Mycopath (2015) 13(1): 29-32 **Research Article**

Occurrence of leaf scab caused by *Spilocaea pyracanthae* on loquat (*Eriobotrya japonica*) in the Pothowar region of Pakistan

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Abstract

Loquat [*Eriobotrya japonica* (Thunb.) Lindl.] is attacked by many diseases. Among these, loquat scab caused by *Spilocaea pyracanthae* is the main disease affecting this crop. The fungus can infect leaves and fruits, reducing the marketable quality of the latter. There is no information about the occurrence of this disease in Pakistan. Therefore, in the present studies extensive surveys of loquat orchards were conducted in 2013 in the Pothowar region of Pakistan to determine the occurrence of leaf scab. During surveys heavy infestations of this disease was observed on loquat. There was hardly any loquat orchard in the area free from the infestation of this disease. Leaf symptoms were observed as olive brown, opaque necrotic sub-circular spots, with light brown coloration in the center. Two or more spots coalesced in severe infections covering large leaf areas. The fungus was identified as *S. pyracanthae* on the basis of conidia and morphological characters. As the disease is prevalent throughout the Pothowar region with varying intensities, therefore, stringent surveillance and necessary control strategies are needed to keep the disease from spreading.

Keywords: *Eriobotrya japonica*, loquat leaf scab, *Spilocaea pyracanthae*.

Introduction

Loquat is an evergreen, large shrub or small tree belonging to the family Rosaceae. Pakistan is one of the countries with the largest planted area and the main producer of loquat in Southern Asia (Caballero and Fernández, 2003). With a total production of 13,159 tons (Hussain *et al*., 2009), loquat is mainly cultivated in Punjab and Khyber Phakhtoon Khwa (KPK) provinces of Pakistan contributing about 98% of the total production (Anonymous, 2008). In KPK, the major loquat producing districts are Mardan, Peshawar and Hari Pur whereas in Punjab, it is mostly grown in the Pothowar region (Hussain *et al*., 2007). Loquat leaves have great significance from medicinal and nutritional point of view. In China, loquat leaves are being used as folk medicine for the treatment of pulmonary tuberculosis (Zhang *et al*., 2004). Loquat leaves are also used to cure various skin diseases, pain, inflammation, coughing, diabetes and liver disorders (Nishioka *et al*., 2002; Hamada *et al*., 2004; Sakuramata *et al*., 2004).

Loquat scab incited by *Spilocaea pyracanthae* is a very common disease in Southern Italy, South Africa, the Mediterranean basin, and in the eastern regions of North America on different hosts (Gardner and Raabe, 1966; Raabe and Gardner, 1972). The disease has also been reported from Chile, Lebanon, Pakistan, Spain, Turkey and USA (Salerno *et al*., 1971; Andrade *et al*., 1984; Sánchez-Torres *et al*., 2009; Celikyurt *et al*., 2011; Batool *et al*., 2014). The fungus was first reported on loquat in 1909 (Smith, 1909). The disease resembles pear and apple scabs in all aspects caused by *Venturia pirina* and *V. inaequalis* respectively (Ohlendorf, 1999). Loquat is highly susceptible to leaf and fruit scab especially during wet seasons when control measures are inadequate. Scabbed fruit is rendered unsuitable for market and results in economic loss (Tous and Ferguson, 1996; Caballero and Fernández, 2003). In Pakistan loquat is a neglected fruit tree and no attention was paid to fungal pathogens associated with it. The current study was therefore, carried out to

determine the prevalence of leaf scab in the Pothowar region of Pakistan and the etiology of the fungus associated with the disease.

Material and Methods

During 2013 extensive surveys of loquat orchards were conducted to determine the incidence of leaf scab in the Pothowar region of Pakistan. Ten loquat trees were randomly selected from an orchard and from each tree, twenty leaves were randomly selected from the four sides of the tree and symptoms of scab were observed. In addition to leaves, symptoms were also observed on fruits and twigs. The colour and shape of the spots were recorded. The scabbed leaves and fruits were brought to the laboratory for the isolation and identification of the associated fungus.

Fungus was isolated from the infected spots, purified from a single spore and identified on the basis of morphological characters (Schubert *et al*., 2003; Schubert and Braun, 2005).

Results and Discussion

Almost all the orchards in the Pothowar region were found infested with leaf scab. The symptoms were observed on leaves and fruits. In case of severe infection, attack on young twigs was also noticed. The symptoms appeared on leaves and fruits as few circular chlorotic spots and increased in number with time (Fig. 1) as has been observed by Sánchez-Torres *et al.* (2007 and 2009). The fungus has been reported to grow first subcuticularly, resulting in the formation of a stroma and, with the initiation of the conidiogenesis, force the cuticle until it is ruptured. As a result of production of conidia, the lesions turn olive colored and velvety (Sánchez-Torres *et al.*, 2009). With the passage of time, the lesions enlarge, coalesce and cover most of the leaf area and fruit surfaces (Prota, 1960; Gisbert *et al.*, 2006). The older lesions turn brown and corky in the center as the fungus dies, decreasing the sporulated area to the edge of the lesion (Prota, 1960). Loquat fruit is prone to infection during its all developmental stages (Rodríguez, 1983) while mature and glabrous leaves are not infected (Prota, 1960). Severe infections can cause distortion of young leaves and fruits while badly invaded twigs cause branch cankers and dieback (Rodríguez, 1983). Salerno *et al*. (1971) monitored incidence of loquat scab on weekly basis on leaves and fruits in two orchards during two consecutive growing seasons. In both years, symptoms appeared on leaves in November-December and on fruit from January to April. When the environmental conditions are favorable for the disease, more than 50% of fruits can be damaged, rendering them ummarketable (Rodríguez, 1983).

Fig. 1: Loquat leaf with scab symptoms.

Fig. 2: Olive green coloration of colonies.

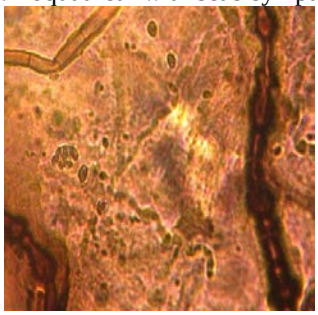

Fig. 3: Solitary conidia of the fungus.

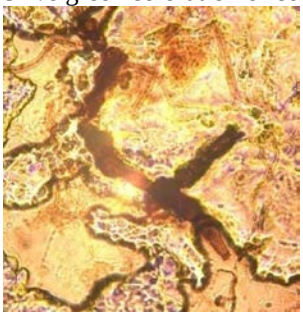

Fig. 4: Conidiogenous percurrent proliferations with annulations.

Fungal mycelium appeared as hyaline and immersed with rare superficial growth on the medium when observed under microscope. At maturity, olive coloration of colonies without aerial mycelia was observed (Fig. 2). The conidia of the fungus were ovoid shaped with no septation, round from the base and pointed at the apex. Conidia measured 5-8 µm by 9-20 µm. Conidiophores and conidia were pigmented and pale to dark brown colored. Conidiophores usually had single conidia (Fig. 3). Conidiophores varied in size depending on the age. Conidiogenous percurrent proliferations were usually seen with a few annulations (Fig. 4). The sexual stage of the fungus was not observed in cultures. The fungus has been reported to reproduce asexually by means of conidia (Raabe and Gardener, 1972). There is no evidence in the available literature that the fungus has teleomorph, although it has been reported once by D'Oliviera and D'Oliviera (1946).

Leaf scab has been found to be present in almost all the orchards and its incidence and intensity are likely to increase. The reasons for its widespread are the favorable environmental conditions in the country (González-Domínguez *et al*., 2013; 2014a). Therefore, stringent control strategies are needed to preclude the spread of this disease (González-Domínguez *et al*., 2014b).

Acknowledgements

The authors acknowledge Dr. Ather Rafi and Dr. Sayed Ahmed Zia, Department of Plant and Environmental Protection, National Insect Museum, National Agriculture Research Centre, Islamabad for providing lab facilities.

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