

Chapter 4

Phytochemical and Pharmacology Effect of Piper betle L.

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ABSTRACT

Piper betle L. is widely recognized for its diverse medicinal properties, including antimicrobial activity, therapeutic efficacy in dermatological disorders, analgesic effects, and its beneficial role in managing respiratory disorders. The plant contains a variety of bioactive chemical constituents, such as hydroxychavicol, chavibetol, chavibetol acetate, caryophyllene, allyl pyrocatechol diacetate, camphene, chavibetol methyl ether, eugenol, α -pinene, β -pinene, limonene, sabinene, 1,8-cineol, and allyl pyrocatechol monoacetate. These compounds exhibit notable pharmacological activities, contributing to the potential as stimulants with properties such as antiplatelet, anti-inflammatory, immunomodulatory, gastroprotective, and antidiabetic activities.

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This review aims to provide a comprehensive overview of the phytochemical constituents and pharmacological properties of Piper betle L., with particular emphasis on its antimicrobial, antioxidant, antidiabetic, anticancer, and anti-gout potential.

INTRODUCTION

Piper betle L. (Piperaceae), commonly known as a perennial creeping plant belonging to the family Piperaceae, is native to central and eastern Peninsular Malaysia with a distribution extending to East Africa and tropical countries of Asia (Biswas, Anand, Saha, Kant, Mishra, Masih, Bar, Pandey, Jha, Majumder, Das, Gadekar, Shekhawat, Kumar, Radha, Proćków, Lastra, & Dey, 2022). *Piper betle* is notable for its yellowish-green to dark green, glossy leaves that emit a distinctive and pleasant aroma. These aromatic leaves owe their sweet to pungent flavor primarily to the presence of essential oils. Morphologically, the leaves are heart-shaped, simple, alternate, stipulate, and petiolate. Their size varies by cultivar, typically ranging from 7 to 15 cm in length and 5 to 14 cm in width. The leaf surface is smooth and leathery, with shapes ranging from ovate to oblong or elliptic, and bases that are acuminate, oblique, or rounded. Traditionally, betel leaves have been widely used as natural mouth fresheners and for treating various ailments such as colds, coughs, bronchial asthma, rheumatism, stomach pain, bad breath, abscesses, conjunctivitis, constipation, gum swelling, and minor wounds. Their essential oils exhibit significant antibacterial, antifungal, and antiprotozoal properties (Das et al., 2016). In this review, we provide a comprehensive summary of the phytochemical characteristics and pharmacological effects of the *Piper betle* L.

MATERIALS AND METHODS

This review is designed to retrieve from the databases of Google Scholar, SciFinder, PubMed, Science Direct, Web of Science, and Springer using the keywords of “Piper betle”, “phytochemistry,” “pharmacology,” “anti-inflammatory” “gout,” “acid uric” and related terms. These articles were published on scientific journals, Vietnam herbal medicine books and magazines, as well as thesis’s, were obtained. This plant was utilized in the World Flora (<https://www.worldfloraonline.org>) database to determine the nomenclature and acquire information on *Piper* genus.

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