

## Leaf protein estimation of Benzolive tree by using different bioinoculants and fertilizers

A.R. ROUT<sup>1</sup>, S.C. KHETI<sup>1\*</sup>, T. MOHAPATRA<sup>1</sup> and A. TRIPATHY<sup>2</sup>

<sup>1</sup>Mahatma Gandhi College of Pharmaceutical Science, Jaipur, Rajasthan (India).

<sup>2</sup>Apex College of Pharmaceutical Science, Jaipur, Rajasthan (India).

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### ABSTRACT

The concept of protein estimation analysis has highly effective on the study of plant reaction in environmental condition. The determination of quantitative protein analysis of plant will vary according to the environmental factors and nutrient application in form of fertilizer and bio-inoculants. The following study specifies the characterization of plant Benzolive tree (*Moringa oleifera*) PKM1 variety by estimating protein and polyphenol from leaf sample with standardization of Bovine Serum Albumin (BSA) and Gallic acid respectively.

**Key words:** Polyphenol, protein, BSA and gallic acid.

### INTRODUCTION

*Moringa oleifera* (Benzolive tree) is the most cultivated species of a monogeneric family, *Moringaceae* native to the Sub-Himalayan tracks of India. Recently there is highly demand of some of the hybrid varieties of *Moringa*, especially variety PKM1 (South Indian origin) has great effect on protein analysis. The present study is to access the effect of different bio-inoculants and fertilizers on the growth and development of *Moringa oleifera* (PKM1) variety under green house condition as a part of rural livelihood support and also for the quantitative analysis of protein and the estimation of polyphenol in the leaf sample.<sup>2</sup>

### MATERIAL AND METHODS

*Moringa oleifera* PKM1 variety was used as the sample, the experiment set up was done inside the green house maintaining the temperature 27-28°C and water was sprayed inside it. The experimental setup contains 2 trays, each of 48 small pots from the total of 96. The pots were filled with sterilized soil and sand through the entire surface area of each pot. Then the row marked as treatments

and columns as replication. There were 12 treatments including control containing 8 replications each. Different fertilizers were added to the respective treatments one by one as per the quantity fixed above. There after water was sprayed & then the seeds sowing inside pot i.e one seed per pot.

Then the leaf sample was collected and protein estimation in the sample was carried out by the following method. Standard curve was plotted by taking various concentrations of Bovine Serum Albumin (BSA) Vs absorbance at 750nm and protein content was calculated by taking the absorbance from the graph. Here sample prepared by using the reagent (1ml of 1% CuSO<sub>4</sub> + 1ml 2% sodium potassium tartarate + 48ml of 2% Na<sub>2</sub>CO<sub>3</sub>) 4ml + 1ml leaf sample, then allowed to stand for 10min by adding 0.5ml folin phenol and put for another 30min. Then OD was taken at 750nm.

### Quantitative estimation of polyphenols in the leaf sample

The leaf samples were collected and polyphenol estimation in the sample was carried out by the following method. Standard curve was plotted by taking various concentrations of sample in Gallic

acid solution Vs absorbance at 515nm and polyphenol content was calculated by taking the absorbance from the graph. Here reagent used for sample preparation is 0.1N HCl, solution of (10% sodium nitrite: 10% sodium molybdate =1:1), 1N NaOH, Gallic acid & 60% methanol.

as standard. The concentration of total protein was calculated from the standard curve and amount of protein present in 5ml of the leaf of 12 different treatments were calculated. The treatment T8 in which Fungi is applied contains maximum amount of protein i.e 77microgm/ml.

**RESULT AND DISCUSSION**

Quantitative analysis of protein presents in the leaf sample of Moringa oleifera PKM1 variety was carried out following Lowry method, taking BSA

**Table 1: Estimation of leaf protein at 750nm**

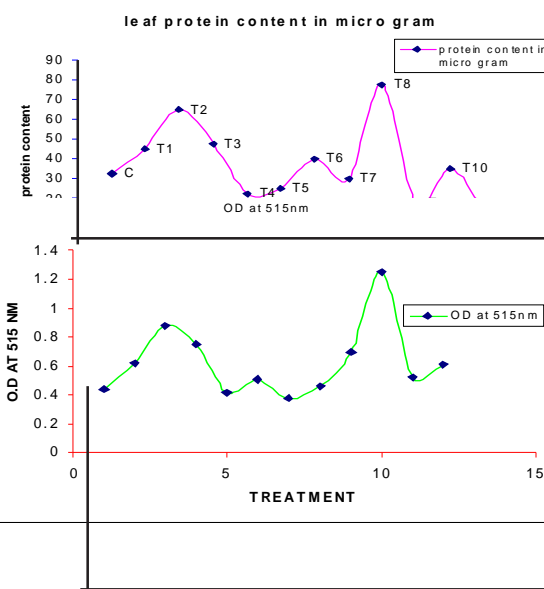
Treatment	SP Reading in nm	protein content in µg/5ml
C	0.4011	32.5
T1	0.4497	45
T2	0.4174	65
T3	0.3407	47.5
T4	0.464	22.5
T5	0.6823	25
T6	0.7229	40
T7	0.4219	30
T8	0.7022	77.5
T9	0.4766	17.5
T10	0.5003	35
T11	0.4916	15

**Table 2: Graph for polyphenol estimation**

Estimation of poly phenols(PP) in leaf sample		
Treatments	OD at 515nm	Quantity of PP in µg/ml
C	0.44	53.75
T1	0.62	77.5
T2	0.88	110
T3	0.75	93.75
T4	0.42	52.5
T5	0.51	65
T6	0.38	42.25
T7	0.46	57.5
T8	0.7	87.5
T9	1.25	156.25
T10	0.52	65
T11	0.61	76



**Fig. 1:**



**Fig. 3:**



**Fig. 4:**

In the estimation of polyphenols the analysis shows the result that Treatment T9 with Fungi +SSP gives maximum amount of polyphenols i.e 2.87.

So the present study reveals that application of bio-inoculants affects the synthesis of comparatively more protein contents and other metabolites. So utilization of bio-inoculants along with other fertilizers may be justified enough for better yield of *Moringa oleifera* PKM1 variety.

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