

## **Sohphlang—a potential indigenous leguminous tuber crop of Meghalaya**

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### **ABSTRACT**

*Flemingia vestita* locally called as 'Soh-phlang' belongs to the family Fabaceae. It is an underutilized minor tuber crop domesticated in Indian subcontinent and restricted to its cultivation in Khasi and Jaintia Hills of Meghalaya, Northeast India. Being a leguminous crop, it is known to improve soil quality. The edible tuberous roots are consumed after peeling off the outer yellowish skin and have been an indigenous vermifuge drug among the Khasi and Jaintia tribals. The crop is also known to possess high market value, i.e., Rs. 100-300 per Kg in the local markets. This leguminous tuber crops can serve as a key to future food and nutritional security for small and marginal farmers of Meghalaya.

**Keywords:** *sohphlang*, tuber, legume, indigenous

### **INTRODUCTION**

Meghalaya is a fascinating state, situated in the North- Eastern region of India and endowed with a rich biodiversity of tuber crops, both wild and cultivated. "*Sohphlang*" botanically known as *Flemingia vestita* (synonyms *Flemingia procumbens* Roxb.; *Moghania vestita* (Benth.) ex Baker Kuntze; *Moghania procumbens* (Roxb.) Mukerjee) is one of the unique tuber crops found in Meghalaya. It is a small trailing legume with crisp, white edible root tubers, which are usually eaten raw and have a nutty flavour. Although, the tuber is rich in phosphorus and protein, this pale white shapeless tuber crop is not very attractive to look at, however it is regarded as a powerhouse of medicinal and nutritional value. It is also a rich source of bioactive isoflavones such as genistein, daidzein, formononetin and pseudobaptigenin (Rao and Reddy, 1991). It is further reported that, consumption of *Sohphlang* helps in getting rid of soft-bodied intestinal worms. In Meghalaya it is usually consumed raw with powdered perilla (*Nei lieh* in khasi) after peeling the outer skin. While the plant can be found growing in the wild, its recent demand has turned it into a profitable cash crop for the small and marginal farmers of Meghalaya. Being a legume crop, its might also has the property of nitrogen fixation. It has been reported that mixed cropping with *Flemingia vestita* gave better economic returns, which was mainly due to improved soil fertility with a net gain

in nitrogen up to 250 kg/ha/year (Gangwar and Ramkrishnan, 1989). In spite of huge prospects, its full potential is yet to be realized amongst the farming community. The present article will provide an insight into the nutritional value and cultural practices for the cultivation of this crop. This information will pave the ways for prospecting this underutilized leguminous tuber crop towards its commercial and nutritional potential.

### **BOTANY**

*Sohphlang* is a perennial herb, having a prostrate but weak stem, measuring about 60 cm. It is highly branched with hirsute stems and tuberous roots. Leaves are pinnately compound with obovate-cuneate leaflets; 3-foliolate; and also pubescent like the stem. Lateral leaflets are obliquely elliptic and slightly smaller. Inflorescence is a raceme either axillary or terminal, about 2–10 cm and densely pubescent; bracts lanceolate. Calyx is 5-lobed; lobes are linear-lanceolate, lower one is longest, longer than the tube. Corolla is slightly longer than calyx and elliptical. Fruits are hairy sub-cylindrical pods. Seed is globose, brown or black in colour. Flowers are bright-red. Flowering usually occurs after the monsoon season, August and September, sometime in the autumn, which suggests that day length sensitivity could be an issue if seed production is required (Chaudhri, 2005; Ren and Gilbert, 2010).



**Fig. 1** *Sohphlang* plants

### **CHEMICAL CONSTITUENTS**

The tuber of sohphlang has been an indigenous vermifuge drug among the tribal populace of Meghalaya. The raw tuber is directly consumed for the treatment of soft-bodied intestinal worms (Hrckova and Velebny, 2013). Experimental investigation started in 1996 when the in-vitro activity of tuber peel extract was tested against different helminth parasites, including the nematodes such as *Ascaris suum*, *Ascaris lumbricoides*, *Ascaris diagalli*, *Heterakis gallinarum*, a cestode *Raillietina echinobothrida* and trematodes such as *Paramphi stomum* sp.,

(Tandon *et al.*, 1997) *Artyfechinostomum sufrartyfex* and *Fasciolopsis buski* (Roy and Tandon, 1996). Result suggested the vermifugal activity of this plant extract against trematodes and cestodes. Isoflavone and genistein extracted from tuber are the major anti-helminthic principle, highly potent against trematodes and cestodes (Rao and Reddy, 1991). This compound were also found to be effective against the sheep liver fluke *Fasciola hepatica* (Toner *et al.*, 2008) and human tapeworms such as *Echinococcus multilocularis* and *E. granulosus metacestodes* (Naguleswaran *et al.*, 2006).



**Fig. 2:** *Sohphlang* tuber

## USES

Raw *Sohphlang* is eaten raw with salt, powdered perilla (*nei lieh*) and chilli. The best way to enjoy sohphlang is with *nei lieh* that has been roasted and ground to a fine paste.

## DISTRIBUTION AND GENETIC RESOURCES

This leguminous tuber crop is grown in the wild along the mountain slopes of Himalayas. It is found in some part of China, Nepal, Khasi Hills and Jaintia Hills districts of Meghalaya. It is also sparsely found in Laos, Philippines and Vietnam. However, it is commercially cultivated only in Meghalaya (Van and Bunyaphratsara, 2001; National Research Council, 2002).

Specific varieties are not known in *sohphlang* however, there is a wide variation in tubers with respect to shape, size and weight. Authors conducted survey during 2016-17 in different parts of Meghalaya and found that a vast variability exists among *sohphlang* genotypes. Tubers are found to be cylindrical, fusiform, napiform, round and oval in shape with varying size; 2.5-8.6 cm in length, 1.5-3.0 cm in width and 5-40 g in weight.

## CULTURAL PRACTICES

*Sohphlang* is generally propagated vegetatively through small tubers. After harvesting, the healthy tubers are selected as seed and stored underground for the next planting season. It is interesting to note that *sohphlang* is planted in a virgin soil for one year, after that the place is left fallow or cultivation of another crops for five or more years before replanting of sohphlang. In Meghalaya, *sohphlang* is planted on bund at 30-45 cm plant to plant and 30-45 cm between the lines and covered with soil using a ridger during March-April. Earthing-up and weeding are done as soon as weeds emerge, but preferably when plants attain a height of about 8-10cm during June-July.

The crop takes 7 months to come to maturity. Usually sohphlang comes to the markets in Shillong by October and is available till May. The tubers are manually harvested by digging up with a spade and stored in a pit covered with earth and tubers are taken out as and when demanded in the market. An average yield of 3000 kg/ha has been reported in

Meghalaya (Singh and Arora, 1973). The polished tuber is sold at Rs. 250-400 per Kg in the local markets of Meghalaya.

## CONCLUSION

Sohphlang has a huge potential and can be incorporated in our present farming system. This leguminous tuber crops can serve as a key to future food and nutritional security for small and marginal farmers. In addition, sohphlang also bring additional income to farmers. Therefore, it is imperative to undertake the scientific and systematic study on this locally available untapped underutilized tuber crop for standardizing their agro techniques and their productiveness.

## REFERENCES :

- Chaudhri, A.B. 2005. Forests Plants of Eastern India. Ashish. pp. 205-206. ISBN 8170245370.
- Gangwar, A.K. and Ramakrishnan, P.S. 1989. Cultivation and use of lesser-known plants of food value by tribals in north-east India. *Agriculture, Ecosystems and Environment*, **25** (2-3): 253-267
- Hrckova, G. and Velebny, S. 2013. Pharmacological Potential of Selected Natural Compounds in the Control of Parasitic Diseases. Springer. p. 64. ISBN 978-3-7091-1324-0.
- Naguleswaran, A., Spicher, M., Vonlaufen, N., Ortega-Mora, L.M., Torgerson, P., Gottstein, B. and Hemphill, A. 2006. In vitro metacestodicidal activities of genistein and other isoflavones against *Echinococcus multilocularis* and *Echinococcus granulosus*. *Antimicrobial Agents Chemotherapy*, **50** (11): 3770-3778.
- National Research Council 2002. Tropical Legumes: Resources for the Future. Books for Business/ The Minerva Group, Inc. pp. 37-38. ISBN 0894991922.
- Rao, H.S. and Reddy, K.S. 1991. Isofavones from *Flemingiavestita*. *Fitoterapiam*, **62**(5): 458.
- Ren, S. and Gilbert, M.G. 2010. "FLEMINGIA Roxburgh ex W. T. Aiton, Hort. Kew., ed. 2, 4: 349. 1812, nom. cons., not Roxburgh ex Rottler (1803)". *Flora of China*, **10** (3): 232-237. ISSN 1043-4534.

- Roy, B. and Tandon, V. 1996. Effect of root-tuber extract of *Flemingiavestita*, a leguminous plant, on *Artyfechinostomumsufrartyfex* and *Fasciolopsisbuski*: a scanning electron microscopy study. *Parasitology Research*, **82** (3): 248–252.
- Singh, H.B. and Arora, R.K. 1973. Sohphlang, *Moghaniavestita*, a leguminous root crop of India. *Economic botany*, **27**: 332-338.
- Tandon, V., Pal, P., Roy, B., Rao, H.S. and Reddy, K.S. 1997. In vitro anthelmintic activity of root-tuber extract of *Flemingiavestita*, an indigenous plant in Shillong, India. *Parasitology Research*, **83** (5): 492–498.
- Toner, E., Brennan, G.P., Wells, K., McGeon, J.G. and Fairweather, I. 2008. Physiological and morphological effects of genistein against the liver fluke, *Fasciola hepatica*. *Parasitology*, **135** (10): 1189–1203.
- Van Valkenburg J.L. and Bunyaphatsara N, eds. 2001. Plant Resources of South-East Asia No. **12**(2): Medicinal and Poisonous Plants 2. Backhuys Publisher, Leiden, The Netherlands. pp. 267–270. ISBN 90-5782-099-4.