INSTITUTE OF FOREST GENETICS AND TREE BREEDING

(Indian Council of Forestry Research and Education)

VAN VIGYAN NEWSLETTER

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From the Director's Desk

The interactions of scientists with the field professionals and foresters to understand forestry problems in the field have thrown out a basket full of issues which need urgent research attention. The stakeholder workshops with the forest departments, the Kisan and Karshaka melas in the state of Tamil Nadu and Kerala have increased our responsibility. The scientists of this institute have taken upon themselves more problems as programmes and projects to provide technical solutions. This issue has highlighted the few efforts taken by us in staying connected to the people. It is also satisfying that most of the projects that have been approved by the esteemed RAG and RPC through series of scientific deliberations are topics which would provide practical solutions to burning forestry issues relating to conservation and productivity enhancement. The newsletter is an effort to strengthen the ongoing interactions. We invite comments / suggestions and hope this medium will strengthen our relationship.

Director, IFGTB

Infestation of Common Banded Awl, *Hasora chromus* (Cramer) on *Pongamia pinnata* and its management

Pongamia pinnata is a medium sized leguminous tree, distributed in the moist deciduous forests and coastal plains of India. It is popularly known as "Karanja" in Hindi, "Indian beech" in English and "Pungam" in Tamil. *P. pinnata* has largely been used in the traditional Indian system of medicines for bronchitis, whooping cough, rheumatic arthritis and diabetes. It is also commonly used as fuel wood in rural areas. The oil of *P. pinnata* used as a substitute for diesel. Dried leaves are used as an insect repellent in stored grains. The oil cake, when applied to the soil, has pesticidal value, particularly against nematodes and it also improves soil fertility.

About 30 insects are reported to feed on *P. pinnata*. Among them, the defoliator Common Banded Awl (*Hasora chromus)* often attains serious proportions, in nurseries and young plantations. It is a butterfly belonging to the family Hesperiidae and distributed in India, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar and Sri Lanka. The pest infestation is found to be severe in the months of October-November, when the trees produce lot of young foliage. The larvae feed on young leaves voraciously. During the feeding, it produces a kind of sound. The caterpillar usually ventures to feed only when the light is very low or at night.

Eggs are laid singly on young shoots, or on new leaves, both above and below. The egg is pinkish- white when laid, dome-shaped with a flattened top and with minute longitudinal ridges. The caterpillar is blackish-brown with a constricted second segment, which appears as a neck with black collar (Fig.1). The body has four narrow whitish longitudinal lines and numerous minute white hairs. A mature larva measures about 3.5cm in length. The head is lobed, rounded and yellowish-red in color.

The pupa is stout, pale-brown, with yellowish abdomen and a prominent projection on the head (Fig.2). Pupation takes place in between two leaves or on single leaf folded by larva with the help of silken threads. The butterfly has a rapid skipping flight. The male is unmarked, dark brown on upper side, while females have two small semi-transparent yellowish-white spots (Fig.3). A bluish white outwardly diffused discal band across under hind wing is a characteristic feature of this butterfly.

H. chromus is commonly found in forest as well as in open country; visits flowers and damp patches, near streams and rivers. It is a polyphagous insect and the food plants recorded are *Ricinus communis* (Euphorbiaceae), *Derris scandens* (Fabaceae), and *Trichilia connaroides* (Meliacea).

The pest can be effectively controlled by the application of Vijay Neem (Azadirachtin 0.03% w/w) at a concentration of 1ml /1litre water, at fortnightly intervals on the infested plants. Since castor plants (*Ricinus communis*) serve as an alternate host for *H. chromus,* planting of Castor plants in the vicinity of *P. pinnata* nurseries and plantations may be avoided.

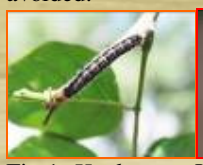

Fig 1. *H. chromus* Larva
Fig 2. *H. chromus* Pupa

Fig 3. Adult of *H. chromus*

G. Ramesh and
K. R. Sasidharan

Interactive Meetings

The Variety Releasing Committee meeting was held on 19.01.2010 at Paryavaran Bhavan, Ministry of Environment and Forests, Govt. of India under the chairmanship of Dr. P.J.Dilip Kumar, IFS, DGF & SS, MoEF, GoI. The VRC unanimously recommended the release of the following 4 clones each of *Eucalyptus* and *Casuarina.*

Eucalyptus camaldulensis

1. IFGTB – EC1, 2. IFGTB – EC2, 3. IFGTB – EC3, 4. IFGTB – EC4

Casuarina equisetifolia

1. IFGTB – CE1, 2. IFGTB – CE2, 3. IFGTB – CE3, 4. IFGTB – CE4

All India Coordinated projects Consultative meet

A National Workshop to Formulate an All India Coordinated project on Fast Growing Native Tree species was held on 10.02.10 by this Institute. The major points that emerged from the Workshop were

1. Adopt fast growing species (showing a GBH of 1 cm / month) with the possibility of providing economic return @ Rs. 200 / tree / year.
2. Implementation of Government schemes to encourage farm forestry for large scale bund planting of fast growing species.
3. Industries to provide assurance to buy-back the material.
4. Develop cost effective strategies for production of large scale quality planting material.
5. The following fast growing native tree species were identified for furthering research. *Melia dubia, Ailanthus spp., Neolamarckia cadamba, Thespesia populnea, Acrocarpus fraxinifolius, Gmelina arborea, Toona ciliata, Canarium strictum, Vateria indica, Hibiscus tiliaceus, Gyrocarpus asiaticus, Dysoxylum malabaricum, Palaquium ellipticum, Givotia moluccana, Melicope lunu-ankenda.*
6. Exploring the potential of fast growing exotic tree species like *Khaya senegalensis* and *Grevillea robusta* also came up during the deliberations.
7. It was decided to initiate the programme with five species namely *Melia dubia, Ailanthus spp., Neolamarckia cadamba, Thespesia populnea* and *Acrocarpus fraxinifolius* as they have already caught the attention of the farmers on account of their fast growth, multiple uses and high economic returns.

A National Workshop to Formulate an All India Coordinated project on Improvement of fast growing phyllodinous Acacia was held on 11.02.10.

Tree Growers Workshop

Institute of Forest Genetics and Tree Breeding, Coimbatore had organised a Tree Growers' Mela on 18th and 19th February, 2010 at Coimbatore. It was inaugurated by Shri Jairam Ramesh, Hon'ble Minister of State (Independent charge), Ministry of Environment and Forests, Government of India. During the function he released four clones of Eucalyptus and four clones of *Casuarina equisetifolia* that have been developed for dryland conditions. They were distributed to the user agencies like Forest departments, Forest Plantation Corporations, Wood-based industries and farmers. He also released a book of abstracts of publications made by the Institute in the last two decades and brochures on the Institute, teak, botanical garden and the newly released clones of Eucalyptus and Casuarina. He launched the quarterly newsletter of the Institute, titled Van Vigyan. He distributed awards to those who had contributed to the development of the newly released clones and those involved in successful demonstration of technologies in field and outreach activities.

A workshop on Plantation Technologies for Dry land Farming on 18.2.2010 and 19.2.2010 as part of the Tree Growers Mela.

The workshop focused on seven tree species suitable for dry land conditions prevailing in the State of Tami Nadu, namely, *Ailanthus excelsa, Melia dubia, Santalum album, Anthocephalus cadamba, Gmelina arborea, Casuarina species, Eucalpytus* and teak. The nursery techniques, cultivation practices, utilization and marketing of these species were discussed at length. The efforts taken by the Institute for the genetic improvement of these species were highlighted. The wood based industries discussed about their schemes related to contract farming and captive plantations of industrial wood. A representative of NABARD spoke about the options available for financing of industrial wood plantations. The farmers from all over the State participated in the deliberations and shared their experiences in cultivation of tree species on their lands.

At the end of the workshop decision was taken to form species network involving scientists, farmers and forest department for twenty species of economic value, suitable for dryland farming. The identified species are *Ailanthus excelsa, Melia dubia, Khaya senegalensis, Anthocephalus cadamba, Acrocarpus fraxinifolius, Casuarina spp., bamboos, Gmelina arborea, Grewia tilaefolia, Acacia auriculiformis and its hybrid, Bombax ceiba, Calophyllum inophyllum, Thespesia populnea, Dalbergia latifolia, Toona ciliata, Santalum album, Pterocarpus marsupium* and *Pterocarpus santalinus*.

About 600 farmers from various districts of Tamil Nadu and Puducherry took part in the workshop.

New Projects initiated

1. Exploitation and utilization of beneficial microflora from the sholas for restoration of degraded shola forests in the Nilgiri Hills, Tamil Nadu (2010-2012; Rs.6.0 lakhs; Hills area Development Program (HADP).

From ICFRE

1. Evaluation of *Calophyllum inophyllum* populations for high oil yield
2. Chemotyping of *Sapindus emarginatus*- A potential NTFP of Tamil Nadu for saponins
3. Influence of beneficial microbes in conferring salt tolerance to Casuarina clones
4. Exploration of potential native natural enemies with a special emphasis on microbial biocontrol agents for management of casuarina hairy caterpillar, *Lymantria ampla* and Ailanthus defoliators, *Eligma narcissus* and *Atteva fabriciella*
5. Pre and Post harvest seed pests and diseases of fast growing native tree species and their management
6. Development of appropriate integrated management methods for the eucalyptus gall was problem in nurseries
7. Influence of eucalypts species on the natural enemy incidence on the gall wasp *Leptocybe invasa*
8. Species recovery using diversity estimate and control pollination in *Bruguiera sexangula*
9. Introduction and evaluation of fast growing tree species under Agroforestry systems in different agro-climatic zones of Tamil Nadu.
10. Selection for desirable wood properties in *Acacia auriculiformis* for short rotation timber production
11. Selection and Vegetative Propagation of *Neolamarkia cadamba* (Roxb.) Miq – An alternative species for Pencil, Match Wood and Ply Wood Industries.
12. Impact of plantations on ground flora diversity and soil characteristics
13. Capacity building among tree farmers for handling large scale *Eucalyptus* clonal propagation
14. Evaluation of *Gmelina arborea* Roxb. selections from North Eastern and Southern Regions.
15. Evaluation of selected phenotypes of *Casuarina* for establishment of windbreaks in farmlands.
16. Developing clonal technology for raising clonal plantation of indigenous species of *Ailanthus excelsa* and *Ailanthus malabarica* in Tamilnadu and Kerala.
17. Study on reproductive biology and breeding systems in *Ailanthus excelsa* and *Ailanthus triphysa*
18. Evaluation and identification of optimal parameters for flowering and fruit set in different Tamarind (*Tamarindus indica* L.) orchards
19. Documentation of agroforestry systems and wood flow to wood based industries in Tamil Nadu.
20. Development of inter and intra specific hybrids in *Eucalyptus camaldulensis*
21. Determination of the target genes through gene-silencing techniques for the management of *Leptocybe invasa* (Hymenoptera: Eulophidae), an invasive pest in eucalyptus plantations in India
22. Development of Tree DNA Fingerprint database.
23. Evaluation of certain forest flora based on ethnobotanical records for their pesticidal properties against important forestry insect pests
24. Studies on oil: chemical composition, antifeedant, insecticidal and antifungal activities of tree born oil seeds.
25. Study of genetic variation in *Pterocarpus santalinus* in Tamil Nadu for growth and heartwood content
26. Studies on Essential Oils: Chemical constituents and toxicity assessment of the Leaf oil of *Lantana camara* from Tamil Nadu
27. Biotransformation of some secondary metabolites by sporulate surface cultures of *Frankia* strains for nodulation capacity in *C. equisetifolia* and *C. junhuhinana*
28. Molecular analysis for population differentiation and mating system in Acacia auriculiformis using dominant and codominant marker.
29. Studies on orthopteran insect pests of forestry importance

EXTENSION AND TRAINING

Institute participated in Pride of India Expo and put up the stall of ICFRE during 97th Indian Science Congress, University of Kerala, Thiruvananthapuram, Kerala from 3-7, January, 2010.

IFGTB organized an exhibition on 18th and 19th February, 2010 at Coimbatore. It was inaugurated by Shri Jairam Ramesh, Hon'ble Minister of State (Independent charge), Ministry of Environment and Forests, Government of India. the research Institutes like the Institute of Wood Science and Technology, Bangalore, Indian Plywood Industries Research and Training Institute, Bangalore, Forest College and Research Institute, Mettupalayam, Ashoka Trust for Research in Ecology and Environment, Bangalore and wood based industries like the Tamil Nadu Newsprint and Papers Ltd., Seshasayee Paper and Paperboards Ltd., Vasan Match Industries Ltd., Splints and Veneers Ltd. Participated and explained their programmes aimed at dryland farming. Manufacturers of farm and irrigation equipment like Vasumita Energy Systems, Jain Irrigation and Need Services Pvt. Ltd., showcased their products. Nurseries producing quality planting stock like Nivee Gardens, Amritha nursery, Growmore Biotech, Tree growers' associations and organizations dealing with non-timber forest produce and medicinal produce also participated.

Shri K. Ravichandran, IFS, DCF, Dr. A. Nicodemus, Scientist-D, Dr. V. Sivakumar, Scientist -D and Shri S. Saravanan, Scientist-C participated in the farmers mela organised by Tamilnadu Newsprint Limited (TNPL), Pugalur under National Agricultural Innovation Project (NAIP). The institute put up a stall and explained the activities, the technologies and products developed by the institute to the farmers and officials of TNPL. Also participated in the deliberations and answered the queries of farmers related to Casuarina and Eucalyptus cultivation and management issues.

International Climate Change Champions 2010 comprising a group of 40 champions from various countries including students and researchers from India supported by British Council visited the Institute on 30.1.2010. Shri Edwin Raj, Shri Ben and Shri Balaji, of IFGTB were part of the team. An overview about the institute was provided by Dr. N. Krishnakumar, IFS, Director and a presentation on climate change related research programme was made by Shri R.S.C. Jayaraj, IFS, Head, FLUCC Division. The team visited the Automated Open Top Chambers and the research nursery and interacted with the scientists and officers. The team also visited the Gass Forest Museum.

Chemist and six Research Scholars from Tamil Nadu State Forest Department were given training in two batches on phytochemical analysis of medicinal plants using TLC, MPLC, UV, HPLC, and GC/MS/MS during 18-23 March, 2010.

A training programme on Tissue culture and its Applications in Tree Breeding was held on 23rd - 24th March 2010 for PG teachers of Coimbatore District. The topics included Fundamentals of plant tissue culture, Hardening and acclimatization of tissue culture plants, DNA markers in quality control of micropropagated germplasm, Cell culture and its applications, Methods of Gene isolation and Transgenics in Forestry. Lab demonstration on DNA Isolation, PCR, Electrophoresis was also given.

Training on Integrated pest and disease management for Tamil Nadu State Forest Officials was held in March, 2010

Training on Biofertilizers and Biomanures for Farmers in March, 2010 was imparted to forest officers. The course contents included importance of Microbial Bio-inoculants in Agriculture and Forestry, Techniques for isolation and identification of different bio-inoculants such as Arbuscular Mycorrhizal (AM) fungi, Ectomycorrhizal (ECM) fungi, Plant Growth Promoting Rhizobacterias (PGPRs such as Azotobacter, Azospirillum, Phosphobacterium), *Rhizobium* and *Frankia* and Techniques for pure culture production, mass culture production, maintenance and application of different bio-inoculants in nursery and field.

Publications

1. Teak Cultivation (In Tamil: *Thekku Sagubady*).
2. Botanical Garden.
3. New Casuarina clones for high yielding clonal plantations (in Tamil and English).
4. New Eucalyptus clones for profitable plantations in dry tracts of Tamil Nadu and Andhra Pradesh (in Tamil and English).
5. IFGTB brochure in Tamil.

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