IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

To Formulation and Evaluation of Fast Dissolving Tablet Containing Nyctanthes Arbos Tristis Leaves

Ms. Jadhav Sayali S, Ms. Desale Mrugasha, Mr. Bhalekar Sachin M.
Samarth Institute of Pharmacy, Belhe, Junnar, Pune, Maharashtra, India

Abstract: *Ayurveda is one of the oldest systems of medicine that uses plants and their extract for treatment and management of various diseased states. The plant plays an important role in drug discovery process and exclusively used to develop a meaningful therapeutic agent. Nyctanthes arbor-tristis belongs to Oleaceae family, which has various medicinal properties. Different parts of the plant are utilized in traditional treatment to cure various diseases like sciatica, chronic fever, skin related diseases. In current research, the methanol and aqueous extracts of Nyctanthes arbor-tristis leaves were evaluated for phytochemical analysis, antioxidant, antibacterial and anti-inflammatory activities. Nyctanthes arbor-tristis has anti-inflammatory activity it is used in treatment of arthritis. Arthritis is a disorder which affect joint and cause joint pain. Phenolic compound, tannins, glycosides, carbohydrates, proteins and alkaloids were present in Nyctanthes arbor-tristis and flavonoids were absent. The fast-dissolving tablets are prepared by direct compression method using other excipients*

Keywords: Nyctanthes arbor-tristis, phytochemicals, antioxidant, antibacterial and anti-inflammatory activities, therapeutic agent

I. INTRODUCTION

Nyctanthes arbor-tristis Linn. (Oleaceae) is popularly known as 'Night Jasmine' (English) or 'Harsinghar' (Hindi) due to the fact that its flowers emit a very strong and pleasant fragrance during the whole night. [1,2] The major medicinal value is due to presence of phytochemical like nyctantic acid, beta-sitosterol and oleanolic acid which are present in leaves and responsible for antiviral and anti-inflammatory activity. The present study is aimed to develop a fast-dissolving tablets containing hydro-alcoholic leaf extract of Nyctanthes arbor-tristis.[3]

The leaves of N. arbor-tristis has many pharmacological properties, extensive work has been done on N. arbor-tristis for exploring their pharmacological properties. Traditionally the stem bark is applied in a form of paste for rheumatic joint pain.[4] The major medicinal value is due to presence of phytochemical like nyctantic acid, friedelin, beta-sitosterol and oleanolic acid which are present in leaves and responsible for antiviral activity.[3]

Fast-dissolving tablets are the solid unit dosages forms that dissolve in saliva without the need of water. Some drugs are absorbed from mouth, pharynx and oesophagus as the saliva passes down in the stomach. FDTs are prepared by various techniques like direct compression, lyophilization and moldings. Direct compression technique is cost effective and simple technique. Mainly super disintegrants are added to a drug formulation to break-up tablet into small particles that can dissolve more rapidly. [5,6]

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

II. MATERIAL AND METHODS

Selection of plant: In the present study I have selected the plant of Nyctanthes arbor-tristis Linn plant.

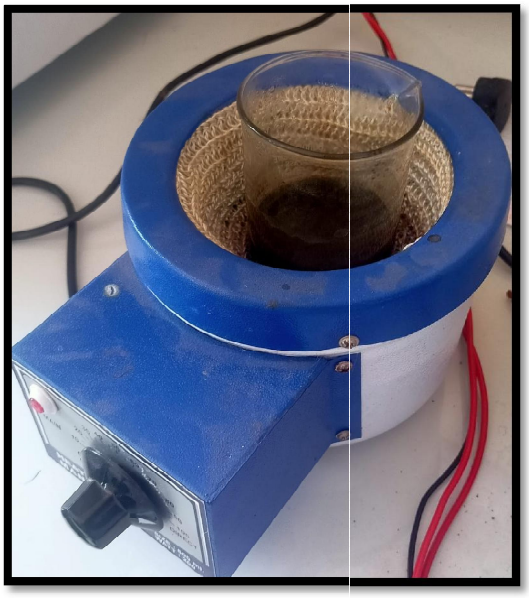
Collection of plant material: The leaves of Nyctanthes arbor-tristis were collected from village of Nighoj, Ahmednagar district, Maharashtra.

Preparation of plant material: For the present study the fresh plant material was taken, and it was wash and dried in shade. The leaves were dried for 10-15 days for proper drying.

Preparation of powder: After drying it was pounded to coarse powder. Powdered drug was stored in airtight and light resistant container for the study.

Extraction of Powder

The extraction was carried out with powdered leaves using the mixture of water and ethanol (1:1) Hydroalcoholic extract of Nyctanthes arbor-tristis evaporated in water bath at 60℃ temperatures. The residue thus obtained was stored in a container until further use.



Precompression Evaluation test

1. Bulk Density:

The bulk density of a powder is the ratio of the mass of an untapped powder sample to the volume. Hence, the bulk density of a powder depends on both the density of powder particles and the spatial arrangement of articles in the

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

powder bed. The bulk density expressed in grams per ml (g/ml) although the international unit is kilograms per cubic meter (1g/ml=1000 kg/m3)

Bulk density= Weight of sample in gm / Volume occupied by sample

2. Tapped Density:

The tapped density is an increased bulk density attained after mechanically tapping a containing the powder sample. Tapped density of powdered extract is obtained by mechanically tapping graduated measuring cylinder or vessel.

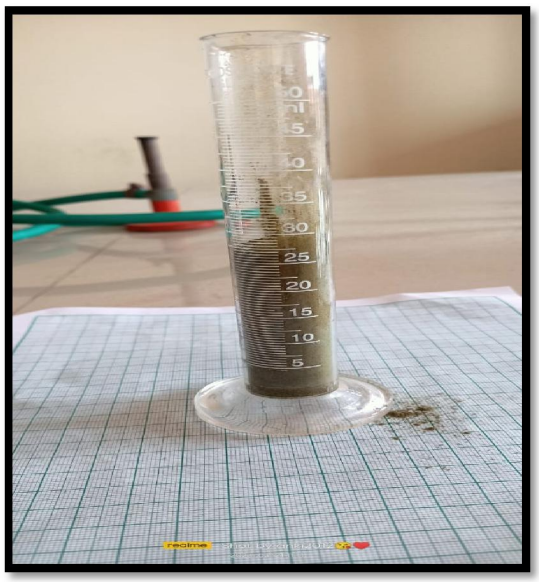
Tapped density= Weight of sample in gm / Volume occupied by sample

3. Carr's Index / Hausner's ratio:

The inter-particulate interactions influencing the bulking properties of a powder are also the interaction that interfere with powder flow, a comparison of bulk and tapped densities can give a measure of the relative importance of this interaction, such a comparison is often used as an index of the ability of the powder to flow.

Carr's Index= (Tapped density- bulk density) ×100

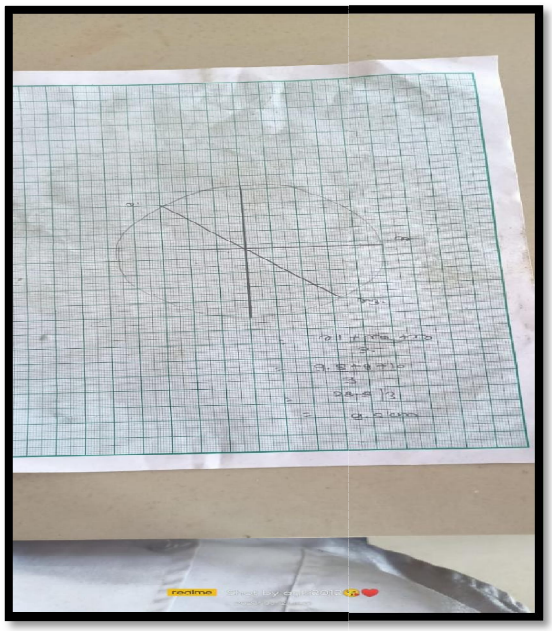
Tapped density



4. Angel of repose: -

Angle of repose is the maximum possible angle between the surface of the pile of powder and the horizontal plane. A funnel with 10 mm diameter is fixed at a height of 2 cm over the plane. Sample powder is slowly allowed to pass through it till the pile touches the funnel stem then a rough circle was drawn around the pile base and the radius was measured of the circle [13, 18, 19]. The angle of repose is calculated using below mentioned formula:

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

Preparation of Fast Dissolving tablet: -

Fast dissolving tablet are prepared by using dried powdered hydro alcoholic leaf extract .
All the ingredients are powered in a clean pestle and mortar and passed through 60 mesh size sieve
The extracted dry leaf powder & all the additives are mix in a sufficient ratio.
The powdered mixture is then compressed using single punch tablet punching machine.
The tablets are prepared and stored in closed container for further evaluation.


IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

Formulation Table:-

Sr. No	Ingredients	Quantity	Categories
1	Nyctanthes arbor- tristis	300 mg	Anti- inflammatory
2	Sodium alginate	100 mg	Stabilizer
3	Banana powder	15 mg	Disintegrate
4	Polyethylene glycol	50 mg	Binder
5	Sodium saccharine	10 mg	Sweeting agent
6	Magnesium stearate	5 mg	Lubricant
7	Talc	5 mg	Lubricant

Post Compression Evaluation Test :

1. Weight Variation Test: 10 tablets are weighed individually and the average weight is determined using digital balance. The test requirements are met; if not more than two of the individual tablets weights deviate from the average weight of the tablet

2. Friability test: The friability test is carried out using Roche Friabilator apparatus and expressed in percentage (%). Ten tablets were weighed separately and placed in the friabilator, which was then operated for 100 revolutions at 25 rpm. The tablets are weighed and the percentage weight loss is calculated.

3. Disintegration Test : The disintegration time of the prepared tablets is determined using disintegration test apparatus. Each tablet is placed in each of the 6 tubes of the basket. The experiment is carried out by using water and temperature maintained at 37 ± 2 °C. The time at which the tablet gets disintegrated is noted

4. Stability Study: The stability study for the tablets is carried out in three different temperature and humidity condition (25 oC and 40% RH, 40 oC and 70% RH and 8 oC) as per ICH guidelines. The study is conducted for six months and the tablets are evaluated for disintegration time and physical appearance.

5. Wetting Time :A tissue paper was folded and placed on a petri dish containing 10 ml of water and eosin dye was added to the water and tablet was gently placed on a petri dish and tablet is allowed to wet completely and the wetting time was noted

III. RESULT AND DISCUSSION

The hydro alcoholic extracts were obtained by extracting the leaf of Nyctanthes arbortristis using mixture of water and ethanol. The extracted materials were further used for the formulation of fast dissolving tablet.

Preliminary phytochemical screening test :-

Precompression Parameters :-

Sr. No	parameter	Observation
1	Bulk Density	0.49 kg/m^3
2	Tapped Density	0.47 kg/m^3
3	Hauser's ratio	8.5%
4	Angel of repose	12.40

Post compression parameter :-

Sr. No	Parameters	Observation
1	Thickness	0.3 mm
2	Weight variation	0.276 mg
3	Hardness	3 kg/cm^3
4	Friability test	0.50%
5	Disintegration test	46 sec
6	Weighting Time	3.50 sec

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

IV. CONCLUSION

Nyctanthes arbor-tristis was a traditional medicinal plant which having various medicinal activities. The leaves of Nyctanthes arbor-tristis Linn. are used extensively in Ayurvedic medicine for the treatment of various diseases such as sciatica, chronic fever, rheumatism, and internal worm infections, and as a laxative, diaphoretic, and diuretic. Leaves are used in cough.

REFERENCES

[1]. Siddiqui, Anis M. Jahan AA. Rapid multiplication of Nyctanthes arbor-tristis through in-vitro auxiliary shoots proliferation world Journal of Agricultural science 2006; 2:188-192.
[2]. Rout GR, Mahato A, Senapati SK. In vitro clonal propagation of Nyctanthes arbor-tristis Linn a medicinal tree. Horticulture science (Prague) 2007; 34:84-89.
[3]. Sharma R. (2003). Medicinal plants of Indian Encyclopaedia, Delhi, Daya publishing house, 71.
[4]. Kirtikar K.R. and Basi B.D. (2000) Indian medicinal plants, Vol. VII cari Sataguru publication, New Delhi, 2110-2113.
[5]. Tiwari OP, Sharma M. Formulation and development of fast dissolving tablet of methanolic extract of some traditionally used medicinal plants for Arthritis. Internationally Journal of Pharmaceutical and Biological archives. 2017; 8(3): 28-32.
[6]. Jain CP, Naruka PS. Formulation and evaluation of fast dissolving tablets of varsartan. International Journal of Pharmacy and Pharmaceutical Science. 2009; 1(1): 219-226.
[7]. Shandhar HK, Kaur M. An update on Nyctanthes arbor-tristis Linn. Journal of International Pharmaceutical science, 2011; 1:77-86.
[8]. Sasmal D, Das S, Basu SP. Phytoconstituents and therapeutic potential of Nyctanthes arbor-tristis Linn. Pharmacognosy Rev 2007; 1(2): 344-349.
[9]. Tuntiwachwuttiku P, Rayanil K, Taylor WC. Chemical constituents from the flowers of Nyctanthes arbor-tristis. Science Asia 2003; 29: 21-30.
[10]. Girach RD, Aminuddin SA, Siddiqui PA, Khan SA (1994) Ethanomedicinal studies on Harsinghar less known medicinal plant in Unani medicine Hamdard Med 37(2): 60-66.
[11]. Plant R (1984) Nyctanthes arbor-tristis Sachitra Ayurveda 35(9): 613-615.
[12]. Goyal DK, Tiwari SK, Agarwal R (1997) effect of Parijata leaves on Sciatica Sachitrrayurveda 51: 667-668
[13]. Kayalvizhi M, Richa Shri. Quantitative Analysis of Nyctanthes arbor-tristis Linn leaf extracts by HPTLC. Pharmacognosy Journal 2014; 6(3): 117-130.
[14]. Pattanayak C, Datta PP, Prasad A, Panda P. Evaluation of anti-inflammatory activity of Nyctanthes arbor-tristis leaves. International Journal of medicine and pharmaceutical science. 2013; 3(9): 18-22.
[15]. Micheal E Aulton's. Aulton's pharmaceutics the design and manufacture of medicines 3rd edition China; Elsevier publishers; 2007. P. 178, 355-356.
[16]. Indian Pharmacopoeia. The government of India, Ministry of the Health and family welfare published by the controller of publication, Delhi. 2014; 1:224, 256 & 337.
[17]. Arunachalam A, Mazumder A. The outcome of formulation and in vitro release studies of levothyroxine sodium tablets. Asian Journal of pharmaceutical science and technology. 2011; 1(1): 33-39.
[18]. Adahali SB, Talluri M. Formulation and evaluation of tablet prepared by coamorphous system containing antihypertensive and anti-hyperlipidemic drug. International Journal of pharmacy and pharmaceutical science. 2016; 8(9): 182-193.
[19]. Indian Pharmacopoeia. The government of India, Ministry of the Health and family welfare, published by the controller of publication, Delhi. 2007; 2: 807-49.
[20]. The United States Pharmacopoeial-25/ National formulary 20 United State Pharmacopeial convention