

STANDARD OPERATIVE PROCEDURE FOR FORMULATION OF MORINDA CITRIFOLIA L. GRANULES

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<https://doi.org/10.46607/iamjp04042020>

(Published online: May 2020)

Open Access

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Article Received: 27/03/2020 - Peer Reviewed: 07/05/2020 - Accepted for Publication: 23/05/2020



ABSTRACT

The science of life is the basic meaning of Ayurveda. As like any other medical system, success of treatment also depends upon quality of medicine prescribed to the patient. Standardization of Ayurvedic drugs at various levels starting from the selection and collection of raw materials till the final product. It is essential to produce a safe and efficacious formulation for the needy patients. Preparation of granules is one of modified form of Ghana (solid preparation of herbal extract) and Khanda Kalpana (Solid preparation similar to granules). Present study has elaborated formulation of noni granules with analytical studies conducted as mentioned in Ayurvedic Pharmacopodia of India. Noni is the common name of the drug *Morinda citrifolia L.* and is also called as Indian mulberry. It has been used widely as a complementary and alternative therapy owing to its potent antioxidant property and proven health benefits. As every part of noni plant is useful, it is widely used as Antioxidant, Immunostimulant, Immunomodulant, Analgesic, Antiarthritic, Antipyretic, Antirheumatic, Antitumours, Antispasmodic, Depurative, Diuretic, Antiemetic, Hypotensive, Fungicide, Laxative, Litholytic, Sedative, Stomachic. The aim of the study is to form noni granules from noni fruit juice by adding adjuvants in order to improve its palatability and shelf life. The prepared granules have shown good palatability and increased shelf life.

Keywords: Noni, *Morinda Citrifolia L.*, Ayurveda, Standardization, Granules

INTRODUCTION

Nature possess immensely valuable and powerful medicines in the form of plants, minerals etc. *Morinda citrifolia L.* is one such plant commonly known as ‘Noni’ or ‘Indian mulberry’¹. It belongs to the family Rubiaceae. A small evergreen tree 3-10 m in height; bright green and elliptical leaves, white tubular flowers and ovoid ‘grenade’ like yellowish white fleshy fruit 5- 10cm long has a lumpy surface covered by polygonal shaped section, triangular and reddish brown seeds and fruit has a foul taste and odour. *Morinda* species has been mentioned in our classical texts under *Phalavarga* in the name of *Ashyuka*, *Akshikiphala* etc². Noni fruits are used by people in different regions for medicinal, commercial as well as a part of food.³ Noni is usually recommended in the form of fresh juice and advised to consume immediately⁴ or as a fermented

drink which has poor palatability due to pungent taste and odour. Hence present study was planned to change conventional form of noni juice to granules with addition of adjuvant. *Avaleha* and *Khanda Kalpanas* are dealt under the preview of *Ghana Kriya* where the semisolid to solid form of dosage have been described. Conversion of dosage form into more suitable form is essential for modern era with additional benefits of palatability and presentation is always essential.

Materials and Methods:

Preparation of Noni Granules

Raw materials were collected and authenticated by the Botanist. The ingredients used for the preparation of granules are as mentioned in the table no. 1.

Table 1.

Sl. No.	Ingredients	Quantity
1.	Noni fruits (<i>Morindacitrifolia</i>)	350g
2.	Water	150g
3.	<i>Sita</i> (Sugarcandy powder)	1 kg
4.	<i>Twak</i> (<i>Cinnamomumverum</i>)	5g
5.	<i>Patra</i> (<i>Cinnamomumtamala</i>)	5g
6.	<i>Ela</i> (<i>Elatteriacardamomum</i>)	5g
7.	<i>Nagakesara</i> (<i>Mesuaferrea</i>)	5g

Preparation of Noni granules was carried out at Bhaishajya Kalpana Lab., Alva’s Ayurveda Medical College, Moodubidire. General method of preparation emphasized for *Khanda Paka* is followed in the preparation of Noni Granules⁵. Ripe Noni fruits are taken in the mixer and grinded with sufficient amount of water, the seeds are separated with a help of cotton cloth. 2 parts of sugar candy powder was added to Noni juice and was heated on mild intensity of fire (*Mandagni*) i.e., 90°C-100°C till it attained more than two thread consistency. At this stage, the contents removed from the heat source. Obtained product was added with powdered *Twak*, *Patra*, *Ela*, *Nagakesara* and mixed rapidly. Then the mixture was dried in hot air oven for 2hrs. Thus formed granules were sieved for equal size of particle. Granules obtained were stored in

the airtight container.

Pharmaceutico-Analytical Study: Pharmaceutico-analytical study was carried to establish the basic standards for Noni granules. The studies were conducted in the analytical lab of Dravya Guna Department, Alva’s Ayurveda Medical College, Moodubidire and Nitte Pharmacy College as per API Standards⁶.

Under the light of ‘*Rasa Panchaka*’, The textbook of Ayurvedic Principles of Drug Action, an independent palatability test⁷ was designed to test the palatability of Noni juice vs noni granules.

100 healthy volunteers were selected, 10ml of noni juice was served to observe the response regarding palatability (taste), smell and other findings (if any) and instructed to wash the oral cavity (repeated for three times).

Volunteers were asked to wash the oral cavity with normal water, then 10ml of noni juice was administered orally and the observations were noted on a questionnaire method. Same procedure was repeated with noni granules (1tsp=5g) and results were documented.

Observations and Results

Preparation of Noni Granules

After adding sita to the noni juice, effervescence was observed which subsided on constant stirring and heating. Gradual thickening of the syrup, consistency of *Tantumata* (thread like), *Darvi Pralepa*

(adhesion of syrup to spoon) was observed in 45min of heating. After 1hr 15min of heating, the juice was found to have two thread consistency with *Apsumajjana* (dipping in water). *Bindupaka* (settled drop of juice in water) with *Patitastu Na Shiryate* (no instant dissolution in water) was observed at 1hr 45min. Final yield of Noni granules obtained was 1.150kg. Granules had overcome the disadvantages of noni juice i.e. poor palatability and foul smell. Noni juice was successfully standardized into different dosage form i.e. Noni granules. The details are as mentioned in the table no. 2.

Table 2:

Duration	Observations on heating
45min	<i>Tantumata</i> (thread like), <i>Darvi Pralepa</i> (adhesion of syrup to spoon)
75min	2 thread consistency, <i>Apsumajjana</i> (dipping in water)
105min	<i>Bindupaka</i> (settled drop of juice in water), <i>Patitastunashiryate</i> (no instant dissolution in water)

Pharmaceutico-Analytical Study

Table 3: Orgaoleptic character of the Noni Juice and Noni Granules were documented as mentioned in the table no. 3

Noni juice			Noni granules	
Colour	Dark Green	100%	Brown	100%
Appearance	Juicy	100%	Granule (Coarse Powder)	100%
Smell	Unpleasant	100%	Pleasant/aromatic	100%
	Nauseating	86%	Unpleasant	0%
Taste	Extremely bitter	86%	Sweet	63%
	Bitter	14%	Sweet with tinge of bitter taste	37%
Palatability	Non palatable	89%	Non palatable	0%
	Palatable with difficulty	8%	Palatable with difficulty	0%
	Palatable	3%	Palatable	100%
Others	Nausea	14%	Feeling of nausea	0%

Table 4: The results of analytical studies conducted for the Noni granules are as mentioned in the table no.4

Sl. No.	Analytical Study	Results
1.	Bulk density	0.56g/cc
2.	Tap density	0.68g/cc
3.	Compressibility	17.5%
4.	Flow property	26

DISCUSSION

Noni has been used widely as a complementary and alternative therapy owing to its potent antioxidant

property, immunological effect and proven health benefits⁸, but, it cannot by many due to its non-palatability. Hence an attempt is made to bring new

formulation into stream of science to aid in health benefits of noni fruit juice and also to study SOP (Standard Operative Procedure) of the pharmaceutical preparation of Noni granulation. The organoleptic character indicating brown colour and aroma is due to presence of adjuvant like *Twak, Patra, Ela, Nagakesara*. Sweet taste is due to addition of sweetening agent *Sita* and bitter taste is due to noni fruit juice. Palatability test conducted among 100 volunteers proved that the noni granules has more palatability, less irritability and good aroma than noni fruit juice. The analytical studies undertaken showed the results of bulk density, tap density, compressibility, flow property which were observed to be within the limits of permissible values as per Ayurvedic Formulary of India standards which indicates that it has function of structural support and the fine particle size shows that it has more solubility and thus more will be the gastrointestinal absorption.

CONCLUSION

The Noni granules have shown better palatability owing to its juice. Thus, present study is beneficial to the mass of people. Granule formulation from noni fruit juice helps in increasing the shelf life upto 4 months and also increases the palatability. Thus, one can expect great scope for Noni (*Morinda citrifolia* L) Granules. These preparations can be utilized for clinical trial and can be recommended for wider therapeutic as well as nutritional use in future

REFERENCES

1. <https://www.drugs.com/npc/noni.html>
2. Sonipradeep et. Al., Geriatric Healthcare through nutraceuticals of *Morinda Citrifolia* L. Review. AYUSHDHARA,2014;1(2):33-39
3. Heinicke R. Thexeroninesystem: health prompting action of noni and bromelion: Direct source published on 2001
4. Sharangadharasamhita commentary by Dr. Himasagara Chandramurthy 2ND EDITION, Madhyamakhandha, swarasaadikalpaniyaadhyaya, (1:12-5) P.182, Chowkamba Krishnadas Publications
5. Vaidya SS, Dole VA. Bhaishajya Kalpana Pratykshika. Anamol Publication, Pune. Reprint_2004. p.40
6. Anonymous, The Ayurvedic Pharmacopoeia of India, Part I, Vol. V, Government of India, Ministry of AYUSH, 2016.
7. Dr. S CDhyani, Rasa panchaka, Chowkamba Krishnadas Academy, Oriental publisher and distributors.
8. Soni Pradeep et. al., Geriatric Healthcare through nutraceuticals of *Morinda Citrifolia* L. Review. AYUSHDHARA, 2014;1(2):33-39

Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Krithika R Aithal et al: Standard Operative Procedure For Formulation Of *Morinda Citrifolia* L. Granules. International Ayurvedic Medical Journal {online} 2020 {cited May, 2020} Available from: http://www.iamj.in/posts/images/upload/2289_2292.pdf