EFFECT OF STAKING ON FLOWER INDUCTION, POLLINATION AND CROSS-COMPATIBILITY AMONG SWEETPOTATO CLONES

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Introduction

- **Sweetpotato is ranked 7th in the world statistics**
- **Source of Vit. A & minerals**
- **Free from HCN as in cassava**
- **Drought tolerance ability**
- **Good sweetener in industry**
- **Weed smoldering ability**

Limitations of Sweetpotato Breeding

- **It is highly heterogeneous**
- **Self- incompatible**
- **Poor flowering ability**

Induction of Flowering in Sweetpotato Breeding

- **Grafting with *Ipomoea nil, I. setosa***
- **Trellises**
- **Pesticide sprays**
- **Staking**
- **Combination of two or more methods above**

Objectives

- **Examine the method for flower induction**

- **Determine the pollination and cross-compatibility among sweetpotato clones**

Materials and Methods

- **Two Field Experiments: Staking And Non Staking For Crossing block**
- **Design: RCBD**
  - **Clones:40**

    14 Orange flesh

    9 white flesh

    17 yellow flesh

  - **Source: Germplasm collection, Department of Agronomy, University of Ibadan**

NON STAKING PLOT

*The experimental plot consisted of two rows of 3m long ridge with 1m between ridges in 3 replications arranged in Randomized Complete Block Design (RCBD).

*Planting of 25cm long vine cuttings was done on the crest of each ridge

Each vine cutting was inserted at a slant, with two-third buried below the soil surface at a spacing of 30cm

*Other agronomic practices were carried out except staking

Establishment of Staked plot

Two vines of each clone were planted on 1 x 1 m ridge with 5 heaps/clone in 3 replications arranged in Randomized Complete Block Design (RCBD).

Wooden stakes were erected on each heap and the vines were tied with string (to induce flowering)

18 clones flowered and were hand-pollinated

Covering with plastic straw

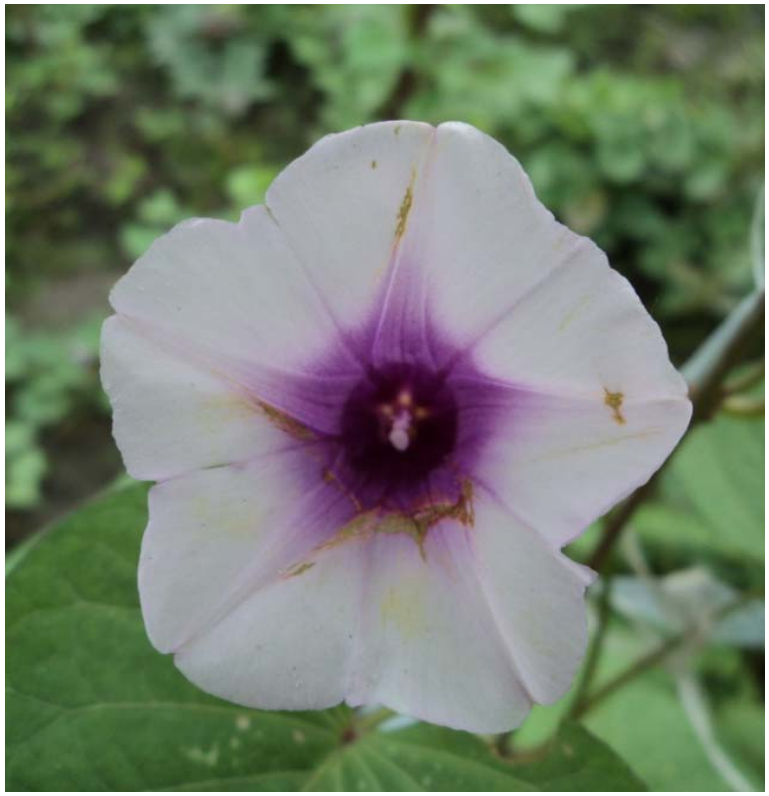
Rubbing anther on stigma

Petals tied to avoid insect visit

Fruit set after hand pollination

Different flower petal shapes in sweetpotato

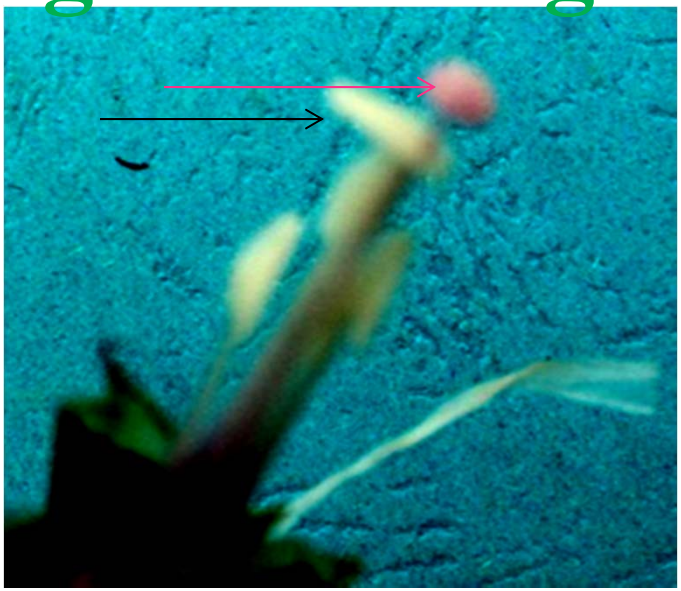
Pentagonal Shaped Petal



Semi-stellate Shaped Petal

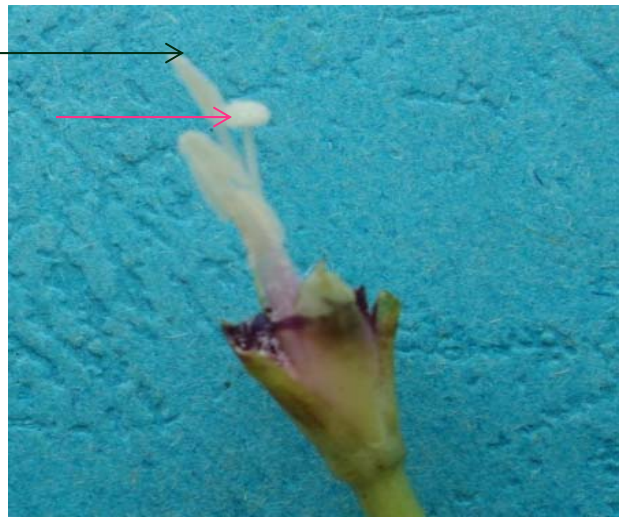
Round Shaped Petal

Stigma Arrangements in Sweetpotato



Longer Stigma than Anther

Same Height as Anther

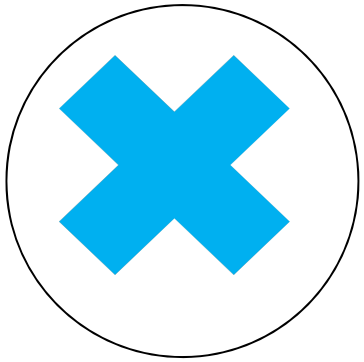


Anther longer than the stigma

Stigma

Anther

Example of a crossing



Female parent

Male parent

Offspring

Results and Discussion

- Total of 306 cross-combinations expected from all crosses among the 18 clones

- 109 cross-combinations were compatible = 35.6% success

Genetic Compatibility of I8 Sweetpotato Clones

♂/♀	199024.2	440034	BLESBOK	96-117	1995-21	RESISTO	EXCEL	W-151	440215	BAT H	SAUTI	FAMGBE 1	440168	TIS8250	199034.1	AK-WIDE	TIS8441	TIS87/0087
199024.2	N	C	C	C	C	C	C	C	N	N	N	N	N	N	C	N	N	N
440034	C	N	C	C	C	C	C	C	N	N	N	N	N	N	C	N	N	N
Blesbok	C	C	N	C	C	C	C	C	N	N	N	N	N	N	C	N	N	N
96-117	C	C	C	N	C	C	C	N	N	N	N	N	N	N	C	N	N	N
Resisto	C	C	C	N	N	N	C	N	N	N	N	N	N	N	C	N	N	N
Excel	C	C	C	C	C	C	N	C	N	N	N	N	N	N	C	N	N	N
W-151	N	N	N	N	N	N	N	N	C	C	C	N	C	C	N	N	C	C
440215	N	N	N	N	N	N	N	C	N	C	C	C	N	N	N	C	C	C

N/B:**N=NOT-COMPATIBLE, C=COMPATIBLE**

% Compatibility and Germination of Sweetpotato Clones

Cloness	Compa-tibility %	Germi-nation %
Resisto	16.7	43.3
Sauti	25.0	45.0
Ak-wide	26.7	70.8
TIS 8250	27.5	19.5
199024.2	31.3	67.0
96-117	34.0	44.1
TIS 8441	39.8	83.8
Excel	44.0	31.8
440215	46.3	67.8
1995-5-21	46.4	19.2
440168	47.5	24.7
Famgbe 1	49.5	26.6
Blesbok	52.9	50.0
Bath	53.3	40.6
199034.1	54.0	64.8
440034	67.1	55.6
TIS 87/0087	67.5	72.2
W-151	68.7	83.3
Total	798.2	910.1
Mean	44.3	50.6
Standard Deviation	15.3	19.7
CV	34.5	38.9

Genetic Compatibility of Sweetpotato Clones

Clone	Gene. Comp	Rank
Resisto	7.2	17
Sauti	11.3	15
Ak-wide	18.9	10
TIS 8250	5.4	18
199024.2	21.0	9
96-117	15.0	11
TIS 8441	33.4	5
Excel	14.0	12
440215	31.4	6
1995-5-21	8.9	16
440168	11.7	14
Famgbe 1	13.2	13
Blesbok	26.5	7
Bath	21.6	6
199034.1	35.0	4
440034	37.3	3
TIS 87/0087	67.5	2
W-151	68.7	1

Conclusions and Recommendations

1. 18 of 40 clones studied produced flowers and viable seeds

2. Clone W-151 and TIS 87/0087 were recommended for many cross-combinations during sweetpotato breeding.

Acknowledgments

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Thank You All For Listening