

First Inventory of Ants (Hymenoptera: Formicidae) in Northwestern Shivalik, India

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Abstract

The first inventory of the ants of Indian Northwestern Shivalik is presented. A total of 179 names of species group taxa (163 species, 16 subspecies) are recorded based on literature records and newly sampled material from 2008-2012. Twenty nine species are endemics whilst ten species are introduced. Synonyms, new localities, notes about type localities, depositories and statewide distribution in Northwestern Shivalik is also included. The study indicates that most of the areas of the vast Indian territory are unexplored for ants, perhaps majority of the ants in India are still awaiting identification and future collections should provide many new species records.

Keywords: *Ants, species inventory, distribution, Shivalik, India.*

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Introduction

The Shivalik hills (29° 57' to 31° 20' N and 77° 35' to 79° 20' E) are the southernmost and geologically youngest eastwest mountain chain of the Himalaya. The Shivaliks have many sub-ranges, extending from Sikkim westward through Nepal and Uttarakhand, continuing into Jammu and Kashmir and Pakistan (Fig. 1). Shivalik range is of more recent formation, and is, perhaps, the most recently formed range of similar magnitude on earth (Burrard and Hayden, 1980). Natural vegetation of the Shivalik comprises of the Northwestern tropical dry deciduous forests with the abundance of thorny species; Himalayan subtropical pine forests; tropical and subtropical broadleaf forests. The climate of Shivaliks is subtropical to sub-humid and humid with warm summer and cold winter. Mean annual rainfall varies from 800 to 1400 mm, bulk of which (about 80%) is received during monsoon. Soils are loamy, sandy and skeletal. Shivalik is of significance because of its propinquity to populated tracts. The natural resources in this region are in a process of severe degradation due to increased

anthropogenic activities. The continued over-exploitation and mismanagement of soil resources through deforestation, overgrazing and clearance of lands for agricultural purposes disregard to slope and topography, have resulted in ecological degradation in Shivalik hills (Sidhu *et al.*, 2000).

Accurate faunal lists are the foundation for biodiversity research and essential for understanding distribution of species, and ecosystem structure. These studies are critical for the development of conservation plans. In order to assess how environmental threats affect native biodiversity, it is important to establish baseline inventories before local populations and endemic species are driven extinct (Sarnat *et al.*, 2013; Shah *et al.*, 2014; Wachkoo *et al.*, 2017).

Several ant sampling projects have been undertaken in the India during the last decade however, the faunal knowledge for most of the Indian geographic regions remains fragmentary and insufficient (Bharti *et al.*, 2016a). The ant fauna of Shivalik hills has been least known of all Indian regions (Kumar, 2013; Wachkoo,

2013). Considering, the undersampling of ant biodiversity in Shivalik hills, we present herewith, the first results from an intensive ant inventory carried out in northwestern states of Indian Shivalik: Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand (Fig. 1). The inventory is based mostly on specimens collected in northwestern Shivalik from 2008 to 2012, and earlier literature records.

The present study based on actual material collected during the recent surveys aims to create an inventory of ants in Indian Northwestern Shivalik with synonyms, type localities, new localities and type depositories. A special emphasis on primary types excludes inaccuracies caused by incorrect identification, and the list provides a baseline for an assessment of the biodiversity of the family Formicidae in India.

The intent of this paper is to provide baseline data useful to all those concerned, who care for the reforestation, rehabilitation and restoration of Shivaliks for the posterity.

Materials and Methods

The present inventory was generated using material collected between 2008 and 2012 in Indian Northwestern Shivalik, covering primary, secondary and non-forest sites (Fig. 2). In Northwestern Shivalik, primary forests are restricted to Terrace (Himachal Pradesh), part of Forest Research Institute, Rajaji Forest Area and Selaqui (Uttarakhand). These contain tropical and subtropical broadleaf forests characterized by *Anogeissus latifolia*, *Bauhinia retusa*, *Bauhinia variegata*, *Mallotus philippinensis*, *Shorea robusta*, *Terminalia* spp. etc., predominantly dense green jungles, forming a habitat for a large flora and fauna. Most of the forest cover in Northwestern Shivalik is of secondary type, due to regular forest fires and deforestation. In present study Andretta, Bajaura, Bakhra, Dattal, Ghatti, Guraldhar, Kandwal, Khajjiyan, Kotla, Lwasa, Mandi, Nagabari, Nahan, Palampur, Renuka, Rewalsar (Himachal Pradesh); Billawar, Jasrota, Manda, Mansar, Samba, Sukrala, Surinsar (Jammu and Kashmir); Chohal, Dharampur, Ropar (Punjab); Dakpathar and Mussoorie (Uttarakhand) areas constituting the secondary forest types of Northwestern Shivalik were surveyed for ants.

Secondary forests of Northwestern Shivalik constitute the Northern tropical dry deciduous forests with abundance of thorny species e.g., *Acacia* spp., and Himalayan subtropical pine forests e.g., *Pinus roxburghii*. Due to rapidly increasing human population most of the Northwestern Shivalik is extirpated of its natural vegetation and converted to agricultural lands, human settlements, industrial areas and other urban constructions. Non-forested sites including agricultural fields, dam sites, play fields, community gardens, parks, college and university campuses falling in Baijnath, Bari, Bilaspur, Chanaur, Dehra, Dhaliara, Gagret, Ghamrur, Guga, Jassur, Jogi Panga, Jol, Khatiar, Kushinagar, Poanta Sahib, Pong Dam, Siholi, Suketi, Una (Himachal Pradesh); Kathua, Udhampur (Jammu and Kashmir); Dunera, Sukhna, Thein Dam (Punjab); Assan Barrage and Ranger's College (Uttarakhand) were also surveyed. Site selection was aimed specifically to have an overall look on ant composition of the study region.

The field survey was carried regularly from 2008 to 2012, covering each site to get the proper picture of ant composition in the region. A broad range of sampling techniques was applied at all sites. Ant nests and individual specimens were collected on the ground, in leaf litter, under stones, in dead wood, on tree trunks and twigs using Winkler's leaf litter extractor, pitfall traps, soil core, beating vegetation, honey baits and hand collecting (Fig. 3). All specimens were preserved in 75% ethanol. The sampled material is deposited in the ant collection of the Punjabi University, Patiala (PUAC). The localities which were surveyed for the first time are marked with "*" however, we also include literature records for the taxa already known in Northwestern Shivalik e.g., Himachal Pradesh (Chintpurni, Dharamsala, Nahan, Nangal, Solan, Talwara, Terrace); Punjab (Chandigarh, Chohal, Dunera, Pathankot, Ropar) and Uttarakhand (Dehradun, Rajaji National Park). All sampled localities are mentioned in Table 1.

Most of the names of the described species presented are in accordance with the most recent Formicidae classification following AntWeb. The inventory is arranged systematically to subfamily level and alphabetically thereafter, so as to make the

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search easier for a given taxon. Main references to the distributions of given taxa in Northwestern Shivalik are listed. The acronyms and their equivalents used for depositories are: ANIC - Australian National Insect Collection, Canberra, Australia; BMNH - The Natural History Museum (British Museum, Natural History), London, U.K.; CASC - California Academy of Sciences Collection, San Francisco, California, U.S.A.; HNHM - Hungarian Natural History Museum, Budapest, Hungary; MCZC - Museum of Comparative Zoology, Cambridge, Massachusetts, U.S.A.; MHNG - Muséum d'Histoire Naturelle, Geneva, Switzerland; MNHN - Muséum d'Histoire Naturelle de la Ville de Genève, Geneva, Switzerland; MSNG - Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy; MZLS - Museo Zoologico La Specola, Florence, Italy; NHMB - Naturhistorisches Museum, Basel, Switzerland; NHMW - Natural History Museum Vienna, Austria; OUMNH - University Museum of Natural History, Oxford, U.K.; PUAC - Punjabi University Patiala Ant Collection, Punjab, India; ZISP - Zoological Institute, Academy of

Sciences, St. Petersburg, Russia; ZMUC - Zoological Museum, University of Copenhagen, Copenhagen, Denmark; ZMUK - Zoologisches Museum, Universität Kiel, Germany; ZSIK - Zoological Survey of India, Kolkata, India.

Species inventory

Subfamily Amblyoponinae

Prionopelta kraepelini Forel, 1905

Type locality: Indonesia: Java: Tjompea, near Bogor

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 1 (w.), 11.vi.2010; Dattal, 4 (w.), 16.vi.2010; Nagabari, 2 (w.), 1 (m.), 18.vi.2009. **Jammu and Kashmir:** Jasrota, 2 (w.), 28.vii.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (Bharti and Wachkoo, 2012a: 816).

Stigmatomma boltoni (Bharti and Wachkoo, 2011)

Amblyopone boltoni Bharti and Wachkoo, 2011

Type locality: India: Himachal Pradesh: Ghatti, Khatiar, Terrace

Type depository: HT, PT: PUAC; PT: CASC

Material examined: **Himachal Pradesh:** Terrace, 1 (w.), 17.vii.2010; Ghatti, 2 (w.), 11.x.2008; Khatiar, 6 (w.), 18.x.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Wachkoo, 2011: 586).

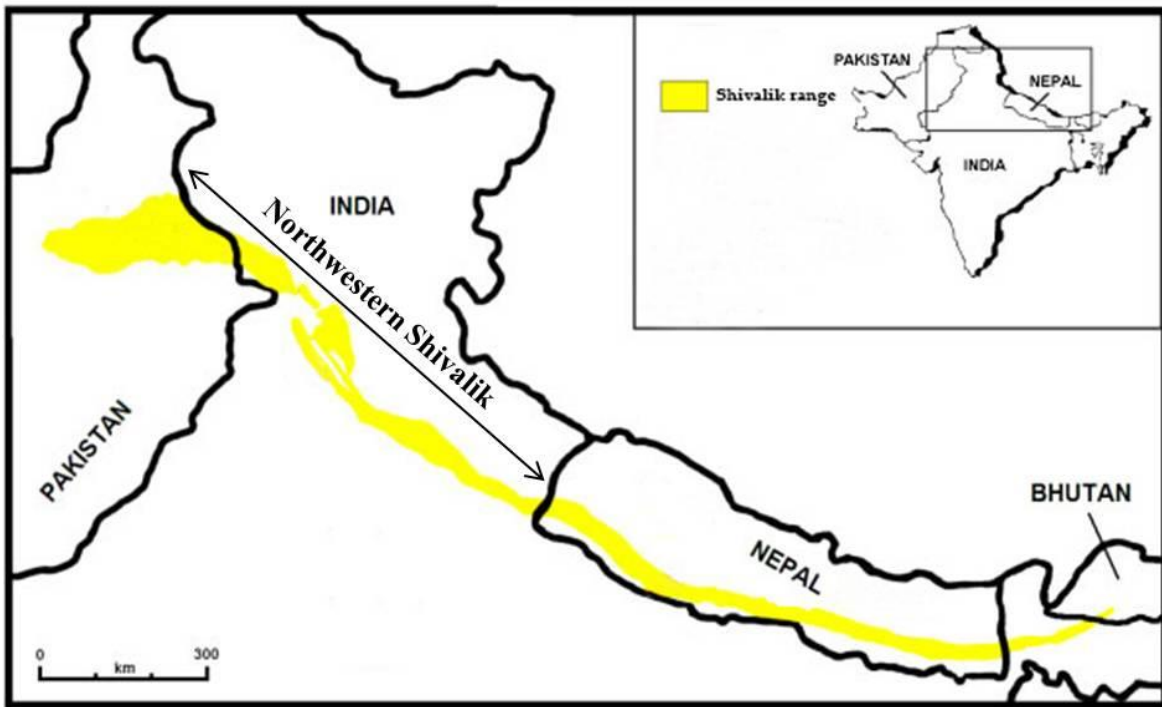


Fig. 1. Map showing location of the Shivalik range.

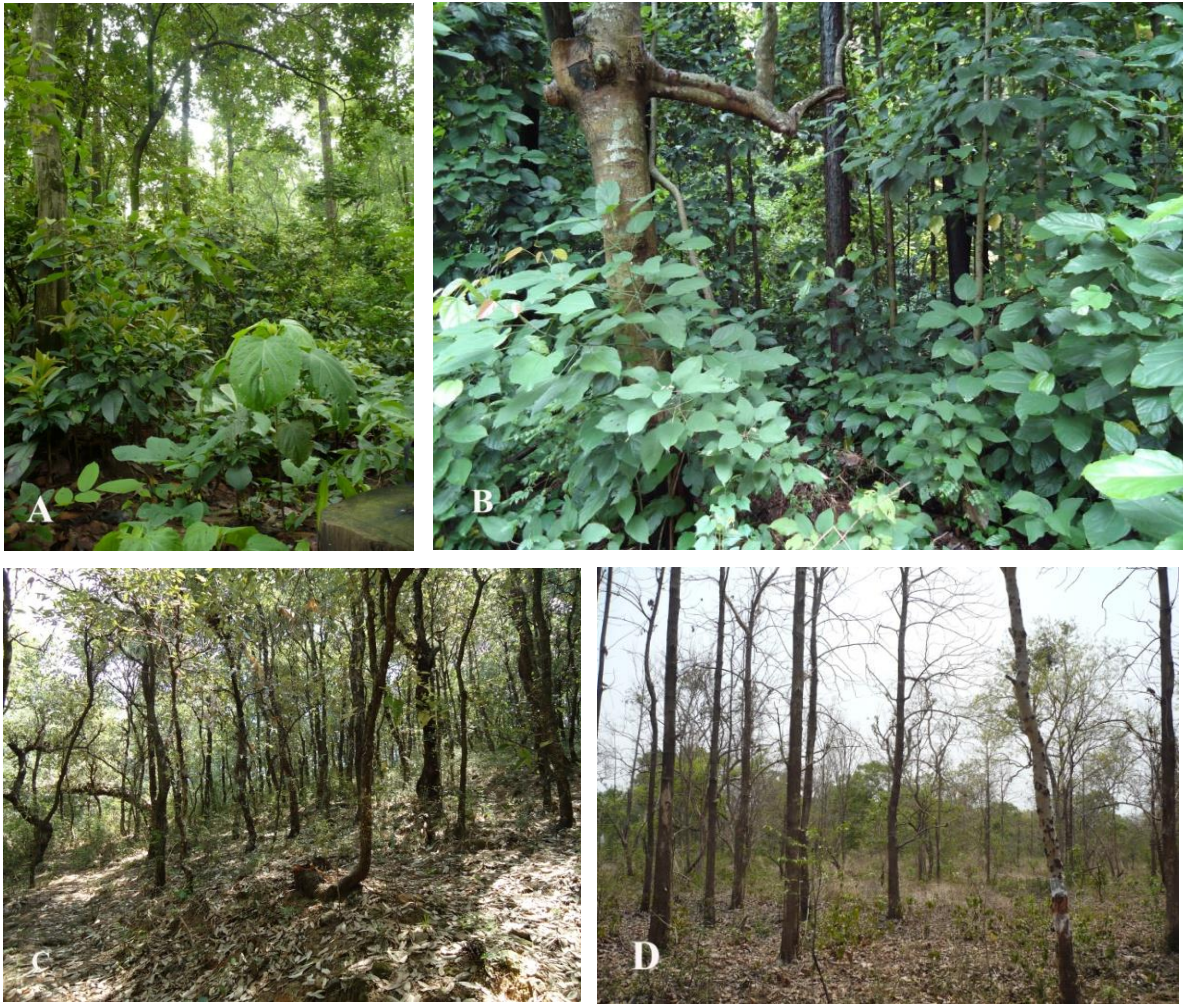


Fig. 2. Forests in Northwestern Shivalik: A and B: Primary Forests; C and D: Secondary Forests



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Fig. 3. Collection techniques used to sample ants: A, Leaf litter collection; B, Leaf litter sifting; C, Winkler bag with four mini Winkler sacs; D, Winkler bags hanging up at a collection locality; E, Placing a pitfall trap; F, Collecting dislodged ants on a beating sheet; G, Ants baited with honey; H, Sieving soil sample for ants; I, Excavating an ant nest; J, Searching for arboreal ants.

Subfamily Dolichoderinae

Chronoxenus wroughtonii (Forel, 1895)

Bothriomyrmex wroughtonii Forel, 1895

Type locality: India: Karnataka: Kanara; Uttarakhand: Dehradun

Type depository: LT: NHMB; PLT: BMNH, MHNG, MZLS

Material examined: **Himachal Pradesh:** Andretta, 4 (w.), 11.vi.2010; Baijnath, 1 (w.), 17.vi.2010; Bari, 12 (w.), 15.x.2008; Dattal, 6 (w.), 16.vi.2010; Dehra, 8 (w.), 06.vii.2010; Gurdalhar, 31 (w.), 16.x.2008; Khajjiyan, 29 (w.), 19.vi.2009; Khatiar, 3 (w.), 11.x.2009; Khushinagar, 3 (w.), 17.vi.2009; Kotla, 6 (w.), 14.vii.2010; Nagabari, 12 (w.), 18.vi.2009; Nahan, 15 (w.), 23.viii.2009; Siholi, 36 (w.), 14.x.2009; Suketi, 1 (w.), 25.viii.2009; Terrace, 8 (w.), 23.x.2008, 5(w.), 25.v.2009, 8 (w.), 25.ix.2009. **Jammu and Kashmir:** Kathua, 47 (w.), 25.vii.2010; Sukrala, 5 (w.), 07.viii.2010. **Punjab:** Dunera, 30 (w.), 21.vi.2009. **Uttarakhand:** Assan Barrage, 36 (w.), 21.viii.2009, 20 (w.), 10.v.2009; Dakpathar, 10 (w.), 20.viii.2009; Forest Research Institute, 12 (w.), 30.vii.2009, 4 (w.), 13.v.2009, leg R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record); Punjab (Bharti *et al.*, 2009: 40); Uttarakhand (Forel, 1895: 470; Shattuck, 1994: 37).

Dolichoderus taprobanae (Smith, F., 1858)

Formica taprobanae Smith, F., 1858

Formica ingruens Walker, 1859

Hypoclinea gracilis Motschoulsky, 1863

Dolichoderus semirufus André, 1887

Dolichoderus taprobanae var. *obscuripes* Santschi, 1920

Dolichoderus taprobanae var. *tonkina* Santschi, 1920

Type locality: Sri Lanka

Type depository: HT: BMNH

Material examined: **Himachal Pradesh:** Andretta, 6 (w.), 1 (q.), 12.vi.2010, 28 (w.), 13.vi.2010, 35 (w.), 20.vi.2010; Baijnath, 7 (w.), 17.vi.2010. **Uttarakhand:** Rajaji Forest Area, 7 (w.), 05.viii.2009, 204 (w.), 10.viii.2009, 12(w.), 11.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record); Jammu and Kashmir (Bharti *et al.*, 2013a: 84).

Ochetellus glaber (Mayr, 1862)

Hypoclinea glabra Mayr, 1862

Iridomyrmex itoi Forel, 1900

Type locality: Australia: New South Wales: Sydney

Type depository: ST: NHMW

Material Examined: **Himachal Pradesh:** Andretta, 1 (w.), 15.vi.2010; Bajaura, 6 (w.), 23.vi.2010; Kotla, 2 (w.), 28.v.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2002a: 341).

Tapinoma himalaicum Bharti, Kumar and Dubovikoff, 2013

Tapinoma himalaica Bharti, Kumar and Dubovikoff, 2013

Type locality: India: Himachal Pradesh: Kotla, Siholi, Terrace; Jammu and Kashmir: Manda; Punjab: Dharampur

Type depository: HT, PT: PUAC; PT: BMNH; PT: ZISP

Material Examined: **Himachal Pradesh:** Kotla, 3 (w.), 13.x.2008; Siholi, 2 (w.), 2.x.2009; Terrace, 13 (w.), 25.ix.2009.

Jammu and Kashmir: Manda, 3 (w.), 4.viii.2010. **Punjab:** Dharampur, 2 (w.), leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Punjab (Bharti *et al.*, 2013b: 303).

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

Formica melanocephala Fabricius, 1793

Formica nana Jerdon, 1851

Myrmica pellucida Smith, F. 1857

Formica familiaris Smith, F. 1860

Tapinoma melanocephalum var. *australe* Santschi, 1928

Tapinoma melanocephalum var. *australis* Santschi, 1928

Type locality: French Guiana

Type depository: T: Unknown

Material Examined: Himachal Pradesh: Bakhra, 72 (w.), 07.x.2008; Chanaur, 10 (w.), 12.vi.2009; Ghatti, 106 (w.), 12.x.2008, 22 (w.), 28.ix.2009, 20 (w.), 13.x.2009; Guga, 80 (w.), 06.x.2008; Guraldhar, 6 (w.), 16.x.2008, 24 (w.), 04.x.2009; Jogi Panga, 12 (w.), 09.x.2008; Kandwal, 5 (w.), 25.vi.2009, 5 (w.), 2 (q.), 23.vii.2010; Khatiar, 20 (w.), 13.x.2008, 31 (w.), 18.x.2008; Kotla, 3 (w.), 28.v.2009; Paonta Sahib, 30 (w.), 09.v.2009, 41 (w.), 19.viii.2009; Rehan, 12 (w.), 08.vii.2010; Renuka, 8 (w.), 08.v.2009; Rewalsar, 36 (w.), 2 (q.), 30.vi.2010; Siholi, 40 (w.), 19.x.2008; Terrace, 93 (w.), 1 (q.), 11.x.2008, 2 (w.), 21.x.2008, 20 (w.), 22.v.2009, 10 (w.), 25.ix.2009; Una, 25 (w.), 05.x.2008. **Jammu and Kashmir:** Kathua, 22 (w.), 25.vii.2010, 36 (w.), 30.vii.2010; Samba, 10 (w.), 11.vii.2009; Surinsar, 4 (w.), 14.vii.2009. **Punjab:** Chohal, 50 (w.), 08.x.2008; Dharampur, 2 (w.), 14.x.2008; Thein Dam, 7 (w.), 26.vi.2009. **Uttarakhand:** Assan Barrage, 15 (w.), 21.viii.2009; Forest Research Institute, 12 (w.), 1.viii.2009, 2 (w.), 17.viii.2009; Rajaji Forest Area, 12 (w.), 3 (q.), 13.viii.2009; Selaqui, 13 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 84), Punjab (Tak and Kazmi, 2011: 41; Bharti *et al.*, 2009: 39).

***Technomyrmex albipes* (Smith, F., 1861)**

Crematogaster forticulus Walker, 1859

Formica detorquens Walker, 1859

Formica albipes Smith, F., 1861

Tapinoma nigrum Mayr, 1862

Tapinoma albitarse Motschoulsky, 1863

Technomyrmex albipes var. *bruneipes* Forel, 1895

Technomyrmex albipes r. *wedda* Forel, 1913

Type locality: Indonesia: Sulawesi Utara: Tondano

Type depository: ST: OUMNH

Material Examined: Himachal Pradesh: Andretta, 11 (w.), 12.vi.2010, 4 (w.), 20.vi.2010; Bilaspur, 25 (w.), 01.vii.2010; Nahan, 5 (w.), 06.v.2009; Paonta Sahib, 31 (w.), 09.v.2009; Renuka, 3 (w.), 26.viii.2009. **Uttarakhand:** Forest Research Institute, 1(w.), 01.x.2008, 6 (w.), 30.vii.2009, 1 (w.), 03.viii.2009, 5 (w.), 1 (q.), 12.viii.2009, 3 (w.), 17.viii.2009, 4 (w.), 19.v.2010; Rajaji Forest Area, 8 (w.), 5 (q.), 05.viii.2009, 2 (w.), 06.ix.2010; Selaqui, 3 (w.), 02.x.2008, 2 (w.), 03.x.2008, 2 (w.), 07.viii.2009, 1 (w.), 08.viii.2009, 4 (w.), 1 (q.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 84); Uttarakhand (Imai *et al.*, 1984: 8).

***Technomyrmex elatior* Forel, 1902**

Technomyrmex albipes var. *cordiformis* Viehmeyer, 1916

Type locality: India: Assam

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Andretta, 19 (w.), 1 (major intercaste), 12.vi.2010, 1 (w.), 13.vi.2010; Baijnath, 1 (w.), 17.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

***Technomyrmex rector* Bolton, 2007**

Type locality: India: Tamil Nadu: Coimbatore

Type depository: HT: BMNH

Material Examined: Himachal Pradesh: Kotla, 10 (w.), 28.v.2009; Lwasa, 9 (w.), 07.v.2009; Siholi, 16 (w.), 02.x.2009, 4 (w.), 14.x.2009; Terrace, 14 (w.), 11.x.2008, 5 (w.), 25.v.2009, 1 (w.), 24.ix.2009, 12 (w.), 09.vii.2010, 3 (w.), 24.ix.2009. **Jammu and Kashmir:** Mansar, 9 (w.), 31.vii.2010. **Uttarakhand:** Selaqui, 10 (w.), 07.viii.2009, 10 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record).

Subfamily Dorylinae

***Aenictus aitkenii* Forel, 1901**

Aenictus aratus var. *asiatica* Forel, 1911

Type locality: India: Karnataka: Kanara; Kerala: Travancore; Maharashtra: Thane

Type depository: ST: MHNG

Material examined: Himachal Pradesh: Nahan, 34 (w.), 23.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wilson, 1964: 447), Jammu and Kashmir (Bharti *et al.*, 2013a: 84).

***Aenictus brevicornis* (Mayr, 1879)**

Typhlatta brevicornis Smith, F., 1873

Typhlatta brevicornis Mayr, 1879

Type locality: India: West Bengal: Kolkata, Eden Gardens

Type depository: LT; PLT: NHMW

Material examined: Punjab: Sukhna, 33 (w.), 23.x.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Punjab (Imai *et al.*, 1884b: 8; Tak and Kazmi, 2011: 41).

***Aenictus ceylonicus* (Mayr, 1866)**

Typhlatta ceylonica Mayr, 1866

Aenictus ceylonicus var. *latro* Forel, 1901

Aenictus ceylonicus var. *formosensis* Forel, 1913

Type locality: Sri Lanka

Type depository: ST: NHMW

Material examined: Himachal Pradesh: Andretta, 82 (w.), 12.6.2010; Ghatti, 56 (w.), 26.ix.2009; Nahan, 69 (w.), 23.viii.2009. **Jammu and Kashmir:** Mansar, 180 (w.), 2.viii.2010. **Uttarakhand:** Dakpathar, 56 (w.), 20.viii.2009; Rajaji Forest Area, 27 (w.), 12.viii.2009, 26 (w.), 13.viii.2009; Selaqui, 55 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wilson, 1964: 454).

***Aenictus doryloides* Wilson, 1964**

Type locality: India: Himachal Pradesh: Solan

Type depository: HT, PT: MCZC

Material examined: Himachal Pradesh: Andretta, 17 (w.), 15.vi.2010. **Uttarakhand:** Rajaji Forest Area, 84 (w.), 5.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wilson, 1964: 460; Jaitrong and Yamane, 2013: 227), Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Uttarakhand (new record).

***Aenictus pachycerus* (Smith, 1858)**

Eciton pachycerus Smith, F., 1858

Typhlatta bengalensis Mayr, 1879

Aenictus bengalensis var. *continuus* Forel, 1901

Type locality: India

Type depository: ST: BMNH

Material examined: Himachal Pradesh: Poanta Sahib, 84 (w.), 19.viii.2009, 10 (w.), Jassur, 8.vi.2009. **Uttarakhand:** Ranger's

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College, 108 (w.), 8.vi.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wilson, 1964: 471; Tiwari, 1999: 17), Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Punjab (Bharti *et al.*, 2009: 39), Uttarakhand (Forel, 1901: 476, 1906: 90; Wilson, 1964: 471; Tiwari, 1999: 17; Bharti, 2003: 717).

Aenictus peguensis Emery, 1895

Type locality: Myanmar: Palon: Pegu

Type depository: LT, PLT: MSNG

Material examined: Himachal Pradesh: Andretta, 12 (w.), 15.vi.2010; Ghatti, 8 (w.), 26.ix.2009; Kotla, 36 (w.), 28.v.2009, 10 (w.), 30.v.2010; Nahan, 30 (w.), 27.ix.2009. **Uttarakhand:** Assan Barrage, 5 (w.), 2.viii.2009, 58 (w.), 21.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Aenictus sagei Forel, 1901

Aenictus wroughtonii var. *sagei* Forel, 1901

Type locality: India: Himachal Pradesh: Dharamsala

Type depository: LT, PLT: MHNG

Material examined: Himachal Pradesh: Andretta, 16 (w.), 11.vi.2010, 5 (w.), 12.6.2010, 6 (w.), 13.vi.2010; Poanta Sahib, 110 (w.), 19.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1901: 469, 1906: 90; Wilson, 1964: 477; Pisarski, 1967: 377; Jaitrong *et al.*, 2010: 40); Punjab (Emery, 1910: 30; Chapman and Capco, 1951: 12).

Aenictus wilsoni Bharti, Wachkoo and Kumar, 2012

Type locality: India: Himachal Pradesh: Andretta

Type depository: HT, PT: PUAC; PT: BMNH, MCZC

Material examined: Himachal Pradesh: Andretta, 108 (w.), 12.vi.2010, 21 (w.), 20.vi.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti *et al.*, 2012: 292).

Chrysapace costatus (Bharti and Wachkoo, 2013)

Cerapachys costatus Bharti and Wachkoo, 2013a

Type locality: India: Uttarakhand: Forest Research Institute

Type depository: HT: PUAC

Material examined: Uttarakhand: Forest Research Institute, 1 (w.), 4.ix.2010, leg. Aijaz A. Wachkoo (holotype).

Distribution in Northwestern Shivalik: Uttarakhand (Bharti and Wachkoo, 2013a: 1191).

Dorylus labiatus Shuckard, 1840

Dorylus hindostanus Smith, F., 1859

Dorylus laeviceps Smith, F., 1878

Type locality: India: Assam; Maharashtra: Pune

Type depository: T: OUMNH

Material examined: Himachal Pradesh: Rewalsar, 29 (w.), 29.vi.2010. **Uttarakhand:** Assan Barrage, 19 (w.), 10.v.2009, 28 (w.), 21.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1901: 464, 1906: 90; Bharti, 2001: 163; Wilson, 1964: 440), Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Punjab (Bharti, 2001: 163; Tak and Rathore, 2004: 165; Bharti *et al.*, 2009: 39; Tak, 2009: 8, 2010: 135; Tak and Kazmi, 2011: 40), Uttarakhand (Forel, 1901: 464, 1906: 90; Wilson, 1964: 440).

Dorylus orientalis Westwood, 1835

Labidus curtisii Shuckard, 1840

Dorylus longicornis Shuckard, 1840

Alaopone oberthueri Emery, 1881

Dorylus fuscus Emery, 1889

Type locality: India

Type depository: T: OUMNH

Material examined: Himachal Pradesh: Andretta, 14 (w.), 20.vi.2010; Ghatti, 30 (w.), 4 (m.), 28.ix.2009, 22 (w.), 3 (m.), 13.x.2009; Guraldhar, 130 (w.), 5 (m.), 6.x.2008; Mandi, 24 (w.), 27.vi.2010; Nagabari, 51 (w.), 1 (m.), 18.vi.2009; Nahan, 7 (w.), 23.viii.2009; Poanta Sahib, 19 (w.), 8 (m.), 19.viii.2009; Siholi, 9 (w.), 12.x.2009; Terrace, 5 (w.), 2 (m.), 17.vii.2009, 6 (w.), 20 (m.), 19.vii.2009. **Jammu and Kashmir:** Kathua, 1 (w.), 23.vii.2010; Surinsar, 9 (w.), 14.vii.2009. **Punjab:** Sukhna, 150 (w.), 5.iv.2011, 4 (w.), 25.v.2011. **Uttarakhand:** Forest Research Institute, 1 (w.), 30.ix.2008; Rajaji Forest Area, 5 (w.), 6.viii.2009, 30 (w.), 11.viii.2009, 4 (w.), 6.ix.2010; Selaqui, 55 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Punjab (Tak and Rathore, 2004: 165; Bharti *et al.*, 2009: 39; Tak, 2009: 9; Tak and Kazmi, 2011: 40), Uttarakhand (Forel, 1901: 464, 1906: 90; Wilson, 1964: 442; Roonwal, 1976: 309).

Lioponera longitarsus Mayr, 1879

Lioponera longitarsus var. *australis* Forel, 1895

Lioponera longitarsus r. *parva* Forel, 1900

Lioponera bicolor Wheeler and Chapman, 1925

Phyracaces pygmaeus Clark, 1934

Lioponera alferii Donisthorpe, 1939

Cerapachys aegyptiacus Brown, 1975

Type locality: India: West Bengal: Kolkata

Type depository: ST: NHMW

Material examined: Jammu and Kashmir: Surinsar, 1 (w.), 14.vii.2009. **Punjab:** Sukhna, 1 (q.), 4.x.2010. **Uttarakhand:** Rajaji Forest Area, 1 (w.), 11.viii.2009; Selaqui, 1 (w.), 7.viii.2009, 9 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Punjab (Bharti *et al.*, 2009: 39), Uttarakhand (Forel, 1900a: 330, 1906: 91; Donisthorpe, 1939: 254).

Ooceraea biroi (Forel, 1907)

Cerapachys biroi Forel, 1907

Cerapachys silvestrii Wheeler, 1909

Cerapachys sinensis Wheeler, 1928

Cerapachys seini Mann, 1931

Cerapachys ierensis Weber, 1939

Type locality: Singapore

Type depository: LT, PLT: MHNG

Material examined: Himachal Pradesh: Suketi, 5 (w.), 25.viii.2009. **Jammu and Kashmir:** Manda, 110 (w.), 15.vii.2009, 19 (w.), 4.viii.2010. **Uttarakhand:** Forest Research Institute, 8 (w.), 30.ix.2008; Rajaji Forest Area, 8 (w.), 11.viii.2009, 19 (w.), 12.viii.2009, 6 (w.), 13.viii.2009, 22 (w.), 6.ix.2010; Selaqui, 203 (w.), 8.viii.2009, 160 (w.), 5.ix.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 84).

Parasyscia browni (Bharti and Wachkoo, 2013)

Cerapachys browni Bharti and Wachkoo, 2013a

Type locality: India: Uttarakhand: Rajaji Forest Area

Type depository: HT: PUAC

Material examined: Uttarakhand: Rajaji Forest Area, 1 (w.), 12.viii.2009, leg. Aijaz A. Wachkoo (holotype).

Distribution in Northwestern Shivalik: Uttarakhand (Bharti and Wachkoo, 2013a: 1189).

Subfamily Formicinae

***Acropyga acutiventris* Roger, 1862**

Plagirolepis flava Mayr, 1862
Acropyga moluccana Mayr, 1879
Acropyga crassicornis Emery, 1900
Acropyga moluccana var. *australis* Forel, 1902
Acropyga moluccana subsp. *mysolensis* Forel, 1911
Acropyga moluccana var. *opaca* Stütz, 1911
Acropyga moluccana var. *occipitalis* Stütz, 1912
Acropyga moluccana subsp. *papuana* Mann, 1919
Acropyga acutiventris var. *carinata* Karavaiev, 1933
Acropyga acutiventris var. *javana* Karavaiev, 1933
Acropyga indosinensis Wheeler, 1935
Pseudolasius undecima Donisthorpe, 1949
Type locality: Sri Lanka
Type depository: ST: Unknown
Material examined: Uttarakhand: Forest Research Institute, 640m, 7 (w.), 4.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Camponotus compressus* (Fabricius, 1787)**

Formica compressa Fabricius, 1787
Formica indefessa Sykes, 1835
Formica callida Smith, F., 1858
Camponotus quadrilaterus Roger, 1863
Type locality: India: Tamil Nadu: Tharangambadi
Type depository: ST: Unknown
Material examined: Himachal Pradesh: Andretta, 15 (w.), 11.vi.2010, 43 (w.), 12.vi.2010, 17 (w.), 3 (q.), 10 (m.), 13.vi.2010; Bakhra, 2 (w.), 7.x.2008; Bari, 7 (w.), 15.x.2008, 6 (w.), 6.vi.2009, 17 (w.), 1.x.2009, 2 (w.), 1 (q.), 12.vii.2010; Chanaur, 9 (w.), 20.x.2008, 25 (w.), 5.vi.2009, 2 (w.), 12.vi.2009, 2 (w.), 3.x.2009; Dehra, 1 (w.), 6.vii.2010; Gagret, 26 (w.), 8.x.2008, 2 (w.), 17.x.2009; Ghamrur, 1 (w.), 1.vi.2009; Ghatti, 2 (w.), 11.x.2008, 2 (w.), 10.vii.2010; Guga, 40 (w.), 6.x.2008; Guraldhar, 1 (w.), 4.x.2009; Jogi Panga, 2 (w.), 9.x.2008; Jol, 425m, 4 (w.), 6.x.2009; Kandwal, 2 (w.), 25.vi.2009; Khatiar, 2 (w.), 18.x.2008, 1 (w.), 11.x.2009; Kotla, 2 (w.), 13.x.2008, 23 (w.), 22.x.2008, 17 (w.), 30.v.2009, 2 (w.), 30.ix.2009, 14 (w.), 13.vii.2010; Kushinagar, 13 (w.), 17.vi.2009; Nagabari, 10 (w.), 18.vi.2009; Poanta Sahib, 4 (w.), 9.v.2009, 1 (w.), 19.viii.2009; Pong Dam, 1 (q.), 17.x.2008; Renuka, 13 (w.), 8.v.2009, 8 (q.), 26.viii.2009; Siholi, 44 (w.), 19.x.2008, 14 (w.), 4.vi.2009, 2 (w.), 2.x.2009, 3 (w.), 14.x.2009, 1 (w.), 8.vii.2010; Suketi, 14 (w.), 25.viii.2009; Terrace, 6 (w.), 24.v.2009, 6 (w.), 25.v.2009, 3 (w.), 23.ix.2009, 1 (w.), 24.ix.2009, 6 (w.), 7.x.2009, 6 (w.), 12.x.2009, 9 (w.), 21.x.2008, 27 (w.), 23.x.2008; Una, 11 (w.), 5.x.2008, 8 (w.), 15.x.2009. **Jammu and Kashmir:** Billawar, 1 (w.), 6.viii.2010; Jasrota, 1 (w.), 28.vii.2010; Kathua, 1 (w.), 23.vii.2010; Manda, 14 (w.), 15.vii.2009, 21 (w.), 2.viii.2010, 2 (w.), 4.viii.2010; Mansar, 3 (w.), 12.vii.2009, 2 (w.), 3.viii.2010; Samba, 1 (w.), 11.vii.2009; Surinsar, 1 (q.), 5 (m.), 14.vii.2009; Udhampur, 1 (w.), 4.vii.2009. **Punjab:** Chohal, 27 (w.), 10.x.2008; Dharampur, 19 (w.), 14.x.2008; Dunera, 10 (w.), 23.vi.2009; Ropar, 7 (w.), 9.iv.2011. **Uttarakhand:** Assan Barrage, 4 (w.), 10.v.2009, 9 (w.), 2 (q.), 7 (m.), 3.vi.2010; Forest Research Institute, 4 (w.), 12.v.2009, 1 (w.), 2.viii.2009, 1 (w.), 3.viii.2009, 6 (w.), 26.v.2010; Rajaji Forest Area, 6 (w.), 10.viii.2009, 3 (w.), 21.v.2010, 9 (w.), 7.ix.2010; Ranger's College, 30 (w.), 22.v.2010; Selaqui, 3 (w.), 3.x.2008, 2 (w.), 7.viii.2009, 1 (w.), 8.viii.2009, 1 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 84); Punjab (Tak and Rathore, 2004: 168; Bharti *et al.*, 2009: 39; Tak, 2009: 33, 2010: 139; Tak and Kazmi, 2011: 46); Uttarakhand (Forel, 1892: 240).

***Camponotus himalayanus* Forel, 1893**

Camponotus marginatus var. *himalayanus* Forel, 1893
Type locality: India: Himalaya
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Lwasa, 6 (w.), 27.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

***Camponotus horseshoetus* Datta and Raychaudhuri, 1985**

Type locality: India: West Bengal: Darjeeling
Type depository: NT: PUAC
Material examined: Himachal Pradesh: Baijnath, 9 (w.), 17.vi.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Wachkoo, 2015: 383).

***Camponotus kattensis* Bingham, 1903**

Camponotus dichrous var. *kattensis* Bingham, 1903
Type locality: India: Uttarakhand: Katapathar
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Kotla, 1 (w.), 22.x.2008; Terrace, 2 (w.), 21.x.2008, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1892: 243, 1906: 84).

***Camponotus lamarckii* Forel, 1892**

Type locality: India: Sikkim
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Andretta, 13 (w.), 11.vi.2010, 5 (w.), 2 (m.), 12.vi.2010, 3 (w.), 19.vi.2010, 1 (w.), 21.vi.2010; Baijnath, 3 (w.), 17.vi.2010; Bakhra, 1 (w.), 7.x.2008; Chanaur, 1 (w.), 20.x.2008; Nagabari, 54 (w.), 2 (q.), 14 (m.), 18.vi.2009; Mandi, 8 (w.), 27.vi.2010. **Uttarakhand:** Selaqui, 2 (w.), 3.x.2008, 1 (w.), 5.ix.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2002a: 341), Uttarakhand (new record).

***Camponotus mitis* (Smith, 1858)**

Formica mitis Smith, 1858
Type locality: Sri Lanka
Type depository: ST: BMNH
Material examined: Himachal Pradesh: Andretta, 1 (q.), 11.vi.2010, 8 (w.), 1 (q.), 12.vi.2010, 5 (w.), 2 (m.), 13.vi.2010, 1 (w.), 15.vi.2010, 1 (w.), 21.vi.2010; Baijnath, 3 (w.), 23.vi.2010; Bakhra, 1 (w.), 7.x.2008; Chanaur, 12 (w.), 20.x.2008, 8 (w.), 1 (q.), 5.vi.2009; Dhaliara, 1 (w.), 2 (m.), 9.vi.2009; Gagret, 4 (w.), 17.x.2009; Ghamrur, 25 (w.), 1.vi.2009; Ghatti, 7 (w.), 11.x.2008; Guga, 2 (w.), 6.x.2008; Guraldhar, 11 (w.), 16.x.2008, 4 (w.), 4.x.2009; Khatiar, 4 (w.), 18.x.2008; Kotla, 8 (w.), 30.v.2009, 4 (w.), 29.ix.2009, 3 (w.), 13.x.2008; Lwasa, 8 (w.), 7.v.2009, 18 (w.), 1 (q.), 27.viii.2009; Mandi, 12 (w.), 1 (q.), 27.vi.2010; Nahar, 7 (w.), 23.viii.2009; Renuka, 11 (w.), 26.viii.2009; Siholi, 1 (w.), 19.x.2008, 12 (w.), 2.x.2009; Terrace, 1 (w.), 12.x.2008, 28 (w.), 24.v.2009, 7 (w.), 1 (m.), 26.v.2009; Una, 7 (w.), 15.x.2009. **Jammu and Kashmir:** Manda, 15 (w.), 15.vii.2009, 10 (w.), 4.viii.2010; Surinsar, 6 (w.), 14.vii.2009, 32 (w.), 1.viii.2010. **Punjab:** Chohal, 2 (w.), 10.x.2008; Dharampur, 1 (w.), 14.x.2008. **Uttarakhand:** Assan Barrage, 1 (w.), 3.vi.2010; Dakpathar, 21 (w.), 20.viii.2009; Forest Research Institute, 11 (w.), 12.v.2009, 1 (w.), 1 (q.), 13.v.2009, 11 (w.), 30.vii.2009, 4 (w.), 2.viii.2009, 1 (w.), 3.viii.2009, 23 (w.), 4.viii.2009, 6 (w.), 3 (q.), 1 (m.), 19.v.2010, 10 (w.), 1 (q.), 2 (m.), 20.v.2010; Rajaji Forest Area, 11 (w.), 5.viii.2009, 1 (w.), 10.viii.2009, 1 (w.), 11.viii.2009, 5 (w.), 2 (q.), 5 (m.), 21.v.2010; Selaqui, 4 (w.), 8.viii.2009, 6 (w.), 15.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record), Punjab (Tak, 2009: 35).

***Camponotus mutilarius* Emery, 1893**

Type locality: Myanmar: Carin Cheba

Type depository: ST: MSNG

Material examined: **Himachal Pradesh:** Andretta, 7 (w.), 1 (m.), 11.vi.2010, 1 (w.), 15.vi.2010; Bakhra, 9 (w.), 7.x.2008; Bari, 15 (w.), 6.vi.2009, 12 (w.), 1.x.2009, 7 (w.), 12.vii.2010; Gagret, 5 (w.), 17.x.2009; Kandwal, 2 (w.), 25.vi.2009; Kotla, 23 (w.), 13.x.2008, 15 (w.), 22.x.2008, 1 (w.), 30.v.2009; Mandi, 1 (w.), 27.vi.2010; Nagabari, 4 (w.), 18.vi.2009; Siholi, 1 (w.), 1 (q.), 8.vii.2010. **Jammu and Kashmir:** Kathua, 1 (w.), 23.vii.2010; Manda, 10 (w.), 2.viii.2010; Mansar, 2 (w.), 13.vii.2009. **Uttarakhand:** Forest Research Institute, 1 (w.), 11.v.2009, 7 (w.), 12.v.2009, 7 (w.), 30.vii.2009, 1 (w.), 16.viii.2009; Rajaji Forest Area, 1 (w.), 5.viii.2009, 11 (w.), 10.viii.2009, 2 (w.), 25.v.2010; Selaqui, 1 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (Wachkoo, 2015: 383), Uttarakhand (Forel, 1895: 454; Wachkoo, 2015: 383).

***Camponotus nirvanae* Forel, 1893**

Type locality: India: Karnataka: Kanara; Maharashtra: Pune; Sri Lanka

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Bari, 2 (w.), 6.vi.2009, 1 (w.), 1.x.2009; Chanaur, 47 (w.), 1 (q.), 20.x.2008, 8 (w.), 5.vi.2009, 8 (w.), 12.vi.2009; Kotla, 1 (w.), 22.x.2008; Kushinagar, 2 (w.), 17.vi.2009; Nahan, 3 (w.), 6.v.2009; Terrace, 1 (w.), 24.v.2009, 8 (w.), 7.x.2009. **Jammu and Kashmir:** Mansar, 4 (w.), 12.vii.2009; Samba, 6 (w.), 11.vii.2009; Surinsar, 6 (w.), 14.vii.2009. **Uttarakhand:** Forest Research Institute, 1 (w.), 12.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record).

***Camponotus oblongus binominatus* Forel, 1916**

Camponotus oblongus var. *binominata* Forel, 1916

Type locality: India: Tamil Nadu: Tiruchirappalli

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 19 (w.), 2 (q.), 12.vi.2010, 15 (w.), 1 (q.), 20.vi.2010; Baijnath, 1 (w.), 17.vi.2010; Bakhra, 13 (w.), 7.x.2008; Bari, 1 (w.), 15.x.2008; Guga, 12 (w.), 6.x.2008; Jogi Panga, 1 (w.), 9.x.2008; Khatiar, 1 (w.), 18.x.2008; Kotla, 16 (w.), 22.x.2008; Lwasa, 50 (w.), 27.viii.2009; Mandi, 8 (w.), 27.vi.2010; Rewalsar, 17 (w.), 29.vi.2010; Una, 15 (w.), 5.x.2008. **Jammu and Kashmir:** Billawar, 7 (w.), 6.viii.2010; Kathua, 2 (w.), 23.vii.2010; Surinsar, 16 (w.), 14.vii.2009, 19 (w.), 1.viii.2010. **Uttarakhand:** Forest Research Institute, 6 (w.), 4.viii.2009, 6 (w.), 16.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 84).

***Camponotus opaciventris* Mayr, 1879**

Type locality: India: West Bengal: Kolkata

Type depository: ST: NHMW

Material examined: **Himachal Pradesh:** Andretta, 2 (w.), 11.vi.2010, 1 (w.), 12.vi.2010, 1 (w.), 15.vi.2010, 15 (w.), 19.vi.2010; Baijnath, 3 (w.), 23.vi.2010; Bari, 13 (w.), 15.x.2008, 1 (w.), 12.vii.2010; Dehra, 1 (w.), 6.vii.2010; Gagret, 1 (w.), 17.x.2009; Guga, 10 (w.), 6.x.2008; Guraldhar, 5 (w.), 16.x.2008; Jogi Panga, 15 (w.), 9.x.2008; Khatiar, 3 (w.), 11.x.2009; Kotla, 1 (w.), 30.v.2009, 3 (w.), 29.ix.2009; Kushinagar, 1 (w.), 17.vi.2009; Nahan, 10 (w.), 4.vi.2010; Pong Dam, 1 (w.), 18.x.2009; Siholi, 1 (w.), 8.vii.2010; Terrace, 1 (w.), 12.x.2009, 1 (w.), 15.vii.2010; Una, 5 (w.), 5.x.2008. **Jammu and Kashmir:** Mansar, 1 (w.), 3.viii.2010; Sukrala, 1 (q.), 7.viii.2010; Udhampur, 2 (w.), 4.vii.2009. **Punjab:** Dunera, 1 (w.), 23.vi.2009,

7 (w.), 1 (q.), 2 (m.), 24.vii.2010. **Uttarakhand:** Assan Barrage, 12 (w.), 10.v.2009, 1 (w.), 21.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1892: 231; Wachkoo and Akbar, 2016: 4), Jammu and Kashmir, Punjab, Uttarakhand (Wachkoo and Akbar, 2016: 6).

***Camponotus par barbatus* Bharti and Wachkoo, 2014**

Type locality: India: Himachal Pradesh: Rewalsar; Uttarakhand: Forest Research Institute, Rajaji Forest Area

Type depository: HT, PT: PUAC

Material examined: **Himachal Pradesh:** Rewalsar, 3 (w.), 3 (q.), 30.vi.2010. **Uttarakhand:** Forest Research Institute, 6 (w.), 1.viii.2009; Rajaji Forest Area, 8 (w.), 10.viii.2009, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti and Wachkoo, 2014a: 3).

***Camponotus parius* Emery, 1889**

Camponotus micans r. *paria* Emery, 1889

Type locality: Myanmar: Bhamo; Yangon; Sri Lanka

Type depository: MSNG

Material examined: **Himachal Pradesh:** Andretta, 2 (w.), 1 (q.), 12.vi.2010, 1 (w.), 15.vi.2010, 8 (w.), 20.vi.2010; Baijnath, 9 (w.), 23.vi.2010; Bakhra, 12 (w.), 7.x.2008; Bari, 12 (w.), 15.x.2008, 3 (w.), 6.vi.2009; Chanaur, 21 (w.), 20.x.2008, 2 (w.), 5.vi.2009, 3 (w.), 12.vi.2009, 1 (w.), 3.x.2009; Dhaliara, 4 (w.), 9.vi.2009; Gagret, 11 (w.), 8.x.2008, 2 (w.), 17.x.2009; Ghamrur, 7 (w.), 1.vi.2009; Ghatti, 13 (w.), 11.x.2008, 10 (w.), 28.ix.2009, 1 (w.), 13.x.2009, 1 (w.), 10.vii.2010; Guga, 9 (w.), 6.x.2008; Guraldhar, 14 (w.), 16.x.2008, 5 (w.), 2.vi.2009; Jassur, 28 (w.), 8.vi.2009; Jogi Panga, 19 (w.), 9.x.2008; Kandwal, 2 (w.), 25.vi.2009; Khatiar, 5 (w.), 18.x.2008, 2 (w.), 3.vi.2009, 1 (w.), 11.x.2009; Kotla, 17 (w.), 13.x.2008, 3 (w.), 22.x.2008, 2 (w.), 28.v.2009, 7 (w.), 30.v.2009, 2 (w.), 29.ix.2009; Kushinagar, 4 (w.), 17.vi.2009; Mandi, 8 (w.), 27.vi.2010; Nagabari, 5 (w.), 18.vi.2009; Nahan, 4 (w.), 6.v.2009, 1 (w.), 23.viii.2009, 1 (w.), 4.vi.2010; Poanta Sahib, 5 (w.), 9.v.2009; Pong Dam, 15 (w.), 17.x.2008; Siholi, 31 (w.), 19.x.2008, 17 (w.), 4.vi.2009, 1 (w.), 2.x.2009, 1 (w.), 14.x.2009; Terrace, 14 (w.), 12.x.2008, 20 (w.), 21.x.2008, 15 (w.), 23.x.2008, 3 (w.), 24.v.2009, 2 (w.), 25.v.2009, 11 (w.), 13.vi.2009, 2 (w.), 23.ix.2009, 3 (w.), 24.ix.2009, 2 (w.), 25.ix.2009, 2 (w.), 7.x.2009, 2 (w.), 12.x.2009; Una, 1 (w.), 5.x.2008, 3 (w.), 15.x.2009. **Jammu and Kashmir:** Kathua, 1 (w.), 23.vii.2010; Mansar, 1 (w.), 12.vii.2009; Udhampur, 5 (w.), 4 (q.), 1 (m.), 4.vii.2009. **Punjab:** Chohal, 21 (w.), 10.x.2008; Dharampur, 8 (w.), 14.x.2008; Dunera, 9 (w.), 21.vi.2009, 1 (w.), 23.vi.2009; Thein Dam, 10 (w.), 24.vi.2009. **Uttarakhand:** Assan Barrage, 2 (w.), 10.v.2009, 1 (w.), 3.vi.2010; Forest Research Institute, 3 (w.), 11.v.2009, 1 (w.), 12.v.2009, 2 (w.), 13.v.2009, 4 (w.), 2.viii.2009, 1 (w.), 3.viii.2009, 2 (w.), 14.viii.2009, 1 (w.), 16.viii.2009; Rajaji Forest Area, 8 (w.), 5.viii.2009, 1 (w.), 12.viii.2009, 1 (w.), 21.v.2010; Ranger's College, 5 (w.), 22.v.2010, 1 (w.), 11 (m.), 8.vi.2010; Selaqui, 3 (w.), 2.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 84), Punjab (Imai *et al.*, 1984: 9; Bharti *et al.*, 2009: 39).

***Camponotus sylvaticus basalis* Smith, 1878**

Camponotus basalis Smith, F., 1878

Camponotus maculatus r. *lobinieri* Forel, 1902

Type locality: India: Jammu and Kashmir: Sind Valley, Kashmir

Type depository: ST: BMNH

Material examined: **Himachal Pradesh:** Andretta, 9 (w.), 1 (q.), 1 (m.), 15.vi.2010; Guga, 5 (w.), 6.x.2008. **Punjab:** Chohal, 2 (w.), 10.x.2008. **Uttarakhand:** Selaqui, 9 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh,

Punjab and Uttarakhand (new record), Jammu and Kashmir (Emery, 1896: 776; Forel, 1902a: 287).

Cataglyphis setipes (Forel, 1894)

Myrmecocystus viaticus r. *setipes* Forel, 1894
Myrmecocystus viaticus subsp. *setipes* var. *setipedesertorum* Ruzsky, 1905
Cataglyphis bicolor var. *turcomanica* Crawley, 1920
Cataglyphis setipes subsp. *dschambulica* Tarbinsky, 1976
Type locality: India: Rajasthan: Nusseerabad, Rajpootana
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Andretta, 3 (w.), 21.vi.2010; Jogi Panga, 2 (w.), 9.ix.2008; Khatiar, 21 (w.), 1 (q.), 6 (m.), 11.x.2009, 9 (w.), 3.vi.2009; Kotla, 5 (w.), 13.x.2008; Nahani, 1 (w.), 23.viii.2009; Poanta Sahib, 2 (w.), 19.viii.2009; Renuka, 3 (w.), 26.viii.2009; Terrace, 1 (w.), 25.v.2009. **Jammu and Kashmir:** Manda, 3 (w.), 4.viii.2010; Mansar, 1 (w.), 3.viii.2010; Surinsar, 3 (w.), 14.vii.2009. **Uttarakhand:** Ranger's College, 3 (w.), 27.v.2010; Selaqui, 1 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (Wachkoo and Bharti, 2015a: 3), Punjab (Imai *et al.*, 1984: 9; Tak and Rathore, 2004: 171; Bharti *et al.*, 2009: 39).

Lepisiota bipartita (Smith, 1861)

Formica bipartita Smith, 1861
Type locality: Israel: Holy Land
Type depository: ST: BMNH
Material examined: Himachal Pradesh: Baijnath, 9 (w.), 17.vi.2010; Bakhra, 21 (w.), 7.x.2008; Ghamrur, 9 (w.), 1.vi.2009; Ghatti, 1 (w.), 12.x.2008; Guraldhar, 15 (w.), 2.vi.2009; Jogi Panga, 13 (w.), 9.x.2008; Renuka, 5 (w.), 8.v.2009; Terrace, 10 (w.), 24.v.2009, 20 (w.), 25.v.2009, 2 (w.), 9.vii.2010. **Jammu and Kashmir:** Manda, 8 (w.), 15.vii.2009; Mansar, 4 (w.), 13.vii.2009. **Punjab:** Chohal, 17 (w.), 11.x.2008. **Uttarakhand:** Forest Research Institute, 3 (w.), 11.v.2009, 3 (w.), 12.v.2009; Ranger's College, 20 (w.), 22.v.2010, 9 (w.), 25.v.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1894: 414), Punjab (Tak and Rathore, 2004: 172), Jammu and Kashmir and Uttarakhand (new record).

Lepisiota capensis (Mayr, 1862)

Acantholepis capensis Mayr, 1862
Type locality: South Africa: Cape of Good Hope
Type depository: NHMW
Material examined: Himachal Pradesh: Andretta, 1 (w.), 21.vi.2010; Baijnath, 3 (w.), 17.vi.2010; Kotla, 1 (w.), 13.x.2008; Palampur, 2 (w.), 18.vi.2010; Nahani, 2 (w.), 27.viii.2009; Renuka, 1 (w.), 8.v.2009; Terrace, 1 (w.), 24.v.2009. **Uttarakhand:** Forest Research Institute, 3 (w.), 2.ix.2009; Rajaji Forest Area, 3 (w.), 21.v.2010; Selaqui, 1 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 85); Uttarakhand (Forel, 1894: 414).

Lepisiota capensis lunaris (Emery, 1893)

Acantholepis lunaris Emery, 1893
Type locality: Sri Lanka: Colombo
Type depository: ST: MSNG
Material examined: Himachal Pradesh: Bari, 3 (w.), 6.vi.2009; Ghatti, 3 (w.), 12.x.2008; Guga, 2 (w.), 22.x.2008; Jassur, 6 (w.), 6.vi.2009; Kotla, 5 (w.), 22.x.2008; Palampur, 4 (w.), 18.vi.2010; Nagabari, 3 (w.), 18.vi.2009; Terrace, 4 (w.), 12.x.2009. **Punjab:** Dunera, 3 (w.), 24.vii.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh and Punjab (new record).

Lepisiota frauenfeldi integra (Forel, 1894)

Acantholepis frauenfeldi var. *integra* Forel, 1894
Type locality: India: Himachal Pradesh: Dharamsala
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Andretta, 1 (w.), 11.vi.2010, 1 (w.), 27.viii.2009. **Jammu and Kashmir:** Manda, 1 (w.), 500m, 15.vii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1906: 86), Jammu and Kashmir (Bharti *et al.*, 2013a: 85), Punjab (Bharti *et al.*, 2009: 39).

Lepisiota modesta (Forel, 1894)

Acantholepis modesta Forel, 1894
Type locality: India: Uttarakhand: Mussoorie
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Lwasa, 17 (w.), 27.viii.2009. **Punjab:** Dunera, 3 (w.), 24.vii.2010. **Uttarakhand:** Mussoorie, 37 (w.), 9.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh and Punjab (new record), Uttarakhand (Forel, 1894: 414; Bharti, 2002b: 356).

Lepisiota opaca (Forel, 1892)

Acantholepis opaca Forel, 1892
Type locality: India: Karnataka: Kanara
Type depository: ST: MHNG, MSNG
Material examined: Himachal Pradesh: Andretta, 4 (w.), 11.vi.2010; Ghatti, 1 (w.), 12.x.2008, 3 (w.), 28.ix.2009, 6 (w.), 27.ix.2009, Kotla, 1 (w.), 22.x.2008, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85).

Lepisiota opaca pulchella (Forel, 1892)

Acantholepis opaca r. *pulchella* Forel, 1892
Type locality: India: Maharashtra: Pune
Type depository: ST: MHNG
Material examined: Himachal Pradesh: Andretta, 3 (w.), 11.vi.2010, 9 (w.), 11.vi.2010; Chanaur, 5 (w.), 12.vi.2009, 5 (w.), 20.x.2008; Ghatti, 6 (w.), 12.x.2008; Guraldhar, 1 (w.), 2.vi.2009, 2 (w.), 10.vi.2009; Khatiar, 7 (w.), 18.x.2008, 1 (w.), 3.vi.2009; Kotla, 8 (w.), 13.x.2008, 3 (w.), 22.x.2008, 5 (w.), 28.v.2009; Lwasa, 12 (w.), 7.viii.2009; Nahani, 13 (w.), 20.viii.2009, 9 (w.), 27.viii.2009; Siholi, 1 (w.), 4.vi.2009; Terrace, 36 (w.), 11.x.2008, 1 (w.), 21.x.2008, 4 (w.), 26.v.2009, 1 (w.), 13.vi.2009, 11 (w.), 24.ix.2009, 10 (w.), 25.ix.2009. **Jammu and Kashmir:** Manda, 7 (w.), 15.vii.2009; Mansar, 1 (w.), 12.vii.2009, 1 (w.), 13.vii.2009; Samba, 2 (w.), 11.vii.2009; Surinsar, 2 (w.), 14.vii.2009. **Punjab:** Dharampur, 2 (w.), 14.x.2008; Dunera, 1 (w.), 23.vi.2009; Thein Dam, 1 (w.), 24.vi.2009. **Uttarakhand:** Dakpathar, 1 (w.), 20.viii.2009; Forest Research Institute, 1 (w.), 17.viii.2009; Mussoorie, 2 (w.), 13.vii.2009; Rajaji Forest Area, 39 (w.), 6.viii.2009, 4 (w.), 10.viii.2009, 1 (w.), 13.viii.2009; Selaqui, 1 (w.), 7.viii.2009, 2 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85), Punjab (Bharti *et al.*, 2009: 39).

Lepisiota rothneyi (Forel, 1894)

Plagiolepis rothneyi Forel, 1894
Type locality: India: Karnataka: Belgaum; West Bengal: Barrakpore
Type depository: ST: MHNG
Material examined: Uttarakhand: Forest Research Institute, 6 (w.), 11.v.2009, 1 (w.), 13.v.2009, 1 (w.), 30.vii.2009, 2 (w.), 26.v.2010; Rajaji Forest Area, 1 (w.), 5.viii.2009, 2 (w.), 6.viii.2009, 4 (w.), 11.viii.2009, 1 (w.), 6.ix.2009; Selaqui, 4 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

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Distribution in Northwestern Shivalik: Uttarakhand (new record).

Lepisiota rothneyi wroughtonii (Forel, 1902)

Plagiolipsis rothneyi r. *wroughtonii* Forel, 1902

Type locality: India: Tamil Nadu: Ooty, Nilgiris

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Khatiar, 3 (w.), 18.x.2008; Poanta Sahib, 4 (w.), 11.v.2009. **Uttarakhand:** Assan Barrage, 3 (w.), 21.viii.2009; Forest Research Institute, 3 (w.), 1.x.2008, 2 (w.), 12.v.2009, 2 (w.), 30.vii.2009, 2 (w.), 20.v.2010, 4 (w.), 26.v.2010; Rajaji Forest Area, 4 (w.), 6.viii.2009, 4 (w.), 10.viii.2009, 3 (w.), 25.v.2010; Ranger's College, 8 (w.), 25.v.2010, 1 (w.), 27.v.2010; Selaqui, 6 (w.), 24.v.2010, 10 (w.), 7.viii.2009, 1 (w.), 5.ix.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Lepisiota sericea (Forel, 1892)

Acantholepis frauenfeldi var. *sericea* Forel, 1892

Type locality: India: Uttarakhand: Mussoorie

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 9 (w.), 21.vi.2010; Baijnath, 6 (w.), 17.vi.2010; Lwasa, 6 (w.), 27.viii.2009; Palampur, 7 (w.), 18.vi.2010. **Jammu and Kashmir:** Surinsar, 10 (w.), 14.vii.2009. **Uttarakhand:** Mussoorie, 7 (w.), 9.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record), Uttarakhand (Forel, 1894: 413).

Lepisiota simplex (Forel, 1892)

Acantholepis simplex Forel, 1892

Type locality: Africa: Somalia

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 6 (w.), 12.vi.2010; Renuka, 3 (w.), 8.v.2009; Terrace, 1 (w.), 11.x.2008, 1 (w.), 23.x.2008. **Jammu and Kashmir:** Mansar, 3 (w.), 13.vii.2009. **Punjab:** Dharampur, 5 (w.), 14.x.2008. **Uttarakhand:** Dakpathar, 5 (w.), 20.viii.2009; Forest Research Institute, 1 (w.), 1.x.2008, 1 (w.), 4.viii.2009; Mussoorie, 3 (w.), 9.viii.2009; Selaqui, 3 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand (new record).

Lepisiota sp.

Material examined: **Himachal Pradesh:** Kotla 1 (w.), 22.x.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh.

Nylanderia birmana (Forel, 1902)

Prenolepis birmana Forel, 1902

Type locality: Myanmar: Mawlamyine

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Palampur, 27 (w.), 1 (q.), 18.vi.2010; **Uttarakhand:** Forest Research Institute, 43 (w.), 30.ix.2008; 37 (w.), 1.x.2008; Selaqui, 44 (w.), 3.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Wachkoo and Bharti, 2015b: 106).

Nylanderia himalayana Wachkoo and Bharti, 2015

Type locality: India: Himachal Pradesh: Rewalsar

Type depository: HT: PUAC; PT: CASC

Material examined: Himachal Pradesh: Rewalsar, 3 (w.), 30.vi.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Wachkoo and Bharti, 2015b: 111).

Nylanderia indica (Forel, 1894)

Prenolepis indica Forel, 1894

Type locality: India: Maharashtra: Pune, South Konkan; Sri Lanka

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Lwasa, 16 (w.), 27.viii.2009; Nahan, 5 (w.), 27.ix.2009; Terrace, 5 (w.), 24.ix.2009. **Uttarakhand:** Dakpathar, 9 (w.), 20.viii.2009; Rajaji Forest Area, 10 (w.), 5 (q.), 5.viii.2009; Selaqui, 9 (w.), 9.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wachkoo and Bharti, 2015b: 112), Uttarakhand (Imai *et al.*, 1984: 9; Wachkoo and Bharti, 2015b: 112).

Nylanderia smythiesii (Forel, 1894)

Prenolepis smythiesii Forel, 1894

Type locality: India: Uttarakhand: Dehradun

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 13 (w.), 21.vi.2010; Baijnath, 110 (w.), 17.vi.2010; Bakhra, 1 (w.), 7.x.2008; Bilaspur, 99 (w.), 1.vii.2010; Chanaur, 204 (w.), 20.x.2008; Kotla, 19 (w.), 30.ix.2009, 9 (w.), 13.vii.2010; Lwasa, 20 (w.), 27.viii.2009; Nagabari, 6 (w.), 18.vi.2009; Nahan, 3 (w.), 27.ix.2009; Poanta Sahib, 216 (w.), 9.v.2009, 171 (w.), 19.viii.2009; Renuka, 8 (w.), 26.viii.2009; Terrace, 5 (w.), 13.vi.2009, 2 (w.), 24.ix.2009, 4 (w.), 19.vii.2010. **Jammu and Kashmir:** Mansar, 3 (w.), 13.vii.2009; Surinsar, 12 (w.), 14.vii.2009. **Punjab:** Chohal, 1 (w.), 8.x.2008. **Uttarakhand:** Assan Barrage, 204 (w.), 3.vi.2010; Dakpathar, 11 (w.), 20.viii.2009; Forest Research Institute, 12 (w.), 30.ix.2008, 1 (w.), 2.x.2008, 16 (w.), 31.vii.2009; Rajaji Forest Area, 5 (w.), 1 (q.), 9 (m.), 5.viii.2009, 21 (w.), 11.viii.2009, 18 (w.), 7.ix.2010; Selaqui, 7 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Punjab (Wachkoo and Bharti, 2014a: 3, 2015b: 114), Uttarakhand (Forel, 1894: 410, 1906: 86; Wachkoo and Bharti, 2014a: 3, 2015b: 114).

Nylanderia taylori (Forel, 1894)

Prenolepis taylori Forel, 1894

Type locality: India: Odisha

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Lwasa, 1 (w.), 27.viii.2009; Kushinagar, 6 (w.), 3 (q.), 17.vi.2009. **Uttarakhand:** Dakpathar, 4 (w.), 20.viii.2009; Rajaji Forest Area, 3 (w.), 5.viii.2009; Selaqui, 1 (w.), 9.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Wachkoo and Bharti, 2015b: 116), Jammu and Kashmir (Bharti *et al.*, 2013a: 85).

Nylanderia yerburyi (Forel, 1894)

Prenolepis yerburyi Forel, 1894

Type locality: India: Tamil Nadu: Coonoor; Sri Lanka

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Terrace, 7 (w.), 24.v.2009, 18 (w.), 1 (q.), 1 (m.), 26.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Wachkoo and Bharti, 2015b: 117).

Oecophylla smaragdina (Fabricius, 1775)

Formica smaragdina Fabricius, 1775

Formica virescens Fabricius, 1775

Formica viridis Kirby, 1819

Formica macra Guérin-Méneville, 1831

Formica zonata Guérin-Méneville, 1838

Type locality: India

Type depository: ST: ZMUK

Material examined: **Himachal Pradesh:** Nahan, 21 (w.), 6.v.2009, 7 (w.), 4.vi.2010. **Jammu and Kashmir:** Surinsar, 6 (w.), 14.vii.2009. **Punjab:** Sukhna, 90 (w.), 5.x.2010. **Uttarakhand:** Dakpathar, 1 (w.), 20.viii.2009; Forest Research Institute, 9 (w.), 11.v.2009, 7 (w.), 12.v.2009, 1 (w.), 26.v.2010, 2 (w.), 16.viii.2009; Rajaji Forest Area, 13 (w.), 10.viii.2009, 1 (w.), 11.viii.2009, 8 (w.), 6.ix.2010; Ranger's College, 1 (w.), 27.v.2010, Selaqui, 11 (w.), 3.x.2008, 5 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85), Punjab (Tak and Rathore, 2004: 172; Bharti *et al.*, 2009: 39; Bharti and Kaur, 2011: 16; Tak, 2009: 39; Tak and Kazmi, 2011: 47), Uttarakhand (Forel, 1894: 401; Mukherji and Ribeiro, 1925: 208; Tak and Rathore, 2004: 172).

Paratrechina longicornis (Latreille, 1802)

Formica longicornis Latreille, 1802

Formica vagans Jerdon, 1851

Formica gracilescens Nylander, 1856

Paratrechina currens Motschoulsky, 1863

Prenolepis longicornis var. *hagemanni* Forel, 1901

Type locality: Thailand: Bangkok

Type depository: NT: ANIC

Material examined: **Himachal Pradesh:** Bari, 30 (w.), 15.x.2008, 11 (w.), 6.vi.2009; Chanaur, 18 (w.), 20.x.2008, 8 (w.), 5.vi.2009, 33 (w.), 3.x.2009; Ghamrur, 10 (w.), 1.vi.2009; Ghatti, 21 (w.), 12.x.2008, 1 (w.), 28.ix.2009; Guga, 4 (w.), 6.x.2008; Guraldhar, 1 (w.), 16.x.2008, 2 (w.), 2.vi.2009; Jogi Panga, 22 (w.), 9.x.2008; Khatiar, 6 (w.), 11.x.2009; Kotla, 25 (w.), 13.x.2008, 1 (w.), 28.v.2009, 39 (w.), 30.v.2009, 1 (w.), 30.ix.2009; Kushinagar, 12 (w.), 1 (q.), 17.vi.2009; Nahan, 33 (w.), 4 (q.), 6.v.2009, 22 (w.), 23.viii.2009; Poanta Sahib, 47 (w.), 19.viii.2009, 4 (w.), 2.vi.2010; Pong Dam, 14 (w.), 17.x.2008; Siholi, 13 (w.), 19.x.2008; Suketi, 2 (w.), 25.viii.2009; Terrace, 25 (w.), 11.x.2008, 32 (w.), 21.x.2008, 1 (w.), 25.ix.2009, 8 (w.), 3.x.2009, 1 (w.), 19.vii.2010. **Jammu and Kashmir:** Jasrota, 3 (w.), 28.vii.2010; Mansar, 2 (w.), 3.viii.2010; Samba, 21 (w.), 11.vii.2009. **Punjab:** Chohal, 35 (w.), 8.x.2008; Dunera, 21 (w.), 23.vi.2009. **Uttarakhand:** Assan Barrage, 15 (w.), 21.viii.2009; Rajaji Forest Area, 3 (w.), 6.viii.2009; Selaqui, 1 (w.), 3.x.2008, 2 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85), Punjab (Imai *et al.*, 1984: 9; Bharti *et al.*, 2009: 39), Uttarakhand (Forel, 1894: 408).

Plagiolepis dichroa Forel, 1902

Type locality: India: West Bengal: Barrackpore

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Kushinagar, 1 (w.), 17.vi.2009. **Jammu and Kashmir:** Mansar, 2 (w.), 13.vii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85).

Plagiolepis jerdonii Forel, 1894

Type locality: India: Maharashtra: Pune

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 10 (w.), 20.vi.2010; Baijnath, 7 (w.), 17.vi.2010; Dehra, 6 (w.), 7.vii.2010; Dhaliara, 17 (w.), 9.vi.2009; Guraldhar, 6 (w.), 16.x.2008; Jogi Panga, 5 (w.), 9.x.2008; Khatiar, 21 (w.), 18.x.2008, 1 (w.), 3.vi.2009; Kotla, 2 (w.), 13.x.2008, 1 (w.) 22.x.2008; Lwasa, 8

(w.), 7.v.2009, 11 (w.), 6 (q.), 2 (m.), 27.viii.2009; Renuka, 3 (w.), 8.v.2009, 2 (w.), 26.viii.2009; Siholi, 14 (w.), 19.x.2008; Terrace, 12 (w.), 12.x.2008, 26 (w.), 23.v.2009, 103 (w.), 25.v.2009, 10 (w.), 23.ix.2009, 18 (w.), 25.ix.2009, 7 (w.), 17.vii.2010, 3 (w.), 19.vii.2010. **Jammu and Kashmir:** Kathua, 5 (w.), 21.vii.2010, Manda, 27 (w.), 4.viii.2010; Mansar, 1 (w.), 12.vii.2009, 6 (w.), 1 (q.), 13.vii.2009, 3 (w.), 3.viii.2010; Samba, 12 (w.), 11.vii.2009; Surinsar, 2 (w.), 14.vii.2009. **Punjab:** Dharampur, 4 (w.), 14.x.2008. **Uttarakhand:** Assan Barrage, 5 (w.), 3.vi.2010; Forest Research Institute, 64 (w.), 12.v.2009; Rajaji Forest Area, 92 (w.), 11.viii.2009; Selaqui, 84 (w.), 8.viii.2009, 11 (w.), 15.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Punjab and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85).

Plagiolepis sp.

Material examined: **Uttarakhand:** Forest Research Institute, 2 (w.), 13.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Uttarakhand.

Polyrhachis exercita lucidiventris Forel, 1907

Type locality: India: Kerala: Kochi

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Gagret, 2 (w.), 8.x.2008; Jogi Panga, 4 (w.), 9.x.2008, Khatiar, 1 (w.), 18.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

Polyrhachis exercita obtusisquama Forel, 1902

Type locality: Maharashtra: Thane; Odisha

Type depository: ST: MHNG, NHMB

Material examined: **Himachal Pradesh:** Dehra, 7 (w.), 6.vii.2010; Siholi, 41 (w.), 14.x.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

Polyrhachis illaudata Walker, 1859

Polyrhachis mayri Roger, 1863

Polyrhachis duodentata Donisthorpe, 1942

Polyrhachis latispinosa Donisthorpe, 1942

Type locality: Sri Lanka

Type depository: HT: BMNH

Material examined: **Himachal Pradesh:** Andretta, 1 (w.), 11.vi.2010, 4 (w.), 12.vi.2010. **Uttarakhand:** Forest Research Institute, 1 (w.), 11.v.2009, 12 (w.), 12.v.2009, 2 (w.), 30.vii.2009, 1 (w.), 31.vii.2009, 1 (w.), 1.viii.2009, 1 (w.), 3.viii.2009, 1 (w.), 14.viii.2009, 65 (w.), 2 (q.), 26.v.2010; Rajaji Forest Area, 1 (w.), 1 (q.), 5.viii.2009, 1 (w.), 6.viii.2009, 7 (w.), 11.viii.2009; Selaqui, 2 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 85).

Polyrhachis lacteipennis Smith, 1858

Polyrhachis simplex Mayr, 1862

Polyrhachis spiniger Mayr, 1879

Type locality: North India

Type depository: HT: BMNH

Material examined: **Himachal Pradesh:** Andretta, 6 (w.), 1 (q.), 2 (m.), 12.vi.2010; Bakhra, 1 (w.), 7.x.2008; Ghatti, 3 (w.), 2 (q.), 3 (m.) 10.vii.2010; Guga, 4 (w.), 6.x.2008; Jogi Panga, 4 (w.), 9.x.2008; Kotla, 1 (w.), 13.x.2008; Renuka, 2 (w.), 26.viii.2009; Rewalsar, 4 (w.), 29.vi.2010; Terrace, 3 (w.), 12.x.2009; Una, 2 (w.), 5.x.2008. **Jammu and Kashmir:** Manda, 2 (w.), 4.viii.2010; Mansar, 4 (w.), 2 (q.), 3 (m.), 13.vii.2009; Surinsar, 1 (w.),

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14.vii.2009. **Punjab:** Dharampur, 1 (w.), 14.x.2008. **Uttarakhand:** Forest Research Institute, 1 (w.), 11.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 85), Punjab (Imai *et al.*, 1984: 9; Bharti *et al.*, 2009: 39), Uttarakhand (Forel, 1893: 34).

Polyrhachis menelas Forel, 1904

Type locality: India: Uttarakhand: Dehradun

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 1 (w.), 11.vi.2010, 11 (w.), 12.vi.2010, 2 (w.), 13.vi.2010; Bakhra, 10 (w.), 7.x.2008; Bari, 4 (w.), 15.x.2008, 1 (w.), 6.vi.2009; Chanaur, 21 (w.), 20.x.2008, 2 (w.), 5.vi.2009, 5 (w.), 12.vi.2009, 11 (w.), 3.x.2009; Ghatti, 31 (w.), 28.ix.2009, 1 (q.), 10.vii.2010; Guga, 1 (w.), 6.x.2008; Guraldhar, 2 (w.), 16.x.2008, 3 (w.), 2.vi.2009; Jogi Panga, 41 (w.), 9.x.2008, Khatiar, 7 (w.), 11.x.2009, 27 (w.), 18.x.2008; Kotla, 2 (w.), 13.x.2008, 23 (w.), 22.x.2008, 7 (w.), 28.v.2009, 2 (w.), 19.vi.2009; Kushinagar, 8 (w.), 17.vi.2009; Nahan, 2 (w.), 23.viii.2009, 11 (w.), 2 (q.), 4.vi.2010; Renuka, 1 (w.), 26.viii.2009; Rewalsar, 1 (w.), 29.vi.2010; Terrace, 16 (w.), 21.x.2008, 3 (w.), 26.v.2009, 1 (w.), 12.x.2009; Una, 10 (w.), 5.x.2008. **Jammu and Kashmir:** Jasrota, 1 (w.), 28.vii.2010; Mansar, 2 (w.), 13.vii.2009; Sukrala, 2 (w.), 7.viii.2010; Kathua, 1 (w.), 29.vii.2010. **Punjab:** Dharampur, 1(w.), 14.x.2008. **Uttarakhand:** Assan Barrage, 4 (w.), 3.v.2010, 2 (w.), 10.v.2009; Ranger's College, 2 (w.), 25.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand (new record).

Polyrhachis punctillata fergusonii Forel, 1902

Type locality: India: Kerala: Travancore

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Guga, 1 (w.), 6.x.2008; Bari, 1 (w.) 15.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

Polyrhachis punctillata smythiesii Forel, 1895

Type locality: India: Uttarakhand: Dehradun

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 1 (w.), 11.vi.2010; Bari, 1 (w.), 12.vii.2010; Jol, 1 (w.), 6.x.2009; Khatiar, 2 (w.), 18.x.2008; Kotla, 1 (w.), 30.ix.2009; Nahan, 2 (w.), 23.viii.2009, 1 (w.), 27.viii.2009; Siholi, 1 (w.), 1.x.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 85), Uttarakhand (Forel, 1895: 456, 1906: 85).

Polyrhachis tibialis caligata Emery, 1895

Type locality: Myanmar: Carin Cheba

Type depository: MNHN, MSNG

Material examined: **Uttarakhand:** Forest Research Institute, 1 (w.), 11.v.2009, 10 (w.), 12.v.2009, 11 (w.), 30.viii.2009, Rajaji Forest Area, 4 (w.), 25.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

Prenolepis fisheri Bharti and Wachkoo, 2012

Type locality: India: Uttarakhand: Forest Research Institute

Type depository: HT, PT: PUAC; PT: BMNH

Type Material: Uttarakhand: Forest Research Institute, 8 (w.), 1 (q.), 11.v.2009, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Uttarakhand (Bharti and

Wachkoo, 2012b: 120).

Prenolepis naoroji Forel, 1902

Type locality: India: Assam

Type depository: ST: MHNG

Material examined: **Himachal Pradesh:** Andretta, 6 (w.), 11.vi.2010, 12 (w.), 15.vi.2010, 14 (w.), 3 (m.), 19.vi.2010, 12 (w.), 20.vi.2010, 4 (w.), 21.vi.2010; Dattal, 5 (w.), 16.vi.2010; Ghatti, 5 (w.), 28.ix.2009; Guga, 4 (w.), 6.x.2008; Guradhar, 1 (w.), 4.x.2009; Kotla, 33 (w.), 13.x.2008, 13 (w.), 30.v.2009, 4 (w.), 29.ix.2009; Lwasa, 12 (w.), 1 (q.), 27.viii.2009; Nahan, 6 (w.), 13.viii.2009. **Jammu and Kashmir:** Manda, 17 (w.), 4.viii.2010; Mansar, 3 (w.), 3.viii.2010; Samba, 2 (w.), 11.vii.2009; Surinsar, 11 (w.), 14.vii.2009. **Punjab:** Dharampur, 2 (w.), 14.x.2008. **Uttarakhand:** Dakpathar, 4 (w.), 20.viii.2009; Forest Research Institute, 1 (w.), 30.ix.2008, 20 (w.), 1.x.2008, 23 (w.), 30.vii.2009, 1 (w.), 12.v.2009, 3 (w.), 17.viii.2009, 21 (w.), 2.ix.2009, 2 (w.), 4.ix.2010; Rajaji Forest Area, 15 (w.), 5.viii.2009, 1 (w.), 6.viii.2009, 2 (w.), 10.viii.2009, 2 (w.), 11.viii.2009, 15 (w.), 25.v.2010; Selaqui, 1 (w.), 2.x.2008, 13 (w.), 3.x.2008, 7 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2002a: 343; Bharti and Wachkoo, 2012b: 122), Jammu and Kashmir (Bharti *et al.*, 2013a: 86; Bharti and Wachkoo, 2012b: 122), Punjab and Uttarakhand (Bharti and Wachkoo, 2012b: 122).

Pseudolasius diversus Wachkoo and Bharti, 2014

Type locality: India: Uttarakhand: Rajaji Forest Area

Type depository: HT, PT: PUAC; PT: BMNH, CASC

Material examined: **Uttarakhand:** Rajaji Forest Area, 25 (w.), 2 (q.), 6 (m.), 11.viii.2009, 7 (w.), 5.viii.2009, 55 (w.), 6.viii.2009, 30 (w.), 13.viii.2009, 62 (w.), 6.ix.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Uttarakhand (Wachkoo and Bharti, 2014b: 275).

Pseudolasius polymorphicus Wachkoo and Bharti, 2014

Type locality: India: Himachal Pradesh: Andretta

Type depository: HT, PT: PUAC; PT: BMNH, CASC

Material examined: **Himachal Pradesh:** Andretta, 46 (w.), 1 (q.), 6 (m.), 11.vi.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Wachkoo and Bharti, 2014b: 276).

Subfamily Leptanillinae

Leptanilla lamellata Bharti and Kumar, 2012

Type locality: India: Himachal Pradesh: Kotla

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Himachal Pradesh:** Kotla, 11 (w.), 30.v.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Kumar, 2012a: 620).

Subfamily Myrmicinae

Cardiocondyla wroughtonii (Forel, 1890)

Emeryia wroughtonii Forel, 1890

Cardiocondyla wroughtonii var. *hawaiiensis* Forel, 1899

Cardiocondyla wroughtonii subsp. *quadriceps* Forel, 1912

Cardiocondyla wroughtonii var. *bimaculata* Wheeler, 1929

Cardiocondyla emeryi subsp. *chlorotica* Menozzi, 1930

Cardiocondyla longispina Karavaiev, 1935

Cardiocondyla yamauchii Terayama, 1999

Type locality: India: Pune

Type depository: MHNG

Material Examined: **Himachal Pradesh:** Chanaur, 11 (w.), 20.x.2008; Dhaliara, 8 (w.), 09.vi.2009; Guga, 11 (w.), 06.x.2008; Jogi Panga, 3 (w.), 09.x.2008; Khatiar, 11 (w.), 11.x.2009; Kotla, 21 (w.), 1 (q.), 13.x.2008; Paonta Sahib, 1 (w.), 19.viii.2009, 5 (w.), 01.vi.2010; Terrace, 5 (w.), 1 (m.), 11.x.2008, 7 (w.), 3 (q.), 24.v.2009, 3 (w.), 07.x.2009. **Jammu and Kashmir:** Billawar, 12 (w.), 06.viii.2010. **Uttarakhand:** Forest Research Institute, 1 (w.), 17.viii.2009, 2 (w.), 30.vii.2009, 3 (w.), 20.v.2010; Rajaji Forest Area, 3 (w.), 05.viii.2009; Selaqui, 7 (w.), 3 (q.), 10.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86).

***Carebara affinis* (Jerdon, 1851)**

Oecodoma affinis Jerdon, 1851

Atta bellicosa Smith, F., 1858

Solenopsis laboriosa Smith, F., 1861

Solenopsis calida Smith, F., 1863

Pheidologeton affinis var. *australis* Forel, 1915

Pheidologeton australis var. *mjobergi* Forel, 1918

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Bari, 9 (w.), 15.x.2008; Ghatti, 2 (w.), 12.x.2008, 6 (w.), 27.ix.2009; Guraldhar, 38 (w.), 16.x.2008; Kandwal, 6 (w.), 23.vii.2010; Kotla, 28 (w.), 13.x.2008, 20 (w.), 30.v.2009; Paonta Sahib, 32 (w.), 09.v.2009; Renuka, 34 (w.), 26.viii.2009; Terrace, 21 (w.), 4.x.2008, 160 (w.), 11.x.2008, 46 (w.), 23.v.2009, 44 (w.), 21.x.2008, 14 (w.), 25.ix.2009. **Jammu and Kashmir:** Mansar, 15 (w.), 13.vii.2009; Surinsar, 2 (w.), 01.viii.2010. **Uttarakhand:** Forest Research Institute, 734 (w.), 30.ix.2008, 212 (w.), 01.x.2008, 2 (w.), 14.viii.2009; Rajaji Forest Area, 13 (w.), 5.viii.2009, 1 (w.), 11.viii.2009, 4 (w.), 06.ix.2010; Selaqui, 32 (w.), 02.x.2008, 60 (w.), 03.x.2008, 4 (w.), 07.viii.2009, 29 (w.), 08.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Punjab and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88).

***Carebara carinata* Bharti and Kumar, 2013**

Type locality: India: Himachal Pradesh: Ghatti

Type depository: HT, PT: PUAC

Material examined: **Himachal Pradesh:** Ghatti, 3 (w.), 27.ix.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Kumar, 2013a: 49).

***Carebara dentata* Bharti and Kumar, 2013**

Type locality: India: Himachal Pradesh: Andretta, Kotla, Mandi, Terrace; Jammu and Kashmir: Kathua, Surinsar; Punjab: Thein Dam; Uttarakhand: Forest Research Institute, Rajaji Forest Area

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Himachal Pradesh:** Andretta, 6 (w.), 12.vi.2010; Kotla, 1 (w.), 13.vii.2010; Mandi, 6 (w.), 27.vi.2010; Terrace, 2 (w.), 17.vii.2010. **Jammu and Kashmir:** Kathua, 3 (w.), 25.vii.2010; Surinsar, 3 (w.), 14.vii.2009. **Punjab:** Thein Dam, 1 (w.), 20.vi.2009. **Uttarakhand:** Forest Research Institute, 4 (w.), 31.vii.2009; 7 (w.), 04.viii.2009; Rajaji Forest Area, 4 (w.), 11.viii.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand (Bharti and Kumar, 2013a: 50).

***Carebara diversa* (Jerdon, 1851)**

Oecodoma diversa Jerdon, 1851

Pheidole ocellifera Smith, F., 1858

Myrmica polita Smith, F., 1860

Pheidole megacephala Smith, F., 1860

Pheidole militaris Smith, F., 1860

Pheidole pabulator Smith, F., 1860

Pheidole megacephalotes Dalla Torre, 1892

Type locality: India: Kerala: Wynaad

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Terrace, 5 (w.), 25.v.2009. **Uttarakhand:** Dakpathar, 2 (w.), 20.viii.2009; Forest Research Institute, 7 (w.), 19.v.2010; Rajaji Forest Area, 2 (w.), 5.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

***Carebara hornata* Bharti and Kumar, 2013**

Type locality: India: Himachal Pradesh: Andretta

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Himachal Pradesh:** Andretta, 23 (w.), 11.vi.2010, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Kumar, 2013a: 52).

***Carebara propomegata* Bharti and Kumar, 2013**

Type locality: India: Himachal Pradesh: Paonta Sahib, Suketi; Jammu and Kashmir: Manda

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Himachal Pradesh:** Paonta Sahib, 4 (w.), 19.viii.2009; Suketi, 1 (w.), 25.viii.2009. **Jammu and Kashmir:** Manda, 11 (w.), 4.viii.2010, 5 (w.), 15.vii.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (Bharti and Kumar, 2013a: 55).

***Carebara rectangulata* Bharti and Kumar, 2013**

Type locality: India: Jammu and Kashmir: Billawar, Surinsar

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Jammu and Kashmir:** Billawar, 11 (w.), 6.viii.2010; Surinsar, 2 (w.), 01.viii.2010, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti and Kumar, 2013a: 56).

***Carebara spinata* Bharti and Kumar, 2013**

Type locality: India: Himachal Pradesh: Ghatti, Lwasa; Jammu and Kashmir: Sukrala; Uttarakhand: Dakpathar, Rajaji Forest Area

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: **Himachal Pradesh:** Ghatti, 1 (w.), 28.ix.2009; Lwasa, 10 (w.), 27.viii.2009. **Jammu and Kashmir:** Sukrala, 1 (w.), 7.viii.2010. **Uttarakhand:** Dakpathar, 31 (w.), 20.viii.2009; Rajaji Forest Area, 6 (w.), 11.viii.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (Bharti and Kumar, 2013a: 59).

***Cataulacus latus* Forel, 1891**

Type locality: India: Maharashtra: Pune

Type depository: ST: MHNG

Material Examined: **Uttarakhand:** Forest research Institute, 7 (w.), 12.v.2009, 28 (w.), 13.v.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Cataulacus taprobanae* Smith, F., 1853**

Type locality: Sri Lanka

Type depository: HT: BMNH

Material Examined: **Himachal Pradesh:** Andretta, 2 (w.), 11.vi.2010, 10 (w.), 15.vi.2010; Baijnath, 10 (w.), 17.vi.2010;

Ants in Northwestern Shivalik

Ghatti, 4 (w.), 12.x.2008, 4 (w.), 28.ix.2009; Nagabari, 5 (w.), 18.vi.2009; Nahan, 11 (w.), 06.v.2009; Terrace, 1 (w.), 13.vi.2009, 1 (w.), 12.x.2009. **Jammu and Kashmir:** Surinsar, 7 (w.), 01.viii.2010. **Uttarakhand:** Assan Barrage, 1 (w.), 10.v.2009; Forest Research Institute, 2 (w.), 12.v.2009, 5 (w.), 17.viii.2009, 3(w.), 20.v.2010; Rajaji Forest Area, 1 (w.), 05.viii.2009; Ranger's College, 4 (w.), 24.v.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record).

Crematogaster anthracina Smith, F., 1857

Type locality: Singapore

Type depository: ST: OUMNH

Material Examined: **Himachal Pradesh:** Chanaur, 3 (w.), 20.x.2008; Dattal, 2 (w.), 16.vi.2010; Ghatti, 5 (w.), 17.x.2008; Kandwal, 12 (w.), 25.vi.2009; Khatiar, 49 (w.), 18.x.2008, 12 (w.), 03.vi.2009; Paonta Sahib, 23 (w.), 3 (q.), 48 (m.), 19.viii.2009; Suketi, 1 (w.), 25.viii.2009; Terrace, 1 (w.), 11.x.2008, 25 (w.), 23.x.2008, 24 (w.), 25.v.2009; Una, 30 (w.), 05.x.2008. **Jammu and Kashmir:** Manda, 25 (w.), 04.viii.2010; Surinsar, 6 (w.), 01.viii.2010. **Punjab:** Chohal, 24 (w.), 08.x.2008. **Uttarakhand:** Assan Barrage, 39 (w.), 10.v.2009, 20 (w.), 02.vi.2010; Rajaji Forest Area, 5 (w.), 11.viii.2009; Selaqui, 8 (w.), 08.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 86).

Crematogaster binghamii Forel, 1904

Type locality: India: Sikkim

Type depository: LT: MHNG

Material Examined: **Himachal Pradesh:** Andretta, 10 (w.), 13.vi.2010, 2 (w.), 20.vi.2010; Chanaur, 2 (w.), 20.x.2008; Guraldhar, 20 (w.), 04.x.2009; Kandwal, 7 (w.), 23.vii.2010; Khatiar, 3 (w.), 18.x.2008; Kotla, 37 (w.), 13.x.2008, 14 (w.), 22.x.2008, 1 (w.), 29.ix.2009, 8 (w.), 30.ix.2009, 4 (w.), 14.vii.2010; Lwasa, 13 (w.), 27.viii.2009; Paonta Sahib, 1 (w.), 19.viii.2009, 3 (w.), 01.vi.2010; Terrace, 49 (w.), 11.x.2008, 1 (w.), 24.ix.2009, 1 (w.), 25.ix.2009. **Jammu and Kashmir:** Billawar, 5 (w.), 06.viii.2010. **Uttarakhand:** Forest Research Institute, 35 (w.), 30.ix.2008, 7 (w.), 01.x.2008, 5 (w.), 12.viii.2009, 6 (w.), 17.viii.2009, 7 (w.), 30.vii.2009, 2 (w.), 04.ix.2010; Selaqui, 1 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record), Uttarakhand (Blaimer, 2012).

Crematogaster biroi smythiesii Forel, 1902

Type locality: India: Uttarakhand: Dehradun, Nagsidh Forests

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Jogi Panga, 4 (w.), 09.x.2008; Khatiar, 20 (w.), 11.x.2009; Kotla, 2 (w.), 30.ix.2009, 2 (w.), 14.vii.2010; Siholi, 6 (w.), 14.x.2009; Terrace, 14 (w.), 11.x.2008, 6 (w.), 25.ix.2009. **Jammu and Kashmir:** Surinsar, 2 (w.), 14.vii.2009. **Uttarakhand:** Forest Research Institute, 14 (w.), 01.x.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record), Uttarakhand (Forel, 1902b: 204, 1903: 684; Chapman and Capco, 1951: 97; Hosoishi and Ogata, 2009: 64).

Crematogaster flava Forel, 1886

Type locality: India: Assam: Sibsagar

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Andretta, 5 (w.), 15.vi.2010, 5 (w.), 20.vi.2010; Baijnath, 3 (w.), 17.vi.2010; Khajjiyan, 3 (w.), 19.vi.2009; Paonta Sahib, 27 (w.), 09.v.2009. **Uttarakhand:** Assan Barrage, 9 (w.), 10.v.2009; Forest Research Institute, 10 (w.), 11.v.2009, 20 (w.), 12.v.2009, 8 (w.), 13.v.2009,

12 (w.), 12.viii.2009, 9 (w.), 20.v.2010; Selaqui, 13 (w.), 09.viii.2009, 6 (w.), 29.v.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Blaimer, 2012), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Uttarakhand (new record).

Crematogaster rothneyi Mayr, 1879

Crematogaster rothneyi Smith, F., 1873

Type locality: India: West Bengal: Kolkata

Type depository: ST: NHMW

Material Examined: **Himachal Pradesh:** Andretta, 6 (w.), 11.vi.2010; Bari, 9 (w.), 01.x.2009; Chanaur, 15 (w.), 20.x.2008, 15 (w.), 05.vi.2009, 20 (w.), 03.x.2009; Dehra, 5 (w.), 06.vii.2010; Guga, 4 (w.), 06.x.2008; Guraldhar, 4 (w.), 16.x.2008; Nahan, 22 (w.), 23.viii.2009; Rehan, 8 (w.), 08.vii.2010; Siholi, 5 (w.), 19.x.2008; Terrace, 4 (w.), 19.x.2008, 12 (w.), 26.v.2009, 16 (w.), 02.x.2009, 24 (w.), 14.x.2009. **Jammu and Kashmir:** Udhampur, 7 (w.), 04.vii.2009. **Punjab:** Dharampur, 7 (w.), 14.x.2008; Thein Dam, 1 (w.), 20.vi.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record), Uttarakhand (Forel, 1903: 682, 1906: 89).

Crematogaster sagei Forel, 1902

Type locality: India: Himachal Pradesh: Dharamsala;

Uttarakhand: Dehradun

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Dattal, 6 (w.), 16.vi.2010; Kotla, 5 (w.), 15.x.2010; Terrace, 2 (w.), 23.x.2008. **Jammu and Kashmir:** Billawar, 5 (w.), 06.viii.2010. **Uttarakhand:** Forest Research Institute, 2 (w.), 30.ix.2008, 2 (w.), 19.v.2010; Selaqui, 6 (w.), 05.ix.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1902b: 205; Blaimer, 2012), Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 86), Uttarakhand (Forel, 1902b: 205).

Crematogaster subnuda Mayr, 1879

Type locality: India: West Bengal: Kolkata

Type depository: ST: NHMW

Material Examined: **Himachal Pradesh:** Bari, 48 (w.), 15.x.2008; Chanaur, 14 (w.), 12.vi.2009, 25 (w.), 20.x.2008; Dhaliara, 12 (w.), 09.vi.2009; Ghatti, 22 (w.), 12.x.2008, 17 (w.), 17.x.2008, 29 (w.), 27.ix.2009; Guga, 24 (w.), 06.x.2008; Guraldhar, 25 (w.), 04.x.2009; Jogi Panga, 14 (w.), 09.x.2008; Jol, 9 (w.), 06.x.2009; Khatiar, 39 (w.), 18.x.2008, 10 (w.), 11.x.2009; Kotla, 38 (w.), 13.x.2008, 13 (w.), 15.x.2009; Nahan, 17 (w.), 23.viii.2009, 10 (w.), 4.vi.2010; Paonta Sahib, 26 (w.), 19.viii.2009; Renuka, 12 (w.), 08.v.2009; Siholi, 3 (w.), 02.x.2009; Terrace, 31 (w.), 11.x.2008, 10 (w.), 21.x.2008, 38 (w.), 25.ix.2009, 23 (w.), 10.vii.2010. **Jammu and Kashmir:** Kathua, 16 (w.), 30.vii.2010; Manda, 27 (w.), 15.vii.2009. **Punjab:** Chohal, 37 (w.), 08.x.2008; Jugial, 9 (w.), 24.vi.2009; Thein Dam, 14 (w.), 17.vi.2009. **Uttarakhand:** Forest Research Institute, 12 (w.), 30.ix.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2008: 84), Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 86), Punjab (Imai *et al.*, 1984: 6; Tak and Rathore, 2004: 175; Bharti, 2008: 84; Bharti *et al.*, 2009: 38; Tak and Kazmi, 2011: 42), Uttarakhand (Bharti, 2008: 84; Blaimer, 2012).

Dilobocondyla gasteroreticulata Bharti and Kumar, 2013

Dilobocondyla gasteroreticulatus Bharti and Kumar, 2013

Type locality: India: Himachal Pradesh: Baijnath; Uttarakhand: Forest Research Institute

Type depository: HT, PT: PUAC; PT: BMNH

Material Examined: Himachal Pradesh: Baijnath, 4 (w.), 17.vi.2010. **Uttarakhand:** Forest Research Institute, 1 (w.), 19.v.2010, 8 (w.), 1 (q.), 26.v.2010, leg. R. Kumar and H. Bharti (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti and Kumar, 2013b: 34).

***Erromyrmex latinodis* (Mayr, 1872)**

Monomorium latinode Mayr, 1872

Monomorium latinode var. *bruneum* Emery, 1893

Monomorium voeltzkowi Forel, 1907

Type locality: Malaysia: Sarawak: Borneo

Type depository: LT: BMNH; PLT: MSNG

Material Examined: Uttarakhand: Rajaji Forest Area, 2 (w.), 06.ix.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Gauomyrmex acanthinus* (Karavaiev, 1935)**

Solenomyrmex acanthina Karavaiev, 1935

Acalama donisthorpei Smith, M.R., 1949

Type locality: Vietnam

Type depository: ST: Unknown

Material Examined: Himachal Pradesh: Andretta, 7 (w.), 20.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

***Lophomyrmex ambiguus* Rigato, 1994**

Type locality: India: Northeast region; Uttarakhand: Dehradun;

Kumaon District, Kathgodam

Type depository: HT: ANIC; PT: ANIC, BMNH, MCZC

Material Examined: Uttarakhand: Forest Research Institute, 6 (w.), 30.vii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Uttarakhand (Rigato, 1994: 54).

***Lophomyrmex bedoti* Emery, 1893**

Type locality: Indonesia: Sumatra: Deli

Type depository: ST: MSNG

Material Examined: Himachal Pradesh: Lwasa, 3 (w.), 27.viii.2009; Renuka, 32 (w.), 26.viii.2009; Terrace, 5 (w.), 24.ix.2009; Una, 4 (w.), 05.x.2008. **Uttarakhand:** Dakpathar, 6 (w.), 20.viii.2009; Forest Research Institute, 352 (w.), 30.ix.2008, 409 (w.), 01.x.2008, 61 (w.), 03.x.2008, 65 (w.), 30.vii.2009, 4 (w.), 01.viii.2009, 3 (w.), 02.viii.2009, 4 (w.), 03.viii.2009, 41 (w.), 04.viii.2009, 5 (w.), 12.viii.2009, 15 (w.), 17.viii.2009, 13 (w.), 26.v.2010; Rajaji Forest Area, 9 (w.), 05.viii.2009, 3 (w.), 06.viii.2009, 27 (w.), 11.viii.2009, 11 (w.), 07.ix.2010; Ranger's College, 19 (w.), 24.v.2010; Selaqui, 309 (w.), 02.ix.2008, 43 (w.), 09.viii.2009, 19 (w.), 05.ix.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Uttarakhand (Forel, 1903: 695; Imai *et al.*, 1984: 7).

***Lophomyrmex quadrispinosus* (Jerdon, 1851)**

Oecodoma quadrispinosa Jerdon, 1851

Lophomyrmex quadrispinosus var. *taprobanae* Forel, 1911

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material Examined: Himachal Pradesh: Chanaur, 1 (w.), 03.x.2009; Kotla, 16 (w.), 29.ix.2009, 89 (w.), 22.x.2008; Nahan, 1 (w.), 23.viii.2009; Paonta Sahib, 6 (w.), 09.v.2009, 10 (w.), 19.viii.2009, 20 (w.), 01.vi.2010; Terrace, 1 (w.), 24.ix.2009.

Uttarakhand: Forest Research Institute, 3 (w.), 20.v.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Uttarakhand (Forel, 1906: 88).

***Lophomyrmex terraceensis* Bharti and Kumar, 2012**

Type locality: India: Himachal Pradesh: Terrace

Type depository: HT, PT: PUAC

Material Examined: Himachal Pradesh: Terrace, 2 (w.), 25.v.2009, leg. R. Kumar and H. Bharti (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Kumar, 2012b: 266).

***Mayriella transfuga* Baroni Urbani, 1977**

Type locality: Nepal: NW Narainghat

Type depository: HT, PT: NHMB; PT: BMNH

Material Examined: Himachal Pradesh: Ghatti, 10 (w.), 12.x.2008, 15 (w.), 27.ix.2009, 8 (w.), 13.x.2009, 21 (w.), 27.ix.2009; Nagabari, 1 (w.), 18.vi.2009; Paonta Sahib, 11 (w.), 19.viii.2009; Rehan, 5 (w.), 08.vii.2010; Terrace, 5 (w.), 07.x.2009. **Uttarakhand:** Forest Research Institute, 1 (w.), 17.viii.2009, 2 (w.), 04.ix.2010; Rajaji Forest Area, 6 (w.), 11.viii.2009; Selaqui, 1 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Uttarakhand (Shattuck and Barnett, 2007: 449).

***Meranoplus bicolor* (Guerin-Meneville, 1844)**

Cryptocerus bicolor Guérin-Méneville, 1844

Myrmica tarda Jerdon, 1851

Meranoplus dimicans Walker, 1859

Meranoplus villosus Motschoulsky, 1860

Meranoplus bicolor var. *lucida* Forel, 1903

Meranoplus bicolor var. *fuscescens* Wheeler, 1930

Type locality: India: Tamil Nadu: Pudicherry

Type depository: T: Unknown

Material Examined: Himachal Pradesh: Andretta, 14 (w.), 11.vi.2010; Baijnath, 4 (w.), 17.vi.2010; Bilaspur, 5 (w.), 02.vii.2010; Chanaur, 4 (w.), 20.x.2008; Dattal, 6 (w.), 16.vi.2010; Ghatti, 10 (w.), 12.x.2008; Kandwal, 21 (w.), 23.vii.2010; Khajjiyan, 1 (w.), 19.vi.2009; Kotla, 3 (w.), 13.x.2008, 3 (w.), 22.x.2008, 22 (w.), 30.ix.2009; Paonta Sahib, 10 (w.), 01.vii.2010; Rehan, 5 (w.), 08.vii.2010; Terrace, 7 (w.), 21.x.2008, 10 (w.), 12.x.2009, 3 (w.), 24.v.2009; Una, 258 (w.), 05.x.2008. **Jammu and Kashmir:** Billawar, 5 (w.), 06.viii.2010; Kathua, 8 (w.), 25.vii.2010, 2 (w.), 30.vii.2010; Mansar, 5 (w.), 31.vii.2010; Sukrala, 3 (w.), 7.viii.2010; Udampur, 6 (w.), 04.vii.2009. **Punjab:** Dharampur, 3 (w.), 14.x.2008. **Uttarakhand:** Forest Research Institute, 11 (w.), 30.vii.2009, 96 (w.), 17.viii.2009, 6 (w.), 26.v.2010; Selaqui, 60 (w.), 08.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Punjab (Imai *et al.*, 1984: 6; Schödl, 1998: 371; Tak and Rathore, 2004: 176; Bharti *et al.*, 2009: 38; Tak, 2009: 17), Uttarakhand (Schödl, 1998: 371).

***Messor himalayanus* (Forel, 1902)**

Stenammina barbarum r. *himalayanum* Forel, 1902

Type locality: India: Jammu and Kashmir: Rajauri, Panjab; Himachal Pradesh: Dharamsala; Uttarakhand: Garhwal, Tons Valley; Mussorie

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Andretta, 6 (w.), 13.vi.2010; Bajaura, 19 (w.), 23.vi.2010; Bilaspur, 1 (w.), 01.vii.2010; Guraldhar, 1 (w.), 16.x.2008, 11 (w.), 04.x.2009; Lwasa, 13 (w.), 27.viii.2009; Mandi, 1 (w.), 27.vi.2010; Rewalsar, 2 (w.), 29.vi.2010. **Punjab:** Dunera, 4 (w.), 23.vi.2009, leg. R. Kumar.

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Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1902b: 220, 1903: 695, 1906: 86), Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 86), Punjab (Tak, 2009: 27), Uttarakhand (Forel, 1902b: 220, 1903: 695).

***Messor instabilis* (Smith, F., 1858)**

Atta instabilis Smith, F., 1858

Aphaenogaster barbara var. *punctata* Forel, 1886

Type locality: India: Northwestern region

Type depository: ST: BMNH

Material Examined: **Himachal Pradesh:** Bakhra, 4 (w.), 07.x.2008; Bari, 64 (w.), 15.x.2008, 11 (w.), 01.x.2009; Chanaur, 13 (w.), 20.x.2008; Ghatti, 51 (w.), 17.x.2008; Guga, 15 (w.), 06.x.2008; Guraldhar, 22 (w.), 16.x.2008, 20 (w.), 04.x.2009; Jogi Panga, 34 (w.), 09.x.2008; Khatiar, 7 (w.), 11.x.2009; Kotla, 7 (w.), 22.x.2008; Siholi, 7 (w.), 17.vii.2010; Terrace, 32 (w.), 23.x.2008, 10 (w.), 10.vii.2010. **Punjab:** Chohal, 4 (w.), 08.x.2008; Dharampur, 14 (w.), 14.x.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 86), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1903: 694).

***Monomorium floricola* (Jerdon, 1851)**

Atta floricola Jerdon, 1851

Monomorium cinnabari Roger, 1863

Monomorium poecilum Roger, 1863

Monomorium specularis Mayr, 1866

Monomorium impressum Smith, F., 1876

Monomorium floricola var. *philippinensis* Forel, 1910

Monomorium floricola var. *furina* Forel, 1911

Monomorium floreanum Stütz, 1932

Monomorium angusticlava Donisthorpe, 1947

Type locality: India: Kerala: Malabar, Thalassery

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Nagabari, 8 (w.), 18.vi.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87).

***Monomorium indicum* Forel, 1902**

Monomorium salomonis r. *indicum* Forel, 1902

Type locality: India: Tamil Nadu: Tiruchirappalli

Type depository: ST: HNHM

Material Examined: **Himachal Pradesh:** Ghatti, 30 (w.), 12.x.2008; Khatiar, 20 (w.), 11.x.2009; Khushinagar, 16 (w.), 17.vi.2009; Nahan, 35 (w.), 23.viii.2009; Suketi, 46 (w.), 1 (q.), 25.viii.2009; Terrace, 12 (w.), 11.x.2008, 39 (w.), 24.v.2009, 4 (w.), 17.vii.2010; Una, 34 (w.), 05.x.2008. **Jammu and Kashmir:** Mansar, 31 (w.), 31.vii.2010; Manda, 24 (w.), 05.vii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Imai *et al.*, 1984: 7; Bharti *et al.*, 2009: 38; Tak and Rathore, 2004: 177; Tak, 2009: 25, 2010: 138; Tak and Kazmi, 2011: 44).

***Monomorium monomorium* Bolton, 1987**

Monomorium minutum Mayr, 1855

Type locality: Italy: Lido

Type depository: ST: BMNH

Material Examined: **Uttarakhand:** Assan Barrage, 3 (w.), 21.viii.2009; Rajaji Forest Area, 2 (w.), 10.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Monomorium orientale* Mayr, 1879**

Type locality: India: West Bengal: Kolkata

Type depository: HT: NHMW

Material Examined: **Himachal Pradesh:** Andretta, 15 (w.), 11.vi.2010; Baijnath, 6 (w.), 17.vi.2010; Chanaur, 3 (w.), 12.vi.2009; Ghatti, 1 (w.), 27.ix.2009, 2 (w.), 12.x.2008; Guga, 8 (w.), 06.x.2008; Guraldhar, 3 (w.), 04.x.2009; Jogi Panga, 1 (w.), 09.x.2008; Khatiar, 7 (w.), 18.x.2008; Kotla, 13 (w.), 30.ix.2009; Lwasa, 2 (w.), 27.viii.2009; Nahan, 6 (w.), 23.viii.2009; Siholi, 1 (w.), 04.vi.2009; Terrace, 14 (w.), 11.x.2008; Una, 6 (w.), 05.x.2008. **Jammu and Kashmir:** Manda, 2 (w.), 15.vii.2009; Sukrala, 8 (w.), 07.viii.2010; Surinsar, 5 (w.), 01.viii.2010. **Uttarakhand:** Rajaji Forest Area, 3 (w.), 11.viii.2009, 20 (w.), 05.viii.2009, 13 (w.), 06.viii.2009, 1 (w.), 10.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Imai *et al.*, 1984: 7).

***Monomorium pharaonis* (Linnaeus, 1758)**

Formica pharaonis Linnaeus, 1758

Formica antiguensis Fabricius, 1793

Myrmica domestica Shuckard, 1838

Atta minuta Jerdon, 1851

Myrmica vastator Smith, F., 1857

Myrmica contigua Smith, F., 1858

Myrmica fragilis Smith, F., 1858

Type locality: Egypt

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Bari, 31 (w.), 15.x.2008; Chanaur, 44 (w.), 20.x.2008; Guga, 8 (w.), 06.x.2008; Guraldhar, 67 (w.), 16.x.2008, 20 (w.), 02.vi.2009; Jogi Panga, 14 (w.), 09.x.2008; Khatiar, 3 (w.), 18.x.2008; Khushinagar, 6 (w.), 17.vi.2009; Kotla, 5 (w.), 13.x.2008, 4 (w.), 22.x.2008; Renuka, 2 (w.), 08.v.2009; Siholi, 6 (w.), 19.x.2008. **Jammu and Kashmir:** Samba, 1 (w.), 11.vii.2009. **Punjab:** Chohal, 4 (w.), 08.x.2008; Dunera, 14 (w.), 21.vi.2009. **Uttarakhand:** Assan Barrage, 2 (w.), 02.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Bharti *et al.*, 2009: 38).

***Monomorium sagei* Forel, 1902**

Type locality: India: Himachal Pradesh: Dharamsala

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Andretta, 15 (w.), 12.vi.2010; Chanaur, 2 (w.), 20.x.2008, 10 (w.), 05.vi.2009; Siholi, 3 (w.), 19.x.2008; Dattal, 12 (w.), 16.vi.2010; Ghatti, 10 (w.), 12.x.2008; Terrace, 11 (w.), 11.x.2008, 8 (w.), 24.ix.2009, 8 (w.), 20.vii.2010. **Jammu and Kashmir:** Kathua, 15 (w.), 25.vii.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1902b: 211, 1903: 688, 1906: 88; Mukherji and Ribeiro, 1925: 207; Pisarski, 1967: 395), Jammu and Kashmir (Bharti *et al.*, 2013a: 87).

***Myrmecaria brunnea* Saunders, 1842**

Type locality: India: Northwestern Provinces

Type depository: HT: Unknown

Material Examined: **Himachal Pradesh:** Bakhra, 39 (w.), 07.x.2008; Bari, 7 (w.), 01.x.2009; Bilaspur, 1 (w.), 01.vii.2010; Ghatti, 3 (w.), 17.x.2008, 10 (w.), 27.ix.2009, 8 (w.), 11.vii.2010; Jogi Panga, 12 (w.), 09.x.2008; Kotla, 2 (w.), 15.x.2009, 10 (w.), 13.vii.2010; Nahan, 14 (w.), 23.viii.2009; Renuka, 2 (w.), 26.viii.2009; Siholi, 4 (w.), 17.vii.2010; Terrace, 2 (w.), 25.v.2009, 3 (w.), 12.x.2009. **Jammu and Kashmir:** Billawar, 8 (w.), 6.viii.2010; Kathua, 5 (w.), 29.vii.2010; Manda, 3 (w.), 04.viii.2010, 7 (w.), 15.vii.2009; Samba, 7 (w.), 11.vii.2009; Surinsar, 6 (w.), 14.vii.2009, 7 (w.), 01.viii.2010; Udampur, 12 (w.), 04.vii.2009. **Punjab:** Chohal, 43 (w.), 08.x.2008; Thein Dam,

10 (w.), 20.vi.2009; 7 (w.), 17.vi.2009. **Uttarakhand:** Assan Barrage, 5 (w.), 21.viii.2009, leg., R. Kumar.
Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88), Punjab (Bharti *et al.*, 2009: 39).

Pheidole indica Mayr, 1879

Pheidole striativentris Mayr, 1879

Pheidole indica r. *himalayana* Forel, 1902

Pheidole indica r. *rotschana* Forel, 1902

Pheidole javana r. *jubilans* var. *formosae* Forel, 1912

Type locality: India: West Bengal: Kolkata

Type depository: LT, PLT: NHMW

Material Examined: Himachal Pradesh: Terrace, 8 (w.), 12.x.2009; Una, 10 (w.), 05.x.2008. **Punjab:** Chohal, 5 (w.), 08.x.2008. **Uttarakhand:** Ranger's College, 5 (w.), 2.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1902b: 198, 1902c: 546, 1906: 89; Eguchi, 2004: 198), Jammu and Kashmir (Bharti and Sharma, 2009: 13; Bharti *et al.*, 2013a: 88), Punjab (Imai *et al.*, 1984: 6; Bharti *et al.*, 2009: 38; Bharti and Gill, 2011: 39), Uttarakhand (new record).

Pheidole jucunda fassulata Forel, 1902

Type locality: India: Maharashtra: Pune

Type depository: ST: MHNG, MSNG

Material Examined: Himachal Pradesh: Ghatti, 2 (w.), 28.ix.2009; Kandwal, 10 (w.), 25.vi.2009; Renuka, 4 (w.), 26.viii.2009. **Uttarakhand:** Rajaji Forest Area, 28 (w.), 1 (q.), 11.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88).

Pheidole latinoda major Forel, 1885

Type locality: India

Type depository: ST: NHMW

Material Examined: Himachal Pradesh: Andretta, 11 (w.), 11.vi.2010, 35 (w.), 15.vi.2010, 3 (w.), 19.vi.2010; Bakhra, 54 (w.), 07.x.2008; Bari, 45 (w.), 15.x.2008; Chanaur, 32 (w.), 12.vi.2009, 32 (w.), 20.x.2008; Ghatti, 93 (w.), 12.x.2008, 25 (w.), 17.x.2008, 27 (w.), 11.vii.2010; Guga, 261 (w.), 06.x.2008; Guraldhar, 183 (w.), 16.x.2008; Jogi Panga, 794 (w.), 09.x.2008; Khatiar, 30 (w.), 18.x.2008; Kotla, 240 (w.), 13.x.2008, 168 (w.), 15.x.2009, 15 (w.), 28.v.2009, 32 (w.), 30.v.2009, 27 (w.), 13.vii.2010; Nagabari, 36 (w.), 18.vi.2009; Paonta Sahib, 13 (w.), 01.vi.2010; Pong Dam, 29 (w.), 17.x.2008; Siholi, 25 (w.), 19.x.2008; Terrace, 50 (w.), 01.x.2008, 736 (w.), 11.x.2008, 241 (w.), 21.x.2008, 26 (w.), 25.v.2009; Una, 263 (w.), 05.x.2008. **Jammu and Kashmir:** Mansar, 5 (w.), 13.vii.2009; Surinsar, 60 (w.), 14.vii.2009; Udhampur, 11 (w.), 04.vii.2009. **Punjab:** Chohal, 487 (w.), 08.x.2008; Dharampur, 24 (w.), 14.x.2008; Thein Dam, 15 (w.), 26.vi.2009; Dunera, 25 (w.), 23.vi.2009. **Uttarakhand:** Assan Barrage, 17 (w.), 21.viii.2009; Forest Research Institute, 107 (w.), 12.v.2009, 13 (w.), 13.v.2009, 35 (w.), 17.viii.2009; Ranger's College, 10 (w.), 24.v.2010; Selaqui, 2 (w.), 02.x.2008, leg., R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Punjab and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88).

Pheidole parva Mayr, 1865

Pheidole parva var. *decanica* Forel, 1902

Pheidole flavens var. *farquharensis* Forel, 1907

Pheidole sauteri Wheeler, 1909

Pheidole rinae var. *mala* Forel, 1911

Pheidole rinae r. *tipuna* Forel, 1912

Pheidole bugi Wheeler, 1919

Pheidole tardus Donisthorpe, 1947

Type locality: Sri Lanka

Type depository: LT, PLT: NHMW

Material Examined: Jammu and Kashmir: Kathua, 20 (w.), 25.vii.2010. **Uttarakhand:** Rajaji Forest Area, 9 (w.), 2.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (new record), Uttarakhand (Eguchi *et al.*, 2007: 261; Eguchi, 2008: 66).

Pheidole pronotalis Forel, 1902

Type locality: Sri Lanka

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Andretta, 1 (w.), 15.vi.2010; Palampur, 3 (w.), 14.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

Pheidole sagei Forel, 1902

Type locality: India: Himachal Pradesh: Dharamsala

Type depository: ST: MHNG, MSNG

Material Examined: Himachal Pradesh: Terrace, 5 (w.), 24.v.2009; Lwasa, 5 (w.), 27.viii.2009. **Uttarakhand:** Forest Research Institute, 6 (w.), 13.v.2009; Rajaji Forest Area, 5 (w.), 05.viii.2009, 10 (w.), 2 (m.), 06.viii.2009, 8 (w.), 10.viii.2009, 24 (w.), 1 (q.), 2 (m.), 11.viii.2009, 4 (w.), 13.viii.2009; Selaqui, 2 (w.), 2 (q.), 2 (m.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1902b: 192, 1902c: 542, 1906: 88; Matthew and Tiwari, 2000: 318), Uttarakhand (new record).

Pheidole sharpi Forel, 1902

Type locality: India: Tamil Nadu: Salem

Type depository: ST: MHNG

Material Examined: Uttarakhand: Forest Research Institute, 18 (w.), 4 (q.), 17.viii.2009; Rajaji Forest Area, 38 (w.), 3 (q.), 05.viii.2009, 2 (w.), 10.viii.2009, 10(w.), 1(q.), 11.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2013a: 88), Uttarakhand (new record).

Pheidole smythiesii Forel, 1902

Pheidole smythiesii var. *bengalensis* Forel, 1902

Pheidole bhavanae Bingham, 1903

Type locality: India: Assam

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Andretta, 9 (w.), 11.vi.2010, 7 (w.), 2 (q.), 14 (m.); Baijnath, 4 (w.), 17.vi.2010; Bilaspur, 7 (w.), 01.vii.2010; Mandi, 3 (w.), 27.vi.2010; Rewalsar, 12 (w.), 6 (q.), 30.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Eguchi, 2008: 87), Jammu and Kashmir (Bharti *et al.*, 2013a: 88).

Pheidole spathifera aspatha Forel, 1902

Type locality: India: Assam

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Dehra, 10 (w.), 1 (m.), 06.vii.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88).

Pheidole woodmasoni Forel, 1885

Type locality: India: West Bengal: Kolkata; Odisha

Type depository: ST: MHNG

Material Examined: Himachal Pradesh: Andretta, 4 (w.), 15.vi.2010; Baijnath, 14 (w.), 17.vi.2010; Terrace, 15 (w.), 23.x.2008, 6 (w.), 26.v.2009. **Jammu and Kashmir:** Manda, 2

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(w.), 15.vii.2009, 4 (w.), 04.viii.2010; Surinsar, 5 (w.), 14.vii.2009; Udhampur, 14 (w.), 04.vii.2009. **Uttarakhand:** Forest Research Institute, 9 (w.), 04.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88), Punjab (Imai *et al.*, 1984: 6), Uttarakhand (Forel, 1902b: 191, 1902c: 541, 1906: 88).

Recurvidris recurvispinosa (Forel, 1890)

Trigonogaster recurvispinosus Forel, 1890

Type locality: India: Maharashtra: Pune

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Chanaur, 6 (w.), 03.x.2009; Ghatti, 52 (w.), 27.ix.2009, 16 (w.), 28.ix.2009; Guraldhar, 2 (w.), 16.x.2008; Kotla, 1 (w.), 13.x.2008, 11 (w.), 30.ix.2009; Lwasa, 2 (w.), 27.viii.2009; Nagabari, 25 (w.), 18.vi.2009; Paonta Sahib, 8 (w.), 19.viii.2009, 3 (w.), 01.vi.2010; Rehan, 2 (w.), 08.vii.2010; Siholi, 35 (w.), 19.x.2008, 3 (w.), 02.x.2009; Terrace, 26 (w.), 11.x.2008, 1(w.), 24.ix.2009, 11 (w.), 25.ix.2009. **Jammu and Kashmir:** Billawar, 1 (w.), 06.viii.2010; Mansar, 7 (w.), 13.vii.2009; Manda, 2 (w.), 04.viii.2010. **Punjab:** Thein Dam, 3 (w.), 20.vi.2009. **Uttarakhand:** Forest Research Institute, 1 (w.), 17.viii.2009; Rajaji Forest Area, 8 (w.), 11.viii.2009, 5 (w.), 13.viii.2009; Selaqui, 5 (w.), 05.viii.2009, 1 (w.), 07.viii.2009, 1 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Punjab (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88), Uttarakhand (Bolton, 1992: 46; Sheela *et al.*, 2000: 95).

Solenopsis geminata (Fabricius, 1804)

Atta geminata Fabricius, 1804

Myrmica paleata Lund, 1831

Solenopsis mandibularis Westwood, 1840

Atta rufa Jerdon, 1851

Atta clypeata Smith, F., 1858

Myrmica mellea Smith, F., 1859

Solenopsis cephalotes Smith, F., 1859

Crematogaster laboriosus Smith, F., 1860

Myrmica laevissima Smith, F., 1860

Diplorhoptrum drewseni Mayr, 1861

Myrmica glaber Smith, F., 1862

Myrmica polita Smith, F., 1862

Atta coloradensis Buckley, 1866

Atta lincecumii Buckley, 1866

Myrmica saxicola Buckley, 1866

Solenopsis geminata var. *diabola* Wheeler, 1908

Solenopsis geminata var. *nigra* Forel, 1908

Solenopsis eduardi Forel, 1912

Solenopsis geminata var. *innota* Santschi, 1915

Solenopsis geminata subsp. *medusa* Mann, 1916

Solenopsis geminata var. *galapageia* Wheeler, 1919

Solenopsis edouardi var. *bahiaensis* Santschi, 1925

Solenopsis edouardi var. *perversa* Santschi, 1925

Type locality: Central America

Type depository: ST: ZMUC

Material Examined: **Himachal Pradesh:** Bajaura, 1100m, 4 (w.), 23.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2001: 164).

Strumigenys exilirhina Bolton, 2000

Type locality: Nepal: Sanghu

Type depository: HT: BMNH; PT: BMNH, MCZC, MHNG, OUMNH

Material Examined: **Uttarakhand:** Forest Research Institute, 2 (w.), 30.ix.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

Strumigenys membranifera Emery, 1869

Strumigenys membranifera r. *simillima* Emery, 1890

Strumigenys membranifera var. *santschii* Forel, 1904

Strumigenys vitiensis Mann, 1921

Strumigenys foochowensis Wheeler, 1928

Strumigenys silvestriana Wheeler, 1928

Strumigenys membranifera var. *marioni* Wheeler, 1933

Strumigenys membranifera var. *williamsi* Wheeler, 1933

Type locality: Italy: Napoli, Portici

Type depository: ST: MSNG

Material Examined: **Himachal Pradesh:** Andretta, 4 (w.), 15.vi.2010; Terrace, 1 (w.), 10.x.2008, 2 (w.), 11.x.2008. **Jammu and Kashmir:** Mansar, 1 (w.), 31.vii.2010. **Uttarakhand:** Dakpathar, 5 (w.), 20.viii.2009; Forest Research Institute, 3 (w.), 1 (q.), 04.ix.2010; Rajaji Forest Area, 2 (w.), 10.viii.2009, 7 (w.), 11.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record).

Strumigenys nepalensis De Andrade, 1994

Type locality: Nepal: Narainghat; Manhari; India: Meghalaya: Darugiri

Type depository: HT: NHMB; PT: BMNH, NHMB

Material Examined: **Himachal Pradesh:** Andretta, 16 (w.), 2 (q.), 15.vi.2010; Nagabari, 1 (q.), 18.vi.2009; Siholi, 3 (w.), 19.x.2008; Terrace, 6 (w.), 11.x.2008. **Uttarakhand:** Rajaji Forest Area, 38 (w.), 1 (q.), 11.viii.2009; Selaqui, 10 (w.), 08.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Strumigenys virgila Bolton, 2000

Type locality: India: Himachal Pradesh: Shivalik Hills, Nahan; Uttarakhand: Dehradun, Rajaji National Park

Type depository: HT: NHMW; PT: BMNH

Material Examined: **Himachal Pradesh:** Andretta, 60 (w.), 2 (m.), 15.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bolton, 2000: 832).

Tetramorium bicarinatum (Nylander, 1846)

Myrmica bicarinata Nylander, 1846

Myrmica cariniceps Guérin-Méneville, 1852

Myrmica kollari Mayr, 1853

Myrmica modesta Smith, F. 1860

Myrmica reticulata Smith, F. 1862

Type locality: U.S.A.: California

Type depository: Lost

Material Examined: **Himachal Pradesh:** Andretta, 1 (w.), 20.vi.2010; Ghatti, 1 (w.), 27.ix.2009; Terrace, 3 (w.), 12.x.2009. **Uttarakhand:** Forest Research Institute, 3 (w.), 13.v.2009, 1 (w.), 17.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Tetramorium coonoorensis Forel, 1902

Type locality: India: Tamil Nadu: Coonoor

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Terrace, 1 (w.), 11.x.2008. **Uttarakhand:** Selaqui, 1 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Tetramorium lanuginosum Mayr, 1870

Tetramorium obesum r. *striatidens* Emery, 1889

Triglyphothrix striatidens var. *laevicens* Forel, 1900

Triglyphothrix striatidens var. *australis* Forel, 1902
Triglyphothrix striatidens r. *orissana* Forel, 1902
Triglyphothrix ceramensis Stütz, 1912
Triglyphothrix striatidens var. *felix* Forel, 1912
Triglyphothrix striatidens var. *flavescens* Wheeler, 1929
Triglyphothrix mauricei Donisthorpe, 1946
Triglyphothrix tricolor Donisthorpe, 1948

Type locality: Indonesia: Java: Batavia

Type depository: HT: NHMW

Material Examined: **Himachal Pradesh:** Bakhra, 5 (w.), 07.x.2008; Chanaur, 17 (w.), 20.x.2008; Dhaliara, 14 (w.), 09.vi.2009; Kotla, 1 (w.), 13.ix.2009; Nahan, 18 (w.), 06.v.2009, 2 (w.), 23.viii.2009; Renuka, 2 (w.), 25.viii.2009; Terrace, 12 (w.), 11.x.2008, 4 (w.), 11.vi.2009. **Jammu and Kashmir:** Mansar, 4 (w.), 13.vii.2009. **Uttarakhand:** Assan Barrage, 20 (w.), 02.vi.2010; Forest Research Institute, 10 (w.), 01.x.2008, 3 (w.), 20.v.2010; Selaqui, 5 (w.), 03.x.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 88), Punjab (Imai *et al.*, 1984: 8).

***Tetramorium obesum* Andre, 1887**

Type locality: India: Tamil Nadu: Gingee

Type depository: ST: MCZC; MNHN

Material Examined: **Himachal Pradesh:** Bakhra, 1 (w.), 07.x.2008, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record).

***Tetramorium shivalikense* Bharti and Kumar, 2012**

Type locality: India: Himachal Pradesh: Andretta, Chanaur, Dattal, Ghatti, Palampur, Siholi, Terrace; Punjab: Dharampur; Uttarakhand: Forest Research Institute, Selaqui

Type depository: HT, PT: PUAC; PT: BMNH

Material Examined: **Himachal Pradesh:** Andretta, 2 (w.), 11.vi.2010; Chanaur, 2 (w.), 3.x.2009; Dattal, 1 (w.), 16.vi.2010; Ghatti, 4 (w.), 27.ix.2009; Palampur, 8 (w.), 14.vi.2010; Siholi, 18 (w.), 19.x.2008; Terrace, 12 (w.), 11.x.2008, 1 (w.), 25.v.2009, 1 (w.), 24.ix.2009. **Punjab:** Dharampur, 1 (w.), 14.x.2008. **Uttarakhand:** Forest Research Institute, 50 (w.), 14.viii.2009, 1 (w.), 17.viii.2009; Selaqui, 1 (w.), 9.viii.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh, Punjab and Uttarakhand (Bharti and Kumar, 2012c: 13).

***Tetramorium simillimum* (Smith, F., 1851)**

Myrmica simillima Smith, F., 1851

Myrmica parallela Smith, 1859

Tetramorium pygmaeum Emery, 1877

Tetramorium simillimum var. *insulare* Santschi, 1928

Wasmannia auropunctata subsp. *brevispinosa* Borgmeier, 1928

Tetramorium simillimum r. *denticulatum* 1902

Tetramorium pusillum var. *bantouana* Santschi, 1910

Tetramorium simillimum var. *opacior* Forel, 1913

Tetramorium pusillum var. *exoleta* Santschi, 1914

Tetramorium pusillum st. *bantuala* var. *breve* Santschi, 1924

Type locality: Great Britain: England: Dorset

Type depository: ST: Lost

Material Examined: **Himachal Pradesh:** Bajaura, 24 (w.), 5 (q.), 3 (m.), 23.vi.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Punjab (Imai *et al.*, 1984: 8; Bolton, 1977: 131).

***Tetramorium smithi* Mayr, 1879**

Tetramorium simillimum r. *laevinode* Forel, 1902

Tetramorium smithi var. *kanariense* Forel, 1902

Type locality: India: West Bengal: Kolkata

Type depository: ST: BMNH, NHMW

Material Examined: **Himachal Pradesh:** Bilaspur, 6 (w.), 01.vii.2010; Chanaur, 16 (w.), 03.x.2009; Dehra, 3 (w.), 06.vii.2010; Guga, 2 (w.), 06.x.2008. **Jammu and Kashmir:** Mansar, 1 (w.), 31.vii.2010. **Punjab:** Dunera, 4 (w.), 23.vi.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Punjab (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89).

***Tetramorium tonganum* Mayr, 1870**

Tetramorium magitae Forel, 1911

Type locality: Tonga: Tongatapu

Type depository: ST: NHMW

Material Examined: **Himachal Pradesh:** Andretta, 28 (w.), 3 (q.), 8 (m.), 20.vi.2010; Baijnath, 14 (w.), 13 (q.), 8 (m.), 17.vi.2010; Lwasa, 1 (w.), 07.v.2009; Mandi, 14 (w.), 27.vi.2010. **Uttarakhand:** Forest Research Institute, 1 (w.), 17.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti and Kumar, 2012c: 23).

***Tetramorium triangulatum* Bharti and Kumar, 2012**

Type locality: India: Himachal Pradesh: Andretta; Punjab: Patiala; Uttarakhand: Assan Barrage

Type depository: HT, PT: PUAC; PT: BMNH

Material Examined: **Himachal Pradesh:** Andretta, 47 (w.), 10 (q.), 7 (m.), 19.vi.2010; **Uttarakhand:** Assan Barrage, 1 (w.), 10.v.2009, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti and Kumar, 2012c: 16).

***Tetramorium walshi* (Forel, 1890)**

Triglyphothrix walshi Forel, 1890

Triglyphothrix musculus Forel, 1902

Triglyphothrix walshi var. *spuria* Forel, 1912

Type locality: India: Bengal; Maharashtra: Pune; Odhisa: Puri

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Ghatti, 5 (w.), 27.ix.2009, 2 (w.), 03.x.2009, 40 (w.), 05.x.2009; Paonta Sahib, 2 (w.), 19.viii.2009; Siholi, 31 (w.), 14.x.2009, 15 (w.), 19.vii.2010; Dehra, 15 (w.), 06.vii.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Imai *et al.*, 1984: 8; Bharti *et al.*, 2009: 38).

***Trichomyrmex aberrans* (Forel, 1902)**

Monomorium aberrans Forel, 1902

Type locality: India: Madhya Pradesh: Pachmarhi

Type depository: ST: MHNG

Material Examined: **Himachal Pradesh:** Andretta, 1 (w.), 11.vi.2010; Baijnath, 7 (w.), 17.vi.2010; Bakhra, 1 (w.), 07.x.2008; Bilaspur, 6 (w.), 01.vii.2010; Ghatti, 4 (w.), 27.ix.2009, 30 (w.), 28.ix.2009; Kandwal, 3 (w.), 23.vii.2010; Khajjiyan, 6 (w.), 19.vi.2009; Khatiar, 1 (w.), 18.x.2008, 10 (w.), 03.vi.2009; Kotla, 21 (w.), 13.x.2008; Mandi, 8 (w.), 30.v.2009, 7 (w.), 27.vi.2010; Paonta Sahib, 4 (w.), 19.viii.2009; Rehan, 6 (w.), 08.vii.2010; Suketi, 11 (w.), 25.viii.2009; Terrace, 35 (w.), 11.x.2008, 10 (w.), 23.v.2009. **Jammu and Kashmir:** Mansar, 5 (w.), 13.vii.2009; Surinsar, 9 (w.), 01.viii.2010. **Punjab:** Dunera, 6 (w.), 23.vi.2009. **Uttarakhand:** Forest Research Institute, 12 (w.), 01.viii.2009; Ranger's College, 1 (w.), 02.viii.2009; Selaqui, 16 (w.), 08.viii.2009, 13 (w.), 05.ix.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh, Punjab and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87).

***Trichomyrmex destructor* (Jerdon, 1851)**

Ants in Northwestern Shivalik

Atta destructor Jerdon, 1851

Myrmica basalis Smith, F., 1858

Myrmica atomaria Gerstäcker, 1859

Myrmica ominosa Gerstäcker, 1859

Myrmica gracillima Smith, F., 1861

Myrmica vexator Smith, F., 1861

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material Examined: Himachal Pradesh: Andretta, 23 (w.), 1 (q.), 2 (m.), 20.vi.2010; Bajaura, 32 (w.), 1 (q.), 23.vi.2010; Bari, 22 (w.), 06.vi.2009, 40 (w.), 01.x.2009; Bilaspur, 28 (w.), 01.vii.2010; Chanaur, 22 (w.), 20.x.2008; Ghamrur, 12 (w.), 01.vi.2009; Ghatti, 11 (w.), 12.x.2008, 10 (w.), 28.ix.2009, 17 (w.), 05.x.2009, 6 (w.), 11.vii.2010; Guraldhar, 35 (w.), 04.x.2009; Khajjiyan, 16 (w.), 19.vi.2009; Khatiar, 21 (w.), 18.x.2008; Khushinagar, 20 (w.), 17.vi.2009; Nahan, 20 (w.), 04.vi.2010; Siholi, 41 (w.), 04.vi.2009; Terrace, 14 (w.), 11.x.2008, 3 (w.), 21.x.2008, 20 (w.), 23.v.2009, 6 (w.), 24.v.2009, 7 (w.), 1 (q.), 2 (m.), 26.v.2009, 12 (w.), 25.ix.2009. **Jammu and Kashmir:** Billawar, 13 (w.), 06.viii.2010; Surinsar, 10 (w.), 14.vii.2009. **Punjab:** Dunera, 4 (w.), 23.vi.2009; Thein Dam, 10 (w.), 20.vi.2009. **Uttarakhand:** Forest Research Institute, 11 (w.), 29.v.2010; Rajaji Forest Area, 12 (w.), 05.viii.2009, leg. R. Kumar. **Distribution in Northwestern Shivalik:** Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Bharti *et al.*, 2009: 38).

Trichomyrmex glaber (André, 1883)

Holcomyrme glaber André, 1883

Holcomyrme glaber var. *clarus* Forel, 1902

Holcomyrme glaber var. *glabrocriniceps* Forel, 1902

Type locality: India: Tamil Nadu: Chennai

Type depository: ST: MNHN

Material Examined: Himachal Pradesh: Jogi Panga, 12 (w.), 09.x.2008; Kotla, 15 (w.), 22.x.2008. **Punjab:** Dunera, 4 (w.), 24.vii.2010; Thein Dam, 18 (w.), 20.vi.2009. **Uttarakhand:** Rajaji Forest Area, 12 (w.), 21.v.2010, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Bharti *et al.*, 2009: 38).

Trichomyrmex scabriceps (Mayr, 1879)

Holcomyrme scabriceps Mayr, 1879

Holcomyrme scabriceps var. *crincipitoscabriceps* Forel, 1902

Type locality: India: West Bengal: Kolkata

Type depository: ST: BMNH, NHMW

Material Examined: Himachal Pradesh: Bakhra, 34 (w.), 07.x.2008; Bari, 6 (w.), 01.x.2009; Bilaspur, 16 (w.), 01.vii.2010; Chanaur, 4 (w.), 20.x.2008; Ghatti, 24 (w.), 27.ix.2009; Guraldhar, 13 (w.), 16.x.2008; Jogi Panga, 42 (w.), 09.x.2008; Kandwal, 26 (w.), 23.vii.2010; Khatiar, 12 (w.), 11.x.2009; Khushinagar, 10 (w.), 17.vi.2009; Kotla, 11 (w.), 13.x.2008, 30 (w.), 22.x.2008, 16 (w.), 23.x.2008, 7 (w.), 29.ix.2009; Nahan, 28 (w.), 23.viii.2009; Rehan, 3 (w.), 08.vii.2010; Renuka, 7 (w.), 08.v.2009; Siholi, 11 (w.), 14.x.2009; Suketi, 7 (w.), 25.viii.2009; Terrace, 11 (w.), 21.x.2008. **Jammu and Kashmir:** Jasrota, 7 (w.), 28.vii.2010. **Punjab:** Chohal, 16 (w.), 08.x.2008; Thein Dam, 13 (w.), 20.vi.2009. **Uttarakhand:** Rajaji Forest Area, 05.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 87), Punjab (Imai *et al.*, 1984: 7; Tak, 2009: 22).

Vollenhovia gasteropunctata Bharti and Kumar, 2013

Type locality: India: Himachal Pradesh: Andretta

Type depository: HT, PT: PUAC

Material Examined: Himachal Pradesh: Andretta, 2 (w.), 15.vi.2010, leg. R. Kumar (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Kumar, 2013c: 68).

Subfamily Ponerinae

Anochetus cryptus Bharti and Wachkoo, 2013

Type locality: India: Jammu and Kashmir: Billawar, Manda, Surinsar; Himachal Pradesh: Chanaur

Type depository: HT, PT: PUAC; PT: BMNH

Material Examined: Himachal Pradesh: Chanaur, 2 (w.), 5.vi.2009. **Jammu and Kashmir:** Billawar, 2 (w.), 6.viii.2010; Manda, 4 (w.), 1 (q.), 15.vii.2009; Surinsar, 1 (w.), 1.viii.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (Bharti and Wachkoo, 2013b: 138).

Anochetus graeffei Mayr, 1870

Anochetus punctiventris Mayr, 1879

Anochetus rudis Emery, 1889

Anochetus punctiventris subsp. *oceanicus* Emery, 1897

Anochetus punctiventris r. *taylori* Forel, 1900

Anochetus amati Karavaiev, 1925

Anochetus minutus Karavaiev, 1925

Type locality: Samoa: Upolu Island

Type depository: LT, PLT: NHMW

Material examined: Himachal Pradesh: Andretta, 15 (w.), 12.vi.2010; Bari, 1 (w.), 1.x.2009; Bilaspur, 8 (w.), 1.vii.2010, 1 (w.), 2.vii.2010; Chanaur, 6 (w.), 20.x.2008, 7 (w.), 5.vi.2009, 9 (w.), 12.vi.2009; Guraldhar, 2 (w.), 16.x.2008, 16 (w.), 2.vi.2009, 1 (w.), 4.x.2009; Kotla, 3 (w.), 30.v.2009, 1 (w.), 13.vii.2010; Lwasa, 44 (w.), 1 (q.), 27.viii.2009; Renuka, 1 (w.), 26.viii.2009; Suketi, 2 (w.), 25.viii.2009; Terrace, 7 (w.), 15.vii.2010. **Jammu and Kashmir:** Kathua, 1 (w.), 27.vii.2010; 4 (w.), 1 (q.), 15.vii.2009; Manda, 2 (w.), 4.viii.2010; Udampur, 5 (w.), 4.vii.2009. **Uttarakhand:** Assan Barrage, 9 (w.), 10.v.2009, 2 (w.), 3.vi.2010; Forest Research Institute, 2 (w.), 12.v.2009, 6 (w.), 14.viii.2009; Ranger's College, 6 (w.), 4.viii.2009, 21 (w.), 2 (m.), 22.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89).

Anochetus madaraszi Mayr, 1897

Type locality: India: Karnataka: Kanara; Sri Lanka: Kalawewa

Type depository: ST: NHMW

Material examined: Jammu and Kashmir: Mansar, 3 (w.), 13.vii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir (new record).

Anochetus myops Emery, 1893

Type locality: Malaysia: Perak

Type depository: HT: MSNG

Material examined: Himachal Pradesh: Andretta, 4 (w.), 12.vi.2010, 3 (w.), 13.vi.2010. **Uttarakhand:** Forest Research Institute, 2 (w.), 30.ix.2008, 26 (w.), 11.v.2009, 1 (w.), 13.v.2009, 2 (w.), 30.vii.2009, 39 (w.), 1.viii.2009, 1 (w.), 3.viii.2009, 6 (w.), 4.viii.2009, 7 (w.), 14.viii.2009, 10 (w.), 16.viii.2009, 12 (w.), 20.v.2010, 3 (w.), 4.ix.2010; Rajaji Forest Area, 1 (w.), 12.viii.2009, 1 (w.), 13.viii.2009; Selaqui, 1 (q.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Anochetus sedilloti Emery, 1884

Anochetus sedilloti var. *indicus* Forel, 1900

Type locality: Tunisia: Gabès, Gafsa

Type depository: ST: MSNG

Material examined: Punjab: Ropar, 9 (w.), 15.vi.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Punjab (new record).

***Anochetus validus* Bharti and Wachkoo, 2013**

Type locality: India: Jammu and Kashmir: Billawar, Jasrota, Kathua, Manda, Mansar, Samba

Type depository: HT, PT: PUAC; PT: BMNH

Material examined: Jammu and Kashmir: Billawar, 4 (w.), 6.viii.2010; Jasrota, 1 (w.), 28.vii.2010; Kathua, 1 (w.), 27.vii.2010; Manda, 1 (w.), 1 (q.), 15.vii.2009, 10 (w.), 4.viii.2010; Mansar, 1 (w.), 13.vii.2009; Samba, 3 (w.), 11.vii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti and Wachkoo, 2013b: 141).

***Bothroponera tesseronoda* (Emery, 1877)**

Ponera tesseronoda Emery, 1877

Type locality: India: West Bengal: Kolkata

Type depository: ST: NHMW

Material examined: Himachal Pradesh: Nahan, 54 (w.), 23.viii.2009. **Uttarakhand:** Dakpathar, 82 (w.), 20.viii.2009; Selaqui, 7 (w.), 3.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900a: 325, 1906: 91).

***Brachyponera jerdonii* (Forel, 1900)**

Ponera jerdonii Forel, 1900

Type locality: India: Assam; Kerala: Calicut; Maharashtra: Pune; West Bengal: Kolkata, Barrackpore

Type depository: ST: MHNG

Material examined: Jammu and Kashmir: Sukrala, 12 (w.), 7.viii.2010. **Uttarakhand:** Assan Barrage, 7 (w.), 10.v.2009, 17 (w.), 21.viii.2009, 1 (w.), 3.vi.2010; 20 (w.), 1 (q.), Selaqui, 2.x.2008, 8 (w.), 3.x.2008, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir and Uttarakhand (new record).

***Brachyponera luteipes* (Mayr, 1862)**

Ponera luteipes Mayr, 1862

Type locality: Andaman and Nicobar Islands: Nicobar Islands

Type depository: ST: NHMW

Material examined: Himachal Pradesh: Andretta, 7 (w.), 11.vi.2010, 18 (w.), 13.vi.2010, 2 (w.), 14.vi.2010, 1 (w.), 20.vi.2010; Baijnath, 14 (w.), 17.vi.2010, 7 (w.), 23.vi.2010; Bakhra, 21 (w.), 7.x.2008; Bari, 25 (w.), 15.x.2008, 1 (w.), 6.vi.2009; Billawar, 11 (w.), 6.viii.2010; Chanaur, 37 (w.), 20.x.2008; Ghamrur, 1 (w.), 1.vi.2009; Ghatti, 8 (w.), 17.x.2008, 61 (w.), 28.ix.2009, 11 (w.), 5.x.2009, 53 (w.), 12.x.2008, 2 (w.), 13.x.2009; Guga, 29 (w.), 6.x.2008; Guraldhar, 38 (w.), 16.x.2008, 8 (w.), 4.x.2009; Jogi Panga, 37 (w.), 9.x.2008; Khatiar, 28 (w.), 18.x.2008, 5 (w.), 11.x.2009; Kotla, 23 (w.), 13.x.2008, 17 (w.), 22.x.2008; Kushinagar, 5 (w.), 17.vi.2009, Lwasa, 5 (w.), 8 (w.), 7.v.2009, 27.viii.2009; Mandi, 1 (w.), 27.vi.2010, Palampur, 1 (w.), 18.vi.2010; Nagabari, 2 (w.), 18.vi.2009; Nahan, 4 (w.), 23.viii.2009; Poanta Sahib, 9 (w.), 4 (m.), 9.v.2009; Pong Dam, 2 (w.), 17.x.2008; Renuka, 6 (w.), 8.v.2009, 17 (w.), 1 (q.), 26.viii.2009; Rewalsar, 12 (w.), 2 (q.), 29.vi.2010; Siholi, 56 (w.), 19.x.2008; Terrace, 374 (w.), 11.x.2008, 21 (w.), 21.x.2008, 27 (w.), 23.x.2008, 2 (w.), 23.v.2009, 12 (w.), 24.v.2009, 30 (w.), 25.v.2009, 2 (w.), 26.v.2009, 26 (w.), 13.vi.2009, 25 (w.), 23.ix.2009, 70 (w.), 24.ix.2009, 2 (w.), 25.ix.2009, 1 (w.), 12.x.2009, 7 (w.), 17.vii.2010, 8 (w.), 19.vii.2010; Una, 51 (w.), 5.x.2008. **Jammu and Kashmir:** Kathua, 1 (w.), 23.vii.2010, 4 (w.), 29.vii.2010; Manda, 3 (w.), 15.vii.2009; Mansar, 1 (w.), 12.vii.2009, 2 (w.),

13.vii.2009; Surinsar, 7 (w.), 14.vii.2009, 5 (w.), 1.viii.2010.

Punjab: Chohal, 56 (w.), 8.x.2008; Dunera, 1 (w.), 24.vii.2010. **Uttarakhand:** Assan Barrage, 3 (w.), 10.v.2009; Dakpathar, 11 (w.), 1 (m.), 20.viii.2009; Forest Research Institute, 24 (w.), 30.ix.2008, 8 (w.), 12.v.2009, 1 (w.), 31.vii.2009, 1 (w.), 1.viii.2009, 2 (w.), 4.viii.2009, 3 (w.), 16.viii.2009, 1 (w.), 20.v.2010; Rajaji Forest Area, 16 (w.), 5.viii.2009, 40 (w.), 1(q.), 11.viii.2009, 116 (w.), 12.viii.2009, 7 (w.), 13.viii.2009, 12 (w.), 6.ix.2010, 1 (w.), 7.ix.2010; Ranger's College, 1 (w.), 22.v.2010, 5 (w.), 25.v.2010; Selaqui, 14 (w.), 2.x.2008, 42 (w.), 3.x.2008, 4 (w.), 7.viii.2009, 59 (w.), 8.viii.2009, 40 (w.), 9.viii.2009, 14 (w.), 10.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1900a: 326, 1906: 91), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900a: 326, 1906: 91).

***Buniapone amblyops* (Emery, 1887)**

Ponera amblyops Emery, 1887

Type locality: Indonesia: Sumatra: Ajer Mantcior

Type depository: ST: MSNG

Material examined: Uttarakhand: Dakpathar, 1 (q.), 20.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Cryptopone subterranea* Bharti and Wachkoo, 2013**

Type locality: India: Jammu and Kashmir: Surinsar; Himachal Pradesh: Nagabari

Type depository: HT, PT: PUAC

Material examined: Himachal Pradesh: Nagabari, 1 (w.), 18.vii.2009. **Jammu and Kashmir:** Surinsar, 1 (w.), 14.vii.2009, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (Bharti and Wachkoo, 2013c: 3).

***Ectomomyrmex striolatus* (Donisthorpe, 1933)**

Pachycondyla striolata Donisthorpe, 1933

Type locality: India: Uttarakhand: Dehradun

Type depository: ST: BMNH

Material examined: Himachal Pradesh: Andretta, 14 (w.), 11.vi.2010, 1 (w.), 13.vi.2010, 2 (w.), 20.vi.2010; Lwasa, 1 (w.), 1 (q.), 27.viii.2009; Mandi, 1 (w.), 27.vi.2010. **Uttarakhand:** Forest Research Institute, 5 (w.), 12.v.2009, 4 (w.), 1.viii.2009, 1 (w.), 3.x.2009, 1 (w.), 4.ix.2010; Rajaji Forest Area, 1 (w.), 5.viii.2009, 3 (w.), 6.viii.2009, 2 (w.), 11.viii.2009, 5 (w.), 12.viii.2009, 1 (w.), 13.viii.2009, 1 (w.), 25.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Uttarakhand (Donisthorpe, 1933: 194).

***Harpegnathos venator* (Smith, 1858)**

Drepanognathus venator Smith, 1858

Type locality: India: Tamil Nadu: Chennai

Type depository: HT: BMNH

Material examined: Himachal Pradesh: Bari, 1 (w.), 6.vi.2009; Bilaspur, 1 (w.), 2.vii.2010; Chanaur, 1 (w.), 5.vi.2009; Lwasa, 1 (w.), 27.viii.2009; Nahan, 1 (w.), 1 (q.), 23.viii.2009; Renuka, 1 (w.), 26.viii.2009; Terrace, 1 (w.), 21.x.2008. **Jammu and Kashmir:** Surinsar, 1 (w.), 16.vii.2009. **Punjab:** Dunera, 1 (w.), 24.vii.2010; Thein Dam, 3 (w.), 4.vi.2009. **Uttarakhand:** Selaqui, 2 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900b: 64, 1906: 92; Donisthorpe, 1937: 199).

***Hypoconera assmuthi* (Forel, 1905)**

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Ponera abeillei r. *assmuthi* Forel, 1905

Type locality: India: Maharashtra: Mumbai: Khandala

Type depository: ST: MHNG

Material examined: Jammu and Kashmir: Jasrota, 1(w.), 28.vii.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti *et al.*, 2015: 40).

Hypoponera confinis (Roger, 1860)

Ponera confinis Roger, 1860

Ponera convexiuscula var. *nautarum* Santschi, 1938

Type locality: Sri Lanka

Type depository: T: Unknown

Material examined: Himachal Pradesh: Andretta, 2 (w.), 12.vi.2010, 6 (w.), 5 (q.), 13.vi.2010; Ghatti, 1 (w.), 12.x.2008, 2 (w.), 28.ix.2009; Kotla, 2 (q.), 30.ix.2009; Nahan, 1 (w.), 20.viii.2009, Rewalsar, 1 (w.), 20.vi.2010, Siholi, 1 (w.), 2.x.2009; Terrace, 37 (w.), 6 (q.), 11.x.2008, 12 (w.), 3 (q.), 24.ix.2009, 2 (w.), 25.ix.2009, 2 (w.), 19.vii.2010. **Jammu and Kashmir:** Manda, 1 (w.), 1 (q.), 15.vii.2009, 2 (w.), 4.viii.2010, Surinsar, 15 (w.), 4 (q.), 1.viii.2010; Udhampur, 1 (q.), 4.vii.2009. **Uttarakhand:** Dakpathar, 1 (w.), 20.viii.2009; Forest Research Institute, 2 (w.), 1 (q.), 30.ix.2008; Rajaji Forest Area, 48 (w.), 1 (q.), 2 (m.), 5.viii.2009, 3 (q.), 6.viii.2009, 7 (w.), 6 (q.), 11.viii.2009, 7 (w.), 9 (q.), 12.viii.2009, 1 (w.), 13.viii.2009, 1 (w.), 6.ix.2010, 2 (w.), 7.ix.2010; Selaqui, 10 (w.), 8.viii.2009, 2 (w.), 2 (q.), 9.viii.2009, 9 (w.), 9 (q.), 5.ix.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti *et al.*, 2015: 42), Jammu and Kashmir (Bharti *et al.*, 2013a: 89; Bharti *et al.*, 2015: 42).

Hypoponera ragusai (Emery, 1894)

Ponera ragusai Emery, 1894

Ponera gleadowii Emery, 1895

Ponera gleadowii r. *decipiens* Forel, 1899

Ponera gleadowii subsp. *aethiopica* Forel, 1907

Ponera ragusai var. *santschii* Emery, 1909

Ponera japonica r. *formosae* Forel, 1913

Ponera lesnei Bondroit, 1916

Ponera parva Bondroit, 1918

Ponera massiliensis Bondroit, 1920

Ponera gyptis Santschi, 1921

Ponera oblongiceps Smith, M.R., 1939

Type locality: Italy: Sicily

Type depository: ST: MSNG

Material examined: Himachal Pradesh: Bilaspur, 21 (w.), 1.vii.2010; Kandwal, 13 (w.), 25.vi.2009; Terrace, 1 (w.), 24.ix.2009, 2 (w.), 15.vii.2010. **Jammu and Kashmir:** Jasrota, 2 (w.), 28.vii.2010, Mansar, 3 (w.), 12.vii.2009, 3 (w.), 1 (q.), 13.vii.2009; Surinsar, 2 (w.), 14.vii.2009. **Punjab:** Dunera, 5 (w.), 24.vii.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Punjab (Bharti *et al.*, 2015: 47), Uttarakhand (Forel, 1900a: 327, 1906: 91).

Hypoponera wroughtonii (Forel, 1900)

Ponera confinis var. *wroughtonii* Forel, 1900

Type locality: India: Karnataka: Kanara

Type depository: ST: MHNG

Material examined: Himachal Pradesh: Andretta, 29 (w.), 12.vi.2010, 36 (w.), 13.vi.2010; Khatiar, 13 (w.), 2 (q.), 1 (m.), 18.x.2008; Kotla, 1 (w.), 13.x.2008, Rewalsar, 30 (w.), 20.vi.2010; Siholi, 21 (w.), 1 (q.), 19.x.2008; Terrace, 37 (w.), 3 (q.), 11.x.2008, 2 (w.), 23.v.2009, 5 (w.), 25.v.2009, 1 (w.), 23.ix.2009, 10 (w.), 25.ix.2009. **Uttarakhand:** Forest Research Institute, 9 (w.), 2 (q.), 2.viii.2009, Rajaji Forest Area, 1 (q.), 6.viii.2009, 3 (w.), 1 (q.), 11.viii.2009, 1 (w.), 12.viii.2009, 1 (w.),

13.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti *et al.*, 2015: 49).

Leptogenys chinensis (Mayr, 1870)

Lobopelta chinensis Mayr, 1870

Type locality: China

Type depository: ST: NHMW

Material examined: Jammu and Kashmir: Manda, 11 (w.), 6.vii.2009. **Uttarakhand:** Ranger's College, 2 (w.), 30.vii.2009, 3 (w.), 2.viii.2009, 2 (w.), 4.viii.2009, 1 (w.), 6.viii.2009, 2 (w.), 14.viii.2009, 1 (w.), 9.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Jammu and Kashmir and Uttarakhand (new record).

Leptogenys diminuta laeviceps (Smith, 1857)

Ponera laeviceps Smith, 1857

Type locality: Malaysia: Borneo: Sarawak

Type depository: ST: BMNH

Material examined: Himachal Pradesh: Andretta, 30 (w.), 11.vi.2010, 22 (w.), 13.vi.2010, 80 (w.), 20.vi.2010; Ghatti, 5 (w.), 12.x.2008, 3 (w.), 17.x.2008, 29 (w.), 13.x.2009; Jol, 34 (w.), 6.x.2009; Kotla, 30 (w.), 13.x.2008, 30 (w.), 30.ix.2009; Nagabari, 7 (w.), 18.vi.2009; Renuka, 5 (w.), 26.viii.2009; Siholi, 3 (w.), 19.x.2008, 1 (w.), 1.x.2009; Suketi, 20 (w.), 25.viii.2009; Terrace, 91 (w.), 11.x.2008, 15 (w.), 21.x.2008, 1 (w.), 23.x.2008, 15 (w.), 25.v.2009, 1 (w.), 25.vii.2009, 4 (w.), 23.ix.2009, 1 (w.), 12.x.2009, 1 (w.), 15.vii.2010. **Jammu and Kashmir:** Billawar, 15 (w.), 6.viii.2010. **Punjab:** Dharampur, 46 (w.), 14.x.2008; Thein Dam 32 (w.), 4.vi.2009. **Uttarakhand:** Dakpathar, 2 (w.), 20.viii.2009; Forest Research Institute, 22 (w.), 30.vii.2009, 20 (w.), 1.viii.2009; Rajaji Forest Area, 5 (w.), 10.viii.2009, 12 (w.), 21.v.2010, 1 (w.), 25.v.2010, 30 (w.), 2 (m.), 6.ix.2010; Selaqui, 50 (w.), 2 (m.), 3.x.2008, 3 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Jammu and Kashmir (new record), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900a: 312, 1906: 91; Imai *et al.*, 1984: 5).

Leptogenys hysterica Forel, 1900

Type locality: India: Karnataka: Belgaum; Kanara; Sri Lanka

Type depository: ST: NHMB

Material examined: Himachal Pradesh: Renuka, 1 (w.), 26.viii.2009. **Uttarakhand:** Forest Research Institute, 1 (w.), 12.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record).

Leptogenys latkei Bharti and Wachkoo, 2013

Type locality: India: Himachal Pradesh: Kangra: Andretta

Type depository: HT, PT: PUAC; PT: BMNH, CASC

Material examined: Himachal Pradesh: Andretta, 2 (w.), 11.vi.2010; 2 (w.), 12.vi.2010, 3 (w.), 13.vi.2010, 1 (w.), 20.vi.2010, leg. Aijaz A. Wachkoo (type series).

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Wachkoo, 2013d: 12).

Leptogenys lucidula Emery, 1895

Leptogenys huangdii Xu, 2000

Type locality: Myanmar: Carin Cheba

Type depository: ST: MSNG

Material examined: Uttarakhand: Forest Research Institute, 13 (w.), 12.v.2009; Selaqui, 12 (w.), 9.viii.2009, 6 (w.), 7.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Uttarakhand (new record).

***Leptogenys transitionis* Bharti and Wachkoo, 2013**

Type locality: India: Himachal Pradesh: Sirmaur: Lwasa
Type depository: HT, PT: PUAC; PT: BMNH, CASC
Material examined: Himachal Pradesh: Lwasa, 10 (w.), 1 (ergatogyne), 13.x.2008, leg. Aijaz A. Wachkoo (type series).
Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Wachkoo, 2013d: 14).

***Myopias shivalikensis* Bharti and Wachkoo, 2012**

Type locality: India: Jammu and Kashmir: Surinsar
Type depository: HT: PUAC
Material examined: Jammu and Kashmir, Surinsar, 1 (w.), 14.vii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Jammu and Kashmir (Bharti and Wachkoo, 2012c: 34).

***Odontomachus monticola* Emery, 1892**

Odontomachus monticola var. *longi* Forel, 1900
Odontomachus monticola r. *punctulatus* Forel, 1900
Odontomachus monticola var. *formosae* Forel, 1912
Odontomachus monticola var. *major* Forel, 1913
Odontomachus monticola subsp. *pauperculus* Wheeler, 1921
Odontomachus monticola var. *hainanensis* Stitz, 1925
Odontomachus latidens subsp. *striata* Menozzi, 1930
Type locality: Myanmar: Carin Ghecù
Type depository: LT, PLT: MSNG
Material examined: Himachal Pradesh: Andretta, 6 (w.), 19.vi.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89).

***Odontoponera denticulata* (Smith, 1858)**

Ponera denticulata Smith, 1858
Type locality: Singapore
Type depository: HT: BMNH
Material examined: Himachal Pradesh: Andretta, 2 (w.), 11.vi.2010, 1 (w.), 13.vi.2010, 1 (w.), 14.vi.2010, 1 (w.), 15.vi.2010, 1 (w.), 21.vi.2010; Baijnath, 2 (w.), 17.vi.2010; Bakhra, 28 (w.), 7.x.2008; Bari, 2 (w.), 15.x.2008, 1 (w.), 1.x.2009, 14 (w.), 2.vii.2010; Billawar, 1 (w.), 30.vii.2010; Chanaur, 86 (w.), 20.x.2008, 1 (w.), 5.vi.2009; Dehra, 3 (w.), 6.vii.2010; Gagret, 2 (w.), 8.x.2008; Ghatti, 58 (w.), 12.x.2008, 1 (w.), 17.x.2008, 6 (w.), 28.ix.2009, 1 (w.), 5.x.2009, 1 (w.), 13.x.2009, Guga, 35 (w.), 6.x.2008, 1 (w.), 7.x.2008; Guraldhar, 101 (w.), 16.x.2008, 2 (w.), 4.x.2009; Jogi Panga, 35 (w.), 9.x.2008; Jol, 1 (w.), 6.x.2009; Khatiar, 35 (w.), 1 (q.), 18.x.2008, 1 (w.), 11.x.2009; Kotla, 76 (w.), 13.x.2008, 26 (w.), 22.x.2008, 1 (w.), 30.v.2009, 1 (w.), 29.ix.2009, 1 (w.), 30.ix.2009; Lwasa, 26 (w.), 27.viii.2009; Mandi, 2 (w.), 27.vi.2010; Nagabari, 9 (w.), 18.vi.2009; Nahan, 1 (w.), 6.v.2009; Poanta Sahib, 1 (w.), 9.v.2009; Renuka, 51 (w.), 26.viii.2009, 2 (w.), 26.ix.2009; Siholi, 74 (w.), 19.x.2008, 52 (w.), 14.x.2009, 2 (w.), 8.vii.2010; Terrace, 66 (w.), 11.x.2008, 15 (w.), 21.x.2008, 13 (w.), 23.x.2008, 5 (w.), 24.v.2009, 1 (w.), 12.vii.2009, 15 (w.), 13.vi.2009, 2 (w.), 23.ix.2009, 20 (w.), 24.ix.2009, 3 (w.), 25.ix.2009, 2 (w.), 12.x.2009, 27 (w.), 9.vii.2010, 1 (w.), 19.vii.2010; Una, 8 (w.), 5.x.2008. **Jammu and Kashmir:** Kathua, 1 (w.), 27.vii.2010; Manda, 2 (w.), 15.vii.2009; Mansar, 52 (w.), 12.vii.2009, 2 (w.), 3.viii.2010; Sukrala, 1 (w.), 7.viii.2010; Surinsar, 1 (w.), 1.viii.2010, Udampur, 29 (w.), 4.vii.2009. **Punjab:** Chohal, 1 (w.), 8.x.2008; Dharampur, 2 (w.), 14.x.2008. **Uttarakhand:** Dakpathar, 2 (w.), 20.viii.2009; Forest Research Institute, 34 (w.), 2 (q.), 1 (m.), 30.ix.2008, 28 (w.), 1.x.2008, 46 (w.), 2 (q.), 30.vii.2009, 30 (w.), 31.vii.2009, 1 (w.), 2.viii.2009, 1 (w.), 3.viii.2009, 22 (w.), 4.viii.2009, 1 (w.), 16.viii.2009, 1 (w.), 20.v.2010, 1 (w.), 26.v.2010, 1 (w.), 4.ix.2010; Rajaji Forest Area, 1 (w.), 6.viii.2009, 6 (w.), 10.viii.2009, 35 (w.), 11.viii.2009, 6 (w.), 12.viii.2009, 2 (w.), 13.viii.2009, 1 (w.), 6.ix.2010; Selaqui,

5 (w.), 2.x.2008, 2 (w.), 7.viii.2009, 1 (w.), 8.viii.2009, 25 (w.), 9.viii.2009, 1 (w.), 5.ix.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand (new record).

***Parvaponera darwinii* (Forel, 1893)**

Belonopelta darwinii Forel, 1893
Euponera lamarki Santschi, 1913
Cryptopone rufotestaceus Donisthorpe, 1943
Type locality: Australia: Northwestern Territory: Port Darwin
Type depository: ST: MHNG
Material examined: Punjab: Sukhna, 1 (q.), 5.x.2010, 1 (q.), 17.x.2010, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Punjab (new record).

***Platythyrea parallela* (Smith, 1859)**

Ponera parallela Smith, F., 1859
Platythyrea inconspicua Mayr, 1870
Platythyrea coxalis Emery, 1893
Platythyrea pusilla Emery, 1893
Platythyrea subtilis Emery, 1900
Platythyrea wroughtonii Forel, 1900
Platythyrea wroughtoni r. *victoriae* Forel, 1900
Platythyrea coxalis var. *tritschleri* Forel, 1901
Platythyrea coxalis var. *javana* Forel, 1905
Platythyrea coxalis var. *annamita* Forel, 1911
Platythyrea wroughtoni subsp. *sechellensis* Forel, 1912
Platythyrea coxalis var. *cylindrica* Forel, 1913
Platythyrea parva Crawley, 1915
Platythyrea pusilla var. *australis* Forel, 1915
Platythyrea coxalis var. *philippinensis* Viehmeyer, 1916
Platythyrea pusilla var. *egena* Viehmeyer, 1916
Platythyrea cephalotes Viehmeyer, 1924
Platythyrea melancholica var. *aruana* Karavaiev, 1925
Platythyrea pulchella Santschi, 1928
Platythyrea pusilla var. *pacifica* Santschi, 1928
Platythyrea ceylonensis Donisthorpe, 1941
Type locality: Indonesia: Maluku: Aru Islands
Type depository: HT: OUMNH
Material examined: Himachal Pradesh: Bari, 1 (w.), 6.vi.2009; Nahan, 5 (w.), 6.v.2009, 1 (w.), 23.viii.2009; Terrace, 2 (w.), 23.x.2008. **Jammu and Kashmir:** Mansar, 3 (w.), 12.vii.2009. **Uttarakhand:** Selaqui, 1 (w.), 1.x.2008, 4 (w.), 7.viii.2009, 1 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh, Jammu and Kashmir and Uttarakhand (new record).

***Platythyrea sagei* Forel, 1900**

Type locality: India: Himachal Pradesh: Dharamsala; Karnataka: Belgaum
Type depository: LT, PLT: MHNG
Material examined: Himachal Pradesh: Andretta, 2 (w.), 1 (m.), 11.vi.2010, 2 (w.), 12.vi.2010, 2 (w.), 13.vi.2010, 11.v.2014, 12 (w.), 5 (m.), leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Forel, 1900a: 315, 1906: 91; Brown, 1975: 52; Boudinot *et al.*, 2016: 60).

***Ponera indica* Bharti and Wachkoo, 2012**

Type locality: India: Himachal Pradesh: Andretta, Mandi, Terrace
Type depository: HT, PT: PUAC; PT: BMNH, CASC
Material examined: Himachal Pradesh: Andretta, 1 (w.), 1 (q.), 11.vi.2010; Mandi, 5 (w.), 27.vi.2010; Terrace, 6 (w.), 12.x.2008, leg. Aijaz A. Wachkoo.
Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti and Wachkoo, 2012d: 218).

Ants in Northwestern Shivalik

Ponera taylori Bharti and Wachkoo, 2012

Type locality: India: Himachal Pradesh: Andretta, Rewalsar; Uttarakhand: Assan Barrage

Type depository: HT, PT: PUAC; PT: BMNH, CASC

Material examined: **Himachal Pradesh:** Andretta, 5 (w.), 11.vi.2010; Rewalsar, 5 (w.), 1 (m.), 30.vi.2010. **Uttarakhand:** Assan Barrage, 2 (w.), 10.v.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (Bharti and Wachkoo, 2012d: 221).

Pseudoneoponera bispinosa (Smith, 1858)

Pachycondyla bispinosa Smith, F., 1858

Type locality: India

Type depository: HT: BMNH

Material examined: **Himachal Pradesh:** Poanta Sahib, 2 (w.), 19.viii.2009. **Uttarakhand:** Dakpathar, 3 (w.), 20.viii.2009; Forest Research Institute, 3 (w.), 30.ix.2008, 2 (w.), 1.x.2008, 3 (w.), 3.x.2008, 3 (w.), 30.vii.2009, 5 (w.), 1.viii.2009, 4 (w.), 3.viii.2009, 2 (w.), 4.viii.2009, 1 (w.), 14.viii.2009, 2 (w.), 16.viii.2009; Rajaji Forest Area, 2 (w.), 5.viii.2009, 3 (w.), 6.viii.2009, 1 (w.), 11.viii.2009, 1 (w.), 12.viii.2009, 2 (w.), 6.ix.2010, 1 (w.), 7.ix.2010; Ranger's College, 3 (w.), 25.v.2010; Selaqui, 11 (w.), 3.x.2008, 2 (w.), 7.viii.2009, 2 (w.), 24.v.2010, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900a: 326, 1906: 91).

Pseudoneoponera rufipes (Jerdon, 1851)

Ponera rufipes Jerdon, 1851

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material examined: **Himachal Pradesh:** Andretta, 1 (w.), 13.vi.2010; Bakhra, 2 (w.), 7.x.2008; Bari, 3 (w.), 15.x.2008, 2 (w.), 1.x.2009, 1 (w.), 12.vii.2010; Bilaspur, 1 (w.), 2.vii.2010; Billawar, 2 (w.), 6.viii.2010; Chanaur, 1 (w.), 20.x.2008; Dehra, 2 (w.), 6.vii.2010; Gagret, 1 (w.), 8.x.2008; Ghamrur, 3 (w.), 1.vi.2009; Ghatti, 1 (w.), 12.x.2008, 1 (w.), 28.ix.2009, 2 (w.), 13.x.2009; Guga, 2 (w.), 6.x.2008; Guraldhar, 1 (w.), 16.x.2008; Jogi Panga, 1 (w.), 9.x.2008; Khatiar, 3 (w.), 18.x.2008, 3 (w.), 11.x.2009; Kotla, 7 (w.), 13.x.2008, 6 (w.), 22.x.2008, 2 (w.), 29.ix.2009, 3 (w.), 13.vii.2010; Kushinagar, 5 (w.), 17.vi.2009; Nagabari, 4 (w.), 18.vi.2009; Poanta Sahib, 1 (w.), 19.viii.2009; Renuka, 2 (w.), 26.viii.2009; Siholi, 1 (w.), 19.x.2008, 1 (w.), 1.x.2009, 1 (w.), 14.x.2009; Terrace, 3 (w.), 11.x.2008, 2 (w.), 21.x.2008, 3 (w.), 13.vi.2009, 3 (w.), 23.ix.2009, 17 (w.), 1 (q.), 24.ix.2009, 1 (w.), 10.vii.2010; Una, 2 (w.), 5.x.2008. **Jammu and Kashmir:** Kathua, 1 (w.), 23.vii.2010, 1 (w.), 27.vii.2010; Manda, 1 (w.), 6.vii.2009, 3 (w.), 15.vii.2009, 1 (w.), 2.viii.2010; Mansar, 12 (w.), 12.vii.2009, 1 (w.), 3.viii.2010; Sukrala, 1 (w.), 7.viii.2010; Surinsar, 1 (w.), 1.viii.2010. **Punjab:** Chohal, 2 (w.), 8.x.2008; Dharampur, 2 (w.), 14.x.2008; Dunera, 13 (w.), 24.vii.2010. **Uttarakhand:** Selaqui, 1 (w.), 8.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: Himachal Pradesh (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti *et al.*, 2009: 38), Uttarakhand (Forel, 1900a: 326, 1906: 91).

Subfamily Proceratiinae

Proceratium williamsi Tiwari, 2000

Proceratium bhutanense Baroni Urbani and De Andrade, 2003

Type locality: India: Meghalaya: East Khasi Hills: Shillong: Risa Colony

Type depository: HT, PT: ZSIK; PT: BMNH

Material examined: **Uttarakhand:** Dakpathar, 4 (w.), 20.viii.2009; Rajaji Forest Area, 3 (w.), 11.viii.2009, 1 (w.), 12.viii.2009, leg. Aijaz A. Wachkoo.

Distribution in Northwestern Shivalik: **Uttarakhand** (Baroni Urbani and De Andrade, 2003: 278; Bharti and Wachkoo, 2014b: 70).

Subfamily Pseudomyrmecinae

Tetraoponera allaborans (Walker, 1859)

Eciton minutum Jerdon, 1851

Eciton rufipes Jerdon, 1851

Pseudomyrma allaborans Walker, 1859

Cerapachys ceylonica Motschoulsky, 1863

Cerapachys femoralis Motschoulsky, 1863

Sima compressa Roger, 1863

Sima subtilis Emery, 1889

Sima allaborans var. *sumatrensis* Emery, 1900

Sima allaborans var. *longinoda* Forel, 1909

Type locality: Sri Lanka

Type depository: ST: BMNH

Material Examined: **Himachal Pradesh:** Bakhra, 11 (w.), 07.x.2008; Bari, 1 (w.), 01.x.2009; Ghamrur, 1 (w.), 01.vi.2009; Guga, 1 (w.), 2 (q.), 06.x.2008; Guraldhar, 1 (w.), 1 (q.), 16.x.2008; Kandwal, 1 (w.), 25.vi.2009; Khushinagar, 1 (w.), 17.vi.2009; Kotla, 6 (w.), 1 (q.), 13.x.2008; Nahan, 1 (w.), 23.viii.2009; Terrace, 1 (w.), 23.x.2008. **Jammu and Kashmir:** Mansar, 1 (w.), 13.vii.2009; Surinsar, 2 (w.), 14.vii.2009, 3 (w.), 1.viii.2010. **Uttarakhand:** Assan Barrage, 2 (w.), 02.vi.2010; Forest Research Institute, 1 (w.), 01.viii.2009, 12 (w.), 12.viii.2009, 8 (w.), 17.viii.2009; Rajaji Forest Area, 1 (w.), 05.viii.2009; Selaqui, 1 (w.), 03.x.2008, 2 (w.), 07.viii.2009, 1 (w.), 08.viii.2009, 10 (w.), 10.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh and Uttarakhand (new record), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti *et al.*, 2009: 39).

Tetraoponera nigra (Jerdon, 1851)

Eciton nigrum Jerdon, 1851

Tetraoponera atrata Smith, F., 1852

Tetraoponera petiolata Smith, F., 1877

Sima nigra var. *insularis* Emery, 1901

Sima nigra r. *fergusoni* Forel, 1902

Sima nigra var. *krama* Forel, 1912

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Bari, 1 (w.), 15.x.2008, 1 (w.), 01.x.2009; Ghatti, 13 (w.), 28.ix.2009, 2 (w.), 27.v.2009, 3 (w.), 17.x.2008; Guraldhar, 3 (w.), 10.vi.2009; Jogi Panga, 6 (w.), 09.x.2008; Jol, 12 (w.), 06.x.2009; Kotla, 3 (w.), 28.v.2009; Poanta Sahib, 5 (w.), 09.v.2009; Suketi, 5 (w.), 25.viii.2009; Terrace, 5 (w.), 11.vi.2009. **Jammu and Kashmir:** Surinsar, 3 (w.), 14.vii.2009. **Punjab:** Chohal, 59 (w.), 08.x.2008, leg., R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2001: 164), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Bharti, 2001: 164), Uttarakhand (Forel, 1903: 709, 1906: 90; Bharti, 2001: 164; Ward, 2001: 634).

Tetraoponera rufonigra (Jerdon, 1851)

Eciton rufonigrum Jerdon, 1851

Sima rufonigra var. *yeensis* Forel, 1902

Sima rufonigra var. *testaceonigra* Forel, 1903

Sima rufonigra var. *ceylonensis* Forel, 1909

Type locality: India: Kerala: Malabar

Type depository: T: Unknown

Material Examined: **Himachal Pradesh:** Andretta, 2 (w.), 12.vi.2010; Bakhra, 1 (w.), 07.x.2008; Bilaspur, 1 (w.), 01.vii.2010; Chanaur, 5 (w.), 20.x.2008; Dhaliara, 2 (w.),

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09.vi.2009; Gagret, 29 (w.), 1 (m.), 08.x.2008; Guga, 1 (w.), 06.x.2008; Khatiar, 4 (w.), 18.x.2008, 1 (w.), 11.x.2009; Kotla, 1 (w.), 28.v.2009, 1 (w.), 13.vii.2010; Nahan, 4 (w.), 23.viii.2009; Pong Dam, 24 (w.), 17.x.2008; Renuka, 5 (w.), 08.v.2009; Siholi, 3 (w.), 2 (q.), 19.x.2008; Suketi, 1 (w.), 25.viii.2009; Terrace, 1 (w.), 21.x.2008. **Jammu and Kashmir:** Samba, 3 (w.), 11.vii.2009; Sukrala, 2 (w.), 07.viii.2010. **Punjab:** Dharampur, 5 (w.), 14.x.2008; Dunera, 2 (w.), 23.vi.2009. **Uttarakhand:** Forest

Research Institute, 1 (w.), 12.v.2009, 1 (q.), 19.v.2010; Ranger's College, 1 (w.), 02.viii.2009, 1 (w.), 24.v.2010; Selaqui, 1 (w.), 09.viii.2009, leg. R. Kumar.

Distribution in Northwestern Shivalik: Himachal Pradesh (Bharti, 2001: 164), Jammu and Kashmir (Bharti *et al.*, 2013a: 89), Punjab (Tak and Rathore, 2004: 174; Bharti, 2001: 164; Bharti *et al.*, 2009: 39; Tak, 2009: 13, 2010: 136; Tak and Kazmi, 2011: 41), Uttarakhand (Bharti, 2001: 164; Ward, 2001: 649).

Table 1. Description of the localities in Northern Shivalik where ants were sampled between 2008 and 2012

State	Locality	Coordinates	Altitude(m)
Himachal Pradesh	*Andretta	32.0744°N 76.5856°E	940
Himachal Pradesh	*Baijnath	32.0527°N 76.6500°E	1000
Himachal Pradesh	*Bajaura	31.8467°N 77.1622°E	1100
Himachal Pradesh	*Bakhra	31.4087°N 76.4327°E	650
Himachal Pradesh	*Bari	31.6591°N 76.5000°E	520
Himachal Pradesh	*Bilaspur	31.3423°N 76.7616°E	520
Himachal Pradesh	*Chanaur	32.0545°N 75.6503°E	600
Himachal Pradesh	*Dattal	32.0433°N 76.5657°E	940
Himachal Pradesh	*Dehra	31.5799°N 76.7109°E	450
Himachal Pradesh	*Dhaliara	31.8496°N 76.1886°E	600
Himachal Pradesh	*Gagret	31.6620°N 76.0601°E	600
Himachal Pradesh	*Ghamrur	31.6620°N 76.0601°E	460
Himachal Pradesh	*Ghatti	31.9300°N 75.9302°E	425
Himachal Pradesh	*Guga	31.6864°N 76.1898°E	600
Himachal Pradesh	*Guraldhar	31.6670°N 76.4684°E	660
Himachal Pradesh	*Jassur	32.2824°N 75.8496°E	520
Himachal Pradesh	*Jogi Panga	31.5408°N 76.3161°E	600
Himachal Pradesh	*Jol	31.8932°N 75.9731°E	425
Himachal Pradesh	*Kandwal	32.2794°N 75.7771°E	480
Himachal Pradesh	*Khajjiyan	31.9349°N 75.9174°E	640
Himachal Pradesh	*Khatiar	32.0057°N 75.9388°E	560
Himachal Pradesh	*Khushinagar	32.3010°N 75.8913°E	620
Himachal Pradesh	*Kotla	31.8821°N 75.9963°E	560
Himachal Pradesh	*Lwasa	30.7394°N 77.1528°E	1200
Himachal Pradesh	*Mandi	31.7047°N 76.9374°E	800
Himachal Pradesh	*Nagabari	32.3004°N 75.8901°E	420
Himachal Pradesh	Nahan	30.5596°N 77.2960°E	880
Himachal Pradesh	*Palampur	32.1109°N 76.5430°E	1140
Himachal Pradesh	*Paonta Sahib	30.4384°N 77.6239°E	460
Himachal Pradesh	*Pong Dam	31.9710°N 75.9469°E	450
Himachal Pradesh	*Rehan	32.1657°N 75.9097°E	500
Himachal Pradesh	*Renuka	30.6083°N 77.4615°E	700
Himachal Pradesh	*Rewalsar	31.6345°N 76.8343°E	1300
Himachal Pradesh	*Siholi	31.9456°N 75.9949°E	550
Himachal Pradesh	*Suketi	31.5660°N 77.2968°E	350
Himachal Pradesh	Terrace	31.9234°N 75.9294°E	420
Himachal Pradesh	*Una	31.4685°N 76.2709°E	400
Jammu and Kashmir	*Billawar	32.6131°N 75.6038°E	840
Jammu and Kashmir	*Jasrota	32.4635°N 75.4040°E	400
Jammu and Kashmir	*Kathua	32.3753°N 75.5184°E	310
Jammu and Kashmir	*Manda	32.7496°N 74.8673°E	500
Jammu and Kashmir	*Mansar	32.6979°N 75.1489°E	690
Jammu and Kashmir	*Samba	32.5537°N 75.1317°E	390
Jammu and Kashmir	*Sukrala	32.6528°N 75.5817°E	1020

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Jammu and Kashmir	*Surinsar	32.7009°N 75.1512°E	700
Jammu and Kashmir	*Udhampur	32.9141°N 75.1424°E	690
Punjab	Chohal	31.6666°N 76.0666°E	450
Punjab	*Dharampur	31.8420°N 75.9132°E	450
Punjab	Dunera	32.4443°N 75.8900°E	520
Punjab	*Jugial	32.3818°N 75.6776°E	500
Punjab	Ropar	30.9827°N 76.5286°E	400
Punjab	*Sukhna	30.7448°N 76.8255°E	252
Punjab	*Thein Dam	32.4426°N 75.7305°E	600
Uttarakhand	*Assan Barrage	30.4417°N 77.6754°E	440
Uttarakhand	*Dakpathar	30.4966°N 77.8004°E	750
Uttarakhand	Forest Research Institute	30.3416°N 77.9903°E	640
Uttarakhand	Mussoorie	30.4606°N 78.0521°E	1820
Uttarakhand	Rajaji Forest Area	30.2483°N 77.9878°E	660
Uttarakhand	*Ranger's College	30.3225°N 78.0445°E	660
Uttarakhand	*Selaqui	30.3720°N 77.8605°E	650

Discussion

This study represents one of the most comprehensive surveys of the ant fauna ever undertaken in India, especially with regard to the variety of collecting techniques employed and the long duration of the sampling program. The paucity of such surveys is reflected in some of the key findings of this study, namely discovery of several new species, significant range extensions of taxa, and records of very rare species (Kumar, 2013; Wachkoo, 2013).

In this study, 179 species group taxa (163 species, 16 subspecies) are listed for 61 genera belonging to eight subfamilies. Many subspecies taxa occur in sympatry in the study area retaining their distinctiveness and accordingly deserve a species rank (Bharti *et al.*, 2015; Wachkoo, 2015; Wachkoo and Akbar, 2016). Species richness was highest in secondary forests, with 150 species followed by primary forests (121 species) and non forest areas (107 species). Out of the 179 taxa currently known in Northwestern Shivalik, 79 species are exclusive of Indomalayan origin, however, there is a profusion of faunal elements of other biogeographic regions. Myrmecofauna equally distributed across study area and Palearctic region are more prominent (98 species) in the study area followed by Australasian (32 species), Oceania (26 species), Malagasy (24 species), Afrotropical (22 species), Neotropical (16 species), and Nearctic (14 species). Twenty nine species recorded are endemic (16% of all species) to the study region, however, some of these might be

actually widespread in distribution due to the overall low sampling in India and surrounding regions and will most likely be collected in other parts of the world e.g., *Chrysapace costatus* (Bharti and Wachkoo, 2013), *Dilobocondyla gasteroreticulata* Bharti and Kumar, 2013 and *Ponera indica* Bharti and Wachkoo, 2012 discovered in the study area were also reported from China and northeastern India (Bharti *et al.*, 2016a; Chen *et al.*, 2016). We recorded ten introduced species in the study area, distributed in all three habitats, their presence is indicative of medium to strong habitat disturbance. The most diverse genera in terms of species and subspecies richness are *Camponotus* with 12 followed by *Lepisiota* with 11. *Pheidole* represents 10 while *Tetramorium* signify 9. *Aenictus* and *Carebara* each are represented by 8 species. *Crematogaster* and *Polyrhachis* each are represented by 7 species and subspecies (Table 2).

Thirty new species have been described from the sampled material (Table 2). Subfamilies Amblyoponinae and Leptanillinae have been reported for the first time from the study area (Bharti and Wachkoo, 2011, 2012a; Bharti and Kumar, 2012). Four genera *Chrysapace*, *Myopias*, *Ponera* and *Prionopelta* were also reported for the first time from India (Bharti and Wachkoo, 2012a, c, d, 2013a). The study indicates a number of the ant taxa in India are still awaiting identification and future collections should provide many new species records.

The overall structure of the ant community recorded in the study area is indicative of a disrupted, degraded ecosystem with high anthropogenic impact and reduced ecosystem health. The distribution of invasive species even in primary forests indicates a threat to the

natural habitats in the study region (Bharti *et al.*, 2016b). As habitat conversion in this region continues, the endemic fauna is particularly threatened and in urgent need of proper conservational efforts.

Table 2. Ants in Northwestern Shivalik arranged by subfamily, genus and species. Endemic species are marked with #, introduced species are marked with +, while new species described from the sampled material are marked with *. Abbreviations in ‘Distribution’ category refer to following biogeographic regions: Afr – Afrotropical, Aus – Australasia, Ind – Indomalaya, Mal – Malagasy, Nea – Nearctic, Neo – Neotropical, Oce – Oceania, Pal – Palearctic. Column ‘Habitat’ refers to habitat type at which species was recorded during this study, PF = primary forest; SF = secondary forest; NF = non forest area.

Taxon	Authors	Distribution	Habitat (PF/SF/NF)
Amblyoponinae			
<i>Prionopelta kraepelini</i>	Forel, 1905	Aus, Ind, Oce	SF
*# <i>Stigmatomma boltoni</i>	(Bharti and Wachkoo, 2011)	Ind	PF, SF
Dolichoderinae			
<i>Chronoxenus wroughtonii</i>	(Forel, 1895)	Ind, Pal	PF, SF, NF
<i>Dolichoderus taprobanae</i>	(Smith, F., 1858)	Ind, Pal	PF, SF, NF
<i>Ochetellus glaber</i>	(Mayr, 1862)	Aus, Ind, Mal, Nea, Oce, Pal	SF
*# <i>Tapinoma himalaicum</i>	Bharti, Kumar and Dubovikoff, 2013	Ind	PF, SF, NF
<i>Tapinoma melanocephalum</i>	(Fabricius, 1793)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF, NF
<i>Technomyrmex albipes</i>	(Smith, F., 1861)	Afr, Aus, Ind, Mal, Neo, Oce, Pal	PF, SF, NF
<i>Technomyrmex elator</i>	Forel, 1902	Ind, Pal	PF, SF
<i>Technomyrmex rector</i>	Bolton, 2007	Ind	PF, SF, NF
Dorylinae			
<i>Aenictus aitkenii</i>	Forel, 1901	Ind	SF
<i>Aenictus brevicornis</i>	(Mayr, 1879)	Ind	NF
<i>Aenictus ceylonicus</i>	(Mayr, 1866)	Aus, Ind, Pal	PF, SF
<i>Aenictus doryloides</i>	Wilson, 1964	Ind	PF, SF
<i>Aenictus pachycerus</i>	(Smith, 1858)	Ind	NF
<i>Aenictus peguensis</i>	Emery, 1895	Ind	SF, NF
<i>Aenictus sagei</i>	Forel, 1901	Ind, Pal	SF, NF
*# <i>Aenictus wilsoni</i>	Bharti, Wachkoo and Kumar, 2012	Ind	SF
* <i>Chrysapace costatus</i>	(Bharti and Wachkoo, 2013)	Ind, Pal	PF
<i>Dorylus labiatus</i>	Shuckard, 1840	Ind, Pal	SF, NF
<i>Dorylus orientalis</i>	Westwood, 1835	Ind, Pal	PF, SF, NF
<i>Lioponera longitarsus</i>	Mayr, 1879	Afr, Aus, Ind, Pal	PF, SF, NF
<i>Ooceraea biroii</i>	(Forel, 1907)	Ind, Mal, Neo, Oce, Pal	PF, SF, NF
*# <i>Parasyscia browni</i>	(Bharti and Wachkoo, 2013)	Ind	PF
Formicinae			
<i>Acropyga acutiventris</i>	Roger, 1862	Aus, Ind, Pal	PF
<i>Camponotus compressus</i>	(Fabricius, 1787)	Ind, Pal	PF, SF, NF
<i>Camponotus himalayanus</i>	Forel, 1893	Ind	SF
<i>Camponotus horseshoetus</i>	Datta and Raychaudhuri, 1985	Ind	NF
<i>Camponotus kattensis</i>	Bingham, 1903	Ind	PF, SF
<i>Camponotus lamarckii</i>	Forel, 1892	Ind	PF, SF, NF
<i>Camponotus mitis</i>	(Smith, 1858)	Ind, Pal	PF, SF, NF

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<i>Camponotus mutilarius</i>	Emery, 1893	Ind	PF, SF, NF
<i>Camponotus nirvanae</i>	Forel, 1893	Ind	PF, SF, NF
<i>Camponotus oblongus binominatus</i>	Forel, 1916	Ind	PF, SF, NF
<i>Camponotus opaciventris</i>	Mayr, 1879	Ind, Pal	PF, SF, NF
^{##} <i>Camponotus parabaratus</i>	Bharti and Wachkoo, 2014	Ind	PF, SF
<i>Camponotus parius</i>	Emery, 1889	Ind, Pal	PF, SF, NF
<i>Camponotus sylvaticus basalis</i>	Smith, 1878	Ind	PF, SF, NF
<i>Cataglyphis setipes</i>	(Forel, 1894)	Ind, Pal	PF, SF, NF
<i>Lepisiota bipartita</i>	(Smith, 1861)	Ind, Mal, Pal	PF, SF, NF
<i>Lepisiota capensis</i>	(Mayr, 1862)	Afr, Ind, Mal, Pal	PF, SF, NF
<i>Lepisiota capensis lunaris</i>	(Emery, 1893)	Ind	PF, SF, NF
<i>Lepisiota frauenfeldi integra</i>	(Forel, 1894)	Ind, Pal	SF
<i>Lepisiota modesta</i>	(Forel, 1894)	Ind	SF, NF
<i>Lepisiota opaca</i>	(Forel, 1892)	Ind, Pal	SF
<i>Lepisiota opaca pulchella</i>	(Forel, 1892)	Ind, Pal	PF, SF, NF
<i>Lepisiota rothneyi</i>	(Forel, 1894)	Ind, Pal	PF
<i>Lepisiota rothneyi wroughtonii</i>	(Forel, 1902)	Ind, Pal	PF, NF
<i>Lepisiota sericea</i>	(Forel, 1892)	Ind, Pal	SF, NF
<i>Lepisiota simplex</i>	(Forel, 1892)	Afr, Ind, Pal	PF, SF
<i>Lepisiota</i> sp.		Ind	SF
<i>Nylanderia birmana</i>	(Forel, 1902)	Ind, Pal	PF, SF
^{##} <i>Nylanderia himalayana</i>	Wachkoo and Bharti, 2015	Ind	SF
<i>Nylanderia indica</i>	(Forel, 1894)	Ind, Pal	PF, SF
[#] <i>Nylanderia smythiesii</i>	(Forel, 1894)	Ind	PF, SF, NF
<i>Nylanderia taylori</i>	(Forel, 1894)	Ind, Pal	PF, SF, NF
<i>Nylanderia yerburyi</i>	(Forel, 1894)	Ind, Pal	PF
<i>Oecophylla smaragdina</i>	(Fabricius, 1775)	Aus, Ind, Oce, Pal	PF, SF, NF
⁺ <i>Paratrechina longicornis</i>	(Latreille, 1802)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF, NF
<i>Plagiolepis dichroa</i>	Forel, 1902	Ind	SF, NF
<i>Plagiolepis jerdonii</i>	Forel, 1894	Ind, Pal	PF, SF, NF
<i>Plagiolepis</i> sp.		Ind	PF
<i>Polyrhachis exercita lucidiventris</i>	Forel, 1907	Ind	NF
<i>Polyrhachis exercita obtusisquama</i>	Forel, 1902	Ind	NF
<i>Polyrhachis illaudata</i>	Walker, 1859	Ind, Pal	PF, SF
<i>Polyrhachis lacteipennis</i>	Smith, 1858	Ind, Pal	PF, SF, NF
<i>Polyrhachis menelas</i>	Forel, 1904	Ind	PF, SF, NF
<i>Polyrhachis punctillata fergusonii</i>	Forel, 1902	Ind	NF
<i>Polyrhachis punctillata smythiesii</i>	Forel, 1895	Ind	SF, NF
<i>Polyrhachis tibialis caligata</i>	Emery, 1895	Ind	PF
^{##} <i>Prenolepis fisheri</i>	Bharti and Wachkoo, 2012	Ind	PF
<i>Prenolepis naoraji</i>	Forel, 1902	Ind, Pal	PF, SF, NF
^{##} <i>Pseudolasius diversus</i>	Wachkoo and Bharti, 2014	Ind	PF
^{##} <i>Pseudolasius polymorphicus</i>	Wachkoo and Bharti, 2014	Ind	SF
Leptanillinae			
^{##} <i>Leptanilla lamellata</i>	Bharti and Kumar, 2012	Ind	SF
Myrmicinae			
<i>Cardiocondyla wroughtonii</i>	(Forel, 1890)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF, NF
<i>Carebara affinis</i>	(Jerdon, 1851)	Aus, Ind, Pal	PF, SF, NF
^{##} <i>Carebara carinata</i>	Bharti and Kumar, 2013	Ind	SF
^{##} <i>Carebara dentata</i>	Bharti and Kumar, 2013	Ind	PF, SF, NF
<i>Carebara diversa</i>	(Jerdon, 1851)	Afr, Ind, Pal	PF, SF
^{##} <i>Carebara hornata</i>	Bharti and Kumar, 2013	Ind	SF
^{##} <i>Carebara propomegata</i>	Bharti and Kumar, 2013	Ind	SF, NF

^{**} <i>Carebara rectangularata</i>	Bharti and Kumar, 2013	Ind	SF
^{**} <i>Carebara spinata</i>	Bharti and Kumar, 2013	Ind	PF, SF
<i>Cataulacus latus</i>	Forel, 1891	Ind	PF
<i>Cataulacus taprobanae</i>	Smith, F., 1853	Ind, Pal	PF, SF, NF
<i>Crematogaster anthracina</i>	Smith, F., 1857	Ind, Pal	PF, SF, NF
<i>Crematogaster binghamii</i>	Forel, 1904	Ind, Pal	PF, SF, NF
<i>Crematogaster biroi smythiesii</i>	Forel, 1902	Ind	PF, SF, NF
<i>Crematogaster flava</i>	Forel, 1886	Ind	PF, SF, NF
<i>Crematogaster rothneyi</i>	Mayr, 1879	Ind, Pal	PF, SF, NF
<i>Crematogaster sagei</i>	Forel, 1902	Ind, Pal	PF, SF
<i>Crematogaster subnuda</i>	Mayr, 1879	Ind, Pal	PF, SF, NF
[*] <i>Dilobocondyla gasteroreticulata</i>	Bharti and Kumar, 2013	Ind	PF, NF
<i>Erromyrma latinodis</i>	(Mayr, 1872)	Afr, Ind, Mal, Pal	PF
<i>Gauromyrax acanthinus</i>	(Karavaiev, 1935)	Ind, Pal	SF
<i>Lophomyrma ambiguus</i>	Rigato, 1994	Ind	PF
<i>Lophomyrma bedoti</i>	Emery, 1893	Ind, Pal	PF, SF, NF
<i>Lophomyrma quadrispinosus</i>	(Jerdon, 1851)	Ind, Pal	PF, SF, NF
^{**} <i>Lophomyrma terraceensis</i>	Bharti and Kumar, 2012	Ind	PF
<i>Mayriella transfuga</i>	Baroni Urbani, 1977	Aus, Ind, Pal	PF, SF, NF
<i>Meranoplus bicolor</i>	(Guerin-Meneville, 1844)	Ind, Neo, Pal	PF, SF, NF
<i>Messor himalayanus</i>	(Forel, 1902)	Ind, Pal	SF, NF
<i>Messor instabilis</i>	(Smith, F., 1858)	Ind, Pal	PF, SF, NF
<i>Monomorium floricola</i>	(Jerdon, 1851)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	SF
<i>Monomorium indicum</i>	Forel, 1902	Ind, Oce, Pal	PF, SF, NF
⁺ <i>Monomorium monomorium</i>	Bolton, 1987	Aus, Ind, Neo, Oce, Pal	PF, NF
<i>Monomorium orientale</i>	Mayr, 1879	Aus, Ind, Pal	PF, SF, NF
⁺ <i>Monomorium pharaonis</i>	(Linnaeus, 1758)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	SF, NF
<i>Monomorium sagei</i>	Forel, 1902	Ind, Pal	PF, SF, NF
<i>Myrmecaria brunnea</i>	Saunders, 1842	Ind, Pal	PF, SF, NF
<i>Pheidole indica</i>	Mayr, 1879	Afr, Ind, Mal, Nea, Neo, Pal	PF, SF, NF
<i>Pheidole jucunda fossulata</i>	Forel, 1902	Ind, Pal	PF, SF
<i>Pheidole latinoda major</i>	Forel, 1885	Ind	PF, SF, NF
<i>Pheidole parva</i>	Mayr, 1865	Ind, Mal, Oce, Pal	PF, NF
<i>Pheidole pronotalis</i>	Forel, 1902	Ind	SF
<i>Pheidole sagei</i>	Forel, 1902	Ind, Pal	PF, SF
<i>Pheidole sharpi</i>	Forel, 1902	Ind	PF
<i>Pheidole smythiesii</i>	Forel, 1902	Ind, Pal	SF, NF
<i>Pheidole spathifera aspatha</i>	Forel, 1902	Ind, Pal	NF
<i>Pheidole woodmasoni</i>	Forel, 1885	Ind	PF, SF, NF
<i>Recurvidris recurvispinosa</i>	(Forel, 1890)	Ind, Pal	PF, SF, NF
⁺ <i>Solenopsis geminata</i>	(Fabricius, 1804)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	SF
<i>Strumigenys exilirhina</i>	Bolton, 2000	Ind, Pal	PF
⁺ <i>Strumigenys membranifera</i>	Emery, 1869	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF
<i>Strumigenys nepalensis</i>	De Andrade, 1994	Ind, Pal	PF, SF, NF
<i>Strumigenys virgila</i>	Bolton, 2000	Ind	SF
⁺ <i>Tetramorium bicarinatum</i>	(Nylander, 1846)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF
<i>Tetramorium coonoorensense</i>	Forel, 1902	Ind	PF
<i>Tetramorium lanuginosum</i>	Mayr, 1870	Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF, NF
<i>Tetramorium obesum</i>	Andre, 1887	Ind	SF
^{**} <i>Tetramorium shivalikense</i>	Bharti and Kumar, 2012	Ind	PF, SF, NF
⁺ <i>Tetramorium simillimum</i>	(Smith, F., 1851)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	SF
<i>Tetramorium smithi</i>	Mayr, 1879	Ind, Oce, Pal	SF, NF
⁺ <i>Tetramorium tonganum</i>	Mayr, 1870	Aus, Ind, Oce, Pal	PF, SF, NF

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^{**} <i>Tetramorium triangulatum</i>	Bharti and Kumar, 2012	Ind	SF, NF
<i>Tetramorium walshi</i>	(Forel, 1890)	Ind, Pal	SF, NF
<i>Trichomyrmex aberrans</i>	(Forel, 1902)	Ind	PF, SF, NF
⁺ <i>Trichomyrmex destructor</i>	(Jerdon, 1851)	Afr, Aus, Ind, Mal, Nea, Neo, Oce, Pal	PF, SF, NF
<i>Trichomyrmex glaber</i>	(André, 1883)	Ind	PF, SF, NF
<i>Trichomyrmex scabriceps</i>	(Mayr, 1879)	Ind	PF, SF, NF
^{**} <i>Vollenhovia gasteropunctata</i>	Bharti and Kumar, 2013	Ind	SF
Ponerinae			
^{**} <i>Anochetus cryptus</i>	Bharti and Wachkoo, 2013	Ind	SF, NF
<i>Anochetus graeffei</i>	Mayr, 1870	Afr, Aus, Ind, Mal, Oce, Pal	PF, SF, NF
<i>Anochetus madaraszi</i>	Mayr, 1897	Ind	SF
<i>Anochetus myops</i>	Emery, 1893	Ind, Pal	PF, SF
<i>Anochetus sedilloti</i>	Emery, 1884	Afr, Ind, Pal	SF
^{**} <i>Anochetus validus</i>	Bharti and Wachkoo, 2013	Ind	SF, NF
<i>Bothroponera tesseronoda</i>	(Emery, 1877)	Ind	PF, SF
<i>Brachyponera jerdonii</i>	(Forel, 1900)	Ind	PF, SF, NF
<i>Brachyponera luteipes</i>	(Mayr, 1862)	Aus, Ind, Oce, Pal	PF, SF, NF
<i>Buniapone amblyops</i>	(Emery, 1887)	Ind, Pal	SF
^{**} <i>Cryptopone subterranea</i>	Bharti and Wachkoo, 2013	Ind	SF
[#] <i>Ectomomyrmex striolatus</i>	(Donisthorpe, 1933)	Ind	PF, SF
<i>Harpegnathos venator</i>	(Smith, 1858)	Ind, Pal	PF, SF, NF
<i>Hypoponera assmuthi</i>	(Forel, 1905)	Ind	SF
<i>Hypoponera confinis</i>	(Roger, 1860)	Aus, Ind, Oce, Pal	PF, SF, NF
⁺ <i>Hypoponera ragusai</i>	(Emery, 1894)	Afr, Aus, Ind, Mal, Nea, Oce, Pal	PF, SF, NF
<i>Hypoponera wroughtonii</i>	(Forel, 1900)	Ind	PF, SF, NF
<i>Leptogenys chinensis</i>	(Mayr, 1870)	Ind, Pal	SF, NF
<i>Leptogenys diminuta laeviceps</i>	(Smith, 1857)	Aus, Ind	PF, SF, NF
<i>Leptogenys hysterica</i>	Forel, 1900	Ind	PF, SF
^{**} <i>Leptogenys latkei</i>	Bharti and Wachkoo, 2013	Ind	SF
<i>Leptogenys lucidula</i>	Emery, 1895	Ind, Pal	PF
^{**} <i>Leptogenys transitionis</i>	Bharti and Wachkoo, 2013	Ind	SF
^{**} <i>Myopias shivalikensis</i>	Bharti and Wachkoo, 2012	Ind	SF
<i>Odontomachus monticola</i>	Emery, 1892	Aus, Ind, Pal	SF
<i>Odontoponera denticulata</i>	(Smith, 1858)	Ind, Pal	PF, SF, NF
<i>Parvaponera darwinii</i>	(Forel, 1893)	Afr, Aus, Ind, Mal, Pal	NF
<i>Platythyrea parallela</i>	(Smith, 1859)	Aus, Ind, Mal, Oce	PF, SF, NF
<i>Platythyrea sagei</i>	Forel, 1900	Ind	SF
[*] <i>Ponera indica</i>	Bharti and Wachkoo, 2012	Ind	PF, SF
^{**} <i>Ponera taylora</i>	Bharti and Wachkoo, 2012	Ind	SF, NF
<i>Pseudoneoponera bispinosa</i>	(Smith, 1858)	Ind, Pal	PF, SF, NF
<i>Pseudoneoponera rufipes</i>	(Jerdon, 1851)	Ind, Pal	PF, SF, NF
Proceratiinae			
<i>Proceratium williamsi</i>	Tiwari, 2000	Ind	PF, SF
Pseudomyrmecinae			
<i>Tetraponera allaborans</i>	(Walker, 1859)	Aus, Ind, Pal	PF, SF, NF
<i>Tetraponera nigra</i>	(Jerdon, 1851)	Ind, Pal	PF, SF, NF
<i>Tetraponera rufonigra</i>	(Jerdon, 1851)	Afr, Ind, Mal, Pal	PF, SF, NF

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References

- Baroni Urbani, C. and De Andrade, M.L. 2003. The ant genus *Proceratium* in the extant and fossil record. Museo Regionale di Scienze Naturali - Torino Monographie 36: 1–492.
- Bharti, H. 2001. Check list of ants from north-west India I. Uttar Pradesh. Journal of Zoology 21(2): 163–167.
- Bharti, H. 2002a. Check list of ants from north-west India II. Journal of the Bombay Natural History Society 99(2): 341–343.
- Bharti, H. 2002b. Redescription of *Lepisiota modesta* Forel (Hymenoptera: Formicidae: Formicinae). Annals of Forestry 10(2): 356–358.
- Bharti, H. 2003. Queen of the army ant *Aenictus pachycereus* (Hymenoptera, Formicidae, Aenictinae). Sociobiology 42: 715–718.
- Bharti, H. 2008. Redescription of *Crematogaster subnuda* Mayr (Hymenoptera: Formicidae: Myrmicinae). Journal of Entomological Research 32(1): 83–88.
- Bharti, H., Akbar, S.A., Wachkoo, A.A. and Singh, J. 2015. Taxonomic studies on ant genus *Hypoponera* (Hymenoptera: Formicidae: Ponerinae) from India. Asian Myrmecology 7: 1–15.
- Bharti, H., Bharti, M. and Pfeiffer, M. 2016b. Ants as bioindicators of ecosystem health in Shivalik Mountains of Himalayas: assessment of species diversity and invasive species. Asian Myrmecology 8: 1–15.
- Bharti, H. and Gill, A. 2011. SEM studies on immature stages of *Pheidole indica* Mayr, 1879 (Hymenoptera: Formicidae) from India. Halteres 3: 38–44.
- Bharti, H., Guénard, B., Bharti, M. and Economo, E.P. 2016a. An updated checklist of the ants of India with their specific distributions in Indian states (Hymenoptera, Formicidae). ZooKeys 551: 1–83.
- Bharti, H. and Kaur, I. 2011. SEM studies on immature stages of weaver ant *Oecophylla smaragdina* (Fabricius, 1775) (Hymenoptera: Formicidae) from India. Halteres 3: 16–25.
- Bharti, H. and Kumar, R. 2012a. A new species of *Leptanilla* (Hymenoptera: Formicidae: Leptanillinae) with a key to Oriental species. Annales Zoologici 62(4): 619–625.
- Bharti, H. and Kumar, R. 2012b. *Lophomyrmex terraceensis*, a new ant species (Hymenoptera: Formicidae) in the *bedoti* group with a revised key. Journal of Asia-Pacific Entomology 15: 265–267.
- Bharti, H. and Kumar, R. 2012c. Taxonomic studies on genus *Tetramorium* Mayr (Hymenoptera, Formicidae) with report of two new species and three new records including a tramp species from India with a revised key. Zookeys 207: 11–35.
- Bharti, H. and Kumar, R. 2013a. Six new species of *Carebara* Westwood (Hymenoptera: Formicidae) with restructuring of world species groups and a key to Indian species. Journal of the Entomological Research Society 15(1): 47–67.
- Bharti, H. and Kumar, R. 2013b. Five new species of *Dilobocondyla* (Hymenoptera: Formicidae) with a revised key to the known species. Asian Myrmecology 5: 29–44.
- Bharti, H. and Kumar, R. 2013c. A new species of *Vollenhovia* (Hymenoptera, Formicidae) From India with key to known Indian species. Vestnik Zoologii 47(2): 67–69.
- Bharti, H., Kumar, R. and Dubovikoff, D.A. 2013b. A new species of the genus *Tapinoma* Foerster, 1850 (Hymenoptera: Formicidae) from India. Caucasian Entomological Bulletin 9(2): 303–304.
- Bharti, H. and Sharma, Y.P. 2009. Diversity and abundance of ants along an elevational gradient in Jammu-Kashmir Himalaya-I. Halteres 1(1): 10–24.
- Bharti, H., Sharma, Y.P., Bharti, M. and Pfeiffer, M. 2013a. Ant species richness, endemism and functional groups, along an elevational gradient in the Himalayas. Asian Myrmecology 5: 79–101.

- Bharti, H., Sharma, Y.P. and Kaur, A. 2009. Seasonal patterns of ants (Hymenoptera: Formicidae) in Punjab Shivalik. *Halteres* 1(1):36–47.
- Bharti, H. and Wachkoo, A.A. 2011. *Amblyopone boltoni*, a new ant species (Hymenoptera: Formicidae) from India. *Sociobiology* 58: 585–591.
- Bharti, H. and Wachkoo, A.A. 2012a. First record of *Prionopelta kraepelini* (Hymenoptera: Formicidae) from India, with description of male caste. *Sociobiology* 59: 815–821.
- Bharti, H. and Wachkoo, A.A. 2012b. *Prenolepis fisheri*, an intriguing new ant species, with a re-description of *Prenolepis naoroji* (Hymenoptera: Formicidae) from India. *Journal of the Entomological Research Society* 14(1): 119–126.
- Bharti, H. and Wachkoo, A.A. 2012c. First record of the genus *Myopias* (Hymenoptera, Formicidae) from India, with description of new species. *Vestnik Zoologii* 46(1):33–35.
- Bharti, H. and Wachkoo, A.A. 2012d. First verified record of genus *Ponera* (Hymenoptera: Formicidae) from India, with description of two new species. *Acta Zoologica Academiae Scientiarum Hungaricae* 58(3): 217–224.
- Bharti, H. and Wachkoo, A.A. 2013a. *Cerapachys browni* and *Cerapachys costatus*, two new rare ant species (Hymenoptera: Formicidae) from India. *Biologia* 68(6): 1189–1192.
- Bharti, H. and Wachkoo, A.A. 2013b. Two new species of trap jaw ant *Anochetus* (Hymenoptera: Formicidae), with a key to known species from India. *Journal of Asia-Pacific Entomology* 16: 137–142.
- Bharti, H. and Wachkoo, A.A. 2013c. *Cryptopone subterranea* sp. nov., a rare new cryptobiotic ant species (Hymenoptera: Formicidae) from India. *Asian Myrmecology* 5: 1–4.
- Bharti, H. and Wachkoo, A.A. 2013d. Two new species of the ant genus *Leptogenys* (Hymenoptera: Formicidae) from India, with description of a plesiomorphic ergatogyne. *Asian Myrmecology* 5: 11–19.
- Bharti, H. and Wachkoo, A.A. 2014a. A new carpenter ant, *Camponotus parabarbatus* (Hymenoptera: Formicidae) from India. *Biodiversity Data Journal* 2: e996.
- Bharti, H. and Wachkoo, A.A. 2014b. New synonymy of *Proceratium williamsi* Tiwari (Hymenoptera, Formicidae). *ZooKeys* 388: 69–72.
- Bharti, H. and Wachkoo, A.A. 2015. Neotype designation and redescription of *Camponotus horseshoetus* (Hymenoptera: Formicidae). *Acta Entomologica Musei Nationalis Pragae* 55: 381–385.
- Bharti, H. and Wachkoo, A.A. and Kumar, R. 2012. Two remarkable new species of *Aenictus* (Hymenoptera: Formicidae) from India. *Journal of Asia-Pacific Entomology* 15: 291–294.
- Blaimer, B.B. 2012. Acrobat ants go global - Origin, evolution and systematics of the genus *Crematogaster* (Hymenoptera: Formicidae). *Molecular Phylogenetics and Evolution* 65: 421–436.
- Bolton, B. 1977. The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus *Tetramorium* Mayr in the Oriental and Indo-Australian regions, and in Australia. *Bulletin of the British Museum (Natural History). Entomology* 36: 67–151.
- Bolton, B. 1992. A review of the ant genus *Recurvidris* (Hym: Formicidae), a new name for *Trigonogaster* Forel. *Psyche* 99: 35–48.
- Bolton, B. 2000. The ant tribe Dacetini. *Memoirs of the American Entomological Institute* 65: 1–1028.
- Boudinot, B.E., Wachkoo, A.A. and Bharti, H. 2016. The first ergatoid male of *Platythyrea* (Hymenoptera: Formicidae: Ponerinae), with contribution to colony labor suggested by observation and comparative morphology. *Myrmecological News* 22: 59–64.
- Brown, W.L. Jr. 1975. Contributions toward a reclassification of the Formicidae. V Ponerinae, tribes Platythyreini, Cerapachyini, Cyldromyrmecini, Acanthostichini, and Aenictogitini. *Search Agriculture (Ithaca, New York)* 5(1): 1–115.
- Burrard, S.G. and Hayden, H.H. 1980. *Geography and Geology of Himalayan Mountains and Tibet. Part I.* Delhi: Mittal Publishers, 307 pp.
- Chapman, J.W. and Capco, S.R. 1951. Check list of the ants (Hymenoptera: Formicidae)

- of Asia. Monographs of the Institute of Science and Technology (Manila) 1: 1–327.
- Chen, Z.L., Shi, F.M. and Zhou, S.Y. 2016. A new species and a new record of *Cerapachys* Smith, 1857 (Hymenoptera: Formicidae) from China. *Far Eastern Entomologist* 324: 1–12.
- Donisthorpe, H. 1933. Descriptions of three new species of Formicidae, and a synonymical note. *Annals and Magazine of Natural History* (10)11: 194–198.
- Donisthorpe, H. 1937. A new species of *Harpegnathos* Jerd., with some remarks on the genus, and other known species (Hym. Formicidae). *Entomologist's Monthly Magazine* 73: 196–201.
- Donisthorpe, H. 1939. The genus *Lioponera* Mayr (Formicidae, Cerapachyinae), with descriptions of two new species and an ergatandromorph. *Annals and Magazine of Natural History* (11)3: 252–257.
- Eguchi, K. 2004. Taxonomic revision of two wide-ranging Asian ants, *Pheidole fervens* and *P. indica* (Insecta: Hymenoptera, Formicidae), and related species. *Annalen des Naturhistorischen Museums in Wien. B, Botanik, Zoologie* 105: 189–209.
- Eguchi, K. 2008. A revision of Northwestern Vietnamese species of the ant genus *Pheidole* (Insecta: Hymenoptera: Formicidae: Myrmicinae). *Zootaxa* 1902: 1–118.
- Eguchi, K., Yamane, S. and Zho, S.Y. 2007. Taxonomic revision of the *Pheidole rinae* Emery complex. *Sociobiology* 50(1): 275–284.
- Emery, C. 1896. Saggio di un catalogo sistematico dei generi *Camponotus*, *Polyrhachis* e affini. *Memorie della Reale Accademia delle Scienze dell'Istituto di Bologna* 5: 363–382.
- Emery, C. 1910. Hymenoptera. Fam. Formicidae. Subfam. Dorylinae. *Genera Insectorum* 102: 1–34.
- Forel, A. 1892. Les Formicides de l'Empire des Indes et de Ceylan. Part I. *Journal of the Bombay Natural History Society* 7: 219–245.
- Forel, A. 1893. Les Formicides de l'Empire des Indes et de Ceylan. Part III. *Journal of the Bombay Natural History Society* 8: 17–36.
- Forel, A. 1894. Les Formicides de l'Empire des Indes et de Ceylan. Part IV. *Journal of the Bombay Natural History Society* 8: 396–420.
- Forel, A. 1895. Les Formicides de l'Empire des Indes et de Ceylan. Part V. *Journal of the Bombay Natural History Society* 9: 453–472.
- Forel, A. 1900a. Les Formicides de l'Empire des Indes et de Ceylan. Part VII. *Journal of the Bombay Natural History Society* 13: 303–332.
- Forel, A. 1900b. Les Formicides de l'Empire des Indes et de Ceylan. Part VI. *Journal of the Bombay Natural History Society* 13: 52–65.
- Forel, A. 1901. Les Formicides de l'Empire des Indes et de Ceylan. Part VIII. *Journal of the Bombay Natural History Society* 13: 462–477.
- Forel, A. 1902a. Variétés myrmécologiques. *Annales de la Société Entomologique de Belgique* 46: 284–296.
- Forel, A. 1902b. Myrmicinae nouveaux de l'Inde et de Ceylan. *Revue Suisse de Zoologie* 10: 165–249.
- Forel, A. 1902c. Les Formicides de l'Empire des Indes et de Ceylan. Part IX. *Journal of the Bombay Natural History Society* 14: 520–546.
- Forel, A. 1903. Les Formicides de l'Empire des Indes et de Ceylan. Part X. *Journal of the Bombay Natural History Society* 14: 679–715.
- Forel, A. 1906. Les fourmis de l'Himalaya. *Bulletin de la Société Vaudoise des Sciences Naturelles* 42: 79–94.
- Hosoishi, S. and Ogata, K. 2009. A checklist of the ant genus *Crematogaster* in Asia (Hymenoptera: Formicidae). *Bulletin of the Institute of Tropical Agriculture Kyushu University* 32: 43–83.
- Imai, H.T., Baroni Urbani, C., Kubota, M., Sharma, G.P., Narasimhanna, M.H., Das, B.C., Sharma, A.K., Sharma, A., Deodikar, G.B., Vaidya, V.G. and Rajasekarasetty, M.R. 1984. Karyological survey of Indian ants. *Japanese Journal of Genetics* 59: 1–32.
- Jaitrong, W. and Yamane, S. 2013. The *Aenictus ceylonicus* species group (Hymenoptera, Formicidae, Aenictinae) from Southeast

- Asia. Journal of Hymenoptera Research 31: 165–233.
- Jaitrong, W., Yamane, S. and Wiwatwitaya, D. 2010. The army ant *Aenictus wroughtonii* (Hymenoptera, Formicidae, Aenictinae) and related species in the Oriental region, with descriptions of two new species. Japanese Journal of Systematic Entomology 16: 33–46.
- Kumar, R. 2013. Taxonomy and species composition of Dolichoderinae, Myrmicinae and Pseudomyrmecinae (Hymenoptera: Formicidae) from North-west Shivalik, Ph.D. thesis, Department of Zoology and Environmental Sciences, Punjabi University, Patiala, 419 pp.
- Mathew, R. and Tiwari, R.N. 2000. Insecta: Hymenoptera: Formicidae. In: State Fauna Series 4: Fauna of of Meghalaya, Part 7. Calcutta: Zoological Survey of India pp 251–409.
- Mukherji, D. and Ribeiro, S. 1925. On a collection of ants (Formicidae) from the Andaman Islands. Records of the Indian Museum 27: 205–209.
- Pisarski, B. 1967. Fourmis (Hymenoptera: Formicidae) d'Afghanistan récoltées par M. Dr. K. Lindberg. Annales Zoologici (Warsaw) 24: 375–425.
- Rigato, F. 1994. Revision of the myrmicine ant genus *Lophomyrmex*, with a review of its taxonomic position (Hymenoptera: Formicidae). Systematic Entomology 19: 47–60.
- Roonwal, M.L. 1976. Plant-pest status of root-eating ant, *Dorylus orientalis*, with notes on taxonomy, distribution and habits (Insecta: Hymenoptera). Journal of the Bombay Natural History Society 72: 305–313.
- Sarnat, E.M., Blanchard, B., Guénard, B., Fasi, J. and Economo, E.P. 2013. Checklist of the ants (Hymenoptera, Formicidae) of the Solomon Islands and a new survey of Makira Island. ZooKeys 257: 47–88.
- Schödl, S. 1998. Taxonomic revision of Oriental *Meranoplus* F Smith, 1853 (Insecta: Hymenoptera: Formicidae: Myrmicinae). Annalen des Naturhistorischen Museums in Wien. B, Botanik, Zoologie 100: 361–394.
- Shah, G.M., Jan, U. and Wachkoo, A.A. 2014. A checklist of Hoverflies (Diptera: Syrphidae) in the Western Himalaya, India. Acta Zoologica Academiae Scientiarum Hungaricae 60(4): 283–305.
- Shattuck, S.O. 1994. Taxonomic catalog of the ant subfamilies Aneuretinae and Dolichoderinae (Hymenoptera: Formicidae). University of California Publications in Entomology 112: i-xix, 1–241.
- Shattuck, S.O. and Barnett, N.J. 2007. Revision of the ant genus *Mayriella*. *Memoirs of the American Entomological Institute* 80: 437–458.
- Sheela, S.T., Narendran, C. and Tiwari, R.N. 2000. Redescription of a little known myrmicine ant *Recurvidris recurvispinosa* (Forel) (Hymenoptera: Formicidae). Records of the Zoological Survey of India 98: 93–98.
- Sidhu, G.S., Walia, C.S., Sachdev, C.B., Rana, K.P.C., Dhankar, R.P., Singh, S.P. and Velayutham, M. 2000. Fifty years of research on Sustainable Resource Management in Shivaliks. Punjab: Central Soil and Water Conservation Research and Training Institute, Research Centre, Chandigarh, 506 pp.
- Tak, N. 2009. Ants Formicidae of Rajasthan. Records of the Zoological Survey of India. Occasional Paper No. 288, iv, 46 pp.
- Tak, N. 2010. Insecta: Hymenoptera: Formicidae. Zoological Survey of India, Fauna of Ranthambore National Park, Conservation Area Series 43: 133–144.
- Tak, N. and Kazmi, S.L. 2011. On a collection of Insecta: Hymenoptera: Formicidae from Uttarakhand. Records of the Zoological Survey of India 111(2): 39–49.
- Tak, N. and Rathore, N.S. 2004. Insecta: Hymenoptera: Formicidae. State Fauna Series 8: Fauna of Gujarat. Zoological Survey of India 161–183.
- Tiwari, R.N. 1999. Taxonomic studies on ants of southern India (Insecta: Hymenoptera: Formicidae). *Memoirs of the Zoological Survey of India* 18(4): 1–96.
- Wachkoo, A.A. 2013. Taxonomy and species composition of Aenictinae, Cerapachyinae, Dorylinae, Formicinae and Ponerinae (Hymenoptera: Formicidae) from North-west Shivalik, Ph. D. thesis, Department of Zoology and Environmental Sciences, Punjabi University, Patiala, 481 pp.

- Wachkoo, A.A. 2015. New status of the ant *Camponotus mutilarius* Emery, 1893 stat. nov. (Hymenoptera: Formicidae). *Journal of Asia-Pacific Biodiversity* 8: 382–387.
- Wachkoo, A.A. and Akbar, S.A. 2016. First description of the sexuals of *Camponotus opaciventris* Mayr, 1879 (Hymenoptera, Formicidae), with notes on distribution in Western Himalaya. *Biodiversity Data Journal* 4: e10464.
- Wachkoo, A.A. and Bharti, H. 2014a. First description of the worker caste of *Nylanderia smythiesii* (Hymenoptera: Formicidae). *Biodiversity Data Journal* 2: e1163.
- Wachkoo, A.A. and Bharti, H. 2014b. Two new species of *Pseudolasius* (Hymenoptera: Formicidae) from India. *Sociobiology* 61(3): 274-280.
- Wachkoo, A.A. and Bharti, H. 2015a. Taxonomy and distribution of the ant *Cataglyphis setipes* (Hymenoptera: Formicidae). *Biodiversity Data Journal* 3: e4447.
- Wachkoo, A.A. and Bharti, H. 2015b. Taxonomic review of ant genus *Nylanderia* Emery, 1906 (Hymenoptera: Formicidae) in India. *Journal of Asia-Pacific Entomology* 8: 105-120.
- Wachkoo, A.A., Shah, G.M., Jan, U. and Akbar, S.A. 2017. A checklist of soldierflies (Diptera, Stratiomyidae) in India. *Journal of Asia-Pacific Biodiversity* 10: 44-54.
- Ward, P.S. 2001. Taxonomy, phylogeny and biogeography of the ant genus *Tetraponera* (Hymenoptera: Formicidae) in the Oriental and Australian regions. *Invertebrate Taxonomy* 15: 589–665.
- Wilson, E.O. 1964. The true army ants of the Indo-Australian area (Hymenoptera: Formicidae: Dorylinae). *Pacific Insects* 6: 427–483.