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 parasitoids 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 fruit fly, 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 is about 21-26.6% in Bushehr Province. 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 parasitoids 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.

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 characters 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 Etieslla zickenenella (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 Palaearctic 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), 1465m, 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 gastral 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**


