Parasitoids (Hymenoptera: Pteromalidae, Diapriidae) of *Carpomya vesuviana* Costa (Diptera: Tephritidae) in South Khorasan province of Iran

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**Abstract.** Occurrence of two new parasitoids on *ber* fruit fly, *Carpomya vesuviana* Costa (Diptera: Tephritidae) was reported for the first time from Iran. Pest is found to be attacked by two parasitoids namely, *Cyrtoptyx lichtensteini* (Masi) (Hymenoptera: Pteromalidae), an ectolarval parasitoid and *Coptera nr. silvestrii* (Kieffer) (Hymenoptera: Diapriidae), an endopupal parasitoid of *Carpomya vesuviana*. The specimens were reared from soil and infested fruits of *Z. jujuba* which were collected in Birjand region, South Khorasan province of Iran. As both parasitoid species were reared found to feed on *C. vesuviana* they could be the potential agents in biological control of fruit flies (Tephritidae). Further research on their taxonomy as well as parasitic efficiency would give more idea to incorporate into successful fruit fly control programmes.

Key words: *Cyrtoptyx lichtensteini*, *Coptera* sp., Ectoparasitoid, Pupal parasitoid, Biological control, Natural enemies.

The *ber* fruitfly, *Carpomya vesuviana* Costa, 1854 (Diptera: Tephritidae) is the most destructive pest of *Ziziphus* spp. in its area of distribution including Bangladesh, China, Georgia, India, Indian Ocean Islands, Iran, Mauritius, Oman, Pakistan, Southern Europe, Turkmenistan, Turkey, and Uzbekistan (Farrar et al. 2004, Vadivelu 2014). The adult females lay their eggs inside the ripening fruits, and the larva begins to eat the flesh of *jujube* fruit immediately after hatching. The larvae undergo three instars before pupation. The mature larva wriggles out of the fruit, and drops down into the soil to pupate. The larvae burrow into the soil, typically to depths of 1–5 cm beneath or near host trees (Thomas 1993). During feeding and later, while burrowing the soil and as buried pupae, they are exposed to attack by a variety of natural enemies. There are various reports of available about *ber* fruitfly parasitoids. However, information in this aspect is very limited and the success rate of reported parasitoids also not upto the mark at field level control. Bhatnagar (2013) also not upto the mark at field level control. Bhatnagar (2013). During feeding and later, while burrowing the soil and as buried pupae, they are exposed to attack by a variety of natural enemies. There are various reports of available and by field level control. Bhatnagar (2013). During feeding and later, while burrowing the soil and as buried pupae, they are exposed to attack by a variety of natural enemies. There are various reports of available about *ber* fruitfly parasitoids. However, information in this aspect is very limited and the success rate of reported parasitoids also not upto the mark at field level control. Bhatnagar (2013).

Two wasp species namely, *Cyrtoptyx lichtensteini* (Masi 1921) (Hymenoptera: Pteromalidae), a larval ectoparasitoid and *Coptera nr. silvestrii* (Kieffer) (Hymenoptera: Diapriidae), a puparial endoparasitoid are reported as new parasitoids of *Carpomya vesuviana* (Tephritidae) in Iran and world. Some key characteristics of these species are as follows:

**Cyrtoptyx lichtensteini** (Masi 1921) (Fig. 1A, B)
**Material examined:** South Khorasan province, Birjand (59° 13′ 55″ E, 32° 51′ 59″ N), 1465 m, 28 July 2012, A. Amini, leg., 2♂; Birjand (59° 13′ 55″ E, 32° 51′ 59″ N), 1465 m, 9 August 2013, A. Amini, leg., 3♀, 1♂; Birjand, Chahkand village (59° 09′ 20″ E, 32° 50′ 49″ N), 1551 m, 2012, A. Amini leg., 1♀; Birjand, Razgvillage (59° 15′ 47″ E, 32° 48′ 25″ N), 1740 m, 3 August 2012, A. Amini leg., 2♀; Birjand, Razgvillage (59° 15′ 47″ E, 32° 48′ 25″ N), 1740 m, 31 July 2013, A. Amini leg., 2♀, 1♂.

This species has recently reported from Iran, East-Azerbaijan province (Lotfalizadeh & Hosseini 2014). This species has also been reported on *Etiella zinckenella* (Treitschke, 1832) (Lepidoptera: Pyralidae) in Iran (Lotfalizadeh & Hosseini 2014) and Curculionidae (Coleoptera) (Noyes 2014). In this study it is reported as parasitoid of *C. vesuviana* larvae for the first time.

This species is distributed in the Palaeartic and Nearctic regions (Noyes 2014). It was previously recorded from Iran by Lotfalizadeh & Hosseini (2014) and this is the first record of this species in eastern part of Iran.

**Coptera nr. silvestrii** (Kieffer 1913) (Fig. 2A, B)
**Material examined:** South Khorasan province, Mood (59°31′ 23″ E, 32° 42′ 31″ N), 1851 m, 20 July 2012, A. Amini, leg., 1♀; Birjand (59° 13′ 55″ E, 32° 51′ 59″ N), 1465 m, 11 July 2012, A. Amini, leg., 2♀; Birjand, Chahkand (59° 09′ 20″ E, 32° 50′ 49″ N), 1551 m, 21 July 2012, A. Amini leg., 1♂.
Species of the genus *Coptera* Say were previously included in the genus *Psilus* Panzer (Nixon 1980, Kozlov 1987). Distinguishing characters between *Psilus* and *Coptera* are found in Muesebeck (1980) most obviously the head shape with transverse carina in front of the occipital carina, longitudinally folded wings usually with an apical notch, and very short apical gastric segments. The specimens of *Coptera nr. silvestrii* were compared with the named specimens in Natural History Museum, London where there is a good coverage of the Nearctic and Afrotropical regions, and also compared against the literature of Kozlov (1987) and Rajmohana (2006), but a close match could not be found. As the taxonomy of this genus is very poorly understood in the Palaearctic (especially Middle East) and there is no reliable key for the Iranian species, identification the species of the *Coptera* specimens remained uncertain. However, they are similar to *Coptera silvestrii* in many respects.

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**References**


