



## Content

### Significant Research Findings

#### Forest Research Institute, Dehradun

- CIE L\*a\*b\* analysis of silk, wool and cotton fabrics dyed with natural dyes developed from *Prosopis juliflora* under different mordanting conditions were determined.
- Extraction of essential oil from *Cymbopogon flexuosus* (lemongrass) collected using different cohobations was also done. The yield% of essential oil was 1.94% using cohobation tube, while it was 1.478% without using any cohobation.

- Surveys were conducted in the Chakarata and Mussoorie areas of Uttarakhand and Rohru, Solan and Renukaji regions of Himachal Pradesh. Infestation of *Pistacia integerrima* by *Biozongia pistaciae* was recorded. Intensity of gall infestation on trees and growth parameters of galls were also recorded. Morphometrics of Winter alates and nymphs laid by winter alates were also studied.

- Forty sweeping samples were collected from Champawat, Almora, Bageshwar and Pithoragarh. Eight samples of insect larva were collected from different forest trees like *Azadirachta indica*, *Cinnamomum tamala*, *Ficus racemosa*, *Pyrus communis* and *Quercus leucotrichophora* for their laboratory rearing which was continued for emergence of *Apanteles* spp. Twenty *Apanteles* spp. were screened out. Slide preparation and identification are in progress.

- Twenty two samples of insect eggs were collected from district: Almora, Bageshwar, Champawat and Pithoragarh from different forestry tree: *Azadirachta*

Significant Research Findings	→	Page-01
Consultancy	→	Page-03
Workshops/seminars/Meetings	→	Page-03
Graining Programmes	→	Page-05
Patents	→	Page-06
Prakriti	→	Page-06
Rajbhasha Activity	→	Page-06
Demonstration Programmes	→	Page-06
Visit of Dignitary	→	Page-07
Miscellaneous	→	Page-07
HR News	→	Page-07

*indica*, *Cinnamomum tamala*, *Ficus racemosa*, *Pyrus communis* and *Quercus leucotrichophora*. Three egg parasitoids were sorted out from collected samples and specimens were identified up to species level: *Anaphes* sp., *Mymar pulchellum* and *Trissolcus latisulcus*.

- Field survey was carried out in Chakrata & Mussoorie Forest Divisions, Dehradun District Dhanaulti in Tehri Garhwal in Uttarakhand. Sampling was carried out in 20 transects in 4 forest sub-types (12/C1a Ban Oak Forest; 12/C1b Moru Oak Forest; 12/C2a Kharsu Oak Forest; 12/C2c Moist Deodar Forest). A total of 68 species were sampled with collection of 16 specimens of uncommon & rare species to Uttarakhand including that of *Pala Jzebel*, *Delias sanaca* were collected and preserved. GIS based false colour composite maps of Mussoorie Forest Division, Joshimath- Malari area were generated for different forest sub-types for touring/sampling besides updating of butterfly database.
- Rearing experiments were continued on 6 larvae of 1 species of Lepidoptera namely, *Calletria gerotei* (Erebidae) collected from

ban oak trees during the field surveys were reared and studied for life history studies in the laboratory. Life cycle of one cerambycid stem borer, *Xylotrechus basifuliginosus* was studied on Kharsu oak logs for 3<sup>rd</sup> instar larval stages. Survey of Kharsu (*Q. semicarpifolia*) forest was carried out in Chakrata Forest Division (Deoban-Kauntalani), Uttarakhand for find out the presence of borer *Xylotrechus basifuliginosus* and extent damage during pre-monsoon season by laying down 20 quadrates (10m x 10m) for tree GBH, density & vegetation composition. Borer infested log was collected from Kharsu forest and brought to the laboratory at FRI, Dehradun for life cycle studies.

- Digitized 300 species of insects. 600 photographs of these species were edited. Verified information on the species and their images cabinet and drawer wise with the data entered in the Database to check if species name or any other information on its image and location is rightly entered in the database. 20 cabinets were verified. Process of database uploading was initiated under the project "Digitization and

enrichment of National Forest Insect Collection (NFIC) of Forest Research Institute, Phase-II (minute insects)".

- Statistical analysis of data collected for production loss due to defoliation and analysis of data collected for estimation of screening resistant clones were done. Maintenance of Clonal nursery under the project "Screening of poplar clones for tolerance against poplar leaf defoliator, *Clostera cupreata* But".
- Collection of butterfly larva and pupa of *Graphium doson* and *Graphium Agamemnon* and exposing them for parasitization. Card mounting of collected 13 specimens mounts have been prepared taking one individual of each species collected and preserved. Collection of leaf galls and scale insect infested leaves has been done. Collection of galled leaves and syconiums of *Ficus religiosa* and *Ficus racemosa* for studying insect emergence of gall forming insects. Status: Emergence of dipteran and apterous hymenoptera insects under the project "Diversity study of pteromalid parasitoids (Hymenoptera: Pteromalidae) of Northern India with special emphasis on bio-efficacy of some selected parasitoids".
- Trials for saponin determination in different diameters of *Grewia optiva* (Bhimal) twigs were carried out. Conducted survey of bhimal trees in four villages viz. Jasau Kharaya, Tipau, Malhau and Chandau of Tehsil Kalasi and interviewed the villagers & farmers and filled up questionnaire and also measured trees.
- Survey was conducted for burnt and un-burnt Chirpine forest of Uttarakhand and collected soil samples were analysed in the laboratory. The Bulk density ranges from 1.03 to 1.58 g/cm<sup>3</sup> in burnt and 0.94 to 1.21 g/cm<sup>3</sup> in un-burnt Chirpine forests increasing with soil depths, Water Holding Capacity (WHC) ranges from 39.85 to 64.77 percent in burnt and 41.36 to 67.18 percent in un-burnt forests decreasing with soil depths, the pH ranges from 5.6 to 5.8 in burnt and 5.5 to 5.7 in un-burnt sites increasing with soil depths, the SOC ranges from 0.71 to 5.05 percent in burnt and 0.83 to 2.68 percent in un-burnt forests decreasing with soil depths and available Nitrogen and Potassium ranges from 0.0091 to 0.0265 percent and 0.0130 to 0.0375 percent in burnt site and 0.0084 to 0.0162 percent and 0.0097 to 0.018 percent in un-burnt sites decreasing with soil depths. The available Phosphorus ranges from 0.0014 to 0.0018 percent in burnt and 0.0011 to 0.0016 percent in un-burnt forests with no trend of decreasing/ increasing with soil depths under Chirpine forest fires of Barkot beat, Ranwai range of Upper Yamuna Forests Division of Uttarakhand in November, 2017 soil survey. Over all the effect of forest fires revealed that there is decrease in WHC in burnt compared to un-burnt Chirpine forests and decrease in available Nitrogen in burnt forest compare to un-burnt forests with a decreasing along with increasing soil depth. The Potassium increased in burnt sites compared to un-burnt sites with decreased with increasing soil depths. The pH and available Phosphorus slightly decreased in burnt sites compared to un-burnt sites of Chirpine forests of Barkot beat of Rawani Range of Upper forest Division Uttarakhand surveyed in November, 2017.
- Physical characterization of soil samples in Alpine Sub-alpine forests of Kedarnath Wildlife Sanctuary of Gopeshwar Forest Division of Garhwal Himalaya (four major Groups/ forest types and seven sub-types/ stands) suggests that the Bulk density (BD) is higher in Group-15/ Moist Alpine Scrubs, Alpine Pasture, Soil profile study at Kedarnath Wildlife Sanctuary (KWS), Lincholi opposite Garur Chatti, Guptkashi Range, Gopeshwar Forest Division (1.33g/cm<sup>-3</sup>) followed by Group-12 (C1a) Soil profile in Ban oak forests, (Ban oak mixed), Sankari village Civil Soyam forests, Guptkashi Range, Rudrapryag Forest Division (1.15g/cm<sup>-3</sup>), Group-12 (C1a)/ Ban oak forests, (Ban oak mixed), Sankari village Civil Soyam forests, Guptkashi Range, Rudrapryag Forest Division (1.09g/cm<sup>-3</sup>) followed by Group-12/ Himalayan moist temperate forests, Kharsu oak (*Quercus semecarpifolia*) in Mungersanti Range, Upper Yamuna Forest Division (0.98g/cm<sup>-3</sup> and 0.94g/cm<sup>-3</sup>), Group-16 (16/C1) Dry Alpine Scrubs, Alpine Pasture KWS above Bhairavnath Temple, Kedarnath, Guptkashi Range (0.92g/cm<sup>-3</sup>), Group-15/ Moist Alpine Scrubs, Alpine Pasture at Chandrashilla, Kedarnath Wildlife Sanctuary (KWS) above Tungnath Temple, Ukhimath Forest Range, Group-15/ Moist Alpine Scrubs, Alpine Pasture at Tungnath, Kedarnath Wildlife Sanctuary (KWS) left to Tungnath Temple, Ukhimath Forest Range, Near HNBSU high altitude PP laboratory and Group-12/ Ban oak forests (12/C1a), Himalayan Moist Temperate Forests, Soil profile and auger sampling at Bhatiya Beat, Mungersanti Range, Upper Yamuna Forest Division (0.91g/cm<sup>-3</sup> and 0.89g/cm<sup>-3</sup>) and least BD shown in Group-14/ Sub-alpine Forests, at Tungnath i.e. *Abies pindro* -*Rhododendron arboretum* forests, left side of way to Tungnath Temple, Ukhimath Forest Range (0.83g/cm<sup>-3</sup>).
- Establishment of H-Flumes (one) and Parshell's Flumes (three) for measurement of stream discharge in sub-watershed of Kempti watershed at Mussoorie Forest range was done.
- Survey activity by total station was performed in mining area of Ganga river at Haridwar as pre-monsoon baseline for estimation of river bed material deposition in respective mining area.

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- Survival and growth data at nine months after planting were collected from *Casuarina* clonal evaluation trials established in Gujarat during September, 2018. The assessment revealed that some *Casuarina junghuniana* clones and two clones of interspecific hybrid between *Casuarina equisetifolia* and *C. junghuniana* performed better in all three places namely Rajkot, Habatpur and Hathab (Bhavnagar). Maximum survival of 98 % was observed at Rajkot (inland area), 50% survival at Hebatpur (saline land) and 40% survival at Hathab (sea coast).

- Under faunal diversity assessment, a total number of 45 species of different birds recorded in Rajbhawans of Jaipur

and Mount Abu. Recorded species in Jaipur and Mt Abu area were 22 species and 29 species respectively.

## Consultancy

- ICFRE presently works on ten consultancy projects, which are awarded by Tehri Hydro Development Corporation India Ltd; Himachal Pradesh Power Corporation Limited; Karnataka State Official Authority; MoEF&CC, Gol, New Delhi; Coal India

Limited, Kolkata; NTPC Ltd Noida; NMDC Ltd, Hyderabad; Singreni Collieries Company Ltd., Kothagudem; Chhattisgarh Forest Department, Raipur; and Deptt. of Forest and Environment, Bhubaneswar are in progress.

## Workshops/ Seminars/ Meetings

S. No.	Topic	Duration	Beneficiaries
<b>Forest Research Institute, Dehradun</b>			
1.	Essential Oils, Perfumery & Aromatherapy	10 to 14 June 2019	Cosmetologists, Beauticians, Scientists, Doctors, Aroma therapists, Traders, Entrepreneurs, Industrialists, Stake holders etc.



Training-cum-Workshop on Essential Oils, Perfumery and Aromatherapy at FRI, Dehradun

## Institute of Forest Genetics and Tree Breeding, Coimbatore

2.	Role of Forestry Interventions to Rejuvenate river Cauvery	25 June 2019	FC & RI, Mettupalayam; CASFOS; Karunya Deemed University; Volunteers of Rally for River, Isha Foundation , Coimbatore; DFO, Coimbatore, Ex –Director, Nityata River other conservancy, Scientists & Technical staffs
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Meeting on Role of Forestry Interventions to Rejuvenate river Cauvery at IFGTB, Coimbatore

## Arid Forest Research Institute, Jodhpur

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| 3. | Tree Improvement of an important timber species of Rajasthan <i>Tecomella undulata</i> | 28 June 2019 | Scientists/Technical staff/<br>Research Scholar |
|----|--|--------------|---|

## Rain Forest Research Institute, Jorhat

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|----|---|-----------------|---|
| 4. | Preparation of Detailed Project Report (DPR) for rejuvenation of river Brahmaputra through forestry interventions | 18 June 2019    | People of Brahmaputra Basin   |
| 5. | Preparation of State REDD+ Action Plan for Sikkim   | 25-26 June 2019 | Indigenous people, Forest dependent communities and Forest Department |

## Himalayan Forest Research Institute, Shimla

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|----|---|------------------|---|
| 6. | Preparation of State REDD+ Action Plan for Himachal Pradesh | 18 -19 June 2019 | Non Governmental Organizations, Rural Development, Public Works Department, Horticulture, Animal Husbandry, Agriculture, HP Department of Environment, Science and Technology and JFMCs |
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Workshop on Preparation of State REDD+ Action Plan for Himachal Pradesh at HFRI, Shimla

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|----|---|--------------|--|
| 7. | Research and Application of Ethno-medicinal Plants  | 26 June 2019 | Scientists, Officers, Technical officers and Other research support staff  |
| 8. | Preparation of Detailed Project Report for Rejuvenation of Indus River Basin through Forestry Interventions | 29 June 2019 | State Forest Departments of Himachal Pradesh, Punjab and J&K National Institute of Hydrology, Soil and Water Conservation, Pollution Control Boards, Remote Sensing and representatives of other line departments, scientists from FRI Dehradun and HFRI, Shimla, academicians from UHF, Nauni |

## Institute of Forest Productivity, Ranchi

9.	DPR preparation for Rejuvenation of Mahanadi and Godavari rivers through Forestry Interventions	10 June 2019	Officers, Scientists & Officials
10.	Molecular Biology in FGR Conservation	19 June 2019	Officers, Scientists, Officials & Students

## Institute of Forest Biodiversity, Hyderabad

11.	DPR Preparation on Rejuvenation of Godavari, Krishna and Mahanadi Rivers through Forestry Intervention	7 June 2019	Nodal officers and some Senior Scientists
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## Training Programmes

S. No.	Topic	Duration	Beneficiaries
<b>Forest Research Institute, Dehradun</b>			
1.	Nursery Diseases and their Management	10 to 14 June 2019	Forest guard of Jharkhand forest Department
2.	Timber Species Identification and Defects	27 and 28 June 2019	Officers and Engineers of Military Engineering Services, Indian Military Academy, Dehra Dun
<b>Institute of Forest Genetics and Tree Breeding, Coimbatore</b>			
3.	Microbiology, GIS & Remote sensing, Forest Genetic Resources Management, Biostatistics & Scientific writing, Plant Biotechnology and Bioprospecting	13 May - 6 June 2019	B.Tech, UG & PG of Biotechnology, Biochemistry and Microbiology, Biochemistry and Microbiology disciplines from various colleges
4.	Seed Handling, Testing and Quality Seedling Production of Forestry Species	20 – 21 June 2019	Farmers and Students



Hands of training given to handle microscope & image analyser at IFGTB, Coimbatore



Training on Seed Handling, Testing and Quality Seedling production of Forestry Species at IFGTB, Coimbatore

## Institute of Wood Science and Technology, Bengaluru

5.	Statistical Methods in Forestry	10 - 11 June 2019	Msc (Forestry) students and faculty from College of Forestry, Ponnempet
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## Tropical Forest Research Institute, Jabalpur

6.	Agroforestry Systems	3 -7 June 2019	UG students from SHIAT, Pryagraj
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## Rain Forest Research Institute, Jorhat

7.	Forestry	3 – 29 June 2019	B.Sc.(Forestry) and B.Sc. (Agriculture) students of Mewar University
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### Patent

- A patent has been granted (Patent No. 313151, dated 24.05.2019) by the Patent Office, Government of India, New Delhi to the Forest Research Institute on the invention entitled: A process for the isolation of Ursolic acid from Eucalyptus hybrid Leaves (Patent Application No.: 361 / DEL / 2009). The Inventors of the Patent were Dr. Praveen Onial, ACTO and Dr. Rameshwar Dayal Ex. Head Chemistry and Bioprospecting Division, FRI, Dehradun.

### Prakriti Programme

- IFP Ranchi organized Prakriti programme on Forestry awareness at Kendriya Vidyalaya, Patratu, Jharkhand on 26 June 2019.

### Rajbhasha Activity

- Hindi Workshop was conducted in IFGTB, Coimbatore on 24 June 2019. The theme of the workshop was – “Noting and Drafting and Letter Correspondence in Hindi”.



Hindi Workshop at IFGTB, Coimbatore

### Demonstration Programmes

- IWST, Bengaluru organized technology demonstration programme on Wood Science, Sandalwood and other forestry species on 25 June 2019. 124 Officials and trainees of Forest Department attended the programme.
- Research and development activities organized by RFRI, Jorhat on Bamboo Cultivation, Propagation, Nursery Management, Value addition & bamboo preservation techniques, Biotechnology and Tissue Culture, Lac Cultivation, Botanical Garden, Orchidarium, Vermicomposting etc. on 18 June 2019.

## Visit of Dignitary

- Dr. Dhan Singh Rawat, Minister, Uttarakhand Govt. visited FRI, Dehradun on 24 June 2019.



Dr. Dhan Singh Rawat, Minister, Uttarakhand Govt.

## Miscellaneous

Institute	Special day/ Theme	Duration
FRI, Dehradun; IFGTB, Coimbatore; IWST, Bengaluru; TFRI, Jabalpur; RFRI, Jorhat; FRC-LE, Agartala; HFRI, Shimla; IFP, Ranchi	World Environment Day-2019	June 2019
FRI, Dehradun; IFGTB, Coimbatore; IWST, Bengaluru; TFRI, Jabalpur; RFRI, Jorhat; FRC-LE, Agartala; HFRI, Shimla; IFP, Ranchi	International Yoga Day	21 June 2019

## HR News

## Appointment

Name of officer	Date
Sh. Arun Singh Rawat, IFS, Director, FRI, Dehradun	21.06.2019
Sh. Raj Kumar Bajpai, IFS ADG(Admin.), ICFRE, Dehradun	17.06.2019
Sh. Sanjay Singh Pundir, Accounts Officer, ICFRE, Dehradun	03.06.2019
Sh. Harendra Singh Rawat, Accounts Officer, FRI, Dehradun	03.06.2019
Sh. Ashok Kumar, FRO, FRI, Dehradun	03.06.2019

## Promotion

Name of officer	Date
Dr. Arundhati Baruah, Sci-B, RFRI, Jorhat	26.06.2019
Sh. Chandra Sharma, Sci-B, ICFRE, Dehradun	26.06.2019
Ms. Shambhavi Yadav, Sci-B, FRI, Dehradun	28.06.2019

## Retirement

Name of officer	Date
Dr. P.B. Meshram, Sci-G, TFRI, Jabalpur	30.06.2019
Dr. Ram Keerti Verma, Sci-G, TFRI, Jabalpur	30.06.2019
Dr. Anil Negi, Sci-D, ICFRE, Dehradun	30.06.2019
Dr. Salil Dhawan, ACF, FRI, Dehradun	30.06.2019
Sh. Arunesh K. Sinha, Librarian, FRI, Dehradun	30.06.2019
Sh. Rajesh K. Bhandari, Under Secretary FRI, Dehradun	30.06.2019

## Patron:

Dr. Suresh Gairola, Director General, ICFRE, Dehradun

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