

- Volume 7 Number 1
- A Quarterly Issue
- April - June 2020



ISSN : 2394-7543

ENVIS Newsletter
Forest Genetic Resources & Tree Improvement
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(Indian Council of Forestry Research and Education)



From the
Director's Desk

Greetings from the IFGTB family!

I am happy to inform you that I have joined as the Director of the Institute. The Environmental Information System at IFGTB has been providing a base for information dissemination in issues related to Forest Genetic Resources and Tree Improvement. This newsletter is an extension component of the ENVIS for increasing public awareness on FGRs. Other components include skill development training, providing information through databases and replies to queries. The newsletters provide information on potential tree genetic resources in India. It also provides an insight into research on various aspects in trees, both basic and applied, to increase awareness among the public.

I sincerely hope that the content of the newsletter would be of interest to tree researchers all over the country. I thank the ENVIS team for their support towards the mandate of the ENVIS.

Dr C. Kunhikannan
Director, IFGTB

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Know your trees - *Albizia lebbbeck* (L.) Benth

Introduction

Albizia lebbbeck (L.) Benth. (Synonym: *Mimosa lebbbeck* L.) belongs to the family Fabaceae. It is commonly called as Siris (English and Hindi), Bagemara (Kannada), Nenmenivaka (Malayalam), Sirisah (Sanskrit), Vagai (Tamil) and Dirisana (Telugu). Common names such as “woman tongue” and “rattle pod” derive from the noise of its pods shaking in the wind.



Taxonomy classification

Kingdom : Plantae
 Class : Dicotyledonae
 Order : Fabales
 Family : Fabaceae
 Subfamily : Mimosoideae
 Genus : *Albizia*
 Species : *lebbbeck*

Distribution and habitat

A. lebbbeck is native to deciduous and semideciduous forests in Asia from eastern Pakistan through India and Sri Lanka to Burma. It can also be found in moist semi-evergreen or in evergreen

forests usually occurring scattered and not gregariously (Troup, 1921). The tree has been introduced as an ornamental and plantation tree throughout the tropics and northern subtropics, including the Greater and Lesser Antilles, Central America, Colombia, Venezuela, and Brazil (Parrotta, 2008). It is a naturalized species in many other tropical and subtropical areas (Streets, 1962).

In Andamans, it is a regular forest tree and occurs not only in the semideciduous or padauk bearing forest but also in the evergreen forests. In the semi-deciduous forests, it is associated with *Pterocarpus dalbergioides*, *Lagerstroemia hypoleuca*, *Terminalia bialata*, *Bombax insigne*, *Sterculia alata*, *S. villosa*, *Myristica irya* and *Artocarpus chaplasha*. In the evergreen forests, its companions are *Dipterocarpus turbinatus*, *Planchonia andamanica*, *Artocarpus lakoocha*, *Calophyllum spectabile*, *Mesua ferrea*, *Hopea odorata*, *Mimusops elengi* and *Podocarpus neriifolia* (Troup, 1921).

It grows in a wide range of climates, covering an annual rainfall range of 600 - 2500 mm. However, it also has been grown successfully in areas with an annual rainfall as low as 400 mm. It grows in Himalayan valleys up to 1200 m. The species is adapted to a wide range of soil types, from acid soils to alkaline and saline conditions (Prinsen 1986). It can also be grown on black cotton soils. The tree grows best on moist, well-drained soils. Older trees withstand grass fires and night frosts of considerable intensity. Such stresses kill off above-ground growth of young trees, but new growth usually follows (NFTA, 1988). It can not withstand water logging.

Botanical Descriptions

In the open, the tree forms a short bole, branching low down, with a broad crown, but in the forest the tree develops a straight bole. It has

smoothish, finely fissured and grayish-brown bark, inner bark reddish. Leaves, bipinnate, rachis 70-90 mm, rachillae 1-5 pairs, 50-70 mm. Leaflets 3-11 pairs, oblong to elliptic-oblong, asymmetrical, 15-65 mm x 5-35 mm, glabrous, entire, initially bright green and folding at night, maturing to a duller glaucous green and fixed rachis. Fully but briefly deciduous in the dry season. Inflorescence, an axillary cluster of 15-40 pedicellate flowers. Peduncle to 100 mm, pedicel 1.5-5 mm, corolla inconspicuous, free filaments numerous, 15-30 mm. Entire inflorescence, fluffy, 60 mm diameter, yellow-green with distinctive pleasant fragrance. Pod, flat oblong 120-350 mm x 30-60 mm, stiff-papery when ripe, swollen over seeds, dehiscent. Seeds, 3-12 per pod, brown, flattened, 7 x 1.5 mm (Parrotta, 2008; Troup, 1921). In northern India, leaf fall commences in October and November and some trees are almost leafless by the end of November. New leaves appear in April or sometimes as early as March. Trees or branches which yield fruits in plenty become leafless earlier and remain leafless longer than those which do not (Troup, 1921).

Reproductive Biology and Breeding System

The fragrant flowers usually appear with new leaves over an extended period beginning at the end of the dry season. The flowers are cream-coloured with long stamens and appear on lateral stalks in round clusters during April to May (Parrotta, 1988). Its flowers are self-compatible, but for flower tripping, it requires pollinator's visitation (Lowry *et*



al., 1994). *Apis dorsata*, *Amegilla cingulata*, *Apis florea*, *Nomia oxybeloides* and *Xylocopa aestuans* were the most abundant species and effective pollinators of *A. lebbek* in open pollination. The open pollinated flowers have significantly higher capsule weight, seed weight, seed numbers per pod and seed germination percentage as compared to caged flowers. (Latif *et al.*, 2019).

Fruit collection and processing

The seeds are subject to the attack of insects and many are destroyed both on the tree and on the ground. Rain sometimes causes much of the seed to rot in the pods, particularly after they have fallen and it is therefore advisable to collect the seeds immediately after it ripens (Troup, 1921). Immature pods are green, turning straw-colored on maturity, usually 6 to 8 months after flowering. Mature pods are collected during the month of November from low branches of *A. lebbek* trees by hand and picking the pods off or by knocking them off with the aid of a long stick. It is advisable to spread sheets under the trees as much of the seeds may fall out during the process. Seeds are extracted from the pods either by opening the latter or by crushing them in the hands and separating the seeds by winnowing. Bhardwaj *et al.* (2006) observed that the last week of December is the optimum seed collection time for *A. lebbek* in Himachal Pradesh, India due to the decrease in leachate conductivity. After removing all abnormal seeds, the cleaned seeds packed in plastic bags and stored in a dark place at room temperature till sowing time. However, seeds can be stored for up to 5 years in sealed containers at room temperature with only moderate reduction in percentage viability (Troup 1921).

Germination

The seeds of this family have impermeable seed coat (Al-Menaie *et al.*, 2010). The thick hard seed coat is impermeable to water causing to physical dormancy resulting in irregular, slow germination



and low germination rate (Nongrum and Kharlukhi, 2013). To overcome this physical dormancy, seeds can be pretreated with concentrated HCl and cold mist condition. Immersing seeds in 37% HCl concentration for 30 and 45 min increases 35.56% and 46.67% seed germination and also cold mist storage at 5°C for 4 and 8 weeks increases 51.11% and 68.89% germination (Ibrahim and Hawramee, 2019). It can be grown by direct sowing and transplanting in the nursery. Germination is epigeal, and generally occurs between 4 to 20 days after sowing, with peak germination a 12 to 18 days. Germination and early seedling development are favored by sowing seeds just below the soil surface in a loose, moist medium under light shade or full sun. If inoculated with *Rhizobium* or sown in soils that contain these nitrogen-fixing bacteria, lateral roots quickly develop large, branched nodules. In Puerto Rico, seedlings raised in plastic sleeves under light shade reaches plantable size (20 to 30 cm) in 3 months (Parrotta, 2008). Under natural conditions germination ordinarily commences early in the rainy season and may continue until late in the rains. If the seeds are exposed to full sunlight germination is usually prompt and complete, but under shade it is delayed and seed may lie un-germinated. The ideal conditions for natural reproduction appear to be loose fairly moist soil, free from weeds, under light shade preferably from the side, the shade being removed when the seedlings have established themselves.



Vegetative propagation

Vegetative propagation of *A. lebbek* species can be achieved through stem cuttings. IBA is effective in inducing rooting in this species and maximum rooting success can be achieved at IBA 400 ppm (71.66%) (Handa, 2005).

In vitro propagation

An efficient and reproducible regeneration of rapid multiplication of *A. lebbek* (L.) has been developed by using intact seed explants. MS medium supplemented with 0.5 μM TDZ gave after 8 weeks of culture 76% shoot regeneration with highest number of shoots (21 nos) and shoot length (5.1 cm) per sprouting epicotyls. For maximum ex-vitro root induction frequency (81%) was accomplished with IBA (250 μM) and end of the microshoots pulse treatment were given to the basal for 30 min then transfer in plastic cups containing soil + soilrite (1:1) with 78% survival rate (Perveen *et al.*, 2013). Biolistic-mediated DNA delivery into



Photo Courtesy : Shahnaz Perveen

hypocotyls of *A. lebbek* has been attempted (Khurana and Khurana, 2000). Different parameters like the type of plasmid, rupture disc pressure and distance were standardized for biolistic DNA delivery in the hypocotyl explants.

Insect-pests and disease management

Establishment can be affected by attack on young plants by mice or rabbits, marsupials and domestic ruminants. Leaves are largely unaffected by insects, but young leaves may be subject to heavy predation by larvae of the grass yellow butterfly (*Eurema hecoba*). This appears to be a very short-lived effect. The most serious pests are bark-feeding larvae of longicorn beetles. These do not affect small stems and have little effect on large stems, but complete girdling can cause dieback in stems in the diameter range 40-100 mm. There is considerable variation in susceptibility of individual trees. Trees may be more susceptible under prolonged water stress (Lowry *et al.*, 2008). A root-knot nematode (*Meloidogyne incognita*) was recorded from the roots of *A. lebbek* seedlings (Nayak *et al.*, 2004).

Pandha *et al.* (2007) conducted a study in Punjab, India, to record the occurrence of natural enemies of pests of *Albizia procera* and *A. lebbek* in

forest nurseries. It was observed that coccinellids (*Coccinella septempunctata* and *Menochilus sexmaculatus*), spiders (*Oxyopes panda*, *Araneus nauticus* and *Zygoballus* sp.) and the preying mantis (*Creobroter pictipenni*) constitute the major natural enemies of insect pests of these species. Prasad and Kumar (2005) reported a new disease, leaf spot caused by *Periconia byssoides* from 6 months old seedlings from nurseries in Bihar, India. A psyllid, probably of the genus *Heteropsylla*, was reported as seriously affecting seedlings in India (Hegde and Relwani 1988). The infestation was controlled by two applications of Nuvacron (0.05%). Elshafie and Omar (2002) reported for the first time dieback in *A. lebbek* caused by *Scytalidium dimidiatum* in Oman.

A new host record of *Acmaeodera aurifera*, a beetle on freshly felled timber of *A. lebbek* in Rajasthan has been reported (Ahmed and Khan, 2002). Balu *et al.* (2001) reported a new root borer (*Sternocera chrysis*) on *A. lebbek* in Tamil Nadu. The adult of this jewel beetle is dark brown with shiny metallic green coloured head. The grub feeds on the tap root as well as the lateral roots and sometimes feeds on the bark of the main stem at the collar region below the ground level at the junction of the stem and root and girdles the tree. Infestation of this pest can be detected through a pale colour of the leaves in the beginning followed by a gradual wilting and total drying of the plants. Leaf spot disease caused by *Alternaria alternata* and *Epicoccum nigrum* has been reported in this species (Khan and Misra, 2000). De (2000) reported the occurrence of



Photo Courtesy : alive.blogspot.com

Sphaerophragmium acaciae which causes rust diseases on foliage of *A. lebbbeck* from the Ramna forest of Burdwan, West Bengal, India. Mehrotra and Mehrotra (2000) reported leaf blight in this species caused by *Phytophthora nicotianae*. Khan and Misra (2000) reported that a species of *Cladosporium* was seriously infecting 1-2 yr old seedlings of *A. lebbbeck* nurseries at Dehradun, India.

Agroforestry practices

Most livestock readily eat leaves and young twigs of this fine fodder tree. Crude protein concentration is about 20% for green leaves, 13% for leaf litter, and 10% for twigs. Edible material has no known toxic compounds (NFTA, 1988). It has low contents of secondary metabolites also (Garcia and Medina, 2005). Sanchez *et al.* (2007) reported that the silage made of *A. lebbbeck* mixed with grass was of good quality and could be fed to lactating goats. Its seeds could be an important protein supplement while pods are an important source of micronutrients for feed formulation (Hassan *et al.*, 2007). *A. lebbbeck* can be grown in the silvipastoral system (Mohapatra, 2003). One of the most interesting aspects of this species is that, in addition to providing feed directly, it appears to enhance pasture production and quality. Isolated siris trees in tropical woodlands frequently have a conspicuously greener sub-canopy area in which black spear grass (*Heteropogon contortus*), dominant in the open grassland, has been replaced by higher quality *Panicum maximum*. On one site in the dry tropics, dry matter yields under the trees were much higher (1,710 kg/ha) than between trees (753 kg/ha) during the early wet season (Lowry *et al.* 1988). Subsequent studies at the same site showed that grass quality was maintained under the trees for about 2 months longer into the dry season than in the surrounding area. The cause of this effect is thought to be related to improved soil moisture status in the surface litter layer of shaded soil which increases litter breakdown and mineralisation of

organic matter (Wild *et al.* 1993). It appears that the tree provides a biological solution to the problem of pasture quality decline in the dry season (Lowry *et al.*, 2008). Queiroz *et al.* (2007) found that the species could be planted under alley cropping system with shrub legumes. Sundaravalli and Paliwal (2002) observed that *Albizia* trees can increase the nutrient content of understorey grasses by their rapid leaf turnover and decomposition of nutrient rich litter, which can result in significant increase in soil fertility. Studies on intercropping of *A. lebbbeck* trees with rice and radish in Bangladesh revealed that pruning of the trees three times a year contributed to the highest increase in rice (50%) and



Photo Courtesy : projectnoah.org

radish (55%) yields (Samsuzzaman *et al.*, 2002). Rao *et al.* (2000) reported that alley cropping of *A. lebbbeck* with groundnut provided higher net returns under rainfed farming conditions in Hyderabad, India.

Genetics and Tree Improvement

Breeding seed orchards of *Albizia lebbbeck* have been established in different parts of Nepal by the Department of Forest Research and Survey (FAO, 2008). *A. lebbbeck* has been identified as one among the 34 important species selected for forest genetic resources conservation and management programme in Cambodia (Thea, 2008). A progeny test was conducted in Brazil to determine the genetic variation and heritability estimates in *A. lebbbeck* germination. Seeds from 26 parent trees

were collected from a site at Brazil. The heritability estimates were 0.43 and 0.79 at individual and parent tree mean levels, respectively, which indicates a moderate to high genetic control. Selection of the 10 best parents provided a genetic gain of 8.1 per cent (Rego *et al.*, 2005).

Growth, yield and economics

Depending on site conditions, annual height growth ranges from 0.5 to 2.0 m; on good sites, individual trees attain an average maximum height of 18 to 25 m and 50 to 80 cm dbh. Plants can grow to 5 m in one year; however, growth in areas with under 800 mm annual rainfall is much slower. In India, annual wood yields of 5 m³/ha were recorded in rotations of 10 - 15 years, but yields depend on environmental conditions (NFTA, 1988).



Photo Courtesy : Wikimedia

Wood properties/utilization

The wood of this species was exported from Asian countries to Europe under the trade name East Indian walnut (Rao and Purkayastha, 1972). It is substituted for teak and sal. Its light yellowish-brown to light brown heartwood has a specific gravity of about 0.55 to 0.90 and is coarse-grained, strong, and



relatively durable. It seasons and works well and is used for furniture, flooring, veneer, paneling, boat building, carving, posts, turnery, toys and a variety of agricultural implements. Pulp is short-fibred and used for paper production only when mixed with long-fibred pulp (NFTA, 1988). Wood provides good fuel and has a caloric value of 22 kilojoules per kg (Anonymous 1970). Indian Plywood Industries Research and Training Institute, Bangalore has made plywood out of this species (Mathews, *et al.*, 2003). The various wood properties worked out are listed hereunder.

- ❖ Weight per cubic metre at 12% moisture content : 641 kg
- ❖ Radial shrinkage (green to oven dry) : 2.9%
- ❖ Tangential shrinkage (green to oven dry) : 5.8%
- ❖ Volumetric shrinkage (green to oven dry) : 9.6%
- ❖ Modulus of rupture (air dry): 887.2 kg cm⁻²
- ❖ Modulus of elasticity (air dry): 122,700 kg cm⁻²
- ❖ Compression parallel to grain (air dry) : 534.1 kg cm⁻²

Medicinal uses

Its leaves, seeds, bark, and roots are all used in traditional Indian medicine. Leaves are used in eye-troubles, has antihyperglycaemic and antidiabetic potential as well as nematicidal effects (Kalia *et al.*, 2015). Bark is used for boils and as astringent, expectorant and anthelmintic and given in piles and



diarrhea. Root bark is used as dental powder for strengthening gums (Sastry and Kavathekar, 1990). Plant parts are also used to treat snake bites (Ch *et al.*, 2006). Gupta *et al.* (2006) observed that bark extract administration of *A. lebbek* arrests spermatogenesis in male rats without noticeable side effects.

Other relevant information

The cut bark yields a reddish-brown gum that is used as a substitute for gum arabic obtained from *Acacia senegal*. Bark also yields tannin used for fishing net. The species is sometimes planted as a shade tree in coffee, tea, cardamom, and cacao plantations. It is also pollarded to use as a host for



Photo Courtesy : [materiamedicaresource](http://materiamedicaresource.com)

the lac insect. It is planted as an avenue tree and used for roadside planting, shelterbelts and for green manure. The tree fixes nitrogen.

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ENVIS ACTIVITIES

Digital Observance of Earth Day, 2020 by ENVIS, IFGTB through Facebook Live

ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at IFGTB, Coimbatore marked the 50th anniversary of Earth Day digitally on 22.04.2020. As a precautionary measure to contain the spread of the COVID-19, the event was organized without public gathering through Facebook live. The programme has been registered with the global Earth Day Network.

The proceedings began with an invocation on Nature in Sanskrit, “Prakruti Vandanam” composed as a “Raga Malika” by Dr Kannan CS Warriar, Scientist F and Coordinator ENVIS in diverse ragas in Carnatic music. During his welcome speech, Dr Kannan CS Warriar highlighted that the first Earth Day, in 1970 is credited with launching the modern environmental movement, and is now recognized as the planet's largest civic event. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Speaking on the carbon stock of India's forests based on the statistics of Forest Survey of India, he pointed out that the per hectare carbon stock at the national level is 100.03 tonnes and only 11 states and UTs could record a carbon stock above the national average. Though the southern states of Karnataka, Andhra Pradesh, Tamil Nadu and Kerala were among the four top ranked states, in terms of tree diversity, they were at 7th, 11th, 12th and 13th positions in terms of carbon stock and Kerala with 100.72 tonnes is the only south Indian state with a per hectare carbon stock above the national average. Shri. S. Senthilkumar, IFS., Director, IFGTB in his special address explained that the Earth's climate has always changed and evolved. Some of these changes have been due to natural causes but others were attributed by human activities such as deforestation, emissions from industries and burning of fossil fuels. Recent research indicates that the climate system is influenced by human activities and resulted in global warming since 1950s, he added. He explained that observance of events like Earth Day brings people closer to earth. Shri S. Senthilkumar urged all to preserve earth's natural resources by changing our daily habits, planting more trees, making efforts towards promoting the concept of cleaner production and requested all to follow 3Rs (Reduce, Reuse and Recycle). An awareness poster highlighting the theme “Climate Action” was released during the occasion. Softcopies of the poster and handouts were transmitted electronically to all the stakeholders. Hard copies will be distributed to school children and college students after reopening. Dr S. Vigneswaran, Programme Officer ENVIS proposed the vote of thanks. The event can be accessed at <https://www.facebook.com/ifgtbenvisrp/videos/2493868984275191/>.



International Day for Biological Diversity 2020 Webinar on Smarter Strategies for Biodiversity Conservation

ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore with the Ministry of Environment Forest and Climate Change organized a Webinar on “Smarter Strategies for Biodiversity Conservation” to mark the International Day for Biological Diversity on 22.05.2020. As a precautionary measure to contain the spread of the COVID-19, the event was conducted through Google Meet. Participants numbering 280 from various parts of the country had registered for the event.

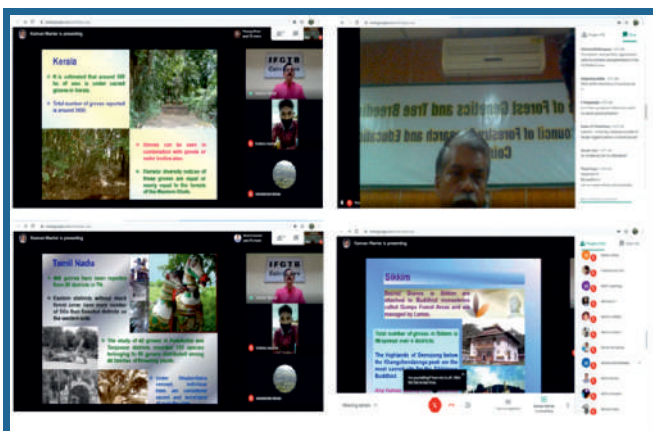
Shri S Senthilkumar, Director, IFGTB released an awareness poster on the varying dimensions of biodiversity.

Dr C Kunhikannan, Scientist G spoke on “Our Solutions are in Nature”. He elaborated on the importance of basic principles of ecology, the ecosystem functions; food chain, food web and their connectivity in nature. If any connectivity get detached problems starts. Threat to the pollinators and food safety aspects were also discussed. He explained the law of nature by giving four examples, restoration of forest and grasslands on mountains, bringing greenery to cities, importance of pollination and food safety.

Dr Kannan CS Warriar, Scientist F and ENVIS Coordinator presented on “Sacred Groves and their Incomparable Values”. He highlighted that ancient sacred groves should be treated as possessing incomparable values and should be protected like how we protect monuments like Taj Mahal and charismatic species like tiger. May valuable medicinal plants and wild relative of cultivated species are present in sacred groves that have immense value in species improvement programmes. They are the abode of many endemic

species including critically endangered tree species. He urged that we all should understand the importance of the sacred groves and join hands to avoid further deterioration to these invaluable resource pockets of biodiversity.

Dr S Vigneswaran, Programme Officer, ENVIS moderated the digital interaction meet. E-Certificate was awarded to all the registered participants. Digital copy of the awareness poster was disseminated to the stakeholders electronically.

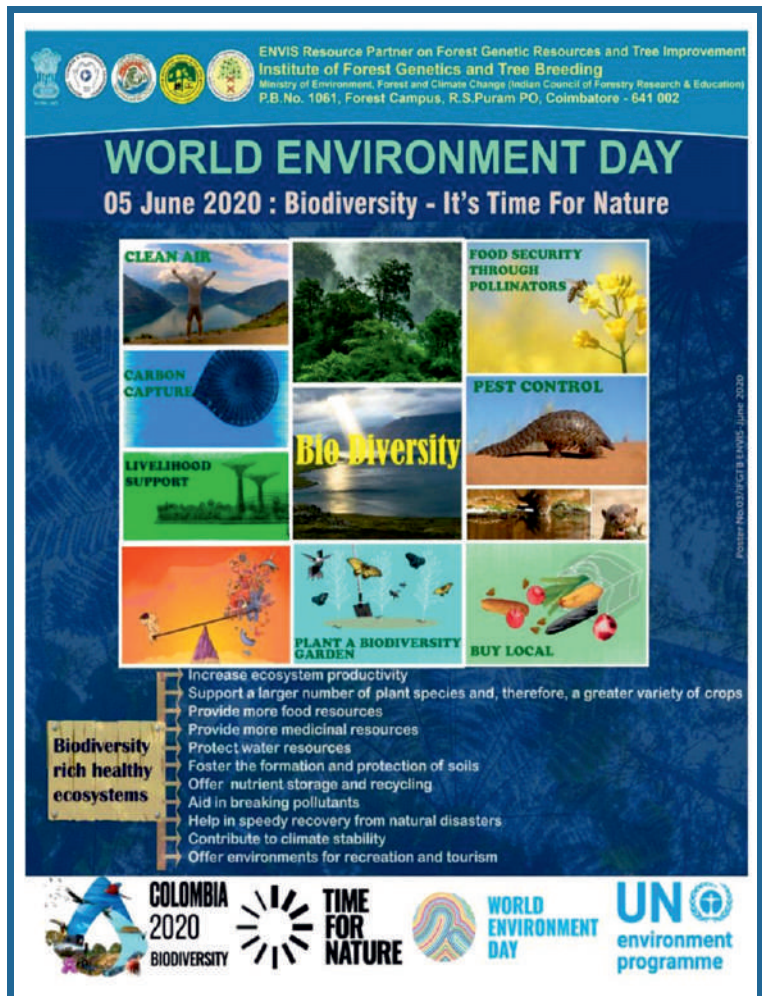


Digital Observance of World Environment Day, 2020 by ENVIS, IFGTB through Facebook Live

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore marked the World Environment Day 2020 digitally through organizing an online Awareness Programme through Facebook Live. It found place in the Global World Environment Day Programmes of the United Nations and had endorsement from the Union Ministry of Environment Forest and Climate Change. The event saw the release of a digital version of an invocation on nature, Prakruthi Vandanam in Sanskrit based on Yajur Veda. It was composed and presented as a 'Raagamaalika' in diverse ragas of Carnatic Classical Music by Dr Kannan CS Warriar, Scientist F and Coordinator ENVIS.

World Environment Day which takes place every year on June 5th is the United Nations' principal vehicle for encouraging worldwide awareness and action for the environment. It is celebrated by millions of people in more than 100 countries since 1974 and is being observed engaging governments, businesses, celebrities and citizens to focus their efforts on a pressing

environmental issue. The current year, 2020 is a critical year for nations' commitments to preserving and restoring biodiversity. Therefore, the theme chosen by the United Nations for World Environment Day 2020 is Biodiversity. During the introductory remarks, Dr Kannan CS Warriar also pointed out that biodiversity involves 8 million plant and animal species, their ecosystems and the genetic diversity among them. We are losing the invaluable treasure at an alarming rate that, it has been estimated that, within the next 10 years, one out of every four known species may have been wiped off the planet. It has also been estimated that to meet the innumerable demands that humans make on nature each year, we may require about more than an additional half of Earth. That is about 1.6 earths to satisfy our greeds, he added. Last year, in 2019, the world lost 3.8 million hectares of tropical primary forest. That is equivalent to a football ground area of forests every six seconds. Southeast Asia is among the hardest hit areas along with South America and Africa. Citing the recent assessment by the Forest Survey of India, Dr Kannan Warriar told that it is heartening to know about the increase in forest area in our country. India shows an increase of 5188 sq km of forest and tree cover at the national level, an increase of 0.65% over the previous assessment in 2017. The top five states in terms of increase in forest cover are, Karnataka (1025 sq km), Andhra Pradesh (990 sq km), Kerala (823 sq km), Jammu and Kashmir (371 sq km) and Himachal Pradesh (334 sq km). The mangrove cover also has increased by 54 sq



km. Though marginal decline was reported in Tamil Nadu (-4 sq km) in terms of mangroves, the State recorded an increase in the forest cover to the tune of 83 sq km, a marginal increase of 0.32% over 2017.

Shri. S Senthilkumar, Director, IFGTB in his special address explained that an environment consists of both biotic and abiotic factors that influence the community. Nature provides whatever human and other living organisms needed. Nature is always resilient, he added. He emphasised that environmental sustainability is one of the biggest issues faced by the mankind at present due to urbanization, industrialization and modern agricultural practices. India is one of the recognized mega-diverse countries of the world, harbouring nearly 8% of World's biodiversity. He insisted that everyone has to join hands to rebuild and protect natural resources and biodiversity in the ecosystems. Environmental protection is a paragliding concept that describes everything we do to protect our planet and conserve its natural resources so that the quality of life can be enhanced for every organism.

Results of the Mobile Photography Contest held on the theme “Impact of Lockdown on the Environment” was declared by the Chief Jury, Dr John Prasanth Jacob, Scientist G. Among the 386, participants who took part in the contest from different states of India, Shri Nanda Kishore, Shri Akash Kar and Keyur Panchal secured first second and third places respectively and 10 best photographs were awarded consolation prizes. An awareness poster highlighting the theme “Biodiversity – It's Time for Nature” was also released during the occasion. Soft copy of the poster and the digital version of the Prakruthi Vandanam were transmitted electronically to students and other stakeholders. Dr S Vigneswaran, Programme Officer, ENVIS proposed the vote of thanks.

Link to the Prakruthi Vandanam: <https://youtu.be/K7Ipv3QLM1k>. The event can be accessed at <https://bit.ly/2Xxl0k8>.



IFGTB PRODUCTS



INSTITUTE OF FOREST GENETICS AND TREE BREEDING

(Indian Council of Forestry Research and Education)

(An autonomous body of Ministry of Environment Forest & Climate Change, Govt. of India)
P.B. No. 1061, R.S. Puram, Coimbatore - 641 002. Tamil Nadu, India



The following Services are provided at IFGTB for various stakeholders. Please contact us for details as below.

Services		Cost per unit		Contact Number with Email ID
Clonal Seedling: For Sale & Booking				
1.	Clones of Casuarina Hybrids (CH-1, CH-2 & CH-5)	Rs. 4.50 per plant		Smt. K. Shanthi , ACTO, Division of Plant Biotechnology, Phone : 0422 2484122 E-mail : shanthik@icfre.org
	Eucalyptus clones (EC-4, EC-6, EC-9 & EC-11)	Rs. 4.00 per plant		
	Tissue Culture Teak Plants	Rs. 25.00 per plant		
2.	Windbreak Clones (WBC-1, WBC-2, WBC-3 & WBC-4)	Rs. 4 per plant		Dr. C. Buvanewaran , Scientist- F, Silviculture & Forest Management Division, Phone : 0422 2484198, 94422 45047 E-mail : buvanesc@icfre.org
3.	ArborEasy® DNA Isolation Kit	Price Rs.	Packaging & Transportation Rs.	Dr. Modhumita Dasgupta , Scientist-F, Division of Plant Biotechnology, Phone : 0422 2484123 E-mail : ghoshm@icfre.org gmodhumita@gmail.com
	Pack Size			
	10 Reactions	950.00	150.00	
	20 Reactions	1900.00	200.00	
	50 Reactions	4750.00	300.00	
4.	Soil Testing (pH, EC, OC, Micro and Macro Nutrients)	Rs. 2850.00		Dr. A.C. Surya Prabha , Scientist-C, Silviculture & Forest Management Division, Phone : 0422 2484150 E-mail : acsuryaprabha@icfre.org
5.	Phytosanitary Certificate	Rs.100.00 + Tax per application		Dr. John Prasanth Jacob , Scientist- G, Forest Protection Division, Phone : 0422 2484159 E-mail : jacob@icfre.org
Products of IFGTB: For Sale & Booking				
6.	Hy-ACT (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle		Dr. N. Senthilkumar , Scientist-E & Head, Division of Chemistry & Bioprospecting, Phone : 0422 2484193 Mobile : 9629160703 E-mail : senthink@icfre.org
	Tree PALH (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle		
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	Tara Red Jam (with natural fruit colorant)	Rs. 60.00 per bottle		Smt. R. Sumathi , ACTO Division of Chemistry & Bioprospecting, Phone : 0422 2484144 Mobile : 9942245542 E-mail : sumathir@icfre.org

ABOUT IFGTB

Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore is a National Research Institute under the Indian Council of Forestry Research and Education. IFGTB envisions a wood secure society. The Institute primarily aims to carry out research to improve productivity of forest tree species through conventional breeding programmes and biotechnological interventions. The major areas of research include tree improvement, breeding, planting stock improvement, marker assisted selection, genomics, clonal propagation, agroforestry systems, climate change research, integrated disease and pest management, seed handling and testing, eco restoration and conservation.

ABOUT ENVIS

ENVIS established by the Government of India, in 1982 has been on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc. all over the country. It is a comprehensive decentralized information system on environment involving effective participation of institutions / organisations in the country actively engaged in work relating to different subject areas of environment. A large number of nodes, known as ENVIS Centres, have been established in the network to cover the broad subject areas of environment with a Focal Point in the Ministry of Environment, Forest and Climate Change.

INSTRUCTIONS TO CONTRIBUTORS

Dear Author/Subscriber/Contributor,

We invite contributions to the ENVIS Newsletter issues! The ENVIS Resource Partner at IFGTB focuses on Forest Genetic Resources and Tree Improvement. It aims to act as a window for quality scientific publications and a forum for presenting your thinking on the challenges in the fields of FGRs and tree improvement. The ENVIS Newsletter, Van Vigyan, a quarterly publication, publishes original research articles, reviews, reports, research highlights, news-scan etc., related to the thematic area of the ENVIS Resource Partner. Original research and review articles, notes, research and meeting reports are invited for the newsletter. Details of forthcoming conferences / seminars / symposia / trainings / workshops also will be considered for publication in the newsletter. Articles may be sent in Times New Roman (with font size 12) in double spacing with a maximum of 5-6 typed pages. Photographs/line drawings and graphs need to be of good quality with clarity for reproduction in the newsletter. Only electronic submission will be accepted.

Details may be sent to: ifgtb@envis.nic.in.

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