OPEN ACCESS

DRA ANNUAL INTERNATIONAL CONFERENCE 2024 ON "SOCIO-ECONOMIC TRANSFORMATION: OPPORTUNITIES AND CHALLENGES"

Int. Jr. of Contemp. Res. in Multi. *PEER-REVIEWED JOURNAL* *Volume 4 [Special Issue 1] Year 2025*

Conference Paper

Ecological and Ethnobotanical Values of Desert Plants of Malpura, Tonk, Rajasthan

Ramji Lal Kumawat *
Research Scholar, Maharaja Ganga Singh University, Bikaner, Rajasthan, India

Corresponding Author: *Ramji Lal Kumawat

DOI: https://doi.org/10.5281/zenodo.17978285

Abstract

Based on various sources, deserts contributed 13 to 33% part of the global terrestrial surface. The desert area is larger than the area of all wetlands and tropical forests combined. The Indian desert, or Thar desert harbor numerous plants, many occurring in wild conditions. The Malpura block covers a large area and contains a diversity of desert plants and animals. Vegetation of Malpura block is diverse in various places, and Sand, hills and water bodies contain biodiversity. In the study area, semi-arid conditions occur in Malpura, and the result is that many desert plants grow in this area. Many desert plants are used as medicines, fuel, food, fodder, making items, etc. The present study and research are to investigate the ecological and ethnobotanical values of many desert plants that belong to different families throughout the year. The major desert plant families were Fabaceae, Asclepiadaceae, Cucurbitaceae, Rhamnaceae, Cactaceae, Arecaceae, Liliaceae, Asparagaceae, Amaranthaceae, etc. The most abundant desert plants were *Acacia* spp. *Prosopis cineraria*, *P. julifora*, *Crotalaria burhia*, *Calotropis procera, Leptadenia pyrotechnica, Momordica dioica, Corollocarpus epigaeus, Cucumis melo* var., *Euphorbia caducifolia, Opuntia dillenii, Ziziphus nummularia, Capparis decidua, Aerva persica, Phoenix dactylifera, Aloe vera* etc.

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 12-12-2024
- **Accepted:** 23-02-2025
- **Published:** 26-03-2025
- **IJCRM:**4(SP1); 2025:100-105

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Article

Kumawat RL. Ecological and Ethnobotanical Values of Desert Plants of Malpura, Tonk, Rajasthan. Int J Contemp Res Multidiscip. 2025;4(SP1):100-105.

Access this Article Online

www.multiarticlesjournal.com

KEYWORDS: Desert, Wetlands, Malpura, Tropical, Ecological, Ethnobotanical.

1. INTRODUCTION

Deserts are rich and dynamic ecosystems that provide a wide range of biodiversity and sustainable life. Deserts cover almost 13 to 33% of the terrestrial surface. "The sandy, stony or rocky substrate contributes more to the appearance of the landscape than does the vegetation" (IUCN). That desert is an arid and semiarid desert of the Indian subcontinent, and it have highest biodiversity compared to other deserts of the world. Semiarid conditions provide good growth of desert plants in the Malpura block, and desert plants play an important role in ecological balances, food sources, fuel for cooking, medicines, timber sources, fodder sources, etc. This research aims to conduct an ecological and ethnobotanical analysis of desert plants to identify their growth duration.

Study Area

The present study was carried out in the Malpura block. Malpura block is located in the Tonk district, Ajmer division in Rajasthan.

This lies between 26.28° N latitude and 75.38° E longitude. Malpura was situated on both sides of the S.H. 12 (Jaipur - Bhilwara highway). C.S.W.R.I. and Shree Kalyanji temple are the most prominent landmarks of Malpura.

2. MATERIAL AND METHODS

The desert plants observed throughout the year, and weakly survey was done by regular field trips, and discussed with local people for observation of the ethnobotanical values of plants. The plant specimens were collected along with their flowering parts for preparing herbarium specimens for identification. The collected plants were carefully pressed and poisoned with $HgCl_2$. The collected plants were identified with the help of different flora and consulting regional herbaria (Shah, 1978. Singh and Shetty Vol. I, II, III 1987, 1991, 1993. Bhandari, 1990; Sharma, 2002. Ethnobotanical values were considered with the help of textbooks (Samba Murty 1989, Subramanyan 1996, Agarwal 1996).

3. RESULT AND DISCUSSION

Desert plants are ecologically and ethnobotanically very useful and sources of earning for people. Desert plants are base of life in desert regions.

A. Ecological values

Desert plants are the most biotic components of a desert ecosystem and are important as producers. Desert plants are ecologically valuable, such as -

1. **As producers**
   Desert plants produce food and O_2 by Photosynthesis and provide food and O_2 for other organisms in the desert ecosystem.
2. **Air Purification –**
   In a desert ecosystem, desert plants absorb carbon dioxide from the air and purify the air.
3. **Stop Desertification**
   Many desert plants, such as *Acacia*, *Leptadenia*, *Saccharum munja*, *Ziziphus*, *Argimone* and annual plants, increase soil fertility after death and litter fall. The result is good conditions available for growing other plants, and desertification stopped.
4. **Protection from Soil Erosion**
   Many desert plants, such as *Acacia*, *Prosopis*, *Ziziphus*, *Saccharum munja, Leptadenia*, *Salvadora*, *Calotropis,* etc., hold soil and protect soil erosion by air and others.
5. **As Habit**
   Many desert plants, such as *Acacia, Prosopis, Tecomella, Ziziphus, Calotropis, Leptadenia, Balanitis, Maytenus, Abutilon,* etc., provide habitats for many desert animals.
6. **Recycling of Matter**
   In desert ecosystem biogeochemical recycling by desert plants such as *Eucalyptus, Calotropis, Acacia*, *Argemone*, etc., are most purifier in the desert ecosystem.

B. Ethnobotanical values

Many years ago, people used plants for many purposes, such as

1. As Food

People are used to desert plants as food sources-

i) As fruits – *Aegle marmelos*, *Ziziphus, Salvadora, Punica, Rhus, Citrus, Cucumis, Phoenix,* etc. are used as fruits.

ii) As vegetables - Leaves of *Amaranthus, Oxalis, Aloe vera, Euphorbia caducifolia,* etc. and tubers of *Solanum tuberosum, Ceropegia bulbosa,* etc., fruits of *Solanum melongena*, *Cordia dichotoma, Cucumis, Coccinia*, *Acacia* (Patra), *Prosopis* (Sangri), *Capparis*, *Carissa*, *Lablab, Cyamopsis,* etc. are used as vegetables.

- *Panch kuta* is a mixed vegetable prepared by local people, in this vegetable mixture of fruits of *Cucumis melo* (Kachari), *Acacia senegal* (Kumtiya), *Capparis decidua* (Ker), *Prosopis cineraria* (Sangri) and *Cordia dichotoma* (Gunda).

2. As Fodder

Leaves of *Prosopis cineraria, Acacia* (Loom), *Ziziphus* (Pala), *Ailanthus* and whole plants such as *Launaea, Sonchus, Ipomea, Crotalaria, Echinops, Trianthema, Pennisetum, Cyamopsis, Amaranthus*, *Convolvulus,* and other grasses are used as fodder for cattle.

3. Timber

Acacia, Prosopis, Tecomella, Anogeissus, Butea, Ziziphus, Salvadora desert plants provide good-quality timber. Timber of desert trees is utilised in making huts, Agricultural instrument, furniture and building materials.

Acacia Senegal

***Cucumis melo* in a date leaf basket**

Momordica dioica

Citrullus colocynthis

4. Fuel for Cooking

Dry wood produced by many desert plants, such as *Acacia, Prosopis, Ziziphus, Butea*, *Salvadora* and other plants, is used by people for cooking in a clay stove (choolha).

5. Charcoal

Acacia, Prosopis, Salvadora, Butea and other desert trees are a source of wood, and this wood is burned in closed stoves in the absence of O2 to prepare charcoal. This process is called pyrolysis. Charcoal is useful in cooking and as toothpaste.

6. Making a Hedge Fence

Some spiny desert plants are used in making a hedge fence for the protection of cropland, such as *Ziziphus nummularia, Prosopis juliflora*, *Euphorbia caducifolia*, and *Maytenus eamarginata*.

Opuntia dillenii, *Balanitis aegyptiaca* etc.

7. As Ornamental plants

Euphorbia, Adenium, Ipomea, Calotropis, Crinum, Oxalis, Lawsonia, Portulaca, Parkinsonia, Agave, Aloe vera, Bryophyllum, Phoenix, Agle, Bougainvillaea, Butea, Ocimum, Amaranthus, Tinospora, Asparagus, etc. are used as ornamental plants at home, garden and temples.

8. Making Items

Leaves of *Phoenix dectylifera* used in making "date leaf basket", "palm fan" and "hut roof", and the stem is used in making agricultural items.

- Wood of *Acacia, Prosopis, Butea*, *Tecomella, Anogeissus,* etc., used in making wooden items like Kitchen items, wooden toys and decorative items.

Tecomella undulata

***Saccharum munja* – Soil holding**

Opuntia dillenii

Leptadenia pyrotechnica

9. As Medicines

Desert plants are traditionally used by local people as medicines.

- *Aloe vera, Prosopis cineraria, Acacia nilotica, Capparis decidua, Aegle marmelos, Citrus aurantium, Cucumis melo, Citrullus Colocynthis, Momordica dioica, Lawsonia inermis, Oxalis,* etc. are used in stomach problems and alimentary canals related disease.
- *Tinospora cordifolia* and *Ocimum* sanctum are used by local people for immunity improvement.

- *Euphorbia hirta* (dudhi) is used in the treatment of typhoid.
- *Withania somnifera* roots are used for weakness.
- *Commiphora wightii* is the king of medicine because it has multiple disease resistance properties, so it is very critical endangered species in its natural habitat.
- *Asparagus is used* in B.P., jaundice, and cough.

10. Other plant products

1. **Gum:** *The acacia* plant produces gum as an excretory material, Gum is used in ulcer treatment and also used in various tasty dishes.
2. **Latex:** *Calotropis*, *Euphorbia,* and some desert plants contain latex. Latex is used in the treatment of boils, cuts, sores, and wounds.
3. **Wood Ash:** Wood ash is produced after the burning of wood in cooking. Wood ash is used in the cleaning of utensils and also used as an insecticide for crops.

Ziziphus nummularia

Aloe vera

Tinospora cordifolia

Agave americana

S. No.	Botanical Name	Family	Local Name	Useful part	Ethnobotanical uses
1.	*Acacia jacquemontii* Benth	Fabaceae	Karitya	Whole plant	Timber
2.	*Acacia leucophloea* (Roxb.) Willd	Fabaceae	Orangjiya	Whole plant	Timber
3.	*Acacia nilotica* (L.) Willed.ex.Delile	Fabaceae	Desi buliya	Whole plant	Timber, gum, Fodder
4.	*Acacia Senegal* (L) Willd.	Fabaceae	Kheri	Whole plant	Timber, gum
5.	*Acacia tortilis* (Forssk) Hayne	Fabaceae	Totles buliya	Whole plant	Timber
6.	*Achyranthes aspera (L.)*	Amaranthaceae	Lat jeera, Andhijhada	Root	Teeth problem
7.	*Adenium obesum* (Forssk) Roem. & Sch.	Apocynaceae	Registani gulab	Whole plant	Ornamental
8.	*Aegle marmelos* (L.) Correa	Rutaceae	Bael	Fruit, life	In the stomach, B.P. problem
9.	*Aerva persica* (Burm.f.)Merr.	Amaranthaceae	Safed bui	Leaf, fibers	Fodder, pillow
10.	*Agave americana* L.	Asparagaceae	Rambans	Whole plant	Ornamental
11.	*Ailanthus excelsa* Roxb.	Simaroubaceae	Aradu	Leaf, stem	Fodder, fuel
12.	*Alhagi pseudalhagi* (M.Bieb.) Desv.Ex Wan.	Fabaceae	Jhanwasa	Whole plant	Hut roof, fodder
13.	*Aloe vera* (L.) Burm.f.	Liliaceae	Gwar patha	Sukulant leaves	In skin & stomach disease
14.	*Amaranthus spinosus* L.	Amaranthaceae	Kantili cholai	Leaves	As vegetable
15.	*Anogeissus pendula* Edgew	Combretaceae	Dhonkra	Stem	Timber
16.	*Argemone mexicana* L.	Papaveraceae	Satyanashi	Whole plant	In Alkaline soil, malaria, Jaundice
17.	*Balanites aegyptiaca* (L.) Delile.	Zygophyllaceae	Hingota	Stem, fruits	Wood, wounds Treatment
18.	*Butea monosperma* (Lam.) Taub	Fabaceae	Chorada	Whole plant	Fodder, Timber, colour
19.	*Bougainvillea glabra* Choisy	Nyctaginaceae	Kagaji fool	Whole plant	Ornamental
20.	*Bryophyllum pinnatum* (Lam.) Oken.	Crassulaceae	Pattharchatta	Leaves	In stone disease
21.	*Calotropis procera* (Aiton)W.T.Aiton.	Asclepiadaceae	Aakda	Leaf Latex	In Muscle pain, Boil
22.	*Capparis decidua* (Forssk) Edgew	Capparaceae	Kair	Buds, fruit	Veg., Pickles
23.	*Carissa Carands* L.	Apocynaceae	Keruja	Fruit	Vegetable, Pickles

24.	*Ceropegia bulbosa* Roxb.	Asclepiadaceae	Khadula	Tuber, Leaf	Veg., In stone treatment
25.	*Citrullus colocynthis* (L.) Schrad.	Cucurbitaceae	Papadpinda	Fruit	In Digestive problem
26.	*Citrus aurantifolia* (Christm.) Swingle	Rutaceae	Nimbu	Juicy fruit	In Pickles, Juice
27.	*Cleome viscosa* L.	Cleomaceae	Kukad bhungda	Whole plant	In Fewer, Ulcer
28.	*Coccinia grandis* (L.)Voigt	Cucurbitaceae	Kundru	Fruit	Vegetable, Pickles
29.	*Commiphora wightii* (Arn.) Bhandari	Burseraceae	Googal	Gummy resin	In Medicines, Perfume
30.	*Convolvulus arvensis* L.	Convolvulaceae	Hiran khuri	Whole plant	Fodder
31.	*Corallocarpus epigaeus* (Rottl.) C.B.Clark	Cucurbitaceae	Mirchiya kand	Tuber	In Snake bite, Psoriasis
32.	*Crinum asiaticum* L.	Amaryllidaceae	Koli kanda	Whole plant	In Pain, Vomiting, Wounds
33.	*Crotalaria burhia* Buch-Hum	Fabaceae	Lagriya	Whole plant	In Ropes, Sheds, and Huts
34.	*Cucumis melo* L.	Cucurbitaceae	Kakdi, Kachari	Fruit	Vegetable, Fruit
35.	*Cyamopsis tetragonoloba* (L.) Taub.	Fabaceae	Gwar	Fruit, Seed	Vegetable, Gwar gum
36.	*Datura stramonium* L.	Solanaceae	Dhatura	Whole plant	In Pain, Surgery
37.	*Echinops echinatus* Roxb.	Asteraceae	Kantila	Whole plant	Fodder, in Fever
38.	*Eucalyptus globulus* Labill.	Myrtaceae	Safeda	Stem	Timber
39.	*Euphorbia caducifolia* Haines	Euphorbiaceae	Ghotathor	Leaf, Latex	Vegetable, Wounds
40.	*Euphorbia hirta* L.	Euphorbiaceae	Badi dudhi	Leaf, Latex	In Typhoid
41.	*Ipomoea pestigridis* L.	Convolvulaceae	Dangdela	Whole plant	Fodder
42.	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	Shakkar kand	Root	Vegetable, Dishes
43.	*Launaea resedifolia* (L.) Kuntze	Asteraceae	Jungali gobhi	Whole plant	Fodder, Ringworm
44.	*Leptadenia pyrotechnica* (Forssk.) Decne	Asclepiadaceae	Khimf	Stem, Latex	Hut, Ropes, Ringworm
45.	*Momordica dioica* Roxb. exWilled.	Cucurbitaceae	Kakoda	Fruit	Vegetable
46.	*Maytenus emarginata* (Willd.) Ding hou	Celastraceae	Kankera	Stem	Coal, Mouthwash
47.	*Opuntia dillenii* (Ker Gawl.) Haw.	Cactaceae	Naag fani	Whole plant	Hedge fence
48.	*Ocimum americanum* L.	Lamiaceae	Nagad bapchi	Whole plant	Mosquitoes repellent
49.	*Parkinsonia aculeata* L.	Fabaceae	Ram Baval	Whole plant	Hedge, Ornamental
50.	*Pedalium murex* L.	Pedaliaceae	Bada gokharu	Whole plant	In Urinary disease, Dish
51.	*Pennisetum americanum* (L.) Tzvelcv	Poaceae	Bajra	Whole plant	Fodder, Millet
52.	*Pergularia daemia* (Forssk.) chiov.	Asclepiadaceae	Dudheli	Leaf	In Muscular pain, Tumour
53.	*Phoenix dactylifera* L.	Arecaceae	Khajur	Whole plant	Items, Fruit, Broom
54.	*Prosopis cineraria* (L.) Druce	Fabaceae	Khejdi	Whole plant	Timber, Fodder, Vegetable
55.	*Prosopis juliflora* (SW.) DC.	Fabaceae	Vilayti buliya	Whole plant	Timber, Fuel, Coal
56.	*Punica granatum* L.	Lythraceae	Anar	Fruit	Fruit
57.	*Rhus mysorensis* (G.Don) Kuntze	Anacardiaceae	Dansara	Fruit	Fruit
58.	*Saccharum munja*	Poaceae	Munj, Paani	Whole plant	Hut, Roof, Broom, Fan
59.	*Salvadora oleoides* Decne	Salvadoraceae	Jaal	White plant	Fruit, timber
60.	*Solanum melongena* L.	Solanaceae	Bengan	Fruit	Vegetable
61.	*Solanum surattense* Burm.f	Solanaceae	Kantili	Fruit	In Muscular pain
62.	*Solanum tuberosum* L.	Solanaceae	Aaloo	Tuber	Vegetable, Dishes
63.	*Tecomella undulata* (Sm.) Seem	Bignoniaceae	Rohida	Whole plant	Timber, Flower, wounds
64.	*Tinospora cordifolia* (Thumb.) Miers	Menispermaceae	Giloy	Whole plant	Fever, Immunity tonic
65.	*Tribulus terrestris* L.	Zygophyllaceae	chhota gokharu	Whole plant	Piles
66.	*Withania somnifera* (L.) Dunal	Solanaceae	Ashwagandha	Whole plant	In weakness

REFERENCES

1. A weekly survey was conducted through regular field trips, and plants were identified using Shah (1978) and e-flora.
2. Odum EP. Fundamentals of ecology. 3rd ed. Philadelphia: W.B. Saunders Co.; 1971.
3. Sharma NK. The flora of Rajasthan. Jaipur (India): Aavishkar Publishers and Distributors; 2002.
4. Shetty BV, Pandey RP. Flora of Tonk district, Rajasthan. Calcutta: Botanical Survey of India; 1983, 1991, 1993.
5. Shetty BV, Singh V. Flora of Rajasthan. Vol I, II, III. Flora of India Series 2. Howrah: Botanical Survey of India; 1987, 1991, 1993.
6. Bannerman RH, Burton J, Wen Chieh C. Journal of ethnopharmacology and western medicine. 1983.
7. Champion HG, Seth SK. A revised survey of the forest types of India. Delhi: Government of India Publication; 1968.
8. Kapoor LD. CRC handbook of Ayurvedic medicinal plants. Boca Raton: CRC Press; 1990.
9. Sharma OP. A handbook of floristic diversity of Angiosperms. Vol I. Jodhpur: Agrobios Research Publishers; 2022.
10. Samba Murty AVSS, Subrahmanyam NS. A textbook of economic botany. New Delhi: Wiley Eastern Limited; 1989.
11. Agrawal VS. Economic plants of India. Calcutta: Kailash Prakashan; 1986.

12. Bhandari MM. Flora of the Indian Desert. 2nd ed. Jodhpur: MPS Repros; 1990.
13. Ikram Bilqis, Heribert. Desert plants to stop desertification. EMBO Reports.
14. Springuel IV. Economic values of desert plants: Acacia trees in the Wadi Allaqi Biosphere Reserve.

CONFERENCE ORGANIZERS

- Desert Research Association (DRA), Headquarters – Jodhpur
- Nehru Study Centre, Jai Narain Vyas University, Jodhpur
- Government Girls College, Jhalamand (Jodhpur)
- Department of Geography, Dr. Bhim Rao Ambedkar Government College, Sri Ganganagar

In Collaboration with Kalinga University, Raipur (Chhattisgarh)