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

Section: 03

CHEMICAL COMPOSITION AND POTENTIAL ACTIVITY OF Terminalia phaeocarpa AND Terminalia glabrescens IN METABOLIC AND NEURODEGENERATIVE DISORDERS

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Diabetes mellitus type 2 (T2D) is a chronic metabolic disorder characterized by hyperglycemia and has recently been recognized as a risk factor for neurodegenerative diseases, particularly Alzheimer's disease (AD). Hyperglycemia contributes to neurodegeneration through oxidative stress, inflammatory response, and the formation of advanced glycation end products. Thus, glycemic control is critical to mitigate both the development and progression of AD among individuals with T2D. The *Terminalia* genus (Combretaceae) comprises over 250 species, many of which are traditionally used for their medicinal properties. Our research group previously reported the hypoglycemic activity of leaf extracts from *T. phaeocarpa* Eichler and *T. glabrescens* Mart.[1] In the present study, we investigated the hypoglycemic potential of ethanolic bark extracts of both species by evaluating their *in vitro* α-glucosidase inhibition activity. At 10 µg/mL, inhibition reached 98.5 ± 0.8% for *T. phaeocarpa* and 98.07 ± 1.5% for *T. glabrescens*, with acarbose as positive control.[1] Additionally, we assessed the neuroprotective effects of leaf and bark extracts by measuring the reduction of glutamate-induced oxidative stress in SH-SY5Y neuroblastoma cells,[2] obtaining inhibition rates reaching up to 55.5 ± 5.9% at 30 µg/mL. The chemical composition of the extracts was preliminarily analyzed by UHPLC-DAD-ESI-MS/MS. The ellagitanin 1-α-*O*-galloylpunicalagin was identified in bark extracts from both species; it had previously been isolated from *T. phaeocarpa* leaves by our group and associated with the hypoglycemic activity of that extract. A total of eight phenolic compounds have so far been identified in the bark extract of *T. phaeocarpa*, including tannins, flavonoids, and organic acids. Notably, the bark extract of *T. glabrescens* was found to be rich in proanthocyanidins. These metabolites may contribute to the antioxidant activity observed for the extracts. To the best of our knowledge, this is the first report on the biological activities and chemical composition of bark extracts from *T. phaeocarpa* and *T. glabrescens*.

Keywords: *Diabetes, neurodegenerative diseases, Terminalia spp., UHPLC-DAD-ESI-MS/MS*

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