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REVIEW OF PHYTOCHEMISTRY AND PHARMACOLOGY OF *HOPEA PARVIFLORA*

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ABSTRACT

The *Hopea parviflora* tree, which belongs to the Dipterocarpaceae family, is endemic to the tropical evergreen forests of southwestern India, particularly those surrounding the Western Ghats in Karnataka. Extracts from H. parviflora leaves have strong antidiabetic and antioxidant properties. Hopea parviflora stem bark exhibits anti-inflammatory properties. Ellagic acid-3,3',4-trimethoxy-4'-O-a-L-rhamnopyranoside decreased the activity of pro-inflammatory mediators like NO, TNF-a, IL-6, 5-LOX, and COX-2 and enhanced the activity of the anti-inflammatory mediator IL-10 via blocking the NF-kB pathway. Ethanol, methanol, and water extracts of Hopea parviflora beddome sawdust were the most effective against Staphylococcus areus.

KEYWORDS: *Hopea parviflora*, Dipterocarpaceae, Anti-oxidant, Anti-diabetics, Anti-inflammatory, Anti-bacterial.

INTRODUCTION

Hopea parviflora, an endemic tree of the Dipterocarpaceae family, can be found in the tropical evergreen forests of south western India, particularly along the Western Ghats in Karnataka. The tree has economic value as a source of timber, and its bark is useful for tanning and astringency with slow dispersion. It is known as "vellaikongu" or "irubogam" in

Tamil and "kampakam" or "thampakam" in Malayalam. Hopea parviflora trees range in height from 30 to 37 meters. The bole may have a diameter of 150 cm with a straight bole, buttresses, and 6–10 mm of light brown or grey bark mottled with white. It is rough, vertically fissured, and fibrous, with a yellowish blaze and reddish-brown, slightly velvet-hairy branchlets.[1]

Scientific Classification

Kingdom: Plantae,

Family: Dipterocarpaceae,

Genus: Hopea,

Species: H. parviflora.

Leaf of Hopea parviflora.

Hopea parviflora bedd.

Chemical Constituents

The stem bark of Hopea parviflora yielded 9 compounds, including friedelin (1), friedelin-3b-ol (2), (-)-ampelopsin A (3), (-)-E-viniferin (4), (-)-hopeaphenol (5), vaticaphenol A (6), 2,4,8-trihydroxyphenanthhrene-2-O-glucoside (7), ellagic acid-3,3',4-trimethoxy-4'-O-a-L-rhamnopyranoside (8), and b-sitosterol-b-D-glucoside (9).[2] Alkaloids, flavonoids, tannins, steroids, triterpenoids, saponins, and glycosides were among the phytocompounds found in the leaves of H. parviflora extracts such as Petroleum ether, Chloroform, Ethyl acetate, Ethanol, and methanol, according to the qualitative preliminary phytochemical study. Compared to the other extracts, the Methanol extract included significant secondary metabolites. The measurement of phenolics, flavonoids, tannins, and saponins in different H. parviflora extracts. The yields of phenolics, flavonoids, tannins, and saponins in the ethanolic extract were higher than those of the other extracts, ranging from 18.9 to 39.9 mg/g.[3]

In addition to three recognized chemicals, two stilbenoids, (+)-parviflorol and (-)-ampelopsin A, were isolated from the bark of Hopea parviflora: (-)-e-viniferin, (-)-hopeaphenol, and (+)-balanocarpol.[4] Hopea parviflora extracts in aqueous, methanolic, and ethanolic forms While beddome sawdust tested negative for steroids, it tested positive for alkaloids, saponins, tannins, phenolics, and flavonoids. There were found to be significant levels of tannins and phenols.[5]

Anti-Oxidant activity

Hopea parviflora antioxidant qualities were evaluated using a variety of extracts using petroleum ether, chloroform, ethyl acetate, ethanol, and methanol. Superoxide, DPPH, FRAP, ABTS, and metal-chelating antioxidant properties were assessed for each of the five extracts. The methanolic extract exhibited the strongest antioxidant properties in the DPPH, FRAP, and superoxide tests. Additionally, the ethanol and ethyl acetate extracts showed good outcomes in the metal chelating and ABTS tests.[3]

Anti-bacterial activity

It was discovered that *Hopea parviflora* beddome sawdust extracts in water, methanol, and ethanol were the most efficient against Staphylococcus areus. With the exception of Escherichia coli, ethanol extracts were much more potent than other extracts against the majority of the test species.[5]

Anti-diabetic activity

Five leaf extracts were investigated for their antidiabetic potential utilizing standard in vitro α-amylase and α-glycosidase inhibition assays. In the α-glycosidase and α-amylase inhibition tests, the methanolic extract's IC50 values were 308.2 and 230.2 µg/mL, respectively, suggesting possible antidiabetic effects.[3]

Anti-inflammatory Activity

Compounds extracted from the stem bark of H. parviflora that have anti-inflammatory properties. RAW 264.7 macrophages showed reduced toxicity to ellagic acid-3,3',4-trimethoxy-4'-O-a-L-rhamnopyranoside than to the other separated compounds. In LPS-stimulated RAW264.7 macrophages, ellagic acid-3,3',4-trimethoxy-4'-O-a-L-rhamnopyranoside decreased the activity of pro-inflammatory mediators such as NO, TNF-a, IL-6, 5-LOX, and COX-2 and enhanced the action of anti-inflammatory mediator IL-10 through inhibition of the NF-kB pathway.

DISCUSSION

The tropical evergreen woods of southwestern India, especially those around the Western Ghats in Karnataka, are home to the endemic *Hopea parviflora* tree of the Dipterocarpaceae family. Leaves of *H. parviflora* extracts show significate antioxidant activity and antidiabetic activity. The stem bark of *Hopea parviflora* shows anti-inflammatory activity By blocking the NF-kB pathway, ellagic acid-3,3',4-trimethoxy-4'-O-a-L-rhamnopyranoside increased the activity of the anti-inflammatory mediator IL-10 and reduced the activity of pro-inflammatory mediators such NO, TNF-a, IL-6, 5-LOX, and COX-2. Ethanol, methanol, and water extracts of Hopea parviflora beddome sawdust were the most effective against Staphylococcus areus.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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