

## Phylogenetic Inferences based on Morphoanatomical Characters in *Plectranthus esculentus* N. E. Br. (Lamiaceae) from Nigeria

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**Abstract :** *P. esculentus* is indigenous to Nigeria yet no wild relation has been encountered or reported. This has made it difficult to establish proper lineages between the varieties and landraces under cultivation. The present work is the first to determine the apomorphy of 135 morphoanatomical characters in organs of 46 accessions drawn from 23 populations of this species based on dicta. The character states were coded in accession x character-state matrices and only 83 were informative and utilised for neighbour joining clustering based on euclidean values, and heuristic search in parsimony analysis using PAST ver. 3.15 software. Compatibility and evolutionary trends between accessions were then explored from values and diagrams produced. The low consistency indices (CI) recorded support monophyly and low homoplasy in this taxon. Agglomerative schedules based on character type and source data sets divided the accessions into mainly 3 clades, each of complexes of accessions. *Solenostemon rotundifolius* (Poir) J.K Morton was the outgroup (OG) used, and it occurred within the largest clades except when the characters were combined in a data set. The OG showed better compatibility with accessions of populations of landrace Isci, and varieties Riyum and Long'at. Otherwise, its aerial parts are more consistent with those of accessions of variety Bebot. The highly polytomous clades produced due to anatomical data set may be an indication of how stable such characters are in this species. Strict consensus trees with more than 60 nodes outputted showed that the basal nodes were strongly supported by 3 to 17 characters across the data sets, suggesting that populations of this species are more alike. The OG was clearly the first diverging lineage and closely related to accessions of landrace Gwe and variety Bebot morphologically, but different from them anatomically. It was also distantly related to landrace Fina and variety Long'at in terms of root, stem and leaf structural attributes. There were at least 5 other clades with each comprising of complexes of accessions from different localities and terrains within the study area. Spherical stem in cross section, size of vascular bundles at the stem corners as well as the alternate and whorl phyllotaxy are attributes which may have facilitated each other's evolution in all accessions of the landrace Gwe, and they may be innovative since such states are not characteristic of the larger Lamiaceae, and *Plectranthus* L'Her in particular. In conclusion, this study has provided valuable information about infraspecific diversity in this taxon. It supports recognition of the varietal statuses accorded to populations of *P. esculentus*, as well as the hypothesis that the wild gene might have been distributed on the Jos Plateau. However, molecular characterisation of accessions of populations of this species would resolve this problem better.

**Keywords :** clustering, lineage, morphoanatomical characters, Nigeria, phylogenetics, *Plectranthus esculentus*, population

**Conference Title :** ICPPB 2019 : International Conference on Plant Physiology and Botany

**Conference Location :** Singapore, Singapore

**Conference Dates :** January 10-11, 2019