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"COMPARATIVE STUDY OF ALKALOIDS & FLAVONOIDS IN SELECTED SPECIES OF OCIMUM IN AND AROUND OF MUNGER DISTRICT"

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Abstract: The District of Munger located in the Eastern part of Bihar, India, is hemmed among the Ganga River in the North, Bhagalpur District in the East, Lakhisarai District in the West and the Jamui District in the South. It is located between $24^0$30' and 25^0N Latitude and between $86^0$30' and 87^0 East Longitude

Ocimum commonly known as Tulsi. It is also known a Paak Paudha in Religious Book Quraan in Surah Rahman under the Name of Reihann.

Present work in the comparative study of alkaloid and Flavonoid in four species of Ocimum like O. sanctum, O. tenuifolium, O. basilicum and O. gratissmum. It was observed that highest content of alkaloids present in *O.sanctum (Rama Tulsi)* and highest content of Flavonoids present in *O.tenuifolium (Shyama Tulsi).*

Keywords *: Alkaloid, Flavonoid, Ocimum, Reihaan.*

1. INTRODUCTION

Alkaloids and Flavonoids are secondary metabolites that are found in plants, fruits and seeds, responsible for the color, fragrance and flavor characteristics in plants flavonoids perform many functions like regulating cell growth, attracting pollinators insect and protecting against biotic and abiotic stresses. Whereas alkaloids protect plants from predators and regulate their growth. Alkaloids are a group of naturally occurring chemical compounds that have a wide range of health benefit they are known to have anti-oxidant, anti-inflammatory and anti-cancer properties. They can also help to reduce cholesterol levels, improve digestion and boost the immune system.

2. Materials & Method

A. Analysis of Alkaloids by gravimetric method

Requirements:

i. Appartus/Equipments: Test tubes, Beaker, Measuring cylinder, Pipettes, Balance, Cyclomixer, dessicator, Whatmann Paper.

ii. Chemical/Reagents : Ethanolie acetic acid, Ammonia

iii. Leaves of four selected species of Ocimum.

Procedure :

To determine TAC (Total Alkaloids Content) 5 grams of selected Tulsi leaf was grinded and soaked in 20 ml of 10% Ethanolie Acetic Acid

↓

Left it 4 hrs. at room temp. after it mixture was filtered through whatman paper

↓

The filterate is concentrated by evaporation over a steam bath till the original volume become 1/4th

↓

Ammonia solution was added drop wise till yellow ppt.

↓

Now this ppt. was filtered using previously weight filter paper

↓

After filtration, the ppt. was cooled in dessicator

↓

Now filter paper was again weighed

The above process was repeated upto 3 times for all the four selected Tulsi Leaves separately and result by tabulated as below (Table 1 to 5)

3. Observation :

Table – 1

No. of Obs.	Ocimum Species	Initial wt. W1 (gms)	Final wt. W2(gms)	Difference (W2-W1)	Average (gms)
1	*O. sanctum*	0.050	0.112	0.062	0.062
2	*O. sanctum*	0.050	0.110	0.060	
3	*O. sanctum*	0.050	0.114	0.064	

$$\% \text{ Alkaloids} = \frac{(w2-W1)}{Wt.of\ sample} x\ 100$$

$$= \frac{0.062}{5} x\ 100 = 1.24\%$$

Table – 2

No. of Obs.	Ocimum Species	Initial wt. W1 (gms)	Final wt. W2(gms)	Difference (W2-W1)	Average (gms)
1	*O. tenuifolium*	0.050	0.110	0.060	0.059
2	*O. tenuifolium*	0.050	0.109	0.059	
3	*O. tenuifolium*	0.050	0.108	0.058	

$$\% \text{ Alkaloids} = \frac{(w2-W1)}{Wt.of\ sample} x\ 100$$

$$= \frac{0.059}{5} x\ 100 = 1.18\%$$

Table – 3

No. of Obs.	Ocimum Species	Initial wt. W1 (gms)	Final wt. W2(gms)	Difference (W2-W1)	Average (gms)
1	*O. basilicum*	0.050	0.098	0.048	0.048
2	*O. basilicum*	0.050	0.100	0.050	
3	*O. basilicum*	0.050	0.098	0.048	

$$\% \text{ Alkaloids} = \frac{(w2-W1)}{Wt.of\ sample} x\ 100$$

$$= \quad \frac{0.048}{5} x\ 100 \quad = 0.97\%$$

Table – 4

No. of Obs.	Ocimum Species	Initial wt. W1 (gms)	Final wt. W2(gms)	Difference (W2-W1)	Average (gms)
1	*O. gratissmum*	0.050	0.107	0.057	0.055
2	*O. gratissmum*	0.050	0.105	0.055	
3	*O. gratissmum*	0.050	0.104	0.054	

$$\% \text{ Alkaloids} = \frac{(w2-W1)}{Wt.of\ sample} x\ 100 = \frac{0.055}{5} x\ 100 = 1.10\%$$

From Table (1), (2), (3) and (4) we can write the % amount of alkaloids as below.

Table – 5

S. No.	Plant Species	% alkaloids
1	*O. sanctum*	**1.24**
2	*O. tenuifolium*	1.18
3	*O. basilicum*	0.97
4	*O. gratissmum*	1.10

B. Analysis of Flavonoids by Aluminum Chloride Method

Requirement :

i. Appartus/Equipments: Test tubes, Test tube stand, Pipette, Measuring cylinder, Beaker, Balance Cyclomixer

ii. Chemical/Reagents : Quarcetin, 10% Ammonium Chloride, 1-M Sodium acetate, D.W. Methanol

Procedure:

→ Preparation of 10% Quarcetion reagent (1mg/ml) 25mg quarcetin dissolved in 25ml of Methanol.

→ 10% Aluminum Chloride : 5gms. Aluminum chloride dissolved in 50ml of D.W

→ 1M – Sodium acetate : 82gms. Sod. acetate dissolved in 1000ml DW.
4.10gms. Sod. acetate dissolved in 50ml DW.

Flow sheet for standard curve of Flavanoids

11 dry and clean Test tubes were arranged on test tube stand and marked as B, 1,2, 3 …10 respectively

↓

0ml, 0.1ml, 0.2ml – 1.0ml of quarcetin reagent was taken in T.T. No. B, 1, 2 ….10 respectively

↓

1 ml, 0.9ml, 0.8ml … 0.0ml methanol was added in T.T.No. B, 1, 2,…….10 respectively

↓

2ml of 10% $AlCl_3$ was added in each Test Tube

↓

Cyclomixed

↓

2ml of 1m sodium acetate was added in each test tube.

↓

Colorimeter reading was taken out at 415nm of each tube

3(A) Observation:

Table -6

T.T. No.	No. of quarceti n (ml)	Vol. of methano l (ml)	Concentr ation of quarectin	Vol. of 10% Alcl3 (ml)		Vol. of Sod. acetate		O.D.
B.	0.0	1.0	00	2ml	Cyclomixed	2ml	Cyclomixed	
1	0.1	0.9	10	2ml		2ml		0.12
2	0.2	0.8	20	2ml		2ml		0.23
3	0.3	0.7	30	2ml		2ml		0.32
4	0.4	0.6	40	2ml		2ml		0.41
5	0.5	0.5	50	2ml		2ml		0.53
6	0.6	0.4	60	2ml		2ml		0.62
7	0.7	0.3	70	2ml		2ml		0.73
8	0.8	0.2	80	2ml		2ml		0.82
9	0.9	0.1	90	2ml		2ml		0.92
10	1.0	0.0	100	2ml		2ml		1.12

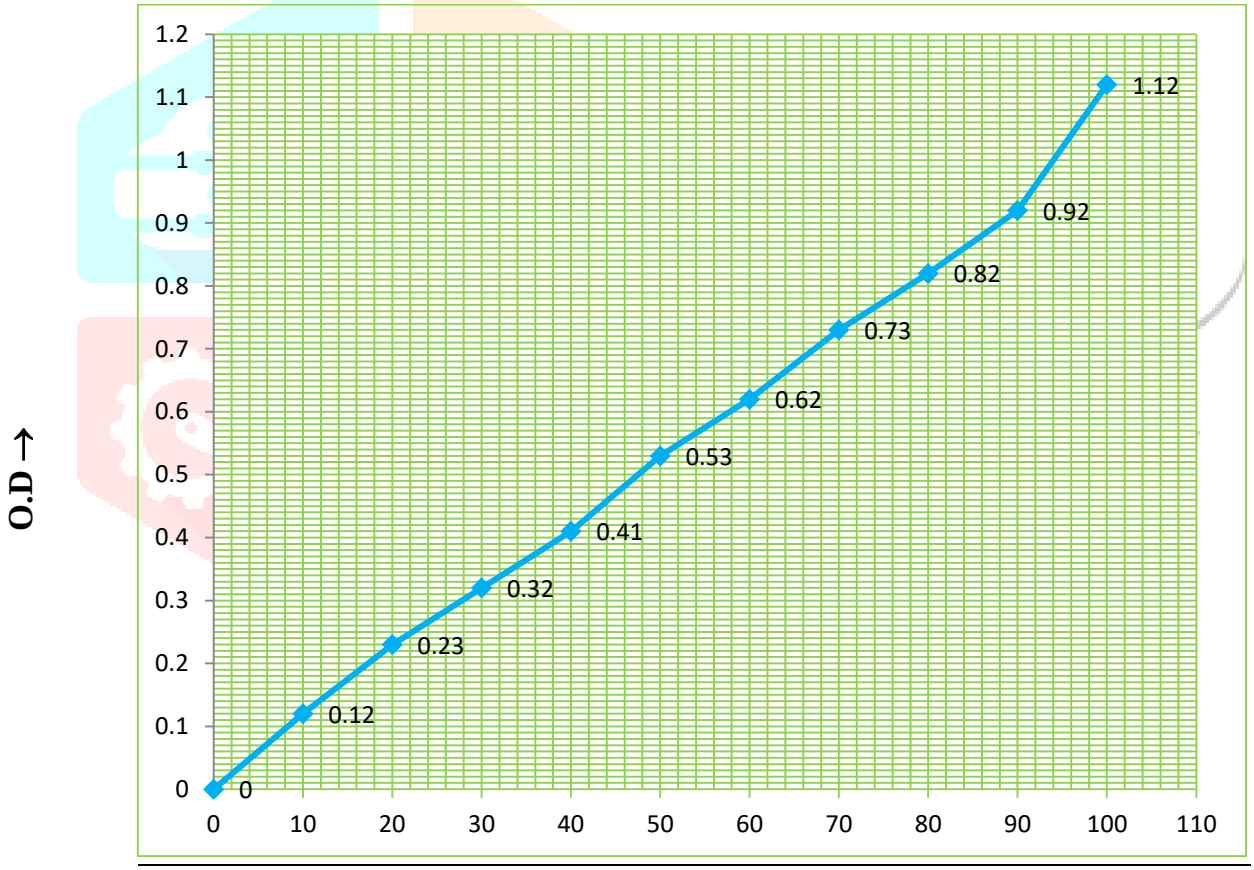

Fig. Standard Curve of Flavonoids

Now optical density of each species of Ocimum was taken and it was coincided with standard curve of Flavonoids, concentration of Flavonoids in each species has been tabulated as below.

Observation :

Table -7

S. No.	Plant Species	Optical Density	Flavonoids ug/uml
1	*O. sanctum*	0.30	28
2	*O. tenuifolium*	0.34	**32**
3	*O. basilicum*	0.28	26
4	*O. gratissmum*	0.26	24

CONCLUSION

It was concluded that *O. sanctum (Rama Tulsi)* has highest amount of alkaloids whereas *O. tenuifolium (Shyama Tulsi)* has highest amount of flavonoids among four species of Ocimum like *O. sanctum, O. tenuifolium, O. basilicum and O. gratissmum*

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