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# Anticancer Potential of Bioactive Compounds in *Premna serratifolia*, *Premna odorata*, and *Premna tomentosa*: A Review of In Vitro Evidence

[Cancer Management and Research](#) • Review • Open Access • 2025 •

DOI: 10.2147/CMAR.S516204

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## Abstract

The genus *Premna* (Lamiaceae), widely distributed across tropical and subtropical regions, is renowned for its ethnomedicinal applications, including cardiotonic, antimicrobial, hepatoprotective, and antitumor properties. Despite these promising uses, the current body of literature relies predominantly on in vitro evidence, with limited knowledge regarding in vivo validation, metabolism, and bioavailability. This review synthesizes findings from the past decade on the *Premna serratifolia* group (*P. serratifolia*, *P. odorata*, and *P. tomentosa*), focusing on their bioactive compounds and mechanisms of

in vitro anticancer activity. The compounds identified— such as flavonoids, terpenoids, and steroids— exhibit diverse actions, including cell cycle arrest, apoptosis induction, inhibition of metastasis, oxidative stress modulation, and autophagy. Key compounds like quercetin, kaempferol, and stigmasterol demonstrate multi-targeted actions, effectively regulating pathways such as PI3K/AKT and NF- $\kappa$ B while selectively targeting cancer cells. These findings underscore chemopreventive potential from *P. serratifolia* group and their ability to complement conventional cancer therapies, potentially reducing side effects and overcoming drug resistance. Furthermore, the review validates the ethnomedicinal use of *Premna* species and bridges traditional knowledge with modern oncology. However, the absence of comprehensive in vivo and clinical data warrants further research to fully harness these compounds' potential. This study highlights *P. serratifolia*, *P. odorata*, and *P. tomentosa* as promising sources for novel plant-derived anticancer agents, offering opportunities for future drug discovery. © 2025 Febriyanti et al.

## Author keywords

chemoprevention; cytotoxic activity; multi-target mechanisms; natural product-based therapy; phytochemicals

## Indexed keywords

### EMTREE drug terms

antineoplastic agent; flavonoid; kaempferol; natural product; phytochemical; quercetin; steroid; stigmasterol; terpenoid

### EMTREE medical terms

antimicrobial activity; antineoplastic activity; apoptosis; autophagy (cellular); bioavailability; cancer cell; cancer inhibition; cell cycle arrest; chemoprophylaxis; controlled study; cytotoxicity; drug analysis; drug development; drug resistance; drug therapy; human; human cell; in vitro study; Lamiaceae; metastasis inhibition; nonhuman; oxidative stress; review; traditional medicine

## Chemicals and CAS Registry Numbers

Unique identifiers assigned by the Chemical Abstracts Service (CAS) to ensure accurate identification and tracking of chemicals across scientific literature.

kaempferol

520-18-3