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## Varitel Response of Wheat *Azospirillum* spp.

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### Abstract:-

Soil samples from ten villages in Pravara area (Tahasil Rahata Dist.Ahmednagar) were collected. From these localities ten different strains of *Azospirillum* were isolated, purified and were labeled as A1,A2,----A10.These strains individually and in mixed combination were further treated to wheat varieties viz HD2189,Mohan wonder,496, Trimbak and 2123.Sowing of seeds was done in 1×1 sq.m field plot at row spacing 22.5 cm in Randomize Blok Design. Crop productivity was measured interm of height, number of tillers and number of leaves. Out of ten strains, A2, A4, A5, A6 individually proved significantly effective over the control, however A2+A4+A6 strain combinations was proved highly significant over the control and individual strain for the growth and development in all wheat varieties. Variety HD2189 was showed significant response to mixed combination over the other verities.

### Key words:-

*Azospirillum* spp., Wheat varieties, Pravara Area.

## INTRODUCTION

Nitrogen is one of the most important factor in limiting crop yield. The potential exists to satisfy the needs of the nearly all crop plants for fixed nitrogen through the use of nitrogen fixing bacteria. In recent years numerous attempts have been used in use of various nitrogen fixing bacteria for the enhancement of associative nitrogen fixation in the rhizosphere of non-leguminous plants.

*Azospirillum* occurrence was reported by Benjerink(1925) and its nitrogen fixing capacity was realized in 1976. It lives in close association with root system of a variety of plants including grasses and cereals. Several reports have been supported a beneficial effect of *Azospirillum* inoculation on plant growth and this has made the organism an object of considerable economic and scientific interest (Elmerich 1984; Okon 1985; Dobereiner & Pedrosa 1987; Michiels et al;1989 b).The history of biofertilizer with beginning in India and use of *Azospirillum* has been revised by Kaushik(2009).

*Azospirillum* has received greater attraction from many agricultural scientists. The changes in the morphology of root may be one of the factors for the positive responses of inoculated plants (Okon, 1985). The inoculation of *Azospirillum* increases root length. (Kapulnik *et al.*, 1985b, 1985c, Zimmer and Bothe 1988; Levanony and Bashan 1989 and Martin *et al.*, 1989).*Azospirillum* spp. have increased plant growth, grain yield (Belimov *et al*; 1995), beneficial for nitrogen fixation (Bashan and Holguin, 1997), synthesis of IAA in

liquid broth (Hernandez *et al.*, 1996), used as biofertilizer for economically important crops and seed inoculation (Dashti *et al.*; 1998).

Considering the importance and major role of *Azospirillum* in increase in productivity of different crop varieties, this work was undertaken with an objective to find out local efficient *Azospirillum* strains for wheat crop.

## MATERIALS AND METHODS

Soil samples were collected from ten wheat fields from Rahata Tahsil Dist-Ahmednagar, (M.S.). One gm of soil was added in 100 ml distilled water and serial dilution were prepared up to  $10^{-6}$ . 1 ml of  $10^{-6}$  dilution was inoculation on sterile NFB medium (Nitrogen free Bromothymol Blue) and incubated at 30 to 32<sup>o</sup> c for 6 to 8 days. Colonies were indentified with microscopic observation, purified by transfer and retransfer on the same medium and labeled as A1, A2.....A10. Effective strain combination A2+A4+A6; was treated to wheat varieties like HD2189,Mohan wonder,496, Trimbak and 2123.Seeds were sown in 1×1 sq.meter field plots at row spacing(22.5cm). Crop productivity was measured in terms of height, number of tillers and number of leaves.

## RESULTS AND DISCUSSION:--

**Table:-Varietal response to the treatments:**

Variety	Treatment	Average of height of plant (cm) after 60 days.				Average number of tillers after 60 days.				Average number of leaves after 60 days.			
		R I	R II	R III	Replicate Mean	R I	R II	R III	Replicate Mean	R I	R II	R III	Replicate Mean
HD-2189	A2+A4+A6	74.5	79.5	67.4	73.80	30.0	30.0	30.0	30.0	7.8	7.8	6.7	7.4
	RDF	60.6	65.6	70.2	65.47	16.0	16.0	17.0	16.33	5.6	5.6	5.6	5.6
	Control	66.2	65.4	60.8	64.13	12.0	12.0	12.0	12.0	5.6	4.5	5.6	5.2
Mohan wonder	A2+A4+A6	70.0	73.4	74.0	72.47	23.0	23.0	23.0	23.0	6.7	6.7	7.7	7.0
	RDF	70.0	69.0	64.6	67.87	20.0	20.0	17.0	19.0	5.6	5.6	5.6	5.6
	Control	62.2	58.8	62.2	61.07	15.0	15.0	14.0	14.67	4.5	4.5	4.5	4.5
496	A2+A4+A6	74.8	67.0	77.6	73.13	24.0	25.0	23.0	24.0	6.7	7.8	7.7	7.4
	RDF	72.8	70.0	70.0	70.93	12.0	12.0	12.0	12.0	4.3	4.5	4.5	4.4
	Control	66.0	45.0	69.6	60.20	11.0	11.0	11.0	11.0	4.4	4.6	4.7	4.6
Trimbak	A2+A4+A6	70.2	80.4	70.4	73.67	22.0	21.0	22.0	21.67	7.5	7.7	7.8	7.7
	RDF	63.0	45.0	69.7	59.23	15.0	15.0	15.0	15.0	6.7	5.6	5.2	5.8
	Control	70.0	43.5	34.5	49.33	15.0	14.0	13.0	14.0	4.5	4.5	4.6	4.5
2123	A2+A4+A6	64.4	70.0	72.8	69.07	18.0	18.0	19.0	18.33	5.6	5.6	5.6	5.6
	RDF	70.0	69.0	64.6	67.87	20.0	20.0	17.0	19.0	5.6	5.6	5.6	5.6
	Control	62.2	58.8	62.2	61.07	15.0	15.0	14.0	14.67	4.5	4.5	4.5	4.5

Different wheat varieties viz., HD2189, Mohan wonder, 496, Trimbak and 2123 were selected for genotypic response. A2+A4+A6 treatment at 60 days proved to be significantly effective for plant height and number of leaves in all varieties. However HD 2189 varieties showed significant response to increase in tiller number than the other varieties over the RDF and control.

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Earlier reports also supported that inoculation of *Azospirillum lipoferum* in wheat and rice varieties increased plant height (Kapulnik *et al*; 1981a; Navak 1986 and Murty 1988), tiller number and root dry matter per plant (Okon, 1985; Wani, 1990; Bashan 1986 and Puente *et al*; 2005). Kapulnik *et al*; (1981) and Srinivasrao *et al*(2007) also proved that application of *Azospirillum brasilense* increased number of leaves in sorghum and sugarcane var CC 934418. Thus earlier reports and present findings are in agreement with significant increased wheat crop productivity by inoculation of *Azospirillum* spp. with their specific strain combination.

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