



# AGRI MAGAZINE

(International E-Magazine for Agricultural Articles)

Volume: 01, Issue: 05 (December, 2024)

Available online at <http://www.agrimagazine.in>

© Agri Magazine, ISSN: 3048-8656

## Kodo Millet (*Paspalum scrobiculatum*) Based Value Added Products

(\*Sylvia Borgis<sup>1</sup> and Sarojani J Karakannavar<sup>2</sup>)

<sup>1</sup>Assistant Professor, Department of Food Science and Nutrition, College of Community Science, University of Agricultural Sciences, Dharwad, Karnataka, India

<sup>2</sup>Dean (Student Welfare), University of Agricultural Sciences, Dharwad, Karnataka, India

\*Corresponding Author's email: [borgissylvia@gmail.com](mailto:borgissylvia@gmail.com)

Kodo millet [*Paspalum scrobiculatum* (L.)] is a tropical small millet crop, indigenous to India. It belongs to Poaceae family. The grain may be yellowish to grey in colour. Kodo millet is highly nutritious and a good substitute to rice or wheat. Kodo millet is very easy to digest; it contains a high amount of lecithin and is excellent for strengthening the nervous system (Hegde and Chandra, 2004). In India, Madhya Pradesh, Tamil Nadu, Rajasthan, Uttar Pradesh, Andhra Pradesh and West Bengal have rich genetic diversity of millets

### Nutrition and antioxidants in kodo millet

Kodo millet is composed of approximately 70 g of carbohydrates, 9 g of protein, 3 g of minerals, 10 g of fibre, 4 g of fat and 400 kcal per 100 g of grain [Muthamilarasan *et al.* (2015) and Deshpande *et al.* (2015)]. The total starch content of kodo millet is 58.45 percent with amylose (25.75 %) and amylopectin (32.74 %). Kodo millet contains around two to four per cent total sugars, one to three per cent non reducing sugars and around one per cent reducing sugars (Thilagavathi *et al.*, 2015 and Prabha and Selvi, 2016). Kodo millet contains calcium (27-38 mg), phosphorous (164-215 mg), iron (0.5–3.85 mg), zinc (0.70-3.17 mg), copper (2.15-3.80 mg) and manganese (1.10-1.42 mg) per 100 g of grain [Thilagavathi *et al.* (2015), Prabha and Selvi, (2016) and Himanshu *et al.* (2018)]. Phenolic compounds ( $\mu\text{g/g}$ ) such as hydroxyl benzoic acid, vanillic acid, caffeic acid, ferulic acid and flavonoids are present in kodo millet (Kumar *et al.*, 2018).

### Value added products from kodo millet

**Bakery products:** Kumar *et al.* (2010) developed soy based kodo millet biscuits. Biscuits were prepared from the blends containing 30 per cent (bakers) full fat soy flour and substitute refined wheat flour with 70, 80, 90, 100 per cent millet flour. On the basis of sensory evaluation 70 per cent kodo millet biscuits were found better acceptable. Sharma *et al.* (2018) prepared enriched multigrain bread. The bread was composed of wheat and malted kodo millet flour in ratios (30:70, 40:60, 50:50, 60:40 and 70:30). Sensory evaluation revealed that 50:50 ratio bread was better acceptable with average of 2.6 on 3-point scale.

**Extruded products:** Devi *et al.* (2014) developed kodo millet-based pasta by incorporating 50, 60, and 70 per cent kodo millet flour into refined wheat flour. Based on sensory evaluation, upto 70 per cent kodo millet pasta was acceptable (6.66) and needed less cooking time (7.43 min). Vijaykumar and Mohankumar (2009) developed noodles from millet flour blends. Millet flour blend was prepared by equal proportion of barnyard and kodo millet. The blend was mixed with whole wheat flour at the level of 0, 10 and 20 per cent. Defatted soy flour at 10 per cent kept constant in all formulations. Based on acceptability, millet flour blend noodles were on par with standard and commercial noodles with maximum score of 20 to 21 out of 25.

**Other products:** Sagu and Sundaravalli (2015) developed iron rich spirulina millet mix flour. Dried finger millet, foxtail millet, kodo millet were roasted, milled in 1:1:1 ratio.

Spirulina 2.5g/serving added. Spirulina millet mix flour (SMMF) was incorporated into five traditional recipes: *dhokla*, *burfi*, *chapathi*, *pakora*, muffin at 0, 25, 50, 75 and 100 per cent. SMMF addition of 75 per cent in *dhokla*, 50 per cent in *chapathi*, 50 per cent in *burfi*, 75 per cent in *onion pakora* and 100 per cent in muffin were on par with control. Nishad *et al.* (2017) developed health drink mix from minor millets. JPU-K3 variety of kodo millet, K-1 variety of barnyard millet, JK-8 variety of little millet and JNR-852 variety of finger millet were used for the study. Results revealed that the overall score (8.9) was highest for the mix containing finger millet (50%), kodo millet (20%), little millet (20%) and barnyard millet (10%). Kumar *et al.* (2018) developed doughnut using 20, 30, 40 and 50 per cent of kodo millet flour. Results revealed that doughnut with 40 per cent kodo millet flour were better acceptable. Rajput *et al.* (2019) developed kodo millet based products for school children. *Laddu* and millet drink was prepared from puffed and malted kodo millet respectively. Sensory scores revealed that *laddus* and millet drink was highly acceptable among school children and teachers with scores between 7 to 8 on a nine point hedonic scale

**Traditional recipes:** Kodo millet based traditional recipes such as dosa, cutlet, payasam, sev and methi rice was formulated by (Muragod *et al.*, 2019). The recipes were acceptable with overall acceptability of 8 on a nine-point hedonic scale.

## Conclusion

Kodo millet and flour up to 70 per cent can be successfully used for development of value-added products such as biscuits, bread, pasta, noodles, health drink, doughnut and traditional foods. Kodo millet can be used with other millets and spirulina to enhance nutritional content.

## References

1. Deshpande, S. S., Mohapatra, D., Tripathi, M. K. and Sadvatha, R.H., 2015, Kodo millet-nutritional value and utilization in Indian foods. *Journal of Grain Processing and Storage*, 2(2):16-23
2. Devi, G. S., Palanimuthu, V. and Kumar, P. A., 2014, Development of kodo millet-based pasta. *Int. J. Pros. Post Harvest Tech.*, 5(1): 33-40
3. Hegde, P. S. and Chandra, T. S., 2004, Health potential in kodo millet (*Paspalum scrobiculatum*) compared to other millets. *Food Chemistry*, 92(1): 177-182.
4. Kumar, S., Joseph, P. and Dayakar, R., 2018, Development and standardization for preparation of doughnut using millets. *International Journal of Current Microbiology and Applied Sciences*, 7(1): 990-999
5. Kumar, S., Rekha, L. and Lalan, K., 2010, Evaluation of quality characteristics of soy-based millet biscuits. *Advances in Applied Science Research*, 1(3): 187-196
6. Muragod, P. P., Muruli, N.V., Padeppagol, S. and Kattimani, A., 2019, Develop the value-added products and evaluate the storage quality of kodo millet grains products. *International Journal of Pure and Applied Bioscience*, 7 (1): 97-107
7. Muthamilarasan, M., Dhaka, A., Yadav, R. and Prasad, M., 2015, Exploration of millet models for developing nutrient rich graminaceous crops. *Plant Science*, 24:89-97.
8. Nishad, P. K., Maitra, S. and Jangre, N., 2017, Physiochemical, functional and sensory properties of developed health drink from minor millets. *International Journal of Home Science*, 3(2): 503-506
9. Prabha, K., and Selvi, S, 2016, Nutrient and antioxidant evaluation of four underutilized minor millets. *International Journal of Current Microbiology and Applied Sciences*, 5(7):224-233
10. Rajput, L.P.S., Pratibha Parihar, Ketki Dhumketi, Seema Naberia and Koji Tsuji, 2019, Development and acceptability of novel food products from millets for school children. *International Journal of Current Microbiology and Applied Sciences*, 8(04): 2631-2638
11. Sagu, S. R. S. and Sundaravalli, A., 2015, Development and evaluation of value-added iron rich spirulina millet mix flour. *International Journal of Science and Research*, 5(10): 1938-1943.

12. Sharma, S., Sharma, N. and Handa, S., 2018, Formulation of functional multigrain bread and evaluation of their health potential. *International Journal of Current Microbiology and Applied Sciences*, 7(7): 4120-4126
13. Thilagavathi, T., Kanchana, S. and Bhanumati, P., 2015, Physico-chemical and functional characteristics of selected millets and pulses. *Indian Journal of Science and Technology*, 8(7):14-17
14. Vijaykumar, T. P. and Mohankumar, S. A., 2010, Quality evaluation of noodles from millet flour. *Journal of Science and Research*, 69:48-54