10th Brazilian Conference on Natural Products
XXXVI RESEM
4-7 November 2025, Belo Horizonte, MG, Brazil

Section: 02

POTENTIAL OF DIPTERYX ALATA (BARU) UNDEREXPLORED PARTS AS RAW MATERIALS FOR COSMETIC INDUSTRY: CHEMICAL AND BIOACTIVE PROPERTIES

Matheus Silva de Barros[1*], Jaqueline Alves Barbosa[1], Isadora Gonzaga da Silva[2], Larissa Silva Costa[3], Jessica Cristina Amaral[4], Philipp Gabor[5], Lorena Ramos Freitas de Sousa[2], Patricia S. Lopes[3], Maria Fátima das Graças Fernandes da Silva[4], Alexander Weng[5], Vanessa Gisele Pasqualotto Severino[1].

barrosmatheus@discente.ufg.br

1- Instituto de Química, Universidade Federal de Goiás, Goiânia, GO, Brazil. 2- Instituto de Química, Universidade Federal de Catalão, Catalão, GO, Brazil. 3- Universidade Federal de São Paulo, Campus Diadema, Diadema, SP, Brazil. 4- Departamento de Química, Universidade Federal de São Carlos, São Carlos, SP, Brazil. 5- Institute of Pharmacy, Freie Universität Berlin, Berlin, Germany.

Dipteryx alata Vogel (Baru), a native tree of the Brazilian Cerrado, is mainly valued for its edible nuts, while other fruit parts remain underexplored despite their promising biotechnological and commercial potential. This study investigated the chemical composition and cosmetic potential of ethanolic extracts from epicarp, mesocarp, endocarp, and nut. Extracts were obtained by maceration and subsequently fractioned by liquid–liquid extraction with solvents of increasing polarity, to afford fractions. The chemical profiles of extracts and fractions were characterized by UHPLC–QTOF–MS/MS. Data were processed with MS-DIAL for feature detection and alignment, and Feature-Based Molecular Networking (FBMN) was carried out on GNPS2 for spectral organization and dereplication. This workflow allowed the annotation of over 30 metabolites, including phenolic acids (gallic, caffeic, ellagic), flavonoids (liquiritigenin, isoliquiritigenin, luteolin, eriodictyol, formononetin), coumarins (umbelliferone, daphnetin, scopoletin, isofraxidin), and hydrolyzable tannins (galloylated compounds), several of which have reported bioactivities relevant to cosmetic applications. Biological assays were selected to evaluate skin-protective and anti-aging properties, including intracellular antioxidant activity (ROS reduction in HaCaT keratinocytes), elastase and tyrosinase inhibition, anti-inflammatory response (IL-6 and TNF-α modulation), cytotoxicity (MTT assay in HaCaT cells, following OECD/GHS criteria), and regenerative potential in 3D keratinocyte spheroids. Extracts exhibited potent intracellular antioxidant activity, particularly in the ethyl acetate fraction of the endocarp. Regarding anti-inflammatory activity, the endocarp extract demonstrated a significant selectivity index (SI = 4.8), indicating selective anti-inflammatory effects. Notably, nut extracts demonstrated remarkable regenerative activity, with up to 28.45% increase in 3D viability. The integration of chemical and biological data suggests that the metabolites annotated in bioactive fractions may underlie the observed antioxidant and anti-inflammatory effects. Overall, the underexplored fruit parts of *D. alata* represent a rich chemical space associated with relevant bioactivities, supporting their potential as sustainable cosmetic ingredients and contributing to the valorization of Cerrado biodiversity.

Keywords: *Dipteryx alata*; MS-DIAL; GNPS2; flavonoids; coumarins; antioxidant; elastase; cosmetics.

Reference: UNITED NATIONS. GHS. 9th rev. ed. New York; Geneva: United Nations, 2021.