Anticancer Activity of Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam by Srb Method

Khushbu Pandey [1*], Pramod K. Sharma [1] and Rupesh Dudhe [1,2]

[1]*Department of Pharmaceutical Technology, M.I.E.T, Meerut- 250005, U.P, India*
[2]*Uttarakhand Technical Universities, Dehradun- 284007, U.K, India*

Abstract

Aim: To study the anticancer activity of ethanolic extract of leaves of Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam by SRB assay method on K562 human leukemia cancer cell line.

Materials and Methods: Anticancer activity of ethanolic extracts leaves of Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam and also in combination of both the plant extract was performed on K562 cancer cell lines by the Advanced Centre for Treatment Research and Education in Cancer (ACTREC) Mumbai, India.

Results: Parthenium hysterophorus and Oldenlandia corymbosa showed significant anticancer acti human leukemia cancer cell line. Cell line were grown in RPMI 1640 medium containing 10% fetal bovine serum and 2 mM L-glutamine with the help of SRB assay and the absorbance was recorded on an Elisa plate reader at a wavelength of 540 nm with 690 nm.

Conclusion: Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam has been showed anticancer activity individually but when they are given in combination of both plants extract on K562 human leukemia cancer cell line has been showed potent anticancer activity.

Keywords: K562 cell line; Leukemia; SRB assay

Introduction

Ethno historical accounts shows that medicinal plants have been used as a remedy for various human ailments, the reason of using these plants is that they contain certain types of chemical constituent which is having greater therapeutic value that produces a definite pharmacological actions on human body with lesser side effects [1]. Cancer is one of the most life threatening diseases and possess many health hazard in both developed and developing countries [2].

Leukemia is one of the most common cause of cancer occur throughout the world due to the lack of effective chemotherapeutic agents and side effects of anticancer drugs on prolong therapy of chemoprevention so anticancer patients switch over to the herbal medicine for their curement.

Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam is the two herbaceous weed and they are known for their various pharmacological activity. Medicinal uses of both the plant extract show remarkable antipyretic, CNS stimulating, skeletal muscle relaxant [3] also the anti-oxidant [4], hypoglycemic activity [5]. Oldenlandia corymbosa are used as an herbal medicine for the treatment of hepatitis among the people of Southern India [6]. Thus, the present study was done to evaluate the anticancer potential of ethanolic extract of leaves of Parthenium hysterophorus Linn and Oldenlandia corymbosa Lam.

Materials and Method

Plant material

The fresh leaves of Parthenium hysterophorus Linn was collected from the Meerut (India) and Oldenlandia corymbosa Lam was collected from Chhattisgarh region of M.P. These plants were identified and authenticated by the research officer of botany at National Bureau of Plant and Genetic Resources (Pusa campus) New Delhi and a voucher specimen had been kept in the department of Pharmacology, Meerut Institute of Engineering and Technology, Meerut.

Experimental procedure or SRB assay

The cell lines were grown in RPMI 1640 medium containing 10%

*Corresponding author: Khushbu Pandey, Department of Pharmaceutical Technology, Meerut Institute of Engineering & Technology, NH-58, Baghpat bypass crossing, Meerut- 250005, UP, India, Tel: 09758709158; E-mail: pandeykhushbu19@gmail.com

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ve times with tap water and air dried. Sulforhodamine B (SRB) solution (50 µl) at 0.4% (w/v) in 1% acetic acid was added to each of the wells, and plates were incubated for 20 minutes at room temperature. A er staining, unbound dye was recovered and the residual dye was removed by washing ve times with 1% acetic acid. e plates were air dried. Bound stain was subsequently eluted with 10 mM trizma base, and the absorbance was read on an Elisa plate reader at a wavelength 540 nm with 690 nm reference wavelength [7].

Percent growth was calculated on a plate-by-plate basis for test wells relative to control wells. Percent Growth was expressed as the ratio of average absorbance of the test well to the average absorbance the control wells *100.

Using the six absorbance measurements [time zero (Tz), control growth (C), and test growth in the presence of drug at the four concentration levels (Ti)]; the percentage growth was calculated at each of the drug concentration levels [8].

Percentage growth inhibition=

For concentrations for which Ti>/=Tz (Ti-Tz) positive or zero = [(Ti-Tz)/(C-Tz)] × 100

For concentrations for which Ti<Tz. (Ti-Tz) negative = [(Ti-Tz)/Tz] × 100

Growth inhibition of 50%

GI_{50} = [(Ti-Tz)/(C-Tz)] × 100

GI_{50} is that value of the drug concentration resulting in a 50% reduction in the net protein increase (as measured by SRB staining) in control cells during the drug incubation. e drug concentration resulting in total growth inhibition (TGI) was calculated from Ti = Tz. e LC_{50} is the drug concentration resulting in a 50% reduction in the measured protein at the end of the drug treatment as compared to that at the beginning. During this there is a net loss of 50% cells following

than the maximum or minimum concentration tested. e experiment data were estimated using linear regression method of plots of the cell viability against the molar drug concentration of tested compounds.

Results

e non toxic dose of Parthenium hysterophorus Linn and