

Telangana Biodiversity

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Editorial

Hello! The 6th of July is celebrated as World Zoonoses Day. A young boy received the first vaccine against rabies, a zoonosis caused by a pathogen transmitted from animals to people, on this day in 1885. At an exponentially increasing rate, new zoonotic diseases emerge and re-emerge. SARS, MERS, and now COVID-19 are all examples of coronavirus diseases that are becoming increasingly common. Approximately 60% of human diseases are zoonotic, and at least 75% of new pathogens that cause human infections are zoonotic. Not all zoonotic infections become pandemics, but zoonoses are responsible for the majority of pandemics, which have become a hallmark of the Anthropocene period. The human–animal–environment interface has been disrupted by intensive livestock farming and agriculture, worldwide trading of exotic animals, and growing human encroachment into wildlife habitats, as well as international travel networks and urbanisation. Pathogens have always spilled from animals to people, but exponentially growing human population and exploitation of natural resources make spillover more likely and catastrophic. Pathogen discovery, surveillance, and prediction of zoonoses with pandemic potential must be prioritised by scientists and the government. A holistic approach to environmental sustainability, livestock health, and human health, acknowledging that a multi-sector strategy is the most effective way to promote public health. The research community has come together to tackle such emergencies, but the common public too need to behave responsibly to mitigate zoonoses in general.



Photo courtesy: Pixabay

Briefly

New floral species added to the list

A new floral species, *Brachystelma ananthagiriense* (Apocynaceae) has been reported from Ananthagiri hills, Vikarabad District, Telangana. This species occurs on gravelly to loamy soils of dry forests at 550–680m altitude. This plant is visible during rains but remains in vegetative state in the other seasons. It has a restricted distribution of about 100 individuals in 3km² of the forest area, making it a ‘Critically Endangered’ species. Another new species, *Cephalanthera erecta* var. *oblancoolata*, an orchid species, also known as ‘Silver Orchid’, was discovered in Quercus-Rhododendron Boreal forested area (at 1870m altitude) of Chamoli District, and reported for the first time in India by researchers of Uttarakhand State Forest Department and Botanical Survey of India (BSI). This orchid flowers in May–June. The authors state that the habitat of this orchid is under threat due to anthropogenic activities namely tourism, livestock grazing, and trampling during pilgrimages. This species has a short aerial life-span and remain underground for most part of the year. IUCN categorises this rare orchid species as ‘Endangered’.



Photo: L. Paramesh *et al.*

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Special Feature

The Tiger *Panthera tigris*

The tiger (*Panthera tigris*) belongs to the Family Felidae and is the largest member of the cat family. Six extant subspecies of this species, namely, Amur or Siberian Tiger (*P. t. altaica*); Bengal Tiger (*P. t. tigris*); Indo-chinese Tiger (*P. t. corbetti*); Sumatran Tiger (*P. t. sumatrae*); South China Tiger (*P. t. amoyensis*); and Malayan Tiger (*P. t. jacksoni*) are distributed across Asia from north-eastern China to Russia through India and Sumatra in south, which is only about 4% of its historic enormously wide distribution range. Three other subspecies, namely, Caspian Tiger (*P. t. virgata*), Javan Tiger (*P. t. sondaica*), and Bali Tiger (*P. t. balica*) have become extinct.

Tigers occur in 11 countries in Asia but only eight countries have confirmed breeding population of the species. The most common subspecies is the Indian or Bengal Tiger which has population of about 1800 individuals. Bengal Tiger has reddish-orange to yellowish coat colour with broad black stripes. The stripes are unique to each individual, just like fingerprints, thus helping in population estimation in a certain area. Ears are blackish with a white spot on the back. Forepaws are stronger and the tail is banded. The habitat of Bengal Tiger exists in Bangladesh, Bhutan, China, India, Myanmar, and Nepal. It can survive in a wide range of habitats, occurs in both dry and wet deciduous forests,

grasslands, mangrove forests, sal forests, and temperate forests. They are obligatory carnivores, hunt alone and primarily feed on ungulates, bovids, sometimes hunt birds, smaller prey species like small mammals, and domesticated animals as well. Tigers can very effectively chase their prey to a short distance or up in trees and usually kill their prey by biting hard on the neck. Adults maintain home ranges. Areas of abundant prey species see a smaller home ranges of tigers. Females give birth to between one to four cubs. A large number of threats are leading to decline in the tiger populations.

Out of all extant subspecies, three (Sumatran Tiger, South China Tiger, Malayan Tiger) are categorized as 'Critically Endangered' while the rest three (Amur Tiger, Bengal Tiger, Indo Chinese Tiger) are enlisted in the 'Endangered' category. Habitat destruction, poaching, and decline in prey species are the main threats causing tiger population decline, while climate change, urbanization, use of body parts in traditional medicine & trade, and other anthropogenic activities too contribute to it.



Photo: Deep Rajwar

Project Tiger

In India, the most ambitious conservation project, 'Project Tiger', to conserve tiger and its habitats via a holistic approach has been most effective in stabilizing the population of the species. The measures to initiate long-term tiger conservation began in early 1970s with setting up of Task Force by the government to implement techniques and surveys to monitor this flagship species.

The Task Force identified nine tiger reserves to be covered under this project. This number has now increased to 51 tiger reserves, covering the length and breadth of the country in 18 states. A total of 73,766 sq km area is covered under this

project, which includes forests, grasslands, mountains, and scrub lands. The Tiger Reserves constitute about 2.23% of the country's geographical area. Out of the total area under Tiger Reserves, 4,657.16 sq km is notified as core/critical tiger habitat while 32,978.42 sq km is notified as buffer.

The most important component of the project was 'Core-Buffer Strategy', where the core areas enclosed sites fostering tigers and the buffer areas had sink populations and provided man-tiger interface. The corridors between core areas were also taken into consideration for implementing the strategic conservation plans.

Two Tiger Reserves - Kawal and Amrabad are present in Telangana State.

NATIONAL TIGER ACTION PLAN 2011-22

This action plan concentrates on addressing the issues like poaching, isolation of source population, managing 'source-sink' dynamics, habitat improvement and water development, strengthening infrastructure within the tiger reserves, and capacity building in the country.



Photo: Jiří Mikoláš

Threatened Taxa

Plant - *Nervilia aragoana* Gaudich.



Photo: S. M. Harish

Taxonomy Order Asparagales; Family Orchidaceae.

Geographic Range Widespread species, distributed throughout Indo-Malaya and China, to Australia and the Pacific. In India, it is distributed throughout.

State Distribution Rare; known from Kavadiguntla in Bhadradi Kothagudem district.

Population Nothing is known about its population status or trends.

Habitat & Ecology Terrestrial, found in the interior of moist deciduous forest.

Major Threats Habitat loss and destruction, livestock grazing, collection for medicinal purposes.

Use & Trade This species is not in trade, but is collected for local medicinal use.

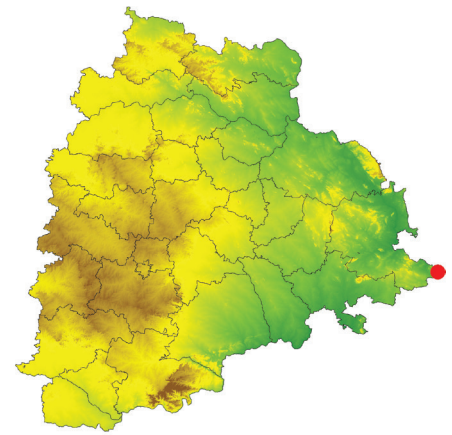
Conservation Measures No species-specific conservation measures are in place.

Assessors C. S. Reddy, B. Sadasivaiah, T. Pullaiah, E. N. Murthy, V. Hanumanth Rao, D. Veer-anjaneyulu & Chelmala Srinivasulu

Remarks

This species is found in moist deciduous forests but not in any protected areas. It is threatened by habitat destruction, livestock grazing, and collection for medicinal purposes. The estimated number of localities is 1; the estimated extent of occurrence (EOO) in Telangana State is <100 km², and the area of occupancy (AOO) is <10 km². There is an inferred continuing decline in the area, extent, and quality of suitable habitat. At the global level, this species has not been assessed. In Telangana State, this species is assessed as Critically Endangered, with the criteria A2d+B1abb(iii)+2ab(iii).

Distribution in Telangana State



Animal - *Boiga flaviviridis* Vogel & Ganesh, 2013



Photo: S.R. Ganesh

Taxonomy Class Reptilia; Order Squamata; Family Colubridae.

Geographic Range Endemic to peninsular India; known from Odisha, Maharashtra, Chhattisgarh, Telangana State, West Bengal, and Tamil Nadu.

State Distribution Very rare; known only from Eagalapenta in Nagarkurnool district.

Population Nothing is known about its population status and trends. Known from only one locality in Telangana State.

Habitat & Ecology Diurnal and arboreal, found in moist deciduous forests.

Major Threats Threats to the species are not known.

Use & Trade This species is not in trade.

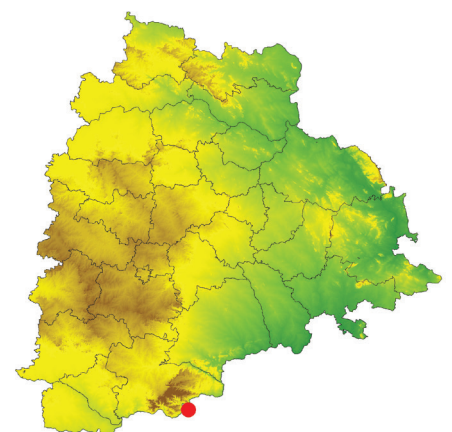
Conservation Measures No species-specific conservation measures are in place for this species. This species is reported from Amrabad Tiger Reserve.

Assessors Avinash, V., Aditya Kesav, Sandeep Anne, M. Seetharamaraju, Aditya Srinivasulu & Chelmala Srinivasulu

Remarks

This taxon is found in moist deciduous forest. It is known from Amrabad TR. Threats to the species are not known. It is very rare in occurrence. It is known from one locality. The estimated extent of occurrence (EOO) in Telangana State is <100 km², and the area of occupancy (AOO) is <10 km². This taxon has not been assessed at the global level. In Telangana State, this species is assessed as Critically Endangered, with the criteria D2.

Distribution in Telangana State



Pioneers in Conservation

Sundaram Verma

Sundaram Verma, a 68-year old environmentalist from Danta village in Sikar, Rajasthan was one of the recipients of Padma Shri, 2020. He was honoured by the Government of India for developing a very innovative, water-saving agricultural technique called 'dryland agroforestry' which made tree and crop plantation of various types in arid regions more efficient during summers. He has planted about 50,000 trees using this technique which requires as less as a litre of water for each tree to grow. Determined to pursue a career in farming, after graduating in Science in 1972, Verma studied dryland farming at the Indian Agricultural Research Institute in New Delhi through Krishi Vigyan Kendra (KVK). It was during this period he developed the technique of Dryland Agroforestry which basically works by levelling the farmland to lock in the rainwater received during monsoon, which is later available to the crops and trees during the dry season; removal of weeds



Photo courtesy: Ramaiah 360 Plus 1

and capillaries by ploughing the field multiple times; and then planting the saplings in deeper and wider pits, which later require only one litre of water to grow; weeding every three months to minimise the loss of water through evaporation. He has set up about 6 nurseries. Alongside, he has also collected and preserved local varieties of pants, crops, and seeds. Verma has been recognised for his outstanding work and has received many accolades including Award for Innovative Farmer at International Conference on Social Perspectives in Agricultural Research and Development (2006); The International Award For Agro Biodiversity by International Development Research Center in Canada (IDRC) in 2007; National innovation Foundation-India, Award for Scouting (2005 and 2015). He has also spoken about the technique at International Treaty on Plant Genetic Resources for Food and Agriculture in Rome in 2007.

Environment Education

International Tiger Day 2021

International Tiger Day (29th July) is observed around the world every year to raise awareness about declining populations of tiger and to discuss the efforts made to save this endangered species from extinction. The theme for 2021 International Tiger Day was "Their survival is in our hands". A number of events were organised in Telangana and Andhra Pradesh as the two states provide a suitable habitat for tiger populations to thrive. Many rallies and marches were organised by Telangana State Forest Department staff to address human-tiger conflicts. A webinar was also conducted in coordination with Nehru Zoological Park and Animal Warriors Conservation Society. Another prominent organization, Hyderabad Tiger Conservation Society (HyTiCoS) also conducted a few programmes on the occasion in KBR National Park and Lamakaan, Hyderabad. India alone accounts for nearly 70% of the world's total tiger population and currently has about 3,900 tiger individuals. India is home to 51 tiger reserves located across 18 states. Telangana has three tiger reserves – Amrabad Tiger Reserve, Kawal Tiger Reserve, and part of NagarjunsagarSrisailem Tiger Reserve (NSTR).

Courtesy: Anand Dharmana



Nature for Kids

Mantids - praying for their survival!

Mantids, also known as mantises or praying mantises, are a group of carnivorous insects belonging to the order Mantodea. There are about 2500 species of mantids present predominantly in tropical and subtropical habitats of the world. India is home to 169 species of mantids, distributed under 71 genera, of which, 60 species are endemic to the country. Their abundance is more in North-Eastern Region, less in Western and Eastern Ghats, and also well-adapted to arid regions of Western India. Mantids acquire their common name from the prayer-like posture they adopt with raised and folded forelegs while resting. They commonly feed on mosquitoes, caterpillars, grasshoppers, moths, butterflies, aphids, beetles, crickets, and flies but may also include frogs, fishes, and lizards as their prey. A typical mantid body is slender; elongated; divided into head, thorax, and abdomen; and has three pairs of legs. The head is triangular, capable of rotating to 180°, and has two large compound eyes. Thorax and abdomen are elongated. Forelegs are broad, spiny and used to capture prey. Two pairs of wings are present, the front pair being

leathery and narrow while the hind wings are wide and fan-shaped when unfolded. Females of some species may lack wings or are short-winged. Their size may vary from less than 10 mm to 10 cm. Females lay eggs on twigs from which nymphs emerge and turn into adults via simple or incomplete metamorphosis. Mantids exhibit very peculiar habits of prey capture, camouflage, and reproductive behaviour. They are known to stay still for very long periods before capturing their prey. They have a remarkable range of morphological adaptations and can mimic dry leaves, sticks, bark, lichen, moss, pebbles, brightly coloured flower, grass blades or an ant. Cannibalism is commonly seen among mantids to maintain territory and also as a part of mating. Females may also sometimes kill, decapitate, and consume males during courtship. Mantids play a very significant role in natural control of insect pests but habitat destruction and pesticide use are the major causes for the population decline of mantids.

Did you know that the ancient Greeks believed mantids to have supernatural powers? They hold important place in Chinese mythology as well. Chinese martial art has movements resembling that of a mantis.



Photo: Quang Nguyen Vinh

Our Biodiversity

Leaf-nosed Bats of Telangana State

Telangana State has 21 species of bats distributed throughout the state. Leaf-nosed bats belong to the family Hipposideridae. They are medium to large-sized insectivorous bats characterised by the presence of a complex noseleaf above their mouth. The noseleaf is composed of complex folds of skin which aid in echolocation. Four species of Leaf-nosed bats occur in Telangana, *Hipposideros fulvus*, *H. speoris*, *H. lankadiva*, and *H. galeritus*. Of these, *H. speoris* is most common. It roosts in caves, rocky crevices, abandoned buildings in groups of 50 – 300 individuals. *H. fulvus* is less common but distributed throughout, and groups of 20 – 40 individuals roost in low subterranean caves and abandoned buildings. *H. lankadiva* is sporadically distributed and it roosts primarily in dilapidated buildings in large colonies. Golconda Fort, Hyderabad and Kadam Dam, Nirmal have the largest roosts in Telangana State. *H. galeritus* has only been reported from a single locality in Nagarkurnool District, and is rarest of all leaf-nosed bats in Telangana State. It is mostly seen solitary or in a group of 2 – 10 individuals. Leaf-nosed bats of Telangana State produce very high frequency sound ranging from 80 – 156 kHz. They are ecologically important as they feed on insect pests including mosquitoes, moths, beetles etc. The populations of leaf-nosed bats are under threat due to habitat destruction, culling due to myths pertaining to them, and other stresses.



Photo: G. Devender, Harpreet Kaur

Feature - Flora

Indian Sandalwood - *Santalum album*

Classification

Kingdom: Plantae
Division: Tracheophyta
Class: Magnoliopsida
Order: Santalales
Family: Santalaceae
Genus: *Santalum*
Species: *album*
Authority: L.



Santalum album (Santalaceae), also known as East Indian Sandalwood, is a medium-sized, evergreen, semi-parasitic, fragrant tree (12–14 m tall). It is distributed from India to Australia through Southeast Asia. In India, this tree is found throughout, but over 90% of the distribution is in Karnataka and Tamil Nadu where it grows naturally. It thrives well up to 1800m altitude in sandy, clayey red soils, lateritic, loamy, and black cotton soils. The tree has slender drooping branchlets; reddish to black bark with vertical cracks. Leaves are thin; flowers are small, unscented, and reddish-purple. Fruit is a globose, fleshy drupe; red to black when ripe. It is commonly called *Chandan* (derived from Sanskrit and Persian) and *Sandanamu* or *Chandanamu* in Telugu. Sandalwood has been referred to in Indian mythology, folklore, and ancient scriptures. *Chandan* powder and oil derived from it hold a very significant place in Hindu rituals. It is used in making incense sticks, cosmetics, fragrance, and in soap industries. “East Indian Sandalwood Oil” is among the oldest known perfumery materials. It also finds its use in medicine as anti-septic, anti-pyretic, anti-inflammatory, anti-spasmodic, astringent, diuretic, disinfectant, emollient, hypotensive, memory booster, sedative, anti-bacterial, and insect repellent. It is also known as the second most expensive plant in the world.

Photo: Bishnu Sarangi

Feature - Fauna

Asian Elephant - *Elephas maximus* Linnaeus, 1758

Classification

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia

Order: Proboscidea

Family: Elephantidae

Genus: *Elephas*

Species: *maximus*

Authority: Linnaeus, 1758



Elephas maximus (Proboscidea), the Asian Elephant (*Enugu* in Telugu), is known to be the largest mammal to occur on land on the Asian continent. Its current distribution range spans over South and South-east Asia. However, its historic range was much vast and this species is now extinct in West Asia, Java, and most of China. India has the largest number of the Asian Elephant (about 60% of the total population), concentrated in four major regions – Southern, North-eastern, Central, and North-western. They occupy moist and dry deciduous forests, thorn forests, scrublands, grasslands, evergreen forests, and cultivated forests. It is a mega-herbivore and can weigh up to a 1000 kg. Elephants consume a large quantity of food that includes a large variety of plants depending on season and habitat. In India, it is reported to feed on 82 different plant species. It has a life-span of 60–70 years. Elephants have the longest gestation period of 22 months. They are extremely sociable and commute in groups or clans. This species holds a very sacred place in the Hindu mythology as Lord Ganesha – Remover of Obstacles, and is honoured before commencement of all sacred rituals. In the wake of extensive hunting for trophies (tusks), this species has seen a steep decline in the numbers. Human-elephant conflicts is another cause of falling numbers of elephants.

Photo: Ramki Sreenivasan

Events

Biodiversity Events at Nehru Zoological Park, Hyderabad



Courtesy: Nehru Zoological Park, Hyderabad

Nehru Zoological Park, Hyderabad has been conducting events that celebrate animals. On World Elephant Day (12th August), elephants of the zoo received a scrumptious treat. Four elephants of the zoo feasted upon ragi and rice cakes along with fruits, corn, and jaggery. Zoo's curator, Ms. VVL Subhadra Devi emphasized on putting a stop to ill-treatment of elephants and human-elephant conflicts. In other such event, a drawing competition was conducted on 10th August to celebrate World Lion Day. About 50 participants took part in the competition and prizes were distributed to the winners. The Zoo organizes such events regularly to spread awareness to the visitors.

News

Efforts by stakeholders to conserve biodiversity in Telangana



Photo courtesy: The New Indian Express

Telangana Forest Department did a commendable job of converting 160 acres of heavily degraded forest patch in Khanapur Forest Division, Nirmal, into a lush green forest by planting one lakh trees. The patch also lies in the core area of Kawal Tiger Reserve. The officials of the department, along with locals, resorted to soil moisture conservation and improving groundwater level. The wildlife has adapted to the newer patch where animals are sighted frequently now. In other news, environmentalists and heritage experts of Telangana have demanded that MoEF&CC should extend the scope of Environment Impact Assessment (EIA) to include the impacts on biodiversity, heritage, and tribal interests, which are rarely quantified in the assessment reports.

Signing Off

COVID19, a threat to animals too

Sars-CoV-2, a new coronavirus, may infect animals other than humans. They, too, can contract the virus and, if tested, will have the virus present in their bodies. While additional data is needed, the novel coronavirus "may transfer from people to animals in some settings, especially during close contact," according to the US disease watchdog, the Centers for Disease Control and Prevention (CDC). Lions, tigers, pumas, cougars, snow leopards, and non-human primates like gorillas have all tested positive in zoos and sanctuaries. These animals have also shown signs of disease in the past. Aside from the species mentioned, laboratory investigations have indicated that pigs, rabbits, and some types of deer can pick up the virus. "In experimental settings, cats, ferrets, fruit bats, hamsters, racoon dogs, and white-tailed deer can spread the virus to other animals of the same species," it claimed. Given that different species, primarily mammals, have been known to contract COVID-19, precautions must be taken to ensure that animals in our environment remain safe. When examples of pets contracting the disease continue to emerge, particularly after they come into touch with sick humans, it is critical to provide animals with the same precautions as humans. Do not allow pets to interact with individuals outside the household, as you would with other human family members. If someone in the house becomes ill, isolate them from the rest of the family, including pets.



Courtesy: Stock.Adobe

We hope you have enjoyed this issue... If you wish to share any information, please do not hesitate to contact us.



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