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Short Communication

Under-utilized crops of Uttarakhand Hills, India.

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Introduction

Uttarakhand known as **Devbhumi** which means "land of god". Due to its religious significance and numerous Hindu temples and pilgrimage centers found in the state. Uttarakhand is known for the natural environment. The state is divided into two divisions, Garhwal and Kumaon with a total of 13 districts. Out of 13 districts, Udham Singh Nagar is famous for its agriculture and irrigation. It has good soil fertility and high yielding crops that helped farmers earn profit. Soil is alluvial in nature, low to medium in Phosphorus, medium to high in potassium, and high in organic matter. Underutilized crops (also called neglected, minor, orphan, promising, or little-used) are mostly wild or semi-domesticated species adapted to local environments. These crops were used as traditional foods for centuries but became increasingly neglected when more productive crops became available in farming systems. Underutilized crops are considered as poor people food.

Importance

- They are adapted to marginal soil and climatic condition.
- Highly Nutritious food.
- Environmental friendly.
- Value addition.
- Improving nutrition.
- Ensuring food security.
- New market opportunity.
- Low agricultural inputs.
- Income generation.

Table 1. Production of underutilized crops of Uttarakhand

Crops	Local names	Area (ha)	Production (mt)	Productivity q/ha)
Finger millet	Maduva	128070	170484	13.312
Barnyard millet	Sava	68056	88056	12.939
Black soyabean	Bhatt	5548	4981	8.978
Amaranthus	Ramdana	6072	2939	4.840
Horse gram	Gohat	12782	10449	8.175

1. Finger millet (*Eleusine coracana*)

Among minor millet, finger millet ranks first in importance in India. *Eleusine* means "Goddess of cereals". The English name Finger millet is derived from finger. Like the structure of the panicle. It is known as, *Mandua* in Uttarakhand. It is known as staple food crops of Uttarakhand hilly region. It is a tetraploid crop ($2n=4x=36$). Finger millet contains more fibre, minerals, and vitamins which are normally deficient in Indian diet.



Uses

- Finger Millet has been used in preparation of traditional foods in India and Africa. It forms the staple diet in many rural and urban households.
- It is highly used as traditional foods,
- Finger millet malt used as fodder, Flakes, popping, Baking, starch Production natural food colour.

2-Barnyard Millet (*Echinochloa esculent*)



Barnyard millet plant is a tall, robust annual and grow upto 90-220 cm high leaf blades flat, wide, ligules absent. The inflorescence in panicle 10-25cm long with dense racemes of awnless 3-4 mm long spikelets, Uttarakhand is major producer of Barnyard millets and Occupies 74,000ha area with and average productivity of 87,000 tones.

Uses

- Barnyard grains are cooked and consumed like rice and also used in preparation of porridge (*kheer*).Barnyard porridge is famous dish of Uttarakhand.
- Barnyard leaves are broad and picks up growth in short time thus produce voluminous fodder. Barnyard fodder is highly palatable and can used in making hay and silage

3-Black Soyabean (*Glycine max*)



Black soyabean is a traditional variety of soyabean (Hybrid crop) is grown in hills of uttarakhand. In the Kumaon region, the black bean is an important crop because of its high nutritional and medicinal value. The seeds are a rich source of vegetable protein and oil.

Uses

- Helps in strengthen bones.
- contain quercetin and saponins which can protect the heart.
- black beans contain around 114 kilocalories per half cup.

4- Amaranthus (*Amaranthus viridis*)



Amaranthus is an erect annual fast growing plant having broad leaves with inflorescence and foliage ranging from purple and red gold that produce very small, round seeds of varying colours and luster. Amaranth has potential to improve nutrition, boost food security, foster rural development and support sustainable land care. Amaranth protein has nearly twice the lysine content than that of wheat protein and thrice that of maize.

Uses

- Amaranthus is a multi-purpose crop with uses as food, fodder, medicine and industrial oil.

5-Horse Gram (*Macrotyloma Uniflora*)



It is a perennial climbing plant with a rhizome, growing to a height of about 60 cm (24 in). The stem sprouts from the rhizome each year. Horse gram thrives where the temperature is in the range 20 to 30 °C (68 to 86 °F) but is killed by frost. It is a drought tolerant crop and is mostly grown in areas with under 900 mm of precipitation.

Uses

- The horse gram vine grows very fast, and becomes quite thick and dense in a short period of time, thus preventing soil erosion. Horse gram is a valuable plant on sloping land with poor mineral content.
- Horse gram is remarkably tough and drought-resistant. It is capable of withstanding extended periods of drought with minimal work on the cultivator's part. On dry lands with little access to technology or irrigation, horse gram is often the preferred crop. It is also grown in low fertility regions where other crop species may have failed.
- Horse gram also provides animals with high quality forage. Its stalks and stems, which hold 30-40% of its nutrients, are widely used as animal feed. Kollu does not let any opportunity go waste

Conclusion

Under-utilized crops are being cultivated and utilized by the native people of Uttarakhand region. They are instrumental in providing food and nutritional cover to the people living in hilly areas but the yields are low. Therefore, an improvement in their productivity and post-harvest management can go a long way in improving the status of food and nutritional security of people living in hilly areas. Majority of under-utilized crops have great potential for food and industrial uses. There seems enough scope for the development of value added products from that under-utilized crops. For increasing demand of under-utilized crops in near future there is need to create awareness among urban people regarding nutritive values of under-utilized crops and need to create remunerative market for it.

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