



PHARMACEUTICO- ANALYTICAL STUDY OF BANDANAARU (BRIDELIA SCANDENS R.) GRANULES – A MODIFIED ETHNO-MEDICINE

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ABSTRACT

Folklore medicines broadly mean all aspects of direct relationship of man with plants. It expands its scope into the use of plants as medicine, food, fibres, dyes, tans, taboos, avoidances, and even magico religious beliefs. Ayurveda is known for the use of poly-herbal formulations and multi-component therapeutics for the management of health and diseases. The overall aim of the drug standardization is to ensure the quality, efficacy and the uniformity of the products in terms of their chemical and biological properties. *Bandanaaru* [*Bridelia scandens* (Roxb) Willd.] is one of the mostly practised folklore drugs for its nutritional value. It is believed to be equivalent to breast milk to the kids. Along with this drug, the drugs like *Bala* and *Shritala* are also added and nutritional granule is prepared based on Standard operative procedure [SOP] of granules mentioned in API. This article reports on standardisation of *Bandanaaru* granules a polyherbal product used as a nutritive supplement. The prepared granule has shown pleasant sweet taste with good palatability. Preliminary qualitative phytochemical studies have shown the presence of Carbohydrates, Proteins, Starch, Flavonoids, Steroids, Vitamins etc.

Keywords: Folklore, *Bandanaaru* (*Bridelia scandens*), *Bala*, *Shritala*, SOP

INTRODUCTION

Ayurveda is the science of life with the aim of maintaining health and curing diseases. Diet plays a key role in maintaining health^{1, 2}. Ayurveda emphasizes that a diet should contain proper amount of nutrients which is lacking now in present era. Malnutrition has become urgent global health issue with under nutrition killing or disabling million of children every year. Malnutrition also prevents million more reaching their full intellectual and productive potential³. It makes the child more susceptible to infection, recovery is slower, and mortality is higher. Undernourished children do not grow to their full potential of physical and mental abilities. Malnutrition in infancy and childhood leads to stunted growth. It also manifests by clinical signs of malnutrition and vitamin deficiencies⁴. In India about 2/3 portion of the children are under the age of 5 years are malnourished, among the 5-8% are severely malnourished. About 75% of population resides in the village; of the total rural population around 50% is still under the poverty lines. Majority of children in India are not in a position to get adequate nourishment because of very low capita income of their families⁵. A significant proportion of these children live in economic and social environment which impedes the child's physical and mental development, this condition include poverty, poor environment sanitation, diseases, infection, inadequate access to primary health care, inappropriate childcaring and feeding practices⁵.

The plant *Bridelia scandens* (Roxb) Willd. belongs to the family Euphorbiaceae, known as *Bandanaaru* in Kannada, widely available in Western Ghats which is practised as a folklore drug for its nutritive value and believed to be equivalent to breast milk⁶. The drug has been proved for its safety and efficacy by experimental study⁷. The plants such as *Bala* (*Sida cordifolia* L.) and *Shritala* (*Caryota urens* L.) are also commonly used in case of general debility as nutritive herb by the folklore people of Karnataka. The decoction of the leaves and barks of *Bridelia scandens* (Roxb) Willd. and roots of *Sida cordifolia* L. are used as general tonic, where as the pith of *Caryota urens* L. known as *Eendu* powder in Kannada is believed to be highly nutritive by the village people of coastal Karnataka⁶.

Hence, the present study is undertaken to evaluate the standard operative procedure and analytical study of herbal nutritive granules by using the above herbal drugs which is a modified ethno-medicine.

Materials and Methods

Preparation of Herbal Nutritive Granules: The raw drugs are collected from the natural habitat and also from the local market of Dakshina Kannada District and authenticated by the expert botanist. The ingredients used for the preparation of herbal nutritive granules are as mentioned in the table number 1.

Table 1

Sl. No.	Name Of The Drug	Latin Name	Part Used	Quantity
1.	<i>Bandanaaru</i>	<i>Bridelia scandens</i>	Bark And Leaves	1kg
2.	<i>Bala</i>	<i>Sida cordifolia</i>	Root	1kg
3.	<i>Shritala</i>	<i>Caryota urens</i>	Pith	1kg
4.	<i>Kajutaka</i>	<i>Anacardium occidentale</i>	Seed Kernel	100g
5.	<i>Ela</i>	<i>Elatteria cardamomum</i>	Seeds	50g
6.	<i>Jala</i>	-	-	16ltr
7.	<i>Sharkara</i>	-	-	4kg

Preparation of herbal 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 Granules⁸. Dried raw materials such as leaves and barks of *Bridelia scandens* and roots of *Sida cordifolia* were taken in equal proportions were crushed to prepare coarse powder separately and mixed

with 8 parts of water in a stainless-steel container. Continuous mild heat was applied until it was reduced to one-fourth of its initial quantity. During heating process, continuous stirring was done to facilitate the evaporation and avoid any deterioration due to burning of materials. After a desirable reduction in volume was achieved, it was filtered. To the 4ltr of decoction, 2kg of sugar was added and continued to heat. When it attains 2 thread consistencies, powders of *Shritala*, *Kajutaka* and *Ela* were added and stirred well until it attains granular form. Granules obtained were stored in the airtight container.

Pharmaceutico-Analytical Study

Pharmaceutico-analytical study was carried to establish the basic standards for *Bandanaaru* granules. The studies were conducted in the Department of Dravya Guna, Department of Bhaishajya Kalpana of Alva's Ayurveda Medical College, Moodubidire and Department of Biotechnology, Alva's College, Moodubidire as per API Standards⁸.

To find the Rasa and palatability of the nutritive granule, Nipata method⁹ was followed. The study was conducted in 30 volunteers who were intelligent to identify the taste and express it. The volunteers were the Ayurveda students and are in the age group of 18-23 years. Volunteers were requested to taste the prepared granules after washing their mouth with distilled water. They were requested to write down the taste they felt instantaneously, and the taste felt after half a minute on a slip of paper. The results were interpreted based on the Rasa perceived. The taste perceived in first half minute is considered as the *Pradhana Rasa* and that perceived after as *Anurasa*. The volunteers were also asked to write about palatability, smell etc.

Observations and Results

1. Total obtained quantity of Herbal Nutritive Granules= 4.850 kg

2. Organoleptic Study: The opinion of the volunteers regarding organoleptic character of the *Bandanaaru* Granules were documented as mentioned in the table no. 2

Table 2

Colour	Light Brown	100%
Appearance	Granule	100%
Smell	Pleasant/aromatic	100%
	Unpleasant	0%
Taste	Sweet	72%
	Sweet with tinge of astringent taste	28%
Palatability	Non palatable	0%
	Palatable with difficulty	0%
	Palatable	100%
Others	Feeling of nausea	0%

3. Analytical Study: The results of analytical studies conducted for the *Bandanaaru* granules as mentioned in the table no.3

Table 3

Sl. No.	Analytical Study	Results
1.	Bulk density	0.58g/cc
2.	Tap density	0.70g/ cc
3.	Compressibility	18.5%
4.	Flow property	25

3. Determination of pH Value pH value of the Granule 7.80

4. Qualitative analysis: Qualitative analysis of the phytochemical in the granules as shown in the table number 4

Table 4

Sl. No.	Organic Component	Qualitative analysis
1.	Carbohydrates	Present
2.	Proteins	Present
3.	Starch	Present
4.	Alkaloids	Present
5.	Flavonoids	Present
6.	Triterpenoids	Present
7.	Phenolics	Present
8.	Tannins	Present
9.	Saponin	Absent
10.	Steroids	Present
11.	Resins	Absent
12.	Vitamins	Present

DISCUSSION

Bandanaaru (*Bridelia scandens* (Roxb) Willd.) has been used widely by the folklore practitioners of Dakshina Kannada District owing to its multiple uses in different ailments. The decoction of the bark is useful in case of anemia, general debility and fever⁶. It is believed to be equivalent to breast milk to the kids⁶. Decoction of the leaf is also beneficial in anemia during pregnancy⁶. The plant is having potent antioxidant property and immunological effect¹⁰. Hence an attempt is made to bring new formulation into stream of science to aid in health benefits of *Bandanaaru* along with *Bala* and *Shritaala*, and to study SOP (Standard Operative Procedure) of the pharmaceutical preparation of granules. Palatability test conducted among 30 volunteers proved that the granules have more palatability, less irritability and good aroma. 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 India¹¹. Carbohydrates, Proteins, Starch, Phenolics, Flavonoids, Steroids, Vitamins etc are having their own nutritive value in the rejuvenation of all the age group of the mankind.

CONCLUSION

The prepared granule has shown pleasant sweet taste with good palatability. Preliminary qualitative phytochemical studies have shown the presence of Carbohydrates, Proteins, Starch, Phenolics, Flavonoids, Steroids, Vitamins etc. The analytical studies have shown the results of bulk density, tap density, compressibility, flow property which were observed within the limits of permissible values. Further, these granules can be utilized for clinical trial and can be recommended for wider therapeutic as well as nutritional use in future.

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