RESEARCH ARTICLE

To study the effect of various concentration of deproteinized leaf juice (DPJ) of selected plants on growth of *Aspergillus niger*

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ABSTRACT

Deproteinized leaf juice is a by-product of mechanical operation called Green Crop Fractionation. DPJ can be used in various purposes like fertilizers for crop plants, milk for the calves, in vitro rhizogenesis and microbial growth. Deproteinized leaf juice contains biologically active substances like sugar, amino acids and vitamins which are essential component of the nutrient media for the growth of the microorganisms. Present investigation focus on the biomass production of the fungi *Aspergillus niger* on different concentration of the DPJ of *Trigonella, Brassica and Raphanus.*

Key words: Green Crop Fractionation, Deproteinized leaf juice, mycelial dry weight or fungal biomass.

INTRODUCTION

Deproteinized leaf juice is the by- product of the process called Green Crop Fractionation (Pirie, 1942)**.** Deproteinized leaf juice is the fraction of the juice extracted from the green foliages that remains after the precipitation of the Leaf Protein Concentration. DPJ is rich in the water soluble nutrients like carbohydrates, vitamins, minerals and unidentified growth factors (Kohler. and Bickoff, 1971). DPJ is also known as liquor or Whey or Brown Juice. Deproteinized leaf juice of various plants have been used for the preparation of culture media for cultivation of many useful bacteria, fungi, and actinomycetes especially species of *Saccharomyces, Streptomyces, Rhizobium, Penicillium,* etc. (Chanda *et al*., 1987; Chanda, 1982b). Several attempts have been done by scholar on the production of fungal biomass and their secondary metabolite on the deproteinized leaf juice showing that suitability of deproteinized leaf juice for the growth and production of microorganisms like fungi and fungal secondary metabolites respectively **(**Gogle, 2000, Josephin, and Sayyed, 2005; Chowdary *et al.,* 2002). Deproteinized leaf juice used as a novel medium for rhizogenesis in vitro (Sreenivasan *et al.,*1995). In this present study, the production of fungal biomass on the different concentration of deproteinized leaf juice of *Trigonella foenium graecum, Brassica oleracea and Raphanus sativus* was employed.

MATERIAL AND METHODS

Preparation of DPJ: The green leaves or foliages of Trigonella, Brassica and Raphanus was collected from the local market and made a pulp using grinding mixer. The pulp was filtered through a cotton cloth and juice was collected. The juice was heated at 95^0C. After heating, the heated juice was filtered and LP and DPJ were obtained. This DPJ was dried in the hot oven at 65^0 C. This dry DPJ was collected and different weight of DPJ used for the different concentration of DPJ for the growth of the *Aspergillus niger*.

Sterilization and Inoculation: All inoculation process done in the aseptic condition in the laminar air flow with using all sterilized glassware. 35ml of different concentration of the DPJ was transfer in the 100ml flasks. Potato-dextrose Yeast extracts (PDY) (200 gm of peeled potato, add 1000 ml distilled water, steamed for 30 minutes then filter. Final volume was made up to 1000 ml by adding distilled water then 20 gm of dextrose, 0.1 gm of yeast extract was added) was used as a control. These flasks were plugged by cotton plugs then autoclaved at 15 lbs for 30 minutes. These flasks were inoculated by *Aspergillus niger* in the form of spore suspension of the fungus *Aspergillus niger* as well as in the control. These all flasks were incubated for 7-8 days at room temperature for the growth of the *A. niger.*

Harvesting of Fungal biomass of *Aspergillus niger*: After 7-8 days of incubation, these all flasks were filtered through a pre-weighted Whatman filter paper. The filtered mycelial biomass along with the filter paper dried in the hot air oven at 65^0C overnight. After all these Whatman filter papers was weighted. For obtaining the Mycelial Dry Weight (MDW), subtraction of weight of pre weighted filter paper was done.

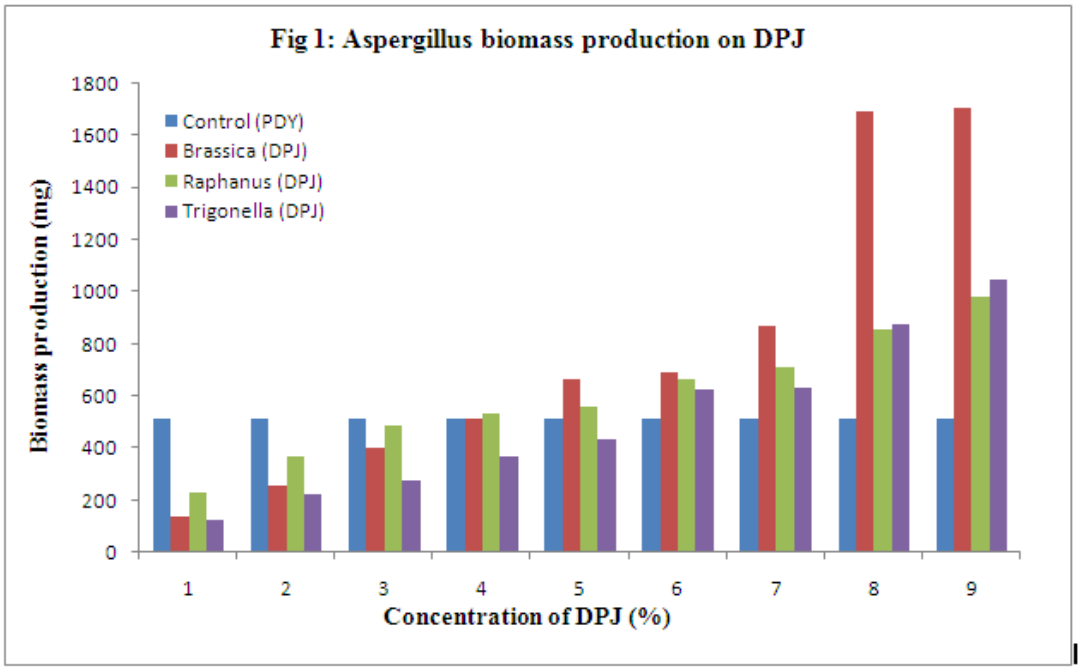
RESULT AND DISCUSSION

In present investigation, the growth of the fungi *Aspergillus niger* on different concentration of deproteinized leaf juice of plants viz. *Trigonella foenium graecum, Brassica oleracea and Raphanus sativus* has been carried out and results obtained presented in the form of table and graph. Biomass production is increased when concentration of DPJ of all three plants are increased from 1% to 9%. But on DPJ of *Brassica*, production of biomass is significantly more (1708 mg) on 9% than the other two viz. *Trigonella foenium graecum* (1051mg) and *Raphanus sativus* (981mg). As compare to control (515mg); 4% DPJ of *Brassica* and *Raphanus* shows equal growth (516 & 635mg). DPJ of all three plants, above 4% up to 9% are shows more biomass than the control.

The biomass production of *Aspergillus niger* is increased when concentration of DPJ of *Brassica, Raphanus* and *Trigonella* are increased, this is due to increase the nutrients when increase the concentration of DPJ. Growth of fungi is more on DPJ than the PDY Medium it is because presence of more micro and macro nutrient in DPJ than the PDY medium.

Table 1:Biomass production of *Aspergillus niger* on DPJ of selected plants

Medium	biomass of *Aspergillus niger* on DPJ (mg)		
	Brassica	Raphanus	Trigonella
Control PDY	515	515	515
Conc. of DPJ in % 1	141	233	124
2	257	367	221
3	399	485	278
4	516	535	371
5	665	558	432
6	692	669	628
7	870	712	633
8	1692	855	876
9	1708	981	1051
Mean	771	599	513
Range	1567	748	927
S. D.	145	61	79
C. V.	18.80%	10.18%	15.39%



CONCLUSIONS

From the above observations, it concluded that, the DPJ of All three viz. *Trigonella foenium graecum, Brassica oleracea and Raphanus sativas* are the suitable for the growth and biomass production of the fungi; above 4% DPJ of all three plants are gives 2 to 3 times more yield then the control (PDY Medium); DPJ as by product of GCF system it is cheaper medium than potato dextrose yeast medium; increase the concentration of DPJ from 1% to 9% increase the yield of biomass of *Aspergillus niger;* in present investigation, among the all DPJ of selected plant, the *Brassica oleracea* DPJ is more effective for the growth and the biomass production of the fungi *Aspergillus niger* than the other two DPJ viz. *Trigonella foenium graecum* and *Raphanus sativas.*

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