

# Molecular Confirmation on the Synonymy of Phaeanthusebracteolatus and P. Ophthalmicus including Biological Activities of Its Phytochemical Constituent

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**Abstract** - The genus *Phaeanthus* Hook.f & Thomson of the family Annonaceae is a medicinal plant essentially characterized by inner petals that are longer than outer petals, numerous carpels and stamens, and monocarpous fruits. Previous studies have recognized *Phaeanthus ebracteolatus* as a synonym of *P. ophthalmicus* based on the morphological examination of limited herbarium specimens. In order to determine the validity of the finding, this study aims to verify the synonymy of *P. ebracteolatus* and *P. ophthalmicus* using combined *matK* and *rbcL* dataset, as well as computing its sequence divergence; and, to further explore the phytochemical and biochemical components of the plant. Collected plant samples were subjected to morphological characterization followed by molecular analysis through DNA extraction, amplification, purification, sequencing, sequence analysis and data analysis. The crude leaf extracts were subjected to phytochemical screening by thin layer chromatography and three colorimetric assays such as  $\alpha$ -glucosidase inhibition, anti-tyrosinase and anti-Staphylococcus. This study confirms that the two *Phaeanthus* species are conspecific using combined *matK* and *rbcL* dataset which is strongly supported and computed sequence divergence which includes 5 bp (0.81%) and 3 bp (0.41%) in *matK* and *rbcL* regions, respectively. Overlapping morphological characters such as axillary inflorescence, valvate inner and outer petals, truncate stamens, club-shaped carpels, and globose monocarps also support the finding. The crude leaf extract yields positive to different antioxidant constituents and demonstrated a high potency in  $\alpha$ -glucosidase inhibition. The study validated the synonymy of *P. ebracteolatus* and *P. ophthalmicus* using sequences and morphology, with *P. ophthalmicus* being acknowledged as its correct name. Furthermore, the plant extracts proved to be efficient as an  $\alpha$ -glucosidase inhibitor.

**Keywords:**  $\alpha$ -glucosidase, *matK*, *Phaeanthus ophthalmicus*, phytochemical constituents, *rbcL*