





## Kodo millet: Resistant and nutrient-rich crop to enhance food security and diet diversity in India

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Kodo millet (Paspalum scrobiculatum) is a small, seeded cereal grain and is among one of the oldest cultivated crops in India. In recent years, kodo millet-in addition to other species of small millet-have seen a sharp decline in production area mainly due to the promotion of other staple cereals (mainly rice and wheat). Millets have been neglected from research and development, and now consequently lack the production advantages of rice and wheat, such as availability of improved varieties and intensified cultivation practices to maximize yields. Due to its rich nutrient profile, low input requirements, and adaptability to marginal soils and various climatic conditions, kodo millet has received renewed research interest as a method of risk management and adaptation to climate change for farmers.

## **General features**

Kodo millet is a monsoon or "kharif" crop, with sowing occurring in early June. It has a relatively short growth period, ranging from 120-180 days. Because of its shorter growing time, kodo millet can be planted later in the season and still be harvested in the fall. Millets, including kodo millet, are commonly intercropped and have an important role as a contingency crop in areas experiencing water stress. Because kodo millet requires few inputs, they serve as a low-risk option for increasing production and minimizing yield losses due to adverse weather conditions or pests and diseases. While kodo millet is typically more resistant to pests and diseases, it is still particularly susceptible to shootfly. Various methods have been used by

farmers to prevent shootfly, including early planting, lower planting densities, and intercropping that show some success. Among the small millets, kodo millet is known for having the highest productivity per unit area, with yields varying from 250-1000 kg/ ha, and a potential yield of 2000 kg/ha. Another advantage of kodo millet is its ability to be stored for long periods of time, serving as an important means of household food security and diet diversity during lean seasons and periods of food shortage.

## **Nutrition**

Similar to other small millets, kodo millet is a good source of phosphorus and iron. They are nutritionally comparable to rice, wheat, and other staple cereals, and even offer higher protein content and sulfur-containing amino acids Cysteine and Methionine. Kodo



millet is particularly high in B vitamins, especially niacin, pyridoxine, and folic acid, in addition to minerals such as calcium, iron, potassium, magnesium, and zinc. Depsite its many positive nutrient values kodo millet also contains polyphenols, tannins, and phytic acids—antinutrients which form complexes with nutrients such as carbohydrates, proteins, iron, calcium, and zinc and reduce their bioavailability. Processing of kodo millet typically reduces the levels of tannins and phytates and increases the bioavailability of nutrients. For example, dehulling kodo millet can remove 40-50% of phytate.

## Processing

Typically, women are responsible for harvesting and processing millets, which begins with threshing the grain with their feet. Millets are dehusked before cooking, which is done traditionally with a mortar and pestle . Improvements in mechanical grainprocessing technology are needed to reduce the amount of time and energy women spend on manual processing. Because kodo millet has several layers of hard seed coats, this process proves to be quite tedious and time-consuming. Kodo millet may then be further processed to produce flour, or may be cooked like rice.

Kodo millet is used to make several traditional foods. The most common examples of this are *roti* and *mudde*. Because millet protein lacks gluten, in order to prepare roti, millet flour must be mixed with hot water to gelatinize the starch. To prepare mudde with kodo millet flour, the dough is steamed and then made into balls. Kodo millet may furthermore be used as a substitute for rice when preparing dishes such as idli and dosa. This is done by mixing kodo millet and black gram in a 3:1 ratio, followed by wetting, grinding, and fermenting overnight. Kodo millet may also be used to prepare ready-to-eat snack foods, prepared by popping or puffing.



Kodo Millet Pulao

Ingredients 1 cup kodo millet 1/4 cup onion, chopped 1/2 cup vegetables 3 green chillies 1 tsp ginger garlic paste 2 bay leaves 1 cinnamon stick 2 cloves 2 cardamom pods Oil, salt to taste 2 tbsp coriander leaves, chopped Preparation Wash and soak the kodo millet for 15 minutes. In a sauce pan, heat oil with bay leaf, cardamom, cinnamon stick and cloves. Add onion and sauté them till translucent, then add ginger garlic paste and sauté them well. Add green chilies, chopped vegetables and salt and sauté them well. Drain the water from the millet

and add them to the vegetables and sauté them. Transfer the mixture to a rice cooker, add 2 cups of water and cook them. Add hereafter a coriander and serve hot with raita.





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