

Market and Biodiversity Survey on Various Species of Fabaceae Family in Dhubri District of Assam

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Review Article

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ABSTRACT

Various species of Fabaceae family are well known for their food value in the form of popular vegetable and also as a source of traditional ethnomedicine. A total of 17 available edible species of Fabaceae family viz., Phaseolus vulgaris (common name: Bush bean), Vigna unguiculata spp. Sesquipedalis, Vigna unguiculata spp. Sesquipedalis, Vigna sinensis/Vigna unguiculata spp. Sesquipedalis, Dolichos bengalensis, Lablab purpureus, Lablab niger, Lablab vulgaris, Phaseolus limensis, Phaseolus lunatus, Phaseolus coccineus, Vigna umbellata, Canavalia enformis, Dolichos pruriens, Dolichos biflorus, Dolichos aciphyllus, and Dolichos lablab were explored in Dhubri district of Assam. These species show excellent market potential in the form of nutrient rich vegetable and also as a source of traditional medicine. Moreover, availability of such biodiversity of fabaceae family in this region is studied for the first time.

INTRODUCTION

Fabaceae family consists of 730 genera and more than nineteen thousand species has a worldwide distribution and are of great importance in terms of food and nutraceutical value. Species of Fabaceae family are leguminous in nature and are consumed by people all across the globe and were amongst the first plants to have been domesticated by mankind [1]. The beans of Fabaceae family are rich in various essential nutrients such as protein as high as 40% of their dry weight, carbohydrate, minerals etc. at different concentration depending on the species. Apart from their nutritional value, they are also known for their ethno medicinal use majorly as a traditional medicinal source for the treatment of diabetes in India. In the year 2017, India was the largest producer of legumes in the world with a huge contribution of 23% of total legume produced worldwide. Considering the market potential legumes in the country and worldwide, it is important to characterize the genetic resources and the market value of various species under fabaceae family by morphological and agronomic traits for further improvement of traits by breeding.

Assam, located in the Northeastern part of India is blessed with fertile soil and good climatic condition which favours large scale production of various species of rice and leguminous crops. Even though their nutritional and

medicinal values are well documented but no systematic market survey on various species of Fabaceae family available in the region is not yet available. On the other hand, agriculture is the major source of income in Dhubri district of Assam which produces the highest amount of pulses in the state (District wise area, production and average yield of total rabi pulses, Govt. of Assam). According to the last latest agricultural census of Assam carried out during 2015-16 shows the production of 7160 tonnes of pulse in Dhubri district with an average yield of 779 tonnes/hect of cultivated area (District wise area, production and average yield of total rabi pulses, Govt. of Assam) [2]. Hence the current study focuses on the survey on the availability of various species under Fabaceae family in Dhubri district of Assam. It may be worth to mention that Northeastern region of India is considered as one of the biodiversity hotspots in the world and is a treasure trove of various flora and fauna diversity which are yet to explore.

LITERATURE REVIEW

Local market survey was also conducted in 200 local shops distributed all across of Dhubri district during the month of January-February and November-December to get a holistic idea on the market scenario. Some of the popular locally grown beans of Fabaceae family were collected during the survey in suitable agricultural sites. The sample collection sites are shown in map and the GPS locations. The taxonomic identification was done in consultation with departmental plant taxonomists of Assam down Town University, Guwahatai, India.

Survey on the availability of species under Fabaceae family shows the availability of 17 species in the region under study. The prevalence of the following species of Fabaceae family was studied viz., *Phaseolus vulgaris* (common name: Bush bean), *Vigna unguiculata* spp. *Sesquipedalis* (common name: Snake bean), *Vigna unguiculata* spp. *Sesquipedalis* (common name: Red noodle bean), *Vigna sinensis/Vigna unguiculata* spp. *Sesquipedalis* (common name: Asperagus bean), *Dolichos bengalensis* (common name: Dolichos bean), *Lablab purpureus* (common name: Hyacinth bean), *Lablab niger* (common name: Small white bean), *Lablab vulgaris* (common name: Purple bean), *Phaseolus limensis* (Butter bean), *Phaseolus lunatus* (common name: Lima bean), *Phaseolus coccineus* (common name: Runner bean), *Vigna umbelleta* (common name: Rice bean), *Canavalia enformis* (common name: Jeck bean), *Dolichos pruriens* (common name: Velvet bean), *Dolichos biflorus* (Horse tail bean), *Dolichos aciphyllus* (common name: Seim bean), and *Dolichos lablab* (common name: Papdi bean). Some of the most commonly found species of Fabaceae family in Dhubri district. Such evidences on availability of 17 species of Fabaceae family in the region were not documented before. Hence such information may be considered as significant from biodiversity perspective [3]. The fruit colour varies from deep green to light green, white, and pink to purple from species to species. The details of available species of Fabaceae family in Dhubri district along with their fruit dimension, fruit, seed and flower colour are listed. Out of these 17 species, the fruit colour of seven species viz., *Phaseolus vulgaris*, *Vigna unguiculata* spp. *Sesquipedalis*, *Vigna sinensis/Vigna unguiculata* spp. *Sesquipedalis*, *Dolichos bengalensis*, *Lablab purpureus*, *Phaseolus lunatus*, *Phaseolus coccineus*, *Vigna umbelleta*, *Dolichos biflorus* and *Dolichos lablab* was found green. Rest of them were found to have purple coloured fruits (viz., *Vigna unguiculata* spp. *Sesquipedalis*, *Lablab vulgaris*, *Canavalia enformis*, *Dolichos pruriens*, and *Dolichos aciphyllus*) except *Phaseolus limensis* and *Lablab niger* with pale white coloured fruits. The highest fruit length was observed in *Vigna unguiculata* spp. *Sesquipedalis* (25.94 ± 0.66 cm) followed by *Vigna sinensis/Vigna unguiculata* spp. (23.77 ± 0.53 cm) and *Vigna unguiculata* spp. *Sesquipedalis* (23.24 ± 0.71 cm).

DISCUSSION

A small scale market survey indicates *Phaseolus purpureus* with highest per kg cost during November-December followed by *Dolichos bengalensis* and *Vigna unguiculata* ssp. *sesquipedalis* which may be due to the demand versus supply in spite of their fruiting season. Rest other species have similar rates in local market which may be due to their large scale availability in the market as popular vegetable option.

Planning and attention are the keys for successful marketing of local bean crops. However, proper irrigation, implementing modern scientific agricultural techniques in harvesting, commercially appealing scientific packaging, refrigerated transportation, cold storage and compliance with health and safety regulations etc. may increase the demand of such varieties not only locally but also globally [4]. Global export may also be enhanced by involving local farmers with modern startups and self-help groups who can promote the products through e-commerce platforms.

Various species of Fabaceae family are well known for their phytochemical values and are used in Ayurvedic research in India since long. In traditional medicine, they are used to maintain healthy stomach by destroying the

worms in it. Species of fabaceae family are also known to have antimicrobial activities against both gram positive bacterial pathogens such as *Bacillus cereus*, *Bacillus subtilis*, *Bacillus megaterium*, *Corynebacterium rubrum*, etc. and also against gram negative pathogens such as *Pseudomonas aeruginosa*, *Pseudomonas stutzeri*, *Pseudomonas pictoruium*, *Klebsiella aerogenes* etc. It may also be noted that various species of fabaceae family not only shows antibacterial activities but also inhibits the growth of fungal pathogens such as *Candida albicans*, *Aspergillus fumigates*, *Aspergillus niger* [5]. They have also been used for treating jaundice, menstrual disorder, epilepsy etc. in Ayurveda and traditional medication. Besides their enormous medicinal value in traditional medicine, they are also rich in protein, vitamin A, thiamin, potassium, phosphorus, iron, etc. Not only the fruiting part, which is popularly used as vegetable but also the flowers are used for making powder and to bake. Even the leaves are also used as home remedy for the treatment of allergy, ringworm and skin rashes etc. Hence, study on the biodiversity of Fabaceae family in the region and also the market value analysis advocates the scope for upliftment in their marketing strategy and awareness among farmers.

CONCLUSION

The current study surveys the availability of 17 species of Fabaceae family in various regions of Dhubri district of Assam for the first time. These species are well known for their nutritional values in the form of popular vegetable in the region and the local market survey also demonstrates their export potential in near future which may be achieved with modern agricultural methods, generating awareness among local farmers, and also with the help of e-commerce platforms.

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