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Gastrointestinal Anti-Inflammatory Activity of Plant-Derived Polyphenols in Experimental Colitis Models

Dr. Noor Aisyah Rahman

Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM), Malaysia

Objectives: This study explores the anti-inflammatory and mucosal-protective potential of selected plant-derived polyphenols in chemically induced experimental colitis.

Material and methods: Colitis was induced in rats using 5% dextran sulfate sodium (DSS). Animals were treated with polyphenol extracts (50, 100, and 200 mg/kg) derived from green tea, grape seed, and pomegranate. Clinical signs, colon weight/length ratio, and disease activity index were recorded. Tissue samples were examined histopathologically and evaluated for inflammatory cytokines (TNF- α , IL-6), oxidative stress markers, and myeloperoxidase activity.

Results: Polyphenol-treated groups showed notable reductions in colonic inflammation, ulceration, and edema. Cytokine levels were significantly reduced, and antioxidant enzyme activities improved in a dose-dependent manner. Histological sections revealed better mucosal integrity and decreased neutrophil infiltration.

Conclusion: Plant-derived polyphenols exhibit strong gastrointestinal anti-inflammatory effects and represent a potential therapeutic option in the management of inflammatory bowel disease.

Biography

Dr. Noor Aisyah Rahman is a medical scientist and senior lecturer at the Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM). Her research focuses on natural anti-inflammatory compounds, gastrointestinal mucosal healing, and oxidative stress modulation. She has conducted extensive work on polyphenol-rich plant extracts and their applications in inflammatory bowel disease models. Dr. Rahman has published widely in gastroenterology and phytochemistry journals, and her research group continues to explore novel plant-based therapeutics for chronic gastrointestinal disorders. She is committed to advancing evidence-based herbal medicine within Southeast Asian health research systems.

nooraisyah.rahman@ukm.edu.my

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