

Detection of pathogenic fungi by a fluorescent sensor array

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Detection and identification of plant pathogenic fungi have relevant implications for both food safety and human health, and require fast and easy-to handle diagnostic techniques. In this context, we report the design and development of a fluorescent array-based sensor, containing different organic receptors, able to detect selectively *Penicillium italicum*, *Alternaria alternata* and *Fusarium sacchari* in washing water using a smartphone, leading to the first example of detection of microscopic fungal plant pathogens by fluorescent array using a smartphone as detector. In addition, our array can be also used to monitor the fruit quality and conservation status inside a packaging. In fact, during storage, citrus fruits release a complex mixture of volatile organic compounds (VOCs), that can serve as indicators of fruit quality and conservation status. The profile of VOCs changes significantly when citrus fruits are infected by *Penicillium digitatum*, so that the record of changes in VOCs profile can be used as biomarker to differentiate between healthy and infected fruits. Here we introduce a novel optical sensor array designed to assess the conservation status of citrus fruit as well as to detect contamination by the fungus *Penicillium digitatum*.