



STUDIES ON CYTOSTATIC ACTIVITY OF ETHANOLIC EXTRACT OF MORINDA CITRIFOLIA L NONI FRUIT

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Abstract

Morinda citrifolia is used in Indian system of medicine for the treatment of variety of diseases and enriched with flavinoids, anthroquinone, glycoside and safe herbal drugs. Present work is to study the effect of ethanolic extract of Noni on various human cell lines to investigate the safety of *morinda citrifolia*. *Morinda citrifolia* (MCF-ET) L fruit ethanolic extract have been studied against inhibition of human cell such as HeLa, Vero, HEL and CRFK cells (Crandell-Rees Feline Kidney cells). Cytotoxicity of *Morinda citrifolia* were investigated by microscopic observation (concentration of extract required to alter normal cell morphology) and tetrazolium based-MTS assay. Ethanolic extract exhibited inhibitory effect on human cells only at high concentration in cells. The ethanolic extract (MCF-ET) displayed cytostatic activity against HeLa and CRFK Cell by both MCPE and MTS assay at the concentration (IC₅₀) of more than 100 µg/ml. Anthroquinone, flavinoid and micronutrients are the principle active constituents of *Morinda citrifolia*, which may responsible for safety profile of Noni. This result presented herein substantiated the basis for noni exhibits cytotoxicity only at higher concentration and safe herbal drug.

Keywords: *Morinda citrifolia*, Cytostatic activity, Ethanolic extract, Vero, HeLa, HEL, CRFK.

Introduction

Morinda citrifolia L (Noni) is a versatile medicinal plant with a broad spectrum of pharmacological activities. *Morinda citrifolia* have been reported to possess hepatoprotective^{1,2} anticancer³, immunomodulatory⁴, anti-inflammatory⁵, wound healing⁶, antioxidant⁷, anti-tubercular⁸ and wide spectrum of biological activity⁹, anti-HIV¹⁰⁻¹². Recently much attention has been devoted for searching potential safe herbal medicines from natural products for the treatment of various diseases and *morinda citrifolia* used for the treatment of variety of disease in human cell line safe herbal drug¹³. The present work is to study the inhibitory activity of ethanolic extract of the fruit powder of *morinda citrifolia* against Vero, HeLa, HEL and CRFK cells to investigate the safety and cytotoxicity.

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Material and Methods

Preparation of Extracts

The fruit of *morinda citrifolia* were dried under shade and powdered. The powder is extracted with ethanol for five days by cold maceration. It is then filtered to get the extracts evaporated to dryness under vacuum. The dried ethanolic extract (MCF-ET) is used for cytotoxicity studies in HeLa, HEL, Vero and CRFK cells.

Cell culture

Vero, HeLa, HEL and CRFK (Crandell-Rees Feline Kidney cells) cells.

Cytotoxicity assay

Morinda citrifolia L fruit ethanolic extract (MCF-ET) have been studied against inhibition of human cell such as HeLa, Vero, HEL and CRFK cells (Crandell-Rees Feline Kidney cells). Cytotoxicity of *Morinda citrifolia* were investigated¹⁴ by microscopic observation (concentration of extract required to alter normal cell morphology) and tetrazolium based-MTS assay. Parameters CC₅₀:50% cytotoxic concentration, as determined by measuring the cell viability with the colorimetric formazan-based MTS assay and MIC

(Minimum Inhibitory Concentration) concentration of extract required to cause a microscopically detectable alteration of normal cell morphology were evaluated for the assessment of cytotoxicity in various cell and the same were shown in table 1.

Table 01: Cytotoxicity of ethanolic extracts *morinda citrifolia* L Noni in cell cultures

| Cell line | MIC ^a ₅₀ µg/ml | CC ^b ₅₀ µg/ml |
|-----------|--------------------------------------|-------------------------------------|
| | MCPE | MTS |
| Vero | >100 | |
| HEL | >100 | |
| HeLa | >100 | >100 |
| CRFK | >100 | >100 |

^aRequired to cause a microscopically detectable alteration of normal cell morphology.

^b50% Cytotoxic concentration, as determined by measuring the cell viability with the colorimetric formazan-based MTS assay.

Results

Ethanolic extract of *Morinda citrifolia* L have been studied inhibition of growth against HeLa, Vero, HEL and CRFK cells. Cytotoxicity of *Morinda citrifolia* was investigated by microscopic observation (concentration of extract required to alter normal cell morphology) and tetrazolium based-MTS assay. Ethanolic extract exhibited inhibitory effect on human cells only at high concentration in Vero, HeLa, CRFK and HEL cells (MIC more than 100 µg/ml). The ethanolic displayed cytostatic activity against HeLa and CRFK cells by both MCPE and MTS assay at the concentration (CC₅₀) of more than 100 µg/ml.

Discussion

The Polynesians utilized the whole Noni plant in various combinations for herbal remedies^{15,16} such as arthritis, diabetes, high blood pressure, muscle aches and pains, menstrual difficulties, headaches, heart disease, AIDS, cancers, gastric ulcers, sprains, mental depression, senility, poor digestion, atherosclerosis, blood vessel problems and drug addiction. Noni reported to possess hepatoprotective and safe herbal medicine. From this study ethanolic extract of fruit of *morinda citrifolia* exhibits cytotoxicity in human cells only at high concentration and further studies regarding isolation of active constituents from ethanolic extract under way.

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