

Evaluation of the anti-bacterial and anti-fungal activity of xanthenes obtained via semi-synthetic modification of α -mangostin

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The fruit of *Garcinia mangostana* Linn. (mangosteen), of the family Guttiferae, has been used in Asian traditional medicines for the treatment of various conditions including diarrhea, dysentery, suppuration, leucorrhoea, chronic ulcers, gonorrhoea, wounds and skin infections. Xanthenes are naturally-occurring compounds with a distinct chemical structure, known as tricyclic aromatic system, with known antibacterial properties. Mangosteen fruit extracts were shown to contain different xanthenes, identified by HPLC analysis: α -mangostin, β -mangostin, γ -mangostin, 8-desoxygartanin and gartanin, two isoprenylated xanthenes and 9-hydroxycalabaxanthone. α -Mangostin (3,6,8-trihydroxy-2-methoxy-1,7-bis(3-methyl but-2-enyl)xanthen-9-one) is a compound purified as a yellow crystalline solid, with molecular mass 410.45 g/mol, having a xanthone core structure. The microbial contamination in food packaging has been a major concern that has paved the way to search for novel, natural anti-microbial agents, such as modified α -mangostin. In the present study, 12 synthetic analogs were obtained through semi-synthetic modification of α -mangostin (I) by Ritter reaction, reduction by palladium-carbon (Pd-C), alkylation and acetylation. The evaluation of the anti-microbial potential of the synthetic analogs showed higher bactericidal activity than the parent molecule. The anti-microbial studies proved that II showed high anti-bacterial activity whereas III showed the highest anti-fungal activity. Due to their microbicidal potential, modified α -mangostin derivatives could be utilized as active anti-microbial agents in materials for the biomedical and food industry.

Biography

Amin Majdalawieh earned a PhD in Biochemistry and Molecular Biology from Dalhousie University, Halifax, Canada. He pursued a post-doctoral fellowship in the Department of Biochemistry & Molecular Biology at Dalhousie University, Halifax, Canada. He received several research awards. His main research interests include cardiovascular disease (atherosclerosis), macrophage cholesterol homeostasis, obesity, cancer, signal transduction, inflammation, natural products, medicinal chemistry, and nutritional immunology. He published his research work in several prestigious international journals.