# ASSESSMENT OF RED ROT DISEASE OF *SACCAHRUM OFFICINARUM* L. (SUGARCANE) CAUSED BY *COLLETOTRICHUM FALCATUM* USING SELECTED SIX MEDICINAL PLANT EXTRACTS

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Red rot disease, caused by the fungal pathogen *Colletotrichum falcatum* Went. (Also, known as *Glomerella tucumanensis*), poses a significant threat to global sugarcane (*Saccharum officinarum* L.) cultivation. The conventional use of chemical fungicides has been limited due to pathogen resistance and environmental concerns. This study aimed to assess the efficacy of six medicinal plant extracts, namely *Azadirachta indica* (Neem), *Solanum torvum* (Turkey Berry), *Zingiber officinale* (Ginger), *Persea americana* (Avocado), *Curcuma longa* (Turmeric), and *Psidium guajava* (Guava), for managing red rot disease in sugarcane. Agar well method was used to evaluate the antifungal properties of the selected plant extracts against *C. falcatum*. Concentration gradient started from 100mg/ml to 225mg/ml of the plant extracts were tested to determine their inhibitory effects on fungal growth and mycelial development. All data, collected from agar well method, were rigorously analysed at a 5% confidence level using Minitab 17.0 statistical software. The choice of a 5% confidence level was based on established statistical practices to ensure robust results. This study observed the initiation of fungal growth characterized by the development of white mycelia. Subsequently, the formation of white cottony aerial mycelia ensued, undergoing a transformation into a light, loose, and floccose texture within a period of five to seven days. The colony's coloration transitions were to either white or grey during this period. Conidia produced by the fungus exhibit a diverse range of shapes, including elongated, fusiform, curved, and straight forms as their common shape. The preliminary phytochemical analysis of six plant extracts exposed varying profiles of availability of bioactive compounds. Notably, *A. indica* and *S. torvum* leaf extracts exhibited the presence alkaloid, flavonoids, tannin, and saponin, while absence of steroids. Future studies should delve into the specific mechanisms underlying the impact of alkaloid, flavonoids, tannin, and saponin on the pathogen, considering factors such as concentration, interaction dynamics, and potential synergistic effects. In general conclusion, suggests that the plant extracts have distinct effects on the zone of inhibition (ZOI). *P. guajava* leaves extract showed the highest ZOI (22.83mm) against the *C. falcatum* at the minimum inhibition concentration (MIC) 200mg/ml. Both *Z. officinale* and *A. indica* exhibited similar effects on *C. falcatum*, with recorded measurements of 16.68 mm and 16.66 mm, respectively. This finding highlighted the potential use of plant extracts on *C. falcatum* as an environment friendly and sustainable alternative for the management of red rot disease in sugarcane cultivation.

**Keywords:** *Red rot disease, Sacchrum officinarium L., Colletotrichum falcatum, Medicinal plants*