Research Paper :

Antifungal activity of *Azotobacter* spp. on seed borne pathogen of Onion

B.M. BELHEKAR AND A.M. BHOSALE

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See end of the article for authors' affiliations

Correspondence to :
B.M. BELHEKAR
Department of Botany, Padamshree Vithalrao Vikhe Patil College, Loni Tal-Rahata, AHMEDNAGAR (M.S.) INDIA

SUMMARY

The present research work deals with the antifungal activity of *Azotobacter* spp. against seed borne fungi of onion. Study revealed that AZT-4 strain of *Azotobactor* has the highest antifungal activity against *Curvularia lunata.* This finding also support the role of *Azotobacter* spp. in phytomedicine.

Key words : Onion, pathogen, *Azotobacter*, antifungal activity

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Onion (*Allium cepa* L.) belonging to family Alliaceae is one of the most important commercial vegetable crops. India is the second largest producer of onion. During storage the seeds infected by different types of fungi which decrease seed vigour, per cent germination and seed viability. Therefore, there is need to protect the seeds during storage. Common use of fungicides leads to pollution of environment and uneconomical to the farmers. Today, it is essential to replace chemical fungicides with bioinoculants like *Azotobacter, Rhizobium* and *Trichoderma,Azotobacter* has an ability to produce antifungal antibiotics and fungalstatic compounds against pathogens like *Fusarium, Alternaria* and *Heliminthosporium*. With this view, the present research work was undertaken to study the antifungal activity of *Azotobacter* spp. against seed borne fungi of onion.

MATERIALS AND METHODS

Eight efficient isolates of *Azotobacter*, nitrogen fixing bacteria, were isolated from the rhizosphere of onion crop grown in different locations in Rahata Tahsil, Ahmednagar, (M.S).They were named as AZT-1 to AZT-8.Rhizosphere soil samples from field of onion were used for isolation of *Azotobacter*. Jenson's agar medium was used for isolation, cultivation and preservation of *Azotobacter*. Seeds of N-53 Phule Fursungi were used to isolate the seed borne pathogen.All strains/ isolates were maintained by routine culturing at one month interval on Jensen,s agar slopes followed by storage at 5^0C and were incubated aerobically at 28+ 2^0 C

Azotobacter was isolated and purified by transfer and retransfer technique.All the eight isolates were subjected to the test of purity. Surface sterilized onion seeds were used to isolate the pathogen and grown on Potato dextrose agar medium and were incubated at 25^0C. Spores from the plates were aseptically transferred on PDA medium and incubated at 25^0C. More than one type of fungal colonies appeared, which could be distinguished by their colour and observed a stained preparation on glass slide under microscope. The fungus was identified by using standard key. Cup plate method was used to test the activity of Azotobacter against seed borne pathogen.

RESULTS AND DISCUSSION

From the experimental study, AZT-4 proved its highest antifungal activity against *Curvularia lunata* followed by AZT-1 against *Aspergillus niger*. Strains AZT-2, AZT-3, And AZT-7 were at par against *Rhizopus* and *Drechslera, Rhizopus* AZT-5 and AZT-8 were at par against *Aspergillus niger* and *Curvularia* whereas AZT-6 was inefficient against *Drechslera.* Variation in antifungal activity as per above result are depicted in Table 1 and Fig. 1, 2 and 3. The present observations derive the support from Konde *et al.* (1980)

Table 1 : Antibacterial activity of *Azotobacter* strains

Sr. No.	Treatments	Col. diameter away (B-mm)	Col. diameter facing (A-mm)	$\frac{B-A}{B} X 100 mm$
1.	AZT-1 + *Aspergillus niger*	30	10	66.67
2.	AZT-2 + *Rhizopus nigricans*	23	15	34.78
3.	AZT-3 + *Drechslera rostata*	20	13	35.00
4.	AZT-4 + *Curvularia lunata*	52	16	69.23
5.	AZT-5 + *Aspergillus niger*	50	20	60.00
6.	AZT-6+ *Drechslera rostata*	10	8	20.00
7.	AZT-7 + *Rhizopus nigricans*	20	13	35.00
8.	AZT-8 + *Curvularia lunata*	52	20	61.54

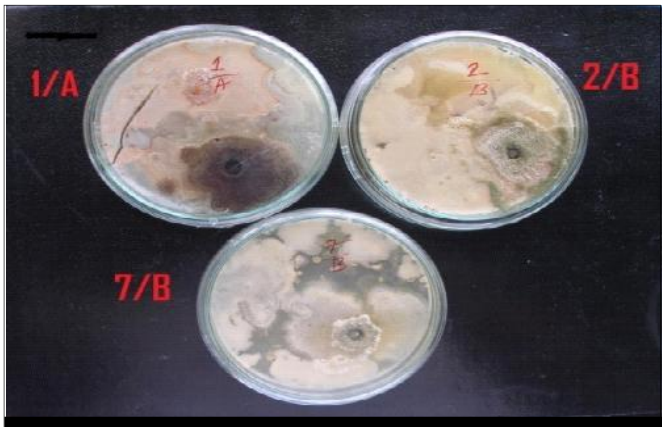

Fig. 1 : 1/A - AZT-1 + *Aspergillus niger*, 2/B - AZT-2 + *Rhizopus nigricans*,7/B - AZT-7 + *Rhizopus*

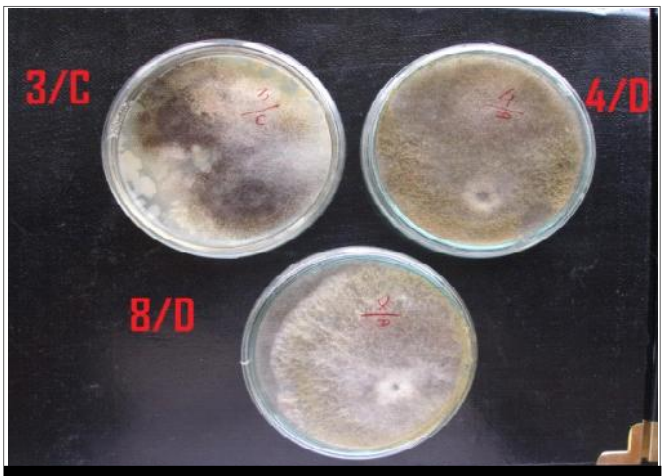

Fig. 2 : 3/C- AZT-3 *Drechslera*,4/D-AZT-4 + *Curvularia*,8/D - AZT-8 + *Curvularia*

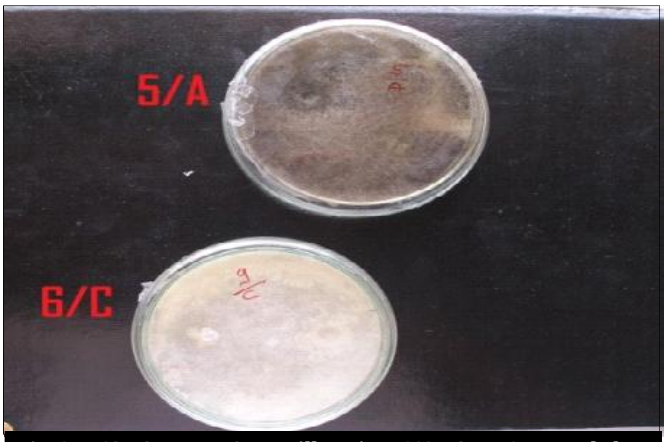

Fig. 3 : 5/A - AZT-5 + *Aspergillus niger*,6/C : AZT-6 + *Drechslera*

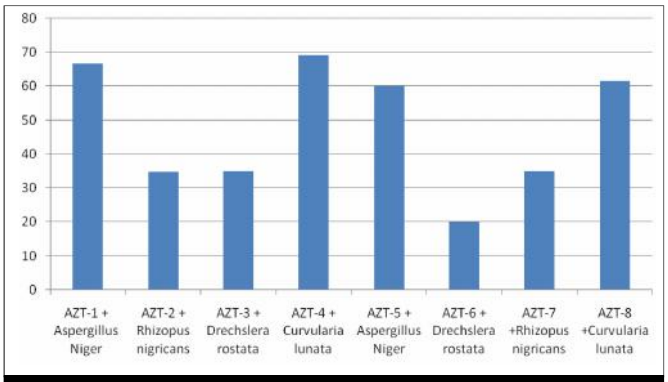

Fig. 4 : Activity of *Azotobacter* against different pathogens

Pal and Jalali (1998), Pande and Sushilkumar (1990) and Suneja and Lakshminarayana (1998) that *Azotobacter* induced growth promoting substances which have antimicrobial and fungicidal properties.

Authors' affiliations:
A.M.BHOSALE, Department of Botany, Padamshree Vithalrao Vikhe Patil College, Loni, Rahata, AHMEDNAGAR (M.S.) INDIA

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