

Inhibition of Germ Tube Formation and Elongation of *Candida albicans* by Root Extracts of *Pongamia pinnata*

H.M.D.K. Kanatiwela^{1,2}, N.B. Parahitiyawa³, G.J. Panagoda³, C.L. Abayasekara¹ and N.K.B. Adikaram¹

¹*Department of Botany, Faculty of Science, University of Peradeniya*

²*Postgraduate Institute of Science, University of Peradeniya*

³*Division of Microbiology, Faculty of Dental Sciences, University of Peradeniya*

Pongamia pinnata ('Karanda') is a plant used in Sri Lankan traditional medicinal systems to cure various ailments including oral infections. *Candida albicans* is an opportunistic human pathogen which produces diseases ranging from superficial infections (e.g. oral thrush) to life threatening invasive infections. The germ tube production by this organism is considered as a significant virulence determinant. Our previous studies have shown a powerful inhibitory activity of root extract of *P. pinnata* against several *Candida* spp. including *Candida albicans*. Hence the objective of this study was to evaluate the effects of root extracts of *P. pinnata* on the germ tube formation and elongation by *C. albicans*.

Roots of *P. pinnata* were extracted in 75% ethanol and the extract was evaporated and freeze dried. Germ tube assay was performed with the Minimum Inhibitory Concentrations (MICs), 2 x MIC, 3 x MIC and 4 x MIC of the root extract of *P. pinnata* against five different clinical isolates of *C. albicans*. The percentage of germ tubes formed and the length of the germ tubes were evaluated by observing under the microscope. Data were subjected to analysis of variance (ANOVA) and means were separated by Duncan Multiple Range Test at $P < 0.05$ significant level.

All five isolates showed a varied reduction in the percentage germ tube formation when treated with the root extract of *P. pinnata*. Extracts of *P. pinnata* inhibited the germ tube formation in a dose dependent manner. The least germ tube production was observed when they were treated with 4 x MIC of the extract, which was the highest concentration used in the experiment. Even the lowest concentration (MIC) used in the study resulted in a significant reduction ($P < 0.05$) in the germ tube formation compared to the control.

In addition to the germ tube formation, the germ tube elongation was also affected by treatment with root extract of *P. pinnata*. Majority of the isolates achieved their least germ tube length when they were exposed to 4 x MIC of the extract. Except one isolate, all the other four isolates showed a significant reduction ($P < 0.05$) in the germ tube elongation when they were treated with their MICs of the extract, which was the least concentration used in the experiment.

Hence, results of the study show the potential of the root extract of *P. pinnata* in reducing the germ tube production and germ tube elongation of *C. albicans*, rendering it less pathogenic.