Annotated checklist of Collembola of Nepal

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Abstract

This is the first annotated checklist of Collembola species of Nepal. It includes 167 collembolan species belonging to 78 genera and 17 families including 45 endemic species. Majority of the Nepalese collembolan species were reported from major trekking routes viz. Mount Everest, Annapurna Conservation Area and Langtang area with very few other locations. The highest record of collembola in Nepal is about 5800 m asl. Southern Terai and Siwalik range remain unexplored.

Keywords: Endemic species; Hexapods; Himalanura; Nepalanura; Springtails

1 | Introduction

Collembola, commonly known as springtails are widely distributed small terrestrial hexapods measuring 0.2–8 mm in size with approximately 9000 species in the World (Bellingr et al. 1996–2021; Deharveng et al. 2008; Timmermans et al. 2008). Previously they were considered as insects but the recent molecular studies reveal their pancrustacean relationship (Timmermans et al. 2008). They are the most diversified soil hexapods at local scale (<10 m²) (Deharveng 1996). However, they live in wide range of habitats viz. soil, leaf litter, ground vegetation, tree trunk, tree canopy, seashore, caves, deserts and even in snow or ice (André 1983; Rodgers & Kitching 1998, 2011; Rusek 1998; Shaw 2013). They play a key role in soil influencing the soil formation, soil microbial ecology, nutrient cycling, and enhance soil fertility by decomposition (Behan-Pelletier 2003; Greenslade 2007; Santos et al. 2008; Snyder & Callaham 2019). Collembolan short generation period, lower dispersal capacity (Dunger & Voigtlander 2009), quick recovery with distinct alteration (Frampton 1994; Geissen & Kampichler 2004), sensitivity (Greenslade 2007) and susceptibility to any kind of disturbances (Petrillo & Witter 2005; Greenslade et al. 2011) make them valuable marker for the indication of environment (Abbas & Parwez 2019; Gruss et al. 2019; Yin et al. 2019).

The earliest available record of Nepalese Collembola date back to early 1910s. The first species known from Nepal was probably Callytrura lineata (Parona, 1892) which was originally described as Paronella bornei Imms, 1912. After forty six years later, two species Onychiurus himalayensis and O. gurjakhanii were described by Choudhuri (1958) from the collection of 1952 British (Natural History) Museum expedition to Nepal. The major taxonomic contributions on Nepalese Collembola were done only in late 1960s. Yosii (1966a, b, 1971) reported more than 60 species with the description of two new genera viz. Nepalanura and Janetschekbrya and several new species from Nepal. Later new addictions were done by Mari Mutt and Bhattacharjee (1980), Mari Mutt (1981), Wilson (1982), Cassagnau (1984, 1993). In subsequent years, new records and species descriptions were further added from the previous expeditions’ collections by Bedos and Deharveng (1991), Tamura and Zhao (1997), Thapa (1997), D’Haese and Weiner (1998), Potapov and Cassagnau (2000), Agolin et al. (2009), Thapa (2015), Zhang (2015), Schulz (2018). Thapa (1997) first time complied the all previously known collembolan from Nepal and listed 125 species and however his later published book of Insect Diversity of Nepal comprised only 122 species of Collembola (Thapa 2015).

Most of springtails’ inventories in Nepal represent the high Himalaya, with very limited reports from mid-hills and low land. The uppermost record of collembolan from Nepal was from 5800 m asl (Janetschek 1990). Many pristine habitats of different physiographic zones of Nepal are still to be explored. The present list comprises 167 species within 78 genera, 17 families and 17 subfamilies. Taxonomic notes, global distribution of each genus is provided.

2 | Methods

The present checklist is based on the published papers on Collembola of Nepal including compiled list of Thapa (1997, 2015). All original descriptions were searched from https://biodiversityheritagelibrary.org and https://www.collembola.org. Recent papers were searched in Google and Google scholar. All species data are tabulated with the species name, original
Results and discussion

3.1 Collembola species diversity in Nepal

The updated list of Collembola of Nepal includes 167 species belonging to 78 genera in 17 subfamilies and 17 families (Table 1). Inventory of Collembola was concentrated along the major trekking routes in Nepal particularly west Nepal (Annapurna Conservation Area) and Central Nepal (Langtang area and trekking route from Banepa-Kavrepalanchowk-Ramechhap-Solukhumbu to Everest base camp) and few high elevation area of west Nepal (Fig. 1). Most of the Tarai and Shiwalik range are completely unexplored with a few exceptions (Fig. 2).

3.2 Species Accumulation Curve

The inventory of Nepalese Collembola began in 1912. Yosii (1966, 1971) discovered 65 species from different part of the country. Janetscheki (1990) is another contributor to describe more than 70 species from Nepal. Based on the available information the species discovery curve is shown in Fig. 3.

3.3 Endemic collembolan species

Endemism patterns varies among regions, habitats and taxa (Deharveng et al. 2008). Endemic species are special attention of conservation point of view. Collembola contain high endemic species (Martin et al. 2000). Nepal is rich in endemic fauna of Collembola. Out of 167 know species 45 species (27%) are endemic to Nepal (see * mark in the Table 1 for endemic species).

3.4 Codes of references

[1. Agolin et al. 2009; 2. Bellinger and Ellis 1997; 3. Cassagnau 1984; 4. Cassagnau 1993; 5. Cassagnau and Deharveng 1981; 6. Choudhuri 1958; 7. D’Haese and Weiner 1998; 8. Imms 1912; 9. Janetschek 1990; 10. Mari Mutt 1979; 11. Mari Mutt 1981; 12. Mari Mutt 1985; 13. Mari Mutt and Bhattacharjee 1980; 14. Palacios-Vargas and Gomez-Anaya 1995; 15. Potapov and Cassagnau 2000; 16. Skarzynski and Smolis 2006; 17. Thapa 2015; 18. Wilson 1982; 19. Yosii 1966b; 20. Yosii 1970; 21. Yosii 1971; 22. Yosii 1977; 23. Yosii 1990; 24. Zhang 2015 25. Mandal and Hazra, 2009, 26. Schulz, 2018]
### Table 1. Checklist of the Nepalese Collembola

| Taxon | Elevation (m) | No. of Global Species* | References | Notes |
|-------|---------------|------------------------|------------|-------|
| **Order: Entomobryomorpha Borner, 1913** | | | | |
| **Superfamily: Entomobroidea Womersley, 1934** | | | | |
| **Family: Entomobryidae Schaffer, 1896** | | | | |
| **Subfamily: Entomobryinae Schaffer, 1896** | | | | |
| **Genus: Entomobrya Rondani, 1861** | | | | |
| Type species: *Degeeria muscorum* Nicolet, 1842 | 329 (5) | 1 |
| *Entomobrya aino* (Matsummura & Uchida, 1931) | 26 |
| *Entomobrya chomolungmae* Yosii, 1971* | 1200–4350 | 9 |
| *Entomobrya chooyuae* Yosii, 1971* | 900–4350 | 9 |
| *Entomobrya lhotseae* Yosii, 1971* | 1200–5700 | 9 |
| *Entomobrya rohtagensis* Baijal, 1958 | 23 |
| *Genus: Himalanura Baijal, 1958** | 19 (5) | | |
| Type species: *Himalanura indica* Baijal, 1958 | | | |
| *Himalanura kangbachensis* (Yosii, 1966)* | 1500–4500 | 9 |
| *Himalanura khumbuenis* (Yosii, 1971)* | 1200–4300 | 9 |
| *Himalanura makalae* (Yosii, 1971)* | 1200–3900 | 9 |
| *Himalanura nuptseae* (Yosii, 1971)* | 1680–5250 | 9 |
| *Himalanura pangpouchensis* (Yosii, 1971)* | 1200–4300 | 9 |
| **Genus: Sinella Brook, 1882** | 87 (1) | | |
| Type species: *Sinella curvisepta* Brook, 1882 | 1200–4300 | 9 |
| *Sinella caeca* (Schött, 1896) | 1100 | 18 |
| *Sinella sp.* | | | |
| **Subfamily: Willowsiinae Yoshi and Suhardjao, 1989** | | | | |
| **Genus: Janetschekbrya Yoshi, 1971** | 2 (2) | 2 |
| Type species: *Janetschekbrya himalica* Yoshi, 1971 | | | |
| *Janetschekbrya brahamides* (Denis, 1936) | 1200–4500 | 9 |
| *Janetschekbrya himalica* Yoshi, 1971* | 3800–4100 | 9 |
| **Genus: Willowsia Shoebotham, 1917** | 40 (3) | 2 |
| Type species: *Seira nigromaculata* Lubbock, 1873 | | | |
| *Willowsia cassagnai* Zhang, 2015* | 24 |
| *Willowsia ieti* Yoshi, 1971* | 24 |
| *Willowsia nivalis* Yoshi, 1971* | 24 |
| **Subfamily: Lepidocyrtinae Wahlgren, 1906** | | | | |
| **Genus: Lepidocyrtus Boulet, 1839** | 273 (3) | | |
| Type species: *Lepidocyrtus curvicollis* Boulet, 1839 | | | |
| *Lepidocyrtus himalayanus* Yoshi, 1971* | 1300–3600 | 17 |
| *Lepidocyrtus cf. instratus* | 21 |
| *Lepidocyrtus omatus* Yoshi, 1966* | 2492–4160 | 9 |
| *Lepidocyrtus sp.* | 1100 | 18 |
| **Genus: Pseudosinella Schäffer, 1897** | 380 (4) | | |
| Type species: *Tullbergia immaculata* Lie-Petersen, 1897 | | | |
| *Pseudosinella cf. immaculata* | 1300–3600 | 17 |
| *Pseudosinella inaequalis* Stach, 1960 | 2700–3100 | 6 |
| *Pseudosinella montis* Yoshi, 1971* | 2700–3100 | 21 |
| *Pseudosinella vaillia* Yoshi, 1971* | 1200–3081 | 9 |
| **Family: Orchesellidae Borner, 1906** | | | | |
| **Subfamily: Heteromurinae Absolon & Kseneman, 1942** | | | | |
| **Genus: Dicranocentrus Schött, 1893** | 70 (7) | | |
| Type species: *Dicranocentrus gracilis* Schött, 1893 | | | |
| *Dicranocentrus dehanvengi* Mari Mutt, 1981 | 1500–2600 | 11 |
| *Dicranocentrus indecisus* Mari Mutt, 1985 | 2400–3081 | 10 |
| *Dicranocentrus janetscheki* Yoshi, 1971* | 2400–3081 | 10 |
| *Dicranocentrus nepalensis* Mari Mutt, 1980* | 1500–3225 | 7 |
| *Dicranocentrus pilosus* Mari Mutt, 1980* | 1500–3225 | 13 |
| *Dicranocentrus violaceus* Mari Mutt, 1981* | 1500–3225 | 11 |
| **Family: Paronellidae Borner, 1913** | | | | |
| **Subfamily: Paronellinae Borner, 1913** | | | | |
| **Genus: Callyntrura Börner, 1906** | 98 (1) | 11 |
| Type species: *Paronella anopla* Börner, 1906 | | | |
Callytrura lineata (Parona, 1892) | 8 | 12  
Genus: Cyphoderopis Carpenter, 1917  
Type species: Cyphoderopis kempfi Carpenter, 1917 | 17 (1) | 9  
Cyphoderopis nepalensis (Wilson, 1982)* | 18  
Genus: Cyphoderus Nicolet, 1842  
Type species: Cyphoderus albinus Nicolet, 1842 | 72 (1) |  
Cyphoderus albinus Nicolet, 1842 | 17  
Genus Dicranocentroides Imms, 1912  
Dicranocentroides flavesens Yosii, 1966 | 25  
Genus: Troglopedetes Absolon, 1907  
Type species: Troglopedetes altius Joseph, 1872 | 33 (1) | 9, 10  
Troglopedetes churchillatus Wilson, 1979* | 18  
Troglopedetes nepalensis Wilson, 1982* | 18  

Superfamily: Isotomoidea Szeptycki, 1979

Family: Isotomidae Schaffer, 1896

Subfamily: Anurophorinae Borner, 1901

Genus: Anurophorus Nicolet, 1842  
Type species: Anurophorus laricis Nicolet, 1842 | 52 (2) |  
Anurophorus cuspidatus Stach, 1920 | 900–5570 | 9  
Anurophorus sp. | 17  
Genus: Cryptopygus Willem, 1901  
Cryptopygus thermophilus (Axelson, 1900) | 1100 | 18 | 40  
Genus: Folsomia Willem, 1902  
Type species: Folsomia candida Willem, 1902 | 202 (7) |  
Folsomia altamontana Yosii, 1971* | 900–5600 | 9  
Folsomia candida Willem, 1902 | 1200–4300 | 9  
Folsomia diplophthalma (Axelson, 1902) | 900–5570 | 9  
Folsomia fitetana (Linnaeus, 1758) | 17  
Folsomia obscurocellata Patapov & Cassagnau, 2000 | 15  
Folsomia octoculata Handschin, 1925 | 22  
Folsomia riozoyoshiii Patapov & Cassagnau, 2000 | 15  
Genus: Hemisotoma Bagnall, 1949  
Type species: Isotoma thermophila Axelson, 1900 | 10 (1) |  
Hemisotoma thermophila Axelson, 1900 | 17  
Genus: Isotomiella Bagnall, 1939  
Type species: Isotomiella distinguenda Bagnall, 1939 | 55 (1) |  
Isotomiella minor (Schäffer, 1896) | 1100–3600 | 17, 18  
Genus: Uzelia Absolon, 1901  
Type species: Uzelia setifera Absolon, 1901 | 12 (1) |  
Uzelia cf. setifera | 1700–4500 | 9  
Subfamily: Isotominiae Schaffer, 1896

Genus: Desoria Agassiz & Nicolet, 1841  
Type species: Desoria saliana Agassiz & Nicolet, 1841 | 102 (3) |  
Desoria mazda (Yosii, 1971) | 9 | 14  
Desoria cf. olivacea | 9  
Desoria tripinata (Mac. Gillivary, 1896) | 9  
Genus: Isotoma Bourlet, 1839  
Type species: Isotoma viridis Bourlet, 1839 | 68 (4) |  
Isotoma anglicana Lubbock, 1873 | 3750 | 26  
Isotoma decorata Brown, 1926 | 900–5570 | 9  
Isotoma diversiculea Yosii, 1966 | 2700–4500 | 19  
Isotoma nepalica Yosii, 1966* | 1219–4300 | 9  
Isotoma viridis | 1420–5450 | 9  
Genus: Parisotoma Bagnall, 1940  
Type species: Isotoma notabilis Schäffer, 1896 | 28 (3) |  
Parisotoma coeca Yosii, 1966 | 19  
Parisotoma ekmani (Fjellberg, 1977) | 9 | 13  
Parisotoma notabilis (Schäffer, 1896) | 17  
Genus: Pseudisotoma Handschin, 1924  
Type species: Isotoma sensibilis Tullberg, 1876 | 8 (1) |  
Pseudisotoma himalayana Yosii, 1971* | 9  
Subfamily: Proisotominae Stach, 1947

Genus: Folsomides Stach, 1922 | 74 (3)
| Type species: Folsomides parvulus Stach, 1922 |
|------------------------------------------------|
| Folsomides angularis (Axelson, 1905) 1200–4300| 9 |
| Folsomides nepalicus Yosii, 1971* 1200–5570| 9 |
| Folsomides parvulus Stach, 1922 1100–4500| 9, 18 41 |

**Genus: Folsomina Denis, 1931**

Type species: Folsomina onychiurina Denis, 1931

| Folsomina onychiurina Denis, 1931 1200–5570| 9 |

**Genus: Proisotoma Börner, 1901**

Type species: Isotoma minutula Tullberg, 1871

| Proisotoma tenella (Reuter, 1895) 950–3600| 17 |

**Genus: Weberacantha Christiansen, 1951**

Type species: Weberacantha octa Christiansen, 1951

Weberacantha janetscheki (Yosii, 1971) 900–4550 9

**Superfamily: Tomoceroidea Szeptycki, 1979**

**Family: Tomoceridae Schaffer, 1896**

| Genus: Plutomurus Yosii, 1956 |
|------------------------------------------------|
| Plutomurus vigintiferispina Lee, 1974 |

**Genus: Tomocerina Yosii, 1955**

Type species: Tomocerus minutus Tullberg, 1876

| Tomocerina simplex Yosii, 1972 2750| 17 |
| Tomocerina aokii (Yosii, 1972) 2600–4550| 9 |

**Order: Poduromorpha Borner, 1913**

**Superfamily: Hypogastruroidea Salmon, 1964**

**Family: Hypogastruridae Borner, 1906**

| Genus: Acherontides Bonet, 1945 |
|------------------------------------------------|
| Type species: Acherontides atoyacensis Bonet, 1945 1200–4500| 9 |

**Genus: Ceratophysella Börner, 1932**

Type species: Podura armata Nicolet, 1842

Ceratophysella communis (Folsom, 1898) 950–2000 17

Ceratophysella dentificala (Bagnall, 1941) 2700–2850 17

Ceratophysella horrida (Yosii, 1960) 1200–4550 17

Ceratophysella planipilis Yosii, 1966 2400 17

Ceratophysella postantarctica Yosii, 1966 1200–4550 17

Ceratophysella cf. sinensis 1200–4550 17

Ceratophysella cf. vulgarius 1200–4550 17

**Genus: Hypogastrura Bourlet, 1839**

Type species: Hypogastrura aquatic Bourlet, 1839

Hypogastrura carpentana Bonet, 1930 1100 17

Hypogastrura distincta (Axelson, 1902) 1200–4550 17

Hypogastrura himalayana Yosii, 1971 1680–4550 9

Hypogastrura nepalica Yosii, 1971* 1680–4550 9

**Genus: Willemia Börner, 1901**

Type species: Willemia anophthalma Börner, 1901

Willemia annapurna D’Haese & Weiner, 1998 1200–4500 9

Willemia anophthalma Börner, 1901 1200–4500 9

Willemia buddenbrocki Huther, 1959 1900–2400 17 20

Willemia nepalensis D’Haese & Weiner, 1998* 9

Willemia wandae Tamura & Zhao, 1997 7

**Genus: Xenylla Tullberg, 1869**

Type species: Xenylla maritime Tullberg, 1869

Xenylla obscura Imms, 1912 900–5570 9

Xenylla yosiiana de Gama, 1971 1420–5450 9

Xenylla mucronata Alexon, 1903 1420–5450 9

**Superfamily: Neanuroidea Massoud, 1967**

**Family: Brachystomellidae Stach, 1949**

**Genus: Brachystomella Ågren, 1903**

Type species: Brachystomella maritime Ågren, 1903

| 26 |
| Genus: Brachystomella parvula (Schäffer, 1896) | 2700 | 17 |
| --- | --- | --- |
| **Family: Neanuridae Borner, 1901** | 197 (3) |
| **Subfamily: Frieseinae Massoud, 1967** |
| Genus: Friesea Dalla Torre, 1895 | 1200–4550 | 9 |
| Type species: Triaena mirabilis Tullberg, 1871 |
| Friesea excelsa Denis, 1936 | 2700 | 19 |
| Friesea paula Yossi, 1966 | 2000 | 17 |
| Friesea sublimis Macnamara, 1921 |
| **Subfamily: Neanurinae Borner, 1901** |
| Genus: Chaetobella Cassagnau, 1983 | 2400–2705 | 19 |
| Type species: Lobella numatai Yossi, 1966 |
| Chaetobella numatai (Yossi, 1966) |
| Genus: Gnatholonche Börner, 1906 | 3600 | 19 |
| Type species: Himalmeria lama Cassagnau, 1984; |
| Himalmeria digitata Cassagnau, 1984 |
| Himalmeria gurung Cassagnau, 1984* |
| Himalmeria himalayana (Yossi, 1966)* |
| **Genus: Lobella Cassagnau, 1983** | 4160 | 17 |
| Type species: Lobella roseola Yossi, 1964 |
| Lobellina roseola (Yossi, 1954) |
| **Genus: Nepalanus Yossi, 1966** | 4160 | 23 |
| Type species: Nepalanus paranuroides Yossi, 1966 |
| Nepalanus paranuroides Yossi, 1966 |
| **Genus: Nepalimeria Cassagnau, 1984** | 14 |
| Type species: Nepalimeria dal Cassagnau, 1984 |
| Nepalimeria coccinea Cassagnau, 1984 |
| Nepalimeria dal Cassagnau, 1984 |
| Nepalimeria ganeesh Cassagnau, 1993* |
| Nepalimeria heterochaeta Cassagnau, 1984 |
| Nepalimeria khorenis Cassagnau, 1984* |
| Nepalimeria lepchana (Yossi, 1966)* |
| **Genus: Paleonura Cassagnau, 1982** | 1200–1500 | 9 |
| Type species: Paleonura spectabilis Cassagnau, 1982 |
| Paleonura khumbica (Cassagnau, 1971)* |
| Paleonura monophthalma (Yossi, 1966) |
| Paleonura reducta (Yossi, 1966) |
| Paleonura siva (Yossi, 1966) |
| Paleonura spectabilis Cassagnau, 1982 |
| **Genus: Paranura Cassagnau, 1982** | 2700 | 19 |
| Type species: Paranura sexpunctata Axelson, 1902 |
| Paranura quadripunctata Yossi, 1966 |
| Paranura tel (Yossi, 1966) |
| **Genus: Propeanura Yossi, 1956** | 1200–1500 | 9 |
| Type species: Neanura pterostigma Yossi, 1956 |
| Propeanura hygrophi (Cassagnau & Deharveng, 1981) |
| Propeanura lapidicola (Cassagnau & Deharveng, 1981) |
| **Genus: Symmeria Cassagnau, 1983** | 2700 | 9 |
| Type species: Phylliomeria miranda Yossi, 1966 |
| Symmeria miranda (Yossi, 1966) |
| **Genus: Yuukianura Yossi, 1955** | 700–4550 | 9 |
| Type species: Protanura aphurooides Yossi, 1953 |
| Yuukianura yasudai (Yossi, 1966) |
| **Subfamily: Pseudachorutinae Borner, 1906** |
| **Genus: Cassagnaudina Massoud, 1967** | 700–4550 | 9 |
| Type species: Cassagnaudina colifalci Cassagnau, 1955 |
| Cassagnaudina khumbuensis Yossi, 1971* |
| **Genus: Cephalachorutes Bedos & Deharveng, 1991** | 2700 | 16 |
| Type species: Cephalachorutes asiaticus Bedos & Deharveng, 1991 |
| Genus: Cephalachorutes nakaoi (Yosi, 1966) | 3500 | 19 | 30 |
| Genus: Furculanurida Massoud, 1967 | Type species: Micranurida africana Massoud, 1963 |
| Furculanurida ashrafi (Yosi, 1966) | 19 |
| Genus: Grananurida Yosi, 1954 | Type species: Grananurida tuberculata Yosi, 1954 |
| Grananurida alba (Yosi, 1966) | 3600 | 19 |
| Genus: Hylaeanura Arlé, 1966 | Type species: Paranurella infima Arlé, 1959 |
| Hylaeanura nepalensis (Yosi, 1966)* | 28 |
| Genus: Micranurida Börner, 1901 | Type species: Micranurida pygmaea Börner, 1901 |
| Micranurida pygmaea Börner, 1901 | 2000–3600 | 17 |
| Genus: Pseudachorudina Stach, 1949 |
| Pseudachorudina alpine Stach, 1949 |
| Pseudachorudina nepalica Yosii, 1966* | 2400 | 19 |
| Genus: Pseudachorutes Tullberg, 1871 |
| Pseudachorutes corticicolus (Schäffer, 1896) | 1200–4550 | 9 | 31 |
| Pseudachorutes kanchenjungae Yosi, 1966* | 4160 | 19 |
| Genus: Simonachorutes Skarzynski, Arbia, Piwnik, 2016 |
| Simonachorutes cf. romeroi | 26 |
| Superfamily: Onychiuroidea D’Haese, 2002 |
| Family: Odontellidae Massoud, 1967 |
| Genus: Austrodontella Ellis & Bellinger, 1973 |
| Type species: Odontella trispina Salmon, 1951 |
| Austrodontella trispina (Womersley, 1935) | 900–4550 | 17 |
| Genus: Superodontella Stach, 1949 |
| Type species: Odontella ewingi Folsom, 1916 |
| Superodontella cf. distincta | 1400–3600 | 17 | 32 |
| Superodontella gladiator Agolin, Houssin & Deharveng, 2009 | 1 |
| Superodontella lamellifera (Axelson, 1903) | 3500–4160 | 17 |
| Superodontella montemaceli Arbea & Weiner, 1992 | 2800 | 26 |
| Superodontella nepalica (Yosi, 1971) * | 9 |
| Superodontella virgulata Yosi, 1966 | 2400 | 19 |
| Family: Tullbergiidae Bagnall, 1935 |
| Genus: Mesaphorura Börner, 1901 |
| Type species: Mesaphorura krausbaueri Börner, 1901 |
| Mesaphorura himalaeyensis Yosi, 1971* | 1200–4300 | 9 | 33 |
| Genus: Onychiurus Gervais, 1841 |
| Type species: Podura ambulans Linnaeus, 1758 |
| Oxyrhynchus decemsetosus Yosi, 1966 | 1200–4300 | 9 |
| Genus: Orthonychiurus Stach, 1954 |
| Type species: Orthonychiurus rectopapilatus Stach, 1933 |
| Orthonychiurus gurjakhani Choudhuri, 1958* | 6 |
| Orthonychiurus himalayensis (Choudhuri, 1958)* | 6 |
| Genus: Thalassaphorura Bagnall, 1949 |
| Type species: Thalassaphorura yoda (Yosi, 1966) | 1100 | 18, 22 |
| Thalassaphorura cf. encarpata | 17 | 34 |
| Order: Symphypleona Borner, 1901 |
| Family: Arrhopalitidae Stach, 1956 |
| Genus: Arrhopalites Börner, 1906 | 52 (1) | 36 |
3.5 | Annotations

1. Species level identification of the Genus Entomobrya Rondani, 1861 is considered the problematic due to intraspecific morphological variations. Combination of both chaetotaxy and morphological characters are useful tools to identify them (Jordan & Baquero 2005), but it is not without complications (Katz et al. 2015).

2. Willowsia and Janetschekbrya are included in Willowsia-complex because of their scale morphology and chaetotaxy, directly derived from the Himalanura-like species (Zhang et al. 2011).

3. Sira brahmides and its re-described combination Janetschekbrya brahmides are proposed to be different species. It is supported by the differences in claw structure, color and geographical distribution (Zhang et al. 2011).

4. Zhang (2015) re-described Willowsia ieti Yosii, 1971 with the addition of characteristics such as details of mouthparts and whole body chaetotaxy.

5. Folsom (1902) stated formerly that Pseudosinella argentae differs from Tullbergia immaculata in claw and mucrones but these two species are now synonymized (Bellinger et al. 1996–2021).

6. Pseudosinella inaequalis Bagnall, 1941 and Pseudosinella inaequalis Stach, 1960 nec Bagnall are treated as two different species (Christianse & Bellinger 1996, Bellinger et al. 1996-2021).

7. Dicranocentrus pilosus Mari Mutt, 1980 has distinct morphology than other members of the genus Dicranocentrus, so it should be revised and placed in another genus (Cipola et al. 2016).
8. Cphydorideridae is included as subfamily within Paronellidae (Soto-Adames et al. 2008).

9. Absolon (1907) mentioned the type specie of Troglopedetes as T. pallidus Absolon, 1907 (Wilson 1982, Thibaud & Najt 1988).

10. Troglopedetes Absolon, 1907 was synonymized with Troglopedetelina Delamare Deboutville, 1945 after reviewing correspondence of characters and Troglopedetes Absolon, 1907 might be junior homonym or synonym to Troglopedetes Joseph, 1872 (Ellis & Bellinger 1973, Wilson 1982).

11. Paronella anopa is synonymized with Calyntrura longicoma (Mitra & Dallai 1980, Bellinger et al. 1996–2021).

12. Yosii (1966a) transferred the species Paronella bornei Imms, 1912 and Hanschinpysa bornei Salmon, 1966 to Calyntrura and synonymized with his species. The species Paronella bornei is also synonymized with Calyntrura ineeta (Parona, 1892) (Mandal & Hazra 2009).

13. As Parisotoma ekmani (Fjellberg, 1977) have lost microsensilla on 2nd abdominal segment is group position in current taxonomy is uncertain (Potapov et al. 2011).

14. Isotoma mazda Yosii, 1971 was transferred to the genus Desoria despite its unusual fit as finding new characters for new taxon was not possible (Yosii, 1990). Mandal & Hazra (2009) placed this species under the subgenus Desoria of the genus Isotoma.

15. Lawrence (1969) re-described Folsomina onychiurina Denis, 1931 and stated that some specimens described from Nepal may refer to F. yosii. However, Christiansen & Bellinger (1992) clarified that both are certainly the same species. And, the species described by Lawrence (1969) is undoubtedly a different species which was later named as Folsomina lawrencei by Greenslade (1999).

16. Gender of the type species of genus Acherontides is treated as neuter in original description (Ellis & Bellinger 1973).

17. Ceratophysella postantennalis recorded by Yosii (1966b) from Solukhumbu match the description of Ceratophysella morula, so the morphologies of both should be well studied before considering the former species as new (Skarzynski & Smolis 2006).

18. Ceratophysella postantennalis and Hypogastrura nepalica are diagnosed as conspecific thus synonymized. It is because the original description of Ceratophysella postantennalis was based on the Hypogastrura nepalica (See Skarzynski & Smolis 2006).

19. Yosii (1960, 1962) split the genus Hypogastrura into three subgenus viz. Ceratophysella, Cyclograna and Hypogastrura based on the known chaetotaxy, later treated as genus. But he mentioned in the paper that his description of genus Hypogastrura resembles with some members of genus Ceratophysella so it needs further modifications (Yosii 1960).

20. Winemania buddenbrocki-group is monophyletic and has distinct clade of its 10 species involved (D’Haese & Weiner 1998).

21. Name of the author of Paleonura khumbica is given as Paleonura khumbica (Yosii, 1971) in Janetschek (1990) and Paleonura khumbica (Cassagnau, 1971) in Bellinger et al. (1996–2021).

22. Janetschek (1990) has incorrect spelling for Paleonura as Paleanura.

23. Yosii (1977) had established Lobellina as subgenus and Yuukianura as special group within the genus Lobella.

24. Dehaverg et al. (2017) proposed for the transfer of Lobella yasudai to Genus Yuukianura for their poorly developed tubercles, complex mouthparts and lateral shift of chaetae on 5th abdominal segment.

25. Cassagnau (1993) clarified that there is an adaptive convergence between the Himalinera and Nepalimeria which is why they were commonly placed in the genus Phyllomeria formerly by Yosii.

26. Selection of Lobella ieti Yosii, 1966 as type species for Propanura by Cassagnau in 1980 violates the article 61 of International Code of Zoological Nomenclature (Ellis & Bellinger 1984).

27. The species Paranura infima was first described by Arlé in 1959 (Vázquez et al. 1998) and not in 1960. Genus Hylaearnae Arlé, 1966, also considered as Kenyura by other authors previously, is delineated based on hyperptrophied sensilla S8 on 4th antennal segment (Vázquez et al. 1998, Palacios-Vargas & Dehaverg 2010).

28. Paranura nepalensis Yosii, 1966 was considered to be included in the genus Kenyura but as the S8 sensillum is hyperptrophied it was transferred to the genus Hylaearnae (Vázquez et al. 1998).

29. Agranurida Kim and Lee, 2000 referred to as synonymy of the genus Grananurida is actually incorrectly spelled (Bellinger et al. 1996–2021).

30. Pseudachorutella nakaci Yosii, 1966 was transferred to the genus Cephalachorutella primarily based on the antennal chaetotaxy (Bedos & Dehaverg 1991).

31. Bellinger et al. (1996–2021) has incorrectly mentioned date of description of Pseudachorutes corticolasus as 1897 instead of 1896.

32. Odontella distincta is listed in Checklist of Collembola of the World as Odontella distincta Peja, 1985 nec Yosii, 1954 (Bellinger et al. 1996–2021).

33. Mesaphorura himalayensis Yosii, 1971 should be revised for its genus as its pseudocelli are not star shaped (Bellinger et al. 1996–2021).

34. Thalassaphorura encarpata (Denis, 1931) is synonymized with Onychiuris hortonensis Gisin, 1949 (Bellinger et al. 1996–2021).

35. Stenognathellus Cassagnau, 1953 is an unavailable name as type species is not designated for it (Ellis & Bellinger 1973).

36. With the revision, species of the genus Arrhopalites was split into two genera as caecus-group and pygmaeus-group into Arrhopalites and Pygmarhopalites respectively (Vargovitskh 2009).

37. Zeppelini (2011) discusses that genus Pygmarmhopalites only informs about the pygmaeus-group so it should be treated as junior synonym of Arrhopalites.

38. Yosii (1969) re-described S-chaetotaxy of Ptenothrix himalayensis to free the ambiguity of previous description.

39. All the species of the genus Szepytyckithaca are to be re-examined of body chaetotaxy for clear definition of genus and its phylogenetic relationship (Zeppelini et al. 2019).

40. Wilson (1962) misspelled “Cryptopygus” as “Cryptopagus”.

41. Wilson (1982) identified Folsomides exigus from Mahendra cave, Pokhara which is a junior synonym of Folsomides parvulus.

42. Wilson (1982) found Lobella kraepelini from Mahendra cave, Pokhara. But other authors spelled it as “kraepelini” (Yosii, 1959; Mandal and Hazra, 2009). Mandal (2018) placed this species under the genus Hyperlobella Cassagnau, 1988.

5 | Conclusions

The history of collembolan research in Nepal is of about 110 years. All collembolan faunas of Nepal were investigated by foreign scientists. Species level information is scattered in various publications all over the world. Species checklists are important to understand species diversity and richness in a particular geographic area given in specific time which is the first
basic information required for ecological studies, biodiversity assessments and developing biodiversity conservation strategies. Faunal checklists are lacking in Nepal. The present list includes 167 species belonging to 78 genera and 17 families including 45 endemic species to Nepal. The most of the collections of collembolan was found from the mountain trekking routes in Nepal. Tarai and Shiwalik range remains still unexplored.

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Authors’ contributions

Both authors wrote the manuscript. Shrestha, P. prepared the distribution map of Collembola in Nepal. Budha, P. edited the manuscript, incorporated reviewer’s comments and finalized it.

Conflicts of interest

Authors declare no conflict of interest.

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