

Research Paper :

The root part of *Costus speciosus* possesses *in vitro* cytotoxic potential against human cancer cell lines from colon, liver and prostate origin

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ABSTRACT

The aim of this research work was to evaluate the anticancer potential of the extracts of the traditional medicinal plant *i.e.* *Costus speciosus*. The extracts of the root part were screened for *in vitro* cytotoxicity by means of SRB assay on five human cancer cell lines : colon cancer cells (COLO-205, HT-29, SW-620), liver cancer cells (HEP-2) and prostate cancer cells (DU-145). The assay yielded very interesting and significant consensus from medicinal view point as all the extracts of the plant showed remarkable cytotoxic effect on each human cancer cell line in the range of 70-92%.

Key words : *Costus speciosus*, Human cancer cells, *In vitro* cytotoxicity, SRB-assay

C*ostus speciosus* (Koenig ex Retz.) J.E.Smith, commonly known as Keukand belonging to the Zingiberaceae family, is a succulent herb with long leaf, white flowers and fruits, globose or ovoid capsules. The plant is native to many Pacific Islands and is found throughout India in moist localities.

Six compounds were isolated from the rhizome of *Costus speciosus* and elucidated as diosgenin(1), prosapogenin B of dioscin (2), diosgenone(3), cycloartenol (4), 25-en-cycloartenol(5) and octacosanoic acid (6) of which compounds 3-6 were obtained from *Costus speciosus* for the first time (Qiao *et al.*, 2002). Rhizome of the plant possesses antifungal principle (Bandara *et al.*, 1988) and hypoglycemic effects (Mosihuzzaman *et al.*, 1994). Different parts of the plant possess polyphenol content and antioxidant activity (Vijayalakshmi and Sarada, 2008). The root extract of *Costus speciosus* possesses antihyperglycemic, antihyperlipemic and antioxidative effects, which may prove to be of clinical importance in the management of diabetes and its complications as hyperglycemia, abnormal lipid and antioxidant profiles are the most usual complications in diabetes mellitus (Bavarva and Narasimhacharya, 2008). In the present study, *in vitro* cytotoxicity of the root extracts (ethanolic, 50% ethanolic, aqueous) of the plant with appropriate positive controls has been carried out against five human cancer cell lines from three different origins.

MATERIALS AND METHODS

Plant material:

The plant was collected from Pounichak village of district Jammu J&K, India in the month of March. The freshly collected plant was chopped, shade dried and ground into powder. Powdered dried seed material was then extracted with different solvents at room temperature to obtain extracts for bioevaluation.

Preparation of plant extracts:

For the ethanolic extract, dried ground plant material (100g) was percolated with 95% ethanol, then concentrated to dryness under reduced pressure. For aqueous ethanolic extract, another lot of dried ground plant material (100g) was percolated with 50% ethanol and concentrated to dryness under reduced pressure. The hot water extract was obtained by boiling dried ground plant material (100g) for 30 min in distilled water (300ml). The ethanolic extract was dissolved in Dimethyl sulfoxide (DMSO), the aqueous ethanolic extract in 50% DMSO and the water extract in sterile water to form stock solutions 20mg/ml. The microbial contamination was controlled by addition of 1% gentamycin in complete growth medium *i.e.* used for dilution of stock solutions to prepare working test solutions 200µg/ml. All extracts were freeze dried.

Preparation of positive controls:

Positive controls, *viz.*, Mitomycin-C and 5-Fluorouracil were prepared in distilled water, then diluted in gentamycin