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Status of ant research and species first described from Nepal with new distribution records

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ABSTRACT

Nepal occupies the Central part of the Himalayas and offers unique ecological and species diversity. Ants are amongst the most diverse and successful insects on the Earth. Study of Nepalese myrmeco-fauna has started only after 1906 and little is known about them except the availability of few published works only. This paper provides a brief overview of the status of ant research in Nepal, type localities, distribution records, diagnosis and etymology of ant species which are described for the first time from Nepalese specimens. All the type materials of these species are deposited in museums abroad and it seems essential to deposit voucher specimens in the country to excel taxonomic work on Nepalese fauna. Systematic surveys of ants and well-curetted ant depository will facilitate the discovery of more ant species from Nepal. We hope that this paper will stimulate local interest in the study of ants of Nepal.

Keywords: holotype, *Myrmica*, *Prenolepis*, *Strumigenys*, type locality

INTRODUCTION

Ants (Family: Formicidae) is one of the most successful groups of organisms in the world with an estimated number of species above 20,000 (Holldobler & Wilson, 1990). They are found from almost all terrestrial ecosystems with highest diversity in the tropics (Guenard, 2013). There are over 13,911 valid ant species belonging to 17 subfamilies and 338 genera in the world (Bolton, 2021). Nepal, the central part of the Himalayas in the oriental region, with its changing ecological conditions accommodates rich species diversity. Recent data on ant species of Nepal has shown that there are 128 nominal species belonging to 48 genera and eight subfamilies (Subedi *et al.*, 2020). However, many areas are still unexplored.

Bharti (2008) listed 202 ant species from the entire Himalayas with 71 endemic species and 115 species. In terms of number of species and endemism *Myrmica* is the dominant and most speciose genus under the largest subfamily Myrmicinae (Bharti, 2008). In Nepal, nine ant species are endemic viz., *Emeryopone franzi* (Baroni -Urbani, 1975), *Leptanilla buddhista* Baroni-Urbani, 1977, *Meranoplus nepalensis* Schodl, 1998, *Myrmica boltoni* Radchenko and Elmes, 1998, *Myrmica martensi* Radchenko and Elmes, 1998, *Prenolepis nepalensis* Williams and LaPolla, 2018, *Stenamma gurkhale* DuBois, 1998, *Strumigenys buddhista* De Andrade, 2007 and *Strumigenys hindu* De Andrade, 2007 (Subedi *et al.*, 2020).

Current knowledge on Nepalese myrmeco-fauna is still in infancy. Existing information about the ant species described from Nepalese specimens is scattered in the literature and often difficult to access. This paper provides a brief history of Nepalese myrmecology and elaborates information on the ant species first described from Nepal with their new distribution records.

MATERIALS AND METHODS

This paper is based on published records and field study and collections made mainly by the first author which are deposited at CDZMTU and PCSIN. The specimens were collected from different parts of the country using different methods like, pitfall traps, food bait, beating, sweeping and manual collection. Published papers on myrmecofauna were reviewed which also included the original descriptions of Nepalese ant species. Available type images either in the original author's descriptions or in www.antweb.org (AntWeb, 2020) were examined for proper identification. The valid name, spelling and authority were updated from an online catalogue of Ants of the World (Bolton, 2021).

The subfamilies and species are arranged alphabetically. Type information including locality, latitude, longitude, altitude, date of collection, collectors' names and the specimen depositories are provided for each species. Distribution records within Nepal (if any) in addition to type information are also provided. Names of the countries have been provided for the distribution records from outside Nepal. Diagnosis and etymology are also provided for each species.

Acronyms of depositories of ants mentioned in this paper

BMNH: The British Museum of Natural History, London (=Natural History Museum, London, UK)

CASC: California Academy of Sciences, California

CDZMTU: Central Department Zoology Museum of Tribhuvan University, Kathmandu, Nepal

ELMES: Collection of G. W. Elmes, UK

MARTENS: Private Collection of Martens

MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA

MHNG: Muséum d'Histoire Naturelle, Geneva, Switzerland

MSNG: Museo Civico di Storia Naturale "Giacomo Doria", Genoa, Italy

NHMB: Naturhistorisches Museum, Basel, Switzerland

NHMW: The Natural History Museum Vienna, Austria

OMNH: Oklahoma Museum of Natural History, University of Oklahoma

PCISN: Private Collection of Indra Subedi, Kathmandu, Nepal

PSWC, WARD: Philip S. Ward Collection

SCHULZ: Private Collection of Schulz

SIZK: Schmalhausen Institute of Zoology of the Ukrainian National Academy of Sciences, Kiev

USNM: United States National Museum of Natural History, Washington DC

RESULTS AND DISCUSSION

Brief history and status of Nepalese myrmecology

The study of Nepalese ants began in 1906 with the description of two new species from Nepal namely, *Aphaenogaster pachei* and *Myrmica pachei* (Forel, 1906). Baroni-Urbani (1975) described a third new species *Belonopelta franzi* (= *Emerypone franzi*) from Nepal after 69 years of the first descriptions made from this country. Nineteen more ant species were described from Nepal during the period of 1977 to 2018. Over the past 115 years, the Nepalese ant fauna were studied intermittently and the exploration was dominated by the foreign scientists. Collingwood (1970) was the first author to publish a list of 34 Nepalese ant species based upon the collections of the 1954 British Museum expedition to east Nepal and Professor H Janetshek's 1961 expedition to the Khumbu Himal region. The

papers which described ants from Nepalese specimens or reported Nepalese ants included Forel, 1906; Menozzi, 1939; Mani & Singh, 1962; Wilson & Taylor, 1967; Collingwood, 1970, 1982; Baroni-Urbani, 1975; 1977a, 1977b; Bolton, 1974, 1977, 1992, 2000, 2007; De Andrade, 1994; Rigato, 1994; Schodl, 1998; DuBois, 1998; Radchenko & Elmes, 1998, 1999, 2002, 2003, 2010; Tiwari *et al.*, 1999, 2003; Thapa, 2000, 2015; Ward, 2001; Dill, 2002; Radchenko, 2003; Seifert, 2003, 2020; Wang, 2003; LaPolla, 2004; Nelder *et al.*, 2006; Baroni-Urbani & De Andrade, 2007; Eguchi, 2008; Wetterer, 2008, 2009a,b, 2010, 2011; Elmes & Radchenko, 2009; Branstetter, 2009; Hosoiishi and Ogata, 2016; Bharti *et al.*, 2016b; Williams & LaPolla, 2016, 2018; Latibari *et al.*, 2017; Seifert *et al.*, 2017; Guénard *et al.*, 2018; Jaitrong & Ruangsittichai, 2018; Neupane & Subedi, 2018; Subedi *et al.*, 2020. The records of Nepalese ant fauna and descriptions of species from Nepalese specimens show a considerable increase in the last three decades (fig. 1, 2).

Earlier researchers have contributed to the myrmeco-fauna of Nepal either by describing new species or by reporting the ant species from the country. Recently, a comprehensive checklist of Nepalese ants has been published with their taxonomic updates (Subedi *et al.*, 2020). The first online resource of Nepalese ants is Nepal ant's Webpage hosted by the California Academy of Science, USA (Bharti & Subedi, 2016). Information on Nepalese ants is now available in online databases such as AntWeb.org, antwiki.org and antmaps.org. However, no attention has been made on the documentation of invasive species of ants in Nepal. Several exotic and invasive ants with rampant effect could be a threat to the native ant fauna, although the severity of the impact has not been documented in Nepal.

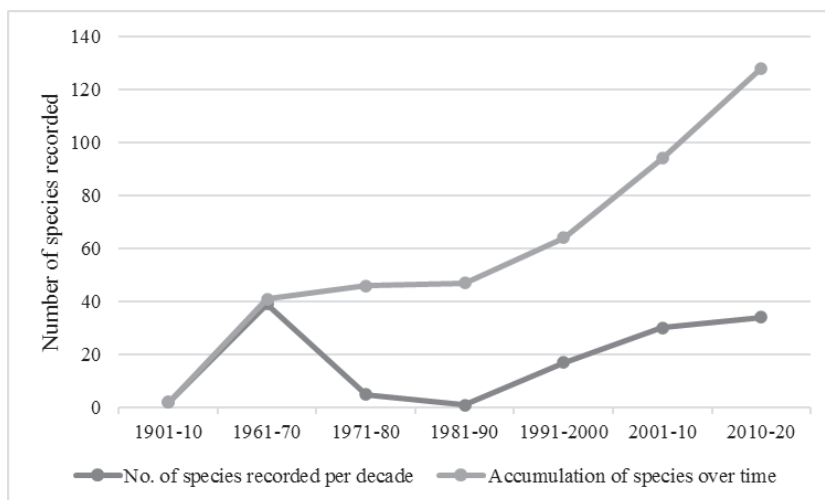


FIG. 1. Recorded ant species as per decades in Nepal.

Previous ant collection in Nepal was based mainly on manual hand picking method. In recent days, ant research following standard sampling techniques (see Agosti & Alonso, 2000) have been started in the country with initiation of the first author who has supervised five Master's Thesis students on ant fauna of Nepal. Recent study and survey (Subedi *et al.*, in prep) of Nepalese ants in different parts of the country followed standard methods. Ant diversity research by undergraduate and graduate students for their theses could be an important source of specimens from the unexplored sites.

Ant species first described from Nepalese specimens

Twenty-one valid species belonging to 10 different genera and four subfamilies have been first described from Nepalese specimens. *Perissomyrmex nepalensis*, described by Radchenko (2003) from Nepalese specimen, is now a junior synonym of *Perissomyrmex monticola* Baroni-Urbani & De Andrade, 1993 (Xu & Zhang, 2012), thus it is not included in the list. *Myrmica rugosa* Mayr, 1865 is excluded from the species list described from Nepal since Mayr (1865) provided no date or collector in his original description of this species and indicated "Himalaya" as the type locality. Bolton (2021) mentioned Nepal as type locality of *Pheidole rogersi* Forel, 1902 but we considered it as erroneous record since the given references do not verify its occurrence in Nepal. Out of 128 Nepalese ant species (Subedi *et al.*, 2020), nearly 16.5% of them were first described from Nepal with over 7% as endemic to the country. Twelve of the 21 ant species described from Nepal belong to two genera *Myrmica* (6) and *Strumigenys* (6). Details of 21 species which were described from the Nepalese specimens are given below.

Six ant species were found to be described till 1990 and the remaining 15 species were described thereafter (fig. 2). Notably, twenty of these species were described from the specimens collected before 1990 except one species which was described from the specimens collected thereafter (fig. 2). Ease for collection and export of the specimens by the foreigners in early days might have caused this unequal pattern. All type specimens of these ant species are deposited in natural history museums elsewhere outside the country. This indicates a need for taxonomic infrastructure development in the country (Budha, 2015) and deposit name bearing types in the home institution to encourage amateur taxonomists and researchers.

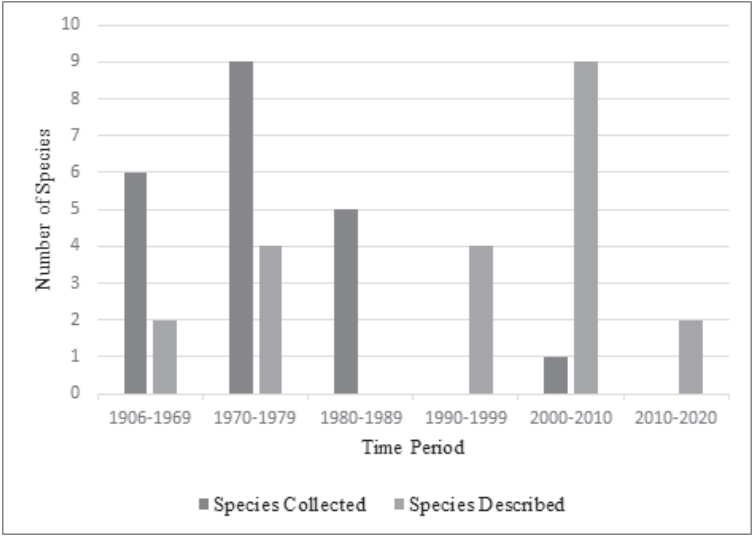


Fig. 2. Date of specimen collection and species description for the ant species with Nepal as type locality.

Most of the known species were reported mainly from central to eastern parts of Nepal and were concentrated particularly to trekking routes in the mid-hill (fig. 3). There are still several unexplored areas to sample ants that will fulfill information gaps of the ants of Nepal.

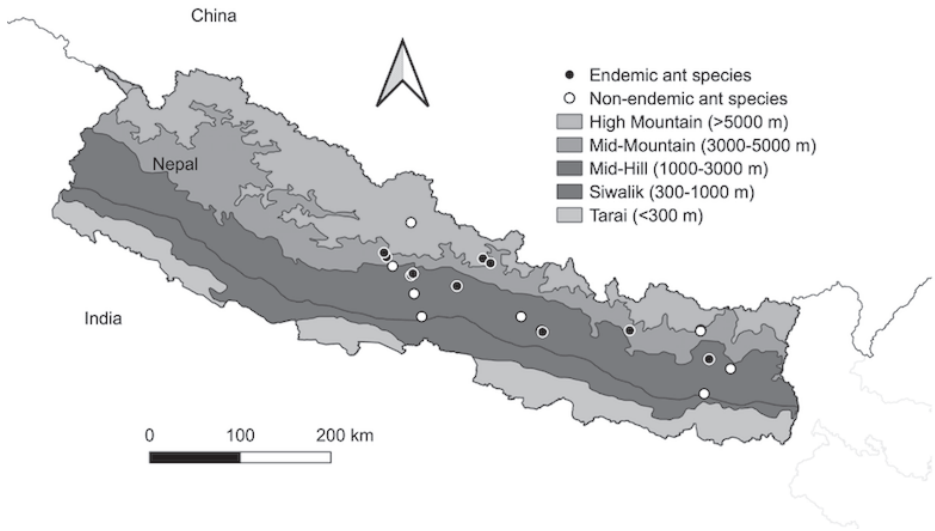


Fig. 3. Distribution of endemic and non-endemic ant species described from Nepal.

Systematic part (Ant species first described from Nepalese specimens)

Subfamily: Formicinae Latreille, 1809

Prenolepis darlena Williams and LaPolla, 2016.

Type locality (TL): Baglung, Nepal (Images of USNMMENT00755129 holotype worker examined).

Holotype worker, 16 km ENE Baglung, 28.30° N, 83.766667° E, 1100 m, *Schima-Castanopsis* forest, 27.XI.1988, leg. P.S. Ward, 2 paratype workers from the type locality, USNM (Williams & LaPolla, 2016)

Distribution: Nepal, Thailand (Williams & LaPolla, 2016)

Diagnosis & Etymology: Workers can be diagnosed by the presence of three small ocelli, square shaped head, erect setae on scapes, petiole low in profile and very narrow and elongated with a rounded dorsal apex of the scale (Williams & LaPolla, 2016). The specific epithet is named after the first author's mother "Darlene".

Prenolepis nepalensis Williams and LaPolla, 2018

TL: Pokhara, Nepal (Images of ANTWEB CASENT0281462 holotype worker examined).

Holotype worker, 4 km SSW Pokhara, 28.20° N, 83.966667° E, 900 m, *Schima-Castanopsis* forest, low vegetation, 10.XII.1988, leg. P.S. Ward, USNM (Williams & LaPolla, 2018)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: Workers can be diagnosed by the presence of shallow postero-lateral borders of clypeus, three small ocelli, robust and compact mesonotum forming dorsal hump anteriorly, distinct sparsity of long macrosetae on head and mesosoma (Williams & LaPolla, 2018). Petiole is forward inclined, sub triangular, and not elongated. Scapes and legs with an abundance of smaller, decumbent setae and pubescence. The specific epithet is named after the country name "Nepal".

Subfamily: Leptanillinae Emery, 1910

Leptanilla buddhista Baroni-Urbani, 1977

TL: Bakkri Kharka, Nepal (Images of ANTWEB CASENT0902774 holotype worker examined).

Holotype worker, Bakkri Kharka, 28.3833°N, 84.75°E, 5500 ft (1676 m), from shaded damp moss on moderately acid soil, leg. K.H. Hyatt, 24.IV.1954, BMNH (BMNH(E)1015818); 1 paratype worker, Godawari (Valle di Kathmandu), 1450 m, 24.V.1976, leg. C. Baroni-Urbani, NHMB (Baroni-Urbani, 1977b)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species differs from other species of this genus by the presence of ventral margin of petiolar sternite with triangular projection and absence of sub-petiolar process. The specific epithet is derived from the religion “Buddhism”.

Subfamily: Myrmicinae Lepeletier de Saint-Fargeau 1835

Aphaenogaster pachei (Forel, 1906)

TL: Tseram, Nepal (Images of ANTWEB CASENT 0907694 holotype worker examined)

Holotype worker, Taplejung: Tseram, NE Nepal, 28.0° N, 84.0° E, 3600 m, leg. Pache, MHNG (ANTWEB CASENT 0907694), syntype of *Aphaenogaster sagei pachei* (Forel, 1906), Thorung Pedi, 28.775° N, 83.96667° E, 4400 m (Antweb, 2019), Solukhumbu: Pangboche, 3950 m, Yaral and Taboche (Mingbo Valley), 3900 m – 4800 m; Ramechhap: Likhu-Khola, 1690 m (Thapa, 2015, 2000; Collingwood, 1970); Sagarmatha NP, Phurte env., 27.8267° N, 86.6833° E, 3462 m, S. Bevacqua leg., PCISN

Distribution: Nepal, India (Bharti *et al.*, 2016)

Diagnosis & Etymology: This species was originally described as *Stenamma* (*Aphaenogaster*) *sagei* subsp. *pachei*. M. Alexis Pache collected it under a stone while typical Sagei was discovered by Major Sage on Himalayas at 2800 m (Forel, 1906). Collingwood (1970) gave *pache* a species status. The specific epithet is named from the name of its collector M. Alexis “Pache”.

Mayriella transfuga Baroni-Urbani, 1977

TL: Narayanghat, Nepal (Images of ANTWEB CASENT 0913960 holotype worker examined)

Holotype worker, Terai, 6 km NW Narainghat (=Narayangarh), 27.75° N, 84.0833° E, 250 m, 30.VI.1976, 7 paratype workers, from the type locality, leg. Baroni-Urbani, NHMB, BMNH (Shattuck & Barnett, 2007; Baroni-Urbani, 1977a)

Distribution: Nepal, Indonesia, Malaysia, Philippines, Singapore, India, Borneo, Hong Kong, Thailand, China, Bhutan (Shattuck & Barnett, 2007)

Diagnosis & Etymology: This species differs from other species in the genus by the presence of well-developed sculpturing in the posterior section of the scrobe, the large, closely spaced pits on mesosomal dorsum, the parallel lateral surfaces of the postpetiole, the strongly angular petiolar node and the relatively long propodeal spines (Shattuck & Barnett, 2007). This species was described by Baroni-Urbani (1977a) from the materials collected in Nepal and Bhutan.

Meranoplus nepalensis Schodl, 1998

TL: Gokarnaban, Nepal (Images of ANTWEB CASENT 0915543 holotype worker examined)

Holotype worker, Gokarnaban, Gokarna Forest Reserve, 1350 m, 12.VI.1976, Kathmandu, Nepal, leg. W Wittmer and C Baroni-Urbani, NHMB, 24 paratype workers, 1 queen, same locality as holotype, NHMB, NHMW, MHNG, BMNH, MCZ (BMNH(E)1015059); 1 paratype worker, Godavari, 1450 m, leg. W Wittmer and C Baroni-Urbani, NHMB; 1 paratype worker, Kokarnab, Kathmandu, leg. H. Franz, NHMB; 3 paratype workers, Sankhuwasabha: Tumlingtar, 27.287292° N, 87.216515° E, 950 m, 26.IV.1984, leg. I. Lobi, A. Smetana, CASC, NHMW (Schodl, 1998)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: It can be diagnosed from other small, similar sized species by the pronotal shield not being armed with distinct spines, by regulose clypeus, and by the excavated anterior clypeal margin (Schodl, 1998). It is named after the country of its origin “Nepal”.

Myrmica alperti Elmes and Radchenko, 2009

TL: Thodung, Nepal (Images of ANTWEB CASENT 0913061 holotype worker examined)

Holotype worker, Solukhumbu: Thodung, 27.6° N, 86.35° E, 3200 m, 2–9.IV.1973, Coniferenwald, leg. J. Martens, NHMB, 14 Paratype workers, from the type locality; 9 paratype workers, Jiri-Thodung, 28.V.1976, leg. W. Wittmer and C. Baroni-Urbani; 1 paratype worker, Shiralaybis, Jiri-ghat, 2200 m, 8.VI.1973, leg. J. Martens, NHMB, SIZK, ELMES (Bharti *et al.*, 2016; Elmes & Radchenko, 2009)

Distribution: China (Mo *et al.*, 2015), Nepal

Diagnosis & Etymology: It closely resembles *Myrmica indica* but differs by its stockier body and shorter appendages, by the longer propodeal spines, by the shape of petiole and especially by its bluntly rounded propodeal lobes (Radchenko & Elmes, 2010). The specific epithet derived from the name of a myrmecologist Gary “Alpert”.

Myrmica boltoni Radchenko and Elmes, 1998

TL: Dhorpatan, Nepal (Images of ANTWEB CASENT 0913060 paratype worker examined)

Holotype worker, Baglung: Dhorpatan, 3000 m, 20.V.1973; leg. T Martens, 15 paratype workers, from the type locality; 3 paratype workers, Goropani, w. Pokhara, IX-X.1971, leg. H Franz; 18 km NNE Baglung, 28.4°N, 83.7°E, 2540 m, 29.XI.1988, leg. PS Ward, PSWC, WARD; 1 worker, Sankhuwasabha: valleed’Induwa Koa, 2000 m, 16.IV.1984, leg. Lobl and Smetana; 1 worker, Manang: Marsyangdi, 28.083332° N, 84.46667° E, 2550 m, 14-17.IV.1980. leg. J Martens and Ausobsky; 2 workers, Mustang: Lethe, 2450-2600 m, 30.IV.1980, leg. J. Martens and Ausobsky; 1 worker, Gorkha: Chuung Khola, Meme Kharka, 28.333332°N, 84.833336° E, 3300-3400 m, leg. J. Martens and W. Schwaller; BMNH, SIZK, ELMES, WARD, MARTENS, SCHULZ (Bharti *et al.*, 2016; Radchenko & Elmes, 1998), 2 miles SE Sikha, 28.4466°N, 83.67179°E, 2286 m, leg. J Quinlan, 21.V.1954, BMNH (Antweb, 2019); 2 workers, Shivapuri-Nagarjun National Park: near Bagdwar, 27.80666°N, 85.39000°E, 2400 m, 5.XII.2020, leg. IP Subedi, CDZMTU.

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species can be distinguished from other members of the *ritae*-complex by the occurrence of finer rugosity on the body and by the dull, dense and coarsely punctured surface of the head (Radchenko & Elmes, 1998). The specific epithet is given from the name of myrmecologist Barry “Bolton”.

Myrmica brancuccii Radchenko, Elmes and Collingwood, 1999 (Fig. 3G)

TL: Utrot, Nepal (Images of ANTWEB CASENT 0900337 holotype worker examined)

Holotype worker, Utrot, 13.V.1983, leg. M. Brancucci, BMNH; 5 paratype workers, from the type locality, 14 paratype workers, Lawarai, 21.V.1983, leg. M. Brancucci; Kaski: Lumle, VI.1988, leg. Collingwood, BMNH, NHMB, CASC, SIZK (Bharti *et al.*, 2016; Radchenko & Elmes, 1999); Kanchenjunga Conservation Area, IV.2012, leg. Y Paudel, PCISN.

Distribution: Nepal, NE Pakistan (Radchenko & Elmes, 2010)

Diagnosis & Etymology: This species can be diagnosed by the presence of striato-punctuation on the first gastral tergites. It could be a relatively polymorphic species in comparison to other *Myrmica* species. The specific epithet is derived from its collector “Brancucci”.

Myrmica martensi Radchenko and Elmes, 1998

TL: Gosaikunda, Nepal (Images of ANTWEB CASENT 0913073 holotype worker examined)

Holotype worker, Rasuwa: Gosainkunda, Sing Gyang, 27.6° N, 86.35° E, 3200 m, 26.IV.1973, leg. J Martens, 3 paratype workers and 1 female, from type locality, NHMB (Radchenko & Elmes, 1998)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species can be distinguished from its closely related species *M. boltoni* by the presence of shorter, upwardly pointing and distinctly divergent propodeal spines, by a distinctly shorter petiole and by its more feebly developed sculpture on alitrunk and pedicel (Radchenko & Elmes, 2010). The specific epithet is derived after its collector J “Martens”.

Myrmica pachei Forel, 1906

TL: Tseram, Nepal (Images of ANTWEB CASENT 0904088 paralectotype worker examined)

Lectotype worker and 3 paralectotype workers (designated by Radchenko & Elmes 2001), Taplejung: Tseram, NE Nepal, 28.0°N, 84.0°E, 3600 m, tree trunk, leg. M. Pache, NHMG, MCZ, 1 paralectotype worker and 1 male, Himalaya, 3600 m, MSNG, Taplejung: upper Simbu Khola valley, vic. Tseram, 3250-3350 m; Dhara und Alm Lasea, 3000 – 3300 m, MSNG, MHNG (Bharti *et al.*, 2016; Forel, 1906)

Distribution: Nepal, India, Bhutan (Radchenko & Elmes, 2010), China (Mo *et al.*, 2015)

Diagnosis & Etymology: This species has transversal rugulosity on the alitrunk dorsum. It can be distinguished from its closely related species *M. villosa* by the presence of much shorter, straighter and sparser hairs on the body, much denser sculpture on the alitrunk (Radchenko & Elmes, 2010). It was named after its collector M. “Pache”.

Myrmica weberi Elmes and Radchenko, 2009

TL: Maghang Kharka, Nepal (Images of ANTWEB CASENT 0913089 holotype worker examined)

Holotype worker, Sankhuwasabha: Maghang Kharka, Makalu Barun Conservation Area, 27.605° N, 87.125° E, 2634 m, 7.XI.2005, leg. Alpert, Alonso and Subedi, NHMB, 15 paratype workers and 1 queen, from type locality; 7 paratype workers, Sankhuwasabha, Maghang Kharka, Makalu Barun Conservation Area, 27.593611° N, 87.1225° E, 2548 m, 5.XI.2005, leg. D. Emmett and Subedi, SIZK, NHMB, ELMES; Sankhuwasabha: Chauki, 27.18333° N, 87.45° E, 2000–3000 m, 22–24.VI.01, NHMB; Nepal, Rigmo, leg. H. Tabata, 7.VI.1978 (Elmes & Radchenko, 2009); Taplejung: Chatedunga, 27.39099°N, 87.74921°E, 2693 m, 8.X.2020, leg. P.B. Budha, CDZMTU.

Distribution: Nepal, India, Bhutan (Radchenko & Elmes, 2010)

Diagnosis & Etymology: This species differs from its closely related species *M. indica* and *M. alperti* by the distinctly smaller size, the thinner and longer propodeal spines, and by the more developed reticulation on the head dorsum (Radchenko & Elmes, 2010). The species name is given after American myrmecologist, N. A. “Weber”, who made the first major taxonomic revision of the genus *Myrmica*.

Stenamma gurkhale DuBois, 1998

TL: Phulchoki, Nepal (Images of ANTWEB CASENT 0900945 holotype worker examined)

Holotype worker, Lalitpur: Phulchoki, 27.5833° N, 85.4° E, 2743 m, 30.V.1983, leg. M. Brendell, 3 workers, from type locality, BMNH, MCZ (Dubois, 1998)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species was originally described as *Stenamma gurkhalis* and is most closely related to *S. owstoni* based upon thoracic and head sculpture and petiolar profile but it is smaller in size (Dubois, 1998). The species was named after the group of people living in Nepal, the “Gurkhas”.

Strumigenys buddhista De Andrade, 2007

TL: Pokhara, Nepal (Images of ANTWEB CASENT 0912868 holotype worker examined)

Holotype worker (unique) from Nepal labelled, Kaski: Pokhara, 28.218536° N, 83.98756° E, 820 m, 15-18.VI.1976, leg. W. Wittmer, C. Baroni-Urbani, NHMB, (Baroni-Urbani & De Andrade, 2007)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species belongs to the *godeffroyi*-group, *godeffroyi*-complex (Bolton, 2000), and differs from its closely related species *S. uberyx* by the longer mandibles and more anteriorly protruding anterior face of petiolar node and *S. hindu*, by its smaller size (total length= 1.96 mm) and smaller scape index (90.9) and both species by less numerous standing hairs on head dorsum (Baroni-Urbani & De Andrade, 2007). The name is derived from “Buddhism”, the second major religion in Nepal.

Strumigenys exilirhina Bolton, 2000

TL: Sanghu, Nepal (Images of ANTWEB CASENT 0900837 holotype worker examined)

Holotype worker, Taplejung: Sanghu, 6.X.1961, in moss on rock, leg. KH Hyatt, BMNH, 19 paratype workers, from type locality, BMNH, MCZ, MHNG, OMNH

(AntWeb, 2019; Bolton, 2000); Kathmandu, 27.75° N, 85.16664° E, leg. M Brendell, 23.V.1983, PSWC, WARD (AntWeb, 2019)

Distribution: Hong Kong (Tang *et al.*, 2019), Nepal, Bhutan, India, Thailand, China, Japan (Bharti & Akbar, 2013)

Diagnosis & Etymology: This species is a member of *feae*-complex of species group *mayri* and is characterized by short mandibles and scapes, distinctly convex upper scrobe margins from just in front of the level of the eyes to the scrobe apex (Bolton, 2000).

Strumigenys hemisobek (Bolton, 2000)

TL: Maiwa Khola, Nepal (Images of ANTWEB CASENT 0900139 holotype worker examined)

Holotype worker, Taplejung: Maiwa Khola, Sanghu, 1981 m, leg. KH Hyatt, 2.X.1961, on wet bank mosses, BMNH (Bolton, 2000)

Distribution: India (Bharti & Akbar 2013, Bharti *et al.*, 2016), Nepal

Diagnosis & Etymology: This species can be distinguished from other members of the group *murphy* by the lack of orbicular hairs on cephalic dorsum and lacks eyes (Bolton, 2000). This species was originally described as *Pyramica hemisobek* by Bolton in 2000. Baroni-Urbani & De Andrade (2007) kept it in combination in *Strumigenys*.

Strumigenys hindu De Andrade, 2007

TL: Pokhara, Nepal (Images of ANTWEB CASENT 0912870 holotype worker examined)

Holotype worker (unique) from Nepal labelled, Kaski: Pokhara, 28.218536° N, 83.987656° E, 820 m, 15-18.VI.1976, leg. W. Wittmer, C. Baroni Urbani, NHMB, (Baroni-Urbani & De Andrade, 2007)

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species belongs to the *godeffroyi*-group, *godeffroyi*-complex (Bolton, 2000), and it differs from its closely related species *S. uberyx* and *S. buddhista* by its larger size (total length= 2.5 mm) and scape index (102.6) (Baroni-Urbani & De Andrade, 2007). The specific name derived from the “Hindu” religion, the major religion in Nepal.

Strumigenys nepalensis De Andrade, 1994

TL: Narayangarh, Nepal (Images of ANTWEB CASENT 0900148 paratype worker examined)

Holotype worker, Chitwan: 6 km NW of Narainghat (=Narayangarh), 250 m, NHMB Nepal expedition, 1976, 21.V.1976, NHMB, 10 paratype workers and 4 dealate gynes, from type locality, 3 paratype workers, 5 km E of Manhari, 350 m, NHMB Nepal Expedition, 1976 (Baroni-Urbani & De Andrade, 1994); Kathmandu: Ranibari Community Forest, 27.729444 N, 85.3205555 E, 1310 m, 16.X.2019, I.P. Subedi & R. P. Pokhrel leg, CDZMTU.

Distribution: Nepal, India, Malaysia, Singapore, Thailand, Vietnam, China, Mauritius, Hong Kong (Tang *et al.*, 2019)

Diagnosis & Etymology: This species can be diagnosed from its species group *transversa* by the presence of four-jointed antennae and by the presence of 5 pairs of long dorsal hairs on the trunk (Baroni-Urbani & De Andrade, 1994). The species name is derived after the country name Nepal from where it is first described.

Strumigenys podarge (Bolton, 2000)

TL: Godawari, Nepal (Images of ANTWEB CASENT 0900142 holotype worker examined)

Holotype worker, Lalitpur: Godawari, 27.59864°N, 85.38718°E, 1700 m, 24.V.1983, leg. M. Brendell, BMNH, 1 paratype worker, from type locality, MCZ (AntWeb, 2019)

Distribution: India (Bharti *et al.*, 2016), Nepal

Diagnosis & Etymology: This species was originally described as *Pyramica podarge*. Baroni-Urbani and De Andrade (2007) kept it in combination in *Strumigenys*. This species can be diagnosed from other members of *extemena*-group by the presence of long remiform hair that projects from the angle of scape, reticulate punctate propodeal dorsum, broad waist segments and blunt pronotal marginations (Bolton, 2000).

Tetramorium difficile Bolton, 1977

TL: Tamur River, Nepal (Images of ANTWEB CASENT 0901089 holotype worker examined)

Holotype worker, Tamur River, Dobhan, 26.911106°N, 87.16165°E, 1.II.1962, forest litter, leg. K. Hyatt, BMNH, 1 paratype worker, from type locality, MCZ (Bolton, 1977)

Distribution: Vietnam, China, India (Liu *et al.*, 2015), Nepal

Diagnosis & Etymology: This species shows affinity with *T. tonganum* but is smaller and has relatively shorter antennal scapes and more angular pronotal corners (Bolton, 1977).

Subfamily: Ponerinae Lepeletier de Saint-Fargeau, 1835

Emeryopone franzi (Baroni Urbani, 1975)

TL: Pokhara, Nepal (Images of ANTWEB CASENT 0915183 holotype worker examined)

Holotype worker, Kaski: Pokhara, Goropani, 28.218536° N, 83.987656° E, IX-X.1971, leg. H. Franz, NHMB, (Baroni-Urbani, 1975); Shivapuri-Nagarjun National Park: Nagarjun forest, 27.74444° N, 85.294167° E, 24.X.2019, leg. I.P. Subedi, CDZMTU.

Distribution: **Endemic to Nepal**

Diagnosis & Etymology: This species was originally described as *Belonopelta franzi* from a single specimen and the species probably close to *B. buttelreepeni* (Now *Emeryopone buttelreepeni*) from which differs at least in longer antennal scape exceeding the occipital margin, ventral protrusion of the postpetiole without fenestra. Bolton (1995) kept it in combination with *Emeryopone*. It was named after the name of Prof. H "Franz" di Vienna. Here we recorded *E. franzi* from outside the type locality for the first time after 50 years of its collection from Nepal.

CONCLUSION

Nepalese ants got sporadic attention from the researchers over the past 115 years. There is a strong sampling bias in the known distribution of ants in Nepal since it is mainly based upon hand collection. Investigation is undergoing in recent days following standard ant sampling techniques which can be expected to generate significant data on Nepalese Myrmecofauna. Type materials of the ant species described from the country were deposited in museums elsewhere outside the country. Developing and managing depositories of type specimens in the country is an urgent need for taxonomic development. This work may be helpful to future researchers as a sources of reference in their research on ants of Nepal.

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