SHORT COMMUNICATION

Microbial Conversion & Formation Studies on the Secondary Metabolites of Solanum Xanthocarpum (Schrad and Wendle)

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Bioconversion of pure solasodine and the quantitative changes in the phytoconstituents of S.Xanthocarpum as a result of bioconversion were noted.

SOLANUM xanthocarpum (Schrad and Wendle), is a prickly diffuse herb commonly found throughout India. Its leaves are ovate, with sinnuate or sub - pinnatified spines, flowers are blue in lateral cymes and berries are globose, yellow or whitish green in colour[1-2].

Solasodine i.e. (Δ^5 22B - 25 X- Spirosolan - 3B - 01) is the major alkaloid and generally occurs in the combined form as a glycoside (Saponin) in the berries and leaves of **S. Xanthocarpum[3]. Solasodine is considered as a promising sterodial precursoe. Hence, efforts were made in the laboratory to study its microbial conversion into an industrially important steroid or its precursor. Attempts were also made to study the changes in the yield of certain phytoconstituents of** S. Xanthocarpum.

The research work conducted was divided into two parts:-

(A) Microbial conversion of the pure steroid, solasodine.

(B) Estimation of the phytoconstituents after fermentation.

The microbes employed for the above experiment were isolated from the soil. The isolation of microbes from the soil was done on an agarified basal medium containing the alcoholic plant extract. The isolated colonies were then identified by the cover-slip technique devised by Kwato and Shinobu[4]. The isolated fungi were identified on the basis of their morphology and colony characteristics into viz. **Aspergillus niger** and **Pencillium notatum**. However, bacterial isolation and identification was not possible and hence, were procured from 'National Chemical Laboratories', Pune. In all, six cultures of both fungal and bacterial origin were employed in fermentation viz.

(I) **Aspergillus niger**

(II) **Penicillium notatum**

(III) **Gliocladium roseum** NCIM 1064

(IV) **Rhizopus arrhizus** NCIM 878

(V) **Arthobacter simplex** NCIM 2449

(VI) **Flarobacterium dehydrogenars** NCIM 2278

The spore suspensions of the above cultures were used as inoculum in the conversion. A 2% suspension of pure solasodine was used as the substrate. The fermentation was carried out under both shaking and static conditions. Shaking conditions were maintained on a rotary shaker at 220

rpm. While for static conditions the flasks were kept in an incubator maintained at 37°C. The fermentation was carried out for a time period of 96 - 120 hours. Alkaloidal extract, tannin and steroidal extracts were used as substrates for estimating the changes in these phyto constituents as a result of fermentation[5].

The bioconversion process where pure solasodine acted as the substrate was monitored by TLC. Comparable Rf values were observed for both pre and post fermentation extracts indicating that no conversion had taken place. Thus it was concluded that none of the microbial cultures used under the stated conditions could bring about the conversion of solasodine.

Quantitative changes in of alkaloids, tannins and steroids were observed under the influence of only two cultures viz. **A. niger** and **P. notatum**. The percentage changes in the alkaloids and tannins were estimated by HPTLC while changes in the steroidal content was studied colorimetrically.

The results obtained after fermentation were as shown below:

Table 1:- Quantitative changes in the phytoconstituents by using A.niger and P.notatum

Phyto constituents	Percentage Change	
	A. niger	P. notatum
Tannins	- 19.09	-80.8
Alkaloids	-45.5	-52.5
Steroids	+3.45	+2.12

(-) :- indicates a decrease.

(+) :- indicates an increase.

Thus **A.niger & P.notatum** decreased the amount of tannins and alkaloids while fermentation by both species brought about an increase in the steroidal content.

Thus, it can been successfully concluded that the two cultures viz. **A.niger & P.notatum** are capable of utilizing tannins and alkaloids while increasing the steroidal content of the medium.

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REFERENCES

1. Wealth of India - Raw Materials, Publications and Information Directorate, CSIR, New Delhi, 1972, Vol. IX, 393.

2. Cooke, I.T, "Flora of Bombay". Botanical Survey of India, Calcutta, 1967, Vol. II, 335.

3. Kunjithapadam, S., "Cultivation & Utilization of Medicinal and aromatic plants", Atal, C.K., Kapur, B.M., CSIR, New Delhi, 1977, 53.

4. Kwato, M., Shinobu, R., **Mem-Osaka Otkrytiya Izobret**. 1989, 11, pp 75-76.

5. Brain, K.R., and Turner, T.D. "Practical evaluation of phytopharmaceuticals". Wright - Scientechnica, 1975, 540.