OSV-44

Phytosterols as Potential Therapeutics in Modulating Human Female Reproductive Health

Rizwan Ahamed Najimudeen[1], Josna Wilson[2], Priya Dharshini Anbalagan[3], Inbathamizh L[1,2*]

[1]School of Medical Science and Technology, Indian Institute of Technology Kharagpur, Kharagpur, India.

[2]Analytics Avenue for Research and Development, Chennai, India.

[3]Department of Biotechnology, Sathyabama Institute of Science and Technology, Chennai, India.

[4]Department of Medical Genetics, Manipal Hospital, HAL Old Airport Road, Bengaluru, India.

Phytosterols, naturally occurring plant-derived sterols structurally analogous to cholesterol, are increasingly recognized for their broad-spectrum therapeutic potential. Beyond their well-established role in lowering circulating low-density lipoprotein (LDL) cholesterol, phytosterols modulate multiple biological processes, including lipid metabolism, immune regulation, oxidative stress mitigation, and tumour suppression. Their ability to interact with membrane dynamics and receptor-mediated pathways highlights their relevance in both metabolic and cellular homeostasis. Recent advances in computational approaches, such as in-silico modelling, molecular docking, and systems bioinformatics, have provided crucial mechanistic insights, revealing how phytosterols engage with molecular targets and alter downstream signalling networks. This study explores the under-investigated contributions of phytosterols to female reproductive health, with a particular focus on their role in preventing and managing reproductive system disorders. Emerging evidence suggests that phytosterols can influence endocrine function, modulate estrogen and progesterone-related signalling pathways, and attenuate oxidative and inflammatory stressors. Furthermore, their antioxidant and immunomodulatory properties may offer protection against reproductive cancers, while their impact on lipid regulation could benefit conditions linked to metabolic syndrome and reproductive dysfunction. By synthesising findings from experimental studies with computational analyses, this work highlights the potential of phytosterols as adjunctive or novel therapeutic agents in reproductive medicine. The study underscores the need for translational research and clinical validation to establish dosage, bioavailability, and safety parameters. Collectively, these insights pave the way for incorporating phytosterols into targeted strategies aimed at improving female reproductive health outcomes.

Keywords: Bioactive compounds, Female Reproductive Systems, Network pharmacology, Phytosterols, Traditional medicine

***Correspondence:** Inbathamizh L
inbathamizh.bte@sathyabama.ac.in