



# RGRMNH-NEWS LETTER



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## Biodiversity: Great Indian Desert



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Great Indian desert also known as the Thar desert, is the 9<sup>th</sup> largest desert of the world and forms a significant portion of western India. The total area of desert is about 2,78,330 km<sup>2</sup>, spread in western part of Indian sub-continent between 24° to 28° N latitude and 68° to 71° E longitude. It covers 1,96,150 sq km (70%) in Rajasthan, 62,180 sq km (23%) in Gujarat and about 20,000 sq km (7%) in Punjab and Haryana states. The desert extends from Sutlej river, surrounded by the Aravalli ranges on east, in south by the salt marsh known as the Great Rann of Kutch, and in the west by the Indus river. In Pakistan, the desert covers eastern Sindh Province and the south-eastern portion of Punjab Province. The desert slopes imperceptibly towards the Indus Plains and surface unevenness is mainly due to sand dunes. The dunes in the south are higher, rising sometimes to 152 m whereas in the

north they are lower and rise to 16 m above the ground level. The Aravalli forms the main landmark in the south-east of the desert. The soil of this region is generally sandy to sandy-loam in texture. The consistency and depth varies according to the topographic features. The desert has very harsh climatic conditions viz., high temperature, erratic rainfall, frequent drought, strong winds and low humidity which makes it inhospitable to different habitats leaving to migration and loss of habitats in the region.

### Biodiversity

Biodiversity refers to the variety and variability of life on earth. It is the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part. Biodiversity is both essential for our existence and intrinsically valuable in its own right because biodiversity provides the fundamental building blocks for the many goods and services a healthy environment provides. The Great Indian desert is one of the ecosystem possessing highest biodiversity among the desert ecosystems of the world. It is rich in biodiversity of flora and fauna, and also is the home of many unique plants and animals. In this region despite harsh climatic conditions several plants of medicinal and other importance occurs since time immemorial.

### Faunal Diversity

The Great Indian desert is very unique in faunal diversity including about 2,043 species from single celled animal Protozoa to Mammalia. Of these, 619 species are of vertebrates and the rest are invertebrates. This faunal diversity comes to about 2.12% of total Indian fauna. The region is represented by 52 species of Protozoa, 7 species of Porifera, 87 species of Platyhelminthes, 8 species of Rotifera, 170 species of Nematoda, 4 species of Acanthocephala, 24 species of Mollusca, 26 species of Annelida, 1035 species of Arthropoda, 11 species of Bryozoa (Ectoprocta), 142 species of Pisces, 8 species of Amphibia, 51 species of Reptilia, 350 species of Aves and 68 species of Mammals.

### Endemic Fauna

The subspecies of Wild Ass (*Equus hemionus khur*) is found only in Rann of Kutch and is endemic to this region.





Chinkara (*Gazella bennettii*)

## Characteristic Fauna

The Great Indian desert also called as the ocean of sand is home of many species of birds, reptiles and wild animals. The various desert animals and plants are adapted to survive in adverse climatic conditions. The following characteristic species of reptiles, birds and mammals are found in the Indian Desert.

**Reptiles:** Desert Monitor (*Varanus griseus*), Spiny tailed lizard (*Uromastix hardwickii*) and Central Asian Cobra (*Naja naja oxiana*)

**Birds:** Great Indian Bustard (*Ardeotis nigriceps*), Houbara Bustard (*Chlamydotis undulata*), Demoiselle Crane (*Grus virgo*), Imperial/Black-bellied Sandgrouse (*Pterocles orientalis*), White-browed Bushchat (*Saxicola macrorhynchus*) and Cream-coloured Courser (*Cursorius cursor*).

**Mammals:** Asiatic Lion (*Panthera leo persica*), Indian Wild Ass (*Equus onager*), Caracal (*Caracal caracal*), Desert Cat (*Felis silvestris*), Desert Fox (*Vulpes vulpes pusilla*), Chinkara (*Gazella bennettii*), Scaly Anteater (*Manis crassicaudata*) and Wolf (*Canis lupus pallipes*).

## Threatened Fauna

The following threatened species of Reptiles, Aves and Mammals are found in the Great Indian desert. Corals, molluscs and lobsters are distributed in the Rann of Kutch besides several species of threatened dolphins and whales. In fact, Rann of Kutch sustains isolated populations of a good number of faunal species which are extremely important from evolutionary point of view.

**Reptiles:** Common cobra (*Naja naja naja*), Central Asian cobra (*Naja naja oxiana*), Rat snake (*Ptyas mucosus*), Saw Scaled Viper (*Echis carinatus*), Spiny tailed lizard (*Uromastix hardwickii*), Desert Monitor (*Varanus griseus*) and Indian Monitor (*Varanus bengalensis*).

**Aves:** Indian Peafowl (*Pavo cristatus*), Painted Spurfowl (*Gallus lagopus*), Demoiselle Crane (*Grus virgo*), Common Crane (*Grus grus*), Great Indian Bustard (*Ardeotis nigriceps*), Houbara Bustard (*Chlamydotis undulata*), Cream-coloured Courser (*Cursorius cursor*) and Stoliczka's Bushchat (*Saxicola macrorhyncha*).

**Mammals:** Leopard (*Panthera pardus*), Jungle cat (*Felis chaus*), Desert cat (*Felis silvestris*), Caracal (*Caracal caracal*), Striped Hyaena (*Hyaena hyaena*), Wolf (*Canis lupus*), Desert Fox (*Vulpes vulpes pusilla*), Indian Fox (*Vulpes bengalensis*), Ratel/ Honey badger (*Mellivora capensis*), Wild Ass/Khur (*Equus onager*), Chinkara (*Gazella bennettii*), Blackbuck (*Antelope cervicapra*) and Indian Pangolin (*Manis crassicaudata*).

## Indian Spiny Tailed Lizard (*Uromastix hardwickii*)

A small lizard known as Indian spiny tailed lizard can be found crouching in the sand of Indian desert. Locally known as the sanda, it is hunted in large numbers for its meat and oil obtained from the fat (sanda ka tel). This is vulnerable species and exists only in Indian desert.



## Saw Scaled Viper (*Echis carinatus*)



*Echis carinatus* is a venomous viper species found in Indian desert. It is found on a range of different substrates, including sand, rock, soft soil and in scrublands. It is characterized

by a stout body with a pear-shaped head that is distinct from the neck, vertically elliptical pupils, rough and strongly keeled scales, and a short thin tail. The desert snakes are hide very easily in sand to protect by hunt and to hunt the lizards and insects.

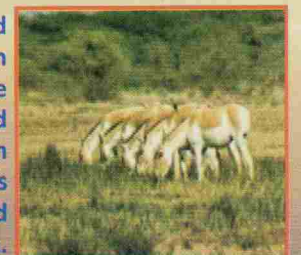
## Great Indian Bustard (*Ardeotis nigriceps*)

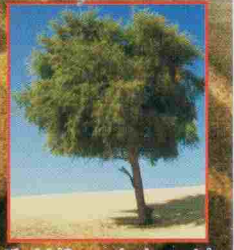


The Great Indian Bustard or Godawan, large bird of the bustard family (Otididae), one of the heaviest flying birds of the world. The great Indian bustard in habits dry grasslands and scrublands of the Indian subcontinent. According to IUCN, it is critically endangered bird. It primarily eats grass, insects, rats and seeds. It is also state bird of Rajasthan.

## Indian Wild Ass (*Equus hemionus khur*)

The Indian wild ass also called the Ghudkhur, Khur or Indian onager in the local language. Presently, the animal found only in the Rann of Kutch in Gujarat, has been classified as an "endangered" animal and also endemic to this region.





Khejri (*Prosopis cineraria*)

## Floral Diversity

The xerphytic condition of the Indian desert supports surprisingly large number of hardy, drought-resistant plant species. These plants have adapted to the desert conditions of sandy soil, scarce water and long hours of strong sunlight. Indian desert has a very rich floral diversity including about 628 species, 352 genera and 87 families of vascular plants. It is reported that the desert represents only 3.43% of the flora of India, which has about 18,259 flowering plants. Permanent features of the general vegetation include trees and shrubs like *Aerva javanica*, *Capparis decidua*, *Calligonum polygonoides*, *Commiphora wightii*, *Euphorbia caducifolia*, *Grewia tenax*, *Leptadenia phytotechnica*, *Lycium barbarum*, *Prosopis cineraria*, *Tamarix aphylla*, *Salvadora oleoides* and *Zizyphus nummularia*. Herbs like *Inula grantioides*, *Blepharis scindica* and *Cyanthillium cinereum* can generally be observed on the rocks and sandy ridges.

## Halophytic vegetation

Saline tracts spread throughout the desert, notably across Talchapar, Didwana, Pachpadra, Lunkaransar and Kuchaman, are covered with halophytic vegetation. The most common halophytes of the Thar desert are *Tamarix aphylla*, *Tamarix dioica*, *Trianthema triquetra*, *Cressa cretica*, *Portulaca oleracea*, *Haloxylon recurvum*, *H. salicornicum*, *Suaeda fruticosa*, *Sesuvium sesuvioides*, *Salsola baryosma*, *Zaleya redimita* and *Zygophyllum simplex*. The major grasses in these depressions are *Eleusine compressa*, *Eragrostis ciliaris* and *Dactyloctenium aegyptium*.

## Vegetation on sand dune

About 44% area of the Thar desert is occupied by sand dunes. Their chief characteristic is their shifting nature, due to a westerly wind action, giving them a rippling effect like sand on seashore. Seed germination is very difficult on shifting dunes, and so only the hardy psammophytic species gain a foothold in the sand. Some common vegetation on sand dunes of Indian desert including *Aerva persica*, *Aerva pseudotomentosa*, *Aerva javanica*, *Boerhavia diffusa*, *Cenchrus setigerus*, *Cenchrus ciliaris*, *Crotalaria burhia*, *Gisekia pharnaceoides*, *Mollugo cerviana*, *Panicum turgidum*, *Pedalium murex* and *Tephrosia purpurea* can be observed during monsoon period. The crests of the sand dunes are colonized often by *Lasiurus syndicus*, which is a nutritive quick-growing perennial grass. Stabilized dunes are covered mainly by *Capparis decidua*, *Calotropis procera*, *Calligonum polygonoides*, *Acacia senegal*, *Lasiurus syndicus* and *Aristida adscensions*, *Cyperus arenarius* acts as an excellent sand binder due to its stolons that bury deep in the sand, preventing the advance of sand dunes.

## Vegetation of interdunal flats

Interdunal flats of the desert holds hard and compact surfaces as compared to sand dunes. These flats retain the rainwater for longer time than sand-dunes. The dominant vegetation of such flats are *Aristida funiculata*, *Arnebia hispidissima*, *Aerva javanica*, *Convolvulus deserti*, *Crotalaria burhia*, *Capparis decidua*, *Calotropis procera*, *Dactyloctenium indicum*, *Eragrostis ciliaris*, *Evolvulus alsinoides*, *Fagonia cretica*, *Farsetia hamiltonii*, *Heliotropium bacciferum*, *Leptadenia pyrotechnica*, *Tribulus terrestris*, *Tephrosia purpurea*, *Zizyphus nummularia*, etc. The dominant tree of the Indian desert is *Prosopis cineraria*. However, in some areas of the desert, other tree flora including *Salvadora oleoides*, *Salvadora persica*, *Zizyphus mauritiana*, *Tecomella undulata*, *Balanites aegyptiaca* and *Acacia senegal*. Some climbers including *Asparagus racemosus*, *Citrullus colocynthis*, *Cucumis callosus*, *Cucumis profetarum*, *Mukia maderaspatana* and *Pergularia daemia* are found in the region.

## Aquatic vegetation

The Thar Desert is very poor in water resources. Tanks and natural lakes with a rocky substratum support a variety of aquatic vegetation like *Ceratophyllum demersum*, *Hydrilla verticillata*, *Ipomoea aquatica*, *Lemna minor*, *Nelumbo nucifera*, *Nymphaea pubescens*, *Potamogeton crispus*, *Spirodela polyrhiza* and *Vallisneria spiralis*. On the margins and dry beds are found *Heliotropium supinum* and *Eclipta prostrata*.

## Vegetation on rocky hills

The eastern border of the Thar desert of Rajasthan touches the Aravalli range. *Euphorbia caducifolia* is a characteristic lithophyte of the Thar desert that grows in dense shrubberies supporting many other climbers and twining plants within. The most common rocky plants are: *Acacia senegal*, *Aristida funiculata*, *Grewia tenax*, *Commiphora wightii*, *Lapidagathis trinervis*, *Melanocentris jacquemontii*, *Pupalia lappacea*, *Tragus biflorus*, *Gymnosporia emarginata*, *Crotalaria burhia*, *Crotalaria medicagenia*, *Euphorbia hirta*, *Tetrapogon tenellus*, etc.

## Endemic plants

According to report of ENVIS, 2016, 22 endemic taxa are found in the Thar Desert. These are *Alysicarpus vaginalis* var. *venosa*, *Cleome gynandra* var. *nana*, *Convolvulus auricomus* var. *ferruginosus*, *Convolvulus blatteri*, *Dicliptera abuensis*, *Echinops rajasthanensis*,



Shrubby horsetail  
(*Ephedra foliata*)



Guggul  
(*Commiphora wightii*)



Phog  
(*Calligonum polygonoides*)



Roheda  
(*Tecomella undulata*)



Karira  
(*Capparis decidua*)



Thar (*Euphorbia caducifolia*)

*Farsetia macrantha*, *Lindernia bracteoides*, *Melhania tomentosa* var. *maior*, *Melhania magnifolia*, *Merremia rajasthanensis*, *Oldenlandia clausai*, *Pavonia arabica* var. *glutinosa*, *Pavonia arabica* var. *massuriensis*, *Phyllanthus ajmerianus*, *Pulicaria rajputanae*, *Tamarix kutchensis*, *Tephrosia uniflora* subsp. *petrosa*, *Rosa clinophylla*, *Strobilanthes hallbergii*, *Veronica anagallis* var. *bracteosa* and *Ziziphus attenua*.

### Rare plants

According to report of ENVIS, 2016, 12 rare taxa viz., *Ammannia desertorum*, *Anogeissus sericea* var. *nummularia*, *Campylanthus ramosissimus*, *Caralluma edulis*, *Helichrysum cutchicum*, *Indigofera coerulea* var. *monosperma*, *Limonium stocksii*, *Monsonia heliotropioides*, *Sida tiagii*, *Tephrosia falciformis* and *Withania coagulans* are found in the region.

### Threatened Plants

The habitat of most of the plant species have shrunk due to expansion of human population and environmental degradation primarily due to heavy live stock grazing, uncontrolled and unscientific harvest of species. According to report of ENVIS, 2016, 7 species i.e., *Ceropegia odorata*, *Cordia crenata*, *Dicliptera abuensis*, *Farsetia macrantha*, *Ephedra foliata*, *Rosa involucreta* and *Strobilanthes hallbergii*, fall in the category of threatened plants.

### Medicinal plants

A large number of plants of the Thar Desert are known to be important from the point of view of medicinal and pharmaceutical uses. *Commiphora wightii*, *Withania somnifera* and *Urginea indica* are widely known and used as plants of medicinal utility. Some other medicinally important plants are: *Achyranthes aspera*, *Calotropis procera*, *Citrullus colocynthis*, *Eclipta prostrata*, *Ephedra foliata*, *Leptadenia pyrotechnica*, *Leucas cephalotes*, *Bacopa monnieri*, *Tecomella undulata*, *Pedaliium murex*, *Haloxylon recurvum*, *Aristolochia bracteolata*, *Euphorbia caducifolia*, *Prosopis cineraria*, *Asparagus racemosus*, etc.

## Educational Programmes/Activities

### Educational Programmes of this Quarter

- Singing Competition on World Wetland Day-02<sup>nd</sup> February, 2019.
- Painting Competition- 20<sup>th</sup> February, 2019 in connection with 5<sup>th</sup> Anniversary of RGRMNH, SWM.
- Debate Competition- 22<sup>nd</sup> February, 2019 in connection with 5<sup>th</sup> Anniversary of RGRMNH, SWM.
- Exhibition of Paintings on "Economic value of Forest"- 01<sup>st</sup> March, 2019 on occasion of 5<sup>th</sup> Anniversary Function of RGRMNH, SWM.
- Prize distribution function of various Competitions on occasion of 5<sup>th</sup> Anniversary Function of RGRMNH, SWM.- 01<sup>st</sup> March, 2019
- A visit to Soorwal Dam on World Day for Water- 22<sup>nd</sup> March, 2019.

### Educational Programmes in next Quarter

- Poster Making Competition on Earth Day- 22<sup>nd</sup> April, 2019.
- Painting Competition and a visit to Ranthambhore Fort on World Heritage Day- 18<sup>th</sup> April, 2019.
- 10 days Summer Vacation Programme for School children- 16<sup>th</sup> -25<sup>th</sup> May, 2019.
- Essay Writing Competition on International Museum Day- 18<sup>th</sup> May, 2019.
- Prize distribution function of various Competitions on occasion of World Environment Day- 5<sup>th</sup> June, 2019.
- Slogan Writing Competition on World Day to Combat Desertification 17<sup>th</sup> June, 2019.

### Highlights of the RGRMNH, SWM

- Biodiversity of Rajasthan
- Biodiversity of Western Ghats
- Common plants and vertebrate animals of Ranthambhore Tiger Reserve
- Tribes of India
- Seeds of India
- Adaptation in desert flora and fauna
- Bird diversity in Rajasthan

### Facilities

- Library
- Eco-theatre
- Auditorium
- Ramp, Wheel Chair, Blind Stick
- Drinking Water
- Parking • Lift • Biodiversity Park
- Hostel • Open Theatre



### Contact ::

**Rajiv Gandhi Regional Museum of Natural History**

Ramsinghpura, Sawai Madhopur - 322001, Tel./Fax : 07462-223010

E-mail : rgrmnhsymp@gmail.com Timinhs : 10.00 AM to 6.00 PM

(Museum will be closed on Monday & National Holidays)

