Immunomodulatory activities of flavonoids, monoterpenoids, triterpenoids, iridoid glycosides and phenolic compounds of Plantago species.


Source

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Abstract

A number of Plantago spp. especially P. major has long been used in the treatment of diseases such as infection, inflammation and cancer. In this study, we evaluated the immunomodulatory activities of five chemical classes of pure compounds obtained from the Plantago genus on human peripheral blood mononuclear cells (PBMC). Studies were conducted on lymphocyte transformation by BrdU immunoassay and secretion of interferon-gamma (IFN-gamma) using an ELISA assay. Results showed that the water-soluble compounds, namely aucubin, chlorogenic acid, ferulic acid, p-coumaric acid and vanillic acid, enhanced the activity of human lymphocyte proliferation and secretion of IFN-gamma. Among the water-insoluble compounds, with the exception of luteolin, both baicalein and baicalin showed an enhancement of the human PBMC. Although oleanolic acid and ursolic acid of the triterpenoids did not significantly affect the proliferation of PBMC, they exhibited a strong stimulation of IFN-gamma secretion. Linalool, a monoterpenoid, showed a similar immunomodulatory activity as the triterpenoids. The present study concludes that the tested compounds, which possess immunostimulating activities, may contribute to the traditional claims of Plantago-based natural products used in treating cancers and infectious diseases.

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