Indian J.Sci.Res.1(1) : 39-41, 2010

BIOCHEMICAL ASPECT OF SAFED MUSLI (*Chlorophytum borivilianum*) AN ASSESSMENT OF ITS BIOCHEMICAL CONSTITUENT

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ABSTRACT

Present paper deals with some biochemical aspects of Safed Musli. Roots of Safed Musli are the rich source of Proteins (5-10%), Carbohydrates (25-30%), Steroidal Sapogenins (2-20%) and Alkaloids (15-25%) etc. Safed Musli is used as an Aphrodisiac agent and sex tonic. It is also used as for remedy for Diabeties, Arthrities, Natal and Post Natal Problems.

Key words: *C. borivilianum,* Sapogenins, Alkaloids, Diabeties.

Chlorophytum borivilianum Santapau and Fernandes is popularly known as safed musli (Ananymous; 2002). It is an important medicinal plant of family Liliaceae. Dried tuberous root of Safed Musli is rich source of alkaloids, steroidal Sapogenins, proteins etc. (Bordia et al; 1995, Bordia; 1999). Its roots are major constituent of more than 100 ayurvedic formulation. The medicinal value of Safed Musli can be gauged from a recent report from the Gujarat State Forest Development Corporation (Mistry, 2000) that tuberous roots of *C. borivilianum* are fetching Rs. 1500/ kg. It has been named as "Nayi Chetna" or "Wonder-drug" a desi version of "Viagra" having all the property. Present Paper summarizes the effects of various fertilizers on the higher yield and development of tuberous roots, and effect of various fertilizers on its biochemical contents, especially alkaloids and Sapogenins.

MATERIALS AND METHODS

The present investigations have been carried out over a period of year 2004-2005. In the first year a presampling was done to find out the effects of various fertilizers on biochemical constituents of Safed Musli plant. The fertilizers are *Leuceana* leaves, Dhaincha plant, Wheat straw, Cow dung, Neem cake and NPK (50:50:50).

Preparation on seeding tubers

Initially the seeding tuber of *C. borivilianum* collected from B.H.U. Varanasi. The mature roots of *C. borivilianum* remain in a fasciculate manner attached to the underside of discoid stem or crown. The crown is cut vertically in such a manner so that 2-3 tubers remain attached to the underside of a portion of crown. Root tuber without a portion of crown does not sprout.

Preparation of experimental plot

The experiments were carried out in Botanical Garden of U P College Campus. Root bunches were planted on the IInd week of July, on the ridges of 15x30 cm height in a single row plot of 4 m. length (Bordia et al; 1995), keeping row to row & plant to plant spacing of 45cm and 30 cm respectively. Plot size was 4x4 m^2 and in different plot various treatment were given i.e. Controlled (No fertilizer) Cowdung, NPK, Neem cake, Dhanicha plant, *Leuccana* leaves and Wheat straw. Application of fertilizer and manure was made before planting of Musli. The field was irrigated immediately after plantation of Safed tubers. All the plots were kept weed free through hand weeding Recommended agronomic and plant protection measures were adopted in raising good crop. Two more irrigations were applied in the month of October and December.

Harvesting

When all the aerial parts start yellowing and drying, harvesting was done in the last week of March. The tubers were washed in running water to remove adhering soil. After peelings off skin were dried in sun for 2 days followed by shade drying.

Chemical analysis

Chemical analysis for Sapogenin and Alkaloid contents of Safed Musli were done. The main active principle is sapogenin where as alkaloids are present in very little amount.

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For Sapogenin content analysis the dried and peeled of skin root sample were powdered and sieved (6mm.) then sapogenin content was estimated by following method-

0.5 g finely powdered dry deskined root powder of each treatment was mixed with 10 ml of 4:1 chloroform: methanol solvent mixture in a beaker and stored overnight. The material was filtered through Whatman No.1 filter paper. The filtrate was collected in a beaker and heated for 3-4 minutes to evaporate the liquid. Then content was transferred in measuring cylinder and volume was made to 10 ml by adding solvent mixture. One ml of liquid was taken into test tube to which 1 ml chloroform and 4 ml modified Liberman-burchard reagent (acetic anhydride: sulphuric acid) were added. The intensity of stable light brown colour was measured at 625 nm on spectrophotometer. The sapogenin content was expressed in terms of mg/100 of dry root sample. This method reported by Simlot was adopted with certain modification (Anonymous 1988-93).

Alkaloid content was estimated by using following method-

Dried tubers of Musli was extracted with CH_3OH (methanol) at the interval of 12-12 hrs, the filtrate was collected in a beaker and heated for 3-4 minutes to evaporate the liquid. The dried material was mixed with 7% Citric acid and stirring efficiently for 3-4 times. Again basify with NH_4 OH until the smell of ammonia comes out. Again extracted with chloroform and stirring slowly until two layer of liquid obtain the upper layer of chloroform and lower layer of alkaloids. The lower layer was decant out and evaporated. The dried material was weight out. This is the total alkaloid content.

Table 1: Sapogenin and Alkaloid content of Musli under different treatment

S. No	Treatment	Sapogenin content(mg/100gm)	Alkaloid Content (mg/100gm)
1.	Control condition (No) fertilizer	0.234	----
2.	*Leuceana* leaves (*L. leucocephala*)	0.243	0.006
3.	Dhaincha plant (*Sesbania sesbane*)	0.	0.01
4.	Wheat straw	0.223	---
5.	Cow dung	0.273	0.02
6	Neem cake	0.230	----
7	NPK (ratio)(50:50:50)	0.237	0.004

RESULTS AND DISCUSSION

The data along with the analysis of various fertilizers effects on the biochemical content were tabulated in table-1. It was noted that production of Sapogenin and Alkaloid content was higher in organic fertilizer as compared to inorganic fertilizers Musli plant show highest sapogenin content in cow dung as fertilizer and lowest in wheat straw condition. However, alkaloid contents are present in very small amount as its highest amount is present in cow dung as manure.

High content of Sapogenin and alkaloids is observed in cow dung supplied plot, this is due to the fact that from organic matter there is slow release of nutrients which is needed by the plant at different stages of lifecycle, where as in synthetic fertilizers condition nutrients percolate deep in the soil along with irrigated water and in not available to plant for root growth. Hence for best yield organic matter Cowdung is recommended.

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