



**BABCOCK**  
**UNIVERSITY**

ILISHAN-REMO, OGUN STATE, NIGERIA

# COLLEGE OF POSTGRADUATE STUDIES

## 2022/2023 PhD Thesis Abstract

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**RT:** Genetic Characterization and Screening for Drought Tolerance of Thirty Selected Accession of *Corchorus olitorius* Linn

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**AB:** *Corchorus olitorius* (Jute) is a leafy vegetable crop cultivated for its rich nutritious and economic values. The cultivation is hindered by drought, leading to low yield of the crop. There is a dearth of information regarding drought tolerance in *Corchorus* cultivars. However, genetic diversity within *Corchorus* species provides ample opportunities for selection of useful genotypes for the genetic improvement of *C. olitorius* in several traits including drought tolerance. This study genetically characterized and screened thirty accessions of *C. olitorius* for drought tolerance and stability.

The experiment was laid out in a Randomized Complete Block Design replicated four times. Thirty accessions of *C. olitorius* sourced from two national research centres in Nigeria were planted in the field and screen house. The accessions were evaluated at two locations (Abeokuta and Ilishan-Remo) within two cropping seasons (early and late). Molecular characterization was conducted using the ISSR markers. Drought tolerance was evaluated in the screen house using morphological indices. Data collected from twelve agronomic characters were analyzed using analysis of variance, correlation coefficient, principal component analysis and Additive Main Effect and Multiplicative Interaction (AMMI). Means were separated using Duncan Multiple Range Test determined at  $p < 0.05$ .

The result showed significant seasonal and location interaction effect on all characters studied. Similarly, significant block and accession effect were observed on all the characters evaluated except in plant height at week five. Abeokuta late season gave the least significant performance in all the characters evaluated, whereas the early seasons gave the highest significant performance in the characters evaluated. Broadsense heritability ranged from 77.63% (number of branches per plant) and 96.38% (stem width). All the characters combined high Genetic Coefficient of Variation, broadsense heritability and genetic advance. There were significant positive phenotypic and genotypic correlations between plant weight and root mass per plant (0.18, 0.21) and also with pod weight (0.35, 0.40). AMMI analysis showed that the early seasons were most favorable for leaf and pod yield. NGB00232 was the best accession combining stability and high leaf length, while NHJM0727 was the most drought tolerant accession. The ISSR markers revealed significant genetic diversity among the accessions.

The study concluded that there was a significant genetic diversity among the thirty accessions evaluated. NGB00232 was the best accession combining yield stability and better performance across the four environments; while NHJM0727 was the most drought tolerant of all the accessions. NGB00232 was therefore recommended to farmers for yield stability and better performance across the four environments, whereas NHJM0727 should be used as a putative parent in breeding for drought tolerance.

**Keywords:** Accessions, *Corchorus olitorius*, Drought tolerance, Genetic variability, ISSR primers, Yield stability

**Word Count:** 419

**Abbreviations:** *RFN: Researcher's Full Name, RD: Researcher's Department, RS: Researcher's School, RE: Researcher's Email, RAE: Researcher's Alternate Email, RP: Researcher's Phone Contact, RT: Registered Title, MS: Main Supervisor, ME: Main Supervisor's E-mail Address, SP: Main Supervisor's Phone Contact, CS: Co-Supervisor, CE: Co-Supervisor's E-mail Address, CP: Co-Supervisor's Phone Contact, AB: Abstract*

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