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Effect of *Azospirillium* on quantity of saponin in roots of *Chlorophytum borivilianum* (Safed musli)

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Abstract
Saponin are naturally occurring glycoside widely distributed in plants. Saponin consists of a sapogenin as the aglycone moiety and a sugar. The sapogenin may be a steroid or a triterpene and the sugar may be glucose, galactose, a pentose, or a methyl pentose. It exhibits antimicrobial properties, guarding your body against fungi, bacteria and viruses.at the same time, they improve immune function by stimulating the production of T-cells. Additionally, they act as antioxidants and scavenge oxidative stress. That's why sapogenin used in some vaccines. These chemical compounds contain the 27 carbon atoms forming the core structures; spirostan and furostan. In present work author try to enlighten the influence of symbiotic association of *Azospirillum* (the nitrogen fixating bacteria) with root nodules of *C. borivilianum* on amount of saponin content in. *C. borivilianum*. To increase the percentage (amount) of saponin the treatment of nitrogen fixating bacteria was given the symbiotic association of nitrogen fixating bacteria with root nodules of plants help to increase the amount of biologically active constituent of plant also help to increase the fertility of soil.

Keywords: saponin, *Azospirillum*, nitrogen fixation, *Chlorophytum borivilianum* (safed musli), medicinal plants

Introduction

Safed musli or *Chlorophytum borivilianum* (Chloros means green and phyton means plant) is commonly known as Dholi musli and locally pronounced by the tribals of Rajasthan, Madhya Pradesh and Gujrat as Koli and Safed musli in Maharashtra. Bordia *et al*, 1995) [1]. It is belonging to *Asparagacea* family. The roots of Safed musli are white, smooth and 3-5 inches long. A single plant produces 5-7 tuber roots. The roots of Safed musli are used in therapeutic preparations against leucorrhoea. It has found common uses due to its aphrodisiac properties and as a tonic for lactating mothers and for women after delivery. Root is also used in commercial preparation of steroidal hormones. Generally, it is used for increasing vitality. Besides this, it is also used in many Ayurvedic preparations prescribed for joint pain, diarrhea and diabetes and also used as a blood purifier. The tubers of safed musli are also used as a substitute for European salad **(**Mishra P., 1994) [3]. It also has an exhaled position as a rasayana drug of Ayurvedic System of Medicine. The drug containing saponin is considered a valuable medicine because of its wide applications as therapeutic and recreational purpose saponin containing plant also have good defense activity against pathogen and animals.

Recently the drug has been investigated for various pharmacological activities and chemical constituents. *Chlorophytum borivilianum has* therapeutic application in Ayurvedic system of medicine. This has a very good application to increase immune system. Its aphrodisiac properties make it useful for the people suffering from Erectile Dysfunction and to increase male potency. Its spermatogenic property is helpful in curing impotency as they are rich in important constituent glycosides It is known to cure many physical illness and weaknesses. Among all the species of *Chlorophytum* present in India *C. borivilianum produces* the highest yield of saponin. The detergent properties of saponin have led to their use in shampoos, facial cleansers and cosmetic creams.

So, present investigation on saponin content of *C. borivilianum* and changes in content of saponin by nitrogen fixing bacteria that was *Azospirillum*.

Material and method

1. **Preparation of *Azospirllum* Culture:** The chemical component require for the preparation of culture media is taken with extra purity. The agar solution is used for preparation of culture media.
2. **Preparation of land plots for cultivation of plant** After pre sampling of soil and studying the effect of various fertilizer on biochemical constituent of *chlorophytum borvilianum (*safed musli), cultivation of seedling tuber which are collected from Chikhaldara, district Amravati, state – Maharashtra from India.
3. **Harvesting:** After the yellowing of aerial part of *Chlorophytum borivilianum* the harvesting was done. Washing of tuber under running water for removing adhering soil is important.
4. **Peeling:** There after washing peeling off skin from root of *Chlorophytum borivilianum carried* out and roots were dried in shade.
5. **Chemical Analysis:** Simlot method a specific method with some modifications used for chemical analysis of saponin content from *Chlorophytum borivilianum*

Fig 1

Observation

The observed saponin content were plotted in following table.

These samples are used after specific interval of day and after specific treatment.

Table 1

Sr. No	control condition	Saponin (mg/100 gm)
1	sample1	0.221
2	sample 2	0.119
3	sample 3	0.219
4	sample 4	0.220
5	sample 5	0.219
6	sample 6	0.217
7	sample 7	0.218
8	sample 8	0.220
9	sample 9	0.218
10	sample 10	0.221
11	sample 11	0.216
12	sample 12	0.219
13	sample 13	0.220
14	sample 14	0.218
15	sample 15	0.220
16	sample 16	0.221
17	sample 17	0.221
18	sample 18	0.222
19	sample 19	0.221
20	sample 20	0.221
21	sample 21	0.219
22	sample 22	0.219
23	sample23	0.221
24	sample 24	0.222
25	sample 25	0.219
	Average quantity (mg/100 gm)	0.219

Result and Discussion

From the observations the final conclusion was made that the nitrogen fixating bacteria i.e., *Azospirillum* affect the biochemical content Saponin of *Chlorophytum borivilianum*. The content was increases quantitatively in treated tuber it is 0.219 mg/ 100 gm.

Smriti Shrivastava *et al*, in 2015 was observed Plant growth-promoting rhizobacteria (PGPR) are bacteria colonizing rhizospheres of plant that enhance plant growth through various mechanisms like nitrogen fixation, solubilization of phosphate, quorum sensing, etc. (Bhattacharya and Jha 2012) [2]. PGPR offer various ways to replace chemical fertilizers, pesticides, etc., and thus this quality has significantly led to their increased demand.

Chlorophytum borivilianum is important medicinal properties which can be explored for health advancement of human beings, steps should be taken for cultivation of Chlorophytum borivilianum and isolation of different phytoconstituents specially saponin, so that true medicinal value of our indigenous medicinal plant can be explored. There is need for commercial cultivation of this species. Thus, subsequently attempts were made to categorize superior germplasm and to develop the cultivation practices (Oudhia, 2001) [5].

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