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Blackberry: A Noxious Weed or Invasive Species of Jammu and Kashmir

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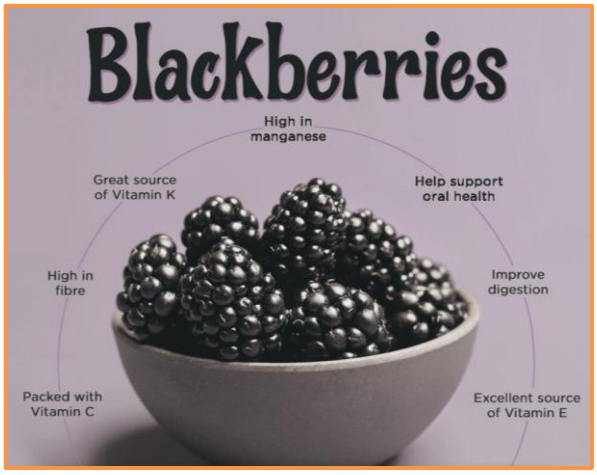
Blackberry - (*Rubus spp*) is a perennial shrub with biennial canes (stems) of the kingdom Plantae, order Rosales, family Rosaceae. The plant has a perennial root system and biennial above-ground stems**,** meaning that individual canes live for two years; first year (primocane): vegetative growth and second year (floricane): flowering and fruiting. "**Noxious weed**" or "**invasive species**" labels are used for blackberries because they grow, spread aggressively via seeds (dispersed by birds, animals, wind) and root suckers and tip layering (canes touch the ground and root), outcompete native vegetation, are hard to remove and disrupt ecosystems and agriculture. These are difficult to eradicate as they have deep, extensive root systems, which make manual removal difficult. These can even regrow from root fragments, even after cutting or burning. Many species also show resistance to herbicides, requiring repeated applications.

The blackberry plant originated in Europe but has become naturalized worldwide, particularly in North America**,** South America**,** Australia and New Zealand and parts of Asia and South Africa due to its hardiness, ecological adaptability, and usefulness. India's blackberry diversity is rich, with many native species adapted to specific climates from tropical southern states (Karnataka, Kerala, Tamil Nadu) to Northern and Himalayan states (Jammu & Kashmir, Himachal Pradesh, Uttarakhand) and Northeast India (Assam, Meghalaya, Nagaland, Tripura, West Bengal).

In Jammu and Kashmir, several species of the genus *Rubus* are found, each known by different local names such as Ainselu, Akhe, Hisalu, Lal Anchu, Aakhe, Aakhare (Dogri), Gouriphal (Kashmiri) and Hinsalu (Hindi) depending on the region and community.

Stems (Canes) are typically woody**,** arched or trailing**,** and often form dense thickets. Covered with prickles (commonly called thorns), which are modified epidermal structures. Some cultivated varieties (e.g., thornless types) have reduced or no prickles.

Leaves are compound leaves, usually with 3 to 5 leaflets (sometimes up to 7) with alternate arrangement. Leaflets are ovate to lanceolate, with prominent midrib and reticulate venation, serrated margins and a pubescent (hairy) underside.



Flowers are bisexual, actinomorphic, pentamerous (5 sepals and 5 white to pale pink petals), numerous stamens and apocarpous pistils with typically racemose or cymose clusters of inflorescences and are pollinated by insects. It blooms in March–April**,** and fruits by April–May.

The type of fruit in a blackberry is called an aggregate fruit, which is formed from multiple ovaries of a single flower. In blackberries, each small bump (called a

drupelet) is a tiny individual fruit with its seed. These drupelets cluster together around a central core, forming the blackberry. Fruits are green when unripe, red as they ripen, and deep purple-black when fully ripe.

Ecology

Blackberries are opportunistic, adaptable shrubs that reproduce both vegetatively and by seed. They flourish in disturbed habitats, provide significant wildlife benefits**,** and play a lasting role in ecosystem dynamics**,** whether beneficial (erosion control, habitat formation) or problematic (invasiveness in some regions). Blackberries thrive in temperate climates, with an ideal temperature range of 12°C to 30°C, well-drained loamy to sandy loam soils with pH: Slightly acidic to neutral (5.5 to 7.0).

How can 'blackberry' be used?

- Both the fruit and the plant of Blackberries have a wide range of uses across culinary, medicinal, cosmetic, and even gardening applications.
- Blackberries are rich in flavour and nutritious in Vitamins, minerals, and antioxidants, making them popular in food and beverages and also eaten raw as a snack or in fruit salads. Blackberries are used in pies, tarts, crumbles, cobblers, cakes, and muffins. These are also made into spreads (jams and jelly) with sugar and pectin, blended into drinks or mixed with other fruits, cooked into sauces for meats (like duck or pork) or desserts and fermented into blackberry wine or infused in spirits.
- The raw blackberry contains macronutrient content per 100 grams such as water ~88 g, protein 1.4 g, carbohydrates 9.6 g, L sugar 4.9 g, L Dietary fibre 5.3g and fat 0.5 g. Vitamins (% DV) such as Vitamin C 21 mg (35%), Vitamin K 20 µg (25%), Folate (B9) 25 µg (6%), Vitamin A 11 µg (1 %), and Vitamin E 1.2 µg (6%). Whereas %DV is the Per cent Daily Value based on a 2,000-calorie diet.
- Blackberries contain active beneficial compounds such as Anthocyanins, flavonoids, ellagic acid, and tannins, which have antioxidant and anti-inflammatory properties and protect cells from oxidative stress, reduce inflammation, slow ageing, and also support cardiovascular and brain health.
- Blackberries (*Rubus* spp.), particularly their fruits, leaves, and roots, have been used in traditional and modern medicine for centuries.
- Fruit and leaf decoctions are used traditionally to treat diarrhoea, especially the leaves (as astringents) and contain tannins that reduce gut inflammation and fluid loss. Roots are used in folk medicine to relieve dysentery and bowel disorders.
- Extracts from berries and leaves have shown antimicrobial activities against the bacteria (*E. coli*, *Staphylococcus aureus*) *and fungi* (*Candida albicans*). This makes them useful in preventing or treating minor infections.
- Flavonoids and polyphenols in blackberries may help in blood sugar control (antidiabetic potential) by lowering blood glucose levels and improving insulin sensitivity. Anthocyanins (the dark pigments in blackberry fruit) help in lowering bad cholesterol (LDL), improve blood vessel function and reduce blood pressure slightly with long-term consumption
- Blackberry juice or leaf extracts may be topically used to soothe inflamed or irritated skin, help with minor wounds and rashes, and provide natural UV protection (due to antioxidants).
- The berries produce a deep purple colour natural dye for fabrics or paper. Dried blackberry vines (especially thorny ones) can be woven into wreaths, potpourri, Natural fencing and rustic baskets (after proper soaking and softening). Blackberry seed oil is used in some hair products for shine and nourishment.
- Blackberries are also used in Ayurveda and folk medicine for curing diabetes, skin diseases, diarrhoea, and fever and also as a blood purifier and tonic in some tribal regions of India.

- The blackberry plant (*Rubus* spp.) can be used in edible landscaping as a productive and attractive fruiting shrub, wildlife habitat, as a source of food and shelter for birds and pollinators and as living fences, as thorny varieties make effective natural barriers.

Post-harvest management

- Post-harvest management of blackberries is crucial due to their high perishability and delicate nature. Proper handling, storage, and transportation are essential to maintain quality, extend shelf life, and minimize losses. Here's a comprehensive overview of post-harvest management of blackberries:
- Blackberries are harvested at full ripeness, as they do not ripen after picking. These are harvested early in the morning or during cool parts of the day in shallow containers to avoid crushing and handled gently to prevent bruising and juice leakage.
- After harvesting, the blackberries are sorted to remove overripe, underripe, or damaged berries. Do not wash the blackberries before storage if it is to be sold fresh (unless necessary), since moisture accelerates spoilage. If washing is needed, use chlorinated water (50–100 ppm) followed by drying.
- Forced-air cooling is used immediately after harvest to reduce field heat. Do not freeze unless intended for processing (IQF – Individual Quick Freezing). Temperature in the range of 0-1 °C, relative humidity 90-95 % and shelf life 3-7 days are recommended for storage.
- Ventilated clamshell containers or trays with liners are recommended for packing blackberries. Containers are generally made of materials PET, PP, or pulp fiber. Modified Atmosphere Packaging (MAP) can also extend shelf life.
- The packed blackberries are transported in refrigerated vehicles (0–1 °C) and stacked carefully to prevent compression damage. Due to the perishable nature of blackberries, short transport times are recommended.
- For marketing display under cool conditions (ideally ≤ 5 °C) and rotate stock to ensure first-in, first-out (FIFO) use. Avoid excessive handling at retail points.
- Mould (Botrytis) due to high humidity, poor airflow, leakage because of over-ripened or bruised fruit, shrivelling in low humidity or dehydration and off-flavours due to ethylene exposure or decay are the common post-harvest issues associated with the blackberries.
- Blackberries are frozen for smoothies or baking, dried for snacks or tea and used for Juices, jams, jellies, purees and wine or vinegar production.