JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

INNOVATIVE OF PALMYRA SPROUT AND PEARL MILLET LADDU

FARZANA MOVAFIHKA FATHIMA.M, Ms PAVITHRA A, DR. P.S. PRATHIBHA
PG SCHOLAR LECTURER PROGRAM HEAD
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND DIETETICS
Dr.MGR EDUCATIONAL AND RESEARCH INSTITUTE, CHENNAI, INDIA

ABSTRACT:

This study is based on the palmyra (Borassus flabellifer L.), sometimes known as the miracle tree, has several health advantages in all parts of the plant. It belongs to the Arecaceae family and is widely distributed throughout Asia, including south India, north and east Sri Lanka, and the majority of other tropical nations. Palmyra sprout and pearl millet laddu is a nutritious and delicious that can be beneficial for individuals suffering from anemia. Palmyra sprouts are rich in iron, calcium, and other essential nutrients, while pearl millet is also a good source of iron and other micronutrients. Combining these ingredients into laddu provides a tasty and convenient way to incorporate them into the diet. The iron content in these laddu can help boost hemoglobin levels, thereby aiding in the management and prevention of anemia. This research explores the nutritional importance and potential health benefits of Palmyra sprout and pearl millet and highlighting it's significance as a promising dietary intervention for addressing anemia and promoting overall well being.

Keywords: *Palmyra sprout, pearl millet, jaggery, honey.*

1.INTRODUCTION:

Iron deficiency anemia (IDA), the most severe result of iron depletion, is still regarded as the most prevalent nutritional deficiency globally. IDA has a complex etiology, but for whatever reason, it usually occurs when the body's iron requirements are not satisfied via iron absorption. Individuals suffering from IDA may experience insufficient intake, compromised absorption or transport, physiological losses linked to advancing age or pregnancy, or persistent blood loss stemming from illness. Adults with IDA may experience a wide range of negative effects, such as decreased ability to work or exercise, immune system dysfunction, reduced thermoregulation, gastrointestinal issues, and impairment to neurocognition (Susan F Clark, et. al 2008)

Palmyra sprout is an underground sprout of the Palmyra tree or *Borassus flabellifer*. It is a Traditional tree with multiple health benefits (Rashi M. Khatri, et.al 2020) They are rich in fiber and provides several minerals, such as potassium, iron, copper, phosphorus, and zinc. Palmyra sprouts are a good source of iron, which is essential for addressing anemia. along with other iron-rich foods, can help boost iron levels and manage anemia. Palmyra sprouts is essential for the production of hemoglobin; also, its protein is responsible for transporting oxygen in the blood.

Pearl millet, scientifically known as *Pennisetum glaucum*, is a nutritious grain crop that is widely cultivated in arid and semiarid regions of Africa and Asia. It is a staple food for millions of people due to its resilience to harsh growing conditions such as drought, heat, and poor soil quality. Pearl millet is highly valued for its nutritional content, particularly its high levels of protein, fiber, iron, and other essential nutrients. It is commonly used to make various traditional foods like porridge, flatbreads, and fermented beverages. Furthermore, pearl millet is becoming more well-known worldwide as a crop that can withstand climate change and maybe aid with food security issues. Its drought tolerance and ability to thrive in marginal lands make it an important crop for sustainable agriculture and food production in vulnerable regions. Pearl millet *(Pennisetum glaucum L.)* helps to deliver Fe for hemoglobin (Hb)-synthesis (Elad Tako et. al 2015). It Is enriched with Iron, Zinc and other minerals (Rupesh, et. al 2018).

In regions where anemia is prevalent, particularly among children and women of reproductive age, innovative approaches to improve dietary iron intake are essential. Traditional foods and recipes can be adapted and enhanced to provide a rich source of essential nutrients, including iron, to combat anemia effectively. Palmyra sprout and pearl millet laddu, a traditional Indian sweet, offers a promising solution to address anemia. Palmyra sprouts, derived from the Palmyra palm tree (Borassus flabellifer), are rich in iron, calcium, and other micronutrients A common cereal grain in many regions of Africa and India, pearl millet is also a good source of fiber, protein, and iron. By combining these nutritious ingredients into a laddu recipe, we can create a delicious and convenient snack that serves as a potent dietary supplement for individuals at risk of anemia. The innovation lies in the formulation and preparation of the laddu to maximize the bioavailability of iron and other nutrients. Traditional methods of processing and cooking are adapted to ensure optimal

nutrient retention and absorption. Additionally, the palmyra sprouts and pearl millet can be sourced locally, promoting sustainability and economic development within the community

2. Materials and Methods:

2.1 Material

2.1.1 Raw materials

Raw materials such as Palmyra sprout, pearl millet, cardamom powder, jaggery, and honey were purchased from the local market in Neyveli.

2.2 METHODOLOGY

2.2.1 STANDARDIZATION OF LADDU:

Clean and cut the Palmyra sprout and pearl millet and dry them in sunlight, after being completely dried; grind them in a blender. Melt the jaggery in a pan and add 15 ml of water to make jaggery syrup. After this process, use a pan and roast pearl millet flour with 10 gm of ghee. Take a large bowl and add pearl millet and Palmyra sprout flour. To this, add jaggery syrup and honey. Then, add cardamom for flavor and finally add a pinch of salt and sprinkle water to make them into laddu.

Table .1 Formulation of laddu

INGREDIENTS	VALUE
Pearl millet	200g
Palmyra sprout	20g
jaggery	100g
Cardamon powder	2g
Ghee	50 ml
Honey	4spoon
Salt	0.5g

Figure 1: Process flow chart for laddu

2.2.2 SENSORY ANALYSIS:

Sensory analysis of prepared palmyra sprout and pearl millet laddu sample was done using a 9 – point hedonic scale rating (Ranganna, et al 2015)

3. RESULT AND DISCUSSION

3.1Physical characteristics of Laddu:

No marked difference was observed in the size, shape and weight of laddu. The size and weight of laddu is 30 g. All the samples were sphere in shape and brown color laddu.

3.2 Organoleptic characteristics of laddu

The developed value – added laddu was standardized using a sensory evaluation technique with the help of 9- point hedonic scale. The developed value-added laddu was served to 45 consumers for sensory evaluation.

Table 2: Mean scores of sensory Evaluation of laddu

ATTRIBUTES	APPEARANCE	FLAVOUR /TASTE	AROMA	TEXTURE	MOUTHFEEL	OVERALL ACCEPTABILITY
SAMPLE	8.43±8.74	8.43±0.68	8.36±0.95	8.58±0.68	8.54±0.78	8.71±0.54

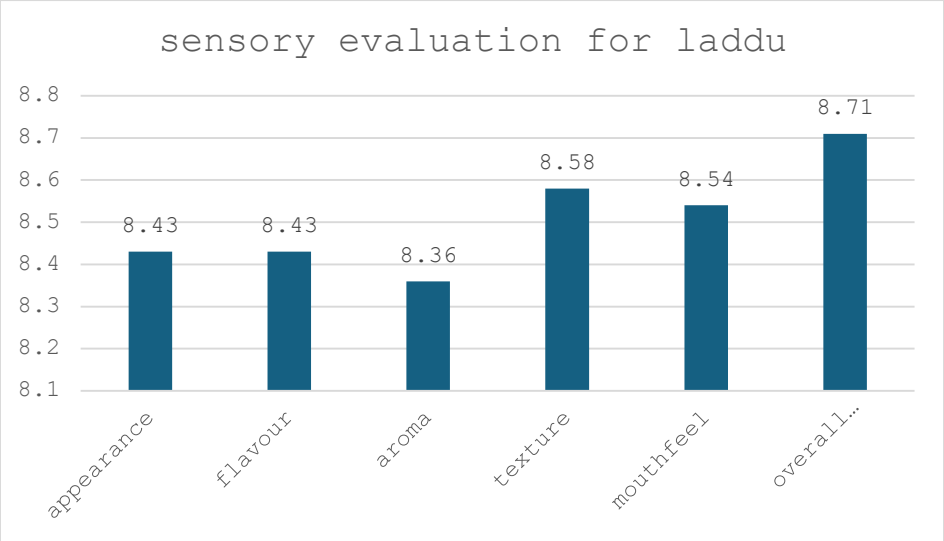

Figure 2: Scorecard for Sensory evaluation of laddu

CONCLUSION:

This study substantiated the appearance, taste, aroma, texture, mouthfeel and the overall acceptability. The Palmyra sprout and pearl millet laddu presents a compelling solution for addressing anemia due to its rich nutritional composition and iron content. These laddus hold significant promise in boosting hemoglobin levels and combating anemia effectively. By integrating this wholesome treat into one's dietary regimen, individuals can not only enjoy a tasty indulgence but also take proactive steps towards improving their overall health and well-being; making it a valuable addition to anemia management strategies.

ACKNOWLEDGEMENT:

We would like to sincerely thank Ms. Pavithra A., Lecturer, Department of Food Science, Nutrition and Dietetics, our guide, for her unwavering support, direction, encouragement, and insightful recommendations that enabled the study to be completed successfully. And to Ms. Prithika.M, Assistant Professor; Ms. Anu Ranjani, Assistant Professor; Ms. Sneha.S, Assistant Professor; and Ms Pranitha S.V., we are very indebted.

REFERENCE:

1. Khatri, R. M., Siddiqui, S., Nagamaniammai, G., & Athmaselvi, K. A. (2020). Development of Muffin Using Palmyra (Borassus flabellifer) Sprout Flour. *International Journal of Nutrition, Pharmacology, Neurological Diseases*, *10*(1), 14-20.
2. 2.Tako, E., Reed, S. M., Budiman, J., Hart, J. J., & Glahn, R. P. (2015). Higher iron pearl millet (Pennisetum glaucum L.) provides more absorbable iron that is limited by increased polyphenolic content. *Nutrition journal*, *14*, 1-9.
3. Cercamondi, C. I., Egli, I. M., Mitchikpe, E., Tossou, F., Zeder, C., Hounhouigan, J. D., & Hurrell, R. F. (2013). Total iron absorption by young women from iron-biofortified pearl millet composite meals is double that from regular millet meals but less than that from post-harvest iron-fortified millet meals. *The Journal of nutrition*, *143*(9), 1376-1382.
4. Kodkany, B. S., Bellad, R. M., Mahantshetti, N. S., Westcott, J. E., Krebs, N. F., Kemp, J. F., & Hambidge, K. M. (2013). Biofortification of pearl millet with iron and zinc in a randomized controlled trial increases absorption of these minerals above physiologic requirements in young children. *The Journal of nutrition*, *143*(9), 1489-1493.
5. Kodkany, B. S., Bellad, R. M., Mahantshetti, N. S., Westcott, J. E., Krebs, N. F., Kemp, J. F., & Hambidge, K. M. (2013). Biofortification of pearl millet with iron and zinc in a randomized controlled trial increases absorption of these minerals above physiologic requirements in young children. *The Journal of nutrition*, *143*(9), 1489-1493.
6. Pompano, L. M., Luna, S. V., Udipi, S. A., Ghugre, P. S., Przybyszewski, E. M., & Haas, J. (2022). Iron-biofortified pearl millet consumption increases physical activity in Indian adolescent schoolchildren after a 6-month randomised feeding trial. British Journal of Nutrition, 127(7), 1018-1025.

7. Kodkany, B. S., Bellad, R. M., Mahantshetti, N. S., Westcott, J. E., Krebs, N. F., Kemp, J. F., & Hambidge, K. M. (2013). Biofortification of pearl millet with iron and zinc in a randomized controlled trial increases absorption of these minerals above physiologic requirements in young children. *The Journal of nutrition*, *143*(9), 1489-1493.
8. Velu, G., Kulkarni, V. N., Muralidharan, V., Rai, K. N., Longvah, T., Sahrawat, K. L., & Raveendran, T. S. (2006). A rapid screening method for grain iron content in pearl millet. *International Sorghum and Millets Newsletter*, *47*, 158-161.
9. 9.Sakthibalan, M., Sarumathi, E., Mangaiarkkarasi, A., & Meher, B. R. (2018). Evaluation of efficacy of jaggery and raisins as supplements in iron deficiency anemia among medical undergraduate students in South India. *National Journal of Physiology, Pharmacy and Pharmacology*, *8*(10), 1432-1436.
10. Patel, R., Luke, F., & Doss, K. (2017). A study to assess the effectiveness of beetroot juice with jaggery on anemia among adolescent girls in the selected urban area at Rajkot. *International Journal of Nursing Education and Research*, *5*(2), 140-142.
11. Baraiya, A. K. (2018). Impact of Iron Supplementation Toward Hemoglobin Levels on Teenage Girls in Jamnagar District. *International Journal of Agriculture Sciences*, *ISSN*, 0975-3710.
12. Nath, A., Dutta, D., Kumar, P., & Singh, J. P. (2015). Review on recent advances in value addition of jaggery based products.
13. Nath, A., Dutta, D., Kumar, P., & Singh, J. P. (2015). Review on recent advances in value addition of jaggery based products.
14. Widowati, R. (2023, October). Utilization of various honey, fruits, and vegetables to increase hemoglobin levels in pregnant women with anemia in Indonesia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1255, No. 1, p. 012037). IOP Publishing.
15. Rahmawati, A., Wulandari, R. C. L., Arisanti, A. Z., & Nurrokhmah, A. (2022). The effect of date juice and honey on increasing hemoglobin in pregnant women with anemia. *International Journal of Islamic and Complementary Medicine*, *3*(2), 57-64.
16. Laili, F. (2020, October). The Effect of Administering Honey on the Increasing of Hemoglobin Level in Pregnant Woman with Anemia. In *The 2nd Strada International Conference on Health* (Vol. 2, No. 1, pp. 49-52).
17. Mulyani, Y., & Sari, D. N. (2020). The Effect of Dragon Fruit Juice and Honey On The Improvement of Pregnant Women's Hb. *STRADA Jurnal Ilmiah Kesehatan*, *9*(2), 1409-1414.
18. Dr.S. Ramani, S. Alagammai, Dr. P. Karthickumar, Incorporation of squid and PALMYRA SPROUTS in the development of protein and fiber enriched noodles, June 2022; 7(6). ISSN: 2456-4184 | IJNRD.ORG
19. Datir, R. P., Adil, S., & Sahare, A. S. (2018). Pearl Millet: boon in mineral deficiency: A review. *Agricultural reviews*, *39*(4), 327-332.