



Research Paper

# TOTAL NITROGEN UPTAKE IN HEALTHY AND INFECTED PLANT PARTS OF *CICER ARIETINUM*

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Our studies dealing with total nitrogen uptake and distribution in healthy and infected crop plant are in conformity with the various works done in different laboratories. Results showed that, in case of blank soil collected from field without plant and soil with plant, the total Nitrogen content/ dry soil, and decline from 0-80<sup>th</sup> days. However this decline is more in the soil of infected plants due to fungal infection. Our studies with total Nitrogen uptake and distribution in healthy and infected crop plants are in agreement with the various works done in our laboratory.

**Keywords:** *Cicer arietinum*, Nitrogen uptake, healthy and infected plants

## INTRODUCTION

Nitrogen is a universally occurring element in all living beings and major component of protein. For investigation on total nitrogen the dried samples of healthy and infected vegetative studies on the total protein nitrogen uptake and distribution in healthy and fungal infected plants in the crop fields of Saharanpur were carried out in *Cicer arietinum* plant parts-stem and leaf disc and floral parts particularly anther and pollen grains were subjected to total nitrogen in days (i.e., day of seedling emergence) and at vegetative growth stage and flowering stage. Plant samples were collected 100 meters away from road side.

## MATERIALS AND METHODS

Plant samples for biochemical analysis were

taken at 40<sup>th</sup> day and 80<sup>th</sup> day of seedling emergence based on crops. Stem, leaf, anther and pollen grains were collected from crop field. Dry weight was recorded and the dried samples of experimental crop plant were used for quantitative estimation of total Nitrogen. Simultaneously experimental plants were sown in the polythene bags containing 2 kg field soil and grown under field condition in the college campus with irrigation being done whenever required. For estimation of Nitrogen digestion was done according to Snell and Snell (1954) and later the nitrogen digested was estimated calorimetrically.

## OBSERVATIONS

Result of all observations are given in Table 1 and Figures 1-4 on gram dry weight basis for revealing

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the effects of infection on the uptake rates of total nitrogen and its distribution in selected plant parts.

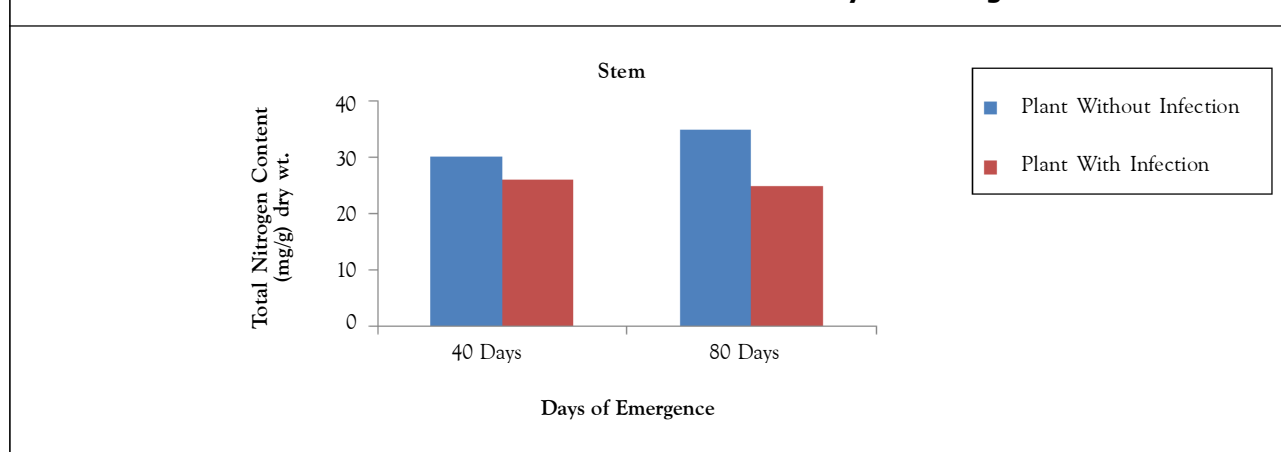
## RESULTS AND DISCUSSION

Table 1 and Figures 1-4 show the effects of infection on nitrogen uptake and its distribution in plant at 40<sup>th</sup> and 80<sup>th</sup> day in *Cicer arietinum*. Table 1 shows, the total nitrogen content in various plant parts and decreases in infected parts in mg/gm on dry weight basis. Thus total nitrogen content of infected plant stem at 40<sup>th</sup> and 80<sup>th</sup> days are ca. 86.3% and 85.7% of control respectively.

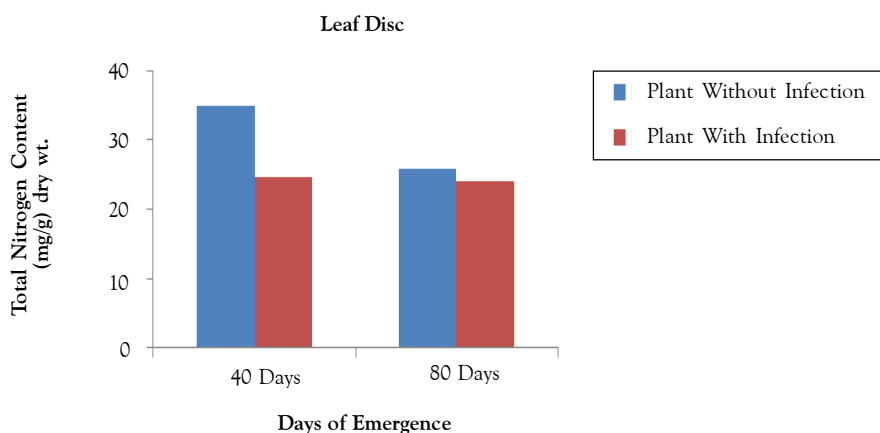
Table 1 shows that the total nitrogen was slightly reduced at later days in presence of infection. Similarly table also shows that translocation of nitrogen from vegetative part to reproductive part was also affected in presence of fungal infection (rust disease caused by *Uromyces* sp.). Thus at 80<sup>th</sup> day anther and pollen grain nitrogen in infected plant sets are ca. 86.0% and 80% of control nitrogen respectively. Results also indicated that in infected plant at 80<sup>th</sup> day is 93% of control 40<sup>th</sup> day it is Ca.70.8% of control.

<b>Table 1: Total Nitrogen (per gram dry weight) uptake and distribution in healthy and infected plant parts of <i>C. arietinum</i></b>						
Days From Emergence	Soil With (blank) Mg/Kg	Soil With Plant mg/Kg	Total Nitrogen Level in			
			Stem	Leaf	Anther	Pollen Grains
<b>Plant Without Infection (Control)</b>						
0	460.0	460.0	–	–	–	–
40	458.0	462.0	30.10	35.00	–	–
80	455.0	464.0	28.00	26.00	20.50	23.60
<b>Plant With Infection</b>						
0	460.0	460.0	–	–	–	–
40	458.0	465.0	26.00	24.80	–	–
80	450.0	460.0	24.00	24.20	17.65	19.00

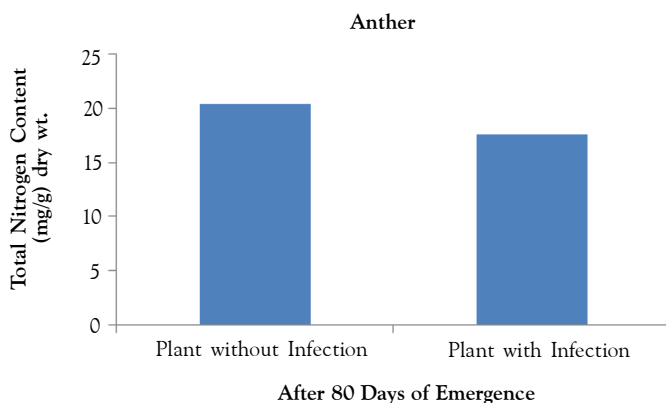
**Figure 1: Total Nitrogen Content in (mg/gm) Dry wt. of Stem in *Cicer arietinum* with and without Infection after 40 and 80 Days of Emergence**



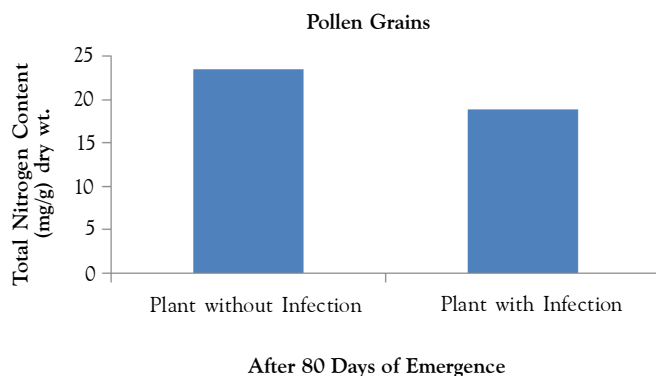
**Figure 2: Total Nitrogen Content in (mg/gm) Dry wt. of Leaf in *Cicer arietinum* with and without Infection after 40 and 80 Days of Emergence**



**Figure 3: Total Nitrogen Content in (mg/gm) dry wt. of Anthers in *Cicer arietinum* with and without Infection After 80 Days of Emergence**



**Figure 4: Total Nitrogen Content in (mg/gm) dry wt. of Anthers in *Cicer arietinum* with and without Infection After 80 Days of Emergence**



Results also shows that in case of blank soil collected from field without plant and soil with plant, the total Nitrogen content/dry soil, decline from 0-80<sup>th</sup> days. However this decline is more in the soil of infected plants. Our studies with total Nitrogen uptake and distribution in healthy and infected crop plants are in agreement with the various works done in our laboratory as Singh (2002), Divya (2003), Paridhi (2003), Bhargava (2006), Reshu (2006).

## CONCLUSION

In this study it was found that total nitrogen content uptake in infected plant of *C. arientinum* had declined due to fungal infection as compared to healthy plant, simultaneously nitrogen content gradually reduced in soil with infected plant as compared to soil with healthy plant.

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