

Studies on Utilisation of Waste Biomass (WBM) of Vegetables Against Spore Germination, Growth and Sporulation of *Aspergillus niger van Tiegh.*

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Abstract: *Vegetables are an excellent source of dietary fibre which aids digestion and promotes healthy blood sugar levels. Vegetable as a part of their daily diet have a reduce risk of chronic disease. It provide a source of many nutrient, antioxidants, potassium, fibre, folate, Vitamin A, E, C. and also protect against infection. In Marathwada region of the Maharashtra state many vegetable plants are very common easily cultivated. The present research paper work for the study of vegetables produce a huge waste biomass (WBM). The waste biomass of the vegetable plants may be utilized as the source of fungicides. On utilization of waste biomass (WBM) of plants in relation to spore germination; growth and sporulation have been studied. By taken borosil conical flask containing 25ml of liquid GN medium supplemented separately with 1gm of powder of WBM of tested common vegetable plants were autoclaved at 15 lbs pressure for 15 minutes. The flasks were inoculated with 1ml of spore suspension of Aspergillus niger Van Tiegh. were incubated at room temperature. The spore germination of Aspergillus niger Van Tiegh. studied after 24 hours while growth and sporulation were studied after seven days of incubation period. The tested WBM of Lycopersicon esculentum L. was found to be more inhibitory for the spore germination (16%), growth (07mg) and sporulation (+) of Aspergillus niger van Tiegh. Where as the WBM of Raphanus sativus L. was found to be very less inhibitory for the same as compared to the WBM of other test Vegetable plants.*

Keywords: Aspergillus niger, Spore suspension, Spore germination, Sporulation, Waste biomass

I. INTRODUCTION

Vegetable are considered essential for well balanced diets since they supply the health nutritional benefit rich in vitamin and minerals and high in fibres and antioxidants. All the vegetables may offer protection to humans against chronic diseases. A word survey indicate 392 vegetable crops cultivated world wide (Joaslvia Dias 2011), vegetable are also significant value as source of protein and amino acids. All vegetables contains digestive cellulose fibre (M.A Kamal Khan and Tabassum Hamid 1986). It is evident from the literature that the vegetables and their seeds carry large number of mycoflora both in field and during storage. Most of the fungi cause decay and rots (Kunte and Yawalkar, 1991). The vegetables associated with the fungi found to be useless. The vegetable seeds associated with the fungi found to be useless. The vegetable seeds associated with the fungi found to be enable to germinate. The vegetable plants can produce an enormous amount of waste biomass (WBM). The waste leaves, stem and roots of some common and easily available plants like Carrot (*Daucus carota* L.), Radish (*Raphanus sativus* L.), Onion (*Allium cepa* L.), Methi (*Trigonella foenum-graecum* L.), Palak (*Spinacia oleracea* L.), Cabbage (*Brassica oleracea* var. *capitata* L.), Cauliflower (*Brassica oleracea* var. *botrytis* L.), Tomato (*Lycopersicon esculentum* L.) and Bhendi (*Abelmoschus esculentus* L.) were referred as waste biomass material (WBM) of vegetable plants. This WBM can be utilized against spore germination, growth and sporulation of vegetable mycoflora. Considering these aspects the present research paper has been selected.

Similar Studies were carried out by, Agarwal, V.K. And O.V. Singh (1974). Bhowmik B.N. and Choudhary (1982), Burapadaja, S. and A. Bunchoo (1995), Chary, M.A.S. and S.M. Reddy (1982), Deo, P.P. and J.S. Gupta (1980), Deena, E. and K.C. Basuchaudhary (1984), Joasilva Dias. (2011), Mishra, M., Y.N. Shukla and S. Kumar (2002), Rati, E. and A. Ramlingam (1974). Singh, B.K. and T. Prasad (1988). Varaprasad, B., K.K. Prasanth, C.K. Naidu and P. Somasekhar (2009).

II. MATERIALS AND METHODS

Collection of sample:

The wbm of common vegetable plants were collected from the field and local vegetable market. In order to study effect of waste biomass (wbm) of some common vegetable plants on spore germination growth and sporulation of *Aspergillus niger Van Tiegh.* taken borosil glass conical flasks containing 25 ml of liquid GN medium supplemented separately with one gram of powder wbm of common vegetable plants like Carrot (*Daucus carota L.*), Radish (*Raphanus sativus L.*), Onion (*Allium cepa L.*), Methi (*Trigonella foenum-graecum L.*), Palak (*Spinacia oleracea L.*), Cabbage (*Brassica oleracea var. capitata L.*), Cauliflower (*Brassica oleracea var. botrytis L.*), Tomato (*Lycopersicon esculentum L.*) and Bhendi (*Abelmosch esculentus L.*) were autoclaved at 15 lbs pressure for 15 minutes. On automatically cooling, the flasks were inoculated with 1 ml of spore suspension of *Aspergillus niger van Tiegh.* prepared from seven days old cultures grown on PDA slants. The flasks were incubated at room temperature. The spore germination of *Aspergillus niger van Tiegh.* was studied after 24 hours of incubation period. The growth in terms of dry mycelial weight and sporulation of the fungus were studied after seven days of incubation period. The liquid GN medium without the supplementation of powder of WBM served as control. The results are presented in Table- 01.

Table 01: Effect of waste biomass (WBM) of vegetables on spore germination, growth and sporulation of *Aspergillus niger van Tiegh* by food poisoning method :

Sr. No.	Name of the Vegetable	WBM of Vegetables	<i>Aspergillus niger van Tiegh</i>		
			Spore Germination (%)	Dry Mycelial Weight (mg)	Sporulation
1.	<i>Daucus carota L.</i>	Leaf	66	32	+++
2.	<i>Raphanus sativus L.</i>	Leaf	71	34	+++
3.	<i>Allium cepa L.</i>	Leaf	30	17	++
4.	<i>Trigonella foenum-graecum L.</i>	Stem	36	27	+++
5.	<i>Spinacia oleracea L.</i>	Stem	54	30	+++
6.	<i>Brassica oleracea var. capitata L.</i>	Leaf	30	23	+++
7.	<i>Brassica oleracea var. botrytis L.</i>	Leaf	27	12	++
8.	<i>Lycopersicon esculentum L.</i>	Root	16	07	+
9.	<i>Abelmoschus esculentus L.</i>	Root	41	12	+++
		Control	71	47	+++

+ = Low, ++ = Medium, +++ = High

III. RESULT AND DISCUSSION

It is clear from the results presented in Table -1, that the WBM of all the test vegetable plants was found to be inhibitory for spore germination, growth and sporulation of *Aspergillus niger van Tiegh.* It is also evident from the results that the test WBM of *Lycopersicon esculentum L.* was found to be more inhibitory for the spore germination (16%), growth (07mg) and sporulation (+) of *Aspergillus niger van Tiegh.* Whereas the WBM of *Raphanus sativus L.* was found to be very less inhibitory for the same as compared to the WBM of other test Vegetable plants.

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