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Moringa Vibe Bite: Optimizing Calcium-Rich Nutrition

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ABSTRACT

One of the efforts to produce functional foods is using ingredients containing health-beneficial bioactive compounds. This study aims to develop nutritious bites using Moringa leaf powder, Kodo millet and Rice flour. The goal of this study is providing a nutrient dense alternative bite. mean score for overall acceptability of Vibe-Bite was ranged 8.4 among all the trials. however, maximum scores were noted for control while, minimum was detected for T_3. Bite is finalized with dough containing 5% Moringa leaf powder, 32% Kodo Millet and 32% Rice flour. In the lab, a product was prepared using powdered Moringa leaves. all value-added variated products developed from Moringa leaves powder with 5%, 10% and 15% incorporation were assessed for their sensory characteristics *viz.,* colour, flavor, taste, texture, appearance and overall acceptability. An ingredient historically believed to have benefits on health is moringa leaf powder. It is a valuable source of functional ingredients, including protein, vitamins, minerals, and phytonutrients The composition and study demonstrated that adding this composition to product is highly nutritious, it is protein and mineral rich. Addition of Moringa powder and Rice flour blend in Product as source of rich in calcium, vitamins and antioxidants. Moringa leaf powder possesses many pharma-cological properties, such as anticancer, anti-inûammatory, hepatoprotective, cardioprotective, and antioxidant ones. Primarily the less fat substance in item separates the from the item which is as of now accessible in market. As valuable composition helps to reduce cholesterol and blood sugar level.

Keywords: Moringa leaf powder, Kodo millet, Mineral, Antioxidants, Cholesterol, Pharma-cological, Phytonutrient

INTRODUCTION

The customary and well-known scrumptious food thing in Indian dietary science. it is a low dampness food ate either in the wake of searing or broiling or as assistant with vegetable soups and curries. Vibe Bite is thick compare to papad - fresh like surface which is consumed as accompaniment alongside the dinners and tidbits. broiled Vibe Bite assists with engrossing the greasy materials from mouth and throat.

Moringa species are native to India, from where they have been introduced in many warm countries (Esa *et al.,* 2013). Moringa, a local plant from Africa and Asia, and the most broadly developed species in Northwestern India, is the sole sort in the family Moringaceae. It includes 13 species from tropical and subtropical environments, going in size from little spices to huge trees (Leone *et al.,* 2015; Vergara-Jimenez *et al.,* 2017). Its medicinal potential derives from secondary metabolites, such as alkaloids, tannins, flavonoids, steroids, saponins, coumarins, quinones and resins (Ansari and Kumar, 2012). The most generally developed species is Moringa Oleifera (MO). MO is developed for its nutritious cases, palatable leaves and f brings down and can be used as food, medication, restorative oil or search for live stock. Its level reaches from 5 to 10m. *Moringa oleifera* is a fast-growing, deciduous tree. Its maximum height is 10–12 m, while its trunk can reach a diameter of 45 cm. The flowers are approximately 1.0–1.5 cm long and 2.0 cm wide. Flowering starts within the first six months after planting (Padayachee and Baijnath, 2012). A few examinations have exhibited the beneficial impacts in people. The plant is reportedly rich in important bioactive and phytochemical compounds that have the potential

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for use in the development of functional foods (Saucedo-Pompa *et al.,* 2018; Kashyap *et al.,* 2022).

Moringa oleifera is an enduring tree, actually considered as among underutilized plant and falls under Moringaceae family. The plant is otherwise called drumstick, sahjan or sohanjana in India (Singh and Prasad, 2013; Abd El-Hack *et al.,* 2018). All plant parts are having wonderful scope of some utilitarian and nutraceutical properties make this plant a different biomaterial for food and partnered utilizes. In addition, some of these bioactive compounds have astringent and bitter tastes which may make foods unpalatable.

Diabetic patients can likewise utilize moringa passes on juice to control pulse and blood glucose levels. Moringa handling may now and again change the bio accessibility of moringa supplements and polyphenols. The powder leaves are used to make beverages of which "Zija" is the most popular in India. Leaves can be consumed cooked or fresh and they can be stored as dried powder unrefrigerated with no nutritional losses, for several months. Undoubtedly, *M. oleifera* adds substantial health benefits to countries where hunger is a problem (Ansari and Kumar, 2012). *MO* leaves also contain 200 mg/100 g of vitamin C, a concentration greater than what is found in oranges (Rajaram, 2019; Ferreira *et al.,* 2008; Vergara-Jimenez *et al.,* 2017). Moringa leaves, which contain four times more calcium and two times more digestible protein than milk, can be used as calcium and protein supplements. The moringa leaves are also rich in minerals such as potassium, zinc, magnesium, iron and copper (Ramachandran *et al.,* 1980; Kashyap *et al.,* 2022).

The miniature supplement content is much more in dried leaves; (multiple times the vitamin A of carrots), (multiple times the calcium of milk), (multiple times the potassium of bananas), (multiple times the iron of spinach) and (multiple times the protein of yogurt) (Rajput *et al.,* 2017; Manzoor *et al.,* 2007).

Fig. 1 : Moringa Leaf Powder

Millets are one of the oats asides the significant wheat, rice, and maize. These are key horticulture produce on a worldwide level having critical commitment for the individuals having low pay particularly in non-industrial nations. Millets can be filled in a brief period, can support dry season condition crop and have long capacity period without bug harm. They are little to medium size crops that are developed all through the jungles and subtropical area (Singh *et al.,* 2023). The millets having a place with sort Poaceae (valid grass) can be delegated significant millets and minor millets which are developed in India, China, Malaysia, Sri Lanka, Australia and a few pieces of Africa since old times (Taylor, 2019).

Glycemic list is a significant apparatus utilized in treating individuals with diabetes, cardiovascular sickness the board, and weight guideline programs. Millets including Kodo contain water dissolvable fiber and this property might be used for keeping up with or bringing down blood glucose reaction among diabetic and CVD patients (Neelam *et al.,* 2013).

Millets contain safe starch, that goes about as prebiotic, advancing the development of gainful microscopic organisms in the stomach and decreasing aggravation, helps in the creation of positive metabolites like short-chain unsaturated fats in the colon (Raza *et al.,* 2023).

Fig. 2 : Kodo millet flour

Rice (*Oryza sativa* L.) is a monocotyledon plant which has a place with the family Poaceae and is a significant food crop, with worldwide yearly creation assessed at around 480 million metric tons (communicated on a processed rice premise). It is filled today in excess of 100 nations, with China and India alone representing over half of worldwide rice creation.

Rice flour creation had a huge upsurge, consequently expanding different improvement in rice-based food items,

for example, without gluten bread, rice cakes, rice noodles, and newborn child food.

Rice flour is utilized as a thickening specialist and for making rice bread.

Rice is utilized in sans gluten items and new higher protein rice assortments presently exist.

Rice is widely utilized in different types of food as entire grain as much as flour. Many individuals in South and Southeast Asia use rice flour both from brown and processed rice to get ready different regular and oddity food things. Each rice-based food item needs exceptional arrangement of handling conditions.

The utilization of entire grains has been accounted for to safeguard against colorectal disease in human mediations

Fig. 3 : Rice flour

Objectives :

1. To develop fat free product.
2. To standardize protein content in Product
3. To standardized mineral rich based Product.
4. To reduce blood sugar and cholesterol level.

METHODOLOGY

The current review was completed in division of food technology, Parul University.

The natural substance was acquired from neighborhood market of Vadodara, for example, rice flour, Kodo millet, cumin seed, basic salt, salt however moringa leaf powder was made by taking leaves from adjacent developed Moringa tree (drumstick) and leaves were dried and powder was framed (Table 1).

Table 1: List of ingredients

Sr. No.	Ingredients
1	Moringa leaf powder
2	Kodo millet flour
3	Rice flour
4	Cumin seeds
5	Ajwain seeds
6	Salt
7	Alkaline salt
8	Green chilies
9	Water

Method:

Vibe Bite was ready of taking different proportion of Moringa leaf powder, Kodo millet and Rice flour into bubbling water. Blending related fixings referenced into bubbling water making it liberated from irregularities. Making delicate mixture by kneading it appropriately. By making little pieces from batter and afterward in the middle of between the roller and make it level and slim, formed like puri and afterward it was sun dried and later on it is roast (Fig. 4 and 5 and Table 2 and 3).

Leaves from moringa tree
↓
Separate it from small stems
↓
Wash two times in clean water
↓
Take it out and dry it at room temperature
↓
Taking two days for complete drying
↓
Make it in form of powder (Kodo millet and moringa leaf)

Fig. 4 : Powdered form of Kodo Millet and Moringa leaf

Boil water
↓
Add ajwain, cumin seeds, salt alkaline salt and crushed green chillies
↓
Boil it for few seconds
↓
Add moringa leaf powder and again boil it for few seconds
↓
Add rice flour and Kodo millet and mix it well
↓
Formation of dough which is to be steamed for 10 min (steaming time depends on the amount is to be made)
↓
Knead the dough well and it will be soft
↓
Chapati or puri shape can be made and dry it under sun light
↓
Roasting or Air fry is allowed for breakfast or snacks purpose

Fig. 5 : Flow chart for processing of Moringa VibeBite

Table 2 : Formulation of the product for preparation of Moringa Vibe-Bite

Ingredients	T_1	T_2	T_3
Moringa leaf powder	5g	10g	15g
Kodo millet	32g	30g	25g
Rice flour	32g	30g	25g
Ajwain seeds	1g	1g	1g
Cumin seeds	1g	1g	1g
Green chilly	1g	4g	4g
Alkaline salt	5g	5g	5g
Salt	5g	5g	5ml
water	15ml	14ml	14ml

Table 3 : Sensory evaluation by 10 people on variation of Vibe-Bite from MO leaf powder, Kodo millet and Rice flour

Sample code	Color	Taste	Flavor	Appearance	Texture	Overall acceptability
T_1	8.1	8.1	8.1	8.2	8.2	8.4
T_2	7.2	7.5	7.7	7.5	8.3	7.6
T_3	7.5	7.3	7.5	7.8	7.5	7.5

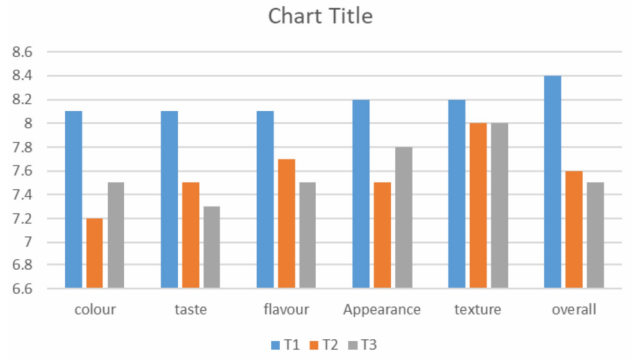

Fig. 6 : Sensory Chart

By the above sensory test it is concluded that sample T1 is finalized (Fig. 6).

Methods of Analysis:

IS 4285: Method for volumetric determination of calcium

This standard prescribes the method for the volumetric determination of calcium by the potassium permanganate.

$$\text{Calcium per cent by weight} = \frac{A \times N \times 2.004}{W}$$

A = Volume in ml of standard potassium permanganate solution required for titration.

N = Normality of standard potassium permanganate solution.

W = Weight in g of material contained in the test solution.

Fat Determination:

FSSAI Manual of Methods of Analysis of Foods – Cereal and Cereal Products, Ch, S.NO.14.5:2016

Applicable to the analysis of cereal grains and powders (pearl millet/maize flour), soybean and soybean-based products (tofu, soymilk), oilseeds, solvent extracted flours, expeller pressed flours and animal feeds at concentrations from 0.5 to 100% fat. It is applicable to the same matrixes as AOAC Official Methods 920.39 and 930.09

$$\% \text{ Oil} = \frac{W_2}{W_1} \times 100$$

where:

W_1 = Mass of sample

W_2 = Mass of oil

Sample no. T_1 Sample no. T_2 Sample no. T_3

RESULTS AND DISCUSSION

Analysis of Physio-Chemical Analysis:

As per the sensory evaluation finalisation of the

Table 4 : Physio-Chemical Analysis

Sr. No.	Quality Characteristics	Result
1.	Moisture	10.63%
2.	Ash	5.75%
3.	Total Fat gm/100gm	0.47
4.	Protein gm/100gm	7.51
5.	Carbohydrate gm/100gm	75.64
6.	Energy KCal/100g	336.83
9.	Calcium (as Ca) mg/100gm	1054.95

product clearly determines about sample T_1 (Table 4).

According to the functional properties of the ingredients the tests were performed and the desired result achieved in various nutritional qualities as mentioned below:

Conclusion:

Moringa Vibe Bite traditionally prepared by Rice flour, here variation in ingredients by using Kodo Millet and Moringa Leaf Powder. Basically, Product made from Rice flour which contributes to the carbohydrate. Focusing to the objectives Vibe Bite made from the value-added ingredients contributes better nutritional quality such as Moringa Leaf Powder rich in Calcium effectively for the malnourished children's and pregnant women and Kodo Millet is diabetic friendly, gluten free and rich in Protein and Calcium. Moringa leaf powder has demonstrated beneficial effects on body weight, lipid profiles, and blood pressure in animal studies. In this study the expansion of fixings to the current ones make item significant in dietary quality. Addition of Moringa powder and Rice flour blend in Product as source of rich in calcium, vitamins and antioxidants. Moringa leaf powder possesses many pharma-cological properties, such as anticancer, anti-inûammatory, hepatoprotective, cardioprotective, and antioxidant ones. Rich in Calcium and Protein and Fat-free food.

REFERENCES

Abd El-Hack, M.E., Alagawany, M., Elrys, A.S., Desoky, E-S.M., Tolba, H.M.N., Elnahal, A.S.M., Elnesr, S.S. and Swelum, A.A. (2018). Effect of Forage *Moringa oleifera* L. (moringa) on Animal Health and Nutrition and Its Beneficial Applications in Soil, Plants and Water Purification. *Agriculture*, **8**(9):145. https://doi.org/10.3390/agriculture8090145

Amagliani, L., O'Regan, J., Kelly, A.L. and O'Mahony, J. A. (2017). Composition and protein profile analysis of rice protein ingredients. *J. Food Composition & Analysis*, **59** : 18-26.

Ansari, M.M. and Kumar, S.D. Fortification of Food Beverages and with Phytonutrients. *Public Health Nutri.,* **2** : 241-253.

Esa, N.M., Ling, T.B. and Peng, L.S. (2013). By-products of rice processing: An overview of health benefits and applications. *J. Rice Res.*, **1**(107) : 2

Ferreira, P.M.P., Farias, D.F., Oliveira, J.T.D.A. and Carvalho, A.D.F.U. (2008). *Moringa oleifera*: Bioactive compounds and nutritional potential. *Rev. Nutr.*, **21** : 431–437.

Joy, E.E. and Ledogo, N. (2016). The effect of variety and processing methods on the functional and chemical properties of rice flour. *Internat. J. Nutrition & Food Sci.*, **5**(1) : 80-84

Kashyap, P., Kumar, S., Riar, C. S., Jindal, N., Baniwal, P., Guiné, R. P., ... and Kumar, H. (2022). Recent advances in Drumstick (*Moringa oleifera*) leaves bioactive compounds: Composition, health benefits, bioaccessibility, and dietary applications. *Antioxidants*, **11**(2) : 402.

Kasolo, J.N., Bimenya, G.S., Ojok, L., Ochieng, J. and Ogwal-Okeng, J.W. (2010). Phytochemicals and Uses of *Moringa oleifera* Leaves in Ugandan Rural Communities. *J. Med. Plants Res.*, **4** : 753–757.

Leone, A., Spada, A., Battezzati, A., Schiraldi, A., Aristil, J. and Bertoli, S. (2015). Cultivation, genetic, ethnopharmacology, phytochemistry and pharmacology of *Moringa oleifera* leaves: An overview. *Internat. J. Molecular Sciences*, **16**(6) : 12791-12835.

Manzoor, M., Anwar, F., Iqba, T. and Bhnager, M.I. (2007). Physico-chemical characterization of Moringa concanensis seeds and seed oil. *J. Am. Oil Chem. Soc*., **84**: 413-419

Nedovic, V., Kalusevic, A., Manojlovic, V., Levic, S. and Bugarski, B. (2011). An overview of encapsulation technologies for food applications. *Procedia Food Sci.*, **1** : 1806–1815.

Neelam, Y., Kanchan, C., Alka, S. and Alka, G. (2013). Evaluation of hypoglycemic properties of kodo millet based food products in healthy subjects. *IOSR J. Pharm.*, **3** : 14-20.

Özcan, M. (2020). *Moringa* spp.: Composition and bioactive properties. *S. Afr. J. Bot.*, **129** : 25–31.

Padayachee, B. and Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. *J. Med. Plants Res.*, **6**(48) : 5831-5839.

Paz, G.M., King, J.M. and Prinyawiwatkul, W. (2021). High protein

rice flour in the development of gluten-free bread. *J. Culinary Sci. & Technol.*, **19**(4) : 315-330

Rajaram, M.D.N. (2019). *Deficit irrigation water management on growth and yield of drumstick (Moringa oleifera lamk.) Cv. Bhagya (kdm-1)* (Doctoral dissertation, Mahatma Phule Krishi Vidyapeeth.

Rajput, H., Prasad, S.G.M., Srivastav, P., Singh, N., Suraj, L. and Chandra, R. (2017). Chemical and phytochemical properties of fresh and dried *Moringa oliferiea* (PKM-1) leaf powder. *Chem. Sci. Rev. Lett.,* **6** : 1004-1009.

Ramachandran, C., Peter, K.V. and Gopalakrishnan, P.K. (1980). Drumstick (*Moringa oleifera*): A multipurpose Indian vegetable. *Econ. Bot.*, **34** : 276–283.

Raza, A.M., Khaitan, J., Ghosh, J. and Kar, S. (2023). Indian Millets (Finger Millet, Kodo, Sorghum And Pearl Millet): Potent Functional Foods and Processing Scopes. *J. Advanced Zoology*, **44** (56) : 2012-2025.

Ronie, M.E. and Hasmadi, M. (2022). Factors affecting the properties of rice flour: a review. *Food Res.*, **6** : 1-12

Saif, S.M.H., Lan, Y. and Sweat, V.E. (2003). Gelatinization properties of rice flour. *Internat. J. Food Properties*, **6**(3) : 531-542

Saucedo-Pompa, S., Torres, J., Castro-López, C., Rojas, R., Sánchez-Alejo, E., Ngangyo-Heya, M., Martínez, G. (2018). Moringa plants: Bioactive compounds and promising applications in food products. *Food Res. Internat.,* **111** : 438–450.

Singh, N., Kumari, P. and Bassi, J. G. N. (2023). Nutrient rich Kodo millet, importance and value addition: An overview. *The Pharma Innovation J.*, **12**(6): 3713-3719

Singh, Y. and Prasad, K. (2013). *Moringa oleifera* leaf as functional food powder. *Charact. Uses*, **4** : 317-324.

Taylor, J.R. (2019). Sorghum and millets: Taxonomy, history, distribution, and production. In *Sorghum and millets* (pp. 1-21). AACC International Press.

Vergara-Jimenez, M., Almatrafi, M.M. and Fernandez, M.L. (2017). Bioactive components in Moringa oleifera leaves protect against chronic disease. *Antioxidants*, **6**(4) : 91.

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