

## **Analysis of Extracts from *Tinospora Cordifolia* for Useful Properties**

**Dr. Sunitha S. N.**

### **Department of Biotechnology**

Many plants are in use for medicinal and therapeutic purpose from time immemorial. *Tinospora cordifolia* is one such plant which is known to be useful in many ways, for its effect as a hepatoprotectant, as an inhibitor of various viral enzymes, as an immunomodulator, and for its antitoxic effects. In the current study, the usefulness of *T. cordifolia* extracts was tested in treating diabetes, lowering cholesterol content and in the green synthesis of nanoparticles. Phytochemical analysis of the petroleum ether, acetone and aqueous extracts showed that they contained flavonoids, phenolics and alkaloids.

Diabetes mellitus-Type 2 is a metabolic disorder characterized by hyperglycemia in which there is overburdened glucose in the blood. Inhibition of glucose formation through reduction in starch digestion may be a way to control the disease. Starch digestion can be reduced by inhibiting starch degrading enzymes such as amylases. In this regard, different extracts of wild and *in vitro* grown *T. cordifolia* were tested for the action of salivary amylase, aspergillus  $\alpha$ -amylase and pancreatic  $\alpha$ -amylase using the DNSA method for the quantification of reducing sugars. Petroleum ether and acetone were used as solvents for the extraction of useful components from different plant parts, and the extracts were analyzed by HPLC. It was found that starch degradation activity of amylase was lower in the presence of the extracts as compared with the control. These results showed that extracts of *T. cordifolia* are capable of inhibiting amylase activity, ultimately inhibiting the formation of reducing sugars, thereby indicating the possibility of their use in treating diabetes.

Further, the cholesterol levels in cells treated with the extracts and in untreated cells were checked. It was found that the cholesterol levels were lowered in cells treated with fresh stem/dry stem/stem callus (grown in a hormone combination of BAP/NAA) of *Tinospora cordifolia*. These results show that the extracts are capable of reducing cholesterol levels, indicating a possibility of their use in the treatment of hypercholesterolemia.

In another set of studies to find the usefulness of plants in the green synthesis of nanoparticles, extracts of *Tinospora cordifolia* were tested for their potential use in the formation of silver nanoparticles. Treatment of silver nitrate with different extracts resulted in the excitation of surface plasmonic resonance, and the colour of the solution changed from light yellow to dark brown. The intensity of the colour increased with incubation time, and this was observed in the UV-Vis spectrum. These results showed preliminary indications of the formation of nanoparticles through the use of *T. cordifolia* extracts.