

# Variability in Morphological Biochemical and Proximate Composition among *Amaranthus hybridus* Cultivars in South-West Nigeria

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## Introduction

*Amaranthus hybridus*, commonly known as smooth pigweed, is a versatile leafy vegetable consumed for its nutritional and health benefits. This study investigates the variability in morphological, biochemical, and proximate composition among different cultivars of *A. hybridus* grown in South-West Nigeria. The introduction contextualizes the importance of *A. hybridus* as a staple food source in the region and outlines the objectives of the study, which aim to characterize and compare the morphological traits, biochemical properties, and nutritional composition of various cultivars. Additionally, it highlights the significance of understanding the variability within *A. hybridus* cultivars for optimizing cultivation practices, enhancing food security, and promoting dietary diversity in South-West Nigeria [1].

## Description

The description section provides a detailed overview of the research methodology, sampling procedures, and analytical techniques employed to assess the morphological, biochemical, and proximate composition of *A. hybridus* cultivars. It describes how samples were collected from different cultivation sites across South-West Nigeria and how morphological traits such as leaf size, shape, colour, and stem characteristics were measured and recorded. Furthermore, the section elucidates the biochemical analyses conducted to quantify secondary metabolites, antioxidants, and anti-nutritional factors in the leafy greens. Additionally, it outlines the proximate analysis performed to determine the nutritional composition, including moisture content, protein, fat, fibre, carbohydrates, vitamins, and minerals [2]. Through systematic data collection and analysis, the study aims to elucidate the extent of variability within *A. hybridus* cultivars and identify potential correlations between morphological traits, biochemical properties, and nutritional composition. Furthermore, the study underscores the potential applications of the findings in breeding programs aimed at developing improved varieties of *A. hybridus* with desirable morphological traits, enhanced nutritional quality, and increased resistance to environmental stresses. By harnessing the natural variability within *A. hybridus* cultivars, breeders can selectively cross and propagate superior genotypes to address specific agronomic challenges and meet the diverse needs of consumers. Additionally, the study highlights the importance of conservation efforts to preserve the genetic diversity of *A. hybridus* germplasm and prevent the loss of valuable traits that contribute to its nutritional and ecological resilience [3].

Looking ahead, future research endeavours should focus on elucidating the underlying genetic mechanisms driving variability in morphological, biochemical, and nutritional traits among *A. hybridus* cultivars. Genome-Wide Association Studies (GWAS), Quantitative Trait Locus (QTL) mapping, and

molecular marker-assisted selection can provide valuable insights into the genetic basis of trait variation and facilitate the development of molecular breeding tools for targeted trait improvement [4]. Moreover, longitudinal studies examining the impact of environmental factors, agronomic practices, and post-harvest handling on the variability of *A. hybridus* cultivars can inform best management practices and quality assurance protocols for sustainable leafy vegetable production in South-West Nigeria. In summary, the study on variability in morphological, biochemical, and proximate composition among *A. hybridus* cultivars in South-West Nigeria contributes to our understanding of the genetic, physiological, and nutritional diversity within this important leafy vegetable species. By characterizing and quantifying variability in key traits, the study provides valuable information for guiding breeding efforts, optimizing cultivation practices, and promoting the consumption of nutrient-rich foods for improved health and nutrition outcomes in the region. Through interdisciplinary collaboration and knowledge exchange, stakeholders can leverage the inherent variability within *A. hybridus* cultivars to enhance agricultural productivity, dietary diversity, and food security in South-West Nigeria and beyond [5].

## Conclusion

In conclusion, the study reveals significant variability in morphological, biochemical, and proximate composition among different cultivars of *A. hybridus* grown in South-West Nigeria. The findings underscore the diversity within this leafy vegetable species and highlight the importance of characterizing and understanding the intrinsic variability for agricultural and nutritional purposes. Moreover, the study emphasizes the potential implications of variability in *A. hybridus* cultivars for dietary diversity, food security, and human health in South-West Nigeria. By elucidating the morphological, biochemical, and nutritional profiles of different cultivars, the study provides valuable insights for breeders, farmers, nutritionists, and policymakers to optimize cultivation practices, enhance food production, and promote the consumption of nutrient-rich leafy greens in the region.

## Acknowledgement

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### Conflict of Interest

None.

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