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Kerala forest research institute

Editor's Column

The firewood crisis

In spite of several alternatives such as liquified petroleum gas, electricity, kerosene and biogas (chiefly gobar gas), firewood [1] continues to be the chief cooking-fuel for the vast majority of households in Kerala. Next comes kerosene. The reasons for these preferences are many— low cost, dependability when other supplies may fail, ease in procurement and use, tradition, etc. But firewood, so essential a commodity, sells for 50 paise per kg in Trichur town, over half the price of tapioca, weight for weight. Yet long queues of women are a common sight in sawmills where conversion wastes are sold as firewood. The demand is more for saw-dust which is cheaper— 20 to 25 paise per kg. Both are scarce— sometimes available, sometimes not.

In the countryside near forests, on the other hand, there is no scarcity. As our interviews with some people show (see 'Forestry, as people see it') few recognize any firewood problem there. But much of it comes from illicit cuttings from forests. Women returning home, almost like a procession, with heavy headloads of firewood collected stealthily from forests has become part of the rural scenery. They collect firewood for themselves as well as for selling. To many, it is a means of livelihood.

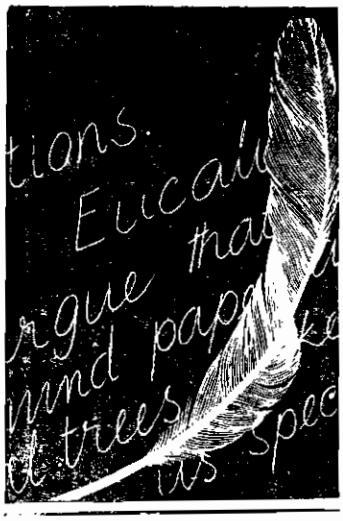
In the face of dwindling supply of firewood and spreading deforestation with all its attendant dangers, it is time now to wake up to the reality and initiate appropriate action. A crisis can no longer be averted because it is already here; only we can prevent a catastrophe. Much has already been written about firewood shortage which is an alarming global problem, no less important than food shortage. A book on firewood crops published by the National Academy of Sciences, U. S. A. is reviewed in this issue of **Evergreen**. 'Unasylva', an international journal of forestry and forest industries published by FAO brought out two special editions (Vol. 33, Nos 131 & 133, 1981) dealing with various aspects of the wood energy problem in the world, in connection with the United Nations Conference on New and Renewable Sources of energy. This conference held in Nairobi in August 1981 focussed attention on the energy

problem of developing countries and noted that close to half of mankind depend upon firewood for fuel Recommendations of the Nairobi Conference included the following. The productivity of existing fuelwood resources must be assessed and improved through better management; the level of planting must be increased several fold to create new resources; the distribution of firewood must be rationally and economically organised; research and development must be intensified on more productive tree species, on improving the efficiency of stoves and cooking utensils, on preprocessing (briquetting, for example) presently wasted twigs and leaves for direct burning and on developing substitutes for fuelwood and charcoal; etc. The 'Indian Forester' brought out a special issue in December 1981 on trees for energy and rural development, to commemorate the centenary of forest education in India. This issue contained several articles covering various aspects of the energy problem in India and various recommendations.

While conferences and discussions help to crystallise ideas for action, action seldom ensues. More often than not, our failures are not due to lack of ideas or technical know-how but due to lack of will to act according to our own prescription. We preach what others must do, but are reluctant to do what we must do ourselves. Do we at KFRI also

Dr. P. M. Ganapathy, erstwhile Director, bids farewell to KFRI — see inside back cover.

1 The term firewood is used here in a broad sense to include all woody material of plant origin commonly used as fuel for cooking food.



OPINION PAGE

Dear Dr. Ganapathy,

I have gone through the Editorial Column under the caption "Do we need exotic forest trees" published in the issue of **Evergreen**, No. 8, March 1982. I entirely agree with the views expressed therein.

I feel we should convene a seminar on this subject in the near future. If you agree we might hold the Seminar in Forest Research Institute, Dehra Dun sometime at the end of October or beginning of November, 1982.

K. M. Tiwari

[Letter from Shri K. M. Tiwari, IFS, President, Forest Research Institute & Colleges, Dehra Dun to the then Director KFRI]

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I propose that abstracts of published reports and papers may be included under "Recent Publications" of **Evergreen**. The abstracts can provoke the readers for reading these reports and papers.

T. G. Alexander
Division of Soil Science

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suffer from this syndrome? KFRI has already taken up more than 60 research projects of relevance to forestry in Kerala but none of them deal with any aspect of the firewood problem explicitly. Let us have specific suggestions on what KFRI could and should do in this field.

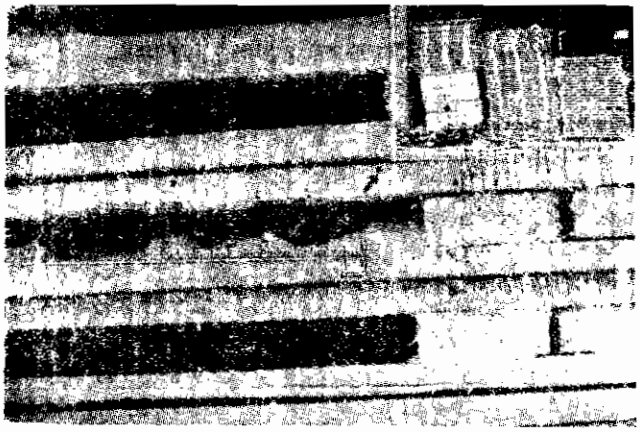
The many advantages of a biogas plant with fresh foliage as raw material are described by Prof. T. C. K. Menon of Sri Kerala Varma College, Trichur in the article 'Fuel from live trees' in this issue of **Evergreen**. The technology for installing such a plant is available; one is functioning in his own house. According to Prof. Menon (Pers. Comm.) 12-16 kg of fresh leaves (4 kg dry organic matter) can produce 1 cu m of biogas sufficient for a 5-member family for a day. It may cost about Rs. 2,000/- to instal. Perhaps the feasibility of putting up a medium size biogas plant at KFRI could be explored. It can meet the laboratory fuel requirement, serve as a demonstration unit for popularising it among the public and be used for research to assess the biogas production potential of various plant/tree species. **Evergreen** invites opinion from readers, both inside and outside the Institute, on what KFRI should do to help ameliorate the firewood crisis. We will publish your suggestions in the opinion page, if written up briefly in about 150 words to occupy not more than half the **Evergreen** column.

Suggestions for solving the firewood crisis in Kerala must take into account certain features unique to Kerala which are mentioned briefly below. It may also be mentioned that more intensive forestry is not the only solution for the firewood crisis; alternative sources of burning material, more efficient utilization of available firewood, etc. may also be thought of (see recommendations of the Nairobi Conference). The most notable feature of the firewood situation in Kerala is that we have a unique non-forest firewood source— the coconut tree. It meets a large percentage of cooking-fuel requirement. Rubber is another firewood source extensively used in some localities because conversion waste is available at comparatively low price. In addition, there are many horticultural trees like mango, jack, cashew, etc , which also yield firewood The approximate area in ha under coconut is 6,64,000, under rubber 2,17,000 and under cashew 1,44,000 (Economic Review 1980. Govt. of Kerala) together making up 10,25,000 ha of woodlots which contribute the major part of the fuel used for domestic purposes. In comparison, the total area under forests in Kerala is about 9,40,000 ha only and their contribution of firewood for domestic use is limited. The major consumers of firewood in Kerala are tile and brick making industries, and hotels. They buy firewood in lorry-loads as it comes from forest coupes. Because of their demand and the many advantages of bulk sales, little firewood from forests reach domestic consumers. What is available to households are conversion waste from sawmills and in some places, what is sold through the outlets of Kerala Forest Development Corporation. Besides, in areas near forests, illicit cuttings from forests cater to the local household demand.

Evergreen welcomes opinion.

Protection of packing-case material from insect and fungal attack

India is one of the few rubber growing countries in the world and Kerala State accounts for nearly 95% of the total area planted with rubber in India (about 2,17,000 ha). Though rubber trees are grown primarily for latex, when they are felled for replanting after their economic life of yielding latex, they become a valuable source of timber.



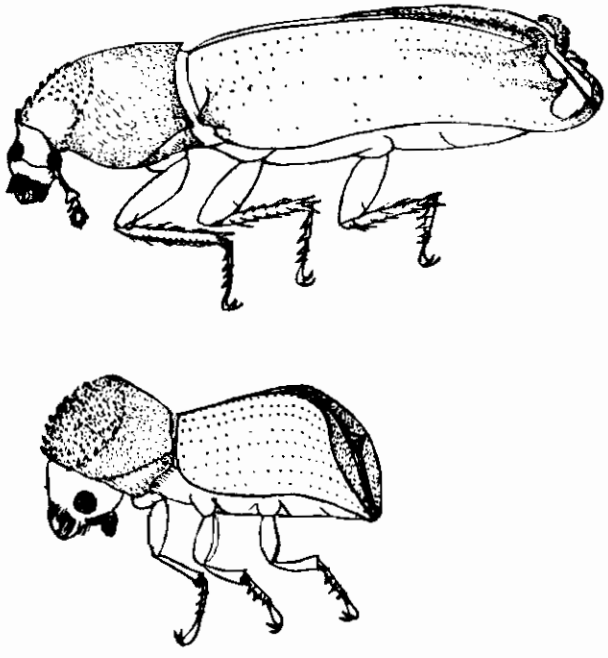
Photograph showing accumulation of dust (white arrow) between planks and borer holes (black arrow) in stacks of rubberwood planks (inset).

In Kerala, at present, rubber wood is mostly used for packing-cases, match veneers and splints, and firewood. A number of small-scale sawmill units are operating now in Kerala with rubber wood as the only raw material It has been estimated that there are about 200 packing-case industries in and around Ollur, near Trichur. Susceptibility of rubber wood to fungal and insect attack limits its wider utilisation, although studies elsewhere have established the suitability of rubber wood for furniture, panel products, etc.

In general, for packing-cases, low-cost perishable timbers are sufficient because of the short-term utility. But they should be durable for at least six months to one year. Not too often, truck-loads of packing-case planks are rejected by the buyer because by the time the material reaches its destination like Bombay, Delhi or other far-off places, they are heavily damaged by borers or fungi and become useless. Such damage is more serious at times when the demand for packing-case is low and planks get accumulated in the factory.

Rubber wood develops sapstain within a few days after conversion and undergoes various types of fungal damage during subsequent storage and transportation. For packing-case industry, sapstain is not a major problem but mould and decay will degrade the wood in a short time. Rubber wood is also prone to attack by borers, particularly the beetles, *Sinoxylon anale* and *Heterobostrychus aequalis*. In and around Ollur, it has been observed that *S. anale* causes substantial damage to rubber wood planks (see Figure).

From studies conducted at the Institute, a simple method has been standardised to protect rubber wood used for manufacture of packing-case from insect and fungal attack. The method involves applying preservatives to green timber by momentary immersion of planks in the preservative solution. This treatment leaves a superficial deposit of chemicals on the surface of timber and is a prophylactic measure. The chemicals used are water-soluble boron compounds (borax and boric acid) which are highly toxic to decay fungi and insects but non-poisonous to mammals. The natural colour of wood will be retained after treatment with these chemicals. Compared to many other preservative chemicals boron compounds are cheaper.

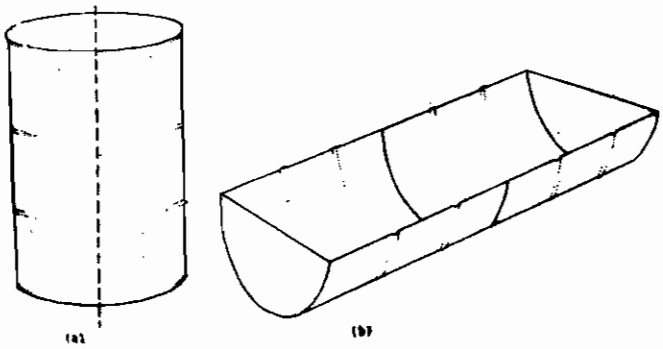


Above : *Heterobostrychus aequalis*

Below : *Sinoxylon anale*

Method of treatment

Materials required



200 litre drum (a) cut into two halves and joined together (b).

1) Treatment tank

This may be a permanent cemsnt tank, about 150 x 50 x 50 cm, to accommodate planks of about 125 cm length. A simpler treatment container may be made by splitting a 200 litre steel drum vertically into two equal halves and joining them together to make a semicylindrical drum (see Figure).

2) Chemicals

Borax (Sodium tetraborate decahydrate, $Na_2B_4O_7 . 10 H_2O$)

Boric acid (H_3BO_3)

Both the chemicals are of technical grade.

The following composition is suggested for use during monsoon season. To every 100 litres of water in a tank or container add 1 kg of borax and 1 kg of boric acid. Stir well to dissolve the chemicals. Dip the planks in the solution for a few seconds. After draining the solution, stack the planks criss-cross leaving gap in between the planks to facilitate quick drying. The planks may be used when they are dry.

The concentration of boron compounds should be doubled during dry season when insect attack is more serious. Also, the planks should be kept immersed in the treatment solution for a longer time (about 1 min).

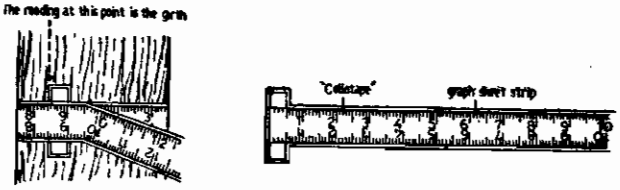
For further details contact the Division of Wood Science.

—Divisions of Wood Science and Entomology

Improvised, yet accurate

A tape which can be conveniently used without sacrificing accuracy, for measuring girth of seedlings, saplings and small trees can be improvised as follows.

Cut out a T-shaped strip of graph paper as in the diagram, about 1 cm wide and 20 cm long. Mark numbers 1, 2, 3, etc., corresponding to the centimetre divisions of the graph paper. Cover the graph paper strip with 'cellotape' on either side. The tape is now ready for use.



The extra width provided at one end is useful to find out the exact point of overlap of the two edges of the tape for measurement of the girth correctly and easily.

Precautions

1. Only graph sheet of good quality is to be used and the divisions on the sheet should be compared with that of a standard scale or tape.
2. Care should be taken to see that both graph paper and 'cellotape' are well stretched at the time of affixing the cellotape.
3. Tape should be carefully handled as it may stretch if pulled hard.

— K. C. Chacko
Division of Silviculture

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"Learning is like roving upstream,
Not to advance, is to fall back"

— Anonymous

What's in a name

Most of you, I am sure, can picture that pale green, shrubby plant standing erect and flowering gregariously in white, and later disseminating enormous number of seeds through air, animals or even man before getting dried up. It is an alien, an invader. In multitudes it bred. The humid climate and the tropical sun nourished them, the offsprings. They conquered open lands, millions marched into our gardens, parks, estates and plantations. This plant is yet another 'Alexander the Great' and is popularly known as "Communist Pacha', the common *Eupatorium*.

Now, if you ask a botanist to list out the names of plants including weeds in your compound, there is likely to be a name *Chromolaena odorata* in the list. Can you recognise this plant from its name? It belongs to the family 'Asteraceae' ('Asteraceae' is the same old family 'Compositae' which comprises sunflower, dahlia, zinnia, and chrysanthemum) and is a native of tropical America. Many of you, I presume, will not be able to recollect a plant with the name *Chromolaena*. But if the botanist says that it is the same old *Eupatorium* itself, a smile may come to your lips and you may even utter, "What nonsense!" The botanist may say, nonchalantly, "Oh, a name change".

This 'nonsense' to many, is the result of an administrative system applied to designate a plant by its correct name. So before going into the story of how our common *Eupatorium* became *Chromolaena*, we have to discuss some basic principles of naming plants.

The botanical name

Common names for plant, animal for any object vary from place to place. For example, the tapioca plant is called 'kappa', 'marachini', 'poola' or 'kolli' in different parts of Kerala. To the world at large, it is 'tapioca', 'cassava', 'manioc', 'mandioc' or 'yuca'. To a botanist, however, it is *Manihot esculenta*.

Won't you agree that it is convenient as well as precisely communicative to use the same name for plants universally? The purpose of a good name is to economise thought and help us in understanding the thing signified with ease. Moreover, "the name of a plant is the key to its literature; the name provides a means for comparing observations and experiments, and enables their repetition".

Before Linnaeus (1707-1778), who is regarded as the father of biological taxonomy, plant names were long descriptive sentences having a chain of more than two words. Adopting Caspar Bauhins' (1560-1624) idea of using two words only for each plant, Linnaeus methodically named plants and animals with two-worded names called binomials (or dual names) and cleared the chaos that existed earlier. He also fixed Latin as the language to be used for nomenclature. In his famous catalogue of the plant kingdom, the 'Species Plantarum,' Linnaeus gave binomial nomenclature for plants and animals then known, and this became the starting point of modern botanical nomenclature.

Each plant species has only one correct scientific name. This is a binomial and consists of two words-the first is the generic name (the name of the genus to which the species belongs) and the second, a specific epithet The two words, a noun (for the genus) and an adjective (for the species) in combination, comprise a binomial for a 'species', that is, the name of a particular type of plant. In a binomial, the first letter of the generic name is capitalised, all others including the first letter of the specific epithet are written in small letters. For example, the mango tree is called *Mangifera indica*, where *Mangifera* is the generic name and *indica* the specific epithet. There are a few wild types of mango trees also. All these different types (or different species) are kept under the genus *Mangifera*. In *Mangifera sylvatica*, *sylvatica* (meaning 'of the woods') is the specific epithet. In *Mangifera andamanica*, *andamanica* (meaning 'of Andamans') is the specific epithet. Likewise there is *Mangfiera altissima* (meaning 'very tall or high Mangifera') and *Mangifera foetida* (meaning 'foul smelling Mangifera'). Most specific epithets are adjectives or words used in an adjectival sense. The names of persons are sometimes used for generic names and specific epithets to honour or commemorate them. For example, the scientific name of 'karanjili' or 'charatta anjili' is *Dipterocarpus bourdilloni*. Here the specific epithet, *bourdilloni* is used to commemorate the name of Bourdillon. The generic name *Eupatorium* was given to commemorate Mithridates Eupator, King of Pontus near

Black Sea who first recognised the species known as *Eupatorium cannabinum*, an antidote for poison. Similarly, the generic name *Gmelina* was given after J. Gottlieb Gmelin, a celebrated German naturalist and traveller. The generic name *Hopea* commemorates Dr. John Hope, a Professor of botany in Edinburgh. The name of the notorious plant *Laportea* (stinging nettle) was given to honour F. L. de Laporte count Castelnau, a French entomologist. Usually, mythological heroes, stalwarts in the field of biology or well-known plant collectors are honoured through plant names.

Attempts at standardisation

When increasing numbers of new plants were discovered the need arose for certain basic principles (or rules) to serve as guidelines for naming them. Here again Linnaeus (1736, 1737, 1751) was the one who initiated a sound system of nomenclature. It became established that no two genera could have the same name and no two species within a genus, the same specific name. But with the rapid increase in the number of genera and species added to our knowledge, confusion arose, particularly because there was no international exchange of information on plant names. In course of time separate patterns and practices were set by botanists of different countries. The need for unification of procedure on nomenclature was recognised by all botanists. In the 1860s Alphonse de Candolle (son of Augustin de Candolle, a noted botanist after Linnaeus) spearheaded the movement for an assembly of botanists to settle nomenclatural problems. In the first International Botanical Congress held in Paris in 1867 Alphonse de Candolle put forward his 'Lois de la nomenclature botanique' (Laws of Botanical Nomenclature) which was accepted with some modifications. But many botanists, especially English and American, were unwilling to accept 'de Candolle Rules' because of certain deficiencies. Since then botanical conferences were held at different places at different times (Rochester 1892, Vienna 1905, Brussels 1910) but it was only in 1930 at Cambridge that international consensus was arrived at to form 'International Rules for Botanical Nomenclature'. With this came a harmonious code which is generally accepted with the modifications added from time to time. This 'International Code of Botanical Nomenclature' (Since 1952 the rules are called 'code') is often referred to as the 'Bible of Plant Taxonomists'. The current edition of the code (1978) is the one adopted with due modification by the Twelfth International Botanical Congress held in Leningrad in July 1975.

The fundamental aim of the code is to provide a stable and uniform system of naming plants, so that communications about plants are based on names acceptable the world over. In the code, the principles of botanical nomenclature have been set out, rules and recommendations formulated with examples, and provisions regulating the modification of the code laid down.

Why then, after all these efforts at unification, are so many changes made in botanical names, even today? To explain the reasons, we must go into some details of the procedure for naming a plant.

Some basics of naming

To be considered valid, a name must be published in a scientific book or periodical. But that is not enough. The name must be authenticated by a type or a voucher, preferably in the form of a herbarium specimen. In case of tree it can be represented by a twig with reproductive parts. This is called the 'Nomenclatural type'. Great care is given to type specimens and they are preserved in special folders and cases. Should there be disagreement between an author's description of the characters of a plant and characters of that plant as shown by the tpye specimen, those of the specimen are considered to be correct.

Details about the type(from where it is collected, where it is kept safely, etc.)must be mentioned in the original publication(the original document wherein a name is published first is called a 'Protologue'). over, it must be properly diagnosed in Latin. An illustration and a good description of the plant are desirable.

If a name is published without description or diagnosis or reference to an earlier diagnosis, the name is not valid and is treated as *nomen nudum* ('naked name' abbreviated as *nom. nud*). After a plant is given a name, to make it foolproof and for the convenience of documentation, the name of the author (or authors) or a short abbreviation of the same is permanently cited with the plant name, suffixed to the tail of the binomial, i. e., after the specific epithet. For exemple, *Cocos nucifera* Linn. (coconut tree). Here 'Linn.' stands for Linnaeus. Nowadays 'Linn'. is further abbreviated to a single capital letter 'L'. Thus it is, *Cocos nucifera* L. A full stop is given at

the end of an author's name only when it has been abbreviated. When names are given in full, no full stop is used. *Dipterocarpus bourdillioni* Brandis is an example.

An important point to remember while applying a binomial is that the specific epithet should not repeat the generic name. Such a name, where the specific epithet exactly repeats the generic name is called a 'tautonym' and is to be rejected according to the code. For example, *Pinus pinus, Malus malus,* etc.

Before selecting and applying a binomial it must be ensured that the same name has not been used by a previous author for any plant. If it has been used previously it becomes a 'homonym.' Even if such a homonym is published by mistake it has to be rejected.

Why change names?

Name changes become necessary for three reasons: (1) misidentification, (2) nomenclatural corrections and (3) taxonomic revision.

(1) Misidentification: When a plant is misidentified and assigned to a wrong species and published in a flora or checklist, it will be considered as a misapplied name and upon confirmation of the mistake the name must be changed to the name of the correct species. For example, the botanical name of 'keezharnelli' is given in most Indian Floras as *Phyllanthus niruri* L. But Webster's studies (1955) on the genus *Phyllanthus* proved that the plant named *Phyllanthus niruri* in these floras is not the real *P. niruri* L. but only *Phyllanthus fraternus* Webster. So the correct botanical name of 'keezharnelli' is *Phyllanthus fraternus* Webster. Thus what has been called (wrongly) once as *Phyallanthus niruri* has now become *Phyllanthus fraternus.*

(2) Nomenclatural corrections: Changes made in the names of plants to comply strictly with the rules of the code, i. e., rejection of superfluous names, later homonyms or tautonyms and selection of names according to their priority often result in change of existing names. Such changes may be considered arising due to nomenclatural corrections, some examples of which are given elsewhere.

(3) Taxonomic revision: Mostly, problems in Botanical Nomenclature are caused by difference of opinion on the affinities between taxa or on their rank in the heirarchal system of taxa.

Advanced researches in plant taxonomy with the application of modern concepts and techniques often necessitate changes in the position of taxa in the hierarchal system or rearrangements like splitting of a genus, transfer of a subdivision of a genus to another genus, transfer of a species from one genus to another, unification of different taxa into one, etc.

Some examples of name changes

Two generic names within the family Celastraceae are given below with their authorities and dates of publication.

Cassine L. (Sp. Pl. 268. 1753)

Elaeodendron Jacq. (Icon. Pl. Rar. 1(2): t. 48, 1782.)

Both were treated as distinct genera in the family Celastraceae. But later taxonomic studies revealed that the two are similar and have precisely the same circumscription.

Ding Hou, while revising the family *Celastraceae* (Fl. Malesiana 1962) united the two genera into one. Since both the names were validly published, according to the principle of priority the earlist of the two must be adopted as the legitimate name for the taxon. Between the two, *Cassine* L. is the earlier published name (1753) while *Elaeodendron* Jacq. is a later name (1782). So according to the code, the earlier name *Cassine* L. is legitimate for the combined genus. It must therefore be accepted and the name *Elaeodendron* Jacq. put into synonomy as it becomes superfluous. When this is done, all the names under *Elaeodendron* Jacq. are to be transferred to *Cassine* L. Now let us take the names of the two southern Indian species kept under the genus *Elaeodendron* Jacq. in Gamble's Flora of the presidency of Madras, Reprint edition, page 152.

They are (1) *Elaedoendron paniculatum* Wt & Arn.
(2) *Elaeodendron glaucum* Pers.

In the case of *Elaeodendron paniculatum* Wt. & Arn. when the generic name is changed to *Cassine*, a new combination results – *Cassine paniculata.* The names of the authors Wight and Arnot who originally proposed the specific name must be retained within brackets and the name of the author who proposed the new combination must follow, all suffixed to the tail of the new combination. In the first edition of the Flora of Hassan district, Karnataka (page 318), the name *Elaeodendron paniculatum* Wt. & Arn. is given as the basionym (a new

name or combination-bringing synonym) of the new combination under *Cassine*, i. e., *Cassine paniculata* (Wt. & Arn.) Ramam. *Comb. nov.* (Here *'Comb. nov'* means new combination). In the second edition of the book (page 871) there is a correction, about the priority of the new combination. As per that the same combination was made by the botanist Lobreau-Callen in the journal 'Adansonia' (Ser.2, 15. 1976), which came out earlier than Ramamoorthy's publication of the new combination. Because of this (according to the principle of priority), Lobreau-Callen gets the authority of new combination. So the correct name of the plant earlier known as *Elaeodendron paniculatum* Wt. & Arn, and subsequenty called E. paniculum (Wt. & Arn). Ramam. is *Cassine paniculata* (Wt. & Arn.) Lobreau-Callen.

Now coming to the other name *Elaeodendron glaucum* Pers., this plant was earlier described as *Mangifera glauca* by Rottboelle in the year 1783. In 1805 Persoon transferred this species from the genus *Mangifera* to the genus *Elaeodendron* and made the combination *Elaeodendron glaucum* (Rottb.) Pers. The combination (binomial) *Mangifera glauca* Rottb. became the basionym of *Elaeodendron glaucum*. Since Kuntze in 1891 had already treated this species as *Cassine glauca*, the correct authority of the plant known as *Elaeodendron glaucum* (Rottb.) Pers. when treated under *Cassine* L. will be *Cassine glauca* (Rottb.) Kuntz and the type of the new combination also will only be the type of *Mangifera glauca* Rottb.

To take another example of name change, the botanical name of 'kakavalli' or 'kakkum valli (a gigantic climber or liana, with large pods containing large circular, compressed blackish brown seeds) is given in most of our Indian Floras as *Entada scandens* (L) Benth. But taxonomic studies revealed that true *E. scandens* is restricted to Ambonia (Moluccas) and that it does not occur in India. *E. scandens* is therefore a misapplied name for 'kakkum valli.' The earliest name (1753) for 'kakkum valli' is *Mimosa entada* L. Since the correct genus to which this Linnaean species belongs is *Entada* Adanson, it is to be treated under *Entada* only. A direct new combination of this will result in a binomial *Entada entada*. Since the specific epithet repeats the generic name, this combination becomes a tautonym and is not acceptable according to the code. So Augustin de Candolle (1825) proposed a new name *Entada monostachya* DC. But a plant with the same circumscription of *Mimosa entada* L. was published by de Candolle in his Prodromus with the name *E. pursaetha* DC. and by Sprengel as *E. rheedii* in his 'Systema' (1825). Brenan (Kes. Bull. 1955) united all the three species, viz., *E. pursaetha* DC, *E. monostachya* DC. and *E. rheedii* Spreng. as one spceies and adopted the earliest name *E. pursaetha* of 'de Candolle' for it. So the correct name of 'kakkum valli' is *E. pursaetha* DC.

It is obvious that finding out the correct name of a plant is a very time consuming process. It involves checking the type specimen for correct identity, finding out the many names (legitimate as well as illegitimate according to the code) used for the same by various authors and checking whether the same binomial has been used for other species, etc. It is certainly desirable to have stability of names of species. But is this possible in the near future? Unfortunately name changes will continue to occur as long as taxonomic studies on plants are carried out. Concepts about the rank of many taxa are likely to change necessitating redesign ation of taxa in conformity with the 'International code of Botanical Nomenclature'. Some of the concepts regarding delimitation of taxa (especially species and genus) put forth by some taxonomists may not be acceptable to many, but the duty of the nomenclaturist is to apply the correct name to a plant according to the generally acceptable view.

Let us now look at the case of 'Communist pacha' or 'Assam pacha', the common *Eupatorium*. *Eupatorium* L. is a very large genus, mostly, American, containing about 1200 species (Willis and Airyshaw-A dictionary of the Flowering Plants and Ferns, 8th EDN 1973). R. M. King and H. M. Robinson (1970) split the Linnaean genus *Eupatorium* into different genera and accepting the genus *Chromolaena* of de Candolle (which was treated only as a section of *Eupatorium* L. by many other taxonomists) transferred many species kept under *Eupatorium* L. to *Chromolaena* DC. Thus many species agreeing with the circumscription of *Chromolaena*, originally treated under *Eupatorium* L. were forced to get included under *Chromolaena* DC. according to King & Robinson's taxonomic concept. *Eupatorium odoratum* L. comes within the circumscriptiion of *Chromolaena* DC, and if *Chromolaena* is accepted as a genus this species must be included within it. So the conventional name *Eupatorium odoratum* L. is changed to *Chormolaena oderata* (L.) King & Robine.

Books of interest

Firewood Crops : Shrub and Tree Species for Energy Production, National Academy of Sciences, Washington, D. C., 1980. xi+237 pp.

To those who are aware of the rural energy crisis in the Third World, the significance of this publication needs little explanation. Despite the clear understanding of the magnitude of the problem, solutions have remained largely chimerical on account of various technical, economic, social and political constraints. Solutions to technical problems have been made difficult not only by gaps in information, but also by gaps in communication, particularly between the laboratory and the field and between land managers in the different parts of the world. 'Firewood Crops' by the National Academy of Sciences is expected to go a long way in bridging the communication gap.

An introduction by Erik Eckholm of the World watch Institute provides the background information to readers. A brief account of the importance of wood as a source of energy is given in Chapter 1. As alternative sources of energy are unlikely to replace wood in the foreseable future, fuelwood plantations will become an indispensable component in the energy strategy of most developing countries. A brief, but useful discussion is given in the same chapter on the problems involved in raising and managing plantations.

Chapters 2 to 4 form the core of the book providing information on the silviculture and management of 60 important species selected out of the 700 species given in the master list of firewood species (Appendix iv). The criteria adopted for shortlisting the species have been given in the preface (p viii). Grouping the species on the basis of their suitability to the three major regions in the tropics, namely humid tropics (chapter 2), tropical highlands (chapter 3) and arid and semi-arid regions (chapter 4) is particularly useful to foresters and other land managers. For each species information is given on main attributes, distribution, use as firewood, yield, environmental requirements, method of establishment, pest and disease problems, calorific value, etc. Of those species listed as suitable to the humid tropics, *Casuarina equisetifolia, Gmelina arborea, Leucaena leucocephala, Syzygium cuminii* and *Trema orientalis* are familiar to the foresters in Kerala. *Calliandra calothyrsus* has been listed as a species suitable for the humid tropics. Survival and growth of the few plants raised in the KFRI campus at Peechi indicates its suitability to conditions in Kerala. Species such as *Eucalyptus globulus, E. grandis, Acacia mearnsii* and *Grevillea robusta* have been recommended for trials in the tropical highlands and most of these have been found suitable to the high ranges in Kerala. Although species such as *Albizia lebbek, Anogeissus latifolia, Azadirachta indica* and *Emblica officinalis* have been suggested as suitable to arid and semi-arid regions, natural occurrence of these species in many areas in Kerala indicate their suitability to the conditions in the State, particularly to the dry rainshadow region. Taking into account the harsh conditions for plant growth and the severity of the energy crisis in the arid and semi-arid regions, more emphasis has been given on species suitable to these regions.

Apart from the detailed description of various species, the publication highlights some of the issues involved in efficient utilization of wood as fuel. Particular emphasis is given on the question of improving the thermal efficiency of stoves (Appendix I). The two case studies (Ethiopia and Korea: Appendix II and III) clearly indicate that the energy crisis is not an intractable problem especially if there is strong political commitment coupled with appropriate institutional arrangements to mobilise public participation. The master list of firewood species

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But many taxonomists do not agree with King and Robinson's concept and they still keep this species under *Eupatorium* L. only. So if you can't remember the new name, don't worry about it; call the 'Communist patcha' *Eupatorium odoratum* until the views of King and Robinson become universally accepted.

I am sure that most of you can't have any trust on the stability of botanical names and that most people consider name changes as an irritating problem. Here I fully agree with Van Steenis (Flora Malesiana 1957) that nomenclature is not an essential part or branch of Systematic botany as a science, but exclusively a matter of administration necessary for establishing the correct names of plants. "Unfortunately, the internationally adopted Rules of Nomenclature are of comparatively recent date And as these rules are for a great deal retroactive, and taxonomic literature is very extensive and historical of nature, it is natural that the application of the Rules will bring about a significant number of name changes".

— N. Gopalakrishnan Nair
Division of Botany (Taxonomy)

Our Vanishing Medicinal Trees-3: *Oroxylum indicum* (Linn.) Vent.

Oroxylum indicum (Family Bignoniaceae) known as 'palagappayani' in Malayalam, 'shyonaka' in Sanskrit and 'Indian trumpet' in English is a small, soft-wooded deciduous tree attaining a height of about 12 meters. In Sankrit the tree has many other names amongst which may be mentioned "prathu-simbih" (having broad pods), "suka nasa" (having a nose like a parrot's beak in allusion to the flower buds) and "bhalluka-priya" (dear to bears).

The root of this species is one of the constituents of 'Dasamoola'. The tree has a superficial root system. The stout, woody roots are greyish-brown to light-brown in colour. The roots are usually collected during rainy season. Root bark is brown externally, yellow internally and is astringent, tonic, carminative and stomachic; useful in diarrhoea, dysentery, bronchitis and rheumatism. Stem bark is soft and is a bitter tonic; and is also used in the treatment of acute rheumatism and sore back of cattle. Bark of stem and root contains three flavones namely Oroxylin-A, Baicalein and Chrysine. Stem is used in treating scorpion sting. Tender fruits are useful in treating pain in stomch due to gas formation and are good for digestion. Seeds are used as purgative.

Leaves are very large, opposite and compound; once-pinnate at the apex, bipinnate in the middle and tripinnate near the base. Flowers are showy, purplish deep blue, borne on stiff, erect, terminal racemes. Calyx is leathary and thick and corolla bell-shaped and fleshy. Fruits are large pods, 38-80 cm long and 5 cm broad, sword shaped, woody and black, hanging down from the tips of branches. Seeds are winged, flat and thin; wings broad, silvery white.

The tree occurs in deciduous forests and clearings made in evergreen forests. The leaves are shed during December to February; new flush appears in May-June. Flowering is from May to August. Being very light and winged, the seeds are dispersed by wind. The seeds normally retain viability for about an year.

For artificial propagation, seeds may be sown in nursery beds during March-April and lightly covered with soil. Partial shade is required. The nursery-raised seedlings can be transplanted during the succeeding rainy season. Propagation can also be carried out by transplanting root suckers.

Wood of *Oroxylum indicum* is yellowish white, soft and light. Heartwood and sapwood are not distinct. Wood is used for fuel and in match industry.

A - TWIG, B - INFLORESCENCE, C - FRUIT

As the tree is small and does not yield valuable timber, much attention has not been given to propagate this species or protect the existing ones. Moreover, unscientific exploitation has led to acute shortage of this much needed raw material in Ayurveda. Effective urgent steps must be taken to identify the forest areas where this species is naturally occuring and to conserve them. The possibility of raising plantations to provide Ayurvedic raw material needs to be explored.

—V. P. K. Nambiar
Division of Botany (Taxonomy)

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(Appendix IV) and the list of contacts are particularly useful to those involved in the formulation and implementation of fuelwood plantation programmes.

With the increasing emphasis on social forestry this publication should form an important reading material for those concerned with land use. The advice **"In any trials of fuelwood plantations, local species should always be given first priority"** (p ix) is particularly apt.

— C. T. S. Nair

Forestry, as people see it

Forest means different things to different people. It is a source, depending on one's interest, of timber, of industrial raw material, of firewood, of green manure, of honey, of Ayurvedic medicines or of other innumerable goods. It is a dwelling place to tribals, a picnic site to urbanites, a source of inspiration to poets, and an encroachable land to some. But one thing is common— to all people it is a resource to be exploited.

To find out how people view forest and what they expect of forestry, Shri. Mathew P. Koshy, Shri K. Ravindran and Dr. K. S. S. Nair interviewed some people, on behalf of **Evergreen**. Those interviewed do not represent the public fully, but their answers give some glimpses of public opinion. The interviews taped in Malayalam have been translated to English. Here is what they said.

— Ed.

Shri C. V. Varghese, 55, is a farmer. He owns about 3 ha of land near Government forest. He cultivates paddy, banana and coconut.

Evergreen: How long have you been living in this area, near the forest?

C. V. V.: For the past 30 years.

Evergreen: Over the past 30 years, what changes have you noticed in the forest around you?

C. V. V.: Much of the forest has disappeared- some areas encroached by people and converted into homes and cultivated lands, and others badly lopped and cut down by people that they no longer look like forest. The barren, rocky hills near Pattikkad with a few sickly trees here and there are good examples of lost forests.

Evergreen: What impact do these changes have on you and your family?

C. V. V.: Direct impact on us are not many' except that firewood and green manure have become more costly and grazing of cattle has become more difficult. Also building materials like poles and bamboos have become scarce. There has been some increase in atmospheric temperature compared to earlier years, but I do not know whether it is due to deforestation.

Evergreen: How do you get your firewood nowadays?

C. V. V.: We buy firewood from people who collect it from forests and sell it.

Evergreen: Have you considered the possibility of raising trees for firewood in your own land?

C. V. V.: So far there has not been much problem in getting firewood. So I haven't thought of other means. Anyway I don't have sufficient land for growing forest trees.

Evergreen: Supposing you are given, say, 5 ha of good forest land, what will you do with it?

C. V. V.: Well, I am a farmer. I will cut down the trees and raise agricultural crops.

Evergreen: Is it because you feel that agriculture is more profitable?

C. V. V: Yes Not only that, forest trees do not give quick returns. We have forests in the adjoining area anyway, to meet common requirements.

Evergreen: As you know, the forests around are slowly vanishing and you may not be able to depend on them for firewood for long. In that case what will you do?

C. V. V.: I grow trees like coconut, mango, jack, etc. They yield fruits as well as some firewood material. I don't have much knowledge about other trees. I will try to grow other trees if there is proof that they could be profitable. We don't get any information about forest trees - how fast they grow, how much nutrients they need, etc. I think, like me, most farmers are afraid that forest trees will take away all the fertility of the soil when grown along with agricultural crops. I think if you give us information on what trees to grow and demonstrate their profitability we will make a trial.

Shri Karuman, 60, a landless Harijan, lives with his family in a roadside thatched hut near KFRI Campus. He makes baskets, mats, etc., with reed and bamboo and sells them for a living.

Evergreen: Where do you get the reed for making baskets and mats ?

K: We get reed from Chalakudy now.

Evergreen: Why do you go all the way to Chalakudy ? Don't you get them here from nearby forests ?

K. : Good reed is not available here, now. Since the cutting for Birla factory started, reed and bamboo have become scarce in this area. Sometimes we go and collect from here, but they are not of good quality.

Evergreen: What type of reed do you require for baskets ?

K. : There are three types. We use the bigger type.

Evergreen: What is the cost of good reed, and how do you bring them from Chalakudy?

K. : At Chalakudy I pay Rs. 30/- for a bundle of reeds. I bring them by bus or lorry.

Evergreen: After paying about one and a half rupee per reed, transporting them from Chalakudy, making baskets and selling, what profit can you make?

K. : I can make about Rs. 10/- a day, if good reed is available, and if I and my wife do a good day's work.

Evergreen: Is there good demand for baskets? Where do you sell them?

K. : Oh, selling is not a problem. Getting reed is the only problem. There is good demand for reed and bamboo baskets locally and in Trichur town. Bamboo is almost impossible to get these days.

Evergreen: You said, sometimes you collect reed from local forests. How do you do it? Do you have a pass?

K: No. We just go deep into the forest and get it. As these reeds are not of good quality, it is not worth paying for the pass. We collect it only when there is dire need.

Evergreen: You said the reed is becoming very scare around this area. If you are given some area will you plant reed?

K: It is difficult Our trade is only weaving.

Evergreen: Do you want anything other than reed from forest?

K: We want some firewood to cook our food. But mainly we want an all-round supply of reed. Our trade depends on reed and without it we cannot survive. If the reed areas are left to us to cut, we will cut in such a way that good reeds are available for cutting all the time. But now the factories are cutting the whole thing that reeds do not grow back properly, If this continues, soon we will have to starve. The Angamali Corporation. [The Kerala State Bamboo Corporation] is our only hope. They are the people who give us good reed at Chalakudy.

Evergreen: Can you not from a co-operative society and make some arrangement to bring reed regulary?

K: We are unable to do that without help from outside. At times people talk about such things, like you. But they are not seen afterwards.

Evergreen: Do you know anything about the near-by Forest Research Institute?

K: Formerly we could graze our cattle in that area. But now that is not permitted. That is all that I know about it.

Shri Joseph, 38, a farm worker until recently, now owns about 1 ha of land. His land was once a fertile forest area.

Evergreen: What do you grow in your land?

J : Formerly I used to grow tapioca. But now it does not come up well. So I have planted cashew.

Evergreen: Why doesn't tapioca come up well now?

J. : Because the fertility of the land is lost

Evergreen: How was the fertility lost?

J. : My land is very slopy. I think loss of soil from top has been the main cause. I could not do any terracing or make bunds to prevent soil run off At first I did not know its importance. Of course, I didn't have enough money to do the terracing and bunding, also. At this stage, I cannot afford to use fertilisers either

Evergreen: Why did you shift to cashew?

J : I feel, trees like cashew can come up in less fertile land Also it is a very profitable crop now.

Evergreen: Are you interested in planting any other tree crop in addition to cashew?

J : Yes, I am trying to plant rubber.

Evergreen: Have you heard about Vanamahotsava?

J. : Yes, I have heard about it. Recently, I got a few seedlings of matti *[Ailanthus triphysa]* from the forest Department during Vanamahotsava. I have planted them in my compound.

Evergreen: Do you find any difficulty in getting firewood?

J. : Not much. Since the forests are nearby, we have no problem.

* * *

Shri P.C. Elias,38, is son of a farmer who owns about 3 ha of land. He is unemployed, but works in his family farm and takes active interest in social activities.

Evergreen: As you know, there is gradual degradation of the forest around us. What do you think are the reasons?

P.C.E. : People living in this area have basic needs of timber firewod, poles, etc. There is no place for buying these materials locally. So they either collect them directly from the forest or buy from people who do so Often this leads to indiscriminate cutting and consequent degradation of the forest

Evergreen: What can be done to prevent this trend?

P.C.E : A large majority of the people want to see that the forests around are maintained properly, particularly the natural forests which give us clean air and a beautiful habitat. But as long as their basic needs are not met, they will continue to damage the forest. If the Government is able to meet local demand by local supply of firewood, poles, etc, people will mostly depend on that and illicit cutting can be reduced considerably. The supply agencies can be operated at the level of Forest Ranges or so. It should be possible for people to buy their small requirements straightaway.

Secondly we should be able to bring to the minds of the people an awareness of the need for maintaining the forests properly.

Evergreen: Do you have any suggestion as to how this awareness could be brought about?

P.C.E. : Well, we have to meet the people. That is the only way. Media like radio, newspaper, etc., also could be used. Bu personal approach village wise, with audio-visual aids would be the best More than the elderly people, the young should have that great idea implanted in their mind.

Apart from Government agencies public also can take part in this kind of activities. We have been doing this kind of work, under the auspices of the Kerala Sastra Sahitya Parishad. KFRI, likewise, can organise even unemployed youth and students to this kind of work. Even they can be made use of in do implementation of Social Forestry programmes. For example, local unemployed youth can be organized for planting and upkeep of trees along the roads and canals, by giving them some incentives. We should grow trees which can yield good revenue to the Government like coconut, jack, mango, tamarind, etc. When they start yielding the trees could be leased out for harvesting. Till then unemployed youth may be engaged to protect them and paid for it. Later the bidders will take care. Our canal banks are ideal for coconuts.

Evergreen: Apart from your promotional activities have you tried growing any forest trees along with agricultural crops at home?

P. C E.: Yes, I am trying to grow trees like *Casuarina* and 'matti' in our family land to meet domestic needs for poles, firewood, etc., and for possible sale. *Casuarina* will be mostly used as poles to support banana.

Evergreen: Do you think people in your village will follow you?

P.C.E.: To a certain extent they are. But if they are provided with more information and seedlings they will do better. We should educate them in this line.

* * * *

Shri C. I. Thomas, 58, is a leading manufacturer of photo frames in Trichur. He has been in this business for the last 30 years.

Evergreen: Being a wood-using Industrialist, what is your association with the forest?

C. I. T.: Well, my association with the forest is not direct; it is rather limited to purchasing the wood required for my industry. Of course, I am totally dependent on forest for my industrial raw material.

Evergreen: Which are the tree species you use in your industry?

C.I T.: We use mainly soft wood species like nedunar [*Polyathia fragrans*,] kanakaitha [*Sagaraca delzelli*], pothondi [*Sterculia alata*] chorapathri (*Knema attenuata*) and vellapine (*Vateria indica*).

Evergreen: Why do you prefer these species?

C.I.T.: For one thing, photo frames made of these timbers will not split when nails are driven into it. That is the most important characteristic desired. Secondly, it is easy to work on them with our indigenous tools.

Evergreen: Being in this industry for the last 30 years, do you find any change in the availability of these timbers oevr the years?

C I.T.: Sure, the availability is very less and uncertain nowadays. Formerly we could buy them from the open market, but now, even in Government depots, these timbers are a scarce commodity. We get a small quota for our industry from the Government, but that is not sufficient to keep the industry running. We are afraid, we might be forced to close down, even this year.

Evergreen: What do you think is the reason for this shortage?

C.I T.: I think much of the natural forests where these species occur have been cut and planted up with teak and eucalypts. I do not know whether there has been any attempt to raise plantations of the species we require.

Evergreen: Have you ever thought of planting these species yourself to meet your needs?

C. I. T.: Being a businessman living in town, it is not possible for me.

Evergreen: Supposing you are given sufficient forest land, say, on lease, will you attempt to raise plantations of the species of your choice?

C. I. T.: That may be possible, but I do not know how long it would take to get the yield. I think the Forest Department should grow these trees and make the timber available.

Evergreen: What are your options to keep the industry going?

C.I.T.: Well, it is a real problem. Of course I am trying other timber species to replace the traditional ones. I think your Institute can give me some help by suggesting alternative timber species that possess characteristics similar to those we are using now.

Evergreen: Yes, KFRI could certainly do that. Did you ever approach KFRI for that?

C.I.T.: No. I never knew what KFRI is doing, except now. Of course, getting to know what timbers could be used is useful, but our problem will be solved only if we can get those timbers.

Evergreen: What is your problem in using timbers like teak for photo frames?

C I T: Price, of course, is one thing. But more important, our locally made machines are not able to handle hard timbers. The blades we get here are not hard enough to operate on them. I am trying to get some improved machinery. But it may be costly. I would appreciate if KFRI can give information on appropriate wood working machinery for our use.

Evergreen: Apart from raw material shortage, do you have any other problem in this industry?

C I T: Yes, we have the problem of wood deterioration. We use soft wood and they are often damaged by borers and fungal growth. By the time the material reaches us, considerable part is damaged. Much of the problem is due to the long interval between felling of trees and their arrival in the factory. If you can do something about it considerable amount of timber can be saved. In fact almost all the industrialists who use soft wood as raw material face this problem.

Evergreen: Have you tried any method to prevent this damage?

C I.T: Well, by the time the timber reaches us they are already damaged. Once it reaches us we use them immediately and practically there is not much need for preservation thereafter. If you can do something as soon as trees are felled or while the trees are in the Forest depot it would be better.

Evergreen: Which are the species most damaged?

C.I.T.: All are damaged, but nedunar, kanakaitha and chorapathri are more attacked by borers.

□

Training Given in Beekeeping

Twentythree interested young people selected from among the local public received a 1-week training in bee keeping at KFRI in April 1982. The free training was organized by the Entomology Division of KFRI in collaboration with the Kerala Sastra Sahitya Parishad (Peechi Unit) and the Khadi & Village Industries Board (KVIB). Shri M. R. Raman and Shri A. K. Abubakar of the KVIB conducted the classes which consisted of lectures and practical demonstrations of field capturing, hiving and upkeep of bee colonies.

During the course of the training, Shri K. E. Kumaran, Secretary, Trichur Village Industries Co-operative Society Ltd., Ollur and a leading bee-keeper of Kerala, and Shri B. Uttamdas, Bee Expert, KVIB addressed the trainees and shared their rich experience with them. The trainees later formed an association, called Peechi Beekeepers Association to co-ordinate beekeeping activities in the area.

— Division of Entomology

□

"Tall Oaks from little acorns grow"

— Anonymous, 1791

□

Fuel from live trees

Spreading awareness of the 20 hectare-a minute destruction of tropical forests has stimulated evolution of schemes for providing alternative wood fuel resources ranging from rather hazy 'social forestry, to well-planned and sophisticated 'silviculture energy farms' [1, 2].

Most of these seem to ignore the fact that in all tree dominated ecosystems only a minor fraction of the annual photosynthate is incorporated into timber. Major part is dropped as litter. For tropical rain forests and seasonal forests the values given in literature are around 10 to 33 kg. total litter fall per sq m composed of leaves, reproductive parts and twigs in the ratio of about 7:3:3, the corresponding standing wood biomass being 5 to 10 kg and annual increment about 0.5 kg/sq. m. [3, 4].

After drying, the litter has almost the same calorific value as wood and can be utilized the same way - burned directly or distilled to charcoal, tar, pyroligneous acid and gas or gasified to producer gas by partial combustion to carbon monoxide or water gas by the action of steam at high temperature or a methane-rich gas by hydrogenation But all these will result in total loss to the soil of all the nitrogen and humus forming polymers

The more sober route is biomethanation or anaerobic fermentation which involves no more complicated process than putting the soft litter under water and allowing it to ferment. My own studies, confirmed in a number of laboratories elsewhere, show that soft litter (leaves, flowers, fruits, etc.) give 200 to 300 l/kg of biogas containing about 70% methane within reasonable periods of fermentation (15 to 90 days) in digesters of simple design, without stirring or heating or any other measures for accelerating fermentation or enhancing gas yield. This gas gives one fourth to half the energy contained in the litter but has the inherent advantage of gaseous fuels viz, instant starting and stopping, fine control of flame, no soot, smoke or polluting sulphur dioxide, nitrogen oxides or hydrocarbons. More important, all nitrogen and humus forming polymers can be returned to the soil as sludge from the fermenter, which also retains all the other nutrients.

The above-ground parts of weeds growing beneath the canopy can supplement litter as fermentation substrate. Even after leaving enough litter to act as mulch, ample biomass will be left for biomethanation to provide more of 'clean' heat than firewood from the same area can generate.

The hard litter (twigs, etc.) can be processed in a wood distillation unit to give more fuel gas, tar, solvents and clean burning charcoal. Volunteers in Technological Assistance (VITA, USA) have recently developed a simple unit for wood distillation which can be assembled by a village artisan.

The up-shot is an entirely different image of the tree as an energy source. Hitherto the slaughtered and dismembered tree was a once-in-a-liletime source of fuel In the 'biogas from-litter' scenerio the living tree is a continuous source of clean fuel and fertiliser.

— Prof. T. C. K. Menon,
Department of Chemistry,
Sri Kerala Varma College,
Trichur

□

"I think that I shall never see
A poem as lovely as a tree.
A tree whose hungry mouth is prest
Against the earth's flowing sweat;
A tree that looks at God all day
And lifts her leafy arms to pray;
A tree that may in summer wear
A nest of robins in her hair;
Upon whose bosom snow has lain,
Who intimately lives with rain.
Poems are made by fools like me,
But only God can make a Tree."

□ — Joyce Kilmer.

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3. Tomlinson, P. B. and Zimmermann, M. H. (Eds.) 1978. Tropical Trees as Living Systems. Cambridge University Press. Cambridge.

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1982- Year of Mass Flowering of Reed

As is well known, many bamboos flower and seed *en masse* at long intervals of several years, which, depending upon the species, may range anywhere from only 5 to as long as 120 years. This phenomenon is variously called mass, gregarious or mast flowering or seeding. Sporadic flowering of isolated clumps may, however, occur every year in a given locality.

During March to May this year, Vazhachal, Sholayar and other localities in the State witnessed mass flowering of *Ochlandra travancorica* (Bedd.) Benth. ex Gamble, the common reed bamboo of Kerala. Exactly 21 (7 x 3) years earlier, in 1961, a similar mass flowering of *Ochlandra* species was recorded in Punalur (Raizada and Chatterji, 1963. *Indain For.* 89(12): 362-63). So the present flowering conforms to the 7-year flowering cycle reported for this species (Varma and Bahadur, 1980. *Indian For. Rec. n s, Bot* No 6, 28p)

—Divisions of Physiology and Genetics.

Social Forestry Workshop

The success of social forestry in the country will largely depend upon building up a committed cadre of 'bare-foot foresters'. A beginning was made in this direction in the Institute by conducting a one-day workshop on 14.6.1982 for the voluntary workers of the Kerala Sastra Sahithya Parishad, to help them in their effort to popularise social forestry in the villages. Major topics covered were, (1) Introduction to social forestry, (2) Important species suitable for planting in Kerala and (3) General planting practices. Seventeen volunteers participated in the workshop conducted under the leadership of Dr. C. T. S. Nair and Prof. V. P K. Nambiar. By interacting with these volunteers, we do hope to learn more about the practical problems which will be of considerable value in identifying problem-oriented programmes.

—Division of Forest Economics

RECENT PUBLICATIONS

Published in Journals

Venkatesh, C. S. 1982. Selection and hybridization of forest trees for quicker and higher biomass production. Indian J. Forestry 5(2): 83-85.

Abstract: Forest biomass is economically utilizable usually in the form of timber and wood, but sometimes also as bark and foliage. Through selection and hybridization, tree species can be made to grow faster, taller and thicker, thereby substantially quickening and increasing total biomass production of man made forests for various practical end uses.

Venkatesh C. S., 1982. A strategy for accelerated selection and release of advanced-generation eucalypt species hybrids. Indian Forester 108(4): 247-252. (Invited paper XVII IUFRO World Congress, Kyoto, Japan, Sept. 1981)

Abstract: This paper outlines a strategy for concurrent multilocation testing, selective breeding and utilization of the second and further advanced generation hybrids of two promising interspecific crosses between *Eucalyptus tereticornis* and *E. camaldulensis* Dehn., two of the most widely grown species of this genus in the world today. The advantages of using second generation hybrids in preference to those of the first are explained. In order to ensure concurrent practical benefits, plantations are envisaged after every step of selection.

KFRI Research Report

Gnanaharan, R.; Nair, K. S. S. and Sudheendrakumar, V. V. Protection of fibrous raw material in storage against deterioration by biological organisms. KFRI Research Report No. 12 Final report of the research project, Wood 04/1980 (Project sponsored by M/s Gwalior Rayons, Mavoor), June 1982, 24p.

KFRI Information Bulletin

How to establish seed orchards of teak (*Tectona grandis* L.). KFRI Information Bulletin No. 5, June 1982. (Division of Genetics). A Malayalam version entitled 'തേക്കിനായ വിത്തുതോട്ടം' is also available

SEMINAR, CONGRESS, LECTURE ...

Dr. R. Gnanaharan (Wood Science) gave an invited lecture on 'Use of coconut stem and other local timbers for structural applications' to the participants of Summer School on 'Optimal management of resources through utilization of waste and replenishable materials' held at the Engineering College, Trichur from 26 April to 8 May 1982.

Dr K. S. S. Nair and **Shri V. V. Sudheendrakumar** (Entomology) participated in the 11th Annual Conference of the Ethological Society of India, at Calicut from 3-5 May, 1982. Dr. Nair presented a paper entitled 'Marching behaviour of *Psara bipunctalis* Fb. (Lepidoptera, Pyraustidae) prior to pupation'. Shri Sudheendrakumar presented a paper entitled 'Ethological observations on a species of *Melitobia* (Eulophidae: Chalcidoidea) collected in Kerala' by himself and Dr. T. C. Narendran.

Shri T. Surendran, Smt. K. K. Seethalakshmi (Physiology), **Shri M. Balagopalan** (Soil Science) and **Shri M. Balasundaran** (Pathology, N. F.) attended the Pre-Workshop Training in connection with 'Treephysindia 82' held at Rubber Research Institute, Kottayam from 24-26August 1982.

Dr. C. S. Venkatesh, Smt. K. K. Seethalakshmi Shri T. Surendran (Physiology) and **Shri M. Balasundaran** (Pathology, N. F.) participated in the International Workshop on Special problems in physiological investigations of tree crops' ('Treephysindia 82') held at Rubber Research Institute, Kottayam from 26-28 August 1982. Dr. Venkatesh presented a paper entitled ' Promising new techniques for the clonal propagation of bamboos' by himself, K. K. Seethalakshmi and T. Surendran.

Campus news * **Campus news**

The Division of Wildlife Biology has moved back to the main campus at Peechi from Thekkady where it has been functioning in connection with a research project until recently.

Joined KFRI recently

Scientific Staff

V. P. K. Nambiar, M. A., M.Sc.	— Scientist, Botany (Taxonomy)
Rekha Sharma, Ph. D.	— Scientist, Wildlife
George Mathew, M.Sc.	— Scientist, Entomology
K. K. Narayanan Nair, Ph.D.	— Scientist, Botany (Taxonomy)
P. K. Muraleedharan, M.A.	— Research Assistant, Forest Economics
K. V. Sankaran, M.Sc.	— Research Assistant, Plant Pathology (Fungal Diseases)
Mammen Chundamannil, M.A.	— Research Assistant, Forest Economics
K. Mohanadas, M.Sc.	— Research Assistant, Entomology
K. Vishnu Bhat, Ph.D.	— Research Assistant, Wood Science
T. K. Dhamodaran, M.Sc.	— Research Assistant, Wood Science

Technical Staff

C. A. Jose	— Book Binder

Administrative Staff

M. Kamalamma, B.A.	— Office Assistant
K. Annapoorni	— Stenographer
V. Dhanalakshmi	— Stenographer
P. Mohandas	— Driver
V. D. Johny	— Driver
K. Mohanan	— Motor Boat Driver, D O E Project

Left KFRI recently

Scientific Staff

P. V. Unneenkutty, M.Sc.	— Research Fellow (DOE Project)
M. K. Ravindranathan, M.Sc.	— Research Fellow (DOE Project)
P. K. Subramanian, M.Sc.	— Research Fellow (DOE Project)

Administrative Staff

R. K. Padmanabhan	— Office Assistant
P. C. Shelly	— Stenographer

Dr. P. M. Ganapathy leaves KFRI

Dr P. M. Ganapathy, Director of KFRI for the past six years, left the Institute on 28 June 1982 to become Director, Indian Plywood Industries Research Institute, Bangalore.

Dr. Ganapathy took over the directorship of KFRI in July 1976 about a year after the Institute was formally registered. At that time KFRI was little more than a concept, with a small office located in a rented house at Patturaikkal, Trichur The main assets were a handful of people, a growing library and a master plan for a campus at Peechi The progress we have made in the six years since then bear ample testimony to Dr. Ganapathy's imaginative planning, administrative and persuasive skills and scientific competence. Dr. Ganapathy brought with him several years of experience as a Forester, Scientist and Administrator. Basically a botanist, Dr. P.M. Ganapathy, now 47, took his M A. and M. Sc. in 1954 and 55, respectively, A. I F C (Forestry) in 1959 and Ph. D. in Wood Science from Madras University in 1960. From 1959 to 1972 he served as Assistant and Deputy Conservator of Forests in Andamans, where he also organized a wood industry complex. For four years immediately before coming to KFRI on deputation from the Indian Forest Service, he served as Assistant Inspector General of Forests in the Union Ministry of Agriculture.

His experiences abroad included training or advanced study in 'Establishment and management of small-scale saw-mills' (University of Helsinki, 1968) 'Timber studies' (University of North Wales, 1974) and 'Planning and appraisal of rural projects' (University of Bradford, 1975).

KFRI as it is today, is largely a transformation of his vision into reality. His contributions as Director, during the crucial formative years of KFRI will be remembered not only in the history of KFRI but also in the history of Forestry in Kerala.

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Dr. C. T. S. Nair, Conservator of Forests, on deputation to KFRI as Forest Economi st, took over additional charge as Director.

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—Ed.