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# Effect of Foliar Spray of indole Acetic Acid in the Presence of Amino-Acids And Sugars in Plant Root Extract of Vicia Faba Linn.

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**Abstract:** *The present study focuses on the effect of foliar spray of indole acetic acid on rhizosphere was study at early, pre-flowering, flowering and fruiting stages. Foliar spray of different concentrations of indole acetic acid maximum number of amino acids and sugars were present at early stage. The number of amino acids reduced with the age of plant. It is clear on the basis of the study that the number of fungi seems less at fruiting stage but on the contrary, the appreciable number of fungi is recorded more than flowering stage*

**Keywords**: Foliar spray, I. A.A., Amino acid and Sugars

## I. INTRODUCTION

Very few workers have studied the effect of foliar application of hormone on the rhizosphere root extract. Rovira (1959), Sullia (1966), Singh (1967) and Pandey (1970), Kumar (1993) and Jain (2001), reported that maximum number of amino acids and sugar were present at early stage, which decrease with the age of plant.

## II. MATERIALS AND METHOD

Detection of amino acids and sugars present in the root extract of the plant at early, pre-flowering, flowering and fruiting stages were done by descending paper chromatography technique. 5g of fresh root were crushed in to pestle mortar in 30-ml. absolute alcohol.The root debris was filtered and filtrate was concentrated by mixing it with three parts of chloroform in separating funnel. Root extract was used for spotting.

The solvent viz. n-butanol/glacial acetic acid/distilled water in ratio of 4:1:5 were taken for the separation of amino acids and sugars.0.1% ninhydrin in n-butanol was used as spraying agent for the identification of amino acids. 8.3 gm. Phthalic acid, 75 ml. distilled water, 425 ml. n-butanol and 5 ml. aniline were used as spraying agents for the identification of sugars suggested by Buchan and Sevage (1952) was used.

**Table – 1 Amino acids present in the root extract at different stages of plant growth.**

| Known amino acids | Difference Stages | | | |
|---|---|---|---|---|
| | Early | Pre-Flowering | Flowering | Fruiting |
| 3(3-4Dihydroxy Phenyl) DL-Alanine | - | - | - | - |
| L-cystine | + | + | + | - |
| DL-Tryptophan | - | - | - | - |
| L-Tyrosine | + | + | + | + |
| Glycine | + | + | + | + |
| DL-iso-Leucine | + | + | + | + |
| DL-B-Phenylalanine | - | - | - | - |
| DL-Serine | - | - | - | - |
| L-Ornithine mono HCl | - | - | - | - |

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| | | | | |
|---|---|---|---|---|
| L-Glutamic Acid | - | - | - | - |
| L-Proline | + | + | - | - |
| DL-Methionine | + | + | + | + |
| DL-Threonine | + | + | + | + |
| L-Arginine mono hydrochloride | + | + | + | + |
| L-Valine | - | - | - | - |
| L-Hydroxy proline | - | - | - | - |
| DL-2Amino N-Butric Acid | - | - | - | - |
| DL-Aspartic acid | - | - | - | - |
| L-Leucine | - | - | - | - |
| L-Cystreine HCl | + | - | - | - |
| DL-Alanine | - | - | - | - |
| L-Histidine Mono Hydrochloride | - | - | - | - |

**Table – 2 Effect of foliar spray of different concentrations of Indole acetic acid in the presence of amino-acids in the root extract at pre- flowering stage.**

| Known amino-acids | Different concentrations | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| 3(3-4Dihydroxy Phenyl) DL-Alanine | - | - | - | - |
| L-cystine | + | + | + | - |
| DL-Tryptophan | - | - | - | - |
| L-Tyrosine | + | + | + | + |
| Glycine | + | + | + | + |
| DL-iso-Leucine | + | + | + | + |
| DL-B-Phenylalanine | - | - | - | - |
| DL-Serine | - | - | - | - |
| L-Ornithine mono HCl | - | - | - | - |
| L-Glutamic Acid | - | - | - | - |
| L-Proline | + | + | + | + |
| DL-Methionine | + | + | + | + |
| DL-Threonine | + | + | + | + |
| L-Arginine mono hydrochloride | + | + | + | + |
| L-Valine | - | - | - | - |
| L-Hydroxy proline | - | - | - | - |
| DL-2Amino N-Butric Acid | - | - | - | - |
| DL-Aspartic acid | - | - | - | - |
| L-Leucine | - | - | - | - |
| L-Cystreine HCl | - | - | - | - |
| DL-Alanine | - | - | - | - |
| L-Histidine Mono Hydrochloride | - | - | - | - |

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**Table – 3 Effect of foliar spray of different concentrations of Indole acetic acids in the presence of amino acids in the root extract at flowering stage.**

| Known amino-acids | Different concentrations | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| 3(3-4Dihydroxy Phenyl) DL-Alanine | - | - | - | - |
| L-cystine | + | + | + | - |
| DL-Tryptophan | - | - | - | - |
| L-Tyrosine | + | + | + | + |
| Glycine | + | + | + | + |
| DL-iso-Leucine | + | + | + | + |
| DL-B-Phenylalanine | - | - | - | - |
| DL-Serine | - | - | - | - |
| L-Ornithine mono HCl | - | - | - | - |
| L-Glutamic Acid | - | - | - | - |
| L-Proline | - | - | - | - |
| DL-Methionine | + | + | + | + |
| DL-Threonine | + | + | + | + |
| L-Arginine mono hydrochloride | + | + | + | + |
| L-Valine | - | - | - | - |
| L-Hydroxy proline | - | - | - | - |
| DL-2Amino N-Butric Acid | - | - | - | - |
| DL-Aspartic acid | - | - | - | - |
| L-Leucine | - | - | - | - |
| L-Cystreine HCl | - | - | - | - |
| DL-Alanine | - | - | - | - |
| L-Histidine Mono Hydrochloride | - | - | - | - |

**Table – 4 Effect of foliar spray of different concentrations of Indole acetic acids in the presence of amino acids in the root extract at fruiting stage.**

| Known amino-acids | Different concentrations | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| 3(3-4Dihydroxy Phenyl) DL-Alanine | - | - | - | - |
| L-cystine | + | + | + | - |
| DL-Tryptophan | - | - | - | - |
| L-Tyrosine | + | + | + | + |
| Glycine | + | + | + | + |
| DL-iso-Leucine | + | + | + | + |
| DL-B-Phenylalanine | - | - | - | - |
| DL-Serine | - | - | - | - |
| L-Ornithine mono HCl | - | - | - | - |
| L-Glutamic Acid | - | - | - | - |
| L-Proline | - | - | - | - |
| DL-Methionine | + | + | + | + |

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| | | | | |
|---|---|---|---|---|
| DL-Threonine | + | + | + | + |
| L-Arginine mono hydrochloride | + | + | + | + |
| L-Valine | - | - | - | - |
| L-Hydroxy proline | - | - | - | - |
| DL-2Amino N-Butric Acid | - | - | - | - |
| DL-Aspartic acid | - | - | - | - |
| L-Leucine | - | - | - | - |
| L-Cystreine HCl | - | - | - | - |
| DL-Alanine | - | - | - | - |
| L-Histidine Mono Hydrochloride | - | - | - | - |

**Table – 5 Sugar present in the root extract at different stages of plant growth.**

| Sugars | Different stages | | | |
|---|---|---|---|---|
| | Early | Pre-flowering | flowering | Fruiting |
| Ribose | - | - | - | - |
| Lactose | - | - | - | - |
| Fructose | - | - | - | - |
| Glucose | - | - | - | - |
| Dextrose | - | - | - | - |
| Glactose | - | - | - | - |
| Maltose | + | + | - | - |
| Sucrose | + | + | + | + |

**Table- 6 Effect of foliar spray of different concentrations of Indole acetic acids in the presence of sugars in the root extract at pre-flowering stage.**

| Sugars | Different stages | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| Ribose | - | - | - | - |
| Lactose | - | - | - | - |
| Fructose | - | - | - | - |
| Glucose | - | - | - | - |
| Dextrose | - | - | - | - |

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| | | | | |
|---|---|---|---|---|
| Glactose | - | - | - | - |
| Maltose | + | + | + | + |
| Sucrose | + | + | + | + |

**Table- 7 Effect of foliar spray of different concentrations of Indole acetic acids in the presence of sugars in the root extract at flowering stage.**

| Sugars | Different stages | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| Ribose | - | - | - | - |
| Lactose | - | - | - | - |
| Fructose | - | - | - | - |
| Glucose | - | - | - | - |
| Dextrose | - | - | - | - |
| Glactose | - | - | - | - |
| Maltose | - | - | - | - |
| Sucrose | + | + | + | + |

**Table-8 Effect of foliar spray of different concentrations of Indole acetic acids in the presence of sugars in the root extract at fruiting stage.**

| Sugars | Different stages | | | |
|---|---|---|---|---|
| | Control | 50 ppm | 100 ppm | 200 ppm |
| Ribose | - | - | - | - |
| Lactose | - | - | - | - |
| Fructose | - | - | - | - |
| Glucose | - | - | - | - |
| Dextrose | - | - | - | - |
| Glactose | - | - | - | - |
| Maltose | - | - | - | - |
| Sucrose | + | + | + | + |

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## III. RESULT AND DISCUSSION

It was found in the present study that the number of amino acids and sugar, in the root extract, decreased in number with age of plants 9, 8, 7 and 6 amino acids were detected in the root extract at early, pre-flowering, flowering, and fruiting stages respectively (Table-1).

The amino acids invariably present in all the stages were Tryosine, Glycine Iso-leucine, Methionine, Threonine and Arginine mono hydrochloride. Cystine was present at early pre- flowering and flowering stages. Proline was present at early and pre-flowering stages while cystreine was only confined to early stage.

2, 2, 1 and sugars were detected in the root extract at early, pre-flowering, flowering, and fruiting stages respectively. Two sugars maltose and sucrose were detected in the root extract. Maltose was present at early and pre-flowering stages while sucrose was present in all the four stages. (Table - 5).

From the above observation, it is clear that the maximum number of amino acids and sugars were present at early stage, which decreases with the age of the plants. Rovira (1959), Sullia (1966), Singh (1967), Pandey (1970), Kumar (1993), and Jain (2001) Observed the same finding.

The above observation leads us to crux of the problem i, e, whether it is the root excretion that stimulates fungi in the rhizosphere or the sloughed off root tissues. It is clear that both root tissues play an important role in the influencing the fungi in the rhizosphere region. Maximum number of fungi were isolated both at early and fruiting stages. It would have been only dependent on the root excretion and the quality and number of amino acids. The number of fungi would have been less at fruiting stage but on the contrary, appreciable number of fungi was recorded more than flowering stage.

Gadgil (1965) noted a progressive decortication of the root with age of the plants in graminaceous root. Sullia (1966) often observed a partial peeling off of epidermal and cortical tissue. It seems, therefor that this disintegration of the outer portion of the root is one of the most important factors in influencing the rhizosphere fungal flora.

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