

Perilla

– a lesser known food crop

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Perilla [*Perilla frutescens* (L.) Britt] is a traditional crop of east Asia that belongs to mint family Lamiaceae. It is known for its exceptional oil quality and is used as a condiment. China is believed to be its centre of origin. In India, it is a lesser known crop due to its localized sporadic cultivation in the Himalayan regions including North-eastern states. Cultivation has also slowly shifted from jhum land to permanent terraced farming thus, paving a way for commercial cultivation on a larger scale with scientific know-how.

Keywords: Bhanjira, Lamiaceae, Perilla

PERILLA is popularly known as Shiso, Chinese basil and locally as Bhanjira (Hindi) and Chhawhchhi (Mizo). In Mizoram, it is mainly cultivated in Jhum lands and often intercropped with rice under rainfed conditions. In the recent past, the cultivation of Perilla due to its exceptional oil quality and condimental property, has gained popularity and importance.

Botanical description

Perilla is an annual, short-day plant that grows up to 1.2–2.0 m in height. Leaves are opposite, oval, 4–12 cm long and 2.5–10 cm wide at maturity; they have serrated margin with 2–7 cm long petiole. Leaves are pubescent and aromatic and the inflorescence is a terminal raceme, 6–20 cm long. Flowers are white or

purple and bloom in September–October. Fruits are greyish brown, nutlet encompassing 1–4 seeds. Seeds remain ovoid, small, greyish brown to white, having a mild pungent taste, containing 38–51% oil.

Classification

Perilla is generally classified into two groups, cultivated and wild. [*Perilla frutescens* (L.) Britt] ($2n=40$) comes under cultivated spices and the cultivated spices are further classified into green and purple spices.

Importance

The leaves are strongly aromatic with a minty flavour and pleasant taste. Perilla is used as a spice, often cooked as potherb or fried and combined with fish, rice, vegetables,

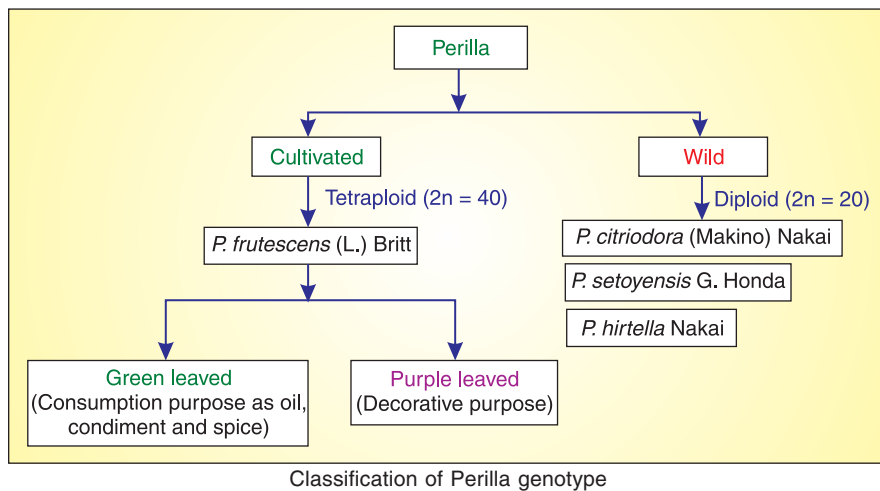
salads and soups. The seeds are roasted and/or grounded with salt, chillis, and tomatoes to make a savoury dip/side dish or chutney. It is also used as an oilseed crop with 38–51% oil recovery. Its oil has the capability of reducing allergic hypersensitivity in humans, and may be beneficial for the treating asthma and improving lung functioning.

Crop growth stages

Perilla seeds germinate 7–10 days after sowing, sometimes they may even take up to 15 days. Seed germination type is epigeal and takes 150–180 days from germination to maturity. It depends on variety/genotype, climate, soil type and other agronomic practices. Days to 50% and 80% flowering may take 120–150 and 150–180 days from



Perilla leaf structure and inflorescence



Perilla seed germination

sowing, respectively. In general, the number of inflorescence per plant varies in the range of 20–100 with inflorescence length 5–10 cm.

Agronomic practices

Perilla is propagated by seeds with a seed rate of 3.5–5.0 kg/ha. For proper growth and development, a well-pulverised soil has to be thoroughly mixed with well-decomposed FYM. Raised beds with 15 cm height, 2.5–3.0 m width and convenient length with a good drainage facility are used for sowing. The crop spacing should be maintained at 40–60 cm row to row and 15–20 cm plant to plant. Perilla can also be raised and sown in nursery. For nursery, pre-soaking is recommended for good germination; after which the seeds have to be spread evenly on the bed. Seedbed is covered with fine-textured soil or sand and then with straw to retain high humidity. After germination, straw can be removed, and transplanting can be done only after full expansion of the first pair of true

leaves (20–25 days after sowing).

Cultivation package of Perilla for Mizoram

Sowing time: Second fortnight of April–May, however, can be sown in June. Care should be taken that it should not coincide with heavy rains.

Soil type: Generally all types of soil (sandy loam to clay loam). Fine and well-pulverised soil under raised seedbed is recommended with good drainage system to avoid waterlogging.

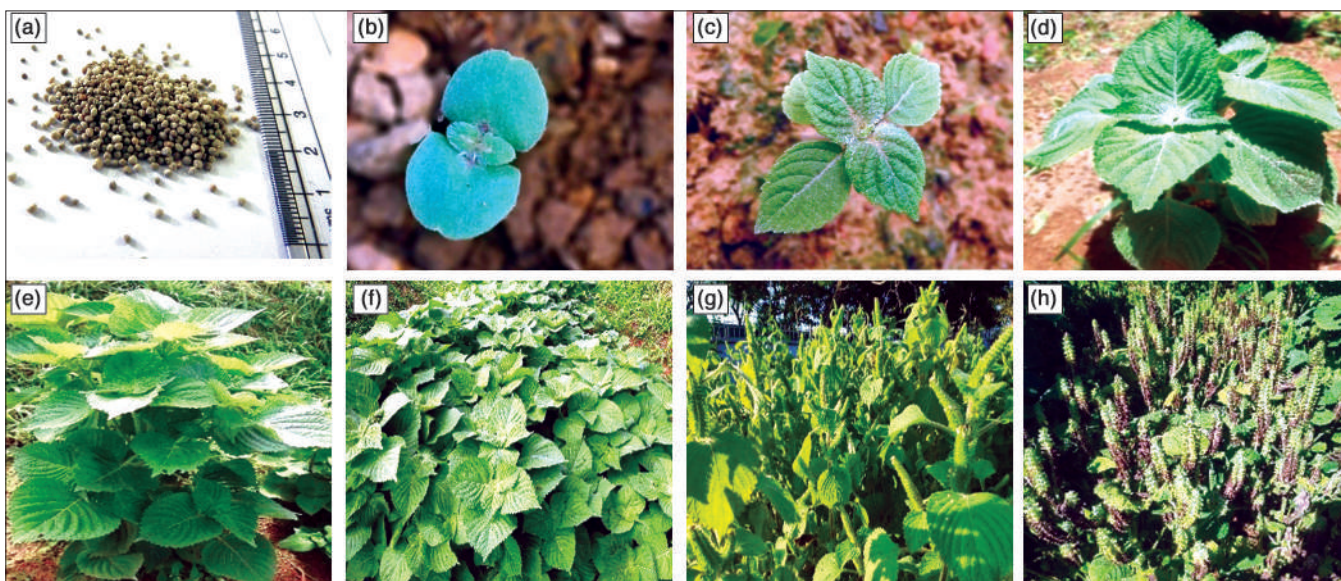
Spacing: Optimum spacing is 40–60 cm row to row and 15–20 cm plant to plant. However, due to the very small seed size, one can go with line sowing of seeds followed by thinning.

Gap filling: Gap filling is very important as germination percentage varies from 60–80%. Therefore, 15–20 days after sowing, gap filling is important at 3–4 leaf stage.

Thinning: Under the line sowing, thinning operation is very important to minimize intra-competition between plants. It should be done at the 4–5 leaf stage and should be completed before the plants reach a height of 15 cm.

Plant density: Population density varies from 80,000–2,50,000 plants/ha based on spacing.

Fertilizer application: Application of 20:20:20:20 NPKS kg/ha along with 5–10 t/ha well-decomposed FYM and compost (or)



Growth stages of Perilla (a) seed (b) germination (c) seedling stage (d) vegetative stage (e & f) active growth stage (g) inflorescence initiation stage (h) maturity



Raised bed method for perilla cultivation



Perilla crop in field

as per soil fertility status.

Weeding: Nearly 2–3 hand weeding are recommended, starting 30–35 days after sowing.

Irrigation: Perilla is generally cultivated as a rainfed crop. However, in case of delayed rainfall at flowering and early seed setting stage, supplement irrigation may be given.

Pests and diseases: In general, plants remain free from pests and diseases. However, occasionally aphids, whitefly, armyworms, cutworms, leafroller, spidermites under pests; bacterial wilt, damping off, downy mildew and rust under disease may sometimes be observed. Fungicide may be used when necessary.

Harvesting: For the seed production, plant mature 5–6 months after sowing. It can be harvested once the fruit turns brown to black and lower leaves start falling. Harvesting is done by hand-picking mature inflorescence (head) or by cutting mature plants through small implements like sickles or *Dhau*. Cut plants are kept for sun drying for 1–2 days. Seeds can be threshed from mature heads, cleaned and stored. Avoid delays in harvesting at maturity to minimize losses from seed shattering.

Drying: Seeds should be dried under the sun up to 10–13% moisture content. After seed drying, it is advisable to store the seeds at



Perilla whitefly



Perilla aphid

5°C temperature for maintaining seed viability. Seeds viability may be lost under room temperature within a year.

Yield: The average seed yield observed in Mizoram is 900–1000 kg/ha with an average test weight of 1.3–2.0 g (1000 grain weight).

Economics: Based on the prevailing market price in 2020–21, the cost of cultivation and gross return was calculated. It has been observed that the cost of cultivation for Perilla in Mizoram has been ₹52,000 to 60,000/ha. While gross return from Perilla seed yield (900–1000 kg/ha) has been ₹2,70,000–30,00,000/ha (considering ₹300/kg of seed price). This resulted in benefit-cost ratio of 4.5 to 5.8.

SUMMARY

Mizoram is blessed with rich Perilla biodiversity. Thus, exploration, collection and conservation of germplasm, and further selection of best-performing genotypes is important for improving yield and quality. More research is required for promising germplasm with scientific knowledge and breeding techniques to escalate the productivity and potential of Perilla cultivation. Also, utilization of available genetic resources will ensure high productivity and ability to develop varieties.

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