

Natural stilbenes and their derivatives as antifungals against rice blast

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Among the fungal plant pathogens, *Pyricularia oryzae* poses a serious threat to sustainable agricultural production causing serious damage on rice and other crop plants. In rice, blast disease by *P. oryzae* causes annually 10-30% of harvest losses. Overreliance on fungicides, especially those with single-site mode of action, monoculture cropping, and use of blast-susceptible rice varieties, have been favoring the development of resistance in pathogen populations increasing thus food insecurity. This in turn creates a strong demand for the development of novel fungicides for rice blast management with emphasis on their low environmental impact and circular economy. Here, we investigated the antifungal activity of natural stilbenes and their use as scaffolds for the development of novel biofungicides. Monomeric and dimeric stilbenoids were tested against wild-type (WT) and strobilurin-resistant (RES) strains of *Pyricularia oryzae* and several compounds showed inhibition higher than 40%, and in particular deoxyrhapontigenin inhibited mycelial growth of both WT and RES strains by 60-80%. Furthermore, a set of molecules based on methoxyacrylate stilbene (MOAS) were synthesized, merging a nature derived stilbene fragment with the β - methoxyacrylate moiety of strobilurin fungicides. We identified two molecules with activity comparable to the reference commercial fungicide azoxystrobin. However, low mycelium growth inhibition of resistant strains indicates that these compounds most likely retain the strobilurin-like mechanism of action.