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Quercus glauca
an important fodder tree of the hills

Yamini Sharma*, Sandeep Sharma, Pravin Rawat

Genetics and Tree Improvement Division, Indian Council of Forestry Research and Education, Himalayan Forest Research Institute, Conifer Campus, Panthaghati, Shimla, Himachal Pradesh 171013, India

Corresponding author: yamisharma1996@gmail.com

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In the tranquil landscapes of the Western and Eastern Himalayas, *Quercus glauca*, a valuable native oak species known locally by names such as Banni and Phaliyant, continues to flourish. Recognizable by its glossy green leaves and acorn-bearing branches, this tree holds immense significance for rural communities. It serves as a vital source of nutritious fodder for livestock, contributes to soil conservation, offers medicinal benefits, and provides durable wood for fuelwood and construction. However, the growing emphasis on fast-growing exotic species has led to the gradual neglect of *Q. glauca*. This quiet decline calls for renewed attention toward preserving and promoting this ecologically and economically important species.

A nutritive fodder from the forest

For generations, hill farmers have relied on *Banni* (*Q. glauca*) not just for firewood, but as a dependable source of livestock fodder, especially during the dry months when grasses are in short supply. In the north-western Himalayas, this tree is commonly lopped for its nutritious leaves. Farmers often prefer it over other native species like *Albizia chinensis* and *Acacia catechu*, thanks to its higher yield, better palatability, and superior nutritional value. Research by Navale et al. (2022) reports that *Q. glauca* leaves contain approximately 54.9% dry matter, 9.26–11.6% crude protein, and about 77.2% carbohydrates. This clearly highlights its value as a high-quality fodder source. With its robust productivity and nutritive richness, *Banni* plays a vital role in sustaining livestock health across Himalayan hill agroecosystems.

Agroforestry potential of *Q. glauca*

Quercus glauca can be effectively integrated into agroforestry systems, particularly in hilly and subtropical regions, where its ecological and livelihood benefits are most valuable. As a boundary plantation tree, it helps prevent soil erosion on sloping farmland while providing fodder and fuelwood without interfering with crop production. In silvopastoral systems, its nutritious leaves serve as a vital fodder source during dry months, and its leaf litter enhances soil fertility. Due to its deep root system, *Q. glauca* competes minimally with crops and grasses, making it suitable for wider alley cropping or mixed agroforestry models. Its resilience to drought, minimal maintenance needs, and long-term ecological value make it an ideal choice for community forestry and sustainable land-use planning. Though slower-growing than exotic species, *Quercus glauca* offers sustainable returns that support both environmental health and rural livelihoods.

Threats to *Q. glauca*

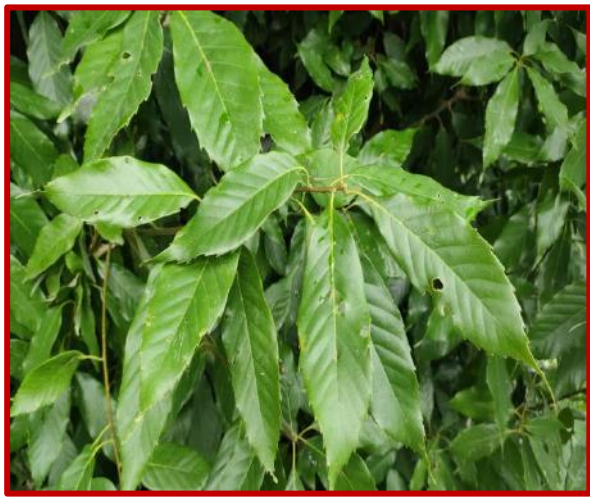
The species faces significant threats due to increasing human pressure, overexploitation for fodder and fuelwood, and limited natural regeneration. The lack of regeneration is largely the result of unscientific and repeated lopping for fodder, degradation of soil properties caused by

continuous human and livestock movement, removal of forest litter, and the consumption of acorns by wild and domestic herbivores. The species produces short-lived, recalcitrant seeds that rapidly lose viability after dispersal in their natural habitat. These factors together have contributed to the gradual decline of this ecologically valuable species in its native habitat.

Q. glauca tree

Young leaves of *Q. glauca*

Young seeds of *Q. glauca*



Mature leaves of *Q. glauca*

Mature seeds of *Q. glauca*

Conservation of *Q. glauca*

To ensure the survival and sustainable use of *Q. glauca*, we must recognize its value not only as a vital fodder and fuelwood source but also as a key species for soil conservation and biodiversity. Farmers, forest officials, and local communities can work together to promote its regeneration by adopting sustainable harvesting practices, protecting natural stands, and integrating *Q. glauca* into agroforestry systems. Supporting nurseries that produce healthy seedlings and planting them during the appropriate season can restore degraded landscapes. By valuing and actively managing this native oak, we can safeguard its benefits for future generations.

Mature seeds of *Quercus glauca* can be collected between September to December. Because of the short viability of the seeds, it is preferable to sow fresh seeds rather than using stored seeds. Pre-sowing scarification is more effective than stratification in improving germination rates. Seedlings grow best in shaded nursery beds. Regular watering is essential to keep the nursery beds moist and support healthy seedling development. Transplanting of nursery-grown seedlings is ideally done during the rainy season, usually about one year after sowing. When planting, seedlings should be carefully removed with their root balls intact, and the lower leaves pruned to reduce water loss and improve survival. A spacing of about 3 meters by 3 meters is recommended, and protecting young plantations with fencing is important to prevent damage from livestock.

Conclusion

Q. glauca is a remarkable species that offers a unique combination of ecological, aesthetic, and cultural significance. Its adaptability, stunning foliage, and versatility make it an excellent choice for landscaping, reforestation efforts, and agroforestry systems. By integrating *Q. glauca* into agroforestry practices, farmers and landowners can promote biodiversity, enhance ecosystem services, and create more resilient and sustainable agricultural landscapes.

References

1. Amare T, Bharadwaj DR. 2017. Germination behaviour and biochemical contents of *Quercus glauca* Thunb. Acorns in relation to pre-showing treatments and acorn sizes. Ind Forester. 143:43–49.
2. Amare T, Bhardwaj DR. 2016. Effect of Lopping on Stand Structure and Tree Species Composition of *Quercus glauca* Thunb. Forests of Himachal Pradesh, India. Ind J Ecology. 43: 218-223.
3. Chand DB, Poudyal K, Jha PK. 2017. Shifts in leaf phenology of three Himalayan oak species: role of wood water properties. Ecoprint: An International J Ecology. 24: 29-36.
4. Chowdhery HJ and Wadhwa BM. 1984. Flora of Himachal Pradesh. 2: 670p.
5. Gaur RD. 1999. Flora of the district Garhwal northwest Himalaya (with ethnobotanical notes). Transmedia Publication Center, Srinagar Garhwal, Uttarakhnad, India. 811p.
6. Gilman EF, Watson DG. 1994. *Quercus glauca* Figure 1. Middle-aged Blue Japanese Oak. Blue Japanese Oak. Fact sheets-547.
7. Ito S, Ohtsuka K, Yamashita T. 2007. Ecological distribution of seven evergreen *Quercus* species in southern and eastern Kyushu, Japan. Vegetable Science. 24:53–63.
8. Khan SM. 2015. Effect of pre-sowing treatments on seed germination in *Quercus glauca* Thunb., collected from different sampling sites of the Himalayan region of Pakistan. International Journal of Biosciences. 6 (11): 42-48.
9. Orwa C, Mutua A, Kindt R, Jamnadass R, Anthony S. 2009. Agroforestree database: A tree reference and selection guide version 4.0. Nairobi: World Agro forestry Centre.
10. Osmoston AE. 1927. Forest Flora for Kumaon. 527p.
11. Purohit VK, Palni LMS, Nandi SK. 2009. Effect of pre-germination treatments on seed

physiology and germination of central Himalayan oaks? Physiol. Mol. Biol. Plants. 15(4): 319-326.
12. Rao M, Ye D, Chen J, Ni J, Mi X, Yu M, Ma K, Cornelissen JH. 2020. Multi-stemming strategies of Quercus glauca in an evergreen broad-leaved forest: when and where. Journal of Plant Ecology. 13(6): 738-743.
13. Singh B, Saklani KP, Bhatt BP. 2010. Provenance variation in seed and seedlings attributes of *Quercus glauca* Thunb. in Garhwal Himalaya, India. Dendrobiology. 63: 59-63.
14. Singh JS, Singh SP. 1987. Forest vegetation of the Himalaya. Bot. Rev. 53: 80–192.
15. Singh RV. 1982. Fodder trees of India. 281-284.
16. Singh SK, Rawat GS. 2000. Flora of Great Himalayan National Park; Himachal Pradesh. Dehradun: Bishen Singh Mahendra Pal Singh. Dehradun, India. 304p.
17. Troup RS. 1921. The Silviculture of Indian Trees (Clarendon Press: Oxford). I-3: 1195p.
18. Upreti N, Tewari JC, Singh SP. 1985. The oak forest of Kumaon Himalaya: Composition, diversity and regeneration. Mountain Research and Development. 5: 163–174.
19. Wangda P, Ohsawa M. 2006. Structure and regeneration dynamics of dominant tree species along altitudinal gradient in a dry valley slope of the Bhutan Himalaya. Forest Ecology and Management 230:136150.
20. Zulfiqar Z, Khan SM, Habib Ahmad HA. 2015. Effect of pre-sowing treatments on seed germination in *Quercus glauca* Thunb., collected from different sampling sites of the Himalayan region of Pakistan.