

Pharmacological Review on Panchamutti Kanji (Porridge) Fighting the Malnutrition in Children

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Abstract

Protein energy malnutrition (PEM) contributes to 60% of the total million deaths of children of less than five years. Two forms of PEM are kwashiorkor and marasmus, and they commonly coexist. Food is considered as the first pillar of our body. Indian food has strongly suggested the role of both preventive and therapeutic in nature. At present, recommendations are warranted to support the consumption of foods rich in bioactive components such as herbs and spices. Siddha is mainly based on preventive aspect first rather than curative. The curative effect of food is an established for many generations in India. Panchamutti kanji is a classic example of traditional Siddha porridge with all its five ingredients therapeutically enriched with protein and high nutritional values such as *Oryzasativa*, *Vigna mungo*, *Cajanuscajan*, *Cicer arietinum*, *Vigna radiata*. Hence, this study is aimed to review the ingredients of panchamutti kanji in the treatment of malnourished children.

Keywords: Panchamutti kanji, protein energy malnutrition, kwashiorkor, marasmus, siddha.

1. Introduction

Protein energy malnutrition (PEM) contributes to 60% of the total million deaths of children of less than five years[1]. The term Kwashiorkor and Marasmus are the two main diseases of protein energy malnutrition (PEM). In Kwashiorkor, the principal cause is incorrect diet with infectious diseases. Food with less protein and high cellulose causes PEM in children and adolescents. Sometimes Kwashiorkor is aggravated by severe anaemia and diarrhoea. Nutritional marasmus is a consequence of extremely low nutrient intake, including protein, known as protein calorie malnutrition (PCM), in 1970; then it was expressed as protein energy malnutrition (PEM). Marasmus is another kind of PEM, that may be caused from lack of breastfeeding and lack of hygiene with a higher mortality rate. It is a disease of low socioeconomic and educational level[2]. Indian food has strongly suggested the role of both preventive and therapeutic in nature. At present, recommendations are warranted to support the consumption of foods rich in bioactive components such as herbs and spices. Siddha system concentrates more on preventive aspects rather than curative measures. so it recommends proper diet and life style changes with medications to be taken by the mother during pregnancy for proper growth and development of the child. In siddha system of medicine total number of diseases is 4448 in number. Of these, 108 diseases are said to occur during childhood. Agathiyar, who is considered as the father of Siddha medicine classified the paediatric disease into many subtypes based on the clinical signs and symptoms[3]. Panchamutti kanji is a classic example of traditional Siddha porridge with all its five ingredients therapeutically enriched with protein and high nutritional values. Hence, this study is aimed to review the ingredients of panchamutti kanji in the treatment of malnourished children [4].

Ingredients of Panchamutti Kanji

- Pacharisi (*Oryzasativa*)
- Ulunthu(*Vigna mungo*)
- Thuvaram paruppu (*Cajanuscajan*)
- Pachai payaru (*Vigna radiata*)
- Kadalai paruppu (*Cicer arietinum*)

2. Pharmacological Review**Pacharisi (*Oryzasativa*) - Bioactive compounds**

- Rice is wealthy source of carbohydrate, mild quantity of protein and fat as well as a source of vitamin B complex like niacin, thiamine and riboflavin [5].
- Sixteen nutrients are considered important for rice, where Nitrogen (N), phosphorus (P), potassium (K) and sulphur(S) are the primary macronutrients.
- Mg, Ca, and S are secondary macronutrients and Zn, Fe, Mn, Cu, B, Mo and Cl are micronutrients are the most important nutrients for plants [6].

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Phytochemicals present in rice grain are powerful antioxidants and responsible to reduce atherosclerotic plague formation, inhibit aldose reductase activity, decrease hyperlipidaemia and suppress cancer cell proliferation [7].

Ulunthu(*Vigna mungo*) - Bioactive compounds

- It is rich in flavonoids, isoflavonoids, phytoestrogens, phenolic acids, enzymes, fibers, starches, trypsin inhibitors, phytic acid, lectins, saponins, tocopherols.
- Black gram seeds contain about 25% protein and 65% carbohydrates.
- Allantoin, glutathione, plant growth regulators, and lignin precursors are present in seeds [8].

Pharmacological review

- *Vigna mungo* has been reported pharmacologically to possess anti-inflammatory and anti-nociceptive activity.
- Anti-inflammatory activity is due to ethanol extracts mainly polyphenols.
- The seeds of nearly all species of *Vigna* have antioxidant properties with presence of enriched protein and polysaccharides used to treat different diseases.
- *Vigna mungo* has been shown to possess antimicrobial activities [9].

Thuvaram paruppu (*Cajanuscajan*) - Bioactive compounds

- The compounds cajanin, longistylin C and longistylin have been found to possess hypocholesterolemic and anti-plasmodial activity.
- A substituted flavanone isolated from leaves possesses anti-inflammatory activity and inhibits sodium channel-activated depolarization of mouse brain synaptoneurosomes.
- Two isoflavanoids genistein and genistin were found to possess antioxidant activity.
- Cajanol an isoflavanone found in the roots is found to possess anticancer activity.
- Four important compounds, pinostrobin, cajaninstilbene acid, vitexin and orientinisolated from ethanolic extracts of leaves were found to possess significantantioxidant properties.
- Isoflavanoids isolated from ethanolic extract of leaves also showed significant antimicrobial activities. Some protein fraction isolated from leaves also showed hepato-protective effects and the presence of phenolics (flavanoids and tannins) impart anthelmintic activity [10].

Kadalai paruppu (*Cicer arietinum*) - Bioactive compounds

- It is a good source of carbohydrates and protein, and protein quality is considered to be better than other pulses.
- Ca, Mg, P and, especially, K are also present in chickpea seeds.
- Chickpea is a good source of important vitamins such as riboflavin, niacin, thiamin, folate and the vitamin A precursor β -carotene [11].

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- Butyrate is reported to suppress cell proliferation and induce apoptosis, which may reduce the risk of colorectal cancer.
- Lycopene reduces the risk of prostate cancer.
- Linoleic acid and β -sitosterol are the major constituents in chickpea to regulate the blood pressure.
- It has a higher amount of resistant starch and amylose is related to improved glucose tolerance and insulin sensitivity.
- Linoleic acid and oleic acid helpful in lowering the cardiovascular disorders.

Pachai payaru (*Vigna radiate*) - Bioactive compounds

- Mung bean protein is also rich in essential amino acids and contain aromatic amino acids, leucine, isoleucine and valine.
- It also contains about carbohydrate content as 50 – 60%.
- Calcium and potassium are also reported in Mung bean, which are essential for enhancing the strength of bones and teeth.
- Mung bean rich in lecithin which reduces the liver fat and regulates the normal functioning of the liver.
- Pharmacological review:
- Flavonoids and phenols are reported from this plant possess antioxidant, antidiabetic and anti-hyperlipidaemic activities.
- Compounds present in the mung dal also possess anti-inflammatory, antimicrobial, antiseptic, antihypertensive and antidiabetic effects [12].

3. Procedure

Take all the ingredients in equal amount of fry it in a pan in medium flame, grind well into a powder and wrap it in a cloth and make as a pouch. Then add 250 ml of water in a pot and immerse the pouch into the water let it boil and the extract get spreads in the water and it is made into a Porridge.

Indication - Indicated for Babies above 6 months of age

Benefits

- It plays a key role in the maintenance of healthy life style.
- It strengthens the immunity and helps in the prevention of disease.
- It is an excellent immnuo-booster and a protein rich porridge having more fibre and micronutrients.
- Improves the weight of the baby. (Highly recommend for Malnourished children).

Table 1. Biochemical composition of major ingredients of Panchamutti Kanji

Ingredients Each 100 gram	Carbohydrate	Protein	Potassium	Sodium	Iron	Fat
Vigno mungo	59 gm	25 gm	983 mg	38 mg	42%	1.6 gm
Gajanusgajan	63 gm	22 gm	1392 mg	17 mg	28%	1.5 gm
Cicerarietinum	42 gm	13 gm	199 mg	387 mg	9.9%	4.5 gm
Vignoradiata	59.7 gm	25.7 gm	303 mg	173 mg	6.7%	0.61 gm
Oryzasativa	53.4 gm	4.4 gm	35 mg	365 mg	2.7%	0.4 gm

4. Conclusion

- Protein deficiency diseases and Malnutrition can be overcome through protein-enriched porridge.
- As it strengthens the immunity, it helps to prevent us from diseases and plays a role in the maintenance of healthy lifestyle.
- This preparation should be brought again practice for the betterment of future generations.

Reference

1. Faruque ASG, Ahmed AMS, Ahmed T, Islam MM, Hossain MI, Roy SK, Alam N, Kabir I, Sack DA. Nutrition: Basis for Healthy Children and Mothers in Bangladesh. *J Health PopulNutr.* 2008;26(3):325–339.
2. RatnabaliSengupta, Narayan Ghorai, Saikat K. Basu, PeimanZandi, William Cetzal-IX,Chapter 7 - A Review on the Nutritional Challenges of School Children From the Perspective Developing Countries,Editor(s): Ram B. Singh, Ronald Ross Watson, Toru Takahashi,The Role of Functional Food Security in Global Health,Academic Press,2019,Pages 109-143,ISBN 9780128131480,
3. National health portal of India – Paediatrics in siddha [internet] [cited 2019 May 29] Available from <https://www.nhp.gov.in/paediatrics-in-siddha>
4. Dr.K.Durairasan,noiillaneribook,unavuporutkalumparupuvagaikkalum ,page -237
5. Umadevi M, Pushpa R, Sampathkumar KP, Bhowmik D. Rice-traditional medicinal plant in India. *Journal of pharmacognosy and phytochemistry.* 2012;1(1):06-12.
6. Shrestha J, Kandel M, Subedi S, Shah KK. Role of nutrients in rice (*Oryzasativa* L.): A review. *Agrica.* 2020 Jun 20;9(1):53-62.
7. Vichit WA, Saewan NI. Antioxidant activities and cytotoxicity of Thai pigmented rice. *International Journal of Pharmacy and Pharmaceutical Sciences.* 2015 Jul;7(7):329-34.7.
8. Khan F, Nayab M, Ansari AN, Zubair M. Medicinal Properties of Māsh (*Vigna mungo* (Linn.) Hepper): A Comprehensive Review. *Journal of Drug Delivery and Therapeutics.* 2021 Jun 15;11(3-S):121-4.
9. Abdel-Motaal FF, Maher ZM, Ibrahim SF, El-Mleeh A, Behery M, Metwally AA. Comparative studies on the antioxidant, antifungal, and wound healing activities of *Solenostemmaarghel* ethyl acetate and methanolic extracts. *Applied Sciences.* 2022 Apr 19;12(9):4121.

10. Wei Z, Qi X, Li T, Luo M, Wang W, Zu Y, Fu Y. Application of natural deep eutectic solvents for extraction and determination of phenolics in *Cajanuscajan* leaves by ultra performance liquid chromatography. *Separation and Purification Technology*. 2015 Jul 27;149:237-44.
11. Jukanti AK, Gaur PM, Gowda CL, Chibbar RN. Nutritional quality and health benefits of chickpea (*Cicer arietinum* L.): a review. *British Journal of Nutrition*. 2012 Aug;108(S1):S11-26.
12. Kalim A, Zaheer M, Siddiqui MU, Ahmed S, Hassan MM. Nutritional value, Ethnomedicine, Phytochemistry and pharmacology of *Vigna radiata* (L.) R. Wilczek. *Journal of Pharmacognosy and Phytochemistry*. 2021;10(2):54-8.