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KODO MILLET-VALUE OF NUTRITION AND USE IN INDIAN DIETS

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ABSTRACT

One of the world's ancient grains, Kodo millet, derived from Africa is a drought-resistant crop that was cultivated in India only several thousand years ago. . In arid and semi-arid parts of the world, this millet crop is grown. Countries from Africa and Asia. In India, Kodo millet is mainly grown in the agriculture of the Deccan area reaches to the foothills of the Himalayas. Kodo millet is abundant in minerals such as iron, antioxidants, and dietary fiber. The phosphorus content of Kodo millet is higher than that of any given millet and its phosphate content the capacity for antioxidants is far higher than any other millet and important from cereals. The resource is influenced by processes such as parboiling and debranding Nonetheless, it slows anti-nutritional factors such as phytate. Many traditional Indian food products have been produced solely from Kodo to increase the nutritional factor or combined with other cereal and legume flours Price, palatability, and features.

Key words: Minerals, Fiber, Feed, Manufacturing, Food, Kodo millet, Product.

INTRODUCTION

cereal crops have led to the development of the growth of Since ages, the human races have played a crucial role in the daily diet of billions of people worldwide. Furthermore, The growth of the main cereal crops is declining **[1].** Because of climate change in recent years, crops Inability due to bad weather that causes floods and draughts Conditions, as a consequence of soil, lower productivity depletion of nutrients, spoiling of soil through chemical residues **[2].** This puts a burden on the agriculture and agricultural sector. Business of foods. Besides, the growing world population, The prices of foodstuffs and basic commodities, and other global socio-economic effects are challenging the Agriculture and the protection of food. Most of the symptoms can be felt by the people in arid and sub-arid regions who live, with restricted capital **[3].**

Food for Everybody, researchers working in the field, it is a great challenge. Manufacturing, storage, and food to tackle malnutrition and poverty. Millets are known as being ancient wheat, which was tamed thousands of years ago, The start of human society **[4]** there is, increasing nutritional and medicinal awareness, the advantages of millet grains that are underutilized, that have The rise of millet production has paved the way for It has been declining since the emphasis was mainly on Cereal crops like wheat and rice. the millets the most, draft-resistant crops, commonly cultivated in Africa, the key source of nutrition for people living in rural areas of the Indian Peninsula and other Asian countries is area.

Such millets are used as nutraceuticals, such as they are rich in antioxidants that are far stronger than those of the large cereal crops. Allegedly, they are useful in Asthma management, migraine, blood pressure, diabetic patients, Atherosclerosis, heart disease, and heart attacks **[5].**

The High Up In millets, the fiber content prevents the development of gall stones. The entire intake of grain is health-promoting, Impact, such as insulin resistance prevention, heart disease, ischemic stroke, diabetes, obesity, breast cancer, asthma in infancy, and early death **[6].** Due to these advantages, It is possible to use millet in functional foods and as Great medicinal goods.

Hence, they are often referred to as Nutricereals'. Furthermore, due to their considerable significance, contributions to food security and future food security contributions Health benefits of battling multiple diseases **[7]**, The grains of millet are now Expecting to receive growing interest from processors of food, And nutritionists, and technologists. Once a poor man's own, staple, now adorn the plates of wealthy and wellness Aware persons. One of the ancient millet grains of this type is Kodo millet, a tropical native of Africa is believed to be Domesticated 3000 years ago in India k **[8].** Kodo (Paspalum) millet Scrobiculatum), is also referred to as rice grass, cow grass, Native Paspalum, ditch millet, or Indian crown grass. They are cultivated in Asia, Pakistan, Indonesia, the Philippines, Thailand, Vietnam, and West Africa. It is a big food that is Source of some regions of the Deccan Plateau of India (Gujarat, Karnataka, and parts of Tamil Nadu) Odisha, Uttar, Pradesh, and the Himalayas, and historically eaten as heath and vitality foods in rural India **[9].**Tamil Nadu and Madhya Pradesh have the Absolute share in the manufacture and promotion of Millet Kodo. The MP government also plays an active role in the Role in supporting this cultivation and marketing seed **[10].**The genus Paspalum has over 400 species, Typically an annual crop, but several cultivars root at After the mature plant, the nodes and culms grow flowers and matured their inflorescence. Any of the ones In nature, organisms are perineal **[11].** This crop is tolerant of drought and is typically grown in With no intercultural activities in semi-arid areas. Kodo is a monocot and the seeds are tiny and very thin. Ellipsoidal, with a width and width of approximately 1.5 mm 2 mm in length; they differ from being light in color; From brown to dark grey. Kodo millet has a shallow root, A method that may be suitable for intercropping, about the grain, Strong, corneous, permanent husks are enclosed in (FAO, In 1995) **[20].**

Kodo-The Poisoning:

Kodo grain is often described as toxic to Bovines and humans. The toxicity of the grain is Mushroom-associated. Fungal illnesses Nervousness caused by Paspalum ergot, loss of muscle Coordination, astonishing gait, depression, and spasms in severe situations, animals cause death. In humans, Kodo-poisoning induces vomiting, nausea, delirium, Anxiety, overdose, and unconsciousness.

A poisonous compound, cyclopiazonic acid, the existence of which is Kodo millet is known to cause 'Kodo a poisoning' and be developed by Aspergillus flavus, A. Tamarii and Tamarii Phomopsis **[12].**

Nutritional data:

Kodo millet is a nutritious and a strong grain a supplement for rice or wheat. The structure of nutrition Table 1 displays different cereal crops. The quality of protein, fiber, and minerals is much higher than The key cereals, such as corn **[13].** The grain for Kodo millet is They consist of 8% protein. The main fraction of proteins in Glutelin is Kodo-millet (Sudharshana et al., 1988). Kodo millet (9 percent) is an excellent source of fiber, as opposed to rice (0.2%), and wheat (1.2%). Includes Kodo millet Per 100 g of grain, 66.6 g of carbohydrates, and 353 kcal, Identical to other millets **[14].** It also includes 1.4% fat Minerals and 2.6 percent. Content of iron in Kodo millet The range is between 25.86ppm and 39.60ppm **[15],** It has the lowest amount of millet among millets, the quality of phosphorous. Hegde and Chandra Kodo millet was found to have strong DPPH quenching Power, as only 18.5µl was required for 50 percent quenching Vitamin C and 0.3488 as opposed to 0.946µmol / ml Vitamin E µmol / ml to achieve the same (50 percent DPPH) Extinguishing). The gelatinization of Kodo millet flour is 13 ° C (76.6-90 ° C) temperature range, which has less Gelatinization-resistant **[16]** and may Breaking of bread and cakes, extrusion of bread and cakes, extrusion of Items based on cereals, gravy, broth, heat-set gel, Porridge, instant powders, modified flour and modified flour Starches with food specialties. As with other grains of rice, The nutritional value of Kodo millet protein likely is Enhanced by legume dietary protein**[17].**

Nutritional Effect of Production Kodo Millet's Consistency: Aside from being an abundant nutritional source, High amounts of polyphenols are also present in Kodo millets, Tannins, phosphorous and phytic acids, antioxidants, Such anti-nutrients build complexes with Micronutrients like iron, zinc, and calcium, and Their absorption and solubility are reduced. Even the tannin The use of proteins and proteins adversely affects By forming a complex, carbohydrates, thus resulting in complexes Reduced development, efficiency in feeding, metabolizable Power of amino acids, and their bioavailability **[18].**

Classic innovations, For example, decortication, soaking, germination, and Fermentation of foods dependent on cereals decrease levels of Increase in the bioavailability of amino tannins and phytates Acids and mineral components and proteins and protein enhancement Digestibility from starch. Dehulling is capable of extracting 40 to 50 Percentage of phytate as well as of total phosphorus. Balasubramanian stressed the significance of Dehulling as millet grains until consumption The phytate content ranged from popular millet varieties 170 to 470 mg of whole grain per 100 g, and Dehulling contributes to a phytate reduction of 27 to 53 percent About material Phytin phosphate decreases by dehulling, by 25 percent in millet Kodo. (1981) by Chandrasekher et al. Millet varieties that have been tested for inhibitory activity against Human salivary amylase and Kodo millet observation There was no detectable behavior of the strains. The antioxidant operation, on the other side, Once the whole grain is cut, Kodo millets decrease Dehulled and prepared. A research by Chandrasekara et al. (2012) **[19]** notes that the antioxidant function of the entire kodo function is In the case of a dehulled one, it dropped from 32.4 to 6.86, While the dehulled boiled Kodo millet consists of just 6.06, The bran also contains approximately 112 (µmol of ferulic acid). Defatted meal equiv / g). These results have been Verified by Annor et al. (2013**)[22]**, who justified The use of whole grains for the production of food products. Their research showed that the anticipated glycemic index (eGI) is lower for the whole Kodo starch than for rice. Besides, the entire kodo grain has lower levels of digestibility of starch and eGI relative to dehulled starch with seeds. In their study, Amadou et al . (2013)**[23]** Stressed the value of millets in the provision of millets Sulphur with essential amino acids such as Methionine and cysteine, germ depletion, bran and other minerals-containing antioxidants on debranning.

Application:

It is possible to use Kodo millets for conventional as well as traditional Like novel foods. Grain that is unprocessed or processed may be Cooked whole or decorated, and ground, if possible, By conventional or industrial processes, for flour. In India, the Kodo millet is ground into flour and is used for the production of Only pudding. In tribal sectors, it is cooked as rice even and The tribal community prepares various recipes out of flour. It is prepared like rice in Africa. It is a good choice as well **[18].**

Animal feed for beef, goats, pigs , sheep, and poultry From chickens. The P. scrobiculatum variety is present in Hawaii. To develop well on the slopes of hills in which other grasses do Don't thrive. It has the ability to be cultivated as a food. The root of hillside farming. It may also have the ability to To avoid soil from being used as grass ties on hillside parcels, Erosion, though also offering food for starvation as a A secondary purpose **[10].** It was observed that it makes a Excellent cover crop. Although it's not a big one, Source of carbohydrates in European countries; but it does As a gluten-free food, it is gaining popularity and is a A part of gluten-free multigrain food products **[2].**

You should cook leavened bread with gluten. Kodo flour with hydrocolloids added to it, which Imitate the features of gluten **[25],** Biscuit made by adding the introduction of The protein was increased by soy flour and 70% kodo flour The biscuit's content **[24]**. Biscuit prepared by Vijayakumar and Mohankumar (2009) **[26]** Composite flour (kodo, barnyard millet, whole flour, whole millet) Fatty wheat flour and soy flour).

Kodo millet flour was used by Ramya (2010) **[27]** to prepare Using butter biscuit, sponge cake and Ajwain biscuit Wheat flour and kodo.

CONCLUSION

While nutrient-rich and traditionally , taken as a staple of the poor guy. Millets are winning again their foothold in the diet of India. Though some of the nutritional structure references for various compositions where are millets and many traditional recipes available, Through study, prepared from this nutria-cereal, is with respect to their bio-availability and reduction of bio-availability, Anti-nutritional forces. It is important to educate farmers Against kodo-poisoning, to ensure adequate precautionary measures Measures for production in wide areas can be taken, Small pockets instead. Additionally, mechanisation in the planting, harvesting and processing needs of the region being to be given up.

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