



Effectiveness of *Bruguiera gymnorhiza* and *Avicennia marina* leaf extracts on the control of common fungi in fish feed

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Abstract

Deterioration of fish feed by microorganisms is a major issue in fed-aquaculture. Antifungal properties of mangrove plants have potential to control feed deterioration in aquafeed. Thus, this study was aimed to identify fungi species in deteriorated commercial fish feed and evaluate the antifungal activity of *Bruguiera gymnorhiza* and *Avicennia marina* leaf extracts against identified fungi species. In this study, fungi were isolated from deteriorated fish feed on potato dextrose agar (PDA). Based on morphological characters and microscopic features, two fungi isolates were identified as *Aspergillus* sp. and *Rhizoctonia solani*. Leaf extractions of *B. gymnorhiza* and *A. marina* were prepared by dissolving 100 g of oven-dried leaf powder in either sterilized distilled water or 95% ethanol (1:5 w/v). Aqueous and ethanolic extracts of both plants were tested against *Aspergillus* sp. and *Rhizoctonia solani* using the Kirby-Bauer disk diffusion method. Briefly, six extracts including four individual crude extracts such as aqueous extracts of *B. gymnorhiza* and *A. marina*, ethanolic extracts of *B. gymnorhiza* and *A. marina* and two combined crude extracts such as combined aqueous extracts of *B. gymnorhiza* and *A. marina* combined ethanolic extracts of *B. gymnorhiza* and *A. marina* in 1:1 (v/v) were tested against *Aspergillus* sp. and *Rhizoctonia solani* in PDA in triplicates. Sterilized distilled water and 95% ethanol were used as controls. Plates were incubated at room temperature (approx. 30 °C). Growth inhibition zone was measured after 72 hours considering the distance between the growing edge of the colony and the paper disc containing crude mangrove extract. Data were analyzed with one way ANOVA followed by Tukey's test in SPSS. There were significant differences ($p < 0.05$) in inhibition zones between treatments and controls. All six extracts showed promising antifungal activity against both fungi isolates. For both *Aspergillus* sp. and *Rhizoctonia solani*, the highest mean inhibition zone was recorded in combined crude extracts of aqueous and ethanol whereas the lowest mean inhibition zone was recorded for crude extracts of *A. marina* (both ethanolic and aqueous). The overall results indicated the potential application of *B. gymnorhiza* and *A. marina* leaf extracts as a source of natural antifungal compounds to control common fungal contamination in feed ingredients and finished fish feed.

Keywords

Fish feed, antifungal activity, mangroves