



Article

First Report of Olive Branch Dieback in Croatia Caused by *Cytospora pruinosa* D efago

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Abstract: Olive (*Olea europaea* L.) is a very important crop grown in the Mediterranean part of Croatia. Olive branch and fruit dieback symptoms were observed in two olive orchards in Istria, Croatia. The samples from symptomatic trees were collected and brought to the laboratory for analysis. Based on their morphological characterization, isolated fungi were identified as *Cytospora* sp. Two representative isolates (one per orchard) were taken for molecular analysis, and based on DNA sequence data of the ITS and TUB gene regions, and phylogenetic analysis of the sequences, the isolates were identified as *Cytospora pruinosa* D efago. To determine pathogenicity, pathogenicity tests were conducted on detached olive branches and two-year-old olive trees in the greenhouse. This is the first report of *C. pruinosa* causing olive branch and fruit dieback in Croatia.

Keywords: canker; *Cytospora* sp.; fungal disease; *Olea europaea* L.

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1. Introduction

The olive (*Olea europaea* L.) is a medium-sized evergreen tree from the family *Oleaceae*, which integrates a unique set of morphological and developmental characteristics suited to the conditions of its Mediterranean origin [1]. The Mediterranean climate is characterized by an amount of rainfall ranging from 150 to 800 mm per year, and by the uneven distribution of rains, concentrated above all in winter and spring months [2,3]. The olive tree is very adapted to extreme environmental conditions, such as drought and high temperatures, and it is resistant to decay [2,4].

During the last decade, plantings and production of European olive (*Olea europaea* L.) have increased globally by about 10 and 20% [5]. According to the latest statistical data, worldwide production of olives is approximately 23 million tons, and it is cultivated on approximately 10 million ha [6]. In Croatia, olives are cultivated on almost 20 thousand ha with a production of 23 thousand tons of olives [6]. Olive is, along with vines, the most common crop grown in the Mediterranean part of Croatia [7]. In Istria, olive trees are known for about 2500 years [8]. Hundreds of named cultivars of both types of olives, table and oil, are grown. The most important domesticated and introduced olive cultivars in Istria (Croatia) are ‘Bjelica’, ‘Bu a’, and ‘Leccino’.

Olives are susceptible to different bacterial, viral, and fungal pathogens, which can cause severe diseases of the drupe, leaves, wood, and roots [9]. Trunk pathogens can infect olive trees through wounds, and cause dieback of twigs and branches, which can lead to a reduced fruit-bearing capacity and lifespan of olive trees [9,10]. Consequently, fungal trunk diseases can cause substantial economic losses [5]. Branches affected with cankers can show symptoms such as fruit rot or twig dieback. A number of different pathogens are reported as the causal agents associated with olive cankers and twig dieback [10]. One of the most harmful olive pathogens associated with the fungal canker of olives is species from the *Botryosphaeriaceae* family. The *Botryosphaeriaceae* were found to be the most prevalent fungal