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Desert Plants Found in the Thar Desert of Rajasthan and Their Importance

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Abstract

'Phytogeography' is the branch of geography that deals with the distribution of plants in different regions. In Thar desert ecosystem found in Rajasthan also, different trees and shrubs are found which have adapted to the climatic conditions existing there. Some of these floral species are endemic to these areas. The different parts of these trees and plants are of varied uses for human beings. The locales living in the desert regions are very well aware of their uses. The stems, leaves and flowers of these flora are used in the food items, medicines, and other purposes. In particular, their medicinal importance makes these species special to be studied and analyzed.

Keywords Phytogeography, flora, desert, adaptation

Introduction

Rajasthan state lies in the western part of India, and is the largest state of India. Its latitudinal extent is from 23 degree 3' N to 30 degree 12' N and longitudinal extent is from 69 degree 30' E to 78 degree 17' E. To its west lies, Pakistan with which it shares boundary called Radcliffe line of 1,070 km. It shares its boundary with Punjab and Haryana to its north and north- east, with Uttar Pradesh and Madhya Pradesh to its east, with Madhya Pradesh to its south-east, with Madhya Pradesh and Gujarat to its south and south-western part. Aside from this, the Tropic of Cancer passes through the southern district of Banswara giving it the characteristics of Tropical climate.

The most important physical feature of Rajasthan is the presence of sandy desert in its western part called the " Thar " desert. The expanse of this desert is about 1,75,000 sq km that lies on the western side of the Aravalli mountains which extends from the north-east i.e. Delhi to south-west in Palanpur in Gujarat with a length of 692 km. The Thar desert in Rajasthan extends in 12 districts of its western part such as Jaisalmer, Barmer, Bikaner, Jodhpur, Churu, Jhunjhunu, Sikar, Jalore, Nagaur, Pali, Sriganganagar, Hanumangarh.

It can be inferred that the presence of the Thar desert in western Rajasthan is due to its climatic characteristics of less rainfall and, dry conditions. Thus, the wide sandy expanse is the wide scene of this area. Therefore, depending upon its climate , this area has scant 'flora' or plants, trees and 'fauna' or animals depending upon them.

Review of literature

The study of desertic flora found in this specific geographical region has been studied by various academicians, planners and environmentalists. Some of these works are:

Avasthi and Pancholi, (2019) in their book "Mumal- Rajasthan 2020", have very effectively explained the wide extent of Thar desert of Rajasthan. The book details the causes and effects of desertification in Rajasthan. It clearly gives knowledge about the districts in which this desert spreads.

Book " Botany", highlights the different types of plants and trees grown in different climatic conditions. They have also underscored the desertic varieties of plants known as xerophytes and the adaptations which these evolve to fight against the harsh climatic parameters.

Charan, P. D., and Sharma, K.C., in their article "Floral diversity of Thar desert of western Raj, India" have given the account of the characteristic species of trees that exist in the Thar desert and their uses.

Laxman Burdak in his article "Flora of the Indian Desert, Jodhpur" has talked about the different floral species of the Indian desert i.e. Thar and their importance for human beings in food, medicines, durable items etc.

Objectives of the study

As per Wikipedia definition,"A hypothesis is a proposed explanation for a phenomenon". The hypotheses proposed by this study are:

1. There are particular species of trees and shrubs that are grown only in a particular climate and so, have to grow according to the climate.
2. These species have special usages for human beings.

3. These can be used to fight against several physical as well as social frailties and bring development to this region.

Methodology

Books, e-journals, and internet have been accessed to collect information regarding the floral diversity found in the Thar desert region of Rajasthan.

Flora found in the Thar

It is imperative here to discuss phytogeography of this region." 'Phytogeography' is the branch of geography which deals with the distribution of plants or groups of plants and its focus is to explain the ranges of plants in terms of their origin, dispersal and evolution. (Matthews et al., 2003). " The father of this branch of geography is 'Humboldt', the renowned geographer.

It is found that in this Thar desert, distinct type of flora is found. 'Flora' meaning all the plant life in a particular region, here it being the area of desert, comprises plant and tree species which have their own physical, biological and economic importance. These floral species have their own special adaptations to meet the adverse desertic climatic conditions. The plant diversity found in dry conditions are called 'Xerophytes'. These are adapted in such a manner so as to absorb maximum water and to reduce transpiration rate, etc.

These xerophytic adaptations include long roots of the plants, so these can penetrate deeper into the soil and absorb maximum water. They have hard and woody stems so as to withstand severe conditions of temperature and rainfall. The stems have thick coating of wax, and are covered with dense hair in some species, so as to reduce evapotranspiration. In some xerophytes, stems may be modified into thorns, which is also an adaptation to reduce transpiration from their surfaces.

This research paper details these tree and shrub species and their relevance in the desert ecosystem to maintain the ecological balance. Here are the names of those trees and shrubs.

TREES

Khejri : ' Prosopis Cineraria'

This tree plays an important role in maintaining ecological balance. The temperature which it can tolerate is 40 degree – 45 degree Celsius in summers, and 10 degree Celsius or less in winters, and 100-600 mm rainfall. It grows on a variety of soils, and when grown in sandy soils, it acts as a stabilizing agent by binding soil particles. It is known as 'Khejra', 'Jant', or 'Janti' in western part of Rajasthan.

It is given the title of ' King of the desert', 'Kalpvriksha of the desert' or 'Wonder tree'.

This tree is used to maintain nitrogen balance in the soil which enhances the soil fertility. The fallen leaves from this tree increases the biological content of the soil. It is used to treat a variety of ailments such as asthma, bronchitis, skin disorders, leprosy, etc.

Source :Varna Ashrama College- Word Press.com

Rohida : ' Tecomella undulata'

It is a deciduous tree of the arid and semi-arid parts of Rajasthan and is called as the 'state flower of Rajasthan'. It is well adapted to loamy to sandy soil and helps in stabilizing sand dunes. It has deep, spreading roots which bind the soil particles.

The wood is used for making furniture and implements. The saffron colour dye is obtained from its flowers and the bark is used to treat several diseases like obesity, cancer, liver diseases, etc.

Source: Varna-Ashrama College- Word Press.com

Neem : ' Azadirachta indica'

It is a significant tree species that reaches a height of 15-30 metres. It has a dense crown of leaves with small white fragrant flowers. This tree is well adapted to poor soils and high temperatures, by extending its deep roots, so it can be found abundantly in Rajasthan.
Its seeds are used to produce oil which helps in curing tooth ailments and it is also used to treat various skin diseases. It is used to make pesticides and insecticides.

Source: The National Academies Press

Ber : ' Ziziphus mauritiana '

It has hard roots, hooked spines to tolerate high temperatures of about 49-50 degree Celsius. It sheds its leaves during extreme summer conditions. It can also withstand freezing temperatures. The production of Ber fruit occurs at about 400 mm rainfall. It grows on a variety of soils such as laterite, black, sandy, gravelly or alluvial soils.
It is important source of vitamin - C, so its fruit is used in candies, pickles etc. Its leaves are fed upon by cattle and camels found in the Thar desert. The timber obtained from it is hard and tough, and so, it is used to make implements and its construction purposes.

Google : ' Commiphora wightii '

It is plant or a small tree found in arid and semi-arid regions. It produces a flower called 'gugal' which is used to manufacture incense sticks and is used in ayurvedic medicines. It has thorny stems and grows upto a maximum height of 4m.
This plant is used to treat skin problems, and obesity.

Pipal : ' Ficus religiosa' It is a tree with large crown of leaves on wide branches. It is a deciduous tree which sheds its leaves in March and April. It grows in all types of soils but requires water timely. It holds medicinal importance. The bark of pipal is used to heal the wounds and in inflammations. Its fruit is used in digestive problems, heart diseases, and breathing problems. Moreover, pipal tree has religious significance as it is considered to be a sacred tree.

Shisham : ' Dalbergia sissoo ' It is a deciduous tree and reproduces by seeds and suckers. This tree is found in tropical and sub-tropical regions. Soil which has adequate moisture availability is suitable for its growth. It is a tall tree with wide girth, and compound leaves and yellow flowers.
The wood obtained from this tree is used to make durable and expensive furniture items, for heating purposes, for making pesticides and even in the treatment of obesity, wounds, intestinal diseases, etc.

Source: Wikipedia

Imli : ' Tamarindus indica ' It is a large perennial tree which grows in tropical and sub-tropical regions. It can grow in a wide variety of soils and is tolerant to strong winds as well as drought as it has widely developed roots. So, it can be widely found in Rajasthan.
Along with heavy rains, dry weather is also essential for its growth because it cannot grow in water logged conditions.
Tamarind tree produces edible fruit which is used for cooking purposes in sauces, chutneys, drinks, etc. It is used to treat constipation problems, malaria, and healing wounds.

SHRUBS

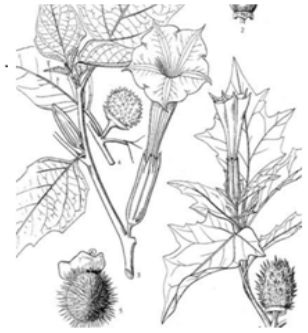
Kair : ' Capparis decidua' It is a bush, with tiny leaves. It produces fruits that are used for preparing vegetables and pickles. It produces red flowers and berries. It can tolerate extreme drought conditions even where sand dunes are found because it binds the soil by its roots.
This tree is used for climatic prediction and is used in food, and medicines. Its wood is used for fuel purposes and in building activities.

Source: Plantillustrations.org

Aakado : ' Calotropis gigantea' It is a bush which grows upto 4m and produces pink-purple flowers. Its stem is erect, branched and contains milky latex. Every part of this plant is poisonous. It is found as a weed. It is used in medicinal purposes such as in leprosy and paralysis.

Datura : ' Datura stramonium'

It is a herbaceous annual plant and grows for about 1m. It spreads its branches and leaves. It grows in different soils and is toxic.
It is important in the treatment of asthma, respiratory ailments, and skin infections. It is known for its hallucinogenic property



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Source : BioCrick- Botany Source Library

Conclusion

The above study underscores the rich number and diversity of tree and shrub species found in the Thar geographical region. These species have adapted themselves to the harsh climatic requirements such as high temperatures, low rainfall, less water availability, and poor soils. Some of these species are extremely valuable and hence become part of the daily lives of the people. The use of every part of these floral varieties is known to the people of these areas. The edible parts are used in food items, and these have extremely important medicinal uses to fight against fatal diseases.
So, it can be concluded that these species of trees and shrubs can be banked upon by taking care to increase their numbers so that, their usable products can be known and utilized for larger chunk of population as well as serve larger areas. Their products can be exported to other states as well as nations. This will lead to increased earning capacities both of the residents of these areas as well as the government. Thus, it can create new employment avenues as well which can be used to tackle the increasing poverty among the people here which leads to the increasing phenomenon of migration causing population pressure in cities.Therefore, the government and the administration should focus upon this aspect of using rich floral wealth to fight against various social problems faced by the state which will bring balanced regional development.

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