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Antifungal Properties of Sesame (*Sesamum indicum* L.) Crude Extract and Purified Sesame Lignans

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Abstract

Plant secondary metabolites have important ecological function not only as attractant for pollinators and seed dispersing animals but also as resistant factor against pathogens. Accessions that produce high levels of such compounds are a valuable source for sesame breeding. With this aim we screened 32 sesame accessions. We extracted leaves, stems and root and tested the extracts against pathogenic fungi, including a root pathogen specialised on sesame *Macrophomina phaseolina*, a leaf pathogen with a broad host range *Alternaria alternata* and a vascular pathogen *Fusarium oxysporum*. Extracts obtained with 80 % ethanol were assayed in microtiter plates, changes in the optical density of growing fungal cultures were recorded as optical density at 550 nm. Most of the extracts had inhibitory effects on all tested fungal species. Some root extracts supported the growth of *A. alternata* and some leaf extracts enhanced the growth of *F. oxysporum* as compared to the controls. The diversity of the effects observed for different accessions lead to the assumption that there is potential to improve plant disease resistance in sesame using metabolic pathway engineering. In a continuation of this research, crude 80 % ethanol extracts of the three sesame tissues were fractionated with different organic solvents and assayed for effects on fungal cultures. The inhibition of a complete crude extract was slightly higher than the effect of diethylether fraction, followed by the effect of ethanol fraction remaining after diethylether extraction. Two purified sesame lignans were also tested. Sesamin had no effect against said fungal species up to a concentration of 5 mg ml⁻¹ while sesamol and 2,4-dinitrophenol (used as a control) had strong inhibitory effects. Different IC₅₀ value was established for each fungal species. The results reveal that sesamol may help the plant by inhibiting the growth of invading pathogens.

Keywords: 2,4-Dinitrophenol, antifungal, crude extract, sesamin, sesamol, *Sesamum indicum*