
Distribution of fluorescent pseudomonads in different agroclimatic zones of West Bengal

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A survey was conducted to enumerate the population of fluorescent pseudomonads in different agroclimatic zones of West Bengal. The populations of fluorescent pseudomonads were found to be highest in alluvial zone in both vegetable and other crops. The lowest population of fluorescent pseudomonads were recorded in terai zone in respective of all plants. In case of pulses the occurrence of fluorescent pseudomonads are arranged in an ascending order in different zones in respect of their availability., terai < saline < laterite < hill < alluvial.

Key words: Survey, fluorescent pseudomonads, occurrence, agroclimatic zones

INTRODUCTION

The fluorescent pseudomonads which are used as PGPR and also acts as a biocontrol agent, but their existence in soil is different. Latour and Lemanceau (1997) and Latour *et al.* (1996) have concluded that soil type is the major factor for the variation of the bacterial population whereas plant species is also partly responsible. Emnova *et al.* (1995) and Lemanceau *et al.* (2001) have observed that the distribution of species of fluorescent pseudomonads varied with the crops. In this experiment the population of fluorescent pseudomonads under different agroclimatic zone of West Bengal have been found out.

MATERIALS AND METHODS

The root portions of the plant samples were collected from different zones and washed thoroughly with sterile distilled water and placed on the petridishes containing King's B medium enriched with cetrimide and incubated at $30^{\circ} \pm 2^{\circ}\text{C}$ for 24-36 hrs. Then the plates were observed under UV radiation. The bacterial growth surrounding the root pieces giving green or blue fluorescent pigmentation which were identified as the presence of fluorescent bacteria. After isolation of bacteria, purification and

sub-culturing were done and stored in refrigeration as mother stalk.

One gram of root pieces were suspended in 9 ml of sterile distilled water and diluted the solution upto 10^{-8} dilution. 1 ml of suspension from each 10^{-6} , 10^{-7} , 10^{-8} were plated on King's B medium containing plate and incubated at $30-32^{\circ}\text{C}$ for 12-16 hrs. The single colony appeared were counted under UV radiation.

RESULTS AND DISCUSSION

It was revealed from Table 1, that fluorescent pseudomonads were present in all zones of W.B. more or less in almost all the crops. Maximum numbers were recorded in alluvial zone i.e. 84.44%. Lemanceau *et al.* (2001) showed both host plant and soil types had significant effect on microbial distribution. The impact of soil type on the association between the host plant and fluorescent pseudomonads was observed. The lowest population of fluorescent pseudomonads was recorded in terai zone. In respect of all group of all plants (0-2.2%) fluorescent pseudomonads was recorded in terai zone.

Lower range of population were recorded in cereals and field crops in hill (0-2). In case of pulses in hill,

Table 1 : Percentage of fluorescent bacteria present in the rhizoplanes of different groups of plants in hill, terai, laterite, alluvial and saline zones in *kharif* season

Group of plants	Presence of fluorescent bacteria in different agroclimatic zones (in percentage)				
	Hill	Terai	Laterite	Alluvial	Saline
Cereals	0 – 2	0	6 – 24	20 – 46	1 – 2.2
Pulses	2 – 8	1 – 2	2 – 4	6.66 – 11	1 – 2.2
Other field crops	0	0	4 – 22	15 – 15	—
Weeds, green manure plants and fodder	3 – 13	1 – 2	10 – 40	8.88 – 84	20 - 50
Vegetables	15 – 40	2 – 4	13 – 28	26.67 – 80	20 - 46

terai laterite, alluvial and saline zones fluorescent pseudomonads were recorded 2-8%, 1-2%, 2-4%, 6-11%, 1-2% respectively. Higher population were observed in alluvial zone 8-84% fluorescent pseudomonads population were observed in case of fodder and green manure producing plants.

It was also observed that irrespective of zones and crops, under different agroclimatic condition, higher population of fluorescent pseudomonads were recorded in alluvial zone.

Higher fluorescent pseudomonads population was recorded mostly on the rhizoplane of plants of alluvial soil. The alluvial soil contained higher amount of organic matter. Soil played an important role for build up bacterial population. Where the organic matters was low, population of bacteria was also lesser number. So population of bacteria directly related with organic carbon. Though Jossernod *et al.*, (1999) found no clear relationship between the distribution of metabolic type in case of vegetables (26-80%) in alluvial soils and distribution of bacterial species. So further research is required to find out the exact reason of such variation of population within the different zones of West Bengal.

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