

Research Article

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Diversity of berries in Nilgiris (Tamil Nadu: India)

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Abstract

Keywords

Berries,
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Diversity and
Origin

Berries play a significant role in the human diet due to their rich nutritional and medicinal properties. They are abundant in vitamins, minerals, and bioactive compounds, particularly phenolic compounds, which contribute to their health-promoting effects. Their sweet taste, unique aroma, and high antioxidant content enhance diet quality. Berries have been associated with beneficial effects on various human body systems, including the cardiovascular, gastrointestinal, immune, and nervous systems, and a few types of cancers. This study presents the distribution and diversity of berry species in the Nilgiris region.

Introduction

Berries are known for their taste aroma, diet benefits and health care. Commonly known varieties of berries include strawberries, blueberries, and black and red raspberries. Their colours range from orange and red to purple or black, depending on the species. Berries are consumed fresh, dried, or processed into products such as jams, jellies, and beverages.

The bioactive content of berries is directly connected to the amble environmental and edaphic factors. Their nutritional value depends on factors such as variety, soil type, climate, location, harvest time, and storage conditions (Johnson *et.al* 2013). Berries are rich in both macro-and micronutrients, including dietary fibre, natural sugars (fructose), vitamins (A, C, E, and B-complex), minerals, and essential fatty acids, contributing to their high antioxidant capacity (Li.Y *et al.*, 2021).

The gastro protective effects of black mulberry are evaluated to reduce the ulcerative lesions. Effects of berry polyphenols on the human gut microbiota are considered to have probiotic like action. Berries have effects on the prevention and management of diabetes

Lack of physical activity, high blood pressure, diabetes, smoking, obesity and eating habits leads to cardiovascular diseases. Berries with high phenolic content prevent cardiovascular diseases.

The effects of berry bioactive shows anti-carcinogenic potentials. Black raspberry extract found to diminish proliferation and tube formation in human intestinal endothelial cells (Farooq2017).A bioactive compound, 4B-hydroxy-withanolide E (4HW), isolated from golden berry treated with lung cancer cell lines, inhibited the tissue factor expression as well as procoagulant activity (Wang *et.al.*, 2017)

The polyphenols in berries especially blueberry and strawberry results by postmenopausal woman with pre- and stage 1- hypertension resulted in a decrease in systolic blood pressure and diastolic blood pressure (Hajaji *et.al.*, 2017).

A study conducted in adults of age between 50 and 75 years old with purple Concord grape (*Vitis labrusca*) juice over 9 weeks formed vitamin C and developed immune system compared with a non consumed group of same aged members.

In vitro and in vivo studies on fisetin, a flavanol abundant in strawberries, depicted that it has the potential to treat Parkinson's disease symptoms .Blue berries (*Vaccinium-uliginosum*) and lignoberries (*Vaccinium vitis ideae*) having advantages towards aging and neurodegenerative disorders.

Methodology

The present study was conducted in the Nilgiris district, characterized by its undulating terrain and location within the Nilgiris Biosphere Reserve, a convergence zone of three states. Field surveys were carried out from March 2025 to March 2026 to document berry diversity.

Berries were collected systematically at intervals of two weeks. Specimens with flowers and fruits were collected, brought to the laboratory, and identified using standard floras and monographs. For each species, data including common name, binomial name, family, subclass, habit, and origin were recorded. A checklist of berry species was prepared based on these observations.

Results

A total of 48 berry species belonging to 20 families were recorded in the Nilgiris. The family Guttiferae had the highest representation with six species, followed by Rosaceae, Myrtaceae, and Rutaceae with five species each. Families such as Passifloraceae, Sapotaceae, and Euphorbiaceae were represented by three species each, while several families had two species. Eight families were represented by one species each. Among them Trees are dominant with 25 species .Followed by shrubs with 16 species. Herbs are the least three species. Then climbers are persude by 4 species. Akin to climbing species Passifloraceae, including *Passiflora foetida*, *Passiflora mollissima*, and *Passiflora leschenaultii*. Among Rutaceae, *Toddalia asiatica* was identified as a climber.

All the 48 species belonged to dicotyledons, distributed asPolypetalae with (11 families), followed by Gamopetalae (6 families) and Monochlamydeae of (3 families).Several berry species were identified as indigenous to the Nilgiris region, including species from genera such as *Rubus*, *Vaccinium*, *Syzygium*, *Phyllanthus*, and *Garcinia*.

S. No	Common Name	Botanical Name	Family	Local Name	Habit	Origin
1	Bilimbi	<i>Averrhoa bilimbi</i> L.	Oxalidaceae	Pulima	Tree	Exotic
2	Carambola, Star fruit.	<i>Averrhoa carambola</i> L.	Oxalidaceae	Tamarattai	Tree	Exotic
3	Nilgiri barberry.	<i>Berberis tinctoria</i> (Lesch.)	Berberidaceae	Oosikala	Shrub	Indigenous
4	Conkerberry or bush plum	<i>Carissa spinarum</i> L. (S. of) <i>Carissa gangetica</i> Stapf	Apocynaceae	Chirukila	Shrub	Indigenous
5	Star apple.	<i>Chrysophyllum roxburghii</i> G. Don	Sapotaceae	-	Tree	Indigenous
6	Horse wood	<i>Clausena dentata</i> (Willd.) Roemer.	Rutaceae	Kaattukaruv eppilai	Tree	Indigenous
7	Velvet apple, velvet persimmon.	<i>Diospyros blancoi</i> A. DC. (S. of) <i>D. discolor</i> (Willd)	Ebenaceae	-	Tree	Exotic
8	Persimmon	<i>Diospyros kaki</i> L. f.	Ebenaceae	-	Tree	Exotic
9	False black pepper	<i>Embeliaribes</i> Burm. F.	Myrsinaceae	Vilanga.	Shrub	Indigenous
10	Brazilian cherry	<i>Eugenia uniflora</i> L.	Myrtaceae	-	Shrub	Exotic
11	Mountain sweet thorn	<i>Flacourtia montana</i> J. Graham.	Flacourtiaceae	-	Tree	Indigenous
12	Vaccinium corymbosum	<i>Fragaria ananassa</i>	Rosaceae	Strawberry	herb	Exotic
13	Bush weed, Indian snow berry	<i>Flueggea leucopyrus</i> Willd.	Euphorbiaceae	Mullupputti	Shrub	Indigenous
14	Brindle berry, Camboge.	<i>Garcinia gummigutta</i> (L) Roxb. (or) <i>Garcinia cambogia</i>	Clusiaceae	Kudampuli	Tree	Indigenous
15	Kokum Goa butter	<i>Garcinia indica</i> Choisy	Clusiaceae	Murugal.	Tree	Indigenous
16	Mangosteen	<i>Garcinia mangostana</i> (Linn)	Clusiaceae	-	Tree	Exotic
17	Sour mangosteen	<i>Garcinia xanthochymus</i> Hook. f. ex. T. Anders.	Clusiaceae	Pacchilai	Tree	Indigenous
18	Fragrant wintergreen	<i>Gaultheria fragrantissima</i> Wall.	Ericaceae	Kolakkai	Shrub	Indigenous
19	Orange berry	<i>Glycosmis mauritiana</i> (Lam) Tanaka.	Rutaceae	Konji	Tree	Indigenous

20	Gin berry	<i>Glycosmis pentaphylla (Retz).</i>	Rutaceae	-	Shrub	Indigenous
21	Langsat fruit	<i>Lansium parasiticum (Osbeck) Sahni & Bennet</i>	Meliaceae	-	Tree	Exotic
22	Wild berry	<i>Maesa indica (Roxb) De</i>	Myrsinaceae	Periyaunni.	Shrub	Indigenous
23	Mullumanjanathi	<i>Mahonia leschenaultii (Wall. ex Wight&Arn.) Takeda</i>	Berberidaceae	Mullumanjanathi	Shrub	Indigenous
24	Sapodilla	<i>Manilkara zapota (L) P. Royen</i>	Sapotaceae	Sapota	Tree	Exotic
25	Curry leaf	<i>Murraya koenigii (L) Spreng</i>	Rutaceae	Karuveppilai	Tree	Indigenous
26	Prickly pear	<i>Opuntia dillenii (Ker-Gawl) Haw</i>	Cactaceae	Sappathikallai, Nagathali	Shrub	Exotic
27	Bush passion fruit (or) stinking passionflower	<i>Passiflora foetida Linn</i>	Passifloraceae	Chirupunaikkali.	Climber	Exotic
28	Avocado	<i>Persea americana</i>	Lauraceae	Butter fruit	Tree	Exotic
29	Passion Fruit	<i>Passiflora leschenaultii Dc</i>	Passifloraceae	-	Climber	Indigenous
30	Banana passion fruit	<i>Passiflora mollissima (Kunth) L.H. Bailey</i>	Passifloraceae	-	Climber	Exotic
31	Indian gooseberry	<i>Phyllanthus emblica L. (Linn)</i>	Euphorbiaceae	Nelli	Tree	Indigenous
32	Sunberry, Wild cape gooseberry	<i>Physalis minima Linn</i>	Solanaceae	Tholtakkali, Sodakkuthakkali	Herb	Exotic
33	Cape gooseberry, Golden berry	<i>Physalis peruviana L.</i>	Solanaceae	Milagutakkali, Pottipalam.	Herb	Exotic
34	Egg fruit	<i>Pouteria campechiana (Kunth) Bachni</i>	Sapotaceae	Muttai palam.	Tree	Exotic
35	Strawberry guava.	<i>Psidium cattleianum Afzel ex sabine.</i>	Myrtaceae	-	Tree	Exotic
36	Guava	<i>Psidium guajava L</i>	Myrtaceae	Koyya	Tree	Exotic
37	Pomegranate	<i>Punica granatum L.</i>	Lythraceae	Madhulai	Tree	Exotic
38	Downy rose myrtle	<i>Rodomyrtus tomentosa (Aiton) Hassk</i>	Myrtaceae	Malai koyya, Tavittukoyya.	Shrub	Indigenous

39	Yellow Himalayan raspberry	<i>Rubus ellipticus Smith</i>	Rosaceae	Veli palam.	Shrub	Indigenous
40	Ceylon blackberry	<i>Rubus moluccanus Linn</i>	Rosaceae	-	Shrub	Indigenous
41	Black raspberry	<i>Rubus racemosus Roxb</i>	Rosaceae	-	Shrub	Indigenous
42	Keriberry	<i>Rubus rugosus Var. Thwaitesii</i>	Rosaceae	-	Shrub	Indigenous
43	Malay apple	<i>Syzygium malaccense (L) Merr. & L.M. Perry</i>	Myrtaceae	-	Tree	Exotic
44	Wax apple	<i>Syzygium samarangense (Blume) Merr. & L.M. Perry</i>	Myrtaceae	Neredam	Tree	Indigenous
45	Orange climber	<i>Toddalia asiatica Lam</i>	Rutaceae	Kattumilaku,	Climber	Indigenous
46	Indian cranberry.	<i>Vaccinium leschenaultii Wight (Wt)</i>	Vaccinaceae	Anduvan, Kalavu	Tree	Indigenous
47	Blue berry	<i>Vaccinium neilgherrense Wt.</i>	Vaccinaceae	Kalavu, Kila	Tree	Indigenous

Discussion

The present study on the diversity of berry species in the Nilgiris reveals that this ecosystem possesses rich berry plant composition. The Nilgiris district of Tamil Nadu provides highly favourable climatic conditions—such as moderate temperature, high humidity, and fertile soil—which support the growth of a wide variety of berry-producing plants. The diversity recorded in this study highlights the region's botanical richness and ecological significance.

The occurrence of numerous plant families, genera, and species emphasizes the importance of the Nilgiris as a major centre of plant diversity in the Western Ghats. Similar findings have been reported in earlier studies. Documented 25 berry species from Kilkundha Panchayat of the Nilgiris, (6) while (2016) recorded 21 berry species from Doddabetta and Pakkasuranmalai regions (Manjunath 2016).

Wild edible plants form an integral component of the natural vegetation in the Nilgiris. The berries play a vital role in meeting the nutritional requirements of tribal communities in the region (Farooq 2017). The indigenous people of the Nilgiris maintain a long-standing relationship with forest resources, relying on wild fruits for both nutrition and livelihood. Many berry species are collected seasonally and are used not only as food but also in traditional herbal remedies.

Recent studies further support the richness of wild fruit diversity in the Nilgiris (40) commonly occurring wild fruit species from Horasholai and Mammaram areas, many of which contribute significantly to the local diet (Sherin Joice 2024). Similarly, from the Masinagudi area 38 edible wild fruit species were reported. These findings collectively reinforce the ecological and ethno botanical importance of berry species in this region (Nisargh 2026).

Conclusion

The current study shows that the Nilgiris are a good source of berries plant diversity and its health benefits among the 48 species of berries were reported, Guttiferae 6 species followed by Roseaceae, Myrtaceae and Rutaceae showed 5 species respectively. All the above berries are good source of medicinal and providing numerous health benefits. The above families coming under polypetalous and one that could be easily adapted to the ecosystem of hill vegetation treatment of gastro protective, ant carcinogenic and improve immunity development are the need of the hour to human community. There are growing anthropogenic pressures, habitat change and loss of edible wild fruits that are a significant threat to this. This research gives the necessary baseline information concerning conservation of biodiversity the sustainable use of berries, and conservation of indigenous berries. It is important to combine indigenous and exotic berries records and its uses and conservation planning to protect the biological and cultural integrity of the Nilgiris ecosystem for future generation.

However, the medicinal values of these berries found abundantly in the upper Nilgiris are lacking. Hence, the study on the medicinal value of berries are needed to bring into light about the medicinally valuable berries for the healthy living of mankind.

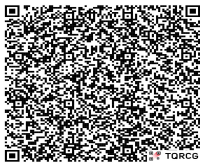
Declaration

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