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Preparation of Balabilwadi modaka: Ayurvedic complementary food

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Abstract

Balabilwadi modaka is a complementary feed which is mentioned in Ayurvedic classics, contains the ingredients like Bala Bilwa (*Aegle marmelos*), Laja saktu (parched rice), Sarkara (*Saccharum officinarum*) and Ela (*Elettaria cardamomum*). In the context of weaning food, method of preparation is of utmost importance. In this article Balabilwadi modaka is prepared by using modern pharmaceuticals equipment. During the process of preparation, the method of preparation of modaka explained by Ayurveda Acharyas has been incorporated.

Keywords: Blabilwadi modaka, pharmaceuticals, Balabilwa, Ela, Laja saktu, Sarkara

Introduction

The introduction of complementary foods is a time of transition when children gradually becomes used to eating semi solid and solid foods. [1] The nutritional role of mother's milk in the second year is inversely related to the adequacy of the complementary diet. [2] Improper nutrition during weaning and post weaning period is the root cause of malnutrition in children. [3] This is the period of dentition [4] and have great dilemma, stress and humiliation to the child and is associated with many disorders like constipation, diarrhea, colic and this age group have unstable Agni (digestive fire) etc. [5] This physical and mental turmoil along with the need for a highly nutritious diet points out the importance of an ideal weaning food. This article highlights the different steps and stages of preparation of Bala bilwadi modaka.

Materials and Method

Ingredients of the formulation

1. Balabilwaphala majja [6] (*Aegle marmelos* Linn.)
2. Laja sakthu (Parched Rice) [7].
3. Sharkara (Sugar) [8].
4. Ela (*Elettaria cardamomum* (L.) Maton [9].

Bala Bilwa (*Aegle marmelos* Linn.) [10].

Aegle marmelos Linn belong to the family Rutaceae [11]. Extensive investigations have been carried out on different parts of *Aegle marmelos* and as a consequence, varied classes of compound viz., alkaloids, coumarins, terpenoids, fatty acids and aminoacids have been isolated from its different parts. It contains γ sitosterol, aegelin, lupeol, rutin, marmesinin, β -sitosterol, flavone, glycoside, O'Isopentenyl Halfords Oil, marmeline and phenylethylcinnamamides [12]. *Aeglemarmelos* Linn. possesses Anti-inflammatory, antipyretic, analgesic Activity, Anti ulcer, Anticonvulsant, Antidepressant, Anxiolytic, Antifertility, Antifungal, Hepatoprotective, Radioprotective, Hypolipidemic, Immunomodulatory and Hypoglycemic activities [13]. The unripe fruits of *Aegle marmelos* Linn. are edible astringent, a laxative, and an expectorant and are useful in treating ophthalmia, deafness, inflammations, cataract, diabetes and asthmatic complaints [14].

Properties and action of apakva phala [15]

Rasa	-	Kashaya, Tikta
Guna	-	Laghu, Ruksha
Virya	-	Ushna
Vipaka	-	Katu
Dosha karma	-	Vata-kaphahara, Grahi, Dipana-Pachana.
Parts used	-	Fruits, leaves, root

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Laja Sakthu (Parched Rice)

When grains like Shali are roasted, they are termed as Laja, [16] Lava, Khil. It is with Kashaya, Madhura [17] rasa and Shita Virya. It is Agnidipaka, Laghu, Balakarak, cures Pipasa, Vamana, Atisara, Prameha, Meda, Kapha, Daha, Kasa, Raktapitta and is laxative.

Sharkara (*Saccharum officinarum* Linn.) [18]

Saccharum officinarum Linn belongs to the family Gramineae.¹⁸ Raw cane sugar contains Sucrose 96-97%, Reducing sugars-0.75-1.0%, Moisture – 0.75%, Ash – 0.5%. Sugar is direct source of Carbohydrate. 100 grams of sugar provides 400Kcal. It is advised that there is no specific nutritional or metabolic need for the addition of sugars to baby foods, as ingredients containing natural carbohydrates / sugars already provide enough energy for use as weaning food.¹⁸

Ayurvedic Properties: [19]

Rasa	:	Madhura
Guna	:	Guru, Snidha
Virya	:	Sheeta
Vipaka	:	Madhura
Doshaghnata	:	Vata pitta hara, Kaphakaraka
Rogaghnata	:	Daha, Raktavikara, Jwara, Chardi, Moorcha
Karma	:	Deepana, Shukrala
Part used	:	Root, juice, crystalline sugar, sugar Powder

Schults *et al* (1938) reported that increase in the fasting blood sugar after the ingestion of the different carbohydrates was seen in the following order; Glucose, Dextri-maltose, Honey, Sucrose, Fructose & Lactose [20]. Sucrose because of its ready availability & low cost, is commonly added to milk for feeding infants. It has the advantage of being digested & absorbed more rapidly than Lactose, but less rapidly than Glucose & Maltose. Since it is too sweet, a mixture of Dextri-maltose & Sucrose may be more suitable

Ela (*Elettaria cardamomum* (L.) Maton [21].

Elettaria cardamomum (L.) Maton belongs to the family Zingiberaceae. Its seeds contain essential oil, principal constituents of the oil are cineol, terpineol, terpinene in the form of formic and acetic acid [22]. It is aromatic, Carminative, Digestive, Expectorant, Stimulant tonic. Studies have shown that Ela is expectorant and its Alexetric property controls infection [23]. Chemical components of cardamom oil (a-pinene, b-pinene, sabinene, myrcene, a-phellandrene) are expectorant and carminative. The fruits are mainly carminative, expectorant, and anodyne medicine in various ailments [24]. The fruits are useful in preparing infusion which is useful for countering the condition of loss of appetite, flatulence, gastric trouble, dyspepsia and respiratory infections.

Parts used	-	fruit- seed
Dose	-	0.5-1gm

Properties and action [25].

Rasa	-	Katu, Madhura
Guna	-	Laghu, Ruksha
Virya	-	Sheeta
Vipaka	-	Madhura
Dosha karma	-	Tridosahara

The drug analysis and standar esearch in Ayurveda and Allied Sciences, Udupi, Karnataka state, India and nutritional analysis was done at Confederation for Ayurvedic Renaissance Keralam Ltd., A joint venture of Ayurvedic Entrepreneurs and KINFRA (Govt. of Kerala), supported by Dept. of AYUSH, Govt. of India, Thrissur, Kerala state, India.

Collection and authentication of raw drugs

The raw Bilwa phala was collected from the local market of Udupi of Karnataka state, India in the month of June 2015. The collected drug was identified and authenticated at the teaching pharmacy of Department of Dravyaguna (Ayurvedic Pharmacology), SDM College of Ayurveda and Hospital, Udupi, Karnatka state, India.

Method of preparation

The Bilwa phala is dried (fig. 1) and the fruit pulp (fig. 2) is collected. The fruit pulp is pounded by hand (fig. 3) and made into powder (crude form) (fig. 4). To the pounded fruit pulp, Ela and parched rice taken according to ratio (fig. 5) and mixed thoroughly by hand (fig. 6). Then the mixture is pounded by machine (fig. 7) and powder is obtained (fig. 8). The powder is then sieved to get fine powder and to remove small husk particles (fig. 9). A thick sugar solution is made (fig. 10) to which the sieved powder is added and mixed (fig. 11). After this process, the drug is obtained in the form of semi solid paste (fig. 12). Modaka is then prepared of 12 gram size immediately before the semi solid paste loses its warmness (fig. 13 and 14). They are packed in plastic containers which are then sealed using machine (fig. 15). Then the containers are labeled and made ready for distribution (fig. 16).



Fig 1: Dried Bilwa Phala



Fig 2: Fruit pulp



Fig 3: Pounding of fruit pulp



Fig 7: Mixing of the ingredients



Fig 4: Pounded fruit pulp made into powder (crude form)



Fig 8: Powder obtained after pounding



Fig 5: Fruit pulp, Ela and parched rice taken according to ratio



Fig 9: Sieving of powder to get fine powder



Fig 6: Mixing of the ingredients



Fig 10: Preparation of Thick sugar solution



Fig 11: Addition of previously made powder to sugar solution



Fig 12: Drug obtained in the form of semi solid paste



Fig 13: Weighing of modaka



Fig 14: Final form of modaka each weighing about 12 gms



Fig 15: Sealing of plastic containers



Fig 16: Labeled and packed Modakas ready for distribution

Precautions to be taken

1. Mandagni (moderate fire 75 degree C - 85 degree C) is in maintained throughout the process.
2. The drugs are finely powdered.
3. The modakas are rolled in the warm stage itself.

Temperature noted at different intervals

- 10.00am - 60 °c
- 10.15am - 63 °c
- 10.30am - 72 °c
- 10.45am - 78 °c
- 11.05am - 81 °c
- 11.15am - 83 °c
- 11.25am - 83 °c

Specific tests for paka lakshana

Tantupaka- After attaining one thread like consistency the powders are added and mixed.



Fig 17

Apsumajjana - The paka when puts on water it readily sink without spreading.

Gandha varna rasothpathi- After the completion of the preparation the smell and taste of the ingredients are perceived.

Organoleptic parameters of finished product

- Colour: yellowish white
- Consistency: hard to touch
- Smell: specific odour
- Taste: sweet with little spicy

Discussion

The finished product, Balabilwadi modaka was yellowish white in colour and hard in consistency which establishes the optimum presentation of modaka type of preparations. The specific odour of modaka is attributed to the properties of Ela. The cumulative effect of Balabilwa, Ela, Sharkara and Laja Sakthu establishes the sweet with little spicy taste of modaka. Most of the children fall into the pit of malnutrition during the weaning and post weaning phase. Weaning/ complementary feeding gives the child other nutritious foods in addition to breast milk. Concentrated energy dense complementary foods are essential in order to maintain an adequate velocity of growth in infants. Malnutrition in infants and young children typically develops during the period between the first 6 and 18 months of age, and is often associated with intake of low nutrient and energy dense diet. The ingredients used for the preparation of Balabilwadi modaka are rich source of protein, carbohydrate, and energy. The same modaka will go to increase the digestive capacity of the infant.

Conclusion

More practical approach must be incorporated in the field of Ayurvedic medicine manufacture even though the introduction of modern expertise in pharmaceutical sector has amplified the effectiveness of such medicinal formulations including those of Ayurveda. As Ayurveda is principle among the traditional health practice in the world, traditional inspired practical approach should be made in preparing prime quality preparations.

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