

Sacred forest of Kunjapuri Siddhapeeth, Uttarakhand, India

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Abstract: Sacred forests are a new frontier for interdisciplinary research and are relevant for biodiversity conservation. However, several sacred forests are experiencing failure of legal protection in guaranteeing their integrity and conservation. To bridge the gap between the needs of local people and to safeguard the health of these sacred places, immediate steps are called for. The present study was conducted in Kunjapuri Siddhapeeth, which is one of the 52 Siddhapeeths of India. A total of 239 plant species belonging to 78 families and 207 genera were collected from the study area. Out of these, nine species are considered threatened and three species vulnerable. Presently, the health of this sacred forest is deteriorating under constant anthropogenic pressures. These disturbances are also a threat for various rare, vulnerable and threatened plants. These forests are maintained and managed by the forest department and the locals are not co-operating. Therefore, the government should either promote community-based conservation of biodiversity in these forests or their administration should be handed over to temple authorities.

Resumen: Los bosques sagrados representan una nueva frontera para la investigación interdisciplinaria y son relevantes para la conservación de la biodiversidad. No obstante, varios bosques sagrados carecen de una protección legal que garantice su integridad y conservación. Es necesario realizar acciones inmediatas para conciliar las necesidades de los pobladores locales y salvaguardar la salud de estos espacios sagrados. El presente estudio se llevó a cabo en Kunjapuri Siddhapeeth, que es uno de los 52 Siddhapeeths de la India. En el área de estudio se recolectó un total de 239 especies de plantas pertenecientes a 78 familias y 207 géneros. Entre éstas, se considera que nueve especies están amenazadas y tres son vulnerables. En la actualidad, la salud de este bosque sagrado se está deteriorando bajo las presiones antropogénicas constantes. Estos disturbios también constituyen una amenaza para varias plantas raras, vulnerables y amenazadas. Estos bosques son mantenidos y manejados por el departamento forestal y los pobladores locales no están cooperando. Por lo tanto, o el gobierno debería promover que la conservación de la biodiversidad en estos bosques tenga una base en la comunidad, o su administración debería pasar a manos de las autoridades del templo.

Resumo: As florestas sagradas são a nova fronteira para a investigação interdisciplinar e é relevante para a conservação da biodiversidade. Contudo, várias florestas sagradas vêm enfrentando uma lacuna legal que não lhes garante a sua integridade e conservação. Para estabelecer a ligação entre as necessidades da população local e a salvaguarda da saúde deste lugares sagrados, é necessário assumir medidas imediatas. O presente estudo foi conduzido em Kunjapuri Siddhapeeth, que é um dos 52 Siddhapeeths da Índia. Um total de 239 espécies de plantas, pertencendo a 78 famílias e 207 géneros, foram colhidos na área de estudo. Destas, nove espécies são consideradas ameaçadas e três são vulneráveis. Presentemente, o estado desta floresta sagrada está a deteriorar-se sob a constante pressão antropogénica. Estes perturbações

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são também uma ameaça para várias plantas raras, vulneráveis e ameaçadas. Estas florestas são mantidas e geridas pelo departamento de florestas mas as populações locais não estão cooperando. Por isso, o governo deve ou promover a conservação da biodiversidade numa base comunitária ou a sua administração deve ser revertida para as autoridades do templo.

Key words: Biodiversity, conservation, protected area, sacred grove, Siddhapeeth, threatened taxa.

According to Hindu mythology, *Siddhapeeth* is a holy place where all your wishes are fulfilled. In India there are 52 Siddhapeeths. These Siddhapeeths have their own forests called sacred forests. These forests are traditionally managed by local people and set aside for religious purposes, and hunting and logging is generally prohibited in these holy places. Sacred forests are special systems of biological heritage and preserve representative genetic resources for generations. They are often the last shelter for endemic and endangered plant and animal species. They are full of medicinal plants mostly used by the local '*vaidyas*' (ayurvedic physician). They also act as gene pool containing wild relatives of crop species, which can be helpful in improving cultivated varieties. Dense sacred forests also prevent soil erosion and are perennial source of water to the nearby villages.

The present study site, Kunjapuri Siddhapeeth, is situated at 30° 11' N latitude and 78° 28' E longitude, at an altitude of 1,645 m. As one of the 52 Siddhapeeths of India, this place is dedicated to goddess Kunjapuri Devi. It lies in the temperate region encompassing three major ecosystems i.e., forest, grassland and hill terraced cultivated ecosystem. It lends a panoramic view of snow clad Himalayan range in the North (Chaukhamba Ranges) and an exhilarating view of the sacred river Ganga, Rishikesh, Haridwar, Doon Valley and Shiwalik Hills in the South. This captivating site of Kunjapuri is an alluring attraction for the pilgrims and tourists, who visit this place from all over the country and world. About 150-200 pilgrims and 10-25 foreign tourists per day visit the temple. During Navratras, a religious fair is celebrated every year where over fifty thousand people gather for the celebration. Kunjapuri offers attractive destination for adventure tourism like trekking, paragliding, etc.

Plant specimens were collected monthly, between 2006 and 2007, covering all the seasons.

They were dried, treated with mercuric chloride (HgCl₂) for preservation and identified. The identification of plants was made under the expert guidance of taxonomists from the Systematic Botany Discipline of Forest Research Institute (FRI) and Wildlife Institute of India (WII). The identified plants were then mounted on the herbarium sheets and these sheets were deposited at the Forest Ecology and Environment Division, Forest Research Institute, Dehradun.

The species identified in the area were further categorized into threatened, rare, endangered and vulnerable categories on the basis of status of these species in IUCN Red List (Walter & Gillett 1998), the Red Data Book published by the Botanical Survey of India (Nayar & Shastry 1987) and other published studies conducted in the Himalayan region by several authors (Gaur 1999; Pandey *et al.* 2006; Ved *et al.* 2003).

A total of 239 plant species belonging to 78 families and 207 genera were reported from the study area (list available on request). The contribution of dicotyledon and monocotyledon families was 84.6 % (66 families) and 14.1 % (11 families), respectively. Contribution of gymnosperms was only 1.3 % (one family) to the total families and 0.8 % (two species) to the total species of the area. Forty three monocotyledon species (18 %) from 37 genera (18 %) were reported as compared to 194 (81.2 %) dicotyledon species from 168 genera (81.2 %). The floristic diversity further shows a great range in life forms viz., herbs or forbs (92 genera and 98 species), shrubs (55 genera and 63 species), trees (30 genera and 34 species), grasses (20 genera and 22 species), climbers (11 genera and 15 species) and sedges (4 genera and 7 species). *Clematis* of the Ranunculaceae family was the most dominant genus (5 species) among all the plants collected followed by *Rhamnus* (4 species) of the family Rhamnaceae, *Rubus* (3 species) of the family Rosaceae, and *Plectranthus* (3 species) of the family Lamiaceae.

Table 1. Categorization of some valuable plants reported in the study area.

Name of species	Family	Category	Reference
<i>Acer oblongum</i>	Aceraceae	Endangered	Walter & Gillett (1998) and Nayar & Shastry (1987)
<i>Bergenia ciliata</i>	Saxifragaceae	Near threatened	Ved <i>et al.</i> (2003)
<i>Carpinus viminea</i>	Betulaceae	Rare	Gaur (1999)
<i>Coleus forskohlii</i>	Lamiaceae	Rare	Gaur (1999)
<i>Cymbopogon distans</i>	Poaceae	Rare	Gaur (1999)
<i>Delphinium denudatum</i>	Ranunculaceae	Critically rare	Pandey <i>et al.</i> (2006)
<i>Fraxinus micrantha</i>	Oleaceae	Rare	Gaur (1999)
<i>Heteropogon melanocarpus</i>	Poaceae	Rare	Gaur (1999)
<i>Swertia chirayita</i>	Gentianaceae	Critically rare	Pandey <i>et al.</i> (2006)
<i>Thallictrum foliosum</i>	Ranunculaceae	Vulnerable	Pandey <i>et al.</i> (2006)

A total of 10 species of the region could be categorized as threatened taxa (Table 1). These are: *Acer oblongum* (endangered), *Carpinus viminea*, *Coleus forskohlii*, *Cymbopogon distans*, *Fraxinus micrantha* and *Heteropogon melanocarpus* (rare), *Bergenia ciliata* (near threatened), *Delphinium denudatum* and *Swertia chirayita* (critically rare), and *Thallictrum foliosum* (vulnerable). Some other important species like *Valeriana jatamansi*, *Zanthoxylum alatum* and *Nervilia aragoana* can be considered vulnerable due to low regeneration.

Presently, health of this sacred grove is deteriorating under constant anthropogenic pressure. Constant grazing, extraction of fuel-wood, collection of medicinal plants and non-wood forest products etc. are affecting the biodiversity of the region. These disturbances are also a threat for various rare, vulnerable and threatened plants of the sacred grove. Currently the forest is maintained and managed by the forest department and this being a non-sacred protection, the locals are not co-operating. Historically, people may dare to break the law of local rulers, but dared not to challenge the authority of the local deities. Therefore, the government should either declare these forests as preservation sites, incorporate them into modern conservation systems, to promote community-based conservation of biodiversity or administration of these forests should be handed over to temple authorities. This will not only protect the diversity of the sacred grove, but also improve the deteriorating condition of the sacred forest (see Rao *et al.* 2011).

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References

- Gaur, R. D. 1999. *Flora of the District Garhwal, North West Himalaya with Ethnobotanical Notes*. Trans Himalayan Publications, Srinagar, Garhwal.
- Nayar, M. P. & A. R. K. Shastry. 1987. *Red Data Book of Indian Plants*. BSI, Calcutta.
- Pandey, H. K., Deendayal & S. C. Das. 2006. Threatened medicinal plant biodiversity of western himalaya and its conservation. pp. 281-294. In: S. John William (ed.) *Biodiversity: Life to Our Mother Earth*. SECNARM. Loyola College, Chennai, Tamil Nadu, India.
- Rao, B. Ravi Prasad, M. V. Suresh Babu, M. Sridhar Reddy, A. Madhusudhana Reddy, V. Srinivasa Rao, S. Sunitha & K. N. Ganeshiah. 2011. Sacred groves in southern eastern ghats, India : Are they better managed than forest reserves? *Tropical Ecology* **52**: 79-90.
- Ved, D. K., G. A. Kinhal, K. Ravikumar, V. Prabhakaran, U. Ghate, R. V. Sankar & J. H. Indresha. 2003. *CAMP Report: Conservation Assessment and Management Prioritisation for the Medicinal Plants of Jammu and Kashmir, Himachal Pradesh and Uttaranchal*. Workshop, Shimla, Himachal Pradesh. FRLHT, Bangalore, India.
- Walter, K. S. & H. J. Gillett. 1998. *IUCN Red List of Threatened Plants*. Compiled by the World Conservation Monitoring Centre. IUCN - The World Conservation Union, Gland, Switzerland and Cambridge, UK.