

## A POTENTIAL INDIGENOUS VEGETABLE OF WESTERN HIMALAYAS: TARADI

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**Introduction:** Traditional vegetables play an important role in the diversification of diet, particularly among the rural population. They are not only desirable in terms of nutrition and health but also maintain the sustainability of the social systems in the region where they have been evolved over a period of time. With increased awareness about a healthy diet, the demand for organic food products is gaining momentum especially from the markets in developing countries. These market opportunities can generate additional income for poor farmers in less-favoured environments where these crops have comparative advantages over commercial crops. These vegetable demands less expenditure and gives high returns. One of the lesser-known vegetable which is cultivated in selected parts of Himachal Pradesh is “Taradi”. It is a popular tuberous vegetable that is consumed by the fasting devotees during Shivratri. It is estimated that during this period its cost rises to Rs 300 to 400 per kg which otherwise is sold for Rs 150-200 per kg. The rising prices of this vegetable might be due to its limited cultivation and it is mainly procured by the rural community from the forest areas. Considering its demand and price, it can turn out to be a profitable crop for Himachal Pradesh. In the Mandi district, many farmers are already growing it for their livelihood.

**Botany:** There is a lot of confusion regarding its botanical name as this plant lack consideration of botanists although its morphology and life cycle pattern showed that it belongs to the genus *Dioscorea*. The different workers had assigned different synonyms *Dioscorea belophylla* Voigt., *D. alata*, *D. nummularifolia*, *D. glabra*. It belongs to the family Dioscoreaceae. It is also known as Himalayan yam. It is found growing wild in forests at an altitude between 1000m and 1800m. It is native to the mid-hills of the western Himalayas. It is a climbing vine, about 5mm thick with heart-shaped leaves. It usually grows on slopes under trees in forests. It prefers shady locations and friable soil rich in organic matter. The

perennial vines climb on small trees and bushes growing in forests. The vines shed their leaves during winter and remain dormant. The growth starts again in March and continues till October. The vines flower during April and May. It bears small round fruit-like structures which are not real fruits and are known as Tardolu in local jargon. When this tardolus are planted in soil, new vines emerge. Its roots have a habit of growing straight down deep into the soil upto 3m below the ground level. A person can collect only 6 to 8 kg of it in a day which is bought by wholesale traders for Rs 70-90 per kg.

**Edible uses:** The tubers are brittle, milky white, and slimy from inside. They are crisp and taste starchy when eaten raw. Tubers are mainly consumed after roasting or deep frying. They can be used for the preparation of dry vegetables as well as curry. A variety of traditional dishes can be prepared from its tubers like Bhalle, Kachori, Badiyan, Parantha, Khichade etc. They are also pickled to preserve for off season. The tardolu are also consumed as vegetable.

**Medicinal Value:** It has numerous therapeutic applications in various pathophysiological conditions like ulcers, sore wounds, spasms, dysentery, diabetes, and cancer. Bioactive components from Taradi have exhibited antioxidant, anti-inflammatory, anti bacterial, plasmid curing activities (Ghosh et al., 2015). The juice from its tubers is taken along with hot water to cure fever, malaria, headache and dysentery.

**Propagation:** They are propagated either through ariel bulbils or true seed and underground tubers. Therefore it should be harvested in a sustainable manner like habitat rotation and keeping bulbils on the parent plant for further regeneration. Though villagers are skilled enough, they harvest and allow regeneration without affecting their natural population growth in forests. But to ensure sustainable development it should be brought into large-scale cultivation. Generally, the tubers are cut few centimeters from near radical and leave the rest of the tuber with vine to grow. The effective duration of crop growth range from 6 to 12 month, depending upon the type of planting material, genotype, and location.

**Cultivation:** It can be easily grown from *tardolous* fruit like structures borne on vines or tubers during August-September. The only limiting factor in the cultivation of Taradi is the labor involved in digging out tubers located deep in the soil which can be solved by planting

it in containers or in beds lined with slates or concrete. They are planted in earthen pitchers or abandoned coal tar drums. But for growing at the commercial scale, beds lined with slates or concrete can also be used. In district Mandi, slates are being used as viable stoppage material. They have a tendency to penetrate 2 to 3 m deep in soil but by putting slates it is harvested easily from about 50cm below the ground. The growing plant can be staked or allowed to spread on the ground. However, staking may increase yield. The vines are tied with a framework of erect poles supported by horizontal poles tied to them. Sufficient space should be left between rows of poles to provide access to vines.

**Harvesting:** The size and shape of the tubers vary with age and soil profile. Mostly they are 8 cm wide and 5cm thick. The thickening of roots starts about 50 cm from the ground level. The roots have a tendency to grow straight down into the soil and if not obstructed by rock or stone they can easily penetrate 2 to 3 m deep. Due to this growth habit, its digging is quite laborious, physically demanding, and involves high cost. For harvesting 2 to 10 kg tubers of Taradi, it requires standing, bending, squatting, and sitting on the ground depending upon the tuber size and depth of tuber penetration. Generally, it is harvested from forests by local villagers during the winter season which leads to soil erosion especially during rains due to excavation of soil at a large scale. It is harvested nearly after 3 years of sowing by using sticks, spades, or diggers. Conventional spading forks and shovels made of wood are preferred over metallic as it is believed that they are less damaging to the frail tubers. In forest areas, tubers grow in the vicinity of other tree roots, therefore the additional step involved is freeing them from other roots which often cause tuber damage.

**Storage:** Although the yams are the least perishable but successful storage is important. The efficiency of tuber storage structures for preserving yams depends on the cultivar, environment conditions (Relative Humidity and Temperature), and the physical condition of the tuber at the time of storage. Traditional storage methods vary according to the ecosystem and yield of yam. They are generally stacked in heap on the floor or preferably on shelves in the shed. Sometimes a circular or rectangular trench is dug, inside which yams are staked or piled after which they are covered with sand. While storing care should be taken to select healthy tubers free from any disease. The tubers should be properly cured before storage.

Adequate ventilation should be provided during storage. The tubers should be regularly inspected and rotting tubers should be removed timely.

**Yield:** It yield 3-4 kg per plant after 1 year of planting while after 5 years it yields upto 10 kg per plant.

**Conclusion:** Himachal Pradesh is rich in biodiversity and there are many wild fruits and vegetables which can uplift the socioeconomic status of the rural poor apart from fulfilling their nutritional requirements. Although these vegetables are in demand at national and international markets amid prominent prices but they are generally available for use only in local markets. The lack of agro technologies, suitable varieties, storage structures, post-harvest processing etc limits their availability. So, there is an urgent need to develop agro-technology and post-harvest processing techniques for these traditional vegetables so that small and marginal farmers can reap benefits.

