



# The Eastern Ghats

EPTRI-ENVIS Newsletter

ENVIS CENTRE ON ECOLOGY OF EASTERN GHATS



The ENVIS Centre on Eastern Ghats is a decentralized Environmental Information Centre established by the Ministry of Environment and Forests, Government of India on thematic issue of Ecology of Eastern Ghats

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## Editorial

The Fresh Water Algal Diversity of Northern Eastern Ghats and their distribution were discussed in the previous newsletter. Mammals of Kambalakonda Reserve Forest – A Habitat for Barking Deer, Mouse Deer and Indian Pangolin are discussed in current newsletter. In addition to this the National Green Tribunal Bill, Abstracts on various issues of Eastern Ghats, Forthcoming Events, World Environment Day celebrations are provided.

ENVIS Coordinator

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## THE NATIONAL GREEN TRIBUNAL ACT 2010 [New Delhi – 2<sup>nd</sup> June 2010, No. 19 of 2010]

The National Green Tribunal (NGT) Act, 2010 provides the establishment of a National Green Tribunal for the effective and expeditious disposal of cases relating to environmental protection and conservation of forest and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. The NGT Act comprises of 5 Chapters 38 sections and 3 Schedules, they are as follows.

**Chapter I [Preliminary]:** This Chapter includes short title, commencement of this act and various definitions.

**Chapter II [Establishment of Tribunal]:** This Chapter includes Establishment and Composition of Tribunal, Qualification for and appointment of Chairperson, Judicial Member and Expert Member to the Tribunal, Term of office and other conditions of service of Chairperson, Judicial Member and Expert Member, Resignation, Salaries, allowances and other terms and conditions of service, Removal and suspension of Chairperson, Judicial Member and Expert Member. To act as Chairperson of Tribunal or to discharge his functions in certain circumstances, Staff of Tribunal, Financial and administrative powers of Chairperson.

**Chapter III [Jurisdiction, Powers and Proceedings of the Tribunal]:** Tribunal to settle disputes, Relief compensation and restitution, Tribunal to have appellate jurisdiction, Liability to pay relief of compensation in certain cases, Application or appeal to Tribunal, Procedure and powers of Tribunal, Tribunal to apply certain principles, Decision to be taken by majority, Appeal to Supreme Court, Cost, Deposit of amount payable for damage for environment, Execution of award or order or decision of Tribunal.

**Chapter IV [Penalty]:** Penalty for failure to comply with orders of Tribunal, Offences by companies, offences by Government Departments

**Chapter V [Miscellaneous]:** Bar of jurisdiction, Cognizance of offence, Members and staff of Tribunal to be public servants, Protection of action taken in good faith, Act to have overriding effect, Power to amend Schedule I, Power to make rules, Amendments of certain enactments, Power to remove difficulties, Repeal and savings

**Schedule I [see section 14(1), 15(1), 17(1)(a), 17(2), 19(4)(i), and 34(1)]**

1. The Water (Prevention and Control of Pollution) Act, 1974;
2. The Water (Prevention and Control of Pollution) Cess Act, 1977;
3. The Forest (Conservation) Act, 1980;
4. The Air (Prevention and Control of Pollution) Act, 1981;
5. The Environment (Protection) Act, 1986;
6. The Public Liability Insurance Act, 1991;
7. The Biological Diversity Act, 2002;

**Schedule II [see section 15(4) and 17(1)]**

A total of 14 heads has been mentioned under which compensation or relief for damage may be claimed

**Schedule III [see section 36]**

Amendments to certain enactments as follows.

- Part I: Amendments to The Water (Prevention and Control of Pollution) Act, 1974;
- Part II: Amendments to The Water (Prevention and Control of Pollution) Cess Act, 1974;
- Part III: Amendments to The Forest (Conservation) Act, 1980;
- Part IV: Amendments to The Air (Prevention and Control of Pollution) Act, 1981;
- Part V: Amendments to The Environment (Protection) Act, 1986;
- Part VI: Amendments to The Biological Diversity Act, 2002;

## KAMBALAKONDA RESERVE FOREST – A HABITAT FOR BARKING DEER, MOUSE DEER AND INDIAN PANGOLIN

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### Study area:

The Eastern Ghats are spread over four states of India, namely Orissa, Andhra Pradesh and Tamil Nadu and Karnataka. They cover an area of about 75, 000 sq. km. with an average width of 200 km in the north and 100 km in the south. They extend over a length of 1750 km between the rivers Mahanadi and Vaigainal along East Coast. (Pullaiah.T, Muralidhara Rao.D, 2002). Kambalakonda Wildlife Sanctuary (KWS) situated at 17°47'–17°50'N and 83°04'–83°20'E is ca. 20 km (by road) northeast of Visakhapatnam city, along NH 5. It is a cluster of west–east running Eastern Ghats hills covering an area of 75 km<sup>2</sup> along with an unprotected wilderness buffer zone of 80 km<sup>2</sup> on its western side. Its topography is a steep and undulating terrain of rolling hills, thickly vegetated gorges and valleys with an average altitude of 200–300 m (Fig. 1). KWS supports three broad categories of vegetations, namely, Tropical semi-evergreen, Tropical moist deciduous and Tropical dry deciduous. The dominant species are *Acacia auriculiformis*, *A. nilotica*, *Albizia procera*, *Tectona grandis*, *Tamarindus indicus*, *Terminalia catappa*, *T. tomentosa*, *Syzygium cumini*, *Borassus flabellifer*, *Azadirachta indica*, *Mangifera indica*, *Anacardium occidentale*, *Bauhinia vahlii*, *Dendrocalamus strictus*, *Phoenix sylvestris*, *Ziziphus oenoplia* ( P.S Rajasekhar, *et al.*, 2008)

### Methodology:

Surveys were carried out on foot from 05:00 hrs to 08:00 hrs in the mornings for a period of 2 months. Mammal species were observed and documented by direct sightings with the help of a 7×35 Field 9.3<sup>0</sup> binoculars. Secondary information was also collected through informal interviews from forest officials and local

inhabitants in the surrounding villages. Indirect animal evidences like burrows, scats, pellets and tracks were also observed and photographed.

### Observations:

The thick impenetrable valleys in the reserve forest with abundant fruiting trees and shrubs offer an ideal refuge for the barking deer or Muntjac. This deer species is confined to the dense thickets and the calls of muntjac can be heard during the early morning hours in the sanctuary. The only natural predator of the barking deer in this sanctuary is the leopard which is the apex carnivore in the habitat. A healthy breeding population of this deer species could inhabit the forest area.

The Indian Pangolin or scaly ant-eater is a rare nocturnal mammal shrouded by myth and legend. The burrows and scats of this elusive animal were observed in the well protected valleys deep inside the reserve. Large termite mounds dug open by the sharp claws of the anteater were seen in the reserve and the species seemed to be thriving in the undisturbed patches of the reserve. Termites and ants which predominantly constitute the diet of the anteater are found in relative abundance in the forest. The Indian Pangolin seems to thrive in the reserve for the moment.

The mouse deer or Indian Chevrotain is the smallest deer species in India. Nocturnal, solitary and moves in areas with thick undergrowth. Rare and difficult to sight in the sanctuary due its excellent camouflaging coat pattern. The best way to identify the presence of the species in the sanctuary is by looking out for pellets and hoof marks on the ground.

Table-1: Other mammal species spotted in the sanctuary during the survey

Sl. No	Common Name	Scientific Name	No. of individuals spotted
1	Sambar	<i>Cervus unicolor</i>	19+
2	Chital or Spotted deer	<i>Axis axis</i>	24+
3	Barking deer	<i>Muntiacus muntjac</i>	3
4	Mouse deer	<i>Moschiola meminna</i>	1
5	Indian Pangolin	<i>Manis crassicaudata</i>	2
6	Palm civet	<i>Paradoxurus hermaphroditus</i>	4
7	Porcupine	<i>Hystrix indica</i>	10+
8	Rufous tailed hare	<i>Lepus nigricollis fuficaudatus</i>	15+
9	Small Indian civet	<i>Viverricula indica</i>	2
10	Long tailed tree mouse	<i>Vandeleuria oleracea</i>	5
11	Indian bush rat	<i>Golunda ellioti</i>	3
12	Three striped palm squirrel	<i>Funambulus palmarum</i>	30+
13	Indian tree shrew	<i>Anathana ellioti</i>	4
14	Wild boar	<i>Sus scrofa</i>	18+
15	Jackal	<i>Canis aureus</i>	6
16	Leopard	<i>Panthera pardus</i>	1



Figure 1: The deep gorges with dense hill forest are a safe haven for small mammals, reptiles and innumerable bird species



Figure 2: A natural catchment area amidst the hills is the main source of freshwater for sanctuary's wildlife.

#### Conclusion:

This patch of Eastern Ghats is another treasure trove for wild animals with its pristine vast expanses of hill forest, undulating terrain and thick canopy that offers excellent habitat for shy and elusive species like the muntjac, mouse deer and pangolin. However long term studies in the region can only generate enough data to understand the distribution and ecology of many species living in the reserve. Extensive surveys in the region will help understand rodent populations

that form an important prey base for many small and medium sized mammals in the sanctuary. The hills and boulders provide good cover for burrowing species. Some of the areas in the reserve are still undisturbed supporting rich bio-diversity. The impenetrable bushes provide an ideal hide out for deer species. The decomposing vegetation is consumed by detritivores like termites which in turn are a food source for the pangolin. Therefore, termites and ants are found abundantly in the reserve owing to the rich supply of decomposing biomass.

Illegal felling of trees for firewood, in the buffer zones, and collection of minor forest produce from the core areas of KWS by the surrounding villagers should be checked. The park is becoming a major tourist attraction with increasing influx of tourists. Development of some areas of the KWS for tourism should be taken up only after environmental impact studies.

#### Acknowledgements:

My field observations in the early mornings would not have been materialized without the assistance and help from the ground staff of the Reserve Forest and local youth from the nearby villages. I am deeply indebted to them. I wish to express my heartfelt gratitude to DFO, Visakhapatnam and the Curator of Indira Gandhi National Zoo, Visakhapatnam for giving me the necessary permission and facilitating this study.

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## ABSTRACTS

1. *K.E. Rajpramukh and P.D.S Palkumar. 2005. Livelihood Challenges and Strategies: The Valmikis of Eastern Ghats. Anthropologist, 7(2): 153-160*

Eastern Ghats are inhabited by numerous tribal groups. Prominent among them in the north coastal districts of Andhra Pradesh are: Bagathas, Konda Doras, Jatapus, Savaras, Gadabas, Porjas, Khonds and Valmikis. Tribals usually have to constantly cope up with different trying situations exacerbated by scarcity of food, poverty, ill-health, lack of information and illiteracy etc., and they face these challenges working out their own strategies which are naïve in some instances and innovative in others. Valmiki is an interesting case in this context. Valmikis are placed at the lowest in the tribal hierarchy. They have a social status equivalent to that of the Dalits of the plains areas. Of late, they could progress astonishingly well in all areas of social and economic life much better than all the other neighboring tribes. Petty trade and Money

business, which established a sound economic base for them, were to a large extent responsible for their phenomenal progress. With better economic status, they could improve their educational status and eventually started donning political roles. At present, with their emergence as leaders in different areas, they are even competing with the Bagathas, the dominant priestly tribe, in

economic and political domains. This paper illustrates the success story of Valmikis, vis-à-vis other tribals, despite many structural disadvantages, over three generations bringing out the role of tribal values and attitudes in exploiting the resources available in their environment. The strategies adopted in this context are three fold viz., adhering to traditional roles and performances, building strong economic base through education and occupying political roles.

2. *D. C. Kamineni and A. T. Rao.1988. Sapphirine granulites from the Kakanuru area, Eastern Ghats, India. American Mineralogist, Volume 73, pages 692-700*

Sapphirine in the granulitic terrane of the Eastern Ghats, near Kakanuru, India, has three modes of occurrence: (1) as a dominant mineral in a rock of possible regolithic origin, (2) generally as rims around spinel and magnetite in khondalite, and (3) replacing spinel in pyroxenites. All three types have distinct compositional characteristics; the  $X_{Mg}$  [Mg/(Mg + Fe<sup>2+</sup>)] value increases from 0.770 to 0.964 from type 1 to type 3. The parageneses of various types are discussed. Temperature and pressure estimates based on suitable mineral pairs and calibrated geothermometers and geobarometers indicate extremely high grade metamorphic conditions. The temperature estimate, based on two-pyroxene and two-feldspar geothermometers, ranges from 840 to 1050 °C. The estimated pressure

is about 7 .3 kbar. These P-T conditions are in accordance with the sapphirine paragenesis. The temperature estimate from the garnet-biotite geothermometer yields a lower value (=600 °C) that can be attributed to a subsequent metamorphic event accompanied by hydration and metasomatism.

3. ***Gandhamardan Hill Range, Eastern Ghats, India: An Approach to Sustainable Biodiversity Conservation. Taiwania, 55(3): 208-215***

The rich biodiversity repository of Gandhamardan hill ranges, Eastern Ghats, India is under severe threat from various magnitudes such as deforestation, unsustainable collection of medicinal plants, invasion of alien species, forest fire, urbanization and habitat destruction. The Protected Forests (PFs) have lost a number of wild species from their natural habitat pose to loss of biodiversity. The hill range having two preservation plots of 100ha each identified in Nrusinghanath (SITE-I) and Harishankar (SITE-II) range as study area. The present study inventoried a total of 10775 trees belonging to 91 tree species within a 17.6 hectare sampled area (441 plots). The predominant tree species are *Diospyros melanoxylon*, *Madhuca indica*, *Cleistanthus collinus*, *Anogeissus latifolia*, and *Lagerstroemia parviflora*. The Shannon-Weiner index ( $H'$ ) is 3.92 (SITE-I) and 3.31 (SITE-II) with Simpson's value 1.0. This value indicates that the tropical moist deciduous forests are also species diverse systems. Mean stand density was 671 ha<sup>-1</sup> in SITE-I and 565 ha<sup>-1</sup> in SITE-II. Stem density and species richness have consistently decreased with increasing girth class of tree species from 50 cm girth. The present study on phyto-diversity of tree species and participatory approaches on sustainable use of natural resources will provide the baseline information for effective and sustainable biodiversity conservation of tropical moist deciduous forest.

4. ***Alluri V. Krishnaraju<sup>1</sup>, Tayi V. N. Rao, Dodda Sundararaju, Mulabagal Vanisree, Hsin-Sheng Tsay, and Gottumukkala V. Subbaraju<sup>1</sup>.2006. Biological Screening of Medicinal Plants Collected from Eastern Ghats of India Using Artemia salina (Brine Shrimp Test). International Journal of Applied Science and Engineering, 4(2): 115-125***

Medicinal plants constitute important components of flora and are widely distributed in different regions of India. Based on ethnomedical significance, we have collected several medicinal plants used in traditional medicine from Eastern Ghats of India and evaluated for their biological activity. In the present study, a method utilizing brine shrimp (*Artemia salina* Leach) lethality was used to screen medicinal plants for their biological activity. Aqueous extracts from 118 Indian medicinal plants were screened by the brine shrimp lethality assay and found eleven out of the 118 extracts showed significant toxicity to the brine shrimp (<60 µg/ml). *Polygonum cuspidatum* and *Syzygium cumini* extracts have exhibited potent activity with LC50 13.5 and 20, respectively. The results were analyzed within the context of the available traditional knowledge and uses for these plants. Present study could be useful in the search for new antitumor compounds from the Indian flora.

5. ***S Bhattacharya and M Basei.2010. Contrasting magmatic signatures in the Rairakhol and Koraput alkaline complexes, Eastern Ghats belt, India. J. Earth Syst. Sci. 119(2): 175–181***

The relation between alkaline magmatism and tectonism has been a contentious issue, particularly for the Precambrian continental regions. Alkaline complexes at the southwestern margin of Eastern Ghats belt, India, have been interpreted as rift-valley magmatism. However, those complexes occurring in granulite ensemble in the interior segments of the Eastern Ghats belt could not possibly be related to the rift-system, assumed for the western margin of the Eastern Ghats belt. Koraput complex was emplaced in a pull-apart structure, dominated by magmatic fabrics and geochemically similar to a fractionated alkaline complex, compatible with an alkalibasalt series. Rairakhol complex, on the other hand, shows dominantly solid-state deformation fabrics and geochemically similar to a fractionated calc-alkaline suite. Isotopic data for the Koraput complex indicate ca. 917 Ma alkaline magmatism from a depleted mantle source and postcrystalline thermal overprint at ca. 745 Ma, also recorded from sheared metapelitic country rocks. The calc-alkaline magmatism of the Rairakhol complex occurred around 938 Ma, from an enriched mantle source, closely following Grenvillian granulite facies imprint in the charnockitic country rocks.

**PUBLIC AWARENESS PROGRAM ARTICLE**

The Andhra Pradesh Pollution Control Board entrusted EPTRI to conduct workshops and hands on training on Bio-Medical Waste Management in Government Hospitals of Andhra Pradesh. A total of 206 programs were conducted from December 2009 to April 2010. In the area of Eastern Ghats the programs were conducted at all UPHCs, CHCs, Maternity Hospitals, Area Hospitals and District Hospitals in Srikakulam, Vijayanagaram Visakhapatnam, East Godavari, West Godavari, Khammam, Nalgonda, Gunturu, Krishna,

EPTRI, ENVIS Staff have taken active part in creating awareness and enhancing skills on management of bio-medical waste among the medical staff.

**WORLD ENVIRONMENT DAY 2010**

Biological diversity represents the natural wealth of the Earth, and provides the basis for life and prosperity for the whole of mankind. With the theme "Bio-diversity: Connecting with Nature" for this year-which focuses on the current and potential loss of bio-diversity and its serious implications on sustainable growth the World Environment day 2010 has been celebrated all over the world.

World Environment Day was celebrated in various parts of the Kakinada on 5<sup>th</sup> June 2010. Andhra Pradesh Pollution Control Board (APPCB), various service organizations and industrial units celebrated the day by taking up awareness programs on environmental protection. Zilla Parishad Chairman Ch. Srinivasa Venugopala Krishna flagged off a rally.

Source: <http://www.hindu.com/2010/06/06/stories/2010060659510600.htm>

In Visakhapatnam, Industries and Government Organizations observed World Environment Day by planting saplings and organizing rallies and seminars. Green Awards were presented to employees who had striven for improvement of environment at Visakhapatnam Steel Plant. The Environment Management Department of VSP organized a number of activities such as cycling, environment walk and individual events such as painting, slogan, essay writing etc. Senior Environmental Engineer of Andhra Pradesh Pollution Control board KSA Krishna attended. Director (Projects) A.P. Choudhary, Executive

Director (Works) TP Rao, officials and union leaders participated. Visakha Container Terminal Private Ltd., Capt. S. Mathur, Deputy Conservator of Visakhapatnam Port Trust inaugurated the event by planting bamboo saplings. VCTPL has earmarked about 2000 sq m to develop into a Bamboo Park. Various competitions were organized for the employees and their families. Winners were given away prizes by Capt. Sriram Ravi Kumar, Vice President HR & A. Around 7000 saplings were planted to enhance the green belt at the Gangavaram Port. Mayor Pulusu Janardhana Rao planted a sapling to mark the occasion at the Port.

At NTPC, a mass tree plantation programme, vehicle emission check-up and a special lecture on 'Meteorological parameters and environment concern' marked the event. Director (projects) of NTPC B.P. Singh inaugurated the program by planting the first sapling and it was followed by plantation of saplings by employees and their family members. General Manager in charge D.K. Sood, GM (projects) P.S. Radhakrishnan, GM (CMG) S. Muley and GM (CTF) M.R. Barmase from New Delhi and other senior officials were present.

Indian Navy: Eastern Naval Command organized lectures, quizzes and workshops on environmental issues at various Naval units. Plantation of trees was also undertaken at the units.

Source: <http://www.hindu.com/2010/06/06/stories/2010060661620300.htm>

In Bhubaneswar, the World Environment Day is celebrated on 5<sup>th</sup> June 2010 by the Forest and Environment department. The Chief Minister Naveen Pattanaik graced the occasion as Chief Guest. Speaking about the rich natural heritage of the state, the Chief Minister said Nature has endowed Orissa with a rich biological diversity. On this special occasion he also informed about the important projects launched by the state government to protect the natural bounties of Orissa. Considering the state's significant expertise in wetland management and restoration, the Ministry of Environment and Forest, Government of India has approved establishment of a National Wetlands and Coastal Ecosystem Research and Training Center at Bhubaneswar, which would serve as a Center of Excellence for capacity building and research in wetland management for India and South Asia. The Chief Minister said Orissa is one amongst the few states of our country to formulate a "State Biodiversity Strategy Action Plan ". The State Biodiversity Board has also been constituted in compliance to the "Biological Diversity Act-2001", for effective conservation of biodiversity. He also informed that Orissa Climate Change Action Plan is launched on the state government website for its review by the public today. Orissa is the first state in the country to formulate the State Climate Change Action Plan. This reflects the great importance the state attaches to this important environmental issue. The suggestions will be very useful in finalizing the Action Plan. Chief Minister congratulated the winners of various competitions organized as part of the celebration of World Environment Day.

Source:<http://orissadiary.com/CurrentNews.asp?id=18904>

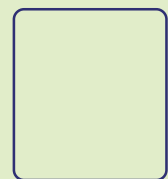
In Tiruchi, V. Ramanathan, Environmental Scientist, Tamil Nadu Pollution Control Board addressed students at the Anna Science Centre Planetarium and said students should preserve the environment by planting saplings. Around 80 students from six schools attended the lecture on 'Protect our environment' organized on account the World Environment Day on June 5. The program was part of the 'Meet your Scientist' series, a monthly initiative by the Science Centre to provide an opportunity for school students to interact with experts from various fields.

Source : <http://www.hindu.com/2010/06/06stories/2010060659500600.htm>



**AWARENESS:**

V. Ramanathan, Environmental Scientist, TNPCB, addressing students in Tiruchi on Saturday



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