

Title Immunomodulatory and anticancer activities of phenolics from emblica fruit (*Phyllanthus emblica* L.)

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Abstract

There is a paucity of studies on the immunomodulatory properties of fruit extracts of emblica with the emphasis on lymphocytes. Therefore, the aim of the study was to evaluate the immunomodulatory properties and anticancer potential of six phenolic compounds from emblica fruit by in vitro proliferation assay. Effects of these compounds on splenocyte proliferation and the cytotoxicity to both human breast cancer cell (MCF-7) and human embryonic lung fibroblast cell (HELFL) were determined by the MTT method. Significantly stimulatory effects ($P < 0.05$) were found for geraniin and isocorilagin. The concentration of geraniin, quercetin 3- β -d-glucopyranoside, kaempferol 3- β -d-glucopyranoside, isocorilagin, quercetin, kaempferol and rutin to obtain 50% of stimulatory effect was 56, 123, 242, 42, 73, 93 and 92 $\mu\text{g/ml}$, respectively. The assay of anticancer activities suggested that geraniin and isocorilagin exhibited higher cytotoxicities than other compounds against MCF-7 with IC_{50} of 13.2 and 80.9 $\mu\text{g/ml}$, respectively. Isocorilagin exhibited a strong cytotoxicity to HELFL cell with IC_{50} of 51.4 $\mu\text{g/ml}$. Geraniin, quercetin, kaempferol and their glycosides had weak cytotoxicity against HELFL cells. Paclitaxel showed a strong cytotoxicity to MCF-7 and HELFL with IC_{50} of 6.8 and 14.5 $\mu\text{g/ml}$, respectively. These findings are in line with the reported potent antioxidant activity. These results suggested that the antitumour activity of these compounds might be achieved by immunomodulatory properties which could partially be attributed to their antioxidant activity.