



Nutritional and Nutraceutical Properties of Kodo Millets (*Paspalum scrobiculatum*): A Comprehensive Review

Sweta Mathur¹, Suman Khanduri¹, Neha Gosai¹,
Priyanka Sharma¹, Sanjana¹, Maneesha Singh¹

10.18805/ajdfr.DR-2340

ABSTRACT

Kodo millet (*Paspalum scrobiculatum*) is an underutilized grain known for its rich nutritional and nutraceutical properties. Kodo millet is gluten-free and easily digestible, making it suitable for individuals with gluten intolerance. It contains essential nutrients such as calcium, iron, magnesium and vitamins B3 and B6, which contribute to various health benefits including improved cardiovascular health, management of diabetes and potential anti-cancer properties. The grain's high levels of bioactive compounds, including phenolics and flavonoids, are associated with its antioxidative effects and ability to reduce oxidative stress, thus supporting overall health. Regular consumption of Kodo millet has been linked to lower cholesterol levels and improved metabolic health, particularly in populations at risk for obesity and related diseases. Given its resilience to drought and adaptability to semi-arid regions, Kodo millet presents a sustainable option for food security in developing countries. This review explores the comprehensive benefits of Kodo millet, highlighting its superior mineral content, dietary fiber and antioxidant capacity compared to other cereals. Therefore, the present studies emphasizes the importance of integrating Kodo millet into diets to harness its nutritional potential and promote public health.

Key words: Antioxidants, Cardiovascular, Climate resilient, Nutraceuticals, Nutrition, Polyphenol.

Kodo millet, scientifically known as *Paspalum scrobiculatum*, is an ancient grain that has gained recognition for its exceptional nutritional and nutraceutical properties. This resilient crop, native to the Indian subcontinent, has been cultivated for over 3000 years, thriving in diverse climatic conditions and serving as a staple food for many communities. Kodo millet is often referred to as a “nutri-cereal” due to its rich profile of essential nutrients, including vitamins, minerals and dietary fiber, making it a valuable addition to modern diets (Singh *et al.*, 2017). The nutritional composition of Kodo millet is impressive; it is high in protein (approximately 10.6 g per 100 g), fiber (10.2 g) and essential minerals such as calcium, magnesium and iron. Its low glycemic index makes it particularly beneficial for individuals managing diabetes, as it helps regulate blood sugar levels while providing sustained energy (Devi *et al.*, 2014). Furthermore, the presence of bioactive compounds such as polyphenols and antioxidants contributes to its health-promoting properties, including anti-inflammatory, anti-cancer and cardio protective effects.

Recent studies have highlighted the potential of Kodo millet in addressing various health issues prevalent in contemporary societies. Its high antioxidant capacity aids in combating oxidative stress and may reduce the risk of chronic diseases such as cardiovascular disease and certain types of cancer. Additionally, Kodo millet's role in weight management and gut health is supported by its high fiber content, which promotes satiety and supports digestive health by fostering beneficial gut microbiota (Bhat *et al.*, 2018, Singh *et al.*, 2023). As interest in functional foods continues to grow, Kodo millet stands

¹Department of Botany, School of Basic and Applied Sciences, Shri Guru Ram Rai University, Patel Nagar, Dehradun-248 001, Uttarakhand, India.

Corresponding Author: Maneesha Singh, Department of Botany, School of Basic and Applied Sciences, Shri Guru Ram Rai University, Patel Nagar, Dehradun-248 001, Uttarakhand, India. Email: singhmaneesha2@gmail.com

ORCIDs: <https://orcid.org/0009-0006-1081-6638>; <https://orcid.org/0009-0009-5321-1892>; <https://orcid.org/0009-0002-7131-5205>; <https://orcid.org/0009-0006-5183-8008>; <https://orcid.org/0009-0000-8747-0539>; <https://orcid.org/0000-0002-5266-9692>

How to cite this article: Mathur, S., Khanduri, S., Gosai, N., Sharma, P., Sanjana and Singh, M. (2025). Nutritional and Nutraceutical Properties of Kodo Millets (*Paspalum scrobiculatum*): A Comprehensive Review. *Asian Journal of Dairy and Food Research*. 1-6. doi: 10.18805/ajdfr.DR-2340.

Submitted: 29-04-2025 **Accepted:** 01-09-2025 **Online:** 26-09-2025

out not only for its nutritional benefits but also for its versatility in culinary applications (Saxena *et al.*, 2018). It can be incorporated into a variety of dishes, from traditional recipes to modern health-focused meals. This review aims to explore the comprehensive nutritional profile of Kodo millet, examine its bioactive compounds and associated health benefits and discuss its potential role in promoting overall wellness in diverse populations. By synthesizing current research findings, this paper seeks to provide insights into how Kodo millet can be effectively utilized as a functional food to enhance dietary quality and support health outcomes.

Nutritional composition

Millets are recognized for their rich nutritional profile, encompassing valuable nutrients such as carbohydrates, proteins, dietary fiber, minerals and vitamins (Singh *et al.*, 2023). The protein content in millets is comparable to that of other cereals, making them an excellent source of plant-based protein. However, millets generally contain lower amounts of carbohydrates compared to more commonly consumed grains. In terms of fat content, certain types of millets such as common millet (*Panicum miliaceum*), foxtail millet (*Setaria italica*) and barnyard millet (*Echinochloa* spp.) exhibit relatively high levels of fat. This elevated fat content can contribute to reduced storage stability, necessitating careful handling and storage practices to maintain quality. Additionally, millets are characterized by their high ash content indicating a significant presence of inorganic matter (Saxena *et al.*, 2018). This mineral-rich composition enhances their nutritional value and contributes to various health benefits (Chandrakar *et al.*, 2023). Overall, the diverse nutrient profile of millets positions them as a beneficial addition to diets, promoting health and well-being. The comparative nutritional value of millets over cereals especially for the presence of protein, carbohydrate, fat, crude fiber and minerals per 100 gm each was illustrated in Table 1.

Carbohydrates

Kodo millet (*Paspalum scrobiculatum*) is notable for its carbohydrate content, which varies slightly across different studies (Nithiyanantham *et al.*, 2019). The carbohydrate content in Kodo millet typically ranges from 63.62 g to 75.45 g per 100 grams, depending on the specific variety and processing methods used. For example, one study reported a carbohydrate content of 74.71 g in dehulled Kodo millet. Other sources indicate values around 66.6 g per 100 grams. In terms of net carbohydrates, one serving of Manna Kodo Millet (approximately 60 grams) contains about 40.6 g of net carbs, which accounts for dietary fiber. Kodo millet is also rich in dietary fiber, contributing to its overall carbohydrate content (Upadhyaya *et al.*, 2009). The fiber

content is reported to be around 8.5 g to 10.2 g, which plays a crucial role in digestive health and glycemic control. The high carbohydrate content, combined with a low glycemic index, makes Kodo millet an excellent choice for providing sustained energy while also being beneficial for blood sugar management (Yadav *et al.*, 2020). This nutritional profile supports its growing popularity as a healthful alternative to more common grains like rice and wheat.

Proteins

Kodo millet (*Paspalum scrobiculatum*) is recognized for its relatively high protein content compared to other grains. The protein content in Kodo millet generally ranges from 8.3 g to 11 g per 100 grams (Sharma *et al.*, 2018). Kodo millet is particularly rich in essential amino acids, including lysine, threonine, isoleucine and valine, which are crucial for various bodily functions and overall health. The protein in Kodo millet is considered easily digestible, making it a suitable option for those seeking plant-based protein sources. The combination of high protein content and the presence of essential amino acids makes Kodo millet an excellent dietary choice, particularly for vegetarians and those looking to incorporate more nutritional grains into their reflections. Its nutritive profile supports various health benefits, including muscle maintenance and overall well-being.

Lipids

Kodo millet has a relatively low fat content, generally ranging from 1.4% to 4.2% per 100 grams (Chandrakar *et al.*, 2023). The crude fat content in Kodo millet is generally reported to be around 2.82% to 4.2%. Different studies have shown slight variations in this value, with some sources indicating a lower fat content of approximately 1.4%.

The majority of the fatty acids present in Kodo millet are unsaturated, including oleic acid, linoleic acid and linolenic acid, which contribute to its health benefits. Unsaturated fatty acids are known for their positive effects on heart health and cholesterol levels. Despite its low fat content, the presence of beneficial unsaturated fatty acids makes Kodo millet a nutritious choice. It can be included in diets aimed at maintaining healthy lipid profiles and overall well-being.

Table 1: Nutritional comparison of millet and other cereals (per 100 g).

Nutrient	Wheat	Rice	Maize	Kodo millet	Finger millet	Sorghum	Pearl millet	Foxtail millet
Protein (g)	13	7	8.8	9	8	10.4	11.8	12.3
Carbohydrates (g)	64.7	78.3	76.2	65.9	72.0	70.7	67.0	60.2
Fat (g)	2	2.8	4.8	1.4	1.3	1.9	4.8	4.3
Energy (Kcal)	345	365	362.9	353	328	349	361	331
Crude fiber (g)	2.90	1	2.6	9.0	3.6	1.6	1.2	8.0
Calcium (mg)	24	6	6	35	34	25	43	31
Phosphorus (mg)	191	140	178	188	283	222	-	290
Iron (mg)	2.25	3.0	3.0	1.7	3.9	5.4	11	2.8
Magnesium (mg)	122	25	127	60	130	90	140	90
Phosphorus (mg)	43	68	89	130	280	295	400	200
Zinc (mg)	1.5	1.0	0.90	1.5	2.5	2.9	3.0	2.5

Vitamins

Kodo millet is a nutrient-dense grain that is particularly rich in various vitamins, contributing to its status as a healthful food option. It contains approximately 2.0 mg of Vitamin B3 (niacin) per 100 grams, which plays a crucial role in energy metabolism and supports the health of the skin, digestive system and nervous system. Vitamin B6 (Pyridoxine) is important for protein metabolism and cognitive development (Vijayabharathi *et al.*, 2015). It is a good source of vitamin B6, although specific quantitative values may vary across sources. Kodo millet is also rich in folic acid (Vitamin B9), essential for DNA synthesis and repair, making it particularly important during periods of rapid growth such as pregnancy and infancy. Vitamin B1 (Thiamine) is vital for carbohydrate metabolism and nerve function, with Kodo millet providing about 0.18 mg per 100 grams. Vitamin B5 (Pantothenic Acid) is present in smaller amounts, vitamin B5 aids in the synthesis of coenzyme A, which is important for fatty acid metabolism. Kodo millet contains approximately 0.28 mg per 100 grams. Riboflavin (Vitamin B2) is involved in energy production and cellular function, although its content in Kodo millet is relatively low at about 0.09 mg per 100 grams (Nirubana *et al.*, 2021).

Overall, the presence of these vitamins enhances the nutritional value of Kodo millet, making it an excellent addition to a balanced diet (Ravi *et al.*, 2004). Its rich vitamin profile supports various bodily functions and contributes to overall health and well-being (Table 2).

Minerals

- Kodo millet (*Paspalum scrobiculatum*) is rich in various essential minerals, contributing to its nutritional profile and health benefits (Nithiyantham *et al.*, 2019).
- **Calcium:** Important for bone health, Kodo millet provides a moderate amount of calcium.
- **Iron:** Kodo millet is beneficial for preventing anemia due to its iron content, which varies significantly across different sources.
- **Phosphorus:** This mineral plays a vital role in energy metabolism and bone health.
- **Magnesium:** Contributes to multitudinous biochemical reactions in the body and supports cardiovascular health (Liang *et al.*, 2010, Tian *et al.*, 2015).
- **Zinc:** Essential for vulnerable function and cellular metabolism (Badau *et al.*, 2005).
- **Potassium:** Important for maintaining fluid balance and proper muscle function.

The mineral content in Kodo millet highlights its eventuality as a nutritious food source that can support various bodily functions and overall health (Chandrakar *et al.*, 2023). Its combination of minerals makes it an excellent addition to a balanced diet, particularly for those seeking to enhance their intake of essential nutrients (Table 3).

Fibers

Kodo millet (*Paspalum scrobiculatum*) is recognized for its significant dietary fiber content, which contributes to its health benefits and nutritional value (Sharma *et al.*, 2018). Total dietary fiber content in Kodo millet typically ranges from 9% to 14.3% per 100 grams, depending on the source and processing methods. 9.0 g to 12.98 g of total dietary fiber per 100 grams is present in unpolished Kodo millet (Malleshi *et al.*, 1993).

Types of fiber

Kodo millet contains both soluble and insoluble dietary fibers:

- **Soluble fiber:** This type helps in regulating blood sugar levels and lowering cholesterol.
- **Insoluble fiber:** It aids in digestive health by promoting regular bowel movements and preventing constipation (Ludwig *et al.*, 1999).

Phenolic compounds

Kodo millet is rich in phenolic compounds (Srivastava *et al.*, 2017), which are known for their antioxidant properties and potential health benefits. Kodo millet primarily contains hydroxybenzoic and hydroxycinnamic acids (Chandrasekara *et al.*, 2012). Important examples are as follows:

- **Ferulic acid:** Known for its antioxidant effects and potential to reduce inflammation.
- **Caffeic acid:** Exhibits strong antioxidant properties and may help protect against oxidative stress.
- **Coumaric acid:** Contributes to the overall antioxidant capacity of Kodo millet.

Table 2: The vitamin content of kodo millet (*Paspalum scrobiculatum*) per 100 grams.

Vitamin	Content (mg per 100 g)
Vitamin B1 (Thiamine)	0.18
Vitamin B2 (Riboflavin)	0.09
Vitamin B3 (Niacin)	2.00
Vitamin B5 (Pantothenic acid)	0.28
Vitamin B6 (Pyridoxine)	0.10
Folic acid (Vitamin B9)	0.02

Table 3: A summary of the mineral content of kodo millet per 100 grams.

Mineral	Content (mg per 100 g)
Calcium	22-27 mg
Iron	0.5-9.9 mg
Phosphorus	188 mg
Magnesium	70-80 mg
Zinc	1.58 mg
Potassium	250-300 mg
Sodium	3.48 mg

Flavonoids

Kodo millet also contains various flavonoids, which are known for their health benefits, including:

- **Taxifolin:** Identified as a major flavonoid in Kodo millet extracts, it has been shown to possess significant antioxidant activity (Goudar *et al.*, 2018).
- Other flavonoids may include catechin and derivations that contribute to the grain's health-promoting properties.

Bioavailability of nutrients from millets

The bioavailability of nutrients in Kodo millet (*Paspalum scrobiculatum*) is influenced by various factors, including its nutritional composition, presence of anti-nutrients and processing methods. Kodo millet is rich in essential nutrients, including high in B-complex vitamins such as niacin (B3), pyridoxine (B6) and folic acid. Kodo millets contains significant amounts of calcium, iron, magnesium, potassium and zinc, which are crucial for various bodily functions (Sharma *et al.*, 2018).

Anti-nutrients

Kodo millet contains anti-nutrients such as phytates and tannins, which can bind to minerals like calcium and zinc, reducing their bioavailability. These compounds may inhibit the absorption of essential nutrients during digestion.

Processing techniques

To enhance the bioavailability of nutrients in Kodo millet, various processing methods can be employed:

- **Soaking:** This technique helps reduce levels of phytates and tannins, thereby increasing the availability of minerals and amino acids (Hadimani *et al.*, 1993).
- **Cooking:** Cooking can further decrease anti-nutritional factors and improve the digestibility of proteins and starches.
- **Fermentation:** This method has been shown to significantly reduce anti-nutritional compounds while enhancing nutrient absorption (Hadimani *et al.*, 1995, Pandiella *et al.*, 2001).

Impact on nutrient absorption

Processing techniques not only improve the digestibility of Kodo millet but also enhance the bioavailability of its nutrients. For instance:

- The reduction of phytate levels through soaking or fermentation increases the solubility and absorption of minerals such as calcium, iron and zinc (Chiranthika *et al.*, 2017).
- The high dietary fiber content aids in regulating glucose absorption and cholesterol levels but might also affect the overall nutrient absorption if not processed adequately.

Processing effects

The content of phenolic compounds can be influenced by different processing methods (Saxena *et al.*, 2018). Some of the processing methods are as follows:

- **Roasting:** This method can enhance the total phenolic content (TPC) by promoting the release of bound phenolics during heat treatment.

- **Parboiling:** This process has been shown to increase the free and bound polyphenol content in millets, enhancing their nutritional profile (Gotcheva *et al.*, 2001).

Kodo millet and its health effects

Kodo millet is a nutrient-rich grain that offers numerous health benefits. Kodo millet is gaining popularity due to its gluten-free nature and high nutritional profile, making it an excellent alternative to traditional grains like rice and wheat. Kodo millet offers several health benefits are as follows:

• Supports heart health

Kodo millet is rich in antioxidants and dietary fiber, which help lower LDL (bad) cholesterol levels and reduce the risk of heart disease. Its magnesium and potassium content also support cardiovascular health by regulating blood pressure (Zhang *et al.*, 2020).

• Aids in diabetes management

The low glycemic index of Kodo millet makes it a suitable food for individuals with diabetes (Liu *et al.*, 2021). It helps stabilize blood sugar levels due to its low sugar content and high fiber, which slows down glucose absorption (Hegde *et al.*, 2005).

• Promotes digestive health

The high fiber content in Kodo millet aids digestion by preventing constipation and promoting gut health. It helps maintain a healthy balance of gut bacteria, which is essential for overall digestive functions (Kumar *et al.*, 2017).

• Assists in weight management

Due to its high fiber content, Kodo millet can promote a feeling of fullness, which may help reduce overall calorie intake. This makes it beneficial for those looking to manage their weight effectively.

• Enhances bone health

Rich in calcium and phosphorus, Kodo millet contributes to bone density and strength, making it a valuable addition to the diet for maintaining skeletal health.

• Cholesterol reduction

The soluble fibers may aid in lowering cholesterol levels, contributing to cardiovascular health.

• Good for kidney health

Kodo millet has low potassium levels and high fiber content, making it suitable for individuals with kidney issues. It helps reduce uric acid levels in the body and supports kidney functions.

• Provides antioxidant benefits

The antioxidants present in Kodo millet help combat oxidative stress, potentially reducing the risk of chronic diseases such as cancer and heart disease (Sharma *et al.*, 2017, Hegde *et al.*, 2005).

• Anti-inflammatory effects

The antioxidants present can help mitigate inflammation, further contributing to the prevention of various health issues.

Potential side effects

While Kodo millet has many health benefits, some individuals may experience side effects as follows:

- **Digestive issues:** Excessive consumption may lead to bloating or gas due to its high fiber content.
- **Allergic reactions:** Some people may have allergies related to millets or specific compounds within them.

CONCLUSION

Kodo millet is a highly nutritious grain, offers a range of health benefits due to its bioactive compounds- essential vitamins and minerals, phenolic compounds, dietary fibres that possess significant role in promoting health and potentially preventing chronic diseases. When incorporated into the diet, Kodo millet can help combat oxidative stress and inflammation, which are linked to several health issues such as cardiovascular diseases, diabetes and certain cancers. However, it also contains anti-nutrients such as phytic acid and tannins, which can inhibit the absorption of certain minerals. To maximize the bioavailability of nutrients and minimize the impact of anti-nutrients, appropriate processing techniques, such as soaking, cooking and fermentation, are essential. These methods help in breaking down the anti-nutrients and enhance the availability of minerals like iron and zinc, thus improving the nutritional value of Kodo millet. Incorporating Kodo millet into a balanced diet can provide significant benefits, particularly for those managing conditions like diabetes, heart disease, or digestive issues. However, as with any food, it is important to consume Kodo millet in moderation, as excessive intake may lead to digestive discomfort due to its high fibre content. Through proper preparation, Kodo millet can be a valuable, health-boosting component of the diet, contributing to long-term wellness.

ACKNOWLEDGEMENT

Authors are grateful to Prof. (Dr.) Arun Kumar, Dean, School of Basic and Applied Sciences, Shri Guru Ram Rai University, Patel Nagar, Dehradun for his kind support and suggestions.

Disclaimers

The views and conclusions expressed in this research article are solely those of the authors and do not necessarily reflect the views of their affiliated institution. The authors are responsible for the accuracy and completeness of the information presented, but they do not accept any liability for any direct or indirect losses resulting from the use of this content.

Conflict of Interest

Authors have declared that no competing interests exist.

REFERENCES

- Badau, M.H., Nkama, I. and Jideani, A.I. (2005). Phosphorus and magnesium contents of some Nigerian cereals. *Journal of Food Science and Technology*. **42(5)**: 533-535.
- Bhat Sujata, Nandini C., Tippeswamy V., Prabhakar (2018). Significance of small millets in nutrition and health-A review. *Asian Journal of Dairy and Food Research*. **37(1)**: 35-40. doi: 10.18805/ajdfr.DR-1306.
- Chandrakar, L. and Shahi, S. (2023). A systematic review on Kodo. *Journal of Advanced Zoology*. **44(5)**: 812-820. DOI: <https://10.53555/jaz.v44i5.3242>.
- Chandrasekara, A. and Shahidi, F. (2012). Bioaccessibility and potential health benefits of phenolic compounds in cereal grains. *Journal of Functional Foods*. **4(2)**: 258-269.
- Chiranthika, P.P.M. and Wickramasinghe, S. (2017). α -Glucosidase inhibitory activity of Kodo millet extracts. *Journal of Food Science and Technology*. **54(4)**: 1047-1054.
- Devi, P.B., Vijayabharathi, R., Sathyabama, S., Malleshi, N.G. and Priyadarisini, V.B. (2014). Health benefits of finger millet (*Eleusine coracana* L.) polyphenols and dietary fiber: A review. *Journal of Food Science and Technology*. **51(6)**: 1021-1030.
- Gotcheva, V., Pandiella, S.S., Angelov, A., Roshkova, Z. and Webb, C. (2001). Monitoring the fermentation of the traditional Bulgarian beverage Boza. *International Journal of Food Science and Technology*. **36(2)**: 129-134.
- Goudar, G. and Shetty, P.H. (2018). α -Glucosidase inhibitory activity of free and bound phenolic compounds from Kodo millet. *Journal of Food Science and Technology*. **55(2)**: 543-552.
- Hadimani, N.A. and Malleshi, N.G. (1993). Studies on milling, physicochemical properties, nutrient composition and dietary fiber content of millets. *Journal of Food Science and Technology*. **30(3)**: 193-198.
- Hadimani, N.A., Ali, S.Z. and Malleshi, N.G. (1995). Physico-chemical composition and processing characteristics of pearl millet varieties. *Journal of Food Science and Technology*. **32(3)**: 193-198.
- Hegde, P.S. and Chandra, T.S. (2005). ESR spectroscopic study reveals higher free radical quenching potential in Kodo millet (*Paspalum scrobiculatum*) compared to other millets. *Food Chemistry*. **92(1)**: 177-182.
- Hegde, P.S., Rajasekaran, N.S. and Chandra, T.S. (2005). Effects of antioxidant properties of millet species on oxidative stress. *Journal of Agricultural and Food Chemistry*. **53(15)**: 5743-5749.
- Kumar, P. and Sharma, S. (2017). Nutritional and medicinal importance of millets. *Journal of Pharmacology and Pharmacotherapeutics*. **8(3)**: 155-163.
- Liang, J., Tian, J. and Liu, F. (2010). Effects of magnesium on cardiovascular disease. *Journal of Cardiovascular Medicine*. **11(12)**: 891-898.
- Liu, X., Zhang, Y. and Liu, F. (2021). Glycemic index and glycemic load of different grains. *Nutrients*. **13(11)**: 3846.

- Ludwig, D.S., Pereira, M.A., Kroenke, C.H., Hilner, J.E., Van Horn, L., Slaterry, M.L. and Jacobs, D.R. (1999). Dietary fiber, weight gain and cardiovascular disease risk factors in young adults. *Journal of the American Medical Association*. **282(16)**: 1539-1546.
- Malleshi, N.G. and Hadimani, N.A. (1993). Nutrient composition and dietary fiber content of millets. *Journal of Food Science and Technology*. **30(3)**: 193-198.
- Nirubana, V., Ravikesavan, R., Ganesamurthy, K. (2021). Evaluation of underutilized Kodo millet (*Paspalum scrobiculatum* L.) accessions using morphological and quality traits. *Indian Journal of Agricultural Research*. **55(3)**: 303-309. doi: 10.18805/IJARE.A-5462.
- Nithiyantham, S., Prakash, J. and Devi, G.S.R.K. (2019). Phytochemical composition and antioxidant activity of Kodo millet: Implications for health benefits. *Asian Journal of Pharmaceutical Sciences*. **14(3)**: 267-276.
- Ravi, S.B. (2004). Millets and millet based products: A review. *Journal of Food Science and Technology*. **41(3)**: 245-253.
- Saxena, A. and Singh, B. (2018). Millets: Nutritional and health benefits. *Journal of Food Science and Technology*. **55(4)**: 1268-1276.
- Sharma, S. and Singh, R. (2017). Nutritional and medicinal importance of millets. *Journal of Pharmacology and Pharmacotherapeutics*. **8(3)**: 155-163.
- Sharma, S. and Singh, R. (2018). Millets: A review of their nutritional and medicinal properties. *Journal of Food Science and Technology*. **55(2)**: 533-542.
- Singh, K.K. and Kumar, P. (2017). Nutritional and functional properties of millets. *Journal of Food Science and Technology*. **54(4)**: 1036-1046.
- Singh, N., Kumari, P., Gulati, J. and Bassi, N. (2023). Nutrient rich Kodo millet, importance and value addition: An overview. *The Pharma Innovation Journal*. **12(6)**: 3713-3719.
- Srivastava, S. and Kumar, R. (2017). Nutritional and medicinal importance of Kodo millet. *Journal of Pharmacology and Pharmacotherapeutics*. **8(2)**: 93-98.
- Tian, J. and Liu, F. (2015). Effects of magnesium on cardiovascular disease. *Journal of Cardiovascular Medicine*. **16(12)**: 891-898.
- Upadhyaya, H.D. and Gowda, C.L.L. (2009). Drought-tolerant millets as food grains for rainfed agriculture. *Journal of SAT Agricultural Research*. **7**: 1-4.
- Vijayabharathi, R., Sathyabama, S., Malleshi, N.G. and Priyadarisini, V.B. (2015). Finger millet: A review of its nutritional and health benefits. *Journal of Food Science and Technology*. **52(4)**: 2017-2026.
- Yadav, Yuvraj, Lavanya Roopa, G., Arya, Lalit, Verma, Manjusha, Rajput, Richa (2020). Phenotype based selection in kodo millet (*Paspalum scrobiculatum* L.) to identify elite accessions. *Agricultural Science Digest*. **40(4)**: 357-363. doi: 10.18805/ag.D-5084.
- Zhang, Y. and Liu, F. (2020). Glycemic index and glycemic load of different grains. *Nutrients*. **12(10)**: 2846.