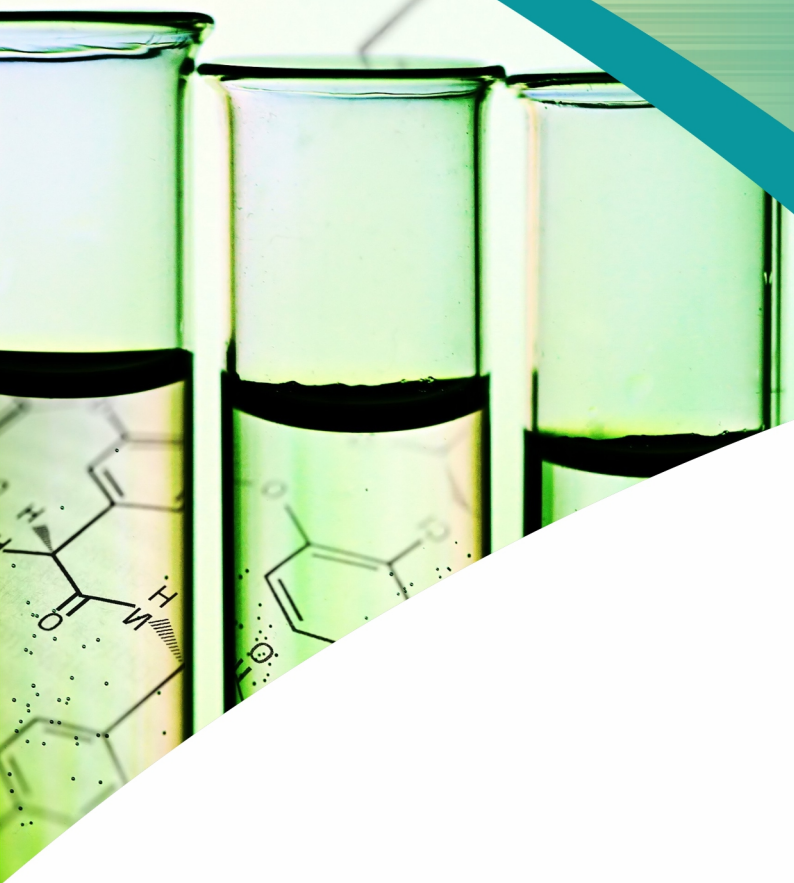


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# Extraction, Biotransformation and *In-vitro* Biological Activity of *Gymnema sylvestre* Leaves Extracts and its Fermented Products

Jalaluddin and Bibhu Prasad Panda

Microbial & Pharmaceutical Biotechnology Laboratory, Department of Pharmacognosy and Phytochemistry, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi.

## ABSTRACT

**Background:** Diabetes mellitus is a metabolic disorder which is characterized by an increase in blood glucose level. In the Indian traditional system of medicine, various plant-based medicine are used to treat this disease; among them *Gymnema sylvestre* is most commonly used. *G. sylvestre* plant extract contains various structurally related saponin glycosides known as gymnemic acids, known for its antidiabetic potential. Fermented products are known to have more therapeutic potential as compared to unfermented products, for the same purpose we have carried out biotransformation of *G. sylvestre* plant extract.

**Methods:** Previously dried *G. sylvestre* leaves were grounded, and hydroalcoholic (70%) extraction was carried out using soxhlet apparatus. Total crude extract, total saponin, gymnemic acid, and gymnemagenin content were analyzed in hydroalcoholic plant extract, 5% w/v plant extract was biotransformed with *Lactobacillus casei* probiotic by incubating plant extract with *L. casei* ( $1 \times 10^6$  CFU) for 48h under anaerobic condition in MRS media, gymnemic acid, and gymnemagenin contents were analyzed using toluene: chloroform: methanol (5:8:3, v/v/v) as a solvent system and densitometric HPTLC scanning was performed at 610 nm after derivatization. Antioxidant potential,  $\alpha$ -amylase,  $\alpha$ -glucosidase, and DPPH assay of *G. sylvestre* extract and its fermented products were carried out to check the antidiabetic potential of plant extract and its fermented product.

**Results:** *G. sylvestre* leaves showed a yield of 32.35% w/w. The total saponin content was found to be 8.5% w/w of leaves, and 25.68% w/w of the total plant extract. The biotransformation process significantly increases gymnemagenin content from 1.21 to 3.34  $\mu\text{g/g}$ . The antioxidant potential ( $\text{IC}_{50}$ ) were found as 45.4  $\mu\text{g/mL}$ , for *G. sylvestre* leaves extract and 38.4  $\mu\text{g/mL}$  with its fermented product.

**Conclusion:** Thus, the present study gives an insight into the biotransformation of gymnemic acid to gymnemagenin and its antidiabetic potential for the management of hyperglycemia.



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