Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Antifungal potential of *Picralima nitida* extracts (Apocynaceae) on phytopathogens: Implication for its use in agriculture

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Abstract

Today, despite its status as a key sector, agriculture faces many problems due to fungi and the use of synthetic pesticides. Synthetic pesticides damage soil and induce health problem to the consumers. This study evaluated the antifungal potential of *Picralima nitida* fruits (African medicinal plant) against three phytopathogens such as *Fusarium oxysporum, Sclerotium rolfsii* and *Colletotrichum gloeosporioides*. The extracts were obtained by the Total Aqueous Extraction method (TEA) and Hydroalcoholic extraction (EE70 %) method. Two dilution types of the extracts in PDA medium were tested: (1) dilution before autoclaving (AvA) and (2) dilution after autoclaving (ApA). The extracts of two fruit morphotypes from two climatic zones were tested at different concentrations (40, 70 and 100 mg ml^{-1}). The yield of fruit extracts was determined for two climatic zones. The variations of the macroscopic aspect adopted by the phytopathogens on each type of extract were noted. Inhibition rate and Lethal and fungistatic inhibitory dose of hydroalcoholic extracts on the three phytopathogens was determined. The results revealed that the yield of fruit extracts from Dahomey Gap (DG) was significantly higher (>8 %) than that from the Guinea Congolese region (GC). A significant difference was observed in yield ($p < 0.05$) between TEA type and the EE70 % type. No significant difference was observed between the pathogen inhibition rates in the dilution type ($p > 0.05$). At 100 mg ml^{-1} the inhibition rates were 72.6 % for *Fusarium oxysporum*, 77.7 % for *Sclerotium rolfsii* and 58.5 % for *Colletotrichum gloeosporioides*, respectively. However, the static fungicidal activity of the types of extracts was observed at 70 mg ml^{-1} on *Fusarium oxysporum* and *Sclerotium rolfsii*. *Colletotrichum gloeosporioides* was the most resistant strain. Although *Sclerotium rolfsii* has shown resistance by change of conformation, it becomes more sensitive depending on the concentration of the extracts. From 40 mg ml^{-1}, a total absence of sclerotia production has been noted in *Sclerotium rolfsii*. The hydroalcoholic extract of fruit morphotypes from Dahomey Gap was more effective than the other extracts. This study demonstrated possibility of the use of *Picralima nitida* extract in agriculture as biopesticide.

Keywords: Antifungal potential, aqueous extract, *Colletotrichum gloeosporioides*, *Fusarium oxysporum*, hydroalcoholic extract, *Picralima nitida*, Sclerotium rolfsii

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