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FORMULATION AND EVALUATION OF HERBAL TABLETS OF *MORINGA OLIEFERA* L. LEAVES EXTRACT

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ABSTRACT

Moringa oliefera tree is commonly known as Miracle Tree, as almost every part of this tree specially leaves possess high level of nutrition which is useful for humans. In the present study an attempt has been made to develop new herbal formulation. The herbal tablet formulation was developed from the Ethanolic Extract of *Moringa Oliefera* (EEMO) leaves by Direct compression process. The EEMO was compressed into tablet using various excipients, viz., micro crystalline cellulose, sodium starch glycolate, ethyl cellulose, magnesium stearate, lactose anhydrous and evaluated for physical parameters such as Thickness, friability, hardness and disintegration time. Stability studies were carried out at 40˚C/75 % RH for 30 days. The results were showed no significant changes on evaluation parameters of tablet.

INTRODUCTION

Now a day compared with the experience of most modern drugs the human use and approval of most herbal remedies awesome. The requirement by the medical and scientific establishment for research to prove that herb is more effective[1]. *Moringa oliefera* belongs to family *Moringaceae.* It is commonly found in subtropical, tropical and semiaride region. In the different parts of India, the plant is well known by different vernacular names are Hindi- Mungna, Marathi- Shevgi, Shevga, Bengali- Sajina, Telgu- Mulaga[2]. As per the various literature survey, the *Moringa oliefera* leaves possess various medicinal properties. Methanolic extract of *Moringa Oliefera* leaves shows the Immunomodulatory action in animal[3]. The Ethnolic extract of the leaves of *Moringa oleifera* Lam.was tested for antimicrobial activity[4]. The reported chemical constituents present in *Moringa oliefera* are leaves contain Glycosides Niazirin, Niazirinin and three mustard oil glycosides; the stem contains vanillin, β-sitosterone, octacosonic acid; Flower contains D-Mannose, D-Glucose, Protine, ascorbic acid[5].

Taking into consideration, the medicinal and traditional uses of leaves the new herbal tablet formulation is developed. The developed formulation is prepared from the Ethanolic Extract of *Moringa oliefera* (EEMO) Leaves.

MATERIALS AND METHODS

Plant material

The Leaves of *Moringa oliefera* Lam. Were collected from the Local area of Nasik, in the month of September and was authenticated by the Ayurved Mahavidyalay, Ganeshwadi, Panchavati, Nasik-422003. All Excipients used for the formulation were obtained from Concept Pharma, Aurangabad. And all solvents were procured from the Modern Science Lab, Nasik.

Preparation of extracts

The Leaves of Moringa oliefera were collected and shade dried at room temperature for 8 days. After that dried leaves were reduced to coarse powder in a mixer grinder. The fine powdered material obtained was then subjected to successive extraction in a batch of pet ether, chloroform, and ethanol. The extraction assembly heated 70-80 $^{\circ}$C using heating mantle for 48-72 hrs. till the completion of extraction. The yield was found to be around 3.56, 6.4, 11.85 %(W/W) respectively. The biologically potent ethanol extract was prepared for herbal tablet manufacturing.

Preparation of herbal tablets from *Moringa oliefera* extract

Herbal tablets were prepared by direct compression process using different proportion of Ethyl cellulose and Sodium starch glycolate and denoted as MOT 1, MOT 2, MOT 3, and MOT 4. The composition is given in Table 1. All the ingredient passed through mesh no. 100 and tablet directly compression each of 300 mg weight on a 10 station rotary tablet compression machine fitted with 10 mm flat shaped punches. No manufacturing defects were observed in tablets like capping, chipping and lamination.

Table 1: Composition of various tablet formulations containing *Moringa oliefera* Ethanolic extract

Formulation code	Drug (mg)	SSG (mg)	Ethyl cellulose(mg)	MCC (mg)	Mg.Stearate (mg)	Lactose anhydrous(mg)	Total wt. (mg)
MOT 1	60	12	15	120	6	87	300
MOT 2	60	12	22.5	120	6	79.5	300
MOT 3	60	15	15	120	6	84	300
MOT 4	60	15	22.5	120	6	76.5	300

Where, MOT = *Moringa oliefera* Ethanolic extract tablet formulation

SSG = Sodium starch glycolate

MCC = Micro crystalline cellulose

EVALUATION OF HERBAL TABLETS[6]

Uniformity of weight

In this test 20 tablets were weighted individually and average weight was calculated from total weight of all tablets. The individual weight compared with average weight. The percentage difference in the weight variation should be within acceptable limits (±5%).

Hardness test

This test was determined using a Monsanto tablet hardness tester (n=6).

Friability test

Friability of tablets was tested using Roche Friabilator.(Limit=1%)

Disintegration

Disintegration apparatus were used for disintegration (n=6).

Thickness

Thickness of tablet was measured using screw micrometer.

Dimension

Dimension of tablet was measured using screw micrometer.

Table 2: Physical properties of compressed tablets of *Moringa oliefera* Ethanolic extract

Formulations	MOT 1	MOT 2	MOT 3	MOT 4
Uniformity of weight (± 5%)	Pass	Pass	Pass	Pass
Hardness (kg/cm2)	3.1 ± 0.67	5.1 ± 0.19	3.5 ± 0.38	3.4 ± 0.63
Friability (%)	0.258	0.189	0.196	0.221
Disintegration(min)	1.4 ± 0.583	2.5 ± 0.192	1.3 ± 0.372	1.2 ± 0.702
Thickness (mm)	3.6 ± 0.018	3.7 ± 0.006	3.7 ± 0.048	3.6 ± 0.076
Dimension (mm)	10.2 ± 0.056	10.2 ± 0.027	10.3 ± 0.009	10.2 ± 0.012

Where, MOT= *Moringa oliefera* Ethanolic extract tablet formulation

Drug polymer compatibility studies[7]

The interaction studies were carried out to determine any kind of chemical interaction of drug with the excipients used in the preparation of stable tablet formulation. Fourier-transform infrared spectra were obtained by using an FT IR Spectrophotometer (SHIMADZU 84005). The dried extract sample (EEMO) was previously ground and mixed thoroughly with potassium bromide (KBr) at 1:5 (sample: KBr) ratio, respectively. The KBr powder was used as a blank for background correction in FT-IR studies.The scans were obtained at a resolution 4000 to 300cm^{-1}.

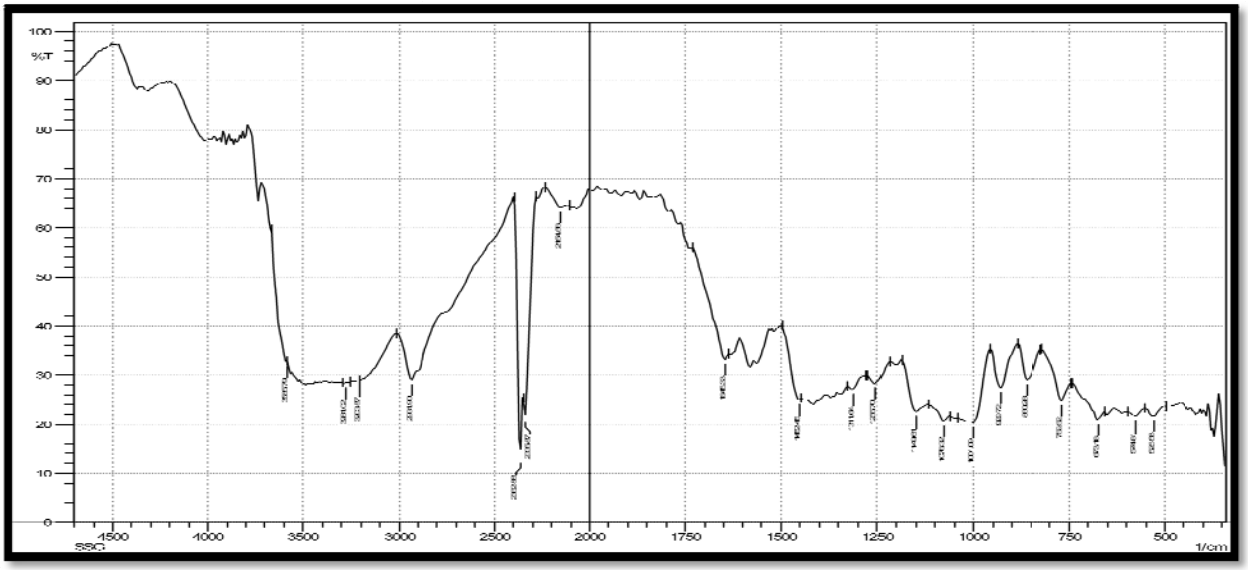

Fig. 1 FT-IR Spectrum of Sodium starch glycolate

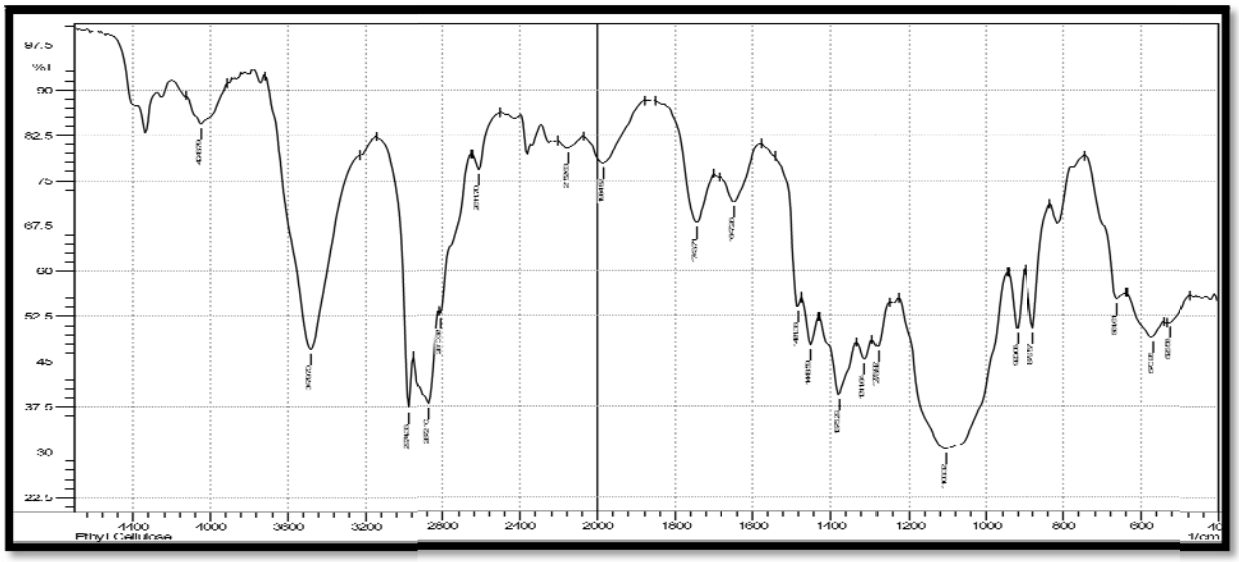

Fig. 2 FT-IR Spectrum of Ethyl cellulose

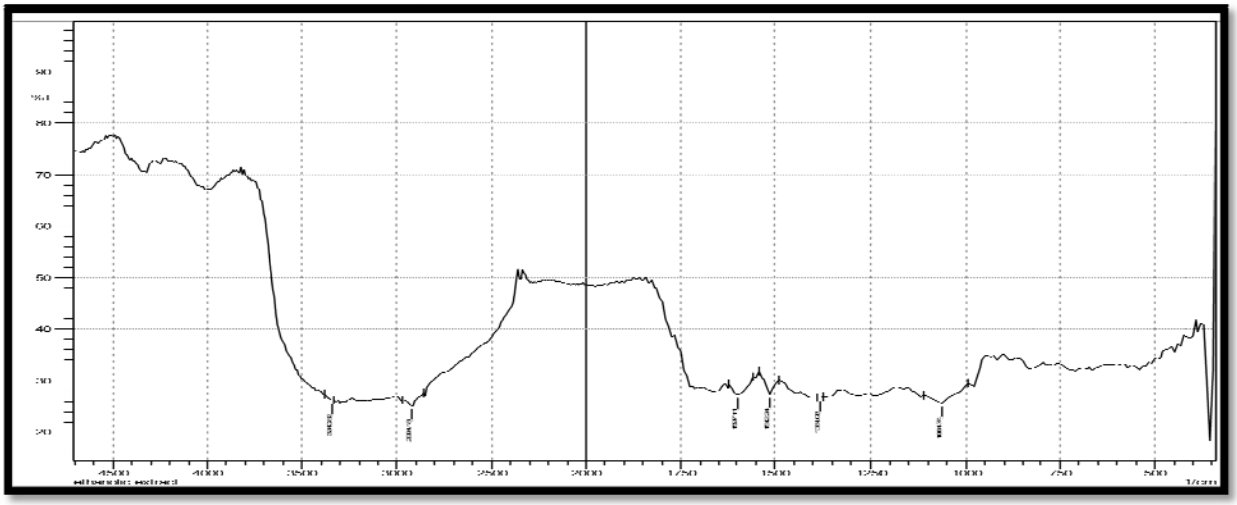

Fig. 3 FT-IR Spectrum of EEMO

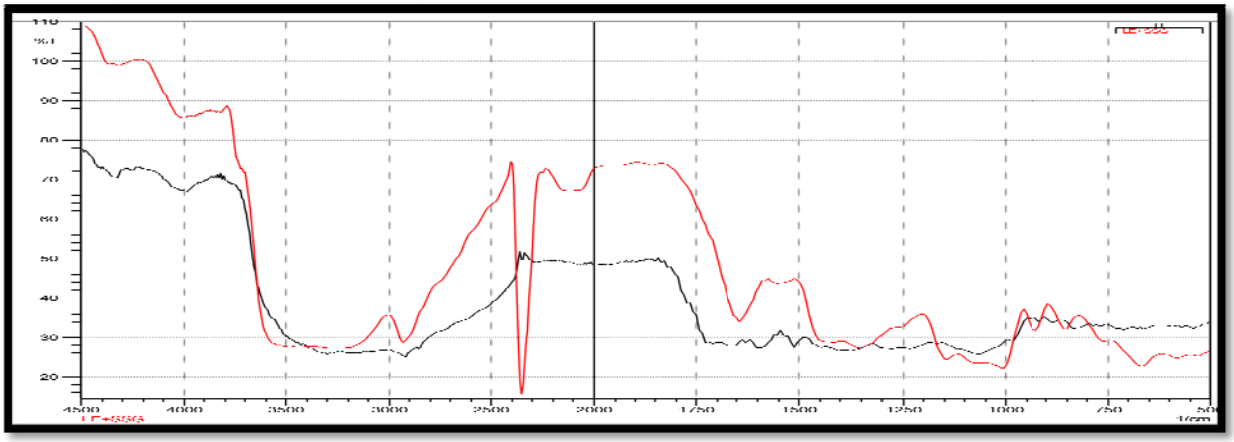

Fig. 4 FT-IR Spectrum of EEMO + Sodium starch glycolate

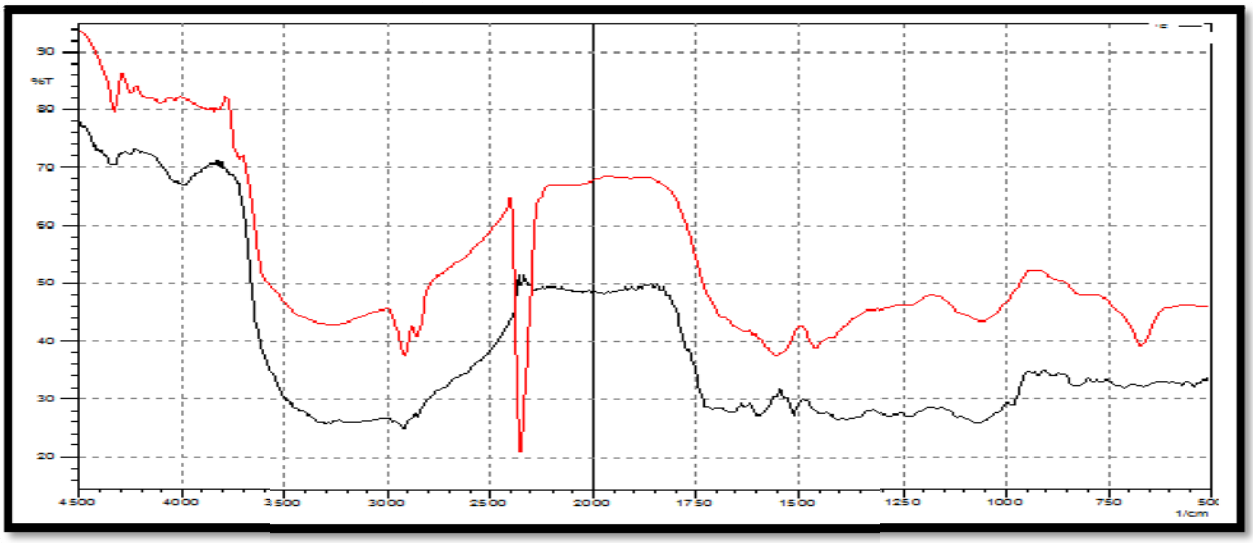

Fig. 5 FT-IR Spectrum of EEMO + Ethyl cellulose

Stability testing of optimized Herbal tablet formulation[8]

The tablets of optimized formulation was wrapped in aluminium foil and subjected to accelerated stability studies at 40^0C/75% RH for 3 months. The Evaluation of tablets were done per month during stability study.

Table 3: Stability data of optimized formulation MOT – 2

Time	Hardness (kg/cm2) (40^0C/75% RH)	Disintegration(min) (40^0C/75% RH)	Friability (%) (40^0C/75% RH)
1 Month	5.1	2.30	0.179
2 Month	5.4	2.15	0.182
3 Month	5.2	2.40	0.185

Fig. 6 Tablets of Ethanolic Extract of *Moringa oliefera* (EEMO)

RESULT AND DISCUSSION

The various composition of the prepared herbal tablet formulations are shown in Table 1. The physical evaluation of the each formulation such as MOT1, MOT2, MOT3, MOT4 was determined and result of the uniformity of weight, hardness, friability, disintegration, thickness, dimension of the tablet are given in Table 2. All the samples of the test product comply with the official requirements of uniformity of weight. The low friability and high hardness indicates that the herbal tablets are compact and hard. The disintegration time of tables complies with official requirements. The results are reproducible, even on tablets that had been stored for 3 months at 40^0C/ 75% RH. The FT-IR Spectra of tablet formulation did not show the presence of any additional peaks for new functional groups. According to Fig 4 and Fig 5 there is no any chemical interaction between drug (EEMO) and the excipients used in the tablet formulations. The optimized formulated herbal tablet MOT-2 was kept for stability studies at the 40^0C/ 75% RH for 3 Months. The results are shown in Table 3 which are reproducible and acceptable.

CONCLUSION

From the all Physical evaluation data and stability study result it is found that the tablet formulation of *Moringa oliefera* L. having satisfactory results so it can be use for manufacturing *Moringa oliefera* L. leaves ethanolic extract tablet at Industry level.

REFERENCES

1. Dr. Pulok K. Mukharjee. Quality control of herbal drugs -an approach to evaluation of botanicals, pharmaceutical publisher, 2007; 46,52,49.
2. The Ayurvedic Pharmacopoeia of India, Part –I,Part II, Volume- VI, first edition, Government of India Ministry of Health & Family Welfare Department of Ayush New Delhi 2008; Vol xv-xvi:163-165.
3. Sudha P., Syed Mohammed Basheeruddin Asdaq, "Immunomodulatory Activity of Methanolic Leaf Extract of *Moringa Oleifera* in Animals", Indian J Physiol Pharmacol 2010; Vol 54 (2) : 133–140.
4. Saroj K. Pal, Pulok K. Mukherjee, Kakali Saha," Antimicrobial Action of the Leaf extract of *Moringa Oleifera* lam", International Research Journal of Pharmacy 1995;Vol 3:197-199.
5. Gurvinder Singh, Sande Sharma.,"Antimicrobial Evaluation of Leaves Extract Of Moringa Oliefera Lam", International Research Journal of Pharmacy 2012; Vol 3(4): 212-215.

6. Indian Pharmacopoeia, Government of India Ministry of health and family welfare, The Indian pharmacopoeia commission, Gaziabad,2007;Vol 3: 78,79, 134, 191.
7. Pavia D., Lampman, G., Kriz, G., Introduction to Spectroscopy,Thomson learning,2001: 23.
8. ICH Harmonised Tripartite Guideline, Stability Testing of New Drug Substances and Products Q1A (R2),International Conference on Harmonization,Geneva,IFPMA 2003:Vol 4.