



## **Varietal susceptibility and effect of antibiotics on little leaf Phytoplasma of brinjal (Solanum melongena L)**

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### **Abstract**

*Among the vegetable crops grown in India, brinjal or egg plant (Solanum melongena L is quite popular. The crop is highly susceptible to several viruses and phytoplasma (The Wealth of India 1972) . Out of various pathogens and diseases, the little leaf disease cause by phytoplasma is the most serious disease in India ( Anjaneyulu et. al. 1968, Verma et.al. 1969, Srinivasan and Chelliah 1978). To study the varietal susceptibility and effect of antibiotics the experiments have been done on eleven varieties of brinjalie. Barahmasia, Black beauty, H-5, H-6, Long White Egg, PusaKranti, Pusa Purple Cluster, Pusa Purple Long, Pusa Purple Round, Supriya, Surbha etc. For control measures different antibiotics used were Biophenicol, Chlorophenicol, Enteromycelin, Lycercelin, Paraxin, Roscillin, Camphicillin, Oxytetracycline, Chlorotetracycline, Rose oil, Clove oil, Eucalyptus oil etc. The disease spread slowly and less effectively in Surbha and Pusa Purple Cluster suggesting that these varieties has some resistance to little leaf phytoplasma. No flowers and fruits were observed in any of the plant suggesting that spraying of these chemicals did not showed any effect in controlling the disease.*

### **Introduction**

Among the vegetable crops grown in India , brinjal or egg plant (Solanum melongena L.) is quite popular. The yield of fruits generally varies from 9.5 to 13 tonnes per hectare depending upon the variety of seeds, type of cultivation and the time of sowing. Yield up to 35 tonnes per hectare has however, been reported. The crop is highly susceptible to several viruses and phytoplasma (The Welth of India 1972). Out of various pathogens and diseases, the little leaf disease cause by phytoplasma is the most serious disease in India (Anjaneyulu et. al. 1968, Verma et.al. 1969, Srinivasan and Chelliah 1978). The present study on this crop aimed at studying the varietal susceptibility of little leaf phytoplasma of brinjal, its extent to damage to the crop and the methods to control it.

### **Material and Method**

To study the varietal susceptibility eleven subplots of (1.0x1.0 meters) were prepared and seeds of eleven varieties ie. Barahmasia, Black beauty, H-5, H-6, Long white egg, Pusa Kranti, Pusa purple cluster, Pusa purple long, Pusa purple round, Supriya, Surbha were sown into these subplots, one variety in one plot. For the transplantation of these varieties 11 sub plots of (2.5x3.0) were made and transplantation of one month old plants were done into these subplots, 50 cm apart in six rows. One diseased plant was planted in the middle of each sub plot as a source of natural infection. Sub plots were regularly observed at the time interval of 15 days and the number of infected plants and healthy plants were noted. The same experiment was repeated again in next season. Data are presented in table-1.

Table - 1

S. No.	Varieties	Stage											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1	Barahmasia	1	1	4	4	8	18	20	20	20	20	20	21
2	Black beauty	3	3	6	6	10	12	13	13	14	14	17	17
3	H-5	--	--	--	2	2	2	6	6	6	6	6	6
4	H-6	1	1	3	3	3	5	5	5	5	5	5	6
5	Long white egg	--	--	--	1	1	4	4	4	4	4	5	5
6	Pusa Kranti	--	1	3	3	9	9	9	14	14	14	14	14
7	Pusa Purple cluster	--	--	--	--	3	4	4	4	8	8	9	9
8	Pusa Purple long	--	--	--	3	6	8	8	8	10	10	12	13
9	Pusa Purple round	--	--	--	--	3	6	8	10	10	10	10	12
10	Supriya	--	--	3	3	5	6	6	6	6	6	7	7
11	Surbha	--	--	--	--	--	3	5	7	9	9	9	10

Plants of comparable size and infection were selected for a detailed study of effect of antibiotics further growth of the plant or control of disease. These plants were planted in beds 2\*3m size in four rows, 50 cm apart and the plant to plant distance within rows being 50 cm. Thirteen such sub plots were prepared. One of sub plot was kept as control and others were used for treatments. Different concentrations ie. 200, 400, 600 and 800 ppm were used for four rows of the sub plot

respectively. The different antibiotics used were Biophenicol, Chlorophenicol, Enteromycelin, Lycercelin, Paraxin, Roscillin, Camphicillin, Oxytetracycline, Chlorotetracycline, Rose Oil, Clove Oil, and Eucalyptus Oil. The solutions/ suspension of antibiotics were prepared in water. The thirteen sub plot was sprayed with water and treated as control. The plants were periodically observed and height of the plants, number of flowers and fruits were recorded (Table- 2).

Table - 2

S. No.	TREATMENT	CONC (ppm)	HEIGHT OF THE PLANT (cm)	NO. OF FLOWERS	NO. OF FRUITS
1	2	3	4	5	6
1	Biophenicol	200	39.3	-	-
		400	39.6	-	-
		600	39.7	-	-
		800	39.7	-	-
2	Chorophenicol	200	40.6	-	-
		400	40.8	-	-
		600	40.9	-	-
		800	41.1	-	-
3	Enteromycelin	200	40.5	-	-
		400	40.5	-	-
		600	40.7	-	-
		800	40.8	-	-

4	Lycercelin	200	38.3	-	-
		400	38.4	-	-
		600	38.4	-	-
		800	38.6	-	-
5	Paraxin	200	38.2	-	-
		400	38.5	-	-
		600	38.7	-	-
		800	38.9	-	-
6	Roscellin	200	37.5	-	-
		400	37.9	-	-
		600	38.3	-	-
		800	38.3	-	-
7	Camphicillin	200	37.3	-	-
		400	37.5	-	-
		600	37.7	-	-
		800	38.2	-	-
8	Oxytetracyline	200	42.0	-	-
		400	42.5	-	-
		600	42.7	-	-
		800	42.8	-	-

1	2	3	4	5	6
9	Chlorotetracycline	200	43.1	-	-
		400	43.4	-	-
		600	43.7	-	-
		800	43.7	-	-
10	Rose oil	200	38.0	-	-
		400	38.2	-	-
		600	37.8	-	-
		800	38.1	-	-
11	Clove oil	200	39.8	-	-
		400	40.1	-	-
		600	40.3	-	-
		800	40.7	-	-
12	Eucalyptus oil	200	38.3	-	-
		400	38.7	-	-
		600	39.6	-	-
		800	39.6	-	-
13	Control	-	37	-	-

### Result and Discussion

It could be seen from table -1 that the variety Long white egg, H-5, H-6, showed the lowest number of infected plants. The maximum number of infected plants were found in Barahmasia plants and Black beauty and H-6 showed early

infection ie. 15 days after transplanting in the field, whereas varieties Surbha (90 days), Pusa purple round and Pusa purple cluster (75 days) showed much delayed infection. The disease spreads slowly and less efficiently in Surbha , Pusa purple round and Pusa purple cluster,

suggesting that these varieties had some resistance to little leaf phytoplasma. It was observed that varieties H-5, H-6 and long white egg showed little infection in comparison to other varieties. Jyani et. al. (1997) studied resistance to little leaf in ten varieties of brinjal and found that ABH-1 and Chaklasi Doli were comparatively resistant varieties. Data presented in table-2 showed little variation in height which were not count to significant. No flowers and fruits were observed in any of the plants. Suggesting that spraying of these chemicals did not showed any effect in controlling the disease.

Phytoplasma are now known to be having protoplasm of their own and thus can easily respond to variety of chemicals which are known to block metabolic activity and arrest the growth of microbes. Tetracycline therapy against little leaf of brinjal is well demonstrated by Anjaneyulu and Ramakrishnan (1969), Bindra et. al.(1972), Verma and Dubey(1978). Control of phytoplasma by tetracycline has also been reported by Rombos and Bosabalidis (1985) in declined plum trees. Jaysinghe et. al. (1984) in *Manihot esculenta* and Tanaka and Nonaka (1984) in onion yellows.

In present study, however, spraying tetracycline did not control the disease. Use of some essential oils, which are established antifungal antibiotics also did not show any encouraging results. Probably a higher concentration or longer duration may be effective as concluded by Verma and Dubey (1978). Thus it can be concluded that the varieties H-5, H-6 and long white egg are relatively much resistant to the phytoplasma and may be recommended to the former for cultivation

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