

# New distributional record of Anthidiine bee (Apoidea: Megachilidae) from Ladakh, India and a checklist of the family Megachilidae Latreille, 1802 (Hymenoptera: Insecta) of India

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## Abstract

The checklist of the Bee family Megachilidae, from India, is presented. Megachilidae is one of the hyper-diverse bee family that includes leafcutter, resin and mason bees. In India, it is the largest bee family with a total of 179 species under 23 genera & 36 subgenera under 2 subfamilies in 3 tribes. This checklist is compiled based on the previously published literature and new survey cum collection data carried out from 2020 to 2022. Here, one species has been recorded as new to Ladakh namely *Anthidium florentinum* (Fabricius, 1775) from Zanskar, Ladakh.

**Keywords:** Checklist, Megachilidae, India, Distribution, Bees

## Introduction

Bees belonging to the family Megachilidae are commonly called leaf cutter, wood borers, mason bees and cuckoo bees. They can be found in widely diverse habitats on all the continents except Antarctica ranging from lowland tropical rainforests to deserts to alpine environments (Litman et al, 2011). Solitary bees are of much economic value because of their role in the pollination of natural, urban and agricultural vegetation. (Berenbaum et al, 2006, Gonzalez et al, 2012). At present, about 4000 species under 70 subgenera are described worldwide (Michener, 2007; Ascher & Pickering, 2020) whereas, more than 150 species of the genus *Megachile* belonging to a dozen subgenera are recognized as valid from Southeast Asia (Ascher & Pickering, 2020). In India it is the largest family with a total of 179 species belonging to 23 genera & 36 subgenera in 3 tribes under 2 subfamilies namely: Lithurginae & Megachilinae. Family Megachilidae constitutes about 40% alone of the bee fauna of India (Gupta, 1993). These bees being important pollinators of many wild plant species, also play an important role in the maintenance

of the ecosystems. There has been a unique pollen-collecting adaptation in which the scopa of the pollen-collecting hairs of a female is located on the ventral surface of the metasoma in the family Megachilidae rather than mostly or exclusively on the hind legs as in other bee families.

Bees of the tribe Anthidiini (Hymenoptera: Megachilidae) can be distinguished from other megachilids in Asia by the short stigma and usually the presence of conspicuous yellow or red integumental markings (Michener 2007; Kumar *et al.* 2017). Anthidiine bees occur almost, worldwide, except in Antarctica and Australia (except for one introduced species), in many different habitats. Anthidiini bees are commonly known as 'resin and carder bees', reflecting the materials from which they built their nests Soil particles or plant resins (Michener, 2007). The tribe Anthidiini currently consists of 894 known species belonging to 40 genera worldwide (Ascher and Pickering 2021). The known Indian fauna includes 46 species (Kasperek, 2017; Kumar et al, 2017; Ascher and Pickering, 2021).

## Materials and Methods

This work is based on the data collected from the published literature and some additional new distributional data is given based on the collection data obtained from 2020-2022 from Jammu and Kashmir and Ladakh. These collections were done in the plains like in Orchid gardens, agricultural fields and at the higher reaches of the Himalayas. Bee specimens have been collected with a sweep insect net, and killed in a glass killing bottle, by using ethyl acetate, with an air-tight cap. The freshly killed specimens have been pinned and stretched as per the standard procedure for bees. Pinned specimens belonging to the family Megachilidae had been separated, labelled and stored in an insect cabinet for their taxonomic studies.

## Identification

For morphological identification, specimens have been identified under stereo zoom trinocular microscope up to Species-level by using dichotomous keys designed by Bingham, 1897; Michener, 2000, 2007; Gupta, 1992 & from the relevant literature.

## Results

Family Megachilidae Latreille, 1802

Subfamily Megachilinae

Tribe Anthidini

*Anthidium (Anthidium) florentinum* Fabricius, 1775

(Figure 1)

*Apis florentina* Fabricius, 1775: 384,



Figure 1. *Anthidium florentinum* : A, habitus, dorsal view; B, head, frontal view; C, mesosoma, dorsal view; D, metasoma, dorsal view; and E, tergites showing lateral spines.

**Diagnosis :** Male.(Figure 1A). Mandible tri-dentate, yellow, with dark brown teeth; clypeus yellow; yellow maculation on paraocular region almost reaching middle of the eye (Figure 1B); vertex with lateral yellow maculation. Tegula with yellow spot anteriorly; boomerang-shaped maculation on scutum anterolaterally (Figure 1C); wings subhyaline; arolia absent. Hind femur with ventral tooth near the base. Maculation on all terga interrupted medially, with the interruptions gradually decreasing towards T6; lateral margins on T2–T4 slightly protuberant, with sparse tufts of white pubescence (Figure 1D); lateral spine of T5 yellow and T6 brown; T7 spiniform with three acute apical spines (Figure 1E); S6 with median apical margin truncately produced.

**Material examined :** 2 , India, Ladakh, Zanskar, 33.2759° N, 76.5355° E, 18 .VIII .2022, sweep net, coll. P M Osman.

**Distribution:** India, Nainital (Uttarakhand)

**Additional material examined:** Zanskar, Padam (Ladakh), (New record)

A checklist of the species belonging to the family Megachilidae occurring in India is provided here.

**Family Megachilidae** Latreille, 1802

**Subfamily Lithurginae** Michener, 1983

**Genus Lithurge** Latreille, 1825

**Subgenus Lithurge** Latreille, 1825

- 1 *Lithurge (Lithurge) atratus* (Smith, 1853)  
**Distribution:** Mussoorie, Dehradun (Uttarakhand)
- 2 *Lithurge (Lithurge) dentipes* (Smith, 1853)  
**Distribution:** Gongtok (Sikkim), Kaziranga (Assam)
- 3 *Lithurge (Lithurge) taprobanae* (Cameron, 1902)  
**Distribution:** Solan (Himachal Pradesh), Dehradun (Uttarakhand), Ludhian (Punjab)
- 4 *Lithurge (Lithurge) rufipes* (Smith, 1853)  
**Distribution:** Lonavala (Maharashtra)
- 5 *Lithurge (Lithurge) tiwarii* (Gupta & Tiwari, 1987)  
**Distribution:** Pondicherry
- 6 *Lithurge (Lithurge) rubricatus* (Smith, 1853)  
**Distribution:** Tiruchirapalli, Madurai (Tamil Nadu)
- 7 *Lithurge (Lithurge) albofacialis* (Gupta, 1993)  
**Distribution:** Haryana (Himachal Pradesh)

- 8 *Lithurge (Lithurge) nigroabdominalis* (Gupta, 1993)

**Distribution:** Haryana (Himachal Pradesh)

- 9 *Lithurge (Lithurge) ovoabdominalis* (Gupta, 1993)

**Distribution:** Haryana (Himachal Pradesh)

- 10 *Lithurge (Lithurge) apiformis* (Gupta, 1993)

**Distribution:** Haryana (Himachal Pradesh)

- 11 *Lithurge (Lithurge) indicus* (Gupta, 1993)

**Distribution:** Haryana (Himachal Pradesh)

- 12 *Lithurge (Lithurge) veeravaliensis* (Gupta, 1993)

**Distribution:** Haryana (Himachal Pradesh)

**2 Subfamily Megachilinae**

**Tribe Anthidiini**

**Genus Eoanthidium** Popov, 1950

**Subgenus Eoanthidium** Popov, 1950

1. *Eoanthidium (Eoanthidium) adentatum* (Gupta & Simlot 1993)

**Distribution:** Alwar, Kota, Deeg (Rajasthan)

2. *Eoanthidium (Hemidiellum) punjabensis* (Gupta & Sharma 1993)

**Distribution:** Pathankot (Punjab)

**Genus Dianthidium** Cockerell, 1900

**Subgenus Icteranthidium**, Michener, 1984

1. *Dianthidium (Icteranthidium) sinapinum* (Cockerell, 1911)

**Distribution:** Nagaur (Rajasthan)

2. *Dianthidium (Icteranthidium) saltatore* (Nurse, 1901)

**Distribution:** Deesa (Gujarat), Nagaur (Rajasthan)

3. *Dianthidium (Icteranthidium) tshangiricum orientale* (Mavromoustakis, 1951)

**Distribution:** Nagaur (Rajasthan)

4. *Dianthidium favoclypeatum* (Gupta, 1993)

**Distribution:** Pathankot (Punjab), Dehradun (Uttarakhand)

**Genus Bathanthidium**, Mavromoustakis, 1953

1. *Bathanthidium (Manthidium) binghami* (Friese, 1901)

**Distribution:** Buxa Tiger Reserve (West Bengal)

**Genus *Trachusa* Panzer, 1804**

**Subgenus *Trichanthidium* Pasteels, 1969**

1. *Trachusa (Trichanthidium) himalayensis* (Gupta, 1993)  
**Distribution:** Dehradun (Uttarakhand)  
**Subgenus *Orientotrachusa* Gupta, 1993**
2. *Trachusa (Orientotrachusa) orientale* (Bingham, 1897)  
**Distribution:** Pune (Maharashtra), Solan (Himachal Pradesh), Alwar (Rajasthan)
3. *Trachusa (Orientotrachusa) flavomaculatum* (Cameron, 1897)  
**Distribution:** Kota (Rajasthan), Bingham 1897, records from Poona (Maharashtra)
4. *Trachusa (Orientotrachusa) serratocaudata* (Gupta, Sharma & Simlote 1993)  
**Distribution:** Deesa (Gujarat), Nagaur (Rajasthan)

**Genus *Anthidium* Fabricius, 1805**

**Subgenus *Anthidium* Fabricius, 1805**

**Genus *Anthidium* Fabricius, 1805**

1. *Anthidium (Anthidium) florentinum* (Fabricius, 1775)  
**Distribution:** Nainital (Uttarakhand), Zaskar, Padam (Ladakh), (New record)  
**Subgenus *Proanthidium* Friese, 1898**
2. *Anthidium (Proanthidium) qingtaoi* (Niu and Zhu, 2020)  
**Distribution:** Chumathang (Ladakh), China (Xizang) (Niu *et al* 2020)
3. *Anthidium (Proanthidium) conciliatum* (Nurse, 1903)  
**Distribution:** Gulmarg, Baramulla (Kashmir), Manali (Himachal Pradesh)
4. *Anthidium (proanthidium) kashmirensis* (Mavromoustakis, 1937)  
**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir)
5. *Anthidium (Proanthidium) sikkimense* (Mavromoustakis, 1937)  
**Distribution:** Gangtok (Sikkim)
6. *Anthidium (Proanthidium) nursei* (Cockerell, 1992)  
**Distribution:** Dehradun (Uttarakhand), Gulmarg (Kashmir) Kullu (Himachal Pradesh)
7. *Anthidium (Proanthidium) himalayense* (Gupta & Simlote, 1995)  
**Distribution:** Mussoorie (Uttarakhand), Gulmarg (Kashmir), Kargil, Leh (Ladakh)

8. *Anthidium alticola* (Tkalcu, 1967)

**Distribution:** Kolkata (West Bengal)

9. *Anthidium ordinatum* (Smith, 1879)

**Distribution:** Sikkim, Pathankote (Punjab), Rajasthan West Bengal

10. *Anthidium saltator* (Nurse, 1902)

**Distribution:** Gulmarg, Baramulla (Kashmir), Mussoorie (Uttarakhand)

11. *Anthidium longstaffi* (Mavromoustakis, 1948)

**Distribution:** Gulmarg, Baramulla (Kashmir), Dehradun, Mussoorie (Uttarakhand)

**Genus *Anthidiellum* Cockerell, 1904**

**Subgenus *Pycnanthidium***

1. *Anthidiellum (Pycnanthidium) carinatum* (Wu, 1962)

**Distribution:** Dharmanagar (Tripura), Hainan, Yunnan (China), (Wu 1962)

**Genus *Parevaspis* Ritsema, 1874**

**Subgenus *Parevaspis* Ritesma, 1874**

1. *Parevaspis (Parevaspis) carbonaria* (Smith, 1854)

**Distribution:** Alwar, Sikar (Rajasthan), Pathankot (Punjab)

**Tribe Osmiini**

**Genus *Heriades* Spinola, 1908**

**Subgenus *Michenerella* Krombein, 1950**

1. *Heriades (Michenerella) longifaciatus* (Gupta & Tewari, 1987)

**Distribution:** Kullu (Himachal Pradesh), Dehradun, Mussoorie (Uttarakhand)

2. *Heriades (Michenerella) tenuis* (Nurse, 1904)

**Distribution:** Deesa (Gujarat), Kullu (Himachal Pradesh)

3. *Heriades (Michenerella) binghami* (Cameron, 1897)

**Distribution:** Deesa (Gujarat)

4. *Heriades (Michenerella) rufoflagellatus* (Gupta & Simlote, 1993)

**Distribution:** Manali, Kangra (Himachal Pradesh)

**Genus *orientoheriades* Gupta, 1987**

1. *Orientoheriades indicus* (Gupta, Sharma & Simlote, 1993)  
**Distribution:** Kullu (Himachal Pradesh)
2. *Orientoheriades nursei* (Gupta & Sharma, 1993)  
**Distribution:** Nagwani, Kullu (Himachal Pradesh)
3. *Orientoheriades patella* (Nurse, 1902)  
**Distribution:** Kulla, Manali, Mandi (Himachal Pradesh), Nurse 1901, collected from Shimla (Himachal Pradesh)
4. *Orientoheriades nigrous* (Gupta & Sharma, 1993)  
**Distribution:** Kullu (Himachal Pradesh)
5. *Orientoheriades solanensis* (Gupta, Simlote & Sharma, 1993)  
**Distribution:** Solan (Himachal Pradesh)
6. *Orientoheriades micheneri* (Gupta, 1993)  
**Distribution:** Kansas (Uttarakhand)
7. *Orientoheriades orientalis* (Gupta, 1987)  
**Distribution:** Kullu, Manali, Kangra (Himachal Pradesh)
8. *Orientoheriades erectus* (Gupta, 1987)  
**Distribution:** Kullu, Manali (Himachal Pradesh)
9. *Orientoheriades himalayensis* (Gupta, 1993)  
**Distribution:** Kullu (Himachal Pradesh)
10. *Orientoheriades haryanensis* (Gupta, Sharma & simlote, 1993)  
**Distribution:** Sonipat (Haryana)
11. *Orientoheriades auroscopatus* (Gupta, sharma & simlote 1993)  
**Distribution:** Kullu, Manali, (Himachal Pradesh)
12. *Orientoheriades fasciatus* (Gupta, Sharma & simlote 1993)  
**Distribution:** Manali, Kullu (Himachal Pradesh)
13. *Orientoheriades hexadenticulatus* (Gupta, Sharma & simlote, 1993)  
**Distribution:** Kullu, Manali (Himachal Pradesh)
14. *Orientoheriades rufomarginatus* (Gupta, Sharma & simlote, 1993)  
**Distribution:** Kullu, Manali (Himachal Pradesh)
15. *Orientoheriades lobatus* (Gupta, & sharma, 1993)  
**Distribution:** Manali (Himachal Pradesh)

16. *Orientoheriades pulchripes* (Cameron, 1987)

**Distribution:** Mussoorie (Uttarakhand)

17. *Orientoheriades bidentatus* (Gupta & Simlote, 1993)

**Distribution:** Kullu (Himachal Pradesh)

**Genus *Pseudoheriades* Peters, 1970**

1. *Pseudoheriades rajasthaniensis* (Gupta, Sharma & Simlote, 1993)

**Distribution:** Udaipur (Rajasthan)

2. *Pseudoheriades himalayensis* (Gupta, Sharma & simlote, 1993)

**Distribution:** Kullu (Himachal Pradesh)

**Genus *Noteriades* Cockerell, 1931**

1. *Noteriades infasciatus* (Simlote & Gupta, 1993)

**Distribution:** Sundernagar (Himachal Pradesh) collected by Simlote 1992

2. *Noteriades himalayensis* (Simlote & Gupta, 1993)

**Distribution:** Kullu, Manali (Himachal Pradesh)

3. *Noteriades tergofasciatus* (Simlote & Gupta, 1993)

**Distribution:** Kullu (Himachal Pradesh)

4. *Noteriades striolatus* (Cameron, 1906)

**Distribution:** Sundernagar (Himachal Pradesh)

**Genus *Spinasternella* Gupta & Sharma, 1993**

1. *Spinasternella mevatus* (Gupta & Sharma, 1993)

**Distribution:** Mevat (Haryana) Alwar (Rajasthan)

2. *Spinasternella pentatuberculata* (Gupta & Sharma, 1993)

**Distribution:** Alwar (Rajasthan) Mandi (Himachal Pradesh)

3. *Spinasternella rufomandibulata* (Gupta & Sharma, 1993)

**Distribution:** Tolawas, Alwar (Rajasthan)

**Genus *Hoplitis* Klug, 1807**

**Subgenus *Liosmia* Thomson, 1872**

1. *Hoplitis (Liosmia) freygessneri* (Fries, 1899)

**Distribution:** Pathankot, Batala (Punjab)

**Subgenus *Tridentosmia* Schmied, 1886**

2. *Hoplitis (Tridentosmia) karakalensis* (Popov, 1936)

**Distribution:** Pathankot (Punjab)

3. *Hoplitis (Tridentosmia) moricei* (Friese, 1899)

**Distribution:** Manali (Himachal Pradesh)

**Genus *Anthocopa* Lepeletier & Serville, 1825**

**Subgenus: *Anthocopa* Lepeletier & Serville, 1825**

1. *Anthocopa (Anthocopa) rubricrus* (Friese, 1899)

**Distribution:** Deesa (Gujarat), Ludhiana (Punjab)

2. *Anthocopa (Anthocopa) saundersi* (Vachal, 1891)

**Distribution:** Pathankot (Punjab)

3. *Anthocopa cathena* (Cameron, 1908)

**Distribution:** Deesa (Gujarat)

4. *Anthocopa indostana* (Cameron, 1908)

**Distribution:** Deesa (Gujarat)

**Genus *Osmia* Panzer, 1806**

**Subgenus *Chalcosmia* Schmied, 1886**

1. *Osmia (Chalcosmia) adae* (Bingham, 1897)

**Distribution:** Kullu, Manali (Himachal Pradesh), Srinagar, Gulmarg (Kashmir)

2. *Osmia (Chalcosmia) caerulea caerulea* (Linnaeus, 1758)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

3. *Osmia cyanea* (Giraud, 1866)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

4. *Osmia purpurea* (Cresson, 1864)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

5. *Osmia rustica* (Cresson, 1864)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

6. *Osmia caerulea* (Dalla Torre, 1897)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

7. *Osmia kashmirensis* (Nurse, 1903)

**Distribution:** Gulmarg, Baramulla (Kashmir), Manali (Himachal Pradesh) Pusa (Bihar)

8. *Osmia dutti* (Cockerell, 1922)

**Distribution:** Gulmarg, Baramulla, Kupwara (Kashmir), Manali (Himachal Pradesh), Pusa (Bihar)

9. *Osmia (Chalcosmia) sita* (Nurse, 1904)

**Distribution:** Manali (Himachal Pradesh)

**Subgenus *Caerulosmia* Zanden, 1988**

10. *Osmia (Caerulosmia) sponsa* (Nurse, 1904)

**Distribution:** Manali (Himachal Pradesh) Pusa (Bihar)

11. *Osmia gulmargensis* (Nurse, 1903)

**Distribution:** Gulmarg, Srinagar (Kashmir)

12. *Osmia balucha* (Nurse, 1904)

**Distribution:** Pathankot (Punjab) Manali, Mandi (Himachal Pradesh)

13. *Osmia nursei* (Friese, 1911)

**Distribution:** Alwar, Nagaur (Rajasthan)

14. *Osmia lignaria* (Say, 1837)

**Distribution:** Anantnag (Kashmir)

**Genus *Robertsonella* Titus, 1904**

1. *Robertsonella himachali* (Gupta, 1991)

**Distribution:** Kullu (Himachal Pradesh), Pathankot (Punjab)

**Tribe Megachilini**

**Genus *Creightonella* Cockerell, 1908**

1. *Creightonella albifrons* (Smith, 1853)

**Distribution:** Alwar (Rajasthan), Bingham 1897, reported from Northwest province & Bombay

**Genus *Eumegachile* Friese, 1899**

**Subgenus *Sayapis* Titus, 1905**

1. *Eumegachile (Sayapis) subfuscus* (Cameron, 1908)

**Distribution:** Alwar, Deeg, Kota (Rajasthan), Mandi (Himachal Pradesh), Cameron, 1908 reported from Deesa (Gujarat)

2. *Eumegachile (Sayapis) inepta* (Cameron, 1906)

**Distribution:** Mandi, Dharamshala (Himachal Pradesh)

3. *Eumegachile (Sayapis) tetradenta* (Gupta, 1988)

**Distribution:** Pathankot (Punjab)

4. *Eumegachile (Sayapis) rajasthaniensis* (Gupta, 1988)

**Distribution:** Deeg, Alwar (Rajasthan)

**Subgenus *Eumegachile* Friese, 1899**

5. *Eumegachile (Eumegachile) tricineta* (Bingham, 1897)

**Distribution:** Kullu, Mandi, Solan (Himachal Pradesh)

**Genus *Chalicodoma* Lepeletier, 1841**

**Subgenus *Callomegachile* Michener, 1962**

1. *Chalicodoma (Callomegachile) disjuncta* (Fabricius, 1781)

**Distribution:** Udaipur (Himachal Pradesh), Sikar (Rajasthan) Pathankot (Punjab)

2. *Chalicodoma (Callomegachile) cephalotes* (Smith, 1853)

**Distribution:** Alwar, Deeg, Kota (Rajasthan) Ludhiana, Pathankot (Punjab), Kullu, Mandi (Himachal Pradesh), Bingham 1897, reported from Dehradun (Uttarakhand)

3. *Chalicodoma (Callomegachile) stirostoma* (Cameron, 1913)

**Distribution:** Alwar, Kota (Rajasthan), Kullu (Himachal Pradesh), Cameron 1913, reported from Dehradun (Uttarakhand)

4. *Chalicodoma (Callomegachile) umbripennis* (Smith, 1853)

**Distribution:** Alwar, Deeg, Kota (Rajasthan), Ludhiana, Pathankot (Punjab) Kullu, Mandi (Himachal Pradesh), Bingham 1897, reported from Nepal, Sikkim & Tenasserim (Malaysia)

5. *Chalicodoma (Callomegachile) quartine* (Gribodo, 1884)

**Distribution:** Alwar, Deeg, Kota (Rajasthan), Ludhiana, Pathankot Kullu (Punjab), Mandi (Himachal Pradesh), Bingham 1897, reported from upper Burma & Tenasserim

**Subgenus *Chelostomoda* Michener, 1962**

6. *Chalicodoma (Chelostomoda) phaola* (Cameron, 1907)

**Distribution:** Sikar, Kota (Rajasthan), Cameron 1907, reported from Deesa (Gujarat)

7. *Chalicodoma (Chelostomoda) nana* (Bingham, 1897)

**Distribution:** Kullu, Solan (Himachal Pradesh), Bingham 1897, reported from Tenasserim (Malaysia)

8. *Chalicodoma (Chelostomoda) saphira* (Cameron, 1907)

**Distribution:** Manali (Himachal Pradesh)

**Subgenus *Pseudomegachilie* Friese, 1899**

9. *Chalicodoma (Pseudomegachilie) lanata* (Fabricius, 1775)

**Distribution:** Alwar, Deega, Sikar (Rajasthan) Chandigarh, Bingham 1897, reported throughout India

10. *Chalicodoma (Pseudomegachilie) creusa* (Bingham, 1898)

**Distribution:** Sonipat (Haryana), Mandi (Himachal Pradesh), Deesa, (Gujarat), Alwar, Sikar (Rajasthan)

11. *Chalicodoma (Pseudomegachilie) velutina* (Smith, 1853)

**Distribution:** Northern India Smith Bingham 1897 reported from Tenasserim

12. *Chalicodoma (Pseudomegachilie) Vigilans* (Smith, 1879)

**Distribution:** Kupwara (Kashmir)

13. *Chalicodoma (Pseudomegachilie) flavipes* (Spinola, 1838)

**Distribution:** Manali, Kangra (Himachal Pradesh), Gulmarg (Kashmir)

14. *Chalicodoma elfrona* (Cameron, 1908)

**Distribution:** Deesa (Gujarat)

**Genus *Cressoniella* Mitchell, 1980**

**Subgenus *Neomegachilie* Mitchell, 1934**

1. *Cressoniella (Neomegachilie) conjuncta* (Smith, 1879)

**Distribution:** Mandi (Himachal Pradesh), Gharo (West Bengal)

2. *Cressoniella (Neomegachilie) lerma* (Cameron, 1908)

**Distribution:** Alwar (Rajasthan), Deesa (Gujarat), Pathankot (Punjab) Kullu, Kangra (Himachal Pradesh) Cameron, 1908 Reported from Deesa (Gujarat)

**Subgenus *Orientocressoniella* Gupta, 1993**

3. *Cressoniella (Orientocressoniella) relata* (Smith, 1879)

**Distribution:** Alwar, Kota (Rajasthan) Kullu, Kangra, Manali (Himachal Pradesh), Bingham 1897, reported from Burma & China

4. *Cressoniella (Orientocressoniella) anthracina* (Smith, 1853)

**Distribution:** Alwar, Kota (Rajasthan) Kullu, Kangra, Manali (Himachal Pradesh) Bingham 1897 reported from throughout the North West provinces and Bengal

5. *Cressoniella (Orientocressoniella) simlaensis* (Cameron, 1906)

**Distribution:** Kullu (Himachal Pradesh), Cameron 1906, reported from Shimla (Himachal Pradesh)

**Subgenus *Neocressoniella* Gupta, 1993**

6. *Cressoniella (Neocressoniella) carbonaria* (Smith, 1853)

**Distribution:** Alwar (Rajasthan) Kangra, Palampur (Himachal Pradesh) Deesa (Gujarat)

7. *Cressoniella (Neocressoniella) rufothoracica* (Gupta & Sharma, 1993)  
**Distribution:** Alwar, Umrain (Rajasthan), Rajgarh (Madhya Pradesh), Narainpura (Ahmedabad)
  8. *Cressoniella (Neocressoniella) elizabethae* (Bingham, 1897)  
**Distribution:** Shimla (Himachal Pradesh), Batra (Chattisgarh), Mussoorie (Uttarakhand) Bingham 1897 reported from Tenasserim (Malaysia)
  9. *Cressoniella (Neocressoniella) amputate* (Smith, 1857)  
**Distribution:** Sikkim, Bingham 1897, reported from Tenasserim (Malaysia)
- Genus *Megachile* Latreille, 1802**
- Subgenus *Aethomegachile* Engel & Baker, 2006**
1. *Megachile (Aethomegachile) laticeps* (Smith, 1853)  
**Distribution:** Maharashtra, Alwar (Rajasthan)
  2. *Megachile (Aethomegachile) conjuncta* (Smith, 1853)  
**Distribution:** Gangtok (Sikkim), Gupta 1999 reported it around North West India in the states of Rajasthan and Gujarat, Jammu & Kashmir (Ascher & Pickering, 2020)  
**Subgenus *Eurymella* Pasteels, 1965**
  3. *Megachile (Eurymella) rugicauda* (Cameron, 1908)  
**Distribution:** Sikar, Nagaur (Rajasthan), Deesa (Gujarat)
  4. *Megachile (Eurymella) rufibasalis* (Gupta, Simlote & Sharma, 1993)  
**Distribution:** Pathankot (Punjab)
  5. *Megachile (Eurymella) haryanensis* (Gupta, Sharma & Simlote, 1993)  
**Distribution:** Hissar (Haryana)
  6. *Megachile (Eurymella) peniculatum* (Gupta, 1993)  
**Distribution:** Alwar (Rajasthan), Mussoorie (Uttarakhand), Pathankot (Punjab)  
**Subgenus *Callochile* Michener, 1962**
  8. *Megachile (Callochile) bicolor* Fabricius, 1781  
**Distribution:** Alwar, Sikar (Rajasthan), Deega, (Uttar Pradesh), Mandi, Kangra (Himachal Pradesh).  
**Subgenus (*Eutricharaea*) Thomson, 1872**
  9. *Megachile (Eutricharaea) femorata* (Smith, 1853)  
**Distribution:** Alwar, Sikar (Rajasthan), Kullu, Manali, Kangra (Himachal Pradesh)
10. *Megachile (Eutricharaea) vera* (Nurse, 1901)  
**Distribution:** Alwar, Sikar, Udaipur (Rajasthan), Kullu, Manali, Kangra, (Himachal Pradesh)
  11. *Megachile (Eutricharaea) hera* (Bingham, 1897)  
**Distribution:** Alwar, Sikar Udaipur, (Rajasthan), Kullu, Manali, Kangra, (Himachal Pradesh) Baramula, Anantnag (Kashmir)
  12. *Megachile (Eutricharaea) chlogaster* (Cameron, 1897)  
**Distribution:** Alwar, Sikar (Rajasthan), Kullu, Manali, Kangra (Himachal Pradesh)
  13. *Megachile (Eutricharaea) coelioxysides* (Bingham, 1899)  
**Distribution:** Alwar, (Rajasthan) Kullu, Manali, Kangra (Himachal Pradesh), Leh, Kargil (Ladakh)
  14. *Megachile (Eutricharaea) gathela* (Cameron, 1908)  
**Distribution:** Alwar, Sikar (Rajasthan) Kullu, Manali, Kangra, Shimla, (Himachal Pradesh), Sonipat (Haryana)
  15. *Megachile (Eutricharaea) studiosa* (Bingham, 1899)  
**Distribution:** Sikar, (Rajasthan) Naghar (Uttarakhand)
  16. *Megachile (Eutricharaea) suavida* (Cameron, 1908)  
**Distribution:** Deesa (Gujarat), Nagaur (Uttarakhand)
  17. *Megachile binghami* (Meade-waldo, 1912)  
**Distribution:** Arunachal Pradesh, Dehradun (Uttarakhand), West Bengal
  18. *Megachile stulta* (Bingham, 1897)  
**Distribution:** Sikkim, Bangalore (Karnataka)
  19. *Megachile umbripennis* (Smith, 1853)  
**Distribution:** Sikkim, Pathankot (Punjab)
  20. *Megachile faceta* (Bingham, 1897)  
**Distribution:** Shillong (Meghalaya)
  21. *Megachile rotundata* (Fabricius, 1787)  
**Distribution:** Kullu, (Himachal Pradesh), Leh, Kargil (Ladakh)
  22. *Megachile centuncularis* (Linnaeus, 1758)  
**Distribution:** Kullu, (Himachal Pradesh), Gulmarg, Kupwara (Kashmir)
  23. *Megachile albiformis* (Smith, 1853)  
**Distribution:** Lonavala (Maharashtra), Bangalore (Karnataka)
  24. *Megachile anthracina* (Smith, 1853)  
**Distribution:** Ludhiana (Punjab), Dehradun, Mussoorie (Uttarakhand)



25. *Megachilie badia* (Bingham, 1809)  
**Distribution:** Pathankot (Punjab), Dehradun (Uttarakhand)
26. *Megachilie bellula* (Bingham, 1897)  
**Distribution:** Mussoorie (Uttarakhand), Kullu (Himachal Pradesh)
27. *Megachilie behavanae* (Bingham, 1897)  
**Distribution:** Sikkim, Ludhiana (Punjab)
28. *Megachilie cephalotes* (Smith, 1853)  
**Distribution:** Sikkim
29. *Megachilie faceta* (Bingham, 1987)  
**Distribution:** Shillong (Meghalaya)
30. *Megachilie vigilans* (Smith 1878)  
**Distribution:** Gangtok (Sikkim)
31. *Megachilie imitatrix* (Smith, 1853)  
**Distribution:** Dehradun (Uttarakhand)
32. *Megachilie implicator* (Cameron, 1897)  
**Distribution:** Mussoorie (Uttarakhand), Ludhiana (Punjab)
33. *Megachilie ladakhensis* (Tkaleu, 1988)  
**Distribution :** Leh, Kargil (Ladakh)
34. *Megachilie nana* (Bingham, 1897)  
**Distribution:** Mussoorie (Uttarakhand), Gangtok (Sikkim)
35. *Megachilie obtusata* (Cameron, 1909)  
**Distribution:** Pathankot (Punjab), Sonipat (Haryana)
36. *Megachilie velutina* (Smith, 1853)  
**Distribution:** Gangtok (Sikkim), Ludhiana (Punjab), Dehradun (Uttarakhand)
- Genus *Hemicoeloxys* Pastells, 1968**
1. *Hemicoeloxys (rufiventris) nursei* (Cockerell, 1922)  
**Distribution:** Deesa (Gujarat)
- Genus *Coelioxys* Latreille, 1809**
- Subgenus *Orientocoelioxys* Gupta, 1992**
1. *Coelioxys (Orientocoelioxys) angulatus* (Smith, 1870)  
**Distribution:** Imphal (Manipur)
2. *Coelioxys (Orientocoelioxys) quadrifasciatus* (Gupta, 1992)
- Distribution:** Alwar (Rajasthan), Mandi, Kullu, Kangri (Himachal Pradesh)
- Subgenus *Boreocoelioxys* Mitchell, 1973**
3. *Coelioxys (Boreocoelioxys) gudhaensis* (Gupta & Sharma, 1993)  
**Distribution:** Sikar (Rajasthan), Gudha (Haryana)
- Subgenus *Xerocoelioxys* Mitchell, 1973**
4. *Coelioxys (Xerocoelioxys) Taurus* (Nurse, 1901)  
**Distribution:** Dantiwada, Deesa (Gujarat)
5. *Coelioxys (Xerocoelioxys) nigrodentatusm* (Gupta & Sharma, 1993)  
**Distribution:** Sikar, Alwar, Deeg (Rajasthan)
- Subgenus *Tropicocoelioxys* Gupta, 1991**
6. *Coelioxys (Tropicocoelioxys) perseus* (Nurse, 1904)  
**Distribution:** Kota (Rajasthan) Nurse 1904 reported from Mount Abu (Rajasthan)
7. *Coelioxys (Tropicocoelioxys) veeravaliensis* (Gupta, & Sharma, 1993)  
**Distribution:** Veraval (Gujarat)
8. *Coelioxys (Tropicocoelioxys) genoconcavitus* (Gupta, 1991)  
**Distribution:** Bangalore (Karnataka)
9. *Coelioxys (Tropicocoelioxys) tenuliniata* (Cameron, 1913)  
**Distribution:** Mandi, Kullu (Himachal Pradesh) Dehradun (Uttarakhand)
- Subgenus *Schizocoelioxys* Mitchell, 1973**
10. *Coelioxys (Schizocoelioxys) decipiens* (Spinola, 1838)  
**Distribution:** Pathankot (Punjab)
11. *Coelioxys (Schizocoelioxys) apicata* (Smith, 1854)  
**Distribution:** Deesa, Palanpur, Sikar (Rajasthan)
12. *Coelioxys (Schizocoelioxys) rajasthanensis* (Gupta, 1992)  
**Distribution:** Alwar (Rajasthan)
13. *Coelioxys (Schizocoelioxys) fuscopterous* (Gupta & Sharma, 1993)  
**Distribution:** Narainpur (Odisha)
- Subgenus *Glyptocoelioxys* Mitchell, 1973**
14. *Coelioxys (Glyptocoelioxys) sulcispina* (Cameron, 1913)  
**Distribution:** Kangra (Himachal Pradesh)

15. *Coelioxys* (*Glyptocoelioxys*) *cuneatus* (Smith, 1875)  
**Distribution:** Palampur (Himachal Pradesh)  
**Subgenus** *Nigrocoelioxys* Gupta, 1993
16. *Coelioxys* (*Nigrocoelioxys*) *pasteeli* (Gupta, 1992)  
**Distribution:** Alwar, Deeg, Sikar (Rajasthan)
17. *Coelioxys* (*Nigrocoelioxys*) *ruficaudis* (Cameron, 1913)  
**Distribution:** Mandi, Cameron 1913 reported from Shimla
18. *Coelioxys* (*Nigrocoelioxys*) *confuses* (Smith, 1875)  
**Distribution:** Manikaran (Himachal Pradesh)
19. *Coelioxys* (*Nigrocoelioxys*) *latus* (Cameron, 1908)  
**Distribution:** Mandi, Shimla (Himachal Pradesh)
20. *Coelioxys* (*Nigrocoelioxys*) *hissarensis* (Gupta & Sharma, 1993)  
**Distribution:** Hissar (Haryana)
21. *Coelioxys* (*Nigrocoelioxys*) *fuscipennis* (Smith, 1854)  
**Distribution:** Kota (Rajasthan), Mandi, Kullu (Himachal Pradesh)
22. *Coelioxys* (*Nigrocoelioxys*) *sexmaculatus* (Cameron, 1897)  
**Distribution:** Udaipur (Rajasthan), Deesa (Gujarat)
23. *Coelioxys* (*Nigrocoelioxys*) *capitatus* (Smith, 1845)  
**Distribution:** Alwar, Deeg, Kota (Rajasthan)  
**Subgenus** *Coelioxys* Latreille, 1809
24. *Coelioxys* (*Coelioxys*) *farinose* (Smith, 1854)  
**Distribution:** Pathankot, Ludhiana, Jalandhar (Punjab)
25. *Coelioxys* (*Coelioxys*) *torrida* (Smith, 1854)  
**Distribution:** Kangra, Mandi (Himachal Pradesh)
26. *Coelioxys* (*Coelioxys*) *indicus* (Gupta, 1990)  
**Distribution:** Alwar (Himachal Pradesh), Pathankot (Punjab), Deeg, Sikar (Rajasthan)
27. *Coelioxys* (*Coelioxys*) *ducalis* (Smith, 1854)  
**Distribution:** Dharamshala (Himachal Pradesh)
28. *Coelioxys* *guptai* (Sachwarz, 1999)  
**Distribution:** Kullu (Himachal Pradesh), Dehradun (Uttarakhand), Jalandhar (Punjab)

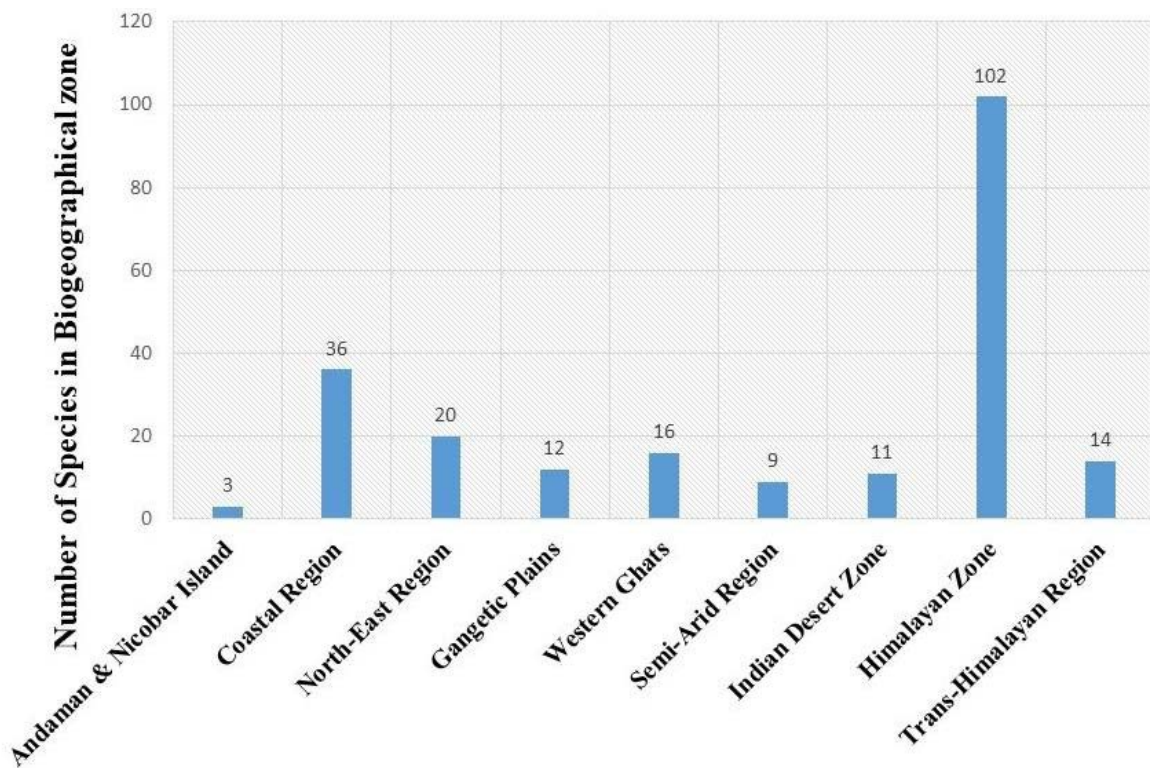
## Discussion

The present study reveals one new distributional record as new to Ladakh namely, *Anthidium florentinum* Fabricius, 1775 from Zanskar, Ladakh, India.

Based on the literature and collection surveys, a total of **179 species** of the family Megachilidae belonging to **23 genera** and **36 subgenera** under 2 subfamilies & 3 Tribes have been enlisted in this paper.

Based on the biogeographic distribution in India, 102 species are found in the Himalayan region. Genus *Megachilie*, *Osmia*, *Coelioxys* & *Anthidium* shows widespread distribution both in the Himalayas and south India.

In “Jammu & Kashmir” the family Megachilidae is reported by **19 species** and in Ladakh **5 species** have been reported. This data have been compiled from the previously published literature and new survey cum collection from 2020 to 2022.



**Figure 1: Biogeographical Distribution of Megachilidae Bees in India**

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