

A general approach for esca disease in the vineyards of Turkey

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Summary. Turkey has very suitable climatic conditions for viticulture and a total of 3.7 million tons of grapes are produced yearly on some of 560,000 ha. When compared with other diseases which negatively affect the quality and quantity of grape production, esca disease is not important. It has primarily occurred in the vineyards of the Aegean and Marmara regions and in southern and southeastern Anatolia. According to the data for these regions, the disease rate is very low. In a study in the Marmara region, the disease rate was determined to be 2.61%. In a study conducted in the Aegean region between 1997 and 1998, *Stereum hirsutum*, *Phellinus* sp., *Phaeoacremonium aleophilum* and *P. chlamydosporum* were isolated from decayed wood of esca-affected grapevines (*Vitis vinifera* L.). The last two species are reported in Turkey for the first time. Moreover *Eutypa lata* and *Phomopsis viticola* were isolated from sectorial brown necrotic areas in the wood.

Key words: esca, *Vitis vinifera*, *Stereum hirsutum*, *Phellinus* sp., *Phaeoacremonium chlamydosporum*, *P. aleophilum*.

Introduction

Turkey occupies a place between 36°-42° latitudes in the northern hemisphere. It has suitable conditions for grapevine (*Vitis vinifera* L.) production (Fidan, 1985). A total of 3.7 million tons of grapes are produced annually in Turkey on an area of 560,000 ha (Anonymous, 1998). In Turkey the major part (44%) of grape production is from the Aegean region, while for other regions the production is 14% for Middle-Anatolia, 12% for South Anatolia, 10% for the Mediterranean and 6% for South Anatolia and Marmara (Çetin and Tipi, 1998). In the Aegean region the predominant variety is Sultanina, much of which is dried. Turkey is the world's second largest seedless raisin producer after the USA. Total raisin production was

220,000 tons in 1997, of which 180,000 tons was exported (Anonymous, 1998). Table and wine grapes are produced in the other regions mentioned above.

Among the diseases of grapevine which negatively affect the quality and quantity of production, powdery mildew, downy mildew, dead arm and grey mould are of importance, in that order, while esca disease is not very important.

Knowledge about esca in Turkey

Esca has been known in Turkey for a long time under the local name "Kav". Viala reported that the disease damaged the vineyards of Smyrna (İzmir), in his article about esca in 1926.

Esca is thought to be caused by a combination of several fungi, occurring especially in older vines. Esca has long been known to be caused by *S. hirsutum* and *Phellinus (Fomes) igniarius* in Turkey. The existence of the disease in the Aegean region

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was first reported by Iyriboz (1942). *Stereum necator*, *S. hirsutum*, *Polyporus igniarius* and *P. versicolor* were found in the decayed wood of old vines by Üzümeri (1947). It also occurred in vineyards in the Marmara, southern and southeastern Anatolia regions, and in Aegean region (Anonymous, 1995). According to all these reports, the rate of esca is very low in these regions. It has been determined to be 2.61% in the vineyards of Tekirdağ, Marmara Region (Köklü *et al.*, 1998).

The chronic form of esca is more common in Turkish vineyards. Symptoms develop in July and August. Foliage deterioration is the most frequent symptom. Small chlorotic areas develop between the primary veins and gradually enlarge, becoming necrotic. The main veins remain green. In coloured varieties of grapes, a dark red margin surrounds the interveinal necrotic zones. The leaves dry gradually and fall prematurely (Onoğur, 1995).

In the wood of infected trunks and branches, a characteristic zone of necrosis is generally associated with a large wound. Cross-sectional cuts from infected wood revealed a damaged central zone, light in colour and soft in texture, which is surrounded by an area of dark and hard wood.

Berries generally do not reach maturity but dry on the vine. These symptoms are also seen in the Sultanina variety. A survey in the vineyards of İzmir Province (Selçuk, Seferihisar and Menderes) in August 1999 showed dark, purple and blackish spots scattered over the epidermis of the berries on the varieties of Osmanca, Razakı and Alphonse-Lavallée. In the variety of Alphonse-Lavallée the berries do not turn black, which is their natural colour. These symptoms are similar to the ones reported by Chiarappa (1959) and Dubos and Larignon (1988).

In spite of the fact that sodium arsenite is suggested for the control of esca according to the Plant Protection Technical Regulations Book in Turkey (Anonymous, 1995) it is not yet used in practice. Cultural control measures are currently the rule, such as not making large pruning wounds and removing diseased vines.

Fungi isolated from woody parts of diseased vines

Surveys were conducted in the Aegean region in 1997 and 1998 to determine the microflora in

diseased woody parts of vines. Samples from the Sultanina, Kozak beyazı, Kozak siyahı and Alphonse-Lavallée varieties which had esca syndromes and were older than ten years were collected in the İzmir and Manisa provinces. Affected trunks and branches were cut in cross section. Isolations were made from different parts of typical necrotic areas in the wood. Sometimes *S. hirsutum* (Willd.) S.F. Gray. was isolated from decayed woody parts in the centre, and sometimes *Phellinus* sp., *Phaeoacremonium aleophilum* W. Gams, Crous, M.J. Wingf. & L. Mugnai and *P. chlamydosporum* W. Gams, Crous, M.J. Wingf. & L. Mugnai were isolated from the black borders of the woody parts in the centre and in discoloured wood. The last two fungi are reported in Turkey for the first time. In addition, *Eutypa lata* (Pers. : Fr) Tul and *Phomopsis viticola* Sacc. were obtained from sectorial brown necrosis of the wood (Erkan Ari and Larignon, 1998).

Conclusion

There is almost no special study on esca in Turkey. The determination of fungi isolated from the diseased woods of vines with esca syndromes is an important first step. Now, further studies should be done to determine the roles of these fungi in esca, carry out pathogenicity tests and explore the use of environmentally-friendly chemicals against the disease.

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