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**Studies on the Effects of Fungal Pathogens on Sugar Contents of
Water Melon (*Citrullus lanatus* L.) in Yola, Adamawa State, Nigeria**

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Introduction

- The production and sale of Water Melon (*Citrullus lanatus* L.) holds an important position in world horticulture. In Nigeria for example, the largest production of watermelon comes from the Northern part of the country, where the suitable agro ecology is found (IITA, 2007). However losses as a result of spoilage are high in the absence of effective postharvest treatment (Bi and Zhang, 1991). During storage and transportation postharvest diseases occur by some fungal species (Yang et al., 2006; Bi and Wang, 2007).



Objectives

- To isolate and identify fungi causing post-harvest rot of Water Melon (*Citrullus lanatus* L.)
- To determine the effect of the pathogens on sugar content level of Water melon (*Citrullus lanatus* L.) from Healthy/Fresh and Disease Water Melon fruit.

Methodology

- Study Area
- Survey and Sample Collection
- Laboratory Analysis of Samples from Survey
 - ✓ *Isolation and identification of causal organisms*
 - ✓ *Pathogenicity test*
- Analysis of Total Sugar Content of Water Melon (*Citrullus lanatus* (Thunb.))
 - Total soluble sugar estimation of Healthy, Fresh and Diseased water melon fruit was determined using a Repractometer as describe by Khurana (1970) and Chimbekujwo (1994). The extraction procedure was similar to that described by Kapoor and Tandon (1969).

Experimental Setting

- Completely randomized Design (CRD) as described by Gomez and Gomez (1984) was used with three replication and data obtained were analyzed statistically by analysis of variance (ANOVA) according to Gomez and Gomez (1984) and means that was significant were separated by Least Significant Difference (LSD) at $P=0.0001$ with Statically Analysis Software (SAS) according to Scheffe (1953).

Results and Discussion

- Isolation and Identification of Fungal Isolates
- Pathogenicity Test

Table 1: Pathogenicity of Fungal Isolates on the Water Melon Fruits (*Citrillus lanatus* L.)

Fungal Isolate	No of Fruit	Days After Inoculation						
		1	2	3	4	5	6	7
A. niger	1	-	-	++	++	+++	+++	+++
	2	-	-	++	++	+++	+++	+++
	3	-	-	++	++	+++	+++	+++
A.parasiticus	1	-	+	++	++++	++++	++++	++++
	2	-	+	++	++++	++++	++++	++++
	3	-	+	++	++++	++++	++++	++++
S. cerevisae	1	-	+	++	++	+++	++++	++++
	2	-	+	++	++	+++	++++	++++
	3	-	+	++	++	+++	++++	++++
A.fumigatus	1	-	-	++	+++	++++	++++	++++
	2	-	-	++	+++	++++	++++	++++
	3	-	-	++	+++	++++	++++	++++
R. stolonifer	1	-	-	++	++	+++	++++	++++
	2	-	-	++	++	+++	++++	++++
	3	-	-	++	++	+++	++++	++++

Results and Discussion

• Effect of Disease on the Total Sugar Content of the Fruits

- The analysis of sugar content of water melon fruits was taken for the Healthy fruit (Ripe), Fresh fruits (Unripe) and Diseased fruit (Spoiled) the analysis of sugar content of healthy fruit collected from these different market showed the average of 6% brix, the fresh (Unripe) fruit have the average of 3.8% brix and the diseased fruit have the average of 3.1%.

Table 2: Total Sugar Content of Healthy, Fresh and Diseased Fruits.

Mean	Fruit Status	Brix (%)
1	Health Fruit(ripe)	6.01 (H)
2	Fresh Fruit(Unripe)	3.81 (F)
3	Spoiled Fruits	3.12 (S)
LSD (0.0001)	P >=0.000q	0.33

Key:

H. = healthy (Ripe) Fruit

F = Fresh (Unripe)

S = Spoiled Diseased Fruit

%Brix = % of Dissolve Sugar Content

Conclusions & Recommendations

- The result showed that a large number of water melon fruits suffer from rot disease caused by 5 fungi such as *Aspergillus niger*, *Aspergillus parasiticus*, *Saccharomyces cerevisiae*, *Aspergillus fungatus* and *Rhizopus Stolonifer*.
- The analysis of total sugar indicated a significant decreased in the diseased water melon fruits than in the healthy and fresh fruit, is supported with the work of Khurana, (1970) and Khare and Dingra, (1974) that diseased papaya fruit has less sugar content when compared with the healthy papaya fruit this is contrary to reports by Chama, *et al.*, (2007), which reported a 57% total soluble sugar for diseased mango fruits against a 52% for healthy ones. The decrease in sugar content in the diseased fruits should be attributed to the fact that the pathogenic fungal have utilized the sugar in water melon fruit which was also reported by Kapoor and Tandon (1969).
- Further study is needed to reveal all the other recent reports about various pathological aspects on the fungal diseases of Water Melon and management strategies opted for diseases.
- Research should be carried out to characterized the principle (ingredient) responsible for fungicidal activity.

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