

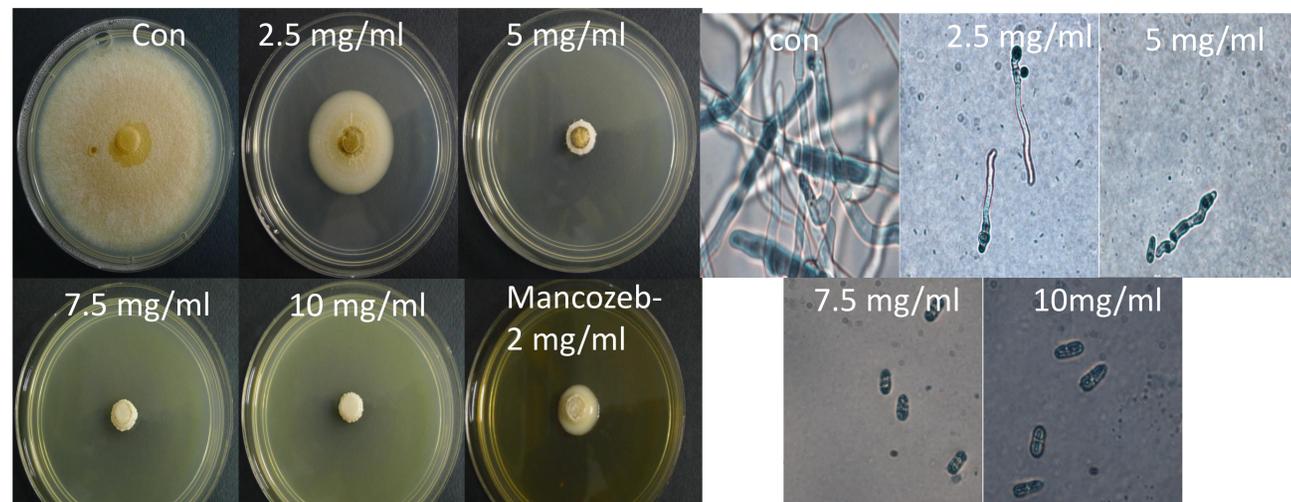
Mechanism of some plant extracts in controlling *Colletotrichum gloeosporioides* that causes dragon fruit anthracnose

Bordoh P. K, Ali A. W., Dickinson M., Mehdi M., Siddiqui Y.

Introduction

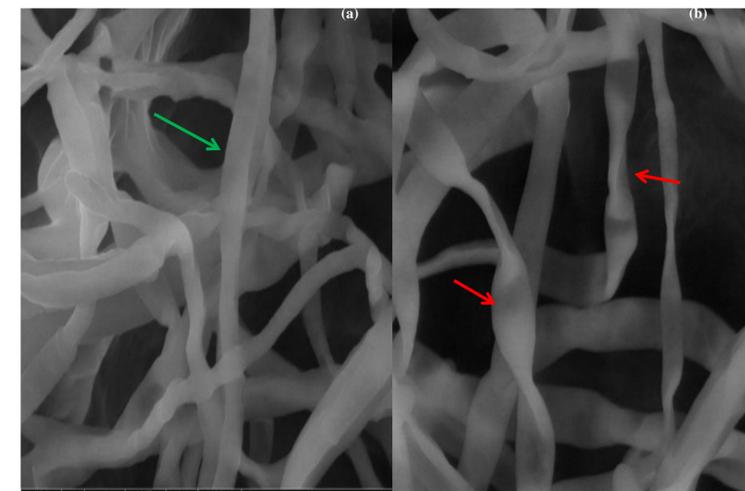
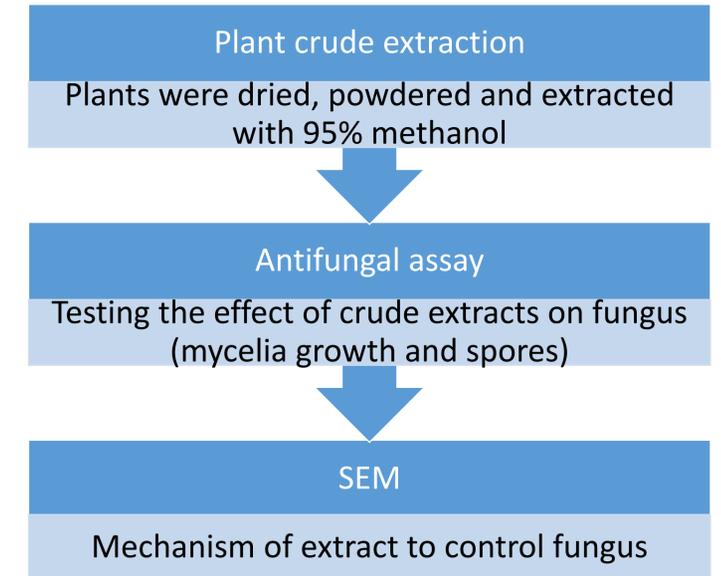
- Plant extracts of “dukung anak (*Phyllanthus niruri*), ginger (*Zingiber officinale* Roscoe cv. “Bentong”) and turmeric rhizome (*Curcuma longa* Linn) have been reported to possess vast antimicrobial properties against some clinical pathogens and phytopathogens.
- little or no information about these plant extracts has been reported in the postharvest management of dragon fruit (*Hylocereus costaricensis*) anthracnose caused by *Colletotrichum gloeosporioides*.
- Understanding the mechanism of these extracts in controlling this fungus by Scanning Electron Microscopy (SEM) is lacking .
- Methanolic crude extracts obtained from *P. niruri*, *C. longa* Linn and *Z. officinale* Roscoe cv. “Bentong” was prepared in aqueous form and tested on fungus.
- Selected concentrations used for this study were 2.5 mg/ml, 5 mg/ml, 7 mg/ml and 10 mg/ml. Mancozeb (2 mg/ml) was used as + control and only PDA as – ve control (Con).

Results and Discussion



Inhibition of fungal mycelia growth and conidia germination (insert picture shows for ginger extract)

Methodology



SEM of control hyphae (green arrows) and treated hyphae (red arrows)

- All plant crude extracts showed a dose dependent effect against the fungus and also fungistatic even at 10 mg/ml.
- Highest % inhibition in fungal growth occurred in ginger crude extracts at 10 mg/ml (88.46%)
- Distortion, shriveling and swollen of fungal hyphae occurred at 2.5 mg/ml (ginger extracts) or 5mg/ml (“Dukung anak and turmeric rhizome extracts) during SEM.
- At 7.5mg/ml or 10 mg/ml fungal growth was slightly or completely inhibited irrespective of the extract used.

Conclusion

- All crude extracts showed diverse alterations in the hyphae such as swelling, depression and distortion along with a lack of spore development.
- These plant extracts can be used as a potential natural antifungal agent to control *C. gloeosporioides* that causes anthracnose in dragon fruit .

References

- Ademe, A., Ayalew A. and Woldetsadiq. (2014). In vitro and in vivo activity of selected plant extracts against Papaya (*Carica papaya* L.) anthracnose (*Colletotrichum gloeosporioides*). *Journal of Horticulture*, 1: 104
- Al-Hetar, M.Y., Zainal Abidin, M.A., Sariah, M. and Wong, M.Y. (2010). Antifungal activity of chitosan against *Fusarium oxysporum* f. sp. *Cubense*. *Journal of Applied Polymer Science*, 120: 2434–2439