



First record of the velvet ants (Hymenoptera: Mutillidae) reared from puparia of the ber fruit fly *Carpomya vesuviana* Costa (Diptera: Tephritidae) in Iran

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Abstract

Two species of mutillids, *Smicromyrme (Astomyrme) nikolskajae* Lelej, 1985 and *S. (Eremotilla) tekensis* Skorikov, 1935, reared from puparia of ber fruit fly, *Carpomya vesuviana* Costa, in South Khorasan, Iran are recorded. Both mutillids are newly recorded from Iran. An overview of eight species of mutillids associated with six species of flies is given in the appendix.

Key words: Mutillidae, parasitoids, Tephritidae, *Carpomya vesuviana*, new record, Iran

Introduction

Most velvet ants (Hymenoptera: Mutillidae) are solitary ectoparasitoids of the enclosed immatures of other insects: Hymenoptera (Mickel 1928; Brothers 1972, 1989; Brothers *et al.* 2000), Diptera (Eminson 1915; Brothers 1971; Invrea 1950, 1951; Lelej 1978, 1985; Bürgis 1990), Lepidoptera (Seyrig 1936), Coleoptera (Péringuey 1899; Sergeev & Lelej), and Blattodea (Mickel 1974). Mutillidae currently includes 210 genera and 4302 described species (Lelej 2007; Lelej & Brother 2008; Aguiar *et al.* 2013), but the hosts information are known for only about 150 species and are mainly bees and wasps (Brothers 1989). In the Palaearctic Region, 523 species in 58 genera are distributed (Lelej 2002, updated). Ninety-two species in 25 genera are recorded from Iran (Lelej 2002, Ljubomirov & Ghahari 2012). The velvet ant fauna of Iran consists of mainly Central Asian (Iranian) species. Mediterranean (Sumerian and Hyrcanian) species penetrate in North-West Iran (the division of Palaearctic follows Semenov-Tian-Shanskij 1935). Because of their extreme sexual dimorphism, sex associations cannot be made on morphological grounds alone; most species and even many genera are known from one sex only. This has resulted in many taxonomic challenges in trying to make associations, and resulted in many synonymies recognized through matching of males and females.

Ber fruit fly, *Carpomya vesuviana* Costa (= *Orellia buccichi* Frauenfeld, = *Carpomyia zizyphae* Agarwal & Kapoor), is one of the notorious monophagous pests of *Ziziphus* (Rhamnaceae) in India, Pakistan, Iran, China, and Middle East countries. The fly infest most of the *Ziziphus* species grown in the world and cause damage internally; in serious cases, it causes severe yield loss up to 80% or even up to 100% damage (Karuppaiah 2014). The occurrence of this pest is reported from India, Pakistan, Iran, China, Georgia, Bangladesh, Mauritius, Indian Ocean Island, Uzbekistan, Turkmenistan, Turkey, temperate Asia, South Europe, and Oman (Karuppaiah 2014). For biological characteristics of *C. vesuviana* see Hu *et al.* (2013), and for morphology of larvae see Kandybina (1977). In spite of that *C. vesuviana* is the serious pest, only a few braconids have been recorded as parasitoids: *Biosteres vandenboschi* Fullaway and *Bracon fletcheri* Silvestri, *Fopius carpomyiae* (Silvestri) (India, Iran) (Karuppaiah 2014). Because the ber fruit fly is the main pest of cultivated *Ziziphus jujuba* Miller in Iran, the natural enemies of this pest in the region of Birjand (Iran, South Khorasan) were studied.

Smicromyrme (Eremotilla) tekensis Skorikov, 1935

Figs 6, 7

Smicromyrme tekensis Skorikov, 1935: 317, ♀, lectotype—♀ (designated by Lelej 1976): Dzhulek, Syr-Dar'inskaya oblast, 13.06.1912, L.M. Wolmann (Kazakhstan) [Zoological Institute, St. Petersburg], examined.

Material examined: Iran, South Khorasan: 1 ♀, reared in July 2013 from puparium of *Carpomya vesuviana* collected in Mood (32°42'N, 59°31'E, 1839 m), Sarbishe, 33 km SE Birjand; 1 ♀ reared in Jan. 2012 from puparium of *C. vesuviana* collected in Razg village (32°53'N, 59°13'E, 1470 m) in the vicinity of Birjand.

Distribution: Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Tajikistan, Iran (new record), China (Xinjiang), Mongolia.

Two mutillid species from the subfamily Dasylabrinae (genus *Chestomutilla* Brothers, 1971) and six species from the subfamily Mutillinae (tribe Smicromyrmini, genera *Smicromyrme* Thomson, 1870 and *Physetopoda* Schuster, 1949) parasitize Diptera (see Appendix). All mutillids were reared from six species of flies, which belong to the families Syrphidae, Tephritidae, Glossinidae, Rhinophoridae, and Tachinidae (all are from suborder Cyclorhapha). In spite of their importance, only a few mutillids currently are known as parasitoids of Diptera, but in future this number is expected to increase.

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APPENDIX

Species of Mutillidae associated with Diptera: records generally accepted only if mutillids reared from host puparia; names of species used in the literature, if different from the currently accepted names, indicated in parentheses.

Dasylabrinae

Chrestomutilla glossinae (Turner, 1915) (= *Mutilla glossinae*), Afrotropical Region.

Glossina morsitans Westwood [tsetse flies] (Diptera: Brachycera, Cyclorrhapha: Glossinidae) (Turner 1916: a large series of both sexes reared in Malawi (former Nyasaland))

Chrestomutilla auxiliaris (Turner, 1920) (= *Mutilla auxiliaris*), Afrotropical Region.