

# ISOLATION OF FLAVONOID USING *Simarouba glauca* AND ITS EFFECT ON ANTICANCEROUS PROPERTIES

## Topic Statement of Proposed Research

*Simarouba glauca* commonly known as Lakshmi Taru towards the southern part of India which belongs to the family *Simarubaceae* is a medicinal plant and has been suggested in the Indian system of medicine for huge number of diseases. Medicinal uses of *Simarouba glauca* is reputed for its beneficial effects properties such as antioxidant and free radical scavenging, anti-inflammatory, analgesic, anti-arthritic, antifertility, hepatoprotective and anticancerous properties.

Alkaloids, flavonoids, phenolics, saturated steroidal saponins, aromatic amines, amino acids and are rich in potassium salts contains in the leaves of *Simarouba glauca*. Medicinal plants show the confirmation of anti-fungal, anti-oxidant and anti-bacterial activity. Microbiologists have conducted experiments that involve frequent demanding food-borne yeast, fungi, and bacteria with phytochemicals extract of plants. Many methods have been used to examine antimicrobial activity, and the most important data vary significantly in quantity and quality among different spices.

More than 4000 chemically unique flavonoids have been isolated and identified in plant extracts obtained through solvent extraction processes. More recently, a few flavonoids have also been isolated from microorganisms as their secondary metabolites. Flavonoids are of great importance for the bioactivities, related to their antioxidant activities and many enzymatic reactions, resulting in a decrease of platelet activation and aggregation, against cardiovascular diseases, cancer chemoprevention and anti-inflammatory activity.

## **Objectives of the work**

In this work I am proposing to isolate, identify and report the flavonoids from methanolic extracts of leaves. Furthermore, we have to characterize the flavonoids through UV, FTIR, LC-MS, DSC, SEM and EDX techniques.

## **Activities and Timetable**

To accomplish the proposed research goal, I propose the following specific activities:

### **Activity 1:**

#### **Preparation of extracts**

Methanol and ethanol extract is produced using Soxhlet method

### **Activity 2:**

#### **Extraction of Flavonoid**

To separate the lead molecule from methanol extract of *Simarouba glauca*, the residue was dissolved in 500mL of distilled water. The filtrate was partitioned with petroleum ether, ethyl ether and ethyl acetate. Ethyl acetate extract was concentrated by vacuum oven. Ethyl acetate extract was subjected to column chromatography on silica gel eluted with chloroform-methanol gradient to afford Compound-A (CHCl<sub>3</sub>: Methanol 9:1). Further the same ethyl acetate extract was subjected to column chromatography on Sephadex LH-20 eluted with methanol-water gradient to obtain Compound-B (Methanol: Water 1:1)

### **Activity 3:**

#### **Identify the Physical and Chemical Characteristics of isolated compounds**

1. Thin Layer Chromatography

The Thin layer chromatography silica gel was prepared to identify the isolated compound

2. Characterization techniques

Various characterisation techniques are done to identify the isolated flavanoid

#### **Activity 4:**

##### **Study on the effect of flavanoid on cancer cells**

The flavonoid isolated from the leaves of *Simarauba glauca* are to be tested for its in vitro cytotoxicity against cancer cell line and the inhibitory concentration is to be found out.

#### **Activity 5:**

##### **Determine the concentration and pathway of flavanoid action**

1. Dietary flavonoids act on apoptotic pathway
2. Act on intrinsic and extrinsic signaling pathways
3. In vivo and in vitro effect on cancer

#### **Activity 6:**

##### **Use the isolated flavanoid to treat Oral cancer in mice**

Oral cancer has to be developed chemically treat with flavonoids in the rat. Kawaii et al. studied about some citrus flavonoids and found that they inhibited the proliferation of cancer cells such as lung carcinoma A549 and gastric TGBC11TKB cancer cell lines. It did not affect the human normal cell lines.

### **Student Goals**

Although the work is representing the Cancer Biology theoretical nature of the research requires strong biochemical understanding. As a biotechnology and biochemical engineering student with deep interest in cancer biology, I feel this research project is uniquely tailored to my strengths and interests. A research position that delves into both of my majors is an exceptional opportunity for me. I am committed to working an organized, efficient and insightful research project and capping my accomplishments with a published article. In

addition to strengthening my appeal to graduate schools, publishing an article would be an exceptional growth opportunity for me personally and would help professionally prepare me to pursue a career in research and development of emerging technologies. In addition, many opportunities for research and development will be in the field of cancer biology.

### **Scope of the work**

In the present study, the possibilities of the use of plant extracts as reducing and stabilizing agent for the synthesis of zinc oxide nanoparticles is being investigated. The optimization of the synthetic process is also carried out to ensure the maximum yield. The characterization of isolated flavanoid is inevitable for better understanding of nature and properties of flavanoid.

This work would help us to develop a solution for prevention of cancer which is a common dreading disease.