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## Control of Seedborne Pathogen in Rice Seed by Coating with Organic Substances

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### Abstract

Types and quantities of seed-borne fungi on rice seed cv. Khao Dawk Mali 105 were assessed by using blotter method. *Fusarium* sp. and *Curvularia* sp. were found as the main fungi 20.67% and 2.25%, respectively. Various concentrations and volumes of non-ionic polyacrylamide (PAM) were applied to control seed-borne fungi on rice seed. It was found that the speed of germination was increased to 15.10 seedling day<sup>-1</sup> after treated with PAM at 1% w/v and with the volume of 2 ml/25 g seed. The increasing of PAM concentration reduced the speed of germination of coating rice seed. However, coating seed with all PAM concentrations showed no significantly effect on the germination percentage.

Combination of PAM (1% w/v, 2 ml/ 25 g seed) and clove and star anise essential oils at different concentrations: 0.01, 0.03 and 0.05% were applied to rice seed. Coating seeds then subjected to their quality testing and their seed health evaluating. Treated seed with PAM and various essential oils showed the promising results in inhibiting seed borne fungi. The higher concentration of the coating substances, the better the efficacy *Aspergillus* sp. and *Nigrospora* sp. were completely 100% under control. Nevertheless, compare to chemical treatment under captan application; captan showed the best in controlling, followed by clove essential oil 0.05% and star anise essential oil 0.05%. Seed qualities; speed of germination, germination percentages were not affected by all treatments.

Clove and star anise crude extracts were investigated then, it showed their positive tendency in seed borne fungi inhibition. Coating seed with all concentration of clove and star anise crude extracts inhibited growth of *Nigrospora* sp. equal to 100% inhibition. All concentration of star anise crude extract completely inhibited *Aspergillus* sp. and *Bipolaris* sp. For seed qualities, the germination percentage of seed coated with star anise crude extract at 0.05% w/v showed a high germeability, evenso for captan. Seed coated with the crude extract of clove at 0.01% w/v showed the highest value of seedling growth rate with 6.2 mg seedling<sup>-1</sup> for 7 days; but, the germination speed was slightly decreased.

**Keywords:** Coating, organic substances, PAM, rice, seed borne fungi