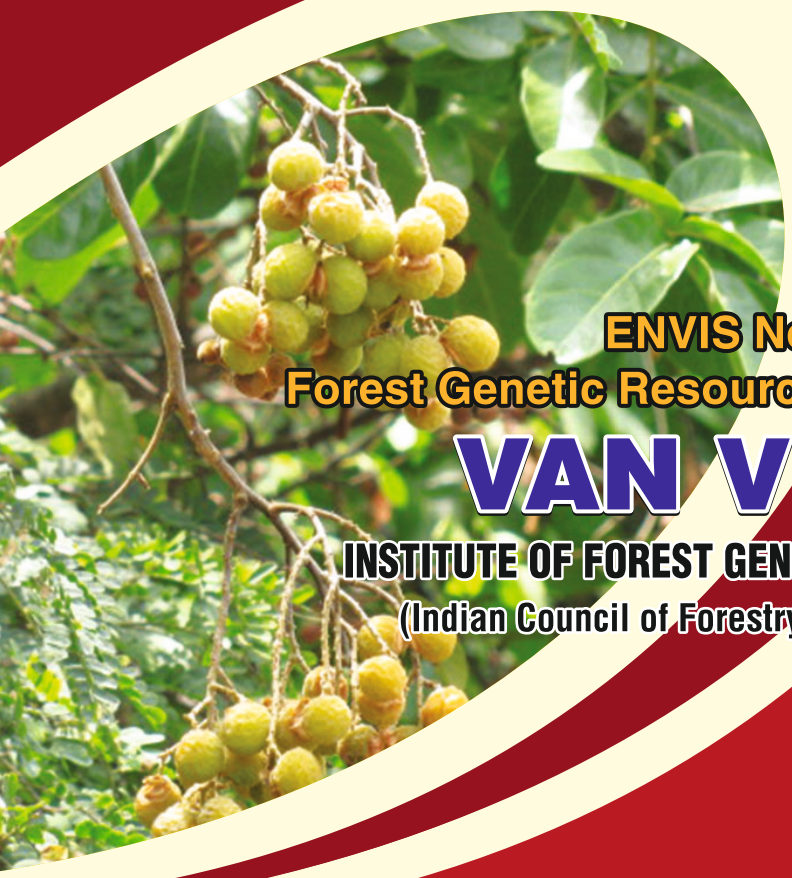

ENVIS Newsletter

Forest Genetic Resources & Tree Improvement

VAN VIGYAN

INSTITUTE OF FOREST GENETICS AND TREE BREEDING

(Indian Council of Forestry Research and Education)

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- Volume 8 Number 2
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2. Recent literature on FGRs & TIP
2. ENVIS Activities
3. IFGTB Products

From the Director's Desk

In this issue of the quarterly newsletter under ENVIS, we would like to familiarise the readers with a very important NTFPs – *Sapindus emarginatus*. The issue also carries details on Recent literature on FGRs & TIP & ENVIS Activities. We also hope to bring out information related to FGRs and Tree improvement in the form of articles, reports and documents. The ENVIS team sincerely looks forward to your suggestions and feedback and seeks your support and co-operation.

Dr C. Kunhikannan
Director, IFGTB

Know Your Trees - *Sapindus emarginatus* Vahl

Introduction

Sapindus emarginatus Vahl the soapnut tree belongs to the family Sapindaceae. In Hindi it is known as Reetha, in Tamil as, Poovandikottai and Chavakayimaram in Malayalam. It is an important Non Timber Forest Produce of India which demands conservation priority due to over-exploitation and habitat destruction. Soapnut has surfactant properties due to the presence of water soluble glycosides, the saponins and has been used for washing by ancient Asian and American peoples. The saponin content in soapnut varies from 10 to 18% (Naidu *et al.,* 2000). The photo film industry alone requires about 6 tonnes of saponin per annum (Mukesh Ahuja., 2006). India exports approximately 63,368 kg/year of saponin extract obtained from various plant sources, among which *S. emarginatus* is an important species. The Expresswire, 2021 has estimated that growth of Saponin market will be significant and over the next five years the Saponin market will register a 0.1% Compound Annual Growth Rate in terms of revenue, the global market size will reach USD 938.1 million by 2026. Due to high commercial demand, the species has been enlisted under 'priority species of economic importance' in the country report of state of forest genetic resource in India.

Distribution and habitat

It is a tree species native to Indian sub-continent and China. In India, it is considered to be originated in the Western-Ghats and later extended up to the West Central- North Indian biogeographical regions. *Sapindus emarginatus*

thrives in any kind of soil but prefers, loamy, clay or black cotton soil. The species flourishes well in deep clayey loam soil and does best in areas experiencing nearly 1500 to 2000 mm of annual rainfall (Warrier, 2020).

Lack of sustainable harvesting practices has been causing problems in the natural regeneration, as the fruits are harvested without leaving seeds for its natural regeneration, which led to fragmentation of the populations from wild and now the plants are found scattered in dry and moist deciduous forests and its periphery. Further, the distribution of the plants is subjected to significant impact due to changing climatic regimes.

Botanical description

It is a medium to large sized deciduous tree growing up to 25 m high, with dark-brown rough bark. Leaves paripinnate, alternate, ex-stipulate. Leaflets 4 or 6, opposite or subopposite. oblong-obovate apex obtuse, round and emarginated, margin entire glabrescent above, softly tomentose beneath and midrib above, coriaceous; petiole 2-3 mm, stout, tomentose. Flowers are white,

polygamous, in terminal and axillary panicles, male flowers, numerous, a few bisexual, both found in the same rusty-velvety panicles. Bisexual flowers provide ample pollen and nectar to bees. The fruit is a small leathery-skinned drupe 1–2 cm in diameter, 2-3 partially united, yellow, blackish when ripens, containing one to three seeds. Seeds pea-size, enclosed in a blackish, hard endocarp.

Reproductive biology and breeding system

Flowers are white, polygamous. Morphologically *S. emarginatus* is monoecious. But becomes dioecious bearing first the staminate, then then the pistillate and finally again the staminate flowers with temporary cessation of blooming between the first two phases. The breeding system incorporates both geitonogamy (in-breeding) and xenogamy (outbreeding), however the anthesis timing promotes out crossing. Male flowers are numerous but few are bisexual. Both are found in the same rust pubescent panicles. Bisexual flowers serve as nectar and pollen source to the bees. Blooming occurs from mid- November to mid-January. The flowers are visited by a broad spectrum of diurnal insects among which the bees and flies move the geitonogamous pollen while the wasps and butterflies deliver xenogamous pollen. Outbreeding is achieved through the asynchrony of staminate and pistillate flowers (Reddi *et al.,* 1983). Flowers open at 07:00 hours. Stamens within a flesh disc produce a large number of cream coloured pollen grains (Warrier, 2020). The receptivity of the stigma is 12 hours. Even though the pollen grains are viable for 72 hours only capable to fertilise the ovule for 48 hours (Reddi *et al.,* 1983).

Fruit collection and processing

The peak fruiting season ranged from February to April. Fruits were collected at fully mature stage as indicated by the brownish-yellow gummy pericarp. Harvesting was done by climbing and plucking the fruit bunches or using pruning poles. The fruits were spread on tarpaulins to dissipate the heat developed while transporting. The next day, the seeds were extracted manually by peeling off the fruit pericarp (Anandalakshmi *et al.,* 2018).

Germination

To raise seedlings, fresh seeds were soaked for 24 hours cold water (Swaminathan and Revathy, 2013) and sown in mother bed filled with river sand as medium (32 ± 2°C; RH: 65 ±2 %). The depth of sowing is 0.25" from the surface of the medium. The beds need to be watered regularly to maintain sufficient moisture. The beds were maintained under green shade net to minimise insolation. It takes about 60 days to produce the first emergent. The final count of germination can be taken after 30 days of first emergence. The root elongation was very significant compared to the shoot growth. As a result the germinated seedlings at two leaf stage were transplanted immediately after the germination. Delay in transplanting increased

the causality. The seedlings were transplanted to sand: red earth: FYM (2:1:1) media filled in 13 x 25 cm black poly bags. The transplanted seedlings were kept under shade upto 3 months and then hardened under open sun light in the nursery for 6 to 12 months before outplanting (Anandalakshmi *et al.,* 2013).

Vegetative propagation

Tamil Nadu forest Department during 1997-98, conducted vegetative propagation experiment in *S. emarginatus* through cleft grafting. Scions with 10-15 cm length and 1.5 to 2.0 cm girth collected from outstanding candidate plus trees of 7-year-old and were subjected to cleft grafting at Amaravathy Centre, results showed that on the 13th day, new shoots emerged from the scion which indicated the fusion of scions with the root stock and 50% success was obtained (Srivastava, 2001).

In vitro propagation

Micropropagation of axillary shoot buds can be done using Murashige Skoog medium fortified with BAP, Kinetin and TDZ (Srinivas *et al.,* 2014). In vitro studies on *S. emarginatus* revealed that direct regeneration of plants from cotyledonary explants can be achieved using MS medium fortified with cytokinins at varying concentrations. (Srinivas, *et al.,* 2015).

Insect pests and diseases

The seedlings of Soapnut after transplanting from mother bed to polybags gets defoliated severely (97%) due to a larval infestation, Geometrid caterpillar. To control this, Methyl Parathion spray (2 ml/ 100 ml water) has been recommended in nursery raising of soapnut seedlings (Anandalakshmi *et al.,* 2012). Survey for the seasonal occurrence, nature of damage and intensity of infestation of insect pests of soap-nut around Bapatla revealed that blossom webber (Cydia sp.) is the most destructive pest causing very severe damage during October-April followed by the fruit feeders *Virachola isocrates* F., *Virachola* sp., *Serinatha augur* Fabr. and *Antilochus coqueberti* Fabr. from January-April. Soap-nut moth, soap-nut tree bug and weevils were of moderate importance (Rao, 1992).

Planting techniques and post planting operation

To raise block plantations in 1 ha at 4 m x 4 m spacing 625 plants of *S. emarginatus* can be deployed. The suitable pit size for planting is 2' x 2' x 2' (Anandalakshmi *et al.,* 2018). Irrigation is required atleast 2 times per month for two years. Drip irrigation is suitable. After 3 months of planting, 250 g (¼ Kg) of Neem cake or 500 g (½ Kg) of Farm Yard Manure per plant need to be applied and simultaneously casuality replacement need to be done. Once in a year, weeds need to be removed and ploughing can be undertaken. After 2 years, the branch must be pruned. As a result, the crown size will increase so that fruit production will be facilitated. The tree is expected to start fruiting from ten years onwards.

Agroforestry practices

Soapnut tree can be intercropped with annual crops in the early years until the tree canopy covers the ground. The intercrops give some income to farmers during the period when the main trees have not started production. At wider spacing, minimum 4 m x 4 m the species is amenable for intercropping and also along the bunds the tree can be planted in farmlands. Intercropping Sapindus with plants like tulasi, turmeric, ginger, nannari can be taken up.

Tree improvement

As a measure of sustainable utilization, harvesting of soapnut in the wild need to be minimized and compensated by agroforestry plantations and industrial plantations raised outside the forests. Hence, domestication and improvement of the *S. emarginatus* has been undertaken at the Institute of Forest Genetics and Tree Breeding, Coimbatore since 2010. The tree improvement program of this species involved reconnaissance survey in Tamil Nadu to select Candidate Plus Trees (CPTs) of *S. emarginatus* based with high fruit yield. Each CPT was chemotyped for saponins. The CPTs were shortlisted and ranked based on saponin yield (>13%). Thirty high fruit yielding accessions rich in saponin content were raised and established multilocation trials to assess their performance (Anandalakshmi *et al.,* 2014). Screening for variability among *Sapindus emarginatus* populations from Pillur, Thengumarada, Mettupalayam and Palani using isozymes showed monomorphic band at single loci indicating lack of prevalence of polymorphism among the 4 populations suggestive of low heterozygosity (Anandalakshmi *et al.,* 2018).

Utilization

The saponins are used in detergents, shampoos, textiles, foods, pharmaceuticals and photo film industry. The species is of substantial importance for global trade in soap and perfumery industries due to the oil and saponin content obtained from its leaves, fruits and seeds. Saponin from soap nuts also have been reported to inhibit tumor cell growth and find use in the remediation of contaminated soil. Traditionally it used as anti-inflammatory, antifertility and antipyretic, especially in traditional Indian and Thai medicines. The seed is intoxicant and the fruit rind has oxytropic action. Nut powder is used as nasal insufflations (Nair *et al.,* 2005). Seeds of *Sapindus emarginatus* contain anti-inflammatory oil which is traditionally used to purify the blood.

Historically it has been used in folk remedies as a mucolytic agent, emetic, paralysis of limbs, treatment of chlorosis. Soapnuts are also used as effective aid for the treatment of skin problems like eczema, itching and psoriasis. Effect on reproductive organs also has been reported. The roots are used as expectorant and demulcent and also are used for cure of hysteria and epilepsy (Aroraa *et al.,* 2012). Antidiabetic activity has also been reported in the ethanolic extracts of *S. emarginatus* (Jeyabalan and Palayan, 2009).The Soap nut solution is a good repellent and used to prevent a wide variety of agricultural pests. The aqueous kernel extract of *S. emarginatus* has potent anti-mosquito activity, it is safe for nontarget aquatic organisms and can be used as an eco-friendly control agent (Koodalingam, *et al.,* 2009).

References

Anandalakshmi, R., Srinivasan, R., Vamadevan, T, Suresh Kumar, K. and Krishna Kumar, N. 2014. Chemotyping of *Sapindus emarginatus* populations for saponins. Journal of Chemical and Pharmaceutical Sciences, 2:104-107.

Anandalakshmi, R., Suja, S., Suresh Kumar, K., Rathnam, K.S., Vamadevan, T. and Ramesh, K. 2012. Effect of insecticides on control of defoliator in *Sapindus emarginatus* seedlings. Pestology, 36(8):13-16.

Anandalakshmi, R., Suja, S., Vamadevan, T., Rathnam, K.S. and Suresh Kumar, K. 2013. Germination behaviour and occurrence of albino seedlings in *Sapindus emarginatus* Vahl. Indian Forester, 139 (6): 543-546.

Anandalakshmi, R., Vamadevan, T., Anandha Prabhakaran, M., Suresh Kumar, K. and Rajesh, C. 2018. Variability studies in populations of *Sapindus emarginatus* Vahl.- A valuable NTFP of Tamil Nadu. International Journal of Advanced Life Sciences, 11(4): 157-164.

Aroraa B., Bhadauriab P., Tripathi D. and Sharma, A. 2012. *Sapindus emarginatus*: Phytochemistry and Various Biological Activities. Indo Global Journal of Pharmaceutical Sciences, 2012; 2(3): 250-257.

Jeyabalan, S. and Palayan, M., 2009. Antihyperglycemic and antidiabetic activity of leaves extracts of *Sapindus emarginatus* Vahl. Asian Biom. 3 (3): 313–318.

Koodalingam, A., Mullainadhan, P. and Arumugam, M. 2009. Antimosquito activity of aqueous kernel extract of soapnut *Sapindus emarginatus*: impact on various developmental stages of three vector mosquito species and nontarget aquatic insects. Parasitol Res 105, 1425 (2009). https://doi.org/10.1007/s00436-009-1574-y.

Mukesh Ahuja. 2006. Life Science volume -2, pg. 269.

Naidu, C.V., Rajendrudu G. and Swamy, P.M. 2000. Effect of plant growth regulators on seed germination of *Sapindus trifoliatus* Vahl. Seed Science and Technology, 28: 249-252

Nair, R., Kalaria, T. and Chanda, S., 2005. Antibacterial activity of some selected Indian medicinal flora. Turky J. Biol. 29: 41–47.

Rao, A.S. 1992. Preliminary studies on the seasonal occurrence of insect pests on soap-nut (Sapindus sp.). Indian Forester 1992 Vol.118 No.6 pp.432-437 ref.5.

Reddi C.S., Reddi E.U.B., Reddi, N.S. and Reddi, P.S. 1983. Reproductive ecology of *Sapindus emarginatus* Vahl. (Sapindaceae). Proc. of Indian National Science Academy, 49B No.1, pp.57-72.

Srinivas, D. Venkateshwarlu, M. , Reddy, K. J. M., Ugandhar, T. 2015. Direct multiple shoot induction and plantlet regeneration from cotyledonary explants of *Sapindus emarginatus* Vahl (Soapnut). Biotechnology Journal International, pp.1-9.

Srinivas. D, Venkateshwarlu, M., Thirupathi, M., Rajender, A.S.K. and Reddy, K.J. 2014. Micropragation of axillary shoot buds in *Sapindus emarginatus* Vahl.. Int. J. of Multidisciplinary and Current research, 2: 313-316.

Srivastava, R.K. 2001. *Sapindus emarginatus* - a New Approach to Cleft Grafting Indian Forester, 127(11):1287-1288.

Swaminathan, C. and Revathy R. 2013. Improving seed germination in *Sapindus emarginatus* Vahl. Pinnacle Agricultural Research and Management, pp. 1- 3.

Warrier R.R. 2010. *Sapindus emarginatus* Vahl. In: N.Krishna Mumar, K. Palanisamy, Maheshwar Hegde, Kannan C.S. Warrier and M. Krishnamurthy (eds.) Manual of economically important forestry species in South India. Published by IFGTB, pp.395-400.

Anandalakshmi, R., Suresh Kumar, K., Vamadevan, T., Geetha, S., Sathish, A. and Vineetha, M.V.

Institute of Forest Genetics and Tree Breeding
Coimbatore

Recent literature on FGRs & TIP

Anil Kumar Nair, A., Raut, M.B., Ashraf, M. and Thanekar, R. 2021. Collection and distribution of Mahua (*Madhuca longifolia*), Tendu (*Diospyros melanoxylon*) and other NTFP's in Critical Tiger Connectivity Corridor of Maharashtra. Indian Forester, 147(4): 374-394.

Baljit Singh, B., Gill, R.I.S., Kaur, N. and Dhillon, G.P.S. 2021. Standardization of irrigation, nutrient and pruning requirement of Jatropha (*Jatropha curcas L.*) for enhancing its productivity. Indian Forester, 147(2): 160-167.

Bayati, H., Najafi, A., Vahidi, J. and Jalali, S.G. 2021. 3D reconstruction of uneven-aged forest in single tree scale using digital camera and SfM-MVS technique. Scandinavian Journal of Forest Research, 36(2-3): 210-220.

Chandramohan, K. and Salman Khan. 2021. Report on Floral Modification of *Canscora pauciflora* Dalzell (Gentianaceae) from Goa, India. Indian Forester, 147(1): 93-94.

Di Pierro, A.M.G., Malvido, J.B. and Rafael Lombera, R. 2021. Germination success of large-seeded plant species ingested by

howler monkeys in tropical rain forest fragments. American Journal of Botany, 108(9).

Kala, S., Meena, H.R., Singh, A.K., Rashmi, I., Kumawat, A., Reeja, S., Subbulakshmi, V. and Singh, R. K. 2021. A first report of albinism in legume medicinal shrub of *Cassia auriculata* L. Indian Forester, 147(1): 91-92.

Khanna, K.K., Dubey, P.C., Tiwari, A.P. and Sikarwar, R.L.S. 2021. Studies on threat status of tree species of Madhya Pradesh, India. Indian Forester, 147(2): 137-140.

Li, S., Zhang, H., Fan, Z., Liang, D., Sun, H., Li, Y. and Zhao, X. 2021. Genetic test and early selection in full-sib families of *Pinus koraiensis*. Scandinavian Journal of Forest Research, 36 (4): 221-229.

Lula, M., Trubins, R., Eko, P.M., Johansson, U. and Nilsson, U. 2021. Modelling effects of regeneration method on the growth and profitability of Scots pine stands. Scandinavian Journal of Forest Research, 36(4): 263-274.

Mohammad, N., Rathor, R., Mishra, Y. and Miskin, B. 2021. Report on the flowering and fruiting in five year old germplasm bank of *Litsea glutinosa* (Lour.) C.B. Robinson. Indian Forester, 147(4): 410-412.

Nair, S.G., Veerasamy, S., Vijayaraghavan, A., Suresh, G., Anees, A., Vinothkumar, A. and Yuvaraj, T. 2021. Stability of stem form quotient in clones of *Eucalyptus camaldulensis* Dehnh across Southern India. Indian Forester, 147(2): 183-190.

Singh, A.N. 2021. Phenology and morphometric attributes of the flower and fruit of cultivated *Elaeocarpus angustifolius,* the rudraksha Plant from India. Indian Forester, 147(2): 147-153.

Singh, C., Singh, R. and Gulati, A. 2021. Performance of *Anthocephalus cadamba* (Roxb.) Miq., Bauhinia variegata Linn. and Grewia optiva Drumm. Ex Burr in Tarai Bhabar region of Uttarakhand, India. Indian Forester, 147(2): 168-174.

Song, Q., Song, X., Deng, X., Luo, J., Wang, J., Min, K. and Song, R. 2021. Effects of plant growth promoting Rhizobacteria microbial on the growth, rhizosphere soil properties, and bacterial community of Pinus sylvestrisvar. mongolica seedlings. Scandinavian Journal of Forest Research, 36(4): 249-262.

Surath Kumar, P., Shukla, G., Vineeta, Panwar, P. and Chakravarty, S. 2021. Sporadic flowering in *Bambusa balcooa* in Sub -Himalayan Region of West Bengal. Indian Forester, 147(4): 413-414.

Suzuki, N., Yoshida, T., Miyamoto, T., Fukuzawa, K., Taniguchi, T. and Yamazaki, H. 2021. Early establishment of spruce (*Picea glehnii* [Fr. Schm.] Masters) seedlings on disturbed soil with the aim of assisted natural regeneration. Scandinavian Journal of Forest Research, 36(2-3): 126-134.

Guleria, V., Chaudhary, Vashisth, A., Sharma, K., Selvan, T. and Thakur, S. 2021. *Terminalia chebula* (Harar) Characterization by using morphological descriptors in Himalayan Region. Indian Forester, 147(2): 154-159.

Yadav, R. 2021. Study on Development and Characterization of Epoxy Resin Bamboo Strip Board. Indian Forester, 147(1): 81- 86.

ENVIS ACTIVITIES

Van Mahotsav 2021 Celebrations

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore celebrated Van Mahotsav 2021 by organizing a Tree Sapling Planting Programme following social distancing in the light of Covid-19. The main aim of this event was to create and spread awareness about the importance of tree planting and role of individuals in protecting the environment from degrading by planting indigenous trees. Director Dr C Kunhikannan, inaugurated the function and released an awareness poster for students. Saplings of indigenous medicinal and timber tree species like *Belleri myrobalan* (Thanni), Portia tree (Poovarasu), Banyan, Shisham, Pongamia (Pungam), Ilanji, Athi, Atcha Maram, Red Tamarind, Amla, Date palm tree etc. were planted in Forest Campus by officers, staff members and students. “Plant a tree sapling photography challenge” was also organized as part of Vana Mahotsav 2021 and people from different walks of life across India participated. E-certificates were awarded to all. Softcopy of the awareness poster was transmitted electronically among the different stakeholders


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Institute of Forest Genetics and Tree Breeding
Ministry of Environment, Forest and Climate Change (Indian Council of Forestry Research & Education)
P.B.No. 1061, Forest Campus, R.S.Puram PO, Coimbatore - 641 002
VAN MAHOTSAV 2021
1st - 7th July 2021
INDIA'S
ANNUAL TREE FESTIVAL
BENEFITS OF TREE PLANTING
Combat climate change
Conserves energy
Cleans the air
Saves water
Prevents pollution
Prevents erosion
Assures food security
Provides habitats
Provides shelter
Provides good health
Economic values

Observance of International Day for the Conservation of Mangrove Ecosystem - 2021

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore commemorated International Day for the Conservation of the Mangrove Ecosystem on 26.07.2021 digitally through Facebook live. The main aim of this event was to raise awareness about the importance of mangrove ecosystems and to promote solutions for their sustainable management and conservation following the mandatory protocols to contain the spread of COVID 19. An awareness quiz was also organized during the occasion and people from different walks of life participated. E certificates were awarded to all of them. Softcopies of the awareness poster released during the occasion signifying the status, contributions and conservation of mangroves were electronically transmitted to students and stakeholders. The digital event can be accessed at https://bit.ly/2TATcyF.

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INTERNATIONAL DAY FOR THE CONSERVATION OF THE MANGROVE ECOSYSTEM - 2021

The International Day for the Conservation of the Mangrove Ecosystem is celebrated every year on 26 July to raise awareness of the importance of mangroves as a "unique, special and vulnerable ecosystem" and to promote their sustainable management, conservation and use. This day is a reminder of the pivotal role of mangroves in preserving ecosystems. Taking care of the nature that surrounds us has become even more critical as the world grapples with the ongoing COVID- 19 pandemic.

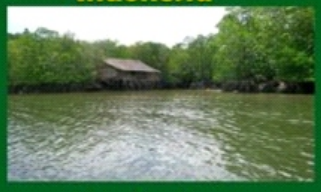
Mangroves in India

- About 40% of world's mangrove cover is found in South East Asia and South Asia. India has about 3% of the total Mangrove cover in South Asia.
- Mangrove cover in the country has increased by 54 sq km (1.10%) as compared to the previous assessment in 2017.
- The current assessment shows that mangrove cover in the country is 4,975 sq km (1.2 million acres), which is 0.15% of the country's total geographical area.
- West Bengal has 42.45% of India'smangrove cover, followed by Gujarat 23.66% and Andaman & Nicobar Islands 12.39%.
- Gujarat shows maximum increase of 37 sq km in mangrove cover over the 2017 assessment.
- Sundarbans is densely populated and is home to the Royal Bengal Tigers. The forest is also home to more than 180 species of trees and plants. Besides, Gangetic dolphins and estuarine crocodiles are also it's popular residents.

Top 10 Mangrove Forest in India

Rank	States/UTs with Highest Mangrove Cover	Total Mangrove Cover in Sq km
1	West Bengal	2,112 .11
2	Gujarat	1,177.27
3	Andaman And Nicobar Islands	616.28
4	Andhra Pradesh	404.14
5	Odisha	250.64
6	Maharashtra	320.27
7	Tamil Nadu	44.83
8	Goa	26.00
9	Karnataka	10.04
10	Kerala	8.90

Indonesia

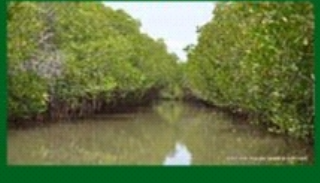


Indonesia contains the largest area of mangroves in the world

Sundarbans

The Sundarbans mangrove forest, one of the largest such forests in the world inscribed as World Heritage site by UNESCO in 1987

Pichavaram



Pichavaram is the second largest Mangrove Forest in the world

World Ozone Day 2021 Celebrations

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore marked the International Day for the preservation of the Ozone Layer 2021 by organizing an awareness cycle rally in Coimbatore. The main objective of the rally was to create awareness about the importance of conservation of the ozone layer. The event received the attention of the Honourable Minister of Environment, Forest and Climate Change Shri Bhupender Yadav.

Dr C Kunhikannan, Director IFGTB inaugurated the awareness cycle rally and spoke about the importance of the ozone layer. People from all walks of life had participated in the awareness cycle rally. An awareness poster highlighting the importance of the ozone layer was released during the occasion and its digital copies were shared with students and all the stakeholders. Certificates were awarded to all the participants of the awareness cycle rally.

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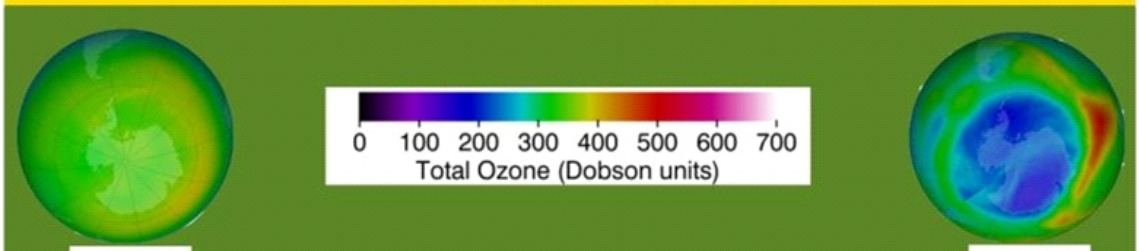
International Day for the Preservation of the Ozone Layer
16th September 2021



The false-color view of total ozone. The purple and blue colors are where there is the least ozone, and the yellows and reds are where there is more ozone.

India and Ozone

- India signed and ratified the Vienna Convention for the Protection of the Ozone Layer in 1991 and the Montreal Protocol on Substances that Deplete the Ozone Layer in 1992, signalling the country's commitments to the global cause of addressing the harmful effects of the ozone layer depletion.
- Since 1993, the United Nations Development Programme (UNDP) has played a crucial role in the phase-out of ozone depleting substances. Government of India has been instrumental in implementing 300 Crores in multilateral fund projects.
- As a result of support, India completely phased out production and consumption of Chlorofluorocarbons, carbon tetrachloride and halons, man-made chemicals responsible for the depletion of the Ozone Layer. This remarkable milestone was achieved two years ahead of schedule. With this achievement, India has contributed significantly to this global environmental cause, by reducing 25,000 ozone depleting particles tonnes and a further potential of 23,000 ozone depleting particles tonnes.
- As a next step, UNDP is supporting the Government of India in phasing out Hydrochlorofluorocarbons (HCFCs) by 2030, as part of the country's commitment to the Montreal Protocol.

Tips to Save Ozone Layer


Plant more trees

Buy local products


Use eco friendly vehicles


Minimize the usage of chemical fertilizers

Practice 3 Rs


Conserve energy

Avoid plastics

Avoid the consumption of dangerous gases

Keep Ozone from becoming the No Zone

IFGTB PRODUCTS

INSTITUTE OF FOREST GENETICS AND TREE BREEDING

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P.B. No. 1061, R.S. Puram, Coimbatore - 641 002. Tamil Nadu, India

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	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. Buvaneswaran,** Scientist- F, Silviculture & Forest Management Division, Phone : 0422 2484198, 94422 45047 E-mail : buvanesc@icfre.org
3.	ArborEasy® DNA Isolation Kit **Pack Size**	**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
	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 : senthilnk@icfre.org (or) **Smt. R. Sumathi,** ACTO Division of Chemistry & Bioprospecting, Phone : 0422 2484144 Mobile : 9942245542 E-mail : sumathir@icfre.org
	Tree PALH (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle		
	Crawl clean (Plant Based Green Insecticide)	Rs. 25.00 per packet		
	Tree Rich Biobooster (Instant Organic potting mixture for home garden, terrace and kitchen garden)	Rs. 50.00 per packet		
	Tara Red Jam (with natural fruit colorant)	Rs. 60.00 per bottle		

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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