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Bitterless Gourds for Widening Kerala’s Vegetable Basket

Spine gourd and mountain spine gourd are two high value wild edible vegetables with domestication potential. While the former is adapted to plains and lower elevations, the latter is suitable for cultivation in high ranges. Being a component of forest ecosystems, both are adapted to partial shade and thus fit well in homestead farming ecosystems prevalent in Kerala. *M. sahyadrica* can be a good companion crop in coffee and cardamom estates especially on the fence and in borders. Bitterless and deliciously flavoured, both are nutritionally rich and fetch a premium price in consumer markets. Alternatively, they can be used as leafy vegetables also. All parts of these wild plants are used in indigenous systems of medicine to cure various ailments. Attributed with health and nutritional qualities, these wild delicacies need to be popularized as vegetable crops.
The genus *Momordica* is familiar to all Keralites because of the bitter gourd, which is the flagship vegetable of the genus. However, only a very few might be aware that the genus includes many other vegetable species, at least four of them with bitterless fruits. Spine gourd (*M. dioica*) and mountain spine gourd (*M. sahyadrica*) are two such entities, eaten regularly by forest dwelling communities and tribals in Kerala. The former, known as erumapaval or kattupaval, grows wild in scrub jungles in west coast and lower Western Ghats and the latter called pothu paval (also named kattupaval) grows wild in the forest openings in Western Ghats and is occasional in coffee and cardamom estates in Wynaad and high ranges. They can tolerate partial shade, high rain fall and low sun shine hours, thus making them good choice as homestead vegetable crops.

Botany, cultivation and uses of both species are similar except their adaptability to altitudinal variations. Tender fruits are esteemed as vegetables and leaf and tender clippings are also cooked as vegetables. It also acts as a taste maker when cooked along with other vegetables even in small quantities. Indigenous communities consider them as health foods for curing piles and anaemia. Ripe and mature fruits also can be cooked in to various traditional recepies like “theeyal”, “thoran”, “rasam”, “koottu curry”, chutney etc. after de-seeding. Compared to other cucurbits with the sole exception of bitter gourd, it can be seen that they are rich in calcium, phosphorous, protein and many other essential amino acids. Mentioned in the *Hortus Malabaricus*, the first ever Botanical treatise on Indian plants, some 450 years ago, they still remain wild or at the most semi-domesticated. Yet to be tamed fully, seed propagation in these two species is a difficult proposition. Seeds have prolonged dormancy and in nature seeds gulped and defecated by frugivorous birds like “kutroven”, bulbul and tree pie, germinate with the onset of pre-monsoon rains. Careful decortications of seed shell before sowing enhance speed and rate of germination. Seedlings may be raised in polybags and transplanted to pots or the main field before the monsoon sets in.

The only released variety of spinegourd is the Indira kakonda, developed by Indira Gandhi Krishi Viswa Vidyalaya, Raipur. Arka Neelachal Sree

The average nutritional value of 100 g edible portion of spine gourd was found to be 84.1% moisture, 7.7 g carbohydrate, 3.1 g protein, 1.0 g fat, 3.0 g fibre, 33 mg calcium, 42 mg phosphorus and 4.6 mg iron. It also contains small quantities of essential vitamins like thiamine (0.05 mg), riboflavin (0.10 mg) and niacin (0.60 mg).
is another variety recommended by Central Horticultural Research Station, Bhubaneswar of Indian Institute of Horticultural Research. In mountain spine gourd, no specific varieties are available; growers have to resort to wild populations for planting material.

After a period of vigorous growth, the aerial parts wither and the tap root tubers undergo hibernation. With the advent of summer, fresh sprouts emerge from the dormant tubers in February-March and come to flowering within 30 days. Thus spine gourds provide vegetables during May-August when few other vegetables are available due to scorching summer followed by torrential rain. One year old sprouting tubers (in 10:1 female male ratio) may be used to establish a vegetable garden. Rooted cuttings from vigorously growing female and male vines (before flowering) can also be used especially for grow bag cultivation. However, they do not perenate over the years and hence ratoon cropping will not be possible unlike with tubers or seeds. The emerging vines should be trailed to trellises or a low floor pandal for good fruiting. Spine gourd flowers open in the evening and flowers are sweetly musk-scented. Mountain spine gourd flowers open during early morning and flowers are large, showy-yellow. Both are pollinated naturally by specific species of moths, flies, stingless bees, ants and occasionally honey bees. Spine gourd fruits weigh around 18-25 g and mountain spine gourd between 35-45 g. On an average, 1.5-2 kg/fruits per plant in spine gourd and 3-4 kg fruits per plant in mountain spine gourd can be harvested from well maintained ratoon crops.

The dormant tubers should be protected from hot sun by covering with mulch or arranging pots or grow bags in a shaded place. Repotting and changing of soil with the addition of fresh dose of FYM should be attempted when tubers starts sprouting, invariably before pre-monsoon rains in March. Tender fruits at the age of 10-12 days after pollination are the best vegetable stage for marketing and consumption. Fruit flies damage spine gourd fruits, though a certain level of tolerance has been observed. Covering tender fruits with butter paper covers or poly bags may be ideal for cosmetic look of fruits. Mountain spine gourd is completely resistant to fruit flies. Emerging larvae of Epilachna beetle damage the photosynthetic leaf area which may be controlled mechanically by hand picking or in large scale cultivation by spraying botanical pesticides.

Thus, these two indigenous wild bitter gourds provide bitterless, highly nutritious and tasty vegetables during lean months. Leafy vegetable use, medicinal importance and ornamental uses are other added advantages. By virtue of their perennial nature, ratoon crops continue to yield for many years. Being adapted to forest habitats, they can fit very well in the homestead gardens thus fully utilizing the shade of other crops. The produce, being organic, tasty and highly nutritious, is expected to fetch a premium price in the market.

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