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Editorial

The basic and most important unit of the society has been the family from the beginning. For the empowerment and development of the country, first of all it is necessary to pay attention to the moral, social, economic and cultural dimensions of basic institutions like family. Balanced development of the family is very important for the development of the society. Therefore, if we want to have a complete and balanced development of the country, then we need to lay maximum emphasis on the basic institution called family. It is necessary that we should not make any discrimination between son and daughter in the family and we must explain this to our sons and get them involved in their activities. Even today, those who belong to the old belief believe that a woman cannot get any freedom, she cannot go anywhere alone, she cannot roam anywhere alone, but today's youth refuse to accept these values.

Some people also say that the importance of the walls in the house, the same importance is given to the education of the boys in the society. But how is a house made? Who are in the base of the house? The base of the house is our daughters, our girls, that means they are related to the roots. If our root becomes weak in the society, then our house or house cannot be strong at all. There is a need to understand this social context in reality.

The extent of favoritism is reached when we see discrimination in small tasks. Some people think that a girl is someone else's wealth, what job she should do. That's why some parents discriminate between boys and girls and this discrimination is visible somewhere in our behavior, in feeding and dressing. This is sheer injustice. God has given the same brain to boys and girls and today girls are proving it by bringing better results.

Girls stay at their parents' house for only a few days, so it is our duty to pay deep attention to their education, upbringing, only then we can fulfill the concept of a strong society. God has made us the trustee of our children so it is our duty to treat all members equally with full justice because both boys and girls have same power, same soul. So we should give them equal opportunities for development.

The basic objective of women empowerment is the development of women and communication of self-confidence in them. Women empowerment is important for the overall development of the society. Empowerment of women is the most important social phenomenon because they are the creators. If you empower them, make them strong, encourage them, it is better for the society. Women and men are the basis of creation and human society. Both complement each other. These are the wheels of the chariot of life by which the journey of life runs

smoothly. The role of both has been equally important for stability in family and society. The basis of change and development in a society depends on the mutual interaction of men and women, walking step by step and equal mobility of both. A chaotic situation is created in social life when any one side lags behind. The history of mankind is witness to this that where women have been neglected, the development of the society has been stunted. The role of women in creation of creation, education of children, upbringing of family is much more important than that of men, thus her position becomes central in the society. Therefore, without the progress of women, there can be no upliftment of mankind and society. As far as India is concerned "Yatra Naryastu Pujayante Ramante Tatra Devta" means where women are worshipped. The deities reside there. With this ideal any Indian woman can feel pride in comparison to the western woman. The ideal of learning in Saraswati, the ideal of wealth in Lakshmi, the ideal of valor in Durga, the ideal of purity in Ganga, even the ideal of creation in the form of Jagad Janani we find only in India.

Professor Akhilesh Shukla
Chief Editor

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Estimation of nitrogen fixation by different genera of Azotobacter and Azospirillum spand effect of herbicides on nitrogen fixation of Azospirillum in malate mediumunder laboratory conditions.

• **Vandna Krishna**

Abstract- *Nitrogen is one of the most limited plant nutrient in Indian soils and our soils are poor in both soil organic matter and nitrogen .Therefore to obtain optimum yields of important cereal crops, maintenance of activity of nitrogen fixing organism at a higher level to raise the soil fertility status is of paramount importance. Chemical fertilizer nitrogen is an expensive input for the medium and marginal farmers. In this context the investigation on the role of non-symbiotic bacteria such as Azo spirillum which can tolerate the use of herbicide and fix a good amount of nitrogen in soil are required. The present investigation was undertaken to test the relative efficiency of selected isolates of Azosspirillum and Azotobacter for nitrogen fixation in presence of different doses of herbicides . The efficiency of different strain of bacteria was seen in lieu of further use of these bacteria as Biofertilizer in different crops to reduce the chemical fertilizer.*

Keywords- *Azotobacter, Azospirillum, Arelon, Tribunil, Dosanex*

Introduction- Azospirillum sp.and Azotobacter sp. were used as biofertilizer and as an inoculants In this study.Trials conducted by Smith and Co-workers in 1974 and 1978 showed that 80% and 60% more protein in Panicum maximum and Digitaria decumbens was found in comparison of uninoculated ones. Dewanand subbarao 1979have noted increase in the yield of root biomass of rice by mixed inoculant of Azospirillum and Azotobacter. Nuret. al.1980 conducted trials under greenhouse conditions on zea mays and found increase in dry matter,yield and total nitrogen content. Tilak and murthy 1983 reported the response of barley inoculation with Azospirillum braslienseresults of the trials indicate that the marginal saving of 20 -30 kg N/ hectare is possible by the application ofAzospirillum.

Before using as an inoculantin different crops their efficiency for supplementing the nitrogen needs for field crops were tested .The effect of different herbicides on nitrogen fixation ofdifferent strains of Azospirillumsp.
Materials and methods- The estimation of nitrogen fixation by different bacterial isolates of Azospirillum and Azotobacter was donein semisolid sodium malate medium(Dobereiner and Day1974) And Jenson liquid media(Jensons,1961) respectively.The effect of three herbicides

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viz.Arelon,Tribunil and to Dosanex was examined on two strains of Azospirillum and three strains of Azotobacter.The herbicides were applied at two dosages….(1/2x)and(x).

Azospirillum- One ml of 48 hours old culture of different isolates were inoculated into 100 ml conical flask containing 50 ml nitrogen free semi solid sodium malate medium(Dobereiner and Day1974). the medium had the following composition in per litre distilled water.

KH2P04.	0.4 g
K2HPO4.	0.1 g
MgSO4.7H2O.	0.2 g
NaCl	0.1 g
CaCl2.	0.02 g
FeCl3.	0.01 g
Na2MoO4.2H2O.	0.002 g
Sodium malate.	5.0 g
Agar.	1.75 g
pH.	7.0

The flasks were incubated at 37 degrees centigrade for 7 days. The amount of atmospheric nitrogen fixed by different isolates was estimated by micro kjeldahl method. the amount of nitrogen fixed was expressed as mgN fixed/ g malate used.

Azotobacter- 0.1 ml of 48 hrs old broth culture of differentisolates were inoculated into 100 ml conical flasks containing 50 ml jenson's liquid medium(Jenson 1951). The flasks were incubated at 28 degree centigrade for 10 days. The amount of nitrogen fixed by different isolates was estimated by micro kjeldahl method. the medium had the following composition in per litre distilled water.

Sucrose.	20 g
K2HPo4.	1.0 g
MgSo4.7H2O.	0.5 g
FeSo4.7H2O.	0.1 g
NaCl.	0.5 g
Na2MoO4.	0.005 g
CaCO3.	2.0 g
pH.	7.0

The effect of three herbicides viz.Arelon,Tribunil,and Dosanex was examined on Azospirillum culture (two strains of Azospirillum lipoferum..12,254)and three of A.brasilense-9,304,201,154).The herbicides were applied at the following dosages:

Arelon at 0.25ppm(1/2x) and 0.50 ppm (x)
Tribunil at 0.50 ppm(1/2x) and 1.0 ppm (x)
Dosanex at 0.30 ppm (1/2 x) and 0.6 ppm (x)

The herbicides was added to 50 ml of sodium malate medium in 100 ml conical flasks. The flasks were sterilised at 15 lbs pressure for 20 minutes. One ml of 48 hrs old cultures of different isolates were inoculated in above flasks. The flasks were incubated at 37 degrees centigrade for 7 days. Each

treatment was triplicated.

Nitrogen was estimated by micro - kjeldahl procedure.

Results- Nitrogen fixation by different genera under laboratory conditions:

Azospirillum- The nitrogen fixing ability of isolates of Azospirillum spp has been presented in Table 1 which showed wide variation when they were grown in semi solid nitrogen free malate media.

The maximum amount of nitrogen fixed by the isolate no 1 obtained from sugarcane rootwas 19.50 mg/ g malate used whereas minimum amount was only 10.0 mg/ g malate fixed by isolate number 201 from jowar roots. The nitrogen fixing capacity of isolate from wheat

(C3 plants) roots and rhizosphere was similar to isolate of sugar cane ,maize, jowar and bajra(C4 plants)showing nitrogen fixation by isolates of diverse origin

Azotobacter- The nitrogen fixing capacity of isolate of Azotobacterwas also determined..Table 2.

The ability for nitrogen fixation of these isolates ranged from 8.20 mg to 19.00 mg/g sucrose used. Both lower and upper limits of nitrogen fixed by Azotobacter isolates were comparatively less than those of Azospirillum isolates .Sugarcane isolate were probably better isolates in nitrogen fixation than the isolates from other plants.

Table 01

Nitrogen fixation by Azospirillum spp.

Name of Organism	Isolate No	Source	mg N/g malate
Azospirillum brasilense	1	Sugarcane roots	19.50
Azospirillum lipoferum	2	.	11.50
Azospirillum brasilense	5	"	10.40
Azospirillum lipoferum	6	Sugarcane rhizosphere	12.50
Azospirillum brasilense	8	"	10.50
Azospirillum brasilense	9	"	10.08
Azospirillum brasilense	11	Wheat rhizosphere	15.10
Azospirillum lipoferum	12	"	12.64
Azospirillum brasilense	15	"	10.06
Azospirillum brasilense	18	Wheat roots	13.80
Azospirillum lipoferum	20	"	19.00
Azospirillum lipoferum	102	Maize roots	13.50
Azospirillum brasilense	151	Maize rhizosphere	12.00
Azospirillum brasilense	154	"	19.00
Azospirillum brasilense	201	Jowar roots	10.00
Azospirillum brasilense	251	Jowar rhizosphere	19.00
Azospirillum lipoferum	254	"	11.00
Azospirillum brasilense	304	Bajra roots	11.55
Azospirillum brasilense	354	Bajra rhizosphere	16.50
Azospirillum lipoferum	353	"	11.50

Table 02
Nitrogen fixation byAzotobacter chroococcum

Name of Organism	isolate number	Source	mg N/g malate
Azotobacter chroococcum	1 S	Sugarcane rhizosphere	18.00
"	4 S	"	15.89
"	6 S	"	17.10
"	8 S	"	13.00
"	1W	Wheat rhizosphere	15.00
"	2W	"	13.00
"	3W	"	14.50
"	4W	"	19.00
"	2M	Maize rhizosphere	17.10
"	4M	"	13.00
"	5M	Maize	15.00
"	2J	Jowar rhizosphere	8.20
"	4J	"	15.00
"	6	"	14.50
"	3B	Bajra rhizosphere	10.00
"	4B	"	19.00
"	6B	"	16.50

In the present study the effect of Arelon, Tribunil and Dosanex at the rate of approximately field rate(x) and half of it(1/2x) was a studied on nitrogen fixation by different *Azospirillum*strains.

In case of *A. lipoferum* (12) Arelon, Tribunil and Dosanex at ½ x and x rates were significantly toxic for nitrogen fixation(10.84 ,6.72, 10.45 ,7.94, 5.55 ,5.3 mg N/g malate) than control(12.64 mg N/g malate) respectively. Likewise, Arelon proved to be less toxic and the observations were non-significant at different intervals by another strain of(254).

The pesticides approximately at field rate suppressed the nitrogen fixation to a greater degree than pesticide applied at half of its field rate. The nitrogen fixation by strains of *A. brasiliense* (strain number 9 ,304 ,201)were not significantly affected by Arelon at 1/2x rate as compared with no Arelon while there was significant reduction in case of (154) with Arelon applied at the same rate.

The field rate application of Arelon reduced nitrogen fixation(5.94, 9.05, 9.84 mgN/g malate) significantly over their control(10.08 ,10.61, 14.56 mg N/g malate) with all strains of *A. brasilense(*strain numbers 9, 304, 154)except srain number 201 where Arelon did not affect nitrogen fixation at all. The nitrogen fixation activity of all *A. brasilense* strains were reduced significantly at both the rates of Tribunil and Dosanex. However, Tribunil atfield rate completely suppressed the activity of two strains (201,154) of *A. brasilense* while their activity at half the rate was significantly reduced.

Table 03
Effect of different herbicides on nitrogen fixation by different *Azospirillum* strains (mg N/g malate

Treatments	Isolate no.	0	1/2x	X	0	1/2 x	x	0	1/2x	x
A.lipoferum	234	10.45	9.55	9.7	10.45	8.77	7.09	10.45	6.55	5.75
A.lipoferum	12	12.64	10.84	6.72	12.64	10.46	7.84	12.64	5.55	5.30
A.brasilense	9	10.08	9.85	5.84	10.08	6.72	6.72	10.08	4.48	4.48
A.brasilense	304	10.61	9.61	9.05	10.61	7.84	5.60	10.61	6.85	4.29
A.brasilense	201	7.84	7.84	7.84	7.84	2.80	_--_	7.84	3.24	2.16
A.brasilense	154	14.56	12.84	9.84	14.56	5.6	--	14.56	8.72	6.91

	Arelon.	Tribunil.	Dosanex
S.em.	0.50.	0.19	0.07
C.D. 5%.	1.44	0.56	0.28

Discussion- Three substituted ureas (Arelon,Tribunil and Dosanex) at normal field rate and it's half dose were found to be toxic for nitrogen fixation by*Azospirillum lipoferum*(Strain 254 and 12) and strains 9, 304 and 154 of *A.brasilense* (Table..3). The field rate of Arelon Tribuniland Dosanex suppressed the nitrogen fixation to a greater extent than the herbicide appliedat half of their field rates.At half field rate,Arelon proved to beless toxic than Tribunil and Dosanex.

Arelon at half dose could reduce nitrogen fixation significantly only in case of two isolates–

A. lipoferum (12) and *A. brasilense* (154), out of six tested. The results showed the variability in the tolerance capacity of the isolates.The maximum toxicity was caused by field rate of Tribunil since nitrogen fixation was completely inhibited in two cultures of *Azospirillum brasilense* (201 and 154). Dosanex proved to be more toxic to *A. brasilense*(9 and 304) *and A.lipoferum*(12 and 254) than Tribunil but the latter was more inhibitory to two remaining strains of *A. brasilense*(201 and 154) than the former.

Eisenhardt (1975) reported reduction of non-symbiotic nitrogen fixationin soil inoculated with*Azotobacter macrocytogenes*was reduced by 10, 100 and 1000 ppmphoxin after 14 days to 82 ,55 and 8% of untreated respectively. Huae (1979) reported the treatment of soil with Tribunil led to a decrease in the number of anaerobic nitrogen fixing bacteria in the sandy soil. Linuron inhibited the development of microorganisms in soil (Minenko et.al., 1980). On the other hand Jagnow et.al. (1981) reported that application of thidiazuron had little adverse effect on nitrogen fixation and other processes.

As Dosanex was found to be more toxic to *A. lipoferum*(12)in pure cultural studies than Tribunil by micro kjeldhal method ,the same way thenitrogenase activity of soil inoculated with *A.lipoferum* was inhibited more in presence of Dosanex than Tribunil and Arelon .

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