

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
Jnana Sangama, BELGAUM- 590 014



A PROJECT REPORT ON



“Enhancement of Diosgenin from Steroidal sapogenin in *Dioscorea hispida*, Dennst. By *Trichoderma* species through Biotransformation.”

Carried-out under the scheme,

34TH SERIES OF STUDENT PROJECTS PROGRAMME (2010-11)

Sponsored by

**KARNATAKA STATE COUNCIL FOR SCIENCE & TECHNOLOGY (KSCST),
INDIAN INSTITUTE OF SCIENCE, BENGALURU.**

*Submitted in partial fulfilment of the requirement for the award of the
degree of*

BACHELOR OF ENGINEERING

In

BIOTECHNOLOGY

Submitted By

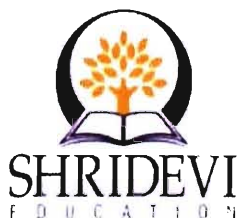
NIRANJAN M. SURALIKERIMATH

USN: 1SV07BT021

Under the guidance of

DR.G.PANDURANGA MURTHY

Asst. Professor & Scientist In-charge, R&D



**DEPARTMENT OF BIOTECHNOLOGY & ENGINEERING
SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY**

(Affiliated to VTU, Belgaum, Karnataka and An ISO certified institution)s

SIRA ROAD, TUMKUR-572106

2011

ABSTRACT

'Diosgenin' is one of the most important steroidal sapogenins in the steroid pharmaceutical industry. It is widely used in the synthesis of sex hormones, oral contraceptives and other steroids in the industry. Currently, the diosgenin is produced by 'acid hydrolysis' of tubers of *Dioscorea sps.* Later, this method yields numerous byproducts that can cause serious pollution. In the present study, the enhancement of 'Diosgenin' from the steroidal sapogenin through Biotransformation using *Trichoderma harzianum* MTCC-4874 has been achieved. In the preliminary stage, the leaf of selected ethno-medicinal plant, *Dioscorea hispida*, Dennst (DHD) was taken to evaluate the status pharmaconostic through physico-chemical and phyto-chemical analysis. The antioxidant activity was also carried-out in the leaf extract of DHD. The physico-chemical values and Fluorescence characteristics of the plant powder under ordinary light that gives an appearance of the substance as 'earthy matter and could be inorganic composition along with other impurities present in the leaf powder. The percentage of total ash, acid insoluble ash and water insoluble ash, foreign organic matter and total moisture content were analyzed in the leaf powder. This indicates the active status of pharmaconostic and efficiency of the plant material towards preparation of drug. The preliminary phyto-chemical parameters viz, alkaloids, flavonoids, saponins, carbohydrates, proteins, tannins, glycosides, fixed Oils & fats, phyto-sterols and phenolic compounds were analyzed for their active presence in the organic solvents like, methanol and ethanolic extracts. Whereas, in the other organic extracts like, chloroform, acetone, benzene and water extracts the active constituents are not at the considerable level. The presence of active secondary metabolites in the leaf extracts of DHD may have profound activity and justifies the status for preparation of potential drug. The antioxidant activity has been evaluated by DPPH radical scavenging method. The selected ethano medicinal plant, *D. hispida* has antioxidant activity at significant level. The ethno medicinal plants contain generally different phenolic compounds with different amount of antioxidant activity. The results obtained in this investigation reveal that, the fractions of DHD leaf extract are free radical scavenger and able to react with the DPPH radical, which might be attributed to their electron donating ability.

The phenomenon of biotransformation allows a compound to be modified into another compound by using green synthesis instead of chemical synthesis. In this study, the fermentation media, K_2HPO_4 (0.29% -w/v), Tween 80(0.73% -w/v), Peptone (2.67% -w/v) with 9.77% w/v substrate

were used under pH-5.8 at 37°C. The idealized incubation period was 6.5 days. Outline of method involved are media preparation, inoculation of fungi, feeding of substrate, incubation for 6.5 days and extraction using ethanol. The extracts were analyzed using TLC and HPLC to indicate the bio-transformed products. Further study should be done to understand the nature of active principles in the plant, *D. hispida*, Dennst will be helpful for further detailed evaluation to substantiate and authenticate the ethno-medicinal plant drug. In addition, the pharmacognostic analysis through physico-chemical, phyto-chemical and antioxidant activities in leaf of DHD can justify the practice of ethno-medicinal plant by tribal community of Biligirirangana Hills, Karnataka, India.