

**PHYTOCHEMICAL EVALUATION, PROXIMATE ANALYSIS AND  
LAXATIVE ACTIVITY OF *LINUM USITATISSIMUM* TABLET  
FORMULATIONS**

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**ABSTRACT:** *Linum Usitatissimum* seeds were collected and qualitatively analyzed for the identification of phytochemical constituents. The results showed the presence of bioactive constituents of carbohydrates, proteins and amino acids. The proximate analysis of the leaves revealed a composition of 3.21% total ash value, 7.61% alcohol soluble extractive value, 4.21% water soluble extractive value and 2.67% acid insoluble ash value. Laxative activity of three different formulations was studied. More research work is recommended on the plant leaves for isolation and characterization of bioactive compounds that may be active against laxative activity.  
**Key words:** *Linum usitatissimum*, phytochemical, proximate analysis, tablet formulation, laxative activity.

## INTRODUCTION:

### Pharmacognostical and Phytochemical Evaluation

To establish the identity and purity of the raw material used for the various physicochemical parameters such as ash values and extractive values were evaluated and reported in Table No.1 & 2

The results revealed that the plant *L.usitatissimum* shows higher percentage of total ash (3.212% w/w) as well as alcohol soluble extractive values (7.61%w/w)

**Table 1. Different ash values of *L.usitatissimum***

S.No	Ash values	Ash value in percentage
		<i>Linum usitatisimum</i>
1	Total ash	3.21
2	Water soluble ash	0.29
3	Acid insoluble ash	2.67
4	Sulphated ash	0.24

**Table 2. Different extractive values of *L.usitatissimum***

S.No	Types of extractives	Extractive value in percentage
		<i>Linum usitatisimum</i>
1	Alcohol soluble extractive	7.61
2	Water soluble extractive	4.21

### Phytochemical Evaluation

The extracts are subjected to various quantitative phytochemical tests and reports are shown in table no.3. The results reveal the presence of carbohydrates, proteins and amino acids.

**Table 3. Phytochemical Evaluations**

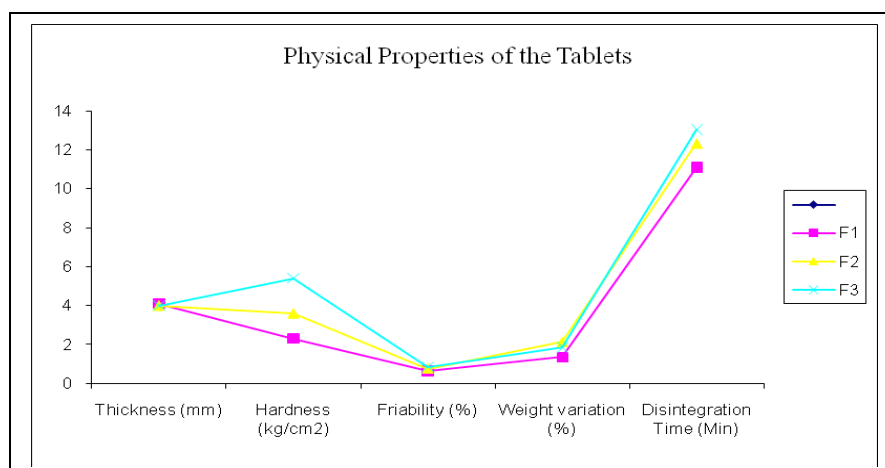
S.No	Tests	<i>Linum usitatisimum</i>
1.	Alkaloids	-
2.	Carbohydrates	+
3.	Proteins	+
4.	Amino acids	+
5.	Glycosides	-
6.	Steroids & sterols	-
7.	Anthraquinones	-
8.	Flavonoids	-
9.	Tannins and Phenolic compounds	-
10.	Triterpenoids	-
11.	Saponin test	-
12.	Fixed oils	-

### Formulation Development

The extracts were subjected to preformulation and granules were prepared by wet granulation method the results shown in Table 4. And the prepared granules were compressed into tablets and subjected for quality control studies and results are shown in Table 5.

**Table 4. Physical Properties of the Tablets**

Formulation	Thickness (mm)	Hardness (kg/cm <sup>2</sup> )	Friability (%)	Weight variation (%)	Disintegration Time (Min)
F1	4.1	2.3	0.65	1.352	11.10
F2	4.0	3.6	0.76	2.121	12.35
F3	4.0	5.4	0.85	1.852	13.05



The formulation has been developed with the basis of preformulation. Results suggest that the extract is compatible with the chosen excipients. The entire tablet formulated showed acceptable pharmaco technical properties and complied with specifications for thickness, hardness, friability and weight variation. The addition of gelatin showed a good hardness for the dosage form. The inclusion of microcrystalline cellulose and sodium starch glycolate in F1 showed very less hardness. The formulation F3 has been formulated with out microcrystalline cellulose and sodium starch glycolate is within the limits for the quality control studies. Our study suggests that the formulation F3 chosen to be the best formulation.

**Table 5. Flow Properties of the Granules**

Formulation	Angle of repose ( $\theta$ )	Loose bulk density (g/ml)	Tapped bulk density (g/ml)	Carr's index (%)
F1	28.51	0.621	0.688	9.73
F2	27.22	0.512	0.571	10.33
F3	24.52	0.432	0.482	12.19

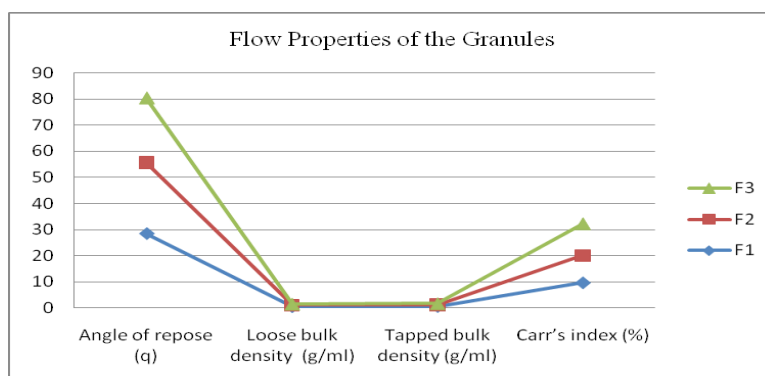
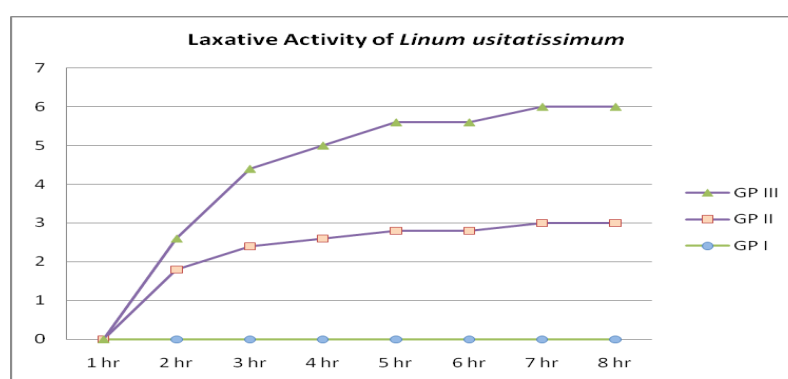


Table 6. Laxative Activity of *Linum usitatissimum*

S. No	Groups	1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	7 hr	8 hr
1	GP I	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
2	GP II	0.0±0.0	*1.8±0.48	2.4±0.40	2.6±0.24	2.8±0.20	2.8±0.20	3±0.0	3±0.0
3	GP III	0.0±0.0	0.8±0.20	2±0.0	2.4±0.24	2.8±0.20	2.8±0.20	3±0.0	3±0.0

Values are Mean ± SEM, n = 5, \*; P < 0.05



The laxative activity of the formulation was evaluated by observing the stool consistency parameters like normal pellet stool, soft-formed stool, watery stool and mucus stool. Formulation at a dose 1000 mg/kg significantly prevented castor oil induced diarrhea  $p < 0.05$  (Table No.6)

## CONCLUSION

The plant *L.usitatissimum* has showed higher percentage of total ash as well as alcohol soluble extractive values. *L.usitatissimum* extract was prepared by using pilot scale extraction plant and spray drying unit. The qualitative phytochemical studies reveal the presence of amino acids carbohydrates and proteins. From the available literatures it was found that *Linum usitatissimum* contains more number of amino acids. The formulated tablets showed acceptable pharmacopoeial limits and complies with specifications for thickness, hardness, friability and weight variation. The formulation has showed better laxative activity indicating additive property of the herbs. *Linum usitatissimum* seed has a tremendous scope on further studies mainly in the area of nutraceuticals and dietary supplements, therefore further research work to be carried out on this plant towards above said field.

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