Research Article

Cytotoxicity Activity of *Gymnosporia montana* on Hepatocellular Carcinoma Cell Line (HEP G_2)

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ABSTRACT

Ethanomedicinal plant like Gymnosporia montana belonging to the family Celeastraceae commonly known as Vikalo in Gujarat. Ethanomedicinally fresh leaves of Vikalo are chewed in trible regions of Gujarat to cure jaundice. The study was aimed to evaluate the cytotoxic activity of selected ethanomedicinal plants on HepG2 (Hepatocellular Carcinoma) cell line. Differnt extracts of leaf of Gymnosporia Montana were prepared. These extracts were tested for its inhibitory effect on HepG2 Cell Line at different ranges of concentration. The percentage viability of the cell line was carried out by using Trypan blue dye exclusion method. The cytotoxicity of plant extracts on HepG2 cells was evaluated by MTT assay. All the plant extracts show very less cytotoxic effect on HepG2. Hence Gymnosporia montana plant extracts can be taken for further studies as hepatoprotective activity.

Keywords: Cytotoxicity Activity, MTT Assay, ethanomedicinal plants, Hep G2 cell line.

INTRODUCTION

Medicinal plants play a key role in the human health care. About 80% of the world populations rely on the use of traditional medicine which is predominantly based on plant materials. Although herbal medicines are effective in the treatment of various ailments very often these drugs are unscientifically exploited and/or improperly used. Therefore, these plant drugs deserve detailed studies in the light of modern science. A detailed investigation and documentation of plants used in local health traditions and pharmacological evaluation of these plants and their taxonomical relatives can lead to the development of invaluable plant drugs for many dreaded diseases [1].

Liver has a pivotal role in regulation of physiological processes. It is involved in several vital functions such as metabolism, secretion and storage. Furthermore, detoxification of a variety of drugs and xenobiotics occurs in liver. The bile secreted by the liver has, among other things, an important role in digestion. Liver diseases are among the most serious ailment. Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other oxidative damages in liver. Enhanced lipid peroxidation produced during the liver microsomal metabolism of ethanol may result in hepatitis and cirrhosis[2].

Hepatocellular carcinoma (HCC) is one of the malignancies with increasing incidence. Though there have been several curative methods for the disease, but the survival solely depends on the tumour location and the underlying liver disease, cirrhosis. There has been urgent need for the treatment of HCC to prevent its occurrence or its reoccurrence. Herbal compounds are known to play a major impact in all the stages of HCC. Therefore, there has been an increase in the research for the use of plant derived compounds as potential hepatoprotective agents against HCC for a novel drug development.Cells from the HepG2 cell line are known to retain differentiated parenchymal functions of normal hepatocytes, including the expression of P450 isoenzymes thus permit long-term studies to be performed.

The *Celestraceae* family, commonly known as the bittersweet family, consists of around 100 genera and 1300 species, mainly in tropical regions. This family contains several ones described to be useful in folk medicine. Many characteristic bioactive compounds have been reported from this family. Polyester sesquiterpene and pyridine-sesquiterpene alkaloids with insect antifeedant or insecticidal properties have been isolated from some species and recently sesquiterpene pyridine alkaloids with immunosuppressive or antitumor activities have also been described. Diterpene triepoxides with potent antileukemic and immunosuppressive activities and triterpenoid quinonemethides named as "Celastroloids" with antibiotic and cytostatic activities have been isolated from species of the *Celesteraceae* family[3].

Family *Celastraceae* contain about 90-100 genera and 1,300 species of vines, shrubs, usually of 1-9 m height with axillary or terminating short branches, glabrous, without latex. The great majority of the genera are tropical, with only Celastrus (the stuff vines), Euonymus (the spindles) and Maytenus widespread in temperate climates[4]**.** Leaves are alternate or opposite, simple and generally stipulate, flowers are bisexual and normally cymose, and fruit are 1-3 seeded, capsule or berry in *Celastraceae* family.

Gymnosporia montana (known as Vikro), occurring throughout the arid, dry areas of India, is traditionally claimed to be useful in various ailments. Very few reports