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Significant Research Findings

Forest Research Institute, Dehradun

- Hydro-steam distillation of *Eucalyptus* sp. and *Cymbopogon* sp. was done in batches of 10 Kg each in the newly designed energy efficient essential oil distillation unit. It was observed that the yield of the oil was better using cohobation principle.
- 20 accessions of one population of *Quercus semicarpifolia* (QS-22) grown in the forests of Balganga, Prinwas, Tehri were characterized for the first time for total phenolic contents determined in their leaves.
- Knot-woods of *Dalbergia sissoo* and *Pinus roxburghii* displayed significant fungi toxicity against two wood decaying fungi in their 95% acetone water extracts.
- Three populations (VAJ-09-DK, VAJ-09-DH and VAJ-09-KD) of *Valeriana jatamansi* collected from Arunachal Pradesh was characterized for the first time for their volatile constituents determined in their rhizomes.
- Derivatization and compositional analysis of neem oil extracted from seeds of selected neem progenies was carried out.
- Ten egg parasitoids were sorted out from collected samples and specimens were identified up to species level of *Gonatocerus aegypticus*, *Mymar schwanni*, *Ooencyrtus* sp., *Paracentrobia bharpurensis*, *Paracentrobia longipensis*, *Trichogramma achaeae*, *Trichogramma pretiosum*, *Trichogramma cuttakensis*. under the project "Studies on diversity and host range of hymenopteran egg parasitoids from northern India (Haryana, Uttar Pradesh and Uttarakhand)".
- Specimens of a rare species Yellow Wood brown, *Lethe nicetas*, Hewitson, 1863(♀) (Lepidoptera: Nymphalidae: Satyriinae), collected during field surveys from Kedarnath Sanctuary, Chamoli District Uttarakhand, India during 2017 were identified and incorporated in NFIC, FRI, Dehradun. Database on butterflies under different forest types was updated under the project "Butterflies associated with different forest types/sub-types in Uttarakhand".
- Life cycle of cerambycid stem borer, *Xylotrechus basifuliginosus* was studied on Kharsu oak logs with emergence of this borer in rearing cages for: emergence, sex determination, sex ratio, courtship & mating, oviposition, eggs, morphology of 1st and 2nd instar larval stages. Life history of *Ptilinus pectinicornis* Linn. 1758 (Coleoptera: Anobiidae) was also studied on Kharsu Oak, *Quercus semicarpifolia*. Database of insects pests of Western Himalayan oaks was updated and 17 new species of cerambycidae (Coleoptera) and 20 species of Lepidoptera and their images of specimens kept in NFIC, FRI, Dehradun besides background information, thus totaling to 152 species (70 Coleoptera and 82 Lepidoptera) in the database under the project "Insect pests of Western Himalayan Oaks and their Control".
- 349 species were digitized –71 with DSLR and 278 with stereo zoom microscope. Photographs of 300 species were edited and stored under the project "Digitization and enrichment of National Forest Insect Collection (NFIC) of Forest Research Institute, Phase-II (minute insects)".
- Diversity study of pteromalid parasitoids (Hymenoptera: Pteromalidae) of Northern India with special emphasis on bio-efficacy of some selected parasitoids was carried

out. Pteromalids from FRI campus and its surrounding area were collected and preserved. Primary observations it is predicted that predominant species around the studied area is likely to be ranging from 2 to 4 species of family Pteromalidae.

- Study undertaken at salt affected soils in Haryana and Punjab revealed that vegetation associated with other environmental factors like soil pH, EC, moisture and temperature are crucial in determining the relative abundance of soil microbial community.
- The soil samples were processed and analysed for soil nutrient status of Chirpine forests at Korai Beat, Pharsula, Lansdowne Forest Division under Group-12 Himalayan Moist Temperate Forests- Cld- Western Mixed Conifer Forests of Lansdowne (Garhwal). The preliminary findings revealed that the Bulk density ranges from 0.98 to 1.30 g/cm³ increasing with soil depths, WHC ranges from 35.81 to 57.27% decreasing with soil depths, pH ranges from 5.93 to 5.96 with no trends found with soil depths, the SOC, available Nitrogen and Potassium percent ranges from 0.98 to 1.82%, 0.0087 to 0.0218% and 0.010 to 0.019% respectively decreasing with increasing soil depths. The available Phosphorus ranges from 0.0011 to 0.0013% In general the data on soil show poor status of nutrients of Chirpine forests at Korai Beat, Pharsula, Lansdowne Forest Division in the study "Soil nutrient pool under different forest types of Uttarakhand".

Institute of Wood Science and Technology, Bengaluru

- The protocol to synthesize nanocellulose from pulp fibers was standardized and the unique property of nanocellulose to form a complex network was effectively used to develop completely biodegradable natural fiber based composite material. The nanocellulose film exhibited very high stiffness (storage modulus – 120 GPa) and negligible damping coefficient. Composites with density ranging from 0.100 g/cc to 0.800 g/cc were prepared by mixing nanocellulose suspension with fibers. Tensile strength, flexural strength, dynamic modulus of elasticity and electrical resistance of the composites increased with increasing density. The material can be tailored for the desired properties by varying the nanocellulose proportion and processing conditions. The developed material can be used as biodegradable packaging material.
- *Hevea braziliensis* (rubberwood) wood specimens treated with nano metal zinc oxide by pressure and non-pressure methods showed that nano zinc oxide is well absorbed by the wood specimens and gets fixed (92% fixation in leaching experiments). The efficacy of nano zinc oxide against termites in the field, and brown rot and

white rot fungi in the laboratory was evaluated and compared with normal zinc oxide. Nano zinc oxide show more antifungal property than normal zinc oxide. The pressure treated wood specimens were found to be in sound condition against termites after 24 months of fld exposure. The study reveals that nano zinc oxide could potentially be used as an effective wood preservative.

- Variability in wood quality was assessed in *Melia dubia* (Hebbevu) plantations of varying age groups in Kolar, Hunsur, Kollegal, Hosur and Bangalore areas. The management practices had a significant influence on growth parameters. Wood quality was found to vary significantly within the plantation and between plantations. Based on the variability assessment, criterion for selection of superior genotypes of *M. dubia* has been worked out and few superior trees have been identified for wood stiffness and density. These trees can potentially form the pool for seed collection. A multiple linear regression prediction model has been developed for the species to predict the pilodyn penetration under bark from bark thickness and measurement of pilodyn penetration over bark to get a quick estimation of wood density. Marker assisted selection of genotypes based on wood properties has also been explored and initial results are showing potential of identifying genotypes with superior wood density and stiffness.
- Germplasm banks of *Dendrocalmus stockssii* (Marihal bamboo) established by IWST, Bengaluru at three locations namely Gottipura (Bengaluru), Honnavara and Dapoli (Maharashtra) were evaluated for bamboo culm quality. Among the three locations, germplasm bank at Dapoli exhibited the best growth and survival. The clumps were assessed for internodal length, ultrasonic velocity, material density and dynamic modulus of elasticity.

Arid Forest Research Institute, Jodhpur

- Guggal seeds collected from 647 genotypes at Deesa, Gujarat indicated that 9.27% genotypes produced more than 80% black seeds in the first year. In second consecutive year, 4.02% genotypes produced more than 80% black seeds. Eight genotypes (A0201, A0301, A0303, A0901, A0404, A0904, C0202, C0516) produced more than 80% black seeds in two successive years.

Himalayan Forest Research Institute, Shimla

- Grafting (wedge, side and cleft) has not been found successful in deodar (*Cedrus deodara*) due to strong incompatibility of stock and scion. The grafts after surviving for six to eight months slowly wither away.

Workshops/ Seminars/ Meetings

S. No.	Topic	Duration	Beneficiaries
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Institute of Forest Genetics and Tree Breeding, Coimbatore

1.	Monthly seminar for the Research Scholar	11 April 2019	35 Research Scholars
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Monthly seminar for the Research Scholar at IFGTB, Coimbatore

Arid Forest Research Institute, Jodhpur

2.	Biodiversity and carbon sequestration	18 April 2019	47 Scientist/Technical/ Foresters /Research Scholars/ Students etc.
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Institute of Wood Science and Technology, Bengaluru

3.	Wood Preservation Meet	25 April 2019	Wood Industries, Saw Millers, Wood Preservation Industries, Researchers, etc.
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Himalayan Forest Research Institute, Shimla

4.	Sustaining Demands for Himalayan Medicinal Herbs: Role of Conservation Assessment & Management Prioritization (CAMP)	29 April 2019	Scientists, officers, research & technical support staff
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Monthly seminar on Sustaining Demands for Himalayan Medicinal Herbs: Role of Conservation Assessment & Management Prioritization (CAMP) at HFRI, Shimla

Award

- Dr. K.S. Shiny, Post Doctoral Fellow, IWST, Bengaluru won Best Poster Award for poster titled “Nanoparticles for wood protection: Biological synthesis of Copper oxide and Zinc oxide nanoparticles using Lantana camera leaf

extract and evaluation of its wood preservative properties authoring K.S. Shiny, R.Sundararaj, G. Vijayalakshmi, N. Mamatha, B. Lingappa. in The Biennial National Conference held by DST, Mahatma Gandhi University, at Kottayam, Kerala from 26 and 27 April 2019.

Training Programmes

S. No.	Topic	Duration	Beneficiaries
Forest Research Institute, Dehradun			
1.	Ecological restoration for integrated environment management in coal mines	22-27 April 2019	330 officials of Sijua, Katras and Lodna coal mine areas
Institute of Wood Science and Technology, Bengaluru			
2.	Field identification of selected important timbers	22 – 24 April 2019	32 RFO Trainees Kundal Forest Academy Sangli, Maharashtra

Visit of Dignitaries

- Shri Siddhanta Das, IFS, Director General of Forests & Special Secretary, MoEF&CC visited Forest Research Centre For Coastal Ecosystem, Visakhapatnam, a Research Centre under Institute of Forest Biodiversity and reviewed the research activities and endeavors of the Centre, dated 1 to 2 April 2019.
- Honble Mr. Justice Adarsh Kumar Goel, Former Judge Supreme court & Chairperson, National Green Tribunal visited FRI on 17 April 2019.



Shri Siddhanta Das, IFS, DGF & Special Secretary, MoEF&CC visited FRC-CE, Visakhapatnam



Honble Mr. Justice Adarsh Kumar Goel, Former Judge Supreme Court & Chairperson, National Green Tribunal visited FRI

Miscellaneous

Institute	Special Day	Duration
IFGTB, Coimbatore	128th birth Anniversary of Babasaheb Dr. B.R. Ambedkar	22 April 2019
FRI, Dehradun; IWST, Bengaluru; TFRI, Jabalpur; AFRI, Jodhpur; HFRI, Shimla; IFP, Ranchi	Earth Day– 2019	22 April 2019



128th birth Anniversary Babasaheb Dr. B.R. Ambedkar at IFGTB



Earth day -2019 at HFRI, Shimla

HR News

Retirement

Name of Officer	Date
Smt. D. Vanmalar, Sci.-E, IWST, Bengaluru	30.04.2019
Dr. V.K.W. Bachpai, Sci.-D, IFGTB, Coimbatore	30.04.2019
Sh. Satish Kant Sharma, Sci.-D, FRI, Dehradun	30.04.2019
Sh. Jagdish Saran Saxena, Under Secretary, FRI, Dehradun	30.04.2019
Sh. Krishan Kant Uniyal, Senior Technical Officer, FRI, Dehradun	30.04.2019

Patron:

Dr. Suresh Gairola, Director General, ICFRE, Dehradun

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Shri Vipin Chaudhary DDG(Extn.), Chairman
 Dr. (Smt.) Shamila Kalia, ADG (M& Extn.), Honorary Editor
 Shri Raman Nautiyal, Scientist- E, Statistics Division, Member
 Shri Ramakant Mishra, CTO, (M&Extn.), Member

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