Antifungal Effect of Essential Oils as a Potential Approach in Mucor Fungal Prevention and Control

Garcia Gonzalez, Marianna (School: Dr. Pedro Albizu Campus)

In 2022, global production of Capsicum annuum, reached about 38.3 million tons. The losses of this crop worldwide have had a significant impact on global food systems, affecting agricultural production and distribution chains, where it has exceeded 100 million dollars. Storage humidity and post-harvest practices are important to prevent contamination. Propionic acids are commonly used to inhibit fungal growth, but they negatively affect agricultural workers and the ecosystem. This research intended to identify fungi that attack post-harvest Capsicum annuum and test the of essential oils as an fungal alternative. Aloe vera, Cinnamomum verum, Lavandula, Melaleuca alternifolia, Syzygium aromaticum, Thymus, and Zingiber officinale were suggested as potential inhibitors of fungal growth. The microorganism was cultured and then identified through histology. Concentrations at 75%, 85%, 95%, and 100% were prepared to determine whether the Traditional Culture Method and the McFarland Method influenced inhibition. Using an antibiotic disc with Kirby Bauer Method, the samples were incubated, and inhibition halos were measured. Kruskal- Wallis and ANOVA statistics test were used to determine the data significance. In Traditional Method, 75% of the essential oil concentrations did not inhibit fungal growth. The combination of Aloe vera and Lavandula demonstrated fungal inhibition. Through the Traditional Method, the 100% Aloe vera, inhibited up to 4mm, while Lavandula inhibited Mucor. Thymus at 100% concentration, demonstrated a 18mm halo of inhibition and propionic acid can inhibit up to 15mm. Essentials oils is a safe alternative for crop protection. We expected to identify which pathogen Zingiber officinale essential oil is effective against.

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