
Effect of homeopathic drugs on conidial germination, growth and sporulation of *Drechslera oryzae*

PAWAN KUMAR CHAUDHARI, R. C. RAI AND BIMLA RAI

Department of Plant Pathology, Rajendra Agricultural University, PUSA, Samastipur 848 125, Bihar

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Tecurium 30 and Calcarea Carb 30 were equally and highly effective in inhibiting conidial germination of *Drechslera oryzae*. None of the homeopathic drugs could not produce more than 60 per cent inhibition. Calcarea Carb 30 and 200 (250 ppm and 500 ppm), Spigelia 30 (500 ppm), Tecurium 30 (250 ppm) and 500 ppm and Thuja 30 (250 ppm and 500 ppm) inhibited the growth of *D. oryzae* where as Cina 30 (250 ppm and 500 ppm) and Spigelia 30 (250 ppm) accelerated the growth of the colony.

Key words : Homeopathic drugs, conidial germination, growth, sporulation, *Drechslera oryzae*

INTRODUCTION

Drechslera oryzae, causing Brown leaf spot of rice and disease causes loss to the extent of 50-90 per cent (Padmanabhan *et al.*, 1948; Padmanabhan, 1963). The great Bengal Famine has been mainly attributed to this disease. The use of hazardous chemical pesticides in modern agricultural is to be minimized as far as possible, to reduce the health risk and also for safe eco-friendly environment. Therefore, there is strong need to find out alternatives to pesticides. With this view investigations have been undertaken on these aspects.

MATERIALS AND METHODS

The disease specimens of rice showing characteristics symptoms of leaf spot were collected from Pusa Farm in *kharif* season. Pathogens were isolated and brought in pure culture. Koch's postulate proved positive.

A total of nine homeopathic drugs with two potency i.e. 30 and 200 of all nine homeopathic drugs such as Acid nitrate, Calcarea Carb, Cina, Kali iodide, Spigelia, Stennum, Sulphur, Tecurium and

Thuja were tested *in vitro* to see their effect on conidial germination, growth and sporulation of *D. oryzae*.

One drop of spore suspension and one drop of homeopathic drugs was mixed in one cavity of groove slide. For each treatment three replications were maintained. The slides were kept in humid moist chamber and incubated at $28 \pm 1^\circ\text{C}$. Distilled water without any drugs served as check. Out of nine homeopathic drugs with two potency were tested, six selected homeopathic drugs which have inhibited spore germination, namely Cina 30, Spigelia 30, Tecurium 30, Thuja 30, Calcarea Carb 30 and Calcarea Carb 200 were evaluated by following the Poison Food Technique. Fifty ml stock solutions of 20,000 $\mu\text{g/ml}$ were prepared for each homeopathic drug separately in sterilized distilled water in 100 Erlenmeyer flask. To obtain the desired concentration of homeopathic drugs in the medium, the amount of stock solution to be added in PDA, was calculated by using the formula : $C_1V_1 = C_2V_2$, where C_1 = Concentration of stock solution ($\mu\text{g/ml}$); C_2 = Concentration of the homeopathic drugs ($\mu\text{g/ml}$); V_1 = Volume (ml) of the stock solution to be added; and V_2 = Measured Volume (ml) of PDA in which homeopathic drug is to be added.

Inoculated Petri plates were incubated at $28\pm 1^\circ\text{C}$ in a B.O.D. incubator for 7 days.

Radial growth of the colony was measured after 7 days of incubation, and measured by straight line drawn diagonally at right angle to each other. The average was expressed, as linear growth in mm. Spore density was determined with the help of haemocytometer. A mean of ten counts was taken for each treatment.

RESULTS AND DISCUSSION

The results presented in Table 1 indicated that Tecurium 30 and Calcarea Carb 30 were equally and highly effective in inhibiting conidial germination of *D. oryzae*. It was also observed that in all the cases higher potency was less effective than lower potency of homoeopathic drugs in inhibiting conidial germination.

Kumar and Kumar (1980) have reported that Tecurium at 200 potency was effective in inhibiting spore germination of *Drechslera australiensis* but to at 30 potency in our studies it was reverse. Kali iodide which had been reported to be effective against spore germination of four isolates of *Alternaria alternata* (Khanna and Chandra, 1976 a) were not effective against *Drechslera oryzae* in present study, Kali iodide and Tecurium 200, Spigelia 200, Thuja 200, Stannum 30 and 200 accelerated spore germination. Kumar and Kumar (1980) had also reported acceleration of spore germination by Cina 30, Stannum 30 and 200, and Tecurim 30 in case of *Drechslera australiensis*. Khanna and Chandra (1976 b) had also reported that spore germination of *Fusarium roseum* was inhibited by a number of homoeopathic drugs tested and degree of inhibition varied with the potencies.

Table 1 : Effect of homoeopathic drugs on conidial germination of *Drechslera oryzae*

Drugs	Potency	Per cent conidial germination		Per cent inhibition of conidial germination	
		Incubation period (hrs)		Incubation period (hrs)	
		48	72	48	72
Acid nitric	30	62.14	70.64	5.90	-6.87
	200	66.67	50.74	0.94	-14.63
Calcarea carb	30	3.37	6.08	94.41	90.84
	200	20.81	22.98	68.41	65.16
Cina	30	25.80	24.50	60.96	63.13
	200	56.85	69.33	13.92	-3.68
Kali iodide	30	77.48	72.38	-16.92	-9.55
	200	70.39	71.58	-6.59	-8.34
Spigelia	30	36.89	37.65	44.14	42.99
	200	68.66	66.09	-3.98	-0.03
Stennum	30	69.11	77.39	-4.65	-17.14
	200	72.90	74.49	-10.41	-12.75
Sulfur	30	80.87	70.55	-22.48	-6.79
	200	76.71	66.68	-17.18	-1.30
Tecurium	30	7.55	7.81	88.51	88.15
	200	71.21	79.13	-7.83	-19.79
Thuja	30	61.40	52.85	6.98	19.97
	200	74.60	68.87	-7.26	-4.24
Control		64.86	66.10	-	-
CD (P=0.05)					4.91

Table 2 : Effect of selected homoeopathic drugs on growth and sporulation of *Drechslera oryzae*

Drugs potency	Concentrations (ppm)	Radial growth*(mm)	Per cent inhibition of radial growth	Sporulation
Calcarea carb 30	250	41.16	57.54	+++
	500	49.66	24.65	+++
Calcarea carb 200	250	57.32	21.92	+++
	500	58.33	27.82	++++
Cina 30	250	65.16	-9.90	++++
	500	63.83	--12.32	++++
Spigelia 30	250	70.50	-4.10	++++
	500	56.83	5.48	++++
Tecurium 30	250	53.33	34.25	+++
	500	53.38	26.16	+++
Thuja 30	250	49.83	53.71	+++
	500	59.16	48.86	+++
Control		65.50	-	++++
CD (P=0.05)		2.33	3.07	

* Average of three replication; '+' – Poor; '++' – Fair; '+++ – Good; '++++' – Excellent

Data presented in Table 2 clearly indicated that homoeopathic drugs such as Calcarea carb 30 and 200 (250 and 500 ppm) and Thuja 30 (250 and 500 ppm) inhibited the growth of *D. oryzae* whereas Cine 30 (250 and 500 ppm) and Spigelia 30 (250 ppm) accelerated the growth of the colony. Inhibition produced by Tecurium 30. Calcarea Carb 30 and 200 Thuja 30 were less than 60 per cent indicating there by that homoeopathic drugs were not highly effective against *D. oryzae*. Kumar and Kumar (1980) had reported that medicines tested by him i.e. Cina, Spigelia, Stannum, Sulfur and Tecurium at 30 and 200 potencies accelerated the colony growth in case of *Alternaria* whereas in case of *Drechslera* they inhibited it. In their studies also inhibition of colony growth ranged 14.29 to 82.15 per cent in case of *Drechslera australiensis*. Khanna and Chandra (1976 b) had reported the effectiveness of Kali iodide and Thuja against *Fusarium roseum*. In our studies also Thuja was effective against *D. oryzae*. Lal (1997) had tested four homoeopathic drugs (Arnica, China,

Hypericum and Symphyticum) against *Alternaria tenuissima* and reported that in general homoeopathic drugs were less effective in inhibiting the radial growth of the fungus.

REFERENCES

- Khanna, K. K. and Chandra, S. 1976 a. Effect of some homoeopathic drugs on the spore germination of four isolates of *Alternaria alternate*. *Indian Phytopath.* **29** (3): 195-197.
- Khanna, K.K. and Chandra, S. 1976 b. Control of tomato fruit rot caused by *Fusarium roseum* with homoeopathic drugs. *Indian Phytopath.* **29** (3): 269-277.
- Kumar, Rajeev and Kumar, Sunil 1980. Effect for certain homoeopathic medicines on fungal growth and conidial germination. *Indian Phytopath.* **33**: 620-621.
- Lal, H. C. 1997. Studies on the management of *Alternaria alternata* blight of Pigeon pea (*Cajanus cajan*). pp.68s
- Padmanabhan, S.Y.; Roy Choudhury, K.R. and Ganguly, D. 1948. *Helminthosporium* disease of rice. 1. Nature and extent of damage caused by the disease. *Indian Phytopath.* **1**(3): 34-47.
- Padmanabhan, S. Y. 1963. *Helminthosporium* disease of rice. VII. A study of meteorological factors associated with the epiphytotic of 1942 in Bengal. *Oryza.* **1**(3): 101-110.