

1 **First record of the genus *Spilomyia* (Diptera, Syrphidae) from the Oriental region**

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1 **Abstract:** *Spilomyia manicata* (Rondani, 1865) is reported as a new genus and species  
2 record from India and the Oriental region. A brief diagnosis, images and comparison with  
3 allied species are provided to scientifically validate this new faunal record from the Indian  
4 subcontinent and to facilitate its prompt identification. The species shows rare distribution  
5 across its range and various factors pose threat to the existence of this large pollinator  
6 species. Therefore, the documentation of this species assumes significance for devising  
7 conservation strategies and sustainable management.

8 **Key words:** *Spilomyia manicata*, Syrphidae, new record, distribution, Indian subcontinent.

## 9 **1. Introduction**

10 The genus *Spilomyia* Meigen, 1803 currently includes 38 species, mainly distributed in the  
11 Holarctic region with few species occurring in the Neotropics (Stenis, 2000). In Indian  
12 subcontinent, this genus is represented by two species: *Spilomyia saltuum* (Fabricius,  
13 1794) and *Spilomyia sulphurea* Sack, 1910 both reported from Afghanistan (Bańkowska,  
14 1968; Ghorpadé, 2014). Despite their large size (9-22 mm) and widespread distribution  
15 *Spilomyia* species are often overlooked in the field even by experienced collectors because  
16 of their morphological and behavioral similarity with social wasps (Curran, 1951; Steenis,  
17 2000).

18 Here we present the first records of *Spilomyia manicata* (Rondani, 1865) from  
19 Afghanistan and India. This also marks the first member of this genus from India  
20 (Ghorpadé, 2014; Shah et al., 2014; Sengupta et al., 2016) and the Oriental region. A brief  
21 diagnosis and coloured images of its diagnostic characters are given here to facilitate its  
22 easy identification, and also to validate this new faunal species record to the region. The

1 discovery is important in backdrop that this species is very rare in distribution and  
2 represents a significant south-eastward extension of the geographic range for this genus  
3 (Stackelberg, 1958; Kuznetsov, 1997; Steenis, 2000).

## 4 **2. Material and Methods**

5 The Indian subcontinent ranges from Afghanistan east through Pakistan, India, Nepal,  
6 Bhutan, and Bangladesh to Myanmar and from Kashmir and SE Tibet to Sri Lanka and the  
7 Laccadive and Maldiva islands and the Chagos archipelago in the Indian Ocean  
8 (Ghorpadé, 2014). The specimens representing Indian record were freshly collected by  
9 sweep net in Kashmir valley (Jammu and Kashmir) and Naggar Castle of Kullu valley  
10 (Himachal Pradesh), situated in northern fringe of the Western Himalayas of the Indian  
11 subcontinent, while the specimen from Afghanistan was studied in MNHNP collection.  
12 The taxonomic study was conducted using a Leica Wild M 10 stereomicroscope and  
13 images were produced using a Canon EOS 500 Dcamera. The acronyms used and their  
14 equivalents are:

15	CNC	The Canadian National Collection of Insects, Arachnids and
16		Nematodes, Ontario, Canada
17	MNHN	Museum National d'Histoire Naturelle, Paris, France
18	MZUF	Museo Zoologico "La Specola", Florence, Italy
19	NBC	Naturalis Biodiversity Centre, Leiden, The Netherlands
20	ZSI	Zoological Survey of India, Kolkata, India

## 21 **3. Results**

22 *Spilomyia manicata* (Rondani, 1865)

(Figures 1-3)

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2 *Milesia manicata* Rondani, 1865: 132. LT ♀ [MZUF, des. J. Van Steenis, 1998]. Italy  
3 (Apennines).

4 *Spilomyia integra* Kuntze, 1913: 549. ST 5 ♂♂, 5♀♀ [lost]. France (Corsica: Monte  
5 D'oro).

6 *Spilomyia boschmai* Lucas, 1964: 206. HT ♀ [NBC]; PT 1 ♀ [NBC]. Italy (Sicily, Monte  
7 Soro, Cesaro).

8       Diagnosis: As for the other species of the genus *Spilomyia manicata* has the  
9 following characters: concave face; a dark-brown pattern on the eyes; elongate antennae;  
10 strongly oblique wing veinr-m; non-pollinose yellow thoracic and abdominal colour  
11 pattern; metafemur with apicoventral anterolateral spur. It differs from the other species by  
12 the combination of the following characters: mesonotum and scutellum long pilose; macula  
13 on scutum in front of scutellum semi-circular; scutellum yellow on posterior 1/4-1/3;  
14 pleura with 4 to 6 yellow spots, one each on proepimeron, dorsal part of katepisternum,  
15 katepimeron and anepisternum and sometimes also on dorsal part of metepimeron and  
16 katatergite; protarsus entirely black; protibia black on apical 1/4-2/3; anteromedial fascia  
17 on tergites II-IV entire to only very slightly separated medially; posterior fascia on tergite  
18 IV curved in the male.

19       Comparison with *Spilomyia saltuum*: The long pilose mesonotum and scutellum is  
20 diagnostic for *S. manicata* (very short pilose in *S. saltuum*); protarsus entirely black, at  
21 most fifth tarsomere light-brown (*S. saltuum* with at least tarsomeres 4 and 5 light-brown  
22 to yellow); setulae on protarsus black (*S. saltuum* yellow); macula on scutum in from of

1 scutellum semi-circular (*S. saltuum* sub-triangular); anteromedial fascia on tergites II-IV  
2 entire, in male sometimes very narrowly separated medially and posterior fascia on tergite  
3 IV curved in the male (*S. saltuum* all fascia straight and clearly separated medially).

4 Distribution: Austria, Balkan Peninsula, Belgium, Croatia, Czech Republic,  
5 Denmark, France, Germany, Greece, Italy, Macedonia, The Netherlands, Norway, Poland,  
6 Rumania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Yugoslavia (Barendregt  
7 et al., 2000; Steenis, 2000; Vujić et al., 2001; Groot, 2004). New record from Afghanistan  
8 and India (Himachal Pradesh and Jammu and Kashmir).

9 Material examined: India: Jammu and Kashmir, Srinagar, 34.1456°N 74.8775°E,  
10 1,800 m. a.s.l., 15.x.2015 (1 ♀, CNC) leg. Zubair A. Rather; Himachal Pradesh, Naggar  
11 Castle, 32.1144°N, 77.1747°E, 1,887 m. a.s.l., 13.vii.2013 (1 ♀, ZSI) leg. D. Banerjee;  
12 Afghanistan: Nouristan, Vallée du Pech, 1800-2400 m. a.s.l., 18.viii.1977, (1 ♂, MNHN)  
13 leg. G. Meurgues & G. Ledoux.

14 Habitat and behaviour: The Indian specimen from Srinagar was swept on *Ageratum*  
15 *houstonianum*, an exotic ornamental plant at SKUAST Campus in Kashmir valley of the  
16 Northwest Himalaya at mid altitude (1800 m. a.s.l.) with an average annual precipitation of  
17 660 mm and 13°C average temperature. The other Indian specimen was collected from the  
18 Western Himalayan state of Himachal Pradesh from a local wild flower bush (Figure 4) at  
19 mid altitude (1887 m) with an average annual temperature of 16.1°C and an average annual  
20 precipitation of 110 mm. The specimen from Afghanistan was collected on the south  
21 slopes of the Hindu Kush Mountains in the north-eastern part of the country.

#### 22 **4. Discussion**

1 In spite of being widespread, this species has often been misidentified as *Spilomyia*  
2 *saltuum*, however, Steenis (2000) cleared the demarcation between the two species. This  
3 large pollinator species distributed in Palaearctic although widespread is rare and is known  
4 by few recent records from most parts of its range (Speight, 2013). It is probably  
5 threatened over much, if not all, of Europe and may be facing a high risk of threat in the  
6 future (Vujić et al., 2001; Speight, 2013). This species marks the first record of the genus  
7 *Spilomyia* from India and the third species from Afghanistan. Since, major areas of the vast  
8 Indian subcontinent are poorly sampled, future biodiversity surveys should provide many  
9 more new records and new species in the region (Wachkoo et al. 2017; Ballal et al. 2018;  
10 Háva et al. 2019). The discovery is important to document our declining biodiversity and  
11 its impact on mankind. This also gains much importance in the backdrop that India is  
12 signatory to CBD and our prime responsibility as a developing nation is to take stern  
13 measures to preserve the disappearing biodiversity (Wachkoo et al. 2018a, b). The  
14 potential for reduced pollination ecosystem service due to global declines of bees and other  
15 pollinators is cause for considerable concern that has resulted in the establishment of  
16 special initiatives by the CBD (International Pollinator Initiative) to tackle the issues of  
17 pollinator declines (Potts et al. 2010). Given the weight of evidence of pollinator loss and  
18 associated risks, investment in developing mitigation options such as alternative managed  
19 pollinators is essential to ensure sustainable pollination services in a changing world.

20 The female from Srinagar has been genetically analysed in Canada (Jeff  
21 Skevington pers. comm.) and its DNA was found to differ from European species of  
22 *Spilomyia manicata*. The morphological characters of the specimens studied here and

1 European specimens of *S. manicata* were not found to be different. There is a possibility  
2 that the DNA was not correctly extracted and thus that the here studied specimens are *S.*  
3 *manicata*. However if the DNA extraction and analysis was done correctly it is most likely  
4 that the here studied specimens belong to an undescribed species. Additional material and a  
5 more thorough study of molecular and morphological characters is needed before there  
6 could be a satisfactory conclusion about the real identity of the Indian specimens.

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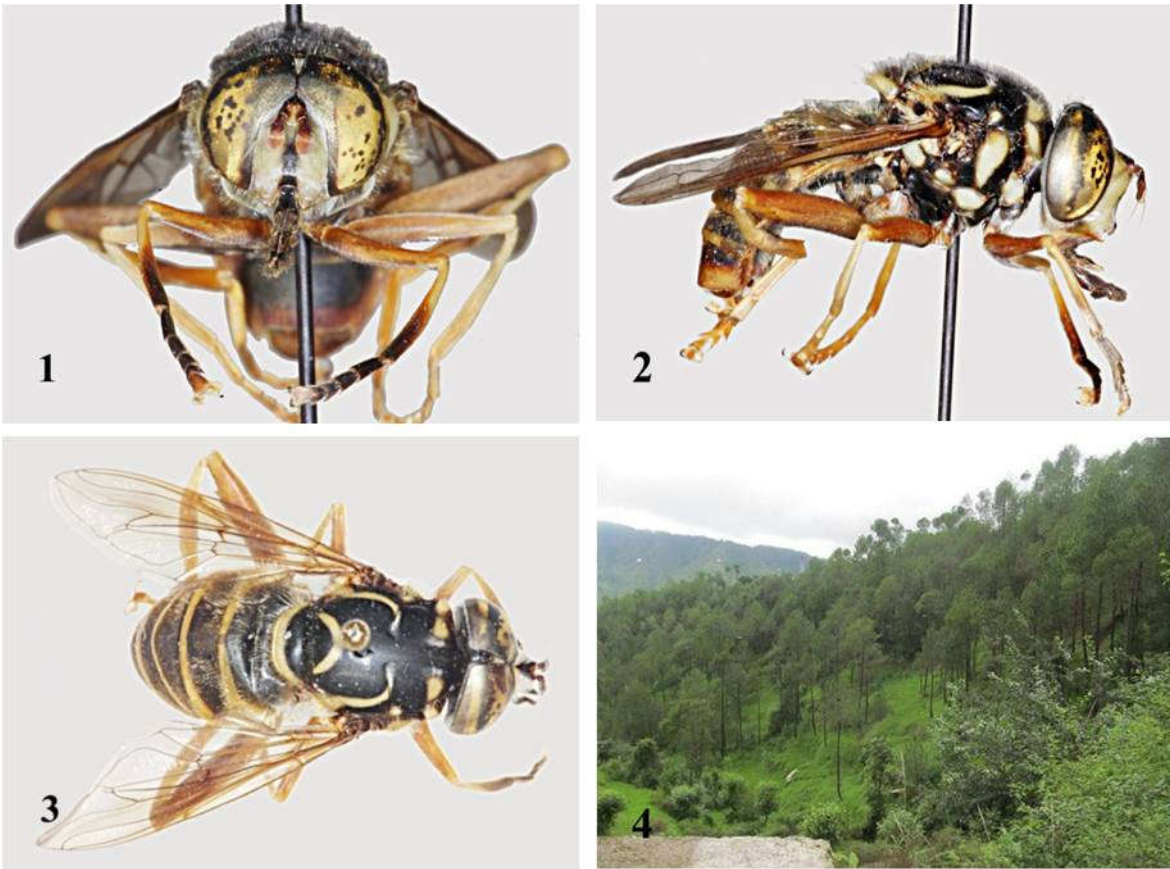
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**Figures 1-4.** 1-3 *Spilomyia manicata* (Rondani, 1865) (♂) Afghanistan: 1, Frontal view; 2, Lateral view; 3, Dorsal view (Photographs courtesy of W. van Steenis). 4. Collection locality of *S. manicata* at Nagar Castle, Kullu, Himachal Pradesh.