

## Anti-inflammatory and hypolipidemic properties of an Ayurvedic polyherbal formulation and its raw materials

K. D. C. Madhushika<sup>1,2</sup>, S. D. Hapuarachchi<sup>1</sup>, T. S. Suresh<sup>3</sup>, P. K. Perera<sup>1</sup>,  
N. D. Kodithuwakku<sup>1</sup>, J. M. Dahanayake<sup>1</sup>, L. A. D. M. Arawwawala<sup>4</sup>

<sup>1</sup>Department of Ayurveda Pharmacology, Pharmaceutics and Community Medicine, Faculty of Indigenous Medicine, University of Colombo, Sri Lanka

<sup>2</sup>Faculty of Graduate Studies, University of Sri Jayewardenepura, Sri Lanka

<sup>3</sup>Faculty of Medicine, University of Sri Jayewardenepura, Sri Lanka

<sup>4</sup>Herbal Technology Section, Industrial Technology Institute, Sri Lanka

Scientific validation of pharmacological properties of Ayurvedic polyherbal formulations (APF) may facilitate the discovery of plant-based therapeutics for managing chronic systemic diseases. This study was designed to evaluate the *in-vitro* anti-inflammatory and hypolipidemic activities of APF and its component plant materials. It was prepared according to traditional methods by boiling 20.00 g from each raw material, *Sida alnifolia* - whole plant (SA), *Aegle marmelos* - root bark (AM) and *Zingiber officinale* -rhizome (ZO) with water (1920 mL) and further concentrating to obtain the hot aqueous extract (240 mL). The individual raw materials were also separately extracted in the same manner. All the aqueous extracts were freeze-dried to obtain the powder form. In vitro anti-inflammatory and hypolipidemic activities were assessed using the egg albumin denaturation and Liebermann–Burchard methods, with diclofenac and atorvastatin as the standards, respectively. APF, along with SA, AM, and ZO, exhibited notable anti-inflammatory activity, in the concentration range of 0.5 mg/mL to 10.0 mg/mL. All extracts showed dose-dependent hypolipidemic activity, with IC<sub>50</sub> values ranging from 59.29 ± 0.42 µg/mL to 291.19 ± 5.83 µg/mL; APF, SA, AM, and ZO recorded IC<sub>50</sub> of 59.29 ± 0.42 µg/mL, 291.19 ± 5.83 µg/mL, and 67.86 ± 6.04 µg/mL, respectively, versus atorvastatin (17.32 ± 0.15 µg/mL). Qualitative phytochemical screening of SA, AM, and ZO aqueous extracts revealed the presence of flavonoids, alkaloids, steroids, tannins, and phenol. Therefore, it could be assumed that the anti-inflammatory and hypolipidemic activity of APF may be due to the numerous phytochemicals present in its raw materials.

**Keywords:** Hypolipidemic, Anti-inflammatory, *Sida alnifolia*, *Aegle marmelos*, *Zingiber officinale*