

# Effect of waste biomass (WBM) of vegetables on mycoflora and seed health of Cabbage (*Brassica oleracea* var. *Capitata* L.)

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## Abstract

Cabbage is a rich source of vitamin C and vitamin K. The health benefits of cabbage include treating constipation, stomach ulcer, obesity, skin disorder, jaundice and scurvy. Vegetables and their seeds carry large number of fungi both in field and during storage. The vegetable seed associated with the fungi found to be unable germinate. These common and dominant mycoflora associated with the test vegetable by using waste biomass of vegetable. The study of waste vegetable biomass for the seed health of vegetable crops. For this seed of the test vegetable were treated with the extract of waste vegetable biomass and seed mycoflora seed health of the test vegetable. The result observed that the WBM of all the test vegetable was found to be inhibitory for the incidence of seed mycoflora on the cabbage seed in more or less degree. The cabbage seeds treated with the WBM of *Brassica oleracea* var. *capitata* L. showed much reduced percentage of incidence of mycoflora (45%).

**Keyword:** Cabbage, Mycoflora, Waste Biomass (WBM), Seed health, Vegetable Extract.

## Introduction

Cabbage is an important component of the human diet. The vegetable are important source of essential vitamins and minerals needed for human system. Cabbage is low calorie vegetable i.e. rich in vitamins minerals and antioxidants. Cabbage is a good source of soluble fiber and plant sterols. These substances have been shown to reduce LDL cholesterol [1]. We can use to make many different dishes i.e. salads, soups, stews etc. by using cabbage. The predominant organism isolated from the outer surface leaves i.e. *Alternaria* spp.



*Penicillium* spp. etc. [2]. The vegetable and their seed carry large number of fungi both in field and during storage. The fungus is carried by the seed and hence it may occur from the early stage [3]. The common fungal diseases and their pathogens in cabbage leaf spot, storage rot [4]. The fungus can causes serious losses in the field in storage and market condition. Guy [5] Studied changes in the biomass and productivity of woodlands. The decreases in biomass of the woodland. Kin *et al.*, [6] Studied rice seed mycoflora and found *Fusarium moniliformi* Sheldon caused rotting in seed.

Cabbage suffers from many important diseases which cause a low yield and also responsible for it poor quality. A large number of studies have been carried out associated with cabbage seeds and heads. Important and fungal species *Fusarium oxysporium* sp. [7]. The important and major fungal species have been reported *Alternaria* spp., *Aspergillus* spp., *Chaetomium* spp., *Cladosporium* spp., *Colletotrichum* spp., *fulcatum* spp., *Curvularia lunata*, *Drechslera* *Fusarium* spp. *Macrophomina phaseolina*, *Penicillium* spp. *Rhizopus stolonifer*. [8]. The vegetable waste biomass contains valuable nutrients which can be put to good use if managed properly. They contain high organic matter and can be treated to utilization control the fungal diseases and seed health i.e. seed germination, root length, and shoot length.

The objective of present investigation is to study the effect of waste biomass of cabbage on mycoflora and seed health of cabbage. The 5% aqueous extract of the WBM vegetable was used for the further studies and important conclusion are reported. Similar studies were carried out by Bhikane [9], DeTempe [10], Dubey *et al.* [11], Iqbal *et al.* [12], Jain [13], Jha [14], Mukhopadhyay [15], Naik *et al.* [16], Neergard [17], and Singh *et al.* [18], Atica *et al.* [19].

## Methodology

For the present studies seeds of Cabbage were soaked separately in 5% aqueous extract of the WBM of the test vegetables for twenty four hours. The soaked seeds were placed on moist blotter plates. The plates were incubated for ten days at room temperature. After incubation percent incidence of seed mycoflora, percentage of seed germination, root length and shoot length of the Cabbage were studied. The Cabbage seeds soaked in sterile distilled water for twenty four hours, plated on moist blotter plates and incubated for ten days at room temperature were served as control. The results are presented in Table 1.

**Table 01:** Effect of waste biomass (WBM) of vegetables on mycoflora and seed health of Cabbage (*Brassica oleracea* var. *capitata* L.) by moist blotter plate method after ten days of incubation at room temperature

Sr. No.	Name of the Vegetable	WBM of Vegetables	Incidence of mycoflora (%)	Seed health of Cabbage		
				SG(%)	RL(cm)	SL(cm)
1.	<i>Daucus carota</i> L.	Leaf	52	90	3.5	2.8
2.	<i>Raphanus sativus</i> L.	Leaf	90	80	3.0	2.5
3.	<i>Allium cepa</i> L.	Leaf	85	85	4.0	3.0
4.	<i>Trigonella foenum-graecum</i> L.	Stem	65	40	3.5	2.6
5.	<i>Spinacia oleracea</i> L.	Stem	80	42	2.8	2.5
6.	<i>Brassica oleracea</i> var. <i>capitata</i> L.	Leaf	45	90	4.2	3.2
7.	<i>Brassica oleracea</i> var. <i>botrytis</i> L.	Leaf	80	70	3.5	2.0
8.	<i>Lycopersicon esculentum</i> L.	Root	48	80	3.2	2.6
9.	<i>Abelmoschus esculentus</i> L.	Root	80	40	2.0	1.6
		Control	90	60	3.0	2.5

SG= Seed germination, RL= Root length, SL= Shoot length



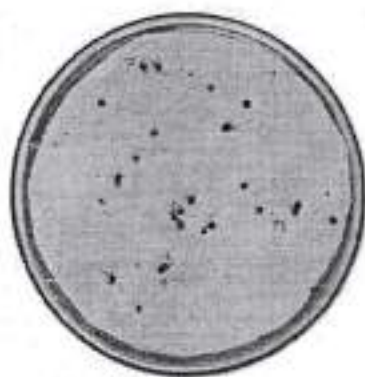


PLATE - 1



Untreated Seeds of Cabbage



Treated Seeds of Cabbage

Plate-1: Seed germination and seedling emergence of Cabbage

## Results and Discussions

Identification of various fungal species studied the results presented in above Table 01. It is observed that the WBM of all the test vegetables was found to be inhibitory for the incidence of seed mycoflora on the Cabbage seeds in more or less degree. The Cabbage seeds treated with the WBM of *Brassica oleracea* var. *capitata* L. showed much reduced percentage of incidence of mycoflora (45%). The WBM of *Trigonella foenum-graecum* L., *Spinacia oleracea* L. and *Abelmoschus esculentus* L. was found to be inhibitory and the WBM of rest of the vegetables stimulatory for the seed germination of Cabbage. The WBM of *Trigonella foenum-graecum* L. and *Abelmoschus esculentus* L. was found to be inhibitory and the WBM of rest of the vegetables was found to be stimulatory for the growth in length of root and shoot of the Cabbage.

## Conclusion

The present study thus revealed that vegetable cabbage fungi associate with them, *Aspergillus* spp. *Fusarium* sp., *curvularia* sp. The aqueous extract of the WBM of the test vegetable contain had preformed effect on the fungal spoilage as well as seed health. The WBM of *Trigonella foenum-graecum* L., *Spinacia oleracea* L. and *Abelmoschus esculentus* L. was found to be inhibitory and the WBM of rest of the vegetables stimulatory for the

seed germination of Cabbage. The WBM of *Trigonella foenum-graecum* L. and *Abelmoschus esculentus* L. was found to be inhibitory and the WBM of rest of the vegetables was found to be stimulatory for the growth in length of root and shoot of the Cabbage.

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