LC-ESI-MS/MS Profile of Annona Muricata Linn. Extracts and Evaluation of In Vitro Antioxidant and Anticancer Activities

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Abstract

Annona muricata Linn. is a member of annonaceae family comprising approximately 130 genera and 2300 species widely grown and distributed in tropical and subtropical regions around the world, belongs to the medicinally important genes annona. Annona muricata Linn. plant leaves extracted by maceration process and phytochemical screening, identification of phenolic compound in ethyl acetate extract by HPLC, HPLC-ESI-MS/MS, NMR was characterized. The antioxidant activity by DPPH radical scavenging assay; FRAP assay and antimicrobial activity using multi resistance bacteria. In the present work the extracts have been evaluated for their antioxidant and anticancer activity for their chemotherapeutic potentials

Custard apples are a common commercial fruit grown in tropical and subtropical climates. These fruits have a delicious flavour and a creamy texture, as well as a high nutritional value. Fresh custard apple production in Australia is 3000 tonnes per year, and the soft edible pulp component of the apples is utilised to manufacture a variety of food products such as jams, candies, and drinks. The soursop custard apple (Annona muricata), also known as 'graviola' and 'guanabana,' is a classic custard apple fruit produced for its edible and medicinal properties. Soursop is used in a variety of commercial foods, such as juice, sweets, and sherbets. Pink's Mammoth (Annona atemoya cv.) and African Pride (Annona atemoya cv.) are two other well-known custard apple varieties. African Pride is high in phytochemicals (catechin and epicatechin gallate), as well as phytonutrients like carbs and crude proteins, whereas Pink's Mammoth is abundant in minerals like calcium and zinc.

Custard apple phytochemicals have recently attracted a lot of attention, especially for the study of phenolic compounds. Polyphenols are secondary metabolites found in a wide range of plants, such as fruits, vegetables, and medicinal plants. Based on their structure, they can be divided into five categories: phenolic acids, flavonoids, lignans, stilbenes, and phenol alcohols. Polyphenols can scavenge free radicals directly or indirectly through a variety of ways. Polyphenols' ability to scavenge free radicals is linked to their structure, as they donate hydrogen atoms or electrons to free radicals, stabilising the reactive species. Total phenolic content (TPC), total flavonoid content (TFC), and total tannin content (TTC) are examples of phenolic content assays, whereas antioxidant capacity of plants can be measured and estimated using a variety of assays such as 2,20-diphenyl-1-picrylhydrazyl (DPPH), 2,20-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS), ferric reducing antioxidant (TAC).

Separation and characterisation of particular phenolic compounds with substantial antioxidant potential in custard apples are of great interest, in addition to assessing phenolic levels and antioxidant potential. Using high performance liquid chromatography with a photodiode array (HPLC-PDA) and LC-MS/MS methods, various phenolic compounds such as catechin and epicatechin were previously found in distinct custard apples. HPLC-PDA allows the quantification of phenolic compounds, whereas liquid chromatography coupled with quadrupole time-offlight mass spectrometry (LC-MS-QTOF-MS/MS) is a high-resolution and highly sensitive technique widely used for the screening and characterization of phenolic compounds in various plant materials. Although several bioactive chemicals from custard apple fruits have been identified, only a few studies have looked at the entire phenolic profiles of custard apples growing in Australia. Furthermore, studies on waste materials such as the peel and seed of custard apples, which have the potential to be used for bioactive component extraction, are lacking.

The phenolic profiles of three different Australian cultivated custard apples (soursop, African Pride, and Pink's Mammoth) were described and quantified using LC-ESI-QTOF-MS/MS in this study. TPC, TFC, and TTC measurements, as well as DPPH, ABTS, FRAP, RPA, •OH-RSA, FICA, and TAC antioxidant assays, were all carried out. The findings of this study allow us to better understand the phenolic composition of different Australian-grown custard apples in order to commercialize them for use in functional, nutraceutical, and pharmaceutical goods. The African Pride peel showed the maximum phenolic concentration (61.69 1.48 mg GAE/g) in the TPC experiment, followed by Pink's Mammoth and soursop peel. In comparison to the other types, African pride exhibited the highest phenolic content in both the seed and pulp portions (1.40 0.07 mg GAE/g and 3.81 0.17 mg GAE/g, respectively). Manochai et al. [5] previously reported values ranging from 33.8 to 140.4 mg GAE/g, with African pride having greater levels than those identified in our investigation. The difference in total phenolic contents in the custard apple could be attributed to the varied solvent concentrations utilised for extraction. The peel extracts exhibit considerably greater levels of total phenolic content (p 0.05) than the seeds and pulps in terms of TP

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