol. II. Ants and Cuckoo-wasps. London and Taylor, 506 pp. **2**: 1- 414.

Bolton, B. 1995. *A New General Catalogue of the World. Harvard University Press, Cambridge, Massachusetts London, England.* : pp. 504.

Bolton, B. 1995. *Identification Guide to the Ant Genera of the World. Harvard University Press, Cambridge, Massachusetts London, England*, pp. 222.

Bolton, B. 2007. Bolton's Catalogue of Ants of the World CD-ROM 2007 (1758-2005).

Chapman, J.W. and Capco, S.R. 1951. Checklist of the Ants (Hymenoptera : Formicidae) of Asia. *Monograph of the Institute of Science and Technology*, Manila, **1**: 327.

Karmaly, K.A. 2004. A new species and a key to species of *Polyrhachis* Smith (Hymenoptera : Formicidae) from India. Pp. 539-551 *in : Rajmohana, K.; Sudheer, K.; Girish Kumar, P.; Santhosh, S. (eds.) Perspectives on Biosystematics and Biodiversity. Prof. T.C. Narendran commemoration volume. Kerala: Systematic Entomology Research Scholors Association,* xxii + 666 pp. i-xxii (1-666): 539-551.

Sheela, S. and Narendran, T.C. 1997. A new genus and a new species of Myrmecinae (Hymenoptera : Formicidae) from India, *J. Ecobiol*, **9**(2): 87-91.

Sheela, S. and Narendran, T.C. 1998. On five new species of *Tetramorium* (Hymenoptera : Formicidae : Myrmicinae) from India, *Entomon,* (**23**): 37-44.

Sheela, S. and Narendran, T.C. 1998. A new species of the genus *Paratopula* Wheeler (Hymenoptera : Formicidae : Myrmicinae) from India, *Geobios,* New Report, **17**(1): 23-26.

Sheela, S.; Narendran, T.C and Tiwari, R.N. 2000. Rediscription of a little known Myrmicine ant *Recurvidris recurvispinosa* (Forel) (Hymenoptera : Formicidae), *Rec. zool. Surv. India,* **98**(2) 93-98.

Sheela, S. 2008. Handbook on Hymenoptera : Formicidae: 1-55. (Published by the Director, Zool. Surv. India, Kolkata).

Tiwari, R.N. 1994. Two new species of a little known genus Myrmecina Curtis(Insecta : Hymenoptera: Formicidae) from Kerala, India. *Rec. zool. Surv. India,* **94**(2-4): 151-158.

Tiwari, R.N. 1998. Taxonomic studies on ants of Southern India (Insecta : Hymenoptera: Formicidae). *Memoirs of Zoological Survey of India.***18**(4): 1-90.

Tiwari, R.N. and Jonathan, J.K. 1986. A new species of *Liomyrmex* Mayr from Andaman Islands. (Hymenoptera : Formicidae). *Rec. zool. Surv. India,* **83**(1&2): 87-90.

Tiwari, R.N. and Jonathan, J.K. 1986. A new species of *Metapone* Forel from Nicobar Islands. (Hymenoptera : Formicidae : Myrmicinae). *Rec. zool. Surv. India,* **83**(1&2): 149-153.

Tiwari, R.N. and Tiwari, S.K. 2002. Contribution to the knowledge of Ants (Hymenoptera: Formicidae) of Chandaka- Dampara Wildlife Sanctuary, Orissa. *Rec. zool. Surv. India,***100**(Part 1&2): 145-169.

Tiwari, R.; Kundu, B.G.; Roychowdhury, S. and Ghosh, S.N. 1998. Insecta: Hymenoptera: Formicidae. *State Fauna Series*, 3: *Fauna of West Bengal,* Part **8**: 211-294.

Tiwari, R.N.; Kundu, B.G.; Roychowdhury, S. and Ghosh, S.N. 2003. Insecta: Hymenoptera : Formicidae. *State Fauna Series*, 9: *Fauna of Sikkim,* Part **4**: 467-506.

Tiwari, R.N.; Kundu, B.G.; Sheela, S. and Ghosh, S.N. 2004. Insecta : Hymenoptera: Formicidae. *State Fauna Series*, 10: *Fauna of Manipur,* 605-625.

Varghese, T. 2003. Ants of Indian Institute of Science campus Centre for Ecological sciences. *Indian Institute of Science Bangalore. Tech. Report,* **98**: 1-112.

Varghese, T. 2004. Record of *Strumigenys emmae* (Emery) (Formicidae : Myrmicinae) from Bangalore, Karnataka and a key to Indian species. *J. Bombay nat. Hist. Soc.*, 101-170.

Varghese, T. 2004. Taxonomical studies on ant genera of the Indian Institute of Science campus with notes on their nesting habits. *Perspectives on Biosystematics and Biodiversity, T.C.N.Com.*, 485-502.

Varghese, T. 2006. A new species of the ant genus *Dilobocondyla* (Hymenoptera: Formicidae) from India, with notes on its nesting behaviour. *Oriental Insects,* Vol. 40, 23-32.

Varghese, T. 2006. Description of a new species of the Ponerine ant genus *Emerypone* (Hymenoptera: Formicidae) from Kanartaka, India *Biospecta*, **1**: 89-92.

Varghese, T. 2009. A Review of Extant Subfamilies Tribes and Ant Genera in India. *Biosystematica*, 3(2) : 81- 89.

CHECK LIST ON ANT SPECIES FROM HARYANA

Order HYMENOPTERA

Family FORMICIDAE LATREILLE, 1809

(i) Subfamily AENICTINAE EMERY, 1901

1. *Aenictus clavatus clavatus* Forel, 1901

(ii) Subfamily DOLICHODERINAE FOREL, 1878

2. *Ochetellus glaber glaber* (Mayr, 1862)
3. *Tapinoma melanocephalum melanocephalum* (Fabricius, 1793) **nr**

(iii) Subfamily CERAPACHYNAE FOREL, 1983

4. *Cerapachys aitkenii* Forel, 1900
5. *Cerapachys sulcinodis* Emery, 1889

   Cerapachys risii Forel, 1892 (Junior synonym of *sulcinodis*)

(iv) Subfamily PSEUDOMYRMECINAE SMITH, M.R., 1952

6. *Tetraponera nigra* (Jerdon, 1851)
7. *Tetraponera rufonigra* (Jerdon, 1851)

(v) Subfamily MYRMIICINAE EMERY, 1877

8. *Crematogaster (Crematogaster) brunnea contemta* Mayr, 1879
9. *Crematogaster (Crematogaster) subnuda subnuda* Mayr, 1879
10. *Crematogaster (Crematogaster) buddhae* Forel, 1902
11. *Crematogaster (Crematogaster) rothneyi rothneyi* Mayr, 1879
12. *Crematogaster (Crematogaster) sagei* Forel, 1902
13. *Crematogaster (Mesocrema) walshi* Forel, 1902
14. *Crematogaster (Physocrema) inflata* Smith, F., 1857
15. *Monomorium dichroum* Forel, 1902
16. *Monomorium destructor* (Jerdon, 1851)
17. *Monomorium glabrum* (Ern. Andre, 1883)
18. *Monomorium indicum indicum* Forel, 1902
19. *Monomorium longi* Forel, 1902
20. *Monomorium monomorium* Bolton, 1987
21. *Monomorium orientale* Mayr, 1879
22. *Monomorium pharaonis* (Linnaeus, 1758)
23. *Monomorium wroughtoni* Forel, 1902
24. *Pheidole latinode angustior* Forel, 1902
25. *Pheidole asperata* Emery, 1895
26. *Pheidole fervens fervens* Smith, F., 1858

    Pheidole javana Mayr, 1867 (Junior synonym of *fervens*)
27. *Pheidole bhavanae* Bingham, 1903
28. *Pheidole fergusoni* Forel, 1802
29. *Pheidole ghatica* Forel, 1902
30. *Pheidole horni* Emery, 1901
31. *Pheidole indica* Mayr, 1879
32. *Pheidole jucunda fossulata* Forel, 1902
33. *Pheidole lamellinoda* Forel, 1902
34. *Pheidole latinoda latinoda* Roger, 1863
35. *Pheidole multidens* Forel, 1902
36. *Pheidole parva parva* Mayr, 1865
37. *Pheidole sharpi hoogwerfi* Forel, 1902
38. *Pheidole spathifera spathifera* Forel, 1902
39. *Pheidole sykesii* Forel, 1902
40. *Aphaenogaster beccarii* Emery, 1887
41. *Aphaenogaster sagei sagei* (Forel, 1902)
42. *Tetramorium christlei* Forel, 1902
43. *Tetramorium coonoorense* Forel, 1902
44. *Tetramorium fergusoni* Forel, 1902
45. *Tetramorium nursei* Bingham, 1903
46. *Tetramorium smithi* Mayr, 1879
47. *Pheidologeton diversus diversus* (Jerdon, 1851)

    Pheidologeton megacephala Smith, F., 1860 (Junior synonym of *diversus*)

48. *Meranoplus rothneyi* Forel, 1902

49. *Monomorium mayri* Forel, 1902 **nr**

50. *Myrmicaria brunnea brunnea* Saunders, 1842 **nr**

51. *Pheidologeton affinis affinis* (Jerdon, 1851) **nr**

(vi) Subfamily AMBLYOPONINAE FOREL, 1893

52. *Myopopone castanea* (Smith, F.,1860)

Myopopone moelleri Bingham, 1903 (Junior synonym of *castanea*)

(vii) Subfamily FORMICIINAE LEPELETIER, 1809

53. *Polyrhachis (Myrmhopla) jerdonii* Forel, 1892

54. *Camponotus* (*Tanaemyrmex*) *invidus* Forel, 1892 **nr**

(viii) Subfamily PONERINAE LEPELETIER, 1835

55. *Odontoponera transversa transversa* (Smith, F.1857) **nr**

56. *Pachycondyla rufipes rufipes* (Jerdon, 1851) **nr**

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