Utilisation of Cassava (*Manihot esculenta* Crantz) peels in the control of some *Fusarium* Pathogens of millet seedlings

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Introduction

Cassava (*Manihot esculenta* Crantz) is a major staple food in the developing world and the third largest source of food carbohydrates in the tropics, after rice and maize (Onyenwoke and Simonyan, 2014). Use of this crop is mostly limited to its food value while it's antifungicidal potentials had not been fully explored in plant disease management, especially in millet where some pathogenic *Fusarium* species causes considerable losses at seedling stage (Akanmu *et al.* 2013). This study therefore evaluated the phytofungicidal potentials of cassava peels extracts in comparism with those of *Moringa oleifera* and *Senna alata* in the control of some soilborne *Fusarium* pathogens of millet seedlings.

Materials and Methods

Source of material used*: Cassava peels** (A cassava processing factory, Ibadan), ***M. oleifera* and *S. alata (Botanical garden of the University of Ibadan), **The pathogens;** *Fusarium anthophilum, F. verticillioides, F. oxysporum and F. scirpi* (Culture collections of the Plant Pathology Laboratory, Department of Botany, University of Ibadan), **Millet seeds** (National Centre for Genetic Resources and Biotechnology (NACGRAB), Apata, Ibadan). Each of the Pathogen was quantified and adjusted to 3.1 x 10^5 spores/ml. *M. oleifera, S. alata* and Cassava peels were washed in clean water and rinsed in 5% NaOCl solution in two exchanges of distilled water. They were air-dried and then blended in sterilized electric blender. The powder of each item was diluted into 5, 10 and 15% g/ ml. **Laboratory experiment:** Inhibitory potential of the extracts was evaluated against the pathogens in-vitro according to the method described by Ramezeni *et al.* (2002). **Screenhouse experiment:** was conducted using sterilised soil, the growth and disease evaluation was conducted according to Gwary *et al.* (2006). Data gathered were subjected to ANOVA using SAS 9.1 (2003 version), and means were separated by DMRT at $\alpha_{0.05}$.

Results

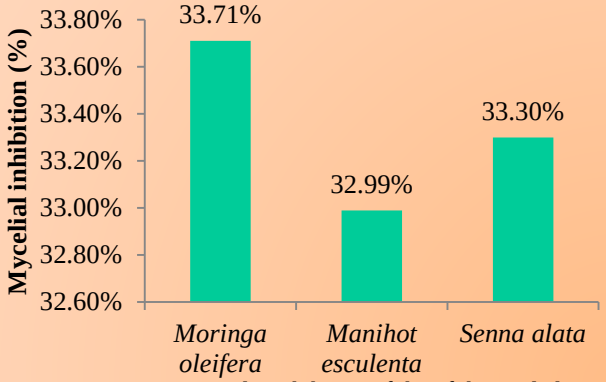


Figure 1: Percentage mycelia inhibition of the of the pooled effect of extracts

Table 1: Effect of extracts and organism on the growth characters of millet seedling

Parameters	Variables	Plant height (cm)	Stem girth (cm)	No of leaves	Leaf area (cm^2)
Extracts and controls	*M. esculenta*	19.66ab	1.00a	3.83a	11.44a
	M. oleifera	21.33a	0.97a	3.86a	9.84b
	S. alata	17.96b	0.93a	3.69ab	9.05b
	Control	16.30b	0.96a	3.85a	7.17b
	Pathogen treatment	14.70c	0.77a	3.50b	5.61c
Organisms	*F. anthophilum*	11.07b	5.96a	2.52b	6.75b
	F. verticillioides	13.40a	6.01a	2.81a	8.18a
	F. oxysporum	13.09ab	6.01a	2.81a	7.48ab
	F. scirpi	13.40a	6.06a	2.86a	8.10a

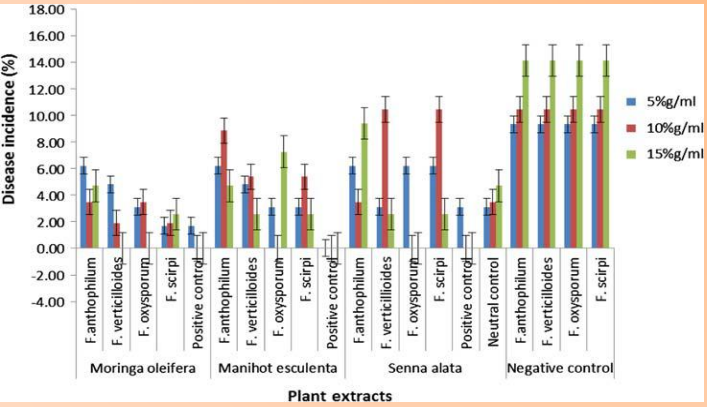


Figure 2: Percentage disease incidence of *Fusarium* species after treatment with plant extracts on millet seedlings

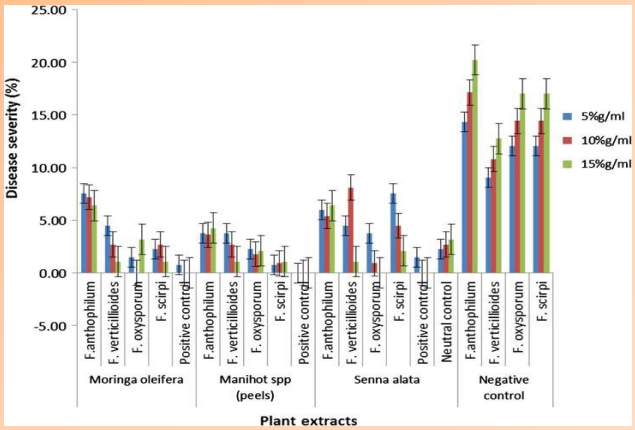
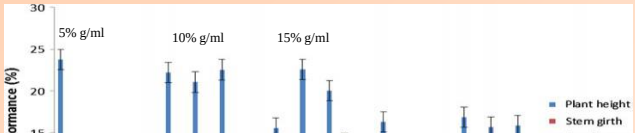


Figure 3: Percentage disease severity of Fusarium species after treatment with plant extracts on millet seedlings



Conclusion

This study revealed the efficacy of the phytofungicidal properties of cassava peels (*Manihot esculenta* crantz) in the management of *Fusarium* species both in vitro and in vivo. More so, the extracts of cassava peel showed the most reduction in the disease severity caused by *Fusarium* species in millet seedling. This verified the study of Abiala *et al.* (2016) which reported the efficacy of cassava peels against the fungal pathogens of *Corchorus olitorus*. Cassava peel extracts at 15% g/ml had the most biofertilizer