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Spotted Wing Drosophila, *Drosophila suzukii* (Matsumura) (Dip.: Drosophilidae), an invasive fruit pest new to the Middle East and Iran.

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Abstract

In the course of monitoring the olive fruit fly, *Bactrocera oleae* (Gmelin), we spotted the specimens of *Drosophila suzukii* (Matsumura) in our hydrolyzed protein-baited traps placed in the olive groves located on the southern slopes of Elburz Mountains, Iran. This species is a new record for the Iranian insect fauna. The discovery of *D. suzukii* in Iran indicates that this species has already expanded its territory into the Middle East region for the first time.

Introduction

The highly polyphagous species *Drosophila suzukii* (Matsumura, 1931), commonly known as spotted wing drosophila (Figures 2, 4), attacks a wide range of fruits such as apple, apricot, blackberry, blueberry, cherry, fig, grape, mulberry, nectarine, peach, pear, persimmon, plum, raspberry, and strawberry (Cabi, 2015). Unlike most of drosophilids, the females of *D. suzukii* are able to attack undamaged fruits and insert their eggs in the fruit tissues with the help of their spectacular saw-like ovipositors (Figures 1, 3). The species has been reported from Europe, New World, Oriental region and southeastern Asia (Cini *et al.*, 2012).

Figures 1-4. *Drosophila suzukii* (Matsumura) from Iran. 1, adult female; 2, adult male; 3, female saw-like ovipositor; 4, male terminali.



1



2



3



4

Material and Methods

The specimens of *D. suzukii* were accidentally captured in the traps, which were basically set to catch the tephritid olive fruit flies, *Bactrocera oleae* (Gmelin). The locality data are as follows: Iran: Qazvin province, Tarom-sofla, Ghoushchi village, 356m., September 24-October 16, 2015, 49°16'00"N 36°42'08"E, olive groves, hydrolyzed protein-baited traps, leg. A.A. Keyhanian. The specimens are preserved at the Hayk Mirzayans Insect Museum (HMIM), Tehran, Iran.

A Tale of Two Drosophilid Invasions of Iran

Over a span of seven years, two exotic drosophilid pests have invaded Iran. The first invasion occurred in 2008 when the African fig flies, *Zaprionus indianus* Gupta, were collected in an orange orchard in southern Iran. The introduction was largely blamed on the authorities who mistakenly issued quarantine clearance for the importation of tons of orange fruits unaware of the fact that the exporting country, Egypt, had been announced contaminated by the drosophilid pest (Parchami-Araghi and Mohammadi-Khorramabadi, 2009; Yassin and Abou-Youssef, 2004). Since 2008, *Z. indianus* has been effectively widening its range across the country, seriously threatening the domestic fruit production through attacking various fruits, especially fig. But the second invasion, by *D. suzukii*, is believed to be the result of nonstandard control of the land border with Pakistan, the only country bordering Iran known to be the home of the spotted wing drosophila (Amin Ud Din *et al.*, 2005). There are no existing records of the species *D. suzukii* in other of Iran's neighboring countries. Iran and Pakistan share a porous and long border (ca. 1000 km), which is heavily frequented by traffickers on either side. This area is affected by poverty and high unemployment rate due to prolonged drought and infrastructural deficiencies. By taking advantage of these issues, smugglers trade in various commodities including agricultural products. Therefore, the highest likelihood is that the infested smuggled fruits from Pakistan have been responsible for the introduction of *D. suzukii* to Iran.

Conclusion

The Iranian fruit farming has been suffering huge economic losses from the polyphagous tephritid *Ceratitis capitata* (Wiedemann), known as Mediterranean fruit fly, for decades. The species *C. capitata*, *D. suzukii*, and *Z. indianus* have overlapping host ranges that might create high level of interspecific competitions among them and with other associated monophagous tephritid fruit pests. Although the females of the species *Z. indianus* are not capable of inserting their eggs under the skin of fruits, they preferably infest fruits at ripening stage (with thin skin) or opportunistically attack the fruits that have been wounded by other pests, including *C. capitata* and *D. suzukii*, enhancing the damage on the harvest. Even though the trapped spotted wing drosophilas have been collected in olive orchards, their possible damages on olive fruits remain uncertain until further detailed studies on the ecology of *D. suzukii* in the region. To date olive fruit has not been recorded as a host for spotted wing drosophila.

References: Amin Ud Din, M., K. Mazhar, S. Haque, and M. Ahmed 2005, Dros. Inf. Serv. 88: 6-7; CABI 2015, Wallingford, UK: CAB International. www.cabi.org/isc; Cini, A., C. Ioriatti, and G. Anfora 2012, Bulletin of Insectology 65(1): 149-160; Parchami-Araghi, M., and A. Mohammadi-Khorramabadi 2009, Studia dipterologica 16(1/2): 243-244; Yassin, A.E., and A.Y. Abou-Youssef 2004, Dros. Inf. Serv. 87: 67-68.



Olive infestation with *Zaprionus indianus* Gupta (Dip.: Drosophilidae) in northern Iran: a new host record and threat to world olive production.

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