

Evaluation of *Spilocaea oleagina* disease onset in olive cultivars and correlation between the different polyphenolic components in resistant and susceptible plants

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The olive tree (*Olea europaea* L.) is an evergreen and drought tolerant species that has been cultivated in the Mediterranean area since ancient time, for its oil and fruits. Phytosanitary problems of the olive tree are the main obstacle to the crop productivity. Among the olive pathogen, *Spilocaea oleagina* is particular dangerous as it causes losses mainly resulting from the defoliation of severely infected trees, causing a detrimental effect on the yield. The disease is particularly serious in dense olive groves especially with susceptible olive varieties and in nurseries. It is estimated that the losses in the olive sector due to the presence of *Spilocaea oleagina* reach up to 80% of lower productivity in susceptible cultivars. The aim of this work is to evaluate the incidence of *Spilocaea oleagina* disease during the agronomic year and how this can be related not only to exogenous factors such as environmental conditions but, also to endogenous ones. The experiment was conducted using samples of three Sicilian cultivars *Nocellara del Belice*, *Abunara*, *Calatina* and one international cultivar, *Koroneiki*, selected from three different planting systems (4 × 2, 4 × 3, 4 × 4) during different periods of the year. It was evaluated how the different qualitative and quantitative component of polyphenols present in the different olive cultivars is related to resistance and susceptibility factors to the disease. It was evident that the disease developed with the increase in rainfall and correlated with the density of the planting system. The content of polyphenols is correlated with the resilience to *Spilocaea*. In fact, the oleuropein content is higher in the more resistant cultivar, *Abunara*. Furthermore, a greater amount of polyphenols appears to be present in response to stress combined with the shorter distance between planting systems. The results obtained suggest a link between the polyphenol content and resistance to the disease. These considerations are important from the point of view of the biodiversity of agronomic systems in Sicily considering that they can lead to a better understanding of disease resistance mechanisms and limiting the use of pesticides.

Keywords: biodiversity, germplasm, olive tree, *Spilocaea oleagina*, polyphenols.