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RESEARCH ARTICLE

First Record of Velvet Ants (Hymenoptera: Mutillidae) from Jammu District, Jammu & Kashmir, India and their ecological significance.

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Abstract: The family Mutillidae (velvet ants) is a diverse group of aculeate wasps that remains poorly documented in the north-western Himalayan region. Field surveys were conducted from August 2025 to July 2026 in selected urban and peri-urban areas of Jammu District, Jammu & Kashmir. Specimens encountered in the study areas were photographed and identified using external morphological characters and relevant taxonomic literature. The current study documented five taxa of the family Mutillidae from urban and peri-urban areas of Jammu District, comprising *Radoszkowskitilla ceylonica*, *Smicromyrme* sp., *Nemka* sp., and two unidentified black velvet ant taxa, designated as Mutillidae taxa 1 and Mutillidae taxa 2 as a new record from the study area. The study contributes to baseline knowledge of Mutillidae in the region and highlights the importance of systematic surveys for documenting urban insect diversity.
Keywords: Aculeata; setose: velvet ants; photographic record; Nandani village; *Radoszkowskitilla ceylonica*.

Introduction

The family Mutillidae Latreille, 1802, (Hymenoptera: Aculeata), commonly known as velvet ants, represents a diverse group of parasitoid wasps distributed across most major biogeographical regions of the world. The common name is derived from the dense, often brightly coloured pubescence covering the body. They exhibit strong sexual dimorphism. The males are winged (rarely brachypterous or apterous) and possess a normal apocritan mesosoma, while the females are entirely apterous, and most of them exhibit complete fusion of the sclerites (Brothers, 1995). The remarkable morphological differences between the sexes, together with considerable variation in body sculpture, pubescence and colouration, make the family an important group for systematic and biodiversity studies. (Lelej, 2005; Lelej and Brothers, 2008; Terine *et al*., 2020). Mutillids are predominantly associated with warm and dry habitats, although species occur across a wide range of ecological conditions, including sandy, open, forested and semi-arid environments.

Velvet ants (Mutillidae) are large groups of aculeate wasps including more than 4600 species, which predominantly occur in tropical regions (Lelej, 2005, 2007; Pagliano *et al*, 2020). Southeast Asia is known

for the rich but hidden velvet ant diversity (Williams et al. 2019; Okayasu *et al*. 2021a). A comprehensive checklist of Indian Mutillidae published by the Zoological Survey of India documented 216 species belonging to 41 genera (Lelej, 2005; Terine *et al*., 2020). However, the diversity of Indian Mutillidae continues to increase as poorly explored regions are surveyed and taxonomic revisions are undertaken. Recent studies have resulted in additional species descriptions and new distributional records. For instance, Terine and Kumar (2024) described three new species of *Odontomutilla* from India, namely *O. jaferpaloti*, *O. vishwanathi* and *O. himalayensis*, the latter being reported from Uttarakhand in the Himalayan region. Only two taxa of the family Mutillidae have been documented from Jammu and Kashmir to date (Hammer, 1962; Charul *et al*., 2026). Besides this Mutillid fauna of the Jammu and Kashmir, remains comparatively poorly documented. In this context, the present study aims to document and characterize the Mutillidae fauna recorded from district Jammu, Jammu and Kashmir (UT) with emphasis on morphological identification, distributional information and photographic documentation. The study is expected to contribute to the existing knowledge of Indian Mutillidae and provide additional baseline data for the north-western Himalayan region.

Material and Methods

Field surveys were conducted from August 2025 to July 2026 in selected urban and peri-urban areas of Jammu District, Jammu & Kashmir, covering residential areas, gardens, vacant plots, grasslands, roadsides and other semi-natural habitats. The study area is located at coordinates 32°43′01.96″ N and 74°48′26.29″ E, at an elevation of 308.48 m above sea level. Individuals specimens encountered in the field were collected and photographed from dorsal, lateral and oblique views using a digital Samsung A56 macro-lens and Nikon D-5300 (70mm-300 mm lens) camera. Information on locality, date, habitat and morphological features was recorded for each observation.

The recorded specimens were identified based on external morphological characters using available taxonomic keys, revisions and catalogues of Mutillidae, particularly Lelej (2005), Terine *et al.* (2020), Lelej *et al*. (2020), Pagliano *et al*. (2020) and Lelej and Williams (2023). Previously published distributional records were consulted to assess the occurrence of each taxon in Jammu & Kashmir, UT (Hammer, 1962; Charul *et al*., 2026). Photographic records were subsequently organized into a systematic inventory of Mutillidae documented from the urban landscape of Jammu District.

Results and Observations

The present study documents five taxa of Mutillidae, namely *Radoszkowskitilla ceylonica*, *Smicromyrme* sp., *Nemka* sp., and two unidentified black velvet ant taxa (Mutillidae taxa 1 and Mutillidae taxa 2), from the urban and peri-urban areas of Jammu District as new record from the study area.

Subfamily: Mutillinae
Tribe: Petersenidiini
Genus: *Radoszkowskitilla* Lelej, 2005.
Diagnosis: Mesosoma broadest at pronotum; T6 with more or less developed pygidial area, at least flattened shiny area carinate laterally; mesosoma elongated; T2 more or less flattened, with lateral longitudinal carina; prementum tuberculate at apex; head with pale spot on the vertex.
Distribution: India, Sri Lanka.
Species from India: R. ceylonica (Lelej, 1993) and R. Karnataka Lelej, 2005.

1. *Radoszkowskitilla ceylonica* (Lelej, 1993)

Fig. 1. *Radoszkowskitilla ceylonica* (Lelej, 1993) ♀

Material observed: India: J&K (UT), Jammu district, Nandani village, 3.v.2026 (10:45am), photography- Brinder Kumar.

Diagnosis: Genal carina anterad with acute denticle; T2 medially with weak basal carina and extremely developed lateral longitudinal carina; S2 postero-laterally with well-developed arcuate carina; T6 with pygidial area shiny, weakly sculptured in basal third, carinate laterally; vertex with silver spot, pronotum laterally, mesopleura and metapleura below with dense recumbent silvery hairs; mesosoma dorsally with sparse recumbent golden hairs. Body length 13.5 mm.

Distribution: India: Jammu (new record), Chhattisgarh, Karnataka. Elsewhere: Sri Lanka.

2.*Smicromyrme sp.*

Fig. 2. *Smicromyrme sp.*

Material observed: India: J&K (UT), Jammu district, Nandani village, 23.v.2026 (6:00pm), photography: Brinder Kumar.

Diagnosis: The body is clearly differentiated into the head, mesosoma and metasoma. The head is dark brown to blackish**,** relatively broad, with a prominent pair of dark compound eyes. The antennae are filiform and segmented, arising from the anterior region of the head. The mesosoma is densely covered with golden-brown to reddish-brown pubescence**,** giving the thoracic region a characteristic velvety appearance. The legs are slender but strongly setose**,** with conspicuous pale to silvery hairs, and terminate in tarsal segments bearing claws**.** The metasoma is comparatively stout and dark**,** predominantly black, with conspicuous 3 silvery-white pubescent patches/bands on the abdominal segments. The abdomen appears strongly sclerotized and shows a distinct constriction between the thoracic and abdominal regions. Dense hairs are present along the margins and lateral portions of the body.

Distribution: India: Jammu (new record), Kashmir, Uttarakhand. Elsewhere: Sri Lanka, Myanmar, China, Malaysia, Indonesia, Philippines.

3. Nemka sp.

Fig. 3. *Nemka sp.* **(**Lelej, 1985)) ♀

Material observed: India: J&K (UT), Jammu district, Nandani village, 17.vi.2026 (3:40pm), photography: Brinder Kumar.

Diagnosis: The head is broad and black, bearing prominent compound eyes and long, segmented antennae. The mesosoma is reddish-brown to coppery brown and densely covered with short, golden-brown pubescence. The legs are black and densely setose, with well-developed tarsal segments. The metasoma is comparatively large, highly setose laterally, rounded and predominantly glossy black, bearing a conspicuous silvery-white patch of dense pubescence dorsally and additional broad silvery-white pubescence near the posterior margin. A distinct constriction separates the mesosoma from the metasoma. The contrasting reddish-brown mesosoma, black metasoma and conspicuous silvery-white abdominal pubescence represent prominent external features of the specimen.

Distribution: India: Jammu (new record), Kerala, Odisha, Gujrat, Pondicherry, Karnataka. Elsewhere: Sri Lanka, Pakistan, Iran.

4. Black Velvet Ant (Mutillidae sp1)

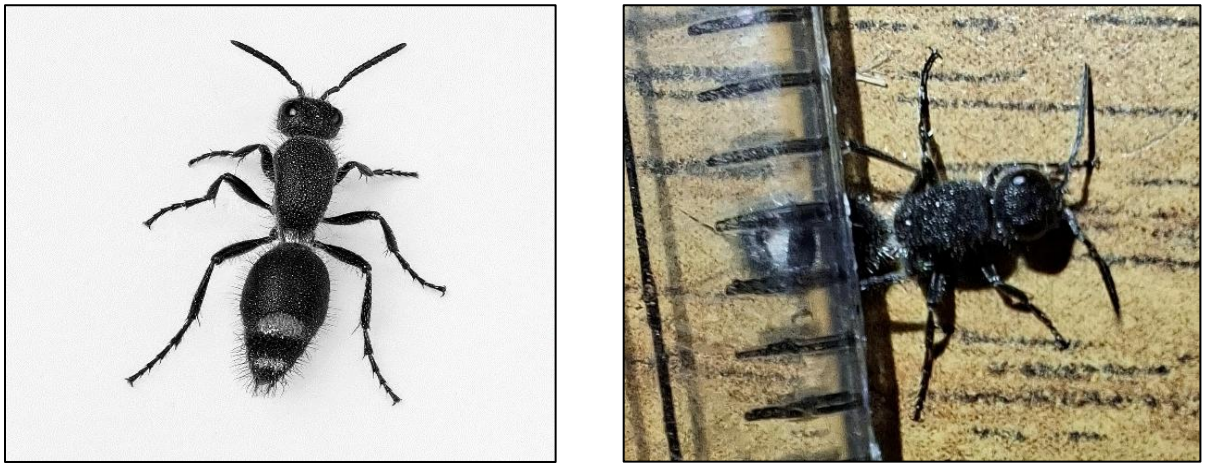

Fig. 4. Black Velvet Ant (Mutillidae taxa 1, Unidentified)

Material observed: India: J&K (UT), Jammu district, GGM Science College, 06.vi.2026 (4:22pm), photography: Brinder Kumar.

Diagnosis: The specimen has a robust, wingless and densely setose body, distinctly divided into head, mesosoma and metasoma. The head is black, rounded, and bears prominent compound eyes and long, segmented antennae. The mesosoma is elongated, black and densely covered with fine whitish setae**.** Three pairs of slender, black, setose legs arise from the mesosoma. The metasoma is enlarged, oval and black**,** with dense erect pubescence and a conspicuous 2 white-silvery transverse large band/spot on its posterior portion.

Distribution: India: Jammu.

5. Black Velvet Ant (Mutillidae sp2)

Fig. 5. Black Velvet Ant (Mutillidae taxa 2, Unidentified)

Material observed: India: J&K (UT), Jammu district, Nandani village, 13.vii.2026 (12:25pm), photography: Brinder Kumar.

Diagnosis: The specimen possesses a robust, wingless and densely setose body, distinctly divided into head, mesosoma and metasoma. The head is black and rounded, with prominent compound eyes and segmented antennae. The mesosoma is elongated, black and strongly punctate, bearing sparse to dense short setae. Three pairs of slender, black, setose legs are present. The metasoma is large, oval and black**,** with dense pubescence and a distinct 3 pale golden to whitish transverse band near the posterior region, followed by a densely setose terminal segment. The contrasting black body, conspicuous abdominal band and dense body pubescence are characteristic external features of a female velvet ant (Mutillidae).

Distribution: India: Jammu.

Discussion

The Himalayan region is of particular significance for the study of Mutillidae because of its complex topography, diverse climatic conditions and wide range of habitats. The occurrence of *Odontomutilla himalayensis* in Uttarakhand and *Orientilla schmideggeri* in Himachal Pradesh indicates the presence of mutillid taxa in the western and central Himalayan region (Terine *et al*., 2020; Terine and Kumar, 2024). Despite this, the mutillid fauna of the north-western Himalaya, particularly Jammu and Kashmir, remains comparatively poorly documented. “The mutillid fauna of Jammu and Kashmir has been historically documented by Hammer (1962), who described *Smicromyrme kashmirensis* from Kashmir. Other *Smicromyrme* species have been recorded from Himalayan states, including *S. cameroni* from Himachal Pradesh and *S. hilaris* from Uttarakhand and West Bengal (Lelej, 2005; Hammer, 1962; Terine *et al*., 2020). Das and Kumar (2016) recorded three species namely, *Radoszkowskitilla ceylonica*, *Dasylabris argentipes* and *Orientilla aureorubra* from Chhattisgarh. A recent inventory of hymenopteran insects from the Jammu division recorded only one taxon namely, *Promecilla sp.* of Mutillidae (Charul *et al*., 2026). This indicating that the family is represented in the region but remains insufficiently studied in comparison with several other hymenopteran families. In comparison with previously published records, the present study documents five taxa of Mutillidae, namely *Radoszkowskitilla ceylonica*, *Smicromyrme* sp., *Nemka* sp., and two unidentified black velvet ant taxa (Mutillidae taxa 1 and Mutillidae taxa 2), from the urban and peri-urban areas of Jammu District. These findings provide additional distributional records for the family in the study area and substantially contribute to the limited knowledge of velvet-ant diversity in Jammu and Kashmir. The occurrence of multiple mutillid taxa within an urban landscape further highlights the need for continued systematic surveys and taxonomic investigations to better understand the diversity, distribution and ecological significance of Mutillidae in the north-western Himalayan region.

Ecological and Biodiversity Significance: Velvet ants are predominantly ectoparasitoids of immature stages of bees, wasps and other aculeate Hymenoptera, and therefore form an important component of host-parasitoid interactions and terrestrial food webs. Their occurrence also indicates the availability of suitable host populations and nesting microhabitats within the urban landscape. Urban gardens, vacant plots, grasslands, soil patches and semi-natural vegetation can provide nesting sites or foraging areas for potential hosts and consequently support mutillid populations. Habitat heterogeneity is known to influence parasitoid-host community structure in Mutillidae. Therefore, maintaining patches of natural vegetation, exposed soil and diverse ground habitats within urban areas may contribute to the conservation of these poorly studied parasitoid wasps. The occurrence of five mutillid taxa within the urban and peri-urban landscape of Jammu suggests that even highly modified habitats can retain suitable ecological conditions for parasitoid wasps and their hosts, emphasizing the importance of habitat heterogeneity for maintaining local insect diversity.

Conclusion

The present study provides baseline information on the occurrence and distribution of velvet ants (Mutillidae) in the urban and peri-urban areas of Jammu District. Photographic documentation revealed several mutillid taxa occurring in diverse urban habitats, emphasizing the ecological importance of these habitats for aculeate Hymenoptera. Previously only two species namely, *Smicromyrme kashmirensis and Promecilla sp*. were reported from J&K (UT). The current study adds five numbers of taxa to the limited information available on Mutillidae family from Jammu and Kashmir and highlights the need for further systematic surveys and taxonomic investigations to improve understanding of their diversity and distribution in the north-western Himalayan region.

Declarations

Ethical approval and consent to participate: Not applicable
Competing interests: NA.
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