

Ethnobotany plus Nutritional, medicinal, economical potential and sustainable use of *Rhododendron arboretum* spp. *arboreum* in watershed Rissa-khad of Distt, Mandi, Himachal Pradesh, India.

Tara Devi

Department of Botany, V. G. C. Mandi, NAAC accredited A Grade College, Himachal Pradesh, INDIA

Abstract: *Rhododendron arboretum* spp. *arboreum*. Is a member of Ericaceae family with a variety of local names as Buraans., Braah, Buras, Bras or Barahkephool. Burans trees usually grow on shady slopes in the forests up to an altitude of 1500-2100 m in Mandi district of H.P. Burans is a multipurpose tree and heavily exploited by locals for food, fodder, fuel, medicinal, ornamental and spiritual purpose by the inhabitants of study area. Burans flowers are edible and are used in many ways by people to harness their nutritive and medicinal properties. Flowers are a good source of earning for poor people they harvest flowers from wild for their local and commercial use. Squash is prepared from the flowers juice. This is bought in large number by tourists visiting Himachal Pradesh and Uttarakhand and is a mean of livelihood option for many. This juice has a very soothing and cooling effect during summer months. Burans tree has also many other uses. This plant also occupies a special place in the cultural & economic life of the people living in and around hills of Distt. Mandi. Flowers are also offered in temples & religious places for decoration purposes.

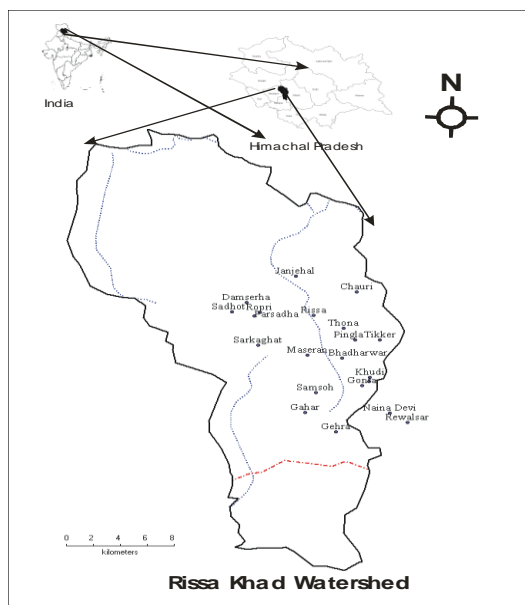
Key Words: Burans, Edible, Nutritional value, Economic potential.

I. Introduction

Burans is an evergreen tree in temperate forests of Himalaya between an altitude of 2300 to 3500 metres. It bears very attractive bright red flowers. The flowers, which are edible, appear from March to May. Sometimes, when there has been drought during this period, a second bloom of smaller intensity may also appear during July or August. But this is not very common. Burans grows all over India. It is national flower of Nepal. It has been declared the state tree of Uttarakhand. Its name, *Rhododendron* has been derived from Greek word rhodo which means rose and dendron meaning tree. Considering the beauty and utility of *Rhododendron* flower, a postal stamp was also issued by the Indian Postal Department in recognition of this flower. Dependence of native communities on floristic diversity is very well known since the Vedic Period They used plant diversity in various forms i.e., medicine, wild edible/food, fodder, fuel, timber, making agricultural tools and various other purposes¹. India is bestowed with enormous biodiversity useful plants. Himalayan forests are the most important source of medicinal plants and with useful species for the local people². But focused studies on the ethnobotany of the economically important plants in forest of the watersheds and catchments and their sustainable use have been poorly attempted. It is well-established fact that the sustainable development at small unit areas like watersheds and catchments is easier than development at a larger scale like district, region, state and country and being preferred for the development. So present study will assess nutritional, medicinal and economical potential and sustainable harvesting of *Rhododendron arboretum* spp. *arboreum* in watershed Rissa -khad of Distt, Mandi, Himachal Pradesh, India.

Study Area:

The present study has been conducted in Rissa Khad Watershed (31° 37' 38" N latitudes and 76° 48' 20" E longitudes) of Mandi district, Himachal Pradesh. It covers approximately 123.07 Km² area and represents 20 panchayats and 132 villages. The altitude of the watershed ranges from 700-2150m. It supports diverse habitats, species, communities and Ecosystems. The vegetation mainly comprises of sub-tropical and temperate types and mostly dominated by broad leaved deciduous and evergreen species and coniferous species. The watershed is inhabited by a large number of villages with 11,258 households and 33,458 human populations. The total livestock population is 11,214 (Statistical Department H.P.).



II. Methods

Rapid samplings of the burans plant was done throughout the watershed. Species is identified with the help of local flora^{3,4}. The knowledgeable persons were interviewed. Information on the local names, plant part(s) used, and use values including indigenous knowledge and practices was gathered. The information on the indigenous uses of the burans plant based on primary as well as secondary data was analysed with respect to its medicinal, nutritive and economic value. The nativity of the species has been identified following Anonymous (1883-1970)⁵ and Samant *et al.*, 1998b⁶.

III. Result and Discussion

Burans plant:

A much-branched evergreen tree, upto 14 m, having girth upto 4-5 m. Leaves oblong lanceolate, 6-12 cm long, 2.5 to 4 cm wide; upper surface glabrous, lower surface silvery-scaly.



Burans tree in full bloom

Flowers showy, in dense, globose cymes, corolla tube spotted; bell-shaped and are held in trusses of 15 to 20 flowers; colour of the flowers varies considerably, from white to shades of pink or red; some of the white and pink forms sometimes having deeper coloured spots which add to their interest and beauty; nectar pouches at the base of the flower; blood-red forms generally considered to be the most tender.

Fruit an oblong and curved capsule

Seeds minute, compressed and oblong.

Burans trees usually grow on shady slopes in the forests.

Nativity and Distribution:

Burans is native of RegHimal India Or Zeylan commonly seen in temperate forests of Himalaya between an altitude of 2300 to 3500 metres, In watershed Rissa-khad is seen from 1500 m to 2100m. Leaves and flowers of this plant are heavily utilized by local people of study area.

Edible uses:

Burans flowers are edible and are used in many ways by people. Flowers - raw or cooked⁷. These are also used commercially for preparing a squash from the juice. This is bought in large number by tourists visiting Himachal Pradesh and Uttarakhand. This has a very soothing and cooling effect during summer months.

As the flowers taste sour, so a chutney is also made from them. These are made into *Kachru* and *pakor*s. Here are recipes for some burans preparations.

Burans chutney:

Ingredients:

Fresh or dry Burans flowers petals, 250 g; fresh mint (*poodina*) leaves, 150 gm; *anardana*, 100gm; red chillies, 5-8; medium sized chopped onions, 1-2; sugar.1 tea spoon and salt, according to taste.



Flowers of *burans*

Method:

Chutney is normally prepared from fresh flowers petal known as *barahki chutney* in local dialect, but can also be prepared from dried flower petal during the off season. For preparing chutney, grind all the ingredients in a mixer except sugar and salt. Take out this mixture in a deep container then add salt and sugar. Now *barahki chutney* is ready to serve.

Buraanskakachru:

For preparing a *kachru*, ingredients required are 1/2 kg *besan* (black gram powder) or *corn flour*. 1 cup amount fresh coriander leaves, 1/2 table spoon *ajwain*, 3-5 green chillies, 1/2 table spoon turmeric powder, 2-3 chopped onions and salt according to taste. Make a paste of flower petals, *besan* or *corn flour* and spices. Heat some oil on a flat heating pan. Put this paste over a pan and cook for 15 to 20 minutes then *kachru* will be ready.



Chutney of *burans* flowers being sold at Dhawa with *pakor*s

Kachru made from <i>burans</i> flowers	
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Juice:

Burans juice a very common and pleasant drink served as sherbet in various local functions or festivals. It is also prepared from burans flowers. Juice is extracted with a common household juice extractor which is used for citrus fruits. Those villagers who do not have a juice extractor, local extract juice by boiling flowers. This juice is given orally as a blood purifier and to check nose bleeding.



Squash made from *burans* flowers

Commercial fruit canning units prepare squash from this juice. It is sold in large quantities in Himachal Pradesh and Uttarakhand.

Food Value:

One hundred grams of fresh flowers of Burans contain, moisture, 82.2% ; protein, 1.6% ; fats, 0.6% ; carbohydrates, 1.7% ; minerals, 1.3% ; fibre, 1.3% ; energy, 40 kcal; phosphorus 2.5 mg⁸.

Medicinal Uses:

The young leaves are poisonous. They are also medicinal and applied for forehead for headache. Fresh juice of flowers given orally to purify blood and check nose bleeding.⁹

The petals are dried and ground into a powder. This powder is stored and used in future as a sniff to treat nose bleeding and is said to be a very effective cure against frequent nose bleeding.

Chemical constituents and biological activity:

Chief constituents from various plant parts are ericolin, ursolic and flowers contain quercitrin and resin¹⁰ Flowers are anticancer, CNS depressant and hypotensive, leaves hypotensive CNS depressant and spasmolytic^{9,11}.

Other uses:

Burans tree has also many uses. This plant also occupies a special place in the cultural & economic life of the people of Himachal Pradesh living in hilly areas. Burans flowers offered in temples & religious places for decoration purposes. Flowers are offered during worship on *Sankranti* (संक्रान्ति) of *Hindu* calendar. Its wood is used to make tool handles, boxes, posts and furniture. The wood is termite safe. Leaves are poisonous when young and applied to forehead for headache. Extract of leaves, stem and bark is useful to get rid of rats. Tree is also exploited for fodder and fuel.

Burans as a source of income:

Wild edible plant has been part of human life since time immemorial. They played an important role in the livelihood of the rural communities in many developing countries^{12,13}.

Burans flower is a good source of income and livelihood option for poor people. Children collect flowers from forest and prepare bouquets of flowers with 10 to 15 flower sticks and sell these bouquets to visiting tourists by standing on roadside. The bouquets are bought for 20 to 50 rupees each by tourists. Some people extract juice from the flowers with simple hand operated juice extractor. This juice easily sells at the rate of 100 rupees per bottle.



Burans flowers fresh or dried being sold at Mandi town.
There is also a great demand for dried flowers and these sell 400 to 500 rupees a kg.

Burans also facing danger of extinction:

People are harvesting burans flowers ruthlessly. There is no regulation on this from State Forest Department. The flowers are removed by just cutting the branches. This causes injury to trees. Secondly very less flowers are left of trees which are affecting natural regeneration of this tree. No new trees are being added and their natural population is therefore declining every year. This need to be checked otherwise this useful tree may not be seen after a few decades.

IV. Conclusion

It has been observed that the traditional knowledge on wild food plants is on sharp decline. Unless efforts are made to educate the younger generations about their tremendous use and importance, this knowledge may be lost in the near future. Awareness is also needed for sustainable use and harvesting of burans flowers like harvesting on year bases rotational bases, encouraging new plantation with participation of local people and forest department etc. Burans flowers are harvested for fresh use or dried and stored for later use. Details for each of these stages are different and nutrient value of each processed parts will vary. So nutrient analysis of dry and other processed stage needs to be attempted

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