In vitro anticancer screening of ethanolic extracts of Macaranga peltata leaves

Sajith Palakka and V Ganesan

Abstract
Cancer is one of the most prominent diseases in humans and currently there is considerable scientific and commercial interest in the continuing discovery of new anticancer agents from natural product sources. Studies of the pharmacological activities of the genus Macaranga indicate the potential of extracts and pure compounds to display specific medical effects. Previous investigation on the chemistry and pharmacology of this genus showed that its crude extracts and compounds displayed interesting bioactivity profiles, possessing various bioactivities including anticancer, antioxidant, antimicrobial, anti-inflammatory and other different types of biological activities [1]. Cytotoxicity property of extracts of leaves of Macaranga peltata was carried out by MTT method against Sk-Mel-28 and HeLa cell lines.

Materials and methods
Cell and cell culture process
Cancer cell lines have been widely used for research purposes and proved to be a useful tool in the genetic approach, and its characterizations shows that they are, in fact, an excellent model
for the study of the biological mechanisms involved in cancer.

**Sk-Mel-28**

Human melanoma cells (from NCCS) were grown and maintained in 25cm² tissue culture flasks in a humidified atmosphere (95% air/5% CO₂) at 37°C in RPMI-1640 medium, containing 10% FBS, glutamine (2mM), and antibiotics (100U/ml penicillin, 100 µg/ml streptomycin, and 250ng/ml amphotericin B).

**HeLa**

Cervix adenocarcinoma cells (from NCCS) was maintained in Dulbecco’s modified eagles media supplemented with 10% FBS and grown to confluency at 37°C in 5% CO₂ in a humidified atmosphere in a CO₂ incubator. The cells were trypsinized (500µl of 0.025% trypsin in PBS/0.5 mM EDTA solution (Himedia) for 2 minutes and transferred to T flasks.)

Macaranga peltata leaves were collected from Calicut district, Kerala, India and authenticated by Dr. Minoo Diwakar, HOD, Dept. of Botany, Providence Women’s College, Calicut. Shade dried leaves of Macaranga peltata was extracted with 95% ethanol in soxhlet and the solvent was evaporated to get the extract. The extracts were pooled and concentrated by distillation under reduced pressure till a syrupy consistency was achieved. Viable cells were determined by spectrophotometer. The concentration of drugs was achieved.

The ethanolic extract of Macaranga peltata leaves were subjected to MTT assay using HeLa and SK-Mel-28 cell lines. The extract gave promising result for the anticancer activity on both the cell lines with better effectiveness against the cervical cell cancer. A thorough study to reveal the active cytotoxic principles and their mechanism would be promising prospective to develop an effective drug in management of cancer.

**References**


**Results and discussion**

MTT assay is a sensitive method for evaluating cytotoxic activity against cancer and non-cancerous cell lines. Phytochemical screening of the leaves of Macaranga peltata confirmed the presence of phenols, flavonoids, alkaloids and glycosides. MTT assay of the ethanolic extracts of the leaves were carried out using Sk-Mel-28 and HeLa cell lines. The present study demonstrated the cytotoxic action of extracts of Macaranga peltata against the two cell lines namely Sk-Mel-28 and HeLa. Concentration required to produce inhibition of viability of 50% cell were calculated. Ethanol extract of the plant drug produced a cytotoxic effect on both cell lines with an IC₅₀ of 156.9 µg/ml on cervical cell lines and 256.4µg/ml on skin carcinoma cell lines.

Cytotoxic actions of the extract is due to the presence of specific phytochemicals present in the extract. The extracts produced a dose dependent inhibitory action. Presence of flavonoids and alkaloids in the ethanolic extracts exerted antiproliferative activity by inducing apoptosis in cancer cell lines. The association between flavonoids and reduced cancer risk has been reported in earlier studies.

**Conclusion**

The ethanolic extract of Macaranga peltata leaves were subjected to MTT assay using HeLa and SK-Mel-28 cell lines. The extract gave promising result for the anticancer activity on both the cell lines with better effectiveness against the cervical cell cancer. A thorough study to reveal the active cytotoxic principles and their mechanism would be promising prospective to develop an effective drug in management of cancer.