



IFGTB NEWS



Quarterly Newsletter on societal applications of research **Interventions in Forestry, Genetics and Tree Breeding** from the Institute of Forest Genetics and Tree Breeding, Coimbatore.

(A national institute of the Indian Council of Forestry Research and Education,
Ministry of Environment, Forest & Climate Change, GOI)

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From the Director's Desk

Insects are an integral part of forestry and agricultural ecosystems, providing varied ecosystem services like pollination and maintenance of ecological balance. The ecological significance of many insects are still to be unravelled. Build-up of insect population beyond a threshold limit, especially in large-scale plantations and farms that are less-diverse, can lead to severe damages to the plants resulting in economic losses. The Institute of Forest Genetics and Tree Breeding, Coimbatore, has taken up several studies to understand the role of insects in contributing to forest productivity so that necessary interventions are developed for insect pest management while the beneficial insects are conserved.

This issue of IFGTB News has forest entomology as the theme, with articles on discovery of grasshopper species, extant diversity of bees in Nilgiris, and a ready reckoner pest calendar to aid the tree farmers and foresters. IFGTB's outreach to tree growers via social media and ICFRE award for an IFGTB Scientist are the other highlights of this issue.

It is hoped that this issue would provide useful information for the tree farmers and foresters.

Dr. C. Kunhikannan
Director, IFGTB



Pest calendar

Jacob J. P., Senthil K., Nataraj P., Mahalingam L. and Srijita Ganguly

Tree cultivation or tree-based farming is a sustainable and viable economic enterprise for farmers. It increases the supply of wood and non-wood products for industrial as well as household consumption, contributing to reduction of pressure on forest land. Trees are exposed to a variety of biotic and abiotic factors detrimental to their growth. Insect pests cause serious damage to trees in seedling stage in nurseries as well as in plantations in farmlands outside forests. Awareness of the periodicity of occurrence and intensity of attack by insect pests is essential to identify and deploy feasible management measures at the right time to avoid economic loss. Pest Calendar for trees would therefore, help

stakeholders in regular monitoring, early detection of pests, planning and undertaking prophylactic measures for key pests well before pest incidence. IFGTB has developed Pest Calenders for forestry nursery pests of 24 tree species, pests of 14 tree species planted outside forests and of 36 species of medicinal plants. A sample of the Pest Calendar for few tree species during a calendar year is depicted below. Based on the type of pests, the season it occurs and the level of incidence, the tools for insect pest management should be carefully selected and attempted in such a way that individual or combination of control methods will bring the pest population to significantly low levels.

Pest calendar for forest nursery (Illustrative)

Probable pest infestation level			L- LOW				M- MEDIUM			H- HIGH				
TREE	PEST	INJURY	MONTHS											
			J	F	M	A	M	J	J	A	S	O	N	D
<i>Albizia lebbek</i>	<i>Psyllid</i>	Sap feeding			L	L	L	M	L	H	H	H	H	H
	Aphid	Sap feeding			L	L	M	M	M	H	H	H		
	<i>Rhesala imparata</i>	Defoliation					L	M	M	M	M			
	<i>Myllocerus</i>	Defoliation					L	L	H	H				
	<i>Eurenma blanda</i>	Defoliation									H	H	H	H
	Coccids	Sap feeding						L	L	L				
<i>Acacia nilotica</i>	<i>Achaea janata</i>	Defoliation									L	M		
	<i>Eumeta cramerii</i>	Defoliation									L	L		
	<i>Chrysomelid beetle</i>	Defoliation									L	L		
	<i>Myllocerus sp.</i>	Defoliation					L	L	L	L	L	L	L	
	<i>Cyrtacanthacris ranaceae</i>	Defoliation									L			
	<i>Cuscutta chinensis</i>	Plant Parasite						L	L	H				
	Scale insect	Sap feeding		L										
	<i>Pteroma plagiophleps</i>	Defoliation					M				M	M		

The following combinations of strategies are recommended for employing feasible pest management methods for insect pests of trees.

No.	PEST LEVEL	METHOD	STRATEGY
1	NIL/LOW	Regular monitoring and early detection of pests with the help of Pest Calendar and identifying abundance level to take appropriate measures.	Initiate implementing pest management strategies well before pest incidence. Install light traps. Assess pest abundance through sampling



No.	PEST LEVEL	METHOD	STRATEGY
2	NIL/ LOW to MEDIUM	Employing cultural and physical methods to minimize incidence and spread of the pest.	Weed clearing, disposal of infested plant parts or plants, hand picking or net collection of pests and destruction, pruning of affected plants.
3	LOW/MEDIUM	Allowing build up of natural enemy population.	Delay pesticide application
4	LOW/MEDIUM	Applying microbial formulations.	Applying commercially available bacterial, viral, fungal formulations.
5	LOW/MEDIUM	Applying effective plant based extracts to minimize pest incidence and spread.	Prepare extracts with easily and commonly available plants through cost effective methods and application.
6	HIGH	Pesticide application	Applying need based or other safe and less persistent insecticides.

The Nilgiris: A haven for bees under distress

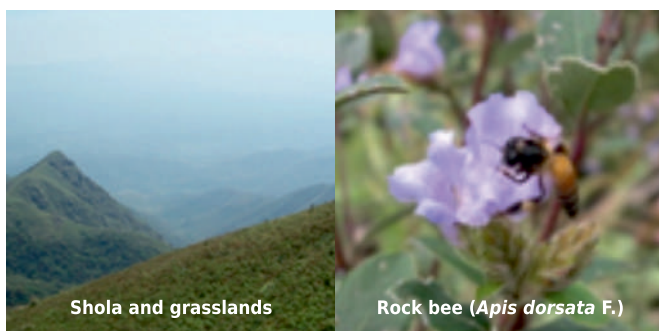
K. R. Sasidharan

Plant-pollinator interactions are widely recognized from Cretaceous period, i.e. about 130 million years ago. Highly evolved pollinators like bees, butterflies and moths appeared after the advent of angiosperms or flowering plants. Among the insects, bees are considered as the most efficient pollinators due to their behavior pattern. Most of the tropical plants, especially the trees are cross-pollinated and they need the services of pollen vectors. Nature also mostly favours cross-pollination through various mechanisms.

The Nilgiris has been an ecologically and phytogeographically important part of the Western Ghats, which is also rich in bee faunal diversity. Our studies have revealed the occurrence of about 92 species of bees in the Nilgiris district. These species fall under 14 genera viz. *Apis*, *Amegilla*, *Braunsapis*, *Ceratina*, *Chelostoma*, *Halictus*, *Lasioglossum*, *Megachile*, *Nomada*, *Nomia*, *Sphcodes*, *Thyreus*, *Trigona* and *Xylocopa*.

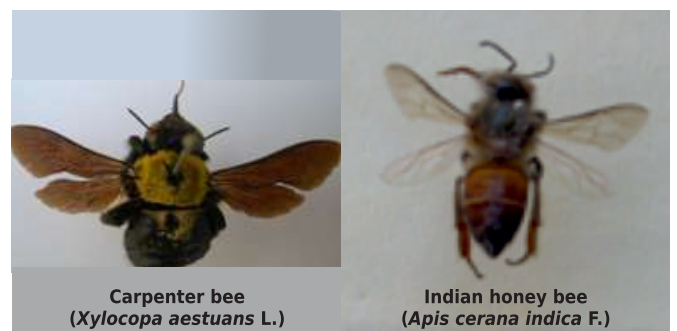
Except for *Apis cerana indica* F., the Indian honey bee, all other species recorded are wild; some have social, semi-social, solitary or nomadic life style and they are not amenable for hiving. The highest diversity of bees was noticed in the Dry deciduous forests, while other forest types registered intermediate levels of diversity. The diversity of bees in monoculture plantations was the lowest, compared to the natural forests. Significant positive correlation of bee faunal diversity with the diversity of shrubs and climbers was noticed, compared to that of tree species. A total of 113 plant species, which act as nectar and pollen resources for bees, was also recorded from the Nilgiris.

Bees encounter several threat factors in the Nilgiris, warranting necessary management interventions to conserve these tiny insects for maintaining the health of this ecologically sensitive hilly tract of the Western Ghats.



Shola and grasslands

Rock bee (*Apis dorsata* F.)



Carpenter bee
(*Xylocopa aestuans* L.)

Indian honey bee
(*Apis cerana indica* F.)

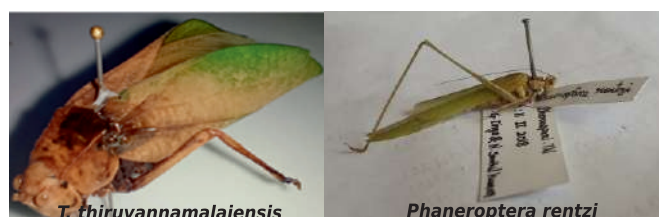


Discovery of new grasshopper species

N. Senthilkumar and G. Divya

The Orthoptera order include short-horned grasshoppers, long-horned grasshoppers and crickets. They are dominant group of herbivorous insects in all terrestrial environments of the world. Their high diversity, functional importance, and sensitivity to disturbance make them useful bioindicators for land management. There is a paucity of information on the biodiversity of Orthoptera in Tamil Nadu. Therefore, biosystematics and diversity of Orthoptera at

different levels viz., habitats, landscapes and agroclimatic zones of Tamil Nadu have been carried out for better understanding of this group of insects. During the expedition, four species of long-horned grasshoppers new to science were discovered from different locations. These have been described as *Trigonocorypha thenensis*, *T. ponmaniae*, *T. thiruvannamalaiensis* and *Phaneroptera rentzi*; and published in *Zootaxa, Journal of Entomology and Zoology Studies*. Their ecological significance is under study.



IFGTB Accolades

ICFRE award of excellence for outstanding research in Forestry

Dr. Kannan C.S. Warriar, Scientist F, at the Institute of Forest Genetics and Tree Breeding, Coimbatore has been conferred with the ICFRE Award of Excellence for Outstanding Research in Forestry for the year 2019. He has released three productive clones of *Casuarina equisetifolia* suitable for salt affected soils. The research has significance as about 6.73 million hectares of salt affected lands exist in India. These clones will also support the efforts of ICFRE which has been declared as the centre of excellence for addressing issues related to land degradation by the Honourable Prime Minister of India. He is also leading a tree improvement programme of *Thespesia populnea* to evolve crook free varieties of this multipurpose tree species. The trees generally grow in short twists and turns, and lumber of good length is not generally available. Plus trees numbering 139 have been selected with straight stem form from south Indian States. Dr Kannan Warriar was also the recipient of the Rolla S



Dr. Kannan C.S. Warriar, Scientist F, Coimbatore has been recognized for his work on salt tolerant clones of *Casuarina equisetifolia*.

Rao National Award by the Indian Association of Angiosperm Taxonomy for the best research work on biodiversity conservation. His extensive research on conservation of endangering sacred groves won him this award. He is the First Rank Holder for both B.Sc. and M.Sc. Forestry degrees from Kerala Agricultural University and holds a doctoral degree in Forest Genetics. He was also the recipient of the Kalaprathibha Award (Most talented male artist) of the Kerala Agricultural University for 5 years. His classical composition Prakruthi Vandanam, an invocation on nature, based on Yajur Veda, released for the Ministry of Environment Forest and Climate Change has been well received. Dr Kannan Warriar has composed music for the Official Theme Song of the Kerala Forests and Wildlife Department "Kadarivu" sung by the renowned playback singer Sh. P. Jayachandran. He is also functioning as the Coordinator of ENVIS Centre on Forest Genetic Resources and Tree Improvement at IFGTB.

Popularizing IFGTB's technologies through webinar on “Tree cultivation for increasing farm income” for tree growers of Tamil Nadu

P. Chandrasekaran, R.G. Anitha and P.A. Sheheena

ICFRE's vision 2030 envisages the adoption of aggressive extension strategies for outreach and demonstration of its research findings. In this regard, IFGTB collaborated with *Pasumai Vikatan*, Chennai for hosting online lecture series on the theme “**Tree cultivation for increasing farm income**”. This initiative was organized as part of *ICFRE-NFRP- project “Developing and Popularizing Digital interactive platform for Tree Growers and Other Stakeholders of Tamil Nadu”* and an outreach project of Extension Division. The main objective of the online series was to popularize the technologies of IFGTB viz., ‘Commercially important clonal varieties and tree crops’, ‘Package of practices’, ‘Agro forestry models’ and ‘integrated pests and disease management’ with the tree growers of Tamil Nadu.

Nearly 7,632 participants registered for the programme and 1,276+ participants attended the webinar in ZOOM App. The theme of lectures and participation is summarized in Table. All the six lectures were streamed online through Facebook live and recorded version was also shared in the social media groups. An outstanding response of more than 70,869+ views in Facebook were recorded for the programmes. The online lectures

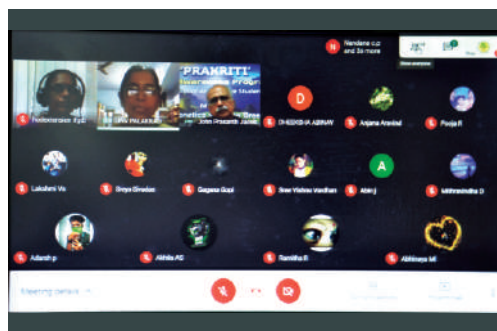
were also documented as review article in *Pasumai Vikatan* journal.



Date	Topic / Speaker	Viewers	
		Zoom (Live)	Facebook (as on 31.12.2020)
05.06.20	High yielding Casuarina Clones - Dr. A. Nicodemus; Facebook link: https://www.facebook.com/PasumaiVikatan/videos/194482061741564/	285+	16,000+
12.06.20	Agroforestry Models & Casuarina Windbreak Clones- Dr. C. Buvaneshwaran; Facebook link: https://www.facebook.com/PasumaiVikatan/videos/1714744458677105/	245+	14,000+
19.06.20	Cultivation practices in Gmelina arborea (Kumil) - Shri. A. Mayavel Facebook link: https://www.facebook.com/PasumaiVikatan/videos/401753460738956/ Youtube link: http://youtu.be/PQbbzjaEx1c	235+	15,000+
26.06.20	Cultivation practices in Cadamba - Dr. A. Vijayaraghavan Facebook link: https://www.facebook.com/PasumaiVikatan/videos/278058636793390/?d=n Youtube link: https://youtu.be/54u04YWJRNQ	266+	18,069+
13.08.20	Cultivation practices in Calophyllum inophyllum (Punnai) - Dr. R. Anandalakshmi; Facebook link: https://www.facebook.com/PasumaiVikatan/videos/1145311492536358/	117+	3,000+
27.08.20	Transit rules and practices in Tamil Nadu for promoting tree farming - Shri. P. Kathirvel, IFS; Facebook link: https://www.facebook.com/PasumaiVikatan/videos/338242360638082/	128+	4,800+
Total		1,276+	70,869+

Activities of IFGTB : July - Sep 2020

- ◆ **Meetings / Seminars :** Conservation and utilization of Cinchona in the present COVID 19 situation (16th Jul), Cultivation practices in *Calophyllum inophyllum* (Punnai) - IFGTB collaboration with Pasumai Vikatan (13th Aug), Transit rules and practices in Tamil Nadu for promoting tree farming (27th Aug), Forest Fire - Ecology and Management (28th Sep).
- ◆ **Other Events :** Van Mahotsav Day (03rd Jul), International Day for the Conservation of the Mangrove Ecosystem (27th Jul), 74th Independence Day (15th Aug), World Ozone Day (16th Sep), Hindi Day (14th Sep).
- ◆ **Prakriti :** 428 school students & 150 college students participated in the PRAKRITI awareness program "Online Knowledge Series - Talk to Scientist Program" (July - Sep).



Workshop Announcement

ICFRE-ICAR Consultative Workshop for scientific collaboration in the area of "Developing Molecular Breeding Technologies for Enhancing Plant Productivity in Degraded Lands" would be hosted online by IFGTB, Coimbatore, on **24 March 2021**. Interest for participation may be conveyed by filling the forms at <http://bit.ly/3o77d0j> by **24 Feb 2021**.

About IFGTB

The Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore, is a national institution of the Indian Council of Forestry Research and Education (ICFRE), an autonomous council under the Ministry of Environment, Forest and Climate Change, Government of India. IFGTB has a mandate to develop new varieties, management and silvicultural techniques to maximize productivity of natural and planted forests under different ecological considerations and changing environment.

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Cover Photo : Common forestry pests by
Dr. J. P. Jacob, Scientist G.

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