

# Effectiveness of Maprang "*Bouea macrophylla* Griffith" Seed Extract against Endodontopathogenic Microorganisms in a Multispecies Bacterial-fungal Biofilm

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## Abstract

**Objective:** This study aimed to assess the antimicrobial efficacy of seed extract derived from *Bouea macrophylla* Griffith (Maprang wan) grown in northern Thailand against *Enterococcus faecalis*, *Streptococcus gordonii* and *Candida albicans* in planktonic and multispecies biofilm.

**Methods:** Agar diffusion and broth microdilution methods were performed to investigate the antimicrobial activities of ethyl acetate extract of Maprang wan seed against planktonic *E. faecalis*, *S. gordonii* and *C. albicans*. Growth curves of *E. faecalis*, *S. gordonii* and *C. albicans* in 1:1:1 and 1:1:0.1 ratio, respectively) were performed to measure the appropriate ratio of the species within biofilm. Multispecies of *E. faecalis*, *S. gordonii* and *C. albicans* biofilms were grown in RPMI for 48 hours at 37°C. Following this, the biofilms were exposed to 25 mg/ml of Maprang seed extracts. 0.02 mg/ml chlorhexidine was used as the positive control and RPMI as the negative control. After exposure, time-kill assay was conducted to evaluate time-point of the extract which showed bactericidal and fungicidal effects. The colony forming unit (CFU) data were analyzed with one-way ANOVA and Dunnett's test ( $p < 0.05$ ).

**Results:** Maprang seed extract demonstrated the antimicrobial activity against planktonic and multispecies *E. faecalis*, *S. gordonii* and *C. albicans*. The time kill assay showed a time dependent action of Maprang seed extract, it demonstrated significant reduction of viable organisms at the time periods.

**Conclusions:** Maprang seed extract had antibiofilm property against multispecies *E. faecalis*, *S. gordonii* and *C. albicans* biofilms. The antimicrobial activity of the extract was comparable to chlorhexidine. Maprang seed extract has potential as a novel antimicrobial agent and may be an alternative to treat superficial infections or as a root canal medicament.

**Keywords:** *Bouea macrophylla* Griffith (Maprang wan) seed extract, multispecies biofilm, root canal medicament