

**Title** In *vitro* Screening of the Antifungal Activity of Plant Extracts as Fungicides against Rice Seed Borne Fungi

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### Abstract

It is well known that some plants containing secondary plant compounds are able to control pathogenic fungi. These plant compounds have different structures and actions when compared with conventional fungicides that used to control the microbial growth and survival. The potential of antifungal properties of plants is related to their ability to synthesize compounds by the secondary metabolism. Several chemical compounds of relatively complex structure with antimicrobial activity have been studied. The antifungal activity of crude extracts of *Acorus calamus* L., *Stemona curtisii* HK. F., *Stemona tuberosa* L., *Mammea siamensis* Kost., *Eugenia caryophyllus*, and eugenol essential oil were *in vitro* studied. To establish these antifungal properties, four species of rice seed borne fungi, *Alternaria solani*, *Colletotrichum* sp., *Fusarium moniliforme*, and *Rhizoctonia solani* were used as target organisms. The agar overlay technique and spore inhibition techniques were employed for the determination of antifungal activity, which compared with control (untreated). The antifungal activity was lined up into a series from strong to low, as follows; most effective was eugenol > *Eugenia caryophyllus* > *Acorus calamus* Linn. > *Stemona tuberosa* L. > *Mammea siamensis* Kost. = *Stemona curtisii* Hk.f. For the mode of action, above eugenol, lysis of spore and inhibition of mycelial growth were detected. Microscopic analysis exhibited completely lysis of spores after 24 hrs of incubation at 1.00%v/v concentration. Moreover, at this concentration, eugenol showed completely inhibited mycelial growth after 96 hrs incubated. Thus, the experiment could be concluded that eugenol was a promising antifungal agent candidate, which showed strongly antifungal activity against pathogenic fungi. Further study is required to determine whether it could be used in the management of plant pathogenic or seed borne fungi, with less phytotoxic effects of plant, seed or products qualities.