



Spatial and temporal evolution of *Xylella fastidiosa* in the canopy of Leccino and Ogliarola olive cvs in Apulia (Italy)

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In the framework of the official monitoring programme of *X. fastidiosa* in the Apulian buffer zone and pest-free area, sampling and testing were carried out on olive trees, as primary host species of De Donno strain. The spatial and temporal progression of the infection was studied in the canopy of asymptomatic or low-symptomatic trees of tolerant Leccino and susceptible Ogliarola cvs from 2 infected olive groves. A total of 640 samples/cv from 2 canopy levels (high and low) were analyzed in 4 collection times (June, September, December, March) testing 2 matrices (xylem tissue from twig and from mature leaf with petiole) for qualitative and quantitative analyses of the infection (ELISA, DTBIA, qPCR). The infection rate in the high level of the canopy was higher than in the low level in Ogliarola cv, while the difference between the two levels was less evident in Leccino cv. With respect to serological testing, qPCR showed the best results with both matrices in all testing times except in September with leaves. Twig xylem tissue was also the best matrix for serological tests. However, ELISA and DTBIA showed the lowest infection rate in September using both matrices. The trend in infection rate was different between the 2 cvs over the entire testing period. It remained in a range between 20% and 40% in Leccino cv, while it showed an exponential increase in Ogliarola cv where it reached even 100% in the high part of the canopy. Twig xylem tissue was also the best matrix for pathogen quantification in both cvs, more evident in the high level of the canopy. For both cvs, pathogen concentration increased in the winter period and decreased in the summer period. The decrease continued until December only in Leccino cv with the twig matrix. Based on these results an improved sampling and testing protocol was proposed for monitoring *X. fastidiosa* in olive trees.

Keywords: sampling, DTBIA, ELISA, qPCR, De Donno strain