



Biodiversity News

of Andhra Pradesh

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Andhra Pradesh Biodiversity Board - An Introduction

The Andhra Pradesh State Biodiversity Board has been established under Section 22(1) of the Biological Diversity Act, 2002 vide the Andhra Pradesh Gazette No. 290 dated May 20, 2006. The Andhra Pradesh State Biodiversity Board consists of ten members (Chairman; Member Secretary; four Ex-Officio Members of State Government including Special Chief Secretary (Environment and Forests), Special Chief Secretary (Animal Husbandry and Dairy Development), Principal Secretary (Agriculture) and Principal Chief Conservator of Forests (Wildlife); and four expert members).

It has been around 36 months that the Andhra Pradesh State Biodiversity Board has been in existence and has many achievements to its credit. The Biodiversity Board has constituted 20 Biodiversity Management Committees in different localities of the State. The significant initiatives of the Board are the benefit sharing with the multi-national companies receiving notices for the accession fees and royalty of the final product sold world over. The Mahanandi Biodiversity Management Committee has served a demand notice to Monsanto and Mahyco in this regard for benefit sharing.

Under the Biological Diversity Act 2002 which empowers the elected bodies a sovereign right over the Biological resources and also to collect royalty for accession, collecting and utilization biological resources for commercial purposes other than the local stakeholders. The Board has conducted a number of seminars and workshops for various stakeholder to educate, train, interact and share information on biological resources. The Board has also taken steps to mitigate cases related to Biopiracy. The Board has successfully registered cases against foreign nationals involved in Biopiracy of tarantula spiders from Visakhapatnam and Anantapur districts of Andhra Pradesh. As a follow-up action to the Biopiracy case the Board has successfully initiated capacity-building initiatives for intellectual property rights, awareness by taking *Sona Masuri* variety case study of getting trademark registration in Malaysia and *Arogyapachha* initiative of benefit sharing between *Kani* tribes and multinational companies involved.

The Biodiversity Board has also initiated a two-pronged strategy in this direction. The first strategy concerns with prevention of biopiracy concept which aims at producing the first video document from the video recording of oral traditional knowledge present with illiterate and bare-footed experienced senior citizens of the Mahanandi Biodiversity Management Committee of Kurnool district. The collaboration with IIIT, Hyderabad for audio-video recording in the local dialect its translation to English and further uplinking the same with floral database of the Andhra Pradesh Forest Department is in progress. Furthermore, the IPR cell of Osmania University has been assigned with the task of uplinking the oral traditional knowledge database to the World Intellectual Property Organization website. The second strategy involves curative measures against Biopiracy. Through our Newletters we had been creating awareness and requesting the stakeholders to report cases of Biopiracy so that actions can be initiated against the perpetrators.

Dr. R. Hampaiah

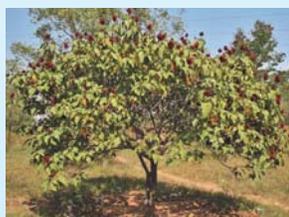
Chairman,

AP State Biodiversity Board, India

Status of Biodiversity in Andhra Pradesh



Sterculia foetida



Bixa orellana



Ficus benghalensis



Bauhinia purpurea



Fungi - *Amanita* sp.

Biological diversity or Biodiversity is defined as the variety and variability among living organisms from all sources, including *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems'

Occupying a strategic position in the Deccan Plateau, Andhra Pradesh is the fifth largest state of India with an area of 2,75,068 sq. km, which incidentally makes it the largest among the four states of South India. Andhra Pradesh sprawls across a greater part of Deccan Plateau, sloping down to embrace the quiet waters of the Bay of Bengal. The state shares its boundaries with that of Orissa and Chattisgarh on northeast, Maharashtra on north, Karnataka on west, Tamil Nadu on south and Bay of Bengal on the East. Moist to semi-evergreen forests on the hill ranges of Eastern Ghats, Nallamala and in the riverrine tracts of mighty Godavari and Krishna rivers, dry deciduous and open scrub of inland, mangroves along the estuaries and along coast line, offers a variety of habitats to varied and diverse fauna of the State.

Owing to its vast area and different geographic, microclimatic and vegetation zones, Andhra Pradesh has been bestowed upon with a rich biodiversity both in terms of flora and fauna.

The state of Andhra Pradesh is broadly divided into three regions, namely, Telengana (North Region), Coastal Andhra (Eastern Region) and Rayalseema (Southern Region). Region-wise, Telengana occupies 45.80% of the geographical area of the State and has 25.43% forest cover of the state, while coastal Andhra occupies 30.67% of the geographical area and has 21.06% of forest cover. The Rayalseema region is 25.53% of the geographical area and has 22.30% of forest cover. All the 23 districts of the state have forest of one kind or other, or an admixture of more than one. The most forested districts of the state are Khammam, Adilabad and East Godavari, while the least forested are Nalgonda and Anantapur.

Flora

Andhra Pradesh harbours a total of 2800 taxa belonging to 1051 genera under 185 families, which accounts for 16% of the angiosperms known from India. Of these 2071 species belonging to 150 families and 796 genera are Dicotyledon and 729 species belonging to 255 genera and 35 families are monocotyledons. The most diverse families are Leguminosae (340 species), Poaceae (294 species), Cyperaceae (157 species), Euphorbiaceae (136 species), Asteraceae (123 species), Acanthaceae (117 species), Rubiaceae (93 species), Orchidaceae (79 species), Lamiaceae (75 species), Convolvulaceae (63 species). Gymnosperms are represented by a meager 19 species of which 14 are cultivated. The wild Gymnosperm species include *Cycas circinalis*, *Cycas beddomei*, *Cycas sphaerica*, *Gnatum montanum* and *Gnatum ula*.

As many as 70 species and subspecies are endemic to Andhra Pradesh. These include *Cycas beddomei*, *Cycas sphaerica*, *Albizia thompsoni*, *Alysicarpus mahabubnagarensis*, *Andrographis beddomei*, *Andrographis nallamalayana*, *Argyrea arakuensis*, *Arthraxon lanceolatus* var. *echinatus*, *Boswellia ovalifolia*, *Bupleurum andhricum*, *Chamaesyce senguptae*, *Chrysopogon velutinus*, *Cleome chilidonii* var. *palla*, *Cleome viscosa* var. *nagarjunakondensis*, *Clotolaria madhurensis* var. *kurnoolica*, *Crotolaria paniculata* var. *nagarjunakondensis*, *Croton scabiosus*, *Cyathocline manilaliana*, *Decaschista cuddapahensis*, *Dicliptera beddomei*, *Dimorphocalyx kurnoolensis*, *Eriolaena lushingtonii*, *Abenaria ramayyana*, *Hybanthes vatavayii*, *Indigofera barberi*, *Iseilema venkateshwarlhuii*, *Kalanchoe cherukondensis*, *Lasiococca comberi*, *Leucas mollissima* var. *mukerjiana*, *Leucas mollissima* var. *sebastiana*, *Memecylon jadhavii*, *Niligirianthus circarensis*, *Ophiorrhiza chndrasekharanii*, *Phlebophyllum jeyporensis*, *Pimpinella tirupatiensis*, *Pterocarpus santalinus*, *Pentanema indicum* var. *sivaramanianum*, *Phyllanthus narayanaswamii*, *Memecylon madgolense*, *Rostellularia vahlii* var. *rupicola*, *Shorea tumbuggaia*, *Syzygium alternifolium*, *Terminalia pallida*, *Toxocarpus roxburghii*, *Urginea nagarjunae*.

Fungi

Fungi belong to kingdom Eukaryota that is divided into four phyla, 103 orders, 484 families and 4979 genera. Nearly more than 27,000 species of fungi have been recorded from India making it one third of the global fungal diversity. As many as 5000+ species of fungi are believed to be present in Andhra Pradesh.

Fauna

The mammalian diversity of Andhra Pradesh is represented by 108 species belonging to 33 families in 12 orders that includes 7 species of marine mammals belonging to 2 families. The larger whales dwell in deep waters and are rarely sighted. More than 50% of the known mammalian diversity of Andhra Pradesh is constituted by small mammals that belong to orders chiroptera (bats), scandentia (tree shrews), rodentia (rodents and squirrels), pholidota (pangolins) and lagomorpha (hares and pikas). The Indian Cheetah that once existed in India was also found in Andhra Pradesh. There are no endemic mammals in Andhra Pradesh, but a recent discovery of a subspecies of roundleaf bat, *Hipposideros ater nallamalaensis* Srinivasulu & Srinivasulu, 2006 makes this taxon the only endemic taxa among mammals.

The avian diversity of Andhra Pradesh is represented by 486 species belonging to 71 families in 17 orders. The passerines contribute to more than 50 percent of this diversity. Some of the rare and endangered avian species occurring in Andhra Pradesh include Great Crested Grebe, Spotted-billed Pelican, Painted Stork, Darter, Vultures (all species), Red Junglefowl, Malabar Pied Hornbill, Great Indian Bustard, Lesser Florican, Indian Courser, Yellow-throated Bulbul, Hill Myna, Tree Sparrow, etc. The Pink-headed duck that was once found in Andhra Pradesh is the only extinct bird species, while Jerdon's Courser or the Double-banded Courser is the only endemic species of bird found in the scrub jungles in the foothills of Seshachalam Hills in Cuddapah district.

The reptilian diversity of Andhra Pradesh is represented by 103 species belonging to 20 families and 3 orders. Two species of crocodiles and less than 15 species of tortoises and turtles are found in Andhra Pradesh. Rest of the reptilian diversity is represented by lizards and snakes. Among the lizards, two species, namely Nagarjuna's Skink (*Eutropis nagarjuni*) and Ashwamedh's Supple Skink (*Lygosoma ashwamedhi*) and among the snakes, one species, namely, Bholanath's Racer (*Coluber bholanathi*) are endemic to Andhra Pradesh.

The amphibian diversity of Andhra Pradesh is represented by 22 species belonging to 14 genera and four families. Some of the interesting amphibians include Grey Balloon Frog (*Uperodon globulosus*), Marbled Balloon Frog (*Uperodon systoma*), Painted Frog (*Kaloula taprobatica*), Leith's Frog (*Indirana leithii*) and a yet to be described species of *Hylorana* genus.

The fishes diversity of Andhra Pradesh includes 180 plus species of freshwater fishes in 98 genera and more than 50 families and 600 plus species of marine and estuarine fishes in 300 genera, 121 families and 28 orders.

There is a great diversity of invertebrates present in Andhra Pradesh, but only a fraction it had been studied and documented. Among the well-studied groups are odonates, spiders and butterflies. Other groups like the mites, beetles and short-horned grasshoppers too have been documented.

The Odonate diversity of Andhra Pradesh is represented by more than 75 species of dragonflies and damselflies in 43 genera and 10 families. The spider diversity is 110 plus species belonging to approximately 38 genera and 27 families. The butterfly species diversity is represented by over 250 species. So far as many as 125 plus species belonging to as many as 65 genera and 7 families of beetles have been documented from Andhra Pradesh.

Among the other invertebrate diversity, as many as 40 plus species of plant mites in 21 genera belonging to 12 families; 15 plus species of ixodid ticks in five genera belonging to one family; 52 plus species of oribatid mites in 37 genera belonging to 23 families; 23 plus species of collembolan in 13 genera belonging to four families; more than seven species of apterygots I five genera under three families and 60 plus species of short-horned grasshoppers in 25 genera belonging to two families have been documented from Andhra Pradesh.

The current status of knowledge on biodiversity of Andhra Pradesh is far from complete and it is suspected that the known diversity, especially among the lower groups of animals and plants, is less than 40% of the diversity that could be present in the State. We appeal to the Government agencies, like the AP State Biodiversity Board, to initiate projects in documenting the biodiversity.



Nilgai

Pic. Dr. C. Srinivasulu



Oriental Magpie Robin

Pic. Dr. C. Srinivasulu



Recently discovered in Andhra Pradesh - Copperheaded Trinket Snake



Marbled Balloon Frog

Pic. Dr. C. Srinivasulu

*Photo of Trinket Snake
Rakesh Soud*

*Dr. C. Srinivasulu & Dr. Bhargavi Srinivasulu
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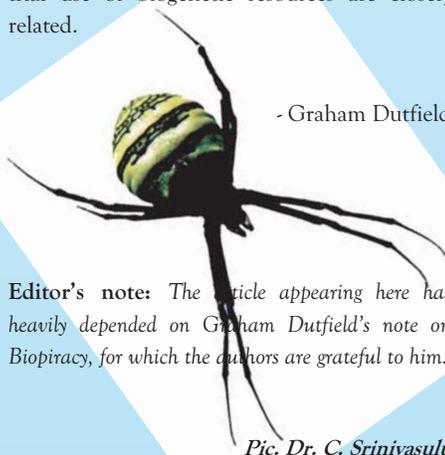
BIOPIRACY

The vast majority of countries formally recognize that cross-border exchange of genetic resources and traditional knowledge (TK) be carried out in compliance with the principles of the Convention on Biological Diversity. For a number of reasons, intellectual property rights, particularly patents but also plant variety protection, have become central to discussions on this matter. These reasons relate to the following:

- The conviction – widely held among developing countries and NGOs – that biodiversity and associated traditional knowledge have tremendous economic potential;
- The fact that patent claims in various countries may incorporate biological and genetic material including life forms within their scope;
- The belief, also shared by developing countries and NGOs, that this feature of the patent system enables corporations to steal, misappropriate or unfairly free-ride on genetic resources and associated traditional knowledge;
- The ability of modern intellectual property law to protect the innovations produced by industries based mainly in the developed world and its inability to protect adequately those in which the developing countries are relatively well-endowed; and
- The perception that as a consequence of the above reasons, the unequal distributions and concentrations of patent ownership and the unequal share of benefits obtained from industrial use of biogenetic resources are closely related.

Editor's note: The article appearing here has heavily depended on Graham Dutfield's note on Biopiracy, for which the authors are grateful to him.

- Graham Dutfield



Pic. Dr. C. Srinivasulu

“Biopiracy” has emerged as a term to describe the ways that corporations from the developed world claim ownership of, free ride on, or otherwise take unfair advantage of, the genetic resources and traditional knowledge and technologies of developing countries. While these and other corporations have been complaining about “intellectual piracy” perpetrated by people in developing countries, the latter nations counter that their biological, scientific and cultural assets are being “pirated” by these same businesses. Intellectual piracy is a political term, and as such is inaccurate and deliberately so. The assumption behind it is that the copying and selling of pharmaceuticals, music CDs and films anywhere in the world is intellectual piracy irrespective of whether the works in question had patent or copyright protection under the domestic laws. After all, if drugs cannot be patented in a certain country, copying them by local companies for the domestic market and/or overseas markets where the drugs in question are also not patented is hardly piracy in the legal sense of the word.

Similarly, biopiracy is an imprecise term, and there are good reasons to keep it so, at least in the international arena. But “strategic vagueness” is not a helpful approach for those working on legal solutions in such forms as national laws, regulations or international conventions. For biopiracy to mean anything at all, however, it cannot be considered merely as a matter of law but as also one of morality and of fairness. Accordingly, we need to acknowledge that where lines should be drawn between acts of biopiracy and legitimate practices is very hard to establish. The difficulty in drawing the line is compounded by the (deliberate) vagueness in the way the term is applied. To illustrate this point, it may be useful to explain and distinguish the terms ‘theft’, ‘unfair free-riding’ and ‘misappropriation’ by pointing out that they can encompass a broad continuum of activities from criminal acts causing serious harm, to legal but unfair activities, and even to legal, fair and socially-welfare enhancing uses of other people’s property. For example, free-riding does not require there to be a victim, whether we speak of the person whose knowledge or goods have been freely ridden upon or of society as a whole. Indeed, some acts of free-riding may be of benefit to society and should therefore be allowed. Consequently, there is likely to be considerable disagreement about how to distinguish between uses of somebody else’s property that are legal, fair and social welfare enhancing, and other uses that are unfair or illegal and/or socially perverse in its effects. Behind much of the debate about biopiracy is disagreement on whether and to what extent such terms as theft, misappropriation and unfair free-riding should apply.

Biopiracy is understood at two levels -

Traditional Knowledge (TK) Biopiracy

Collection and use: The unauthorised use of common TK; the unauthorised use of TK only found among one indigenous group; the unauthorised use of TK acquired by deception or failure to fully disclose the commercial motive behind the acquisition; the unauthorised use of TK acquired on the basis of a transaction deemed to be exploitative; the unauthorised use of TK acquired on the basis of a conviction that all such transactions are inherently exploitative (“all bioprospecting is biopiracy”); and the commercial use of TK on the basis of a literature search.

Patenting: The patent claims TK in the form in which it was acquired; the patent covers a refinement of the TK; patent covers an invention based on TK and other modern/traditional knowledge.

Genetic Resource Biopiracy

Collection and use: The unauthorised extraction and use of widespread resources; The unauthorised extraction and use of resources that can be found in one location; The unauthorised extraction and export of resources in breach of ABS regulations of the relevant country; The unauthorised extraction and export of resources in countries lacking ABS regulations; The authorised extraction of resources on the basis of a transaction deemed to be exploitative; and The authorised extraction of resources on the basis of a conviction that all such transactions are inherently exploitative.

Patenting: The patent claims the resource itself; the patent claims a purified version of the resource; and the patent covers a derivative of the resource and/or is based on more than one re-

Prior to the Convention on Biological Diversity, most countries considered genetic resources to be the "common heritage of humankind", meaning that there was no law or moral obligation requiring a company that collected genetic material from another country to pay for access to that material.

The Convention, by asserting the sovereignty of nations over their biodiversity, explicitly recognizes the right of countries to establish legislation regulating access to genetic resources and, if they wish, require payment for that access.

Moreover, it requires that any company or country collecting biodiversity obtain the prior informed consent of the source country. Because of the Convention, it will soon become standard practice for collectors to pay a fee for access to biodiversity and to enter into contractual agreements with source countries (or institutions within those countries) that allocate a share of royalties (or the patent itself) to the source country.

As has been mentioned already, under the guise of bioprospecting the traditional knowledge is being bio-pirated from India. There are a few case studies from Andhra Pradesh that projects the magnitude of the matter with respect to biopiracy. The first deals with that of a multinational company Monsanto and its Indian counterpart Mahyco Seeds. The analysis of soil from Mahanandi has revealed that the *Bacillus thuringiensis* strain that Monsanto and Mahyco exploit to manufacture the BtCotton varieties are the same as that is found in the virgin soil found in the vicinity of the Mahanandi village in Andhra Pradesh. This fact has been accepted by the reliable officers of both these companies in print media, both at national and international levels. The Mahanandi Biodiversity Monitoring Committee has issued a demand notice in this regard to both these companies and demanded benefit-sharing in return of the exploited biological resource. The companies have agreed to help the Mahanandi Biodiversity Management Committee in this regard and ensure that the local stakeholders will be involved through benefit-sharing mechanism.

The second example deals with the biopiracy case involving an international tourist who was involved in smuggling of Eastern Hemisphere Tarantulas and other large-bodied spiders from India. He was arrested while he was illegally possessing many individuals of spiders and interrogation revealed that he had been involved in this activity since last few years. A case has been booked under the Indian Wildlife (Protection) Act, 1972 and Biological Diversity Act, 2002 against the person involved.

The third case involves the theft of the traditional knowledge pertaining to the medicinal properties of a local herb *Tephrosia purpurea* that had been gathered from a local ayurveda practitioner from Kammarapally of Nizamabad district of Andhra Pradesh. Efforts are on to nail the person/s who have stolen the traditional knowledge and are using them for commercial gains.

The Biodiversity Board has been documenting such cases and taking necessary steps to initiate legal action under the Convention of Biological Diversity guidelines as well as the Biological Diversity Act, 2002 of India. The Board is also speeding up the process of creating databases on Traditional Knowledge and Biological Resources, and also uplinking these databases to International databases to share information on these aspects. Apart from the preventive and curative measures against biopiracy, the Board is also encouraging the proactive role of biological prospecting as one of the growth engines to transform India.



Regal Parachute Spider
Pic. Dr. C. Srinivasulu

Dr. V. B. Ramanamurthy & Dr. R. Hampaiah
Andhra Pradesh State Biodiversity Board, India

BIOPROSPECTING

Biodiversity prospecting, also known as bio-prospecting, is the exploration of wild plants and animals for commercially valuable genetic and biochemical resources.



Coppersmith Barbet
Pic. C. Srinivasulu



Black Marsh Trotter
Pic. C. Srinivasulu



Trapdoor Spider
Pic. C. Srinivasulu

Biodiversity Parks - Conserving Biodiversity



Scenic Rocky outcrop at Yamuna BP, Delhi



Satellite View - Yamuna BP, Delhi



Butterfly Conservatory, Yamuna BP, Delhi



Wetland Ecosystem in Osmania University Campus



Proposed Plan of Osmania University BP

The primary goals of the Biodiversity Parks, especially in or in the fringes of metropolitan cities or important towns are two pronged - a) Conserving biodiversity unique to the area, that was once present but now vanished due to developmental activities, and b) To create awareness amongst citizenry about biodiversity, its conservation and values. Many such Biodiversity Parks have been established in both India and abroad.

In India, the trend was set through the collaborative project of University of Delhi and Delhi Development Authority by setting up of the Yamuna Biodiversity Park and Aravalli Biodiversity Park under the aegis of Prof. C.R. Babu of Centre for Environmental Management of Degraded Ecosystems, University of Delhi, Delhi. Following Delhi, many states in India have set up Biodiversity Parks including Madhya Pradesh (3 Biodiversity Parks in and near Jabalpur), Maharashtra (1 Biodiversity Park in Pune), Rajasthan (1 Biodiversity Park in Jaipur), Karnataka (1 Biodiversity Park in Bangalore), and Andhra Pradesh (1 Biodiversity Park in Vishakapatnam). New parks are being proposed to be set up in Uttar Pradesh (presently five Biodiversity Parks, in collaboration of Banaras Hindu University, Varanasi), Kerala (presently two Biodiversity Parks in Trivandrum and Kochi), and Tamil Nadu (presently one Biodiversity Park in Nagercoil). In Andhra Pradesh, Biodiversity Parks are also being planned to be established in the campuses of Osmania University and Acharya N.G. Ranga Agriculture University in Hyderabad.

The Biodiversity Parks help in conservation through preservation of ecosystems, keystone species and threatened flora and fauna, gene banks for threatened land races and wild genetic resources, promote conservation education and environmental awareness to students and common public through guided tours and nature interpretation centres. The Biodiversity Parks also act as carbon sinks, check carbon-di-oxide and other pollutant levels, buffer ambient temperatures and recharge ground water table.

The need for establishing Biodiversity Parks in Hyderabad is basically due to the unprecedented rate of urbanization the city has witnessed so far and the magnitude of developmental activities that would be taking place. The negative side of this progress is decrease of green cover leading to loss of many plant and animal communities, thus, the ecological services rendered are being depleted as evidenced by depletion of ground water resources, loss of carbon-di-oxide sink, excess surface runoff, erosion of top soil, increase in ambient temperature and presence solid particulate matter in the atmosphere, alteration in concentration of life supporting gaseous elements and loss of natural habitats. All these also result in creation of waste and barren lands with minimum ecological significance that are home to invasive flora and disease carrying vectors.

The experience at the Delhi Biodiversity Parks indicate that the ecosystems can be recreated scientifically and such areas are soon preferred by the local and the migrating fauna. The wetlands of Yamuna Biodiversity Park has become wintering home to as many as 3500 individuals of 10 species of migrating ducks.

The author has conceived the plan for establishment of a Biodiversity Park in Osmania University Campus covering an area of 250 acres in total. A concept plan has been appreciated by the honourable Vice Chancellor who opines that the establishment of the Biodiversity Park in Campus will certainly help many citizens and students alike. The proposed Biodiversity Park in Osmania University envisages creation of herbal garden, bio-vedic garden, rock garden, sacred grove, butterfly garden, cactus garden, wetland ecosystems, terrarium and aquarium, orchard for indigenous fruit-yielding plants, bambusetum and different plant communities representing typical Deccan flora. The conservation education component will be achieved through Nature Interpretation Centre, newsletter, website and conservation education programmes for students and visitors. The proposed Biodiversity Park at Osmania University envisages to provide functional green cover, recharge natural aquifers, help control ambient temperatures, restore lost microhabitats, serve as nature reserve and living laboratory for short and long-term research.

The author in collaboration with the Andhra Pradesh Biodiversity Board is looking for possible funding options.

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Biological Heritage Sites of Andhra Pradesh

Biological Heritage Sites (BHSs) is the name given to the most important non-statutory wildlife sites. They contain valuable habitats such as ancient woodland, species rich grasslands and bogs. Many provide a refuge for rare and threatened plants and animals. BHSs form an irreplaceable part of our environment and are a major part of the strategy to conserve the biological richness of the world. Local authorities are required to identify and provide for the protection and enhancement of the natural heritage within their areas. As part of their planning function they have a responsibility to take account of sites of significant nature conservation value.

Andhra Pradesh Biodiversity Board has recognized 17 Biological Heritage Sites in Andhra Pradesh Basing on the mandatory criteria as per Section 37 of the Biodiversity Act (2002).

These are as follows:

Veerapuram (Anantapur Dist.): Veerapuram is famous for its painted storks which breed here. This BHS has got the distinction of entering into High Court of Judicature, Hyderabad due to imbalances of local Biological Management Committee.

Kondakarla Ava (Visakhapatnam Dist.): It is the second largest freshwater lake of our state. It is visited by diverse species of avifauna including the masked finfoot that is a globally endangered bird species. This area needs protection from the real estate boom around the lake.

Telukunchi (Srikakulam Dist.): It is a major stopover for migratory birds of the eastern corridor. Openbill storks are among the resident avifauna of this lake that breed here. The avifaunal diversity of the Chilka Lake spills on to this lake.

Naupada Swamps (Srikakulam Dist.): These swamps cater to the migratory birds using the eastern migratory route. These swamps are the last and only marine wetlands of India that has a conservational value.

Tatipudi reservoir (Vizianagaram Dist.): It is located on the Gosthani river that originates from the Borra caves. At this reservoir one can observe the masked finfoot and the sociable lapwing.

Katakshapur (Warangal Dist.): These swamps attract migratory waterfowl by the hundreds and thousands. The palm trees along the bunds provide nesting sites for the Black Ibis.

Telineelapuram (Srikakulam dist.): This is home to one of the largest heronries that house a large number of painted storks and spotted-billed pelicans.

Kolleru (West Godavari Dist.): This is one of the largest freshwater lakes of the country. A great diversity of migratory waterfowl visit this wetland. Important among them are the spotted-billed pelicans and the spoon-billed sandpiper.

Uppalapadu (Guntur Dist.): It is a small water body and is home to the spotted-billed pelicans, painted storks, cormorants and ibises.

Pulicat (Nellore Dist.): This is a large waterbody where one can find both the species of flamingos and many other species of migratory waterfowl. The rare white-bellied sea eagle can also be seen here.

Pocharam Lake (Medak Dist.): A fairly good variety of migratory waterfowl species use this wetland, prominent among them are the greylag geese, bar-headed geese, flamingo and painted storks.

Pargi Lake Complex (Ranga Reddy Dist.): This seems to be a stopover point to the migratory waterfowl enroute to their favoured migratory areas. Here great numbers of waterfowl have been recorded including the bar-headed geese and the tufted pochard.

Gundla Brashmeswaram (majorly in Prakasam Dist.): It is richly forested area and is home to good congregations of herbivores and some rare varieties of birds.

Thimmamamarrimanu (Anantapur Dist.): This houses the largest banyan tree in the world spread over 5 acres. It has been included in the Guinness Book of World Records in 1989 as a tree with largest canopy.

Hussainsagar (Hyderabad Dist.): Historically a haven for fish, presently we can see good number of migratory waterfowl and some resident birds and the grey-headed lapwing and avocet has been recorded here.

Vakalapudi (East Godavari Dist.): A wetland spread over 72.14 acres, is home to minimum 47 species of migratory and resident waterfowl.

Punyakshetram (East Godavari Dist.): Is a historically important heronry housing the spotted-billed pelicans and the painted storks.



Kondakarla Ava



Thimmamamarrimanu



Tatipudi



Veerapuram

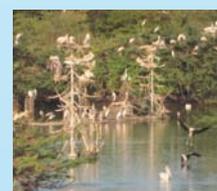
Additionally, Ramappa Temple environs, Machirajupally, Malyala, Devara Uppala and Narsampet have also been recognized as Biological Heritage Sites in Andhra Pradesh by the Andhra Pradesh Biodiversity Board.



Pocharam



Vakalapudi



Uppalapadu



Punyakshetram

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Biodiversity News of Andhra Pradesh

(Special Issue)

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Achievements so far....

Declaration of the first Biological Heritage site of Andhra Pradesh - The Veerapuram Grama Panchayati of Anantapur has submitted resolution requested for declaring Veerapuram as Biological Heritage Site. Under Section 37 (1) of Biodiversity Act, 2002 to enable the State Government to notify in the Official Gazette areas of Biodiversity importance as Biodiversity Heritage Sites under this Act. Beside these many sites have been identified and are in the process of being declared as BHSs. Initiatives to establish Biodiversity Parks taken up and recognized a Biodiversity Park established by Dolphin Conservation Society in Visakhapatnam as first Biodiversity Park of Andhra Pradesh. A ratan nursery at Warangal is being proposed for conserving these species in Andhra Pradesh and also it is proposed to develop Pegionpea Diversity Park in Seetampeta in Northeast Andhra Pradesh. In terms of sustainable utilization of the biological resources, the Board as made an attempt to assess the quantity of biological resources being utilized by various agencies such as herbal units, seed industries, and other Biotechnological companies of Andhra Pradesh and were requested to submit details in Form I of the Biological Diversity Act, 2002, and also the BMC Mahanandi has resolved that an accession fee of Rs. 300 Lakhs on multinational seed company for alleged Biopiracy of the Bacteria, *Bacillus thurengensis*; the Board proposes to initiate action against the soft drink companies which are preparing "herbal cola" drink based on the traditional knowledge of the *Hemidesmus* sp. in southern Andhra Pradesh. The first Biopiracy case as per the Biological Diversity Act, 2002 was booked against a German National Dr. Marc Clark Baumgarten and his local associate, Mr. Venkat Reddy. The Board has proposed prevention of biopiracy through the capacity building initiatives of grass root level staff of the line departments, empowering the self help groups and Biodiversity Management Committees for reporting and preventing biopiracy, and establishment of biopiracy squads as striking force to combat biopiracy. Till date about 11 Biodiversity Management Committees have been constituted in Kumool, Nalgonda, Mahaboobnagar, Visakhapatnam, Anantapur Districts. Peoples Biodiversity Registers for Mahanandi Village has been prepared and trademark dispute case with respect to Sona Masuri variety of rice has been taken up. Besides these activities, numerous capacity building activities in the form of brainstorming session, training workshops and conferences have been organized by the Board to sensitize takeholders in matters pertaining to biodiversity and its conservation.



Large Indian Flying Foxes

Pic. Dr. C. Srinivasulu

Dr. V. B. Ramanamurthy
Member-Secretary,
AP State Biodiversity Board, India