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## Image analysis methods for assessment of H<sub>2</sub>O<sub>2</sub> production and *Plasmopara viticola* development in grapevine leaves: Application to the evaluation of resistance to downy mildew

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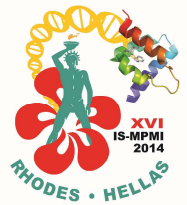
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**IMAGE ANALYSIS METHODS FOR ASSESSMENT OF H<sub>2</sub>O<sub>2</sub> PRODUCTION AND *PLASMOPARA VITICOLA* DEVELOPMENT IN GRAPEVINE LEAVES: APPLICATION TO THE EVALUATION OF RESISTANCE TO DOWNY MILDEW**

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The grapevine downy mildew (*Plasmopara viticola*) provokes severe damages and destroys the harvest in the absence of an effective protection. Numerous fungicide treatments are thus generally necessary. To promote a sustainable production, alternative strategies of protection including new antifungal molecules, resistant genotypes or elicitor-induced resistance are under trial. To evaluate the relevance of these strategies, resistance tests are required. In this context, three image analysis methods were developed to read the results of tests performed to assess *P. viticola* sporulation and mycelial development, and H<sub>2</sub>O<sub>2</sub> production in leaves. They have been validated using elicitors of plant defenses. These methods are reliable, innovative, rapid, and their modular concept allows their further adaptation to other host-pathogen systems.