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kerala forest research institute

Do we need exotic forest trees?

"Ipil-Ipil—The Wonder Ceases", that was the title of an article which appeared in the September 1980 issue of *Canopy International*, a research news-magazine published by the Forest Research Institute, Philippines. Written by Saturnia C. Halos, this article portrayed how, and why, ipil-ipil (*Leucaena leucocephala* (Lam.) de Witt), a Mexican plant, hailed once as the 'wonder tree', failed to fulfil the promises made by its protagonists. At one time, it was claimed that this exceptionally fast-growing tree of multiple uses — with leaves useful for cattle and poultry feed and green manure; tender shoots and green pods for green vegetables (as in Thailand and some Latin American countries); wood for posts, lumber, fuel, pulp and paper; roots for medicine; and the whole stand for soil enrichment with nitrogen and control of erosion in hill slopes — was ideal for many afforestation programmes. Some of the popular articles on ipil-ipil written by professional writers had made it appear more worthwhile than even the coconut tree! This wonder has now ceased, according to Halos, and according to what all of us can see around. In most places in Kerala its growth is stunted. It is now known that ipil-ipil, whether giant variety or not, does not do well in acidic soils, in soils with high iron and aluminium content and that it requires somewhat specific root-nodule forming bacteria.

Most of us have a glamour for anything exotic (It becomes a craving when it comes to personal-use articles!); trees do not appear to be an exception. Among exotic forest trees introduced into Kerala are *Acacia auriculiformis, Albizia falcataria, Calliandra callothyrsus*, several species of *Eucalyptus, Maesopsis eminii, Ochroma pyramidale* (balsa), *Pericopsis moonlana* and some species of *Pinus*. Except for eucalypts, most of these have been planted only in small areas, on a pilot scale. *Albizia falcataria* is currently being extended to larger areas. Eucalypts already account for over a quarter of our forest plantations and they continue to replace more and more of our natural mixed forests every year. These species are changing the face of our countryside. Some may argue that this is inevitable, that change is part of progress, that we need eucalypts and tropical pines to produce rayon-grade pulp and paper, and so on. Others may argue that the exotics are doing irreparable damage to our environment, that we are growing them at the expense of valuable indigenous species like bamboo and 'reed', etc.

We invite opinion from readers on this question —Do we need exotic forest trees? Let us remember that some of our most valuable trees and plants, like rubber (*Hevea braziliensis*, tapioca (*Manihot esculenta)* and coffee (*Coffea arabica* and *C. canephora* (Syn *C. robusta*) are exotics. So are the menacing weeds, eupatorium (*Chromolaena odorata* Syn. *Eupatorium odoratum*) and 'African payal' (*Salvinia molesta*). On a world-wide basis, many potentially valuable tropical species still remain unexplored and unused. In Kerala forests, we have over 300 native tree species, of which only a handful have been raised in plantations. Apparently, several promising species, some of them fast-growing, await research and recognition. A handbook of Kerala timbers compiled by KFRI recently (KFRI Research Report 9) summarised the existing information on timber characteristics of 162 species. Many of them may not adapt well to plantation conditions, but we have not tried. Research should indicate why some indigenous species do not grow well in plantations and point out alternative management methods. Are we giving sufficient attention to these aspects? Are we too much preoccupied with exotics? Do we get carried away by recommendations of visiting foreign experts? These are questions which call for a debate.

In the last issue of Evergreen (September 1981) we invited readers to send opinions, suggestions or querries for publication in the 'Opinion Page.' Except requests for copies of Evergreen, we did not receive any communication. We hope the questions posed here will elicit comments from our readers, particularly those in the Forest Department who are more personally involved in raising plantations. Decisions on what species to plant are normally made at high levels in the Forest Departement. We may not hope to change such decisions by opinions expressed here, but here is a forum where every interested person - whatever his position, can express opinion and hope to influence the decisions. □

Nursery diseases of eucalypts in Kerala

Raising healthy eucalypt seedlings, free of major diseases is not only important for maintaining a good nursery stock but also essential to secure a healtny stand in the field. During our survey of nurseries of *Eucalyptus grandis* and *E. tereticornis* (the latter generally referred to as Mysore gum or *Eucalyptus* hybrid) for occurrence of various diseases, 60 to 100% mortality of seedlings was recorded in various high rainfall areas of Kerala. Such heavy mortality of seedlings upsets the planting schedule and poses practical problems in meeting the planting stock requirement for raising a planned area of plantation.

Heavy mortality of young eucalypt seedlings is generally attributed to a fungal disease caused by *Cylindrocladium quinqueseptatum*. Survey and field trials conducted during 1979 82, have, however, shown that *C. quinqueseptatum* is only one of the many fungi involved in causing mortality. Others are *Pythium, Rhizoctonia, Cylindrocladium clavatum* and *C. ilicicola*. Described below are various diseases caused by these pathogenic fungi which appear in succession at different phases of growth of seedlings, forming a disease complex. The extent of damage caused by various diseases depends upon the climate and management practices followed in raising the nursery.

Diseases in seed beds

1. Damping-off

Damping-off, the first disease to appear may cause considerable loss in the seed beds before and after emergence of seedlings. Pre-emergence damping-off caused by *Rhizoctonia* and *Pythium* is usually characterised by rotting of the just emerged young root called radicle. Post-emergence damping-off, which occurs more commonly than the above appears within a week of emergence of seedlings. It may be caused by *Rhizoctonia, Pythium, Cylindrocladium* or *Fusarium*. Damping-off causes collapse of the stem tissue (marked by water soaked constricted area) at the soil level causing the seedlings to fall over(Fig. 1). Such seedlings fail to survive. Damping-off usually occurs in patches (Fig. 2) but spreads rapidly from the centre of infection in rough circular patches, in which the most recently dead seedlings are on the periphery. Post emergence damping-off may cause mortality for two to three weeks only, by which time the seedlings develop resistance to this disease.

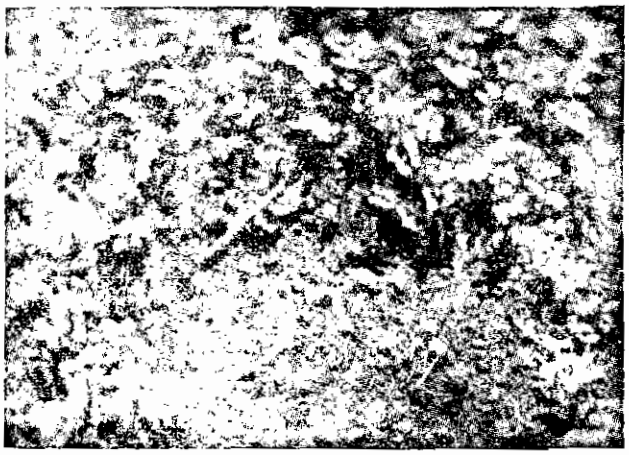


Fig. 1. A patch of 6 day-old seedlings of E. grandis *affected by damping-off*

2. Web-blight

In about two weeks of emergence another serious and common disease, web-blight, appears. It is caused by *Rhizoctonia solani*. The disease is characterised by profuse mycelial growth entangling the affected seedlings, giving the appearance of cob-web. The affected seedlings soon wilt and die. The disease may persist till the time seedlings are pricked out into polythene containers. When the disease continues in older seedlings, the pathogen produces off-white globular fruiting bodies on affected stem and leaves. This disease usually occurs in irregular patches and spreads rapidly under high moisture conditions.

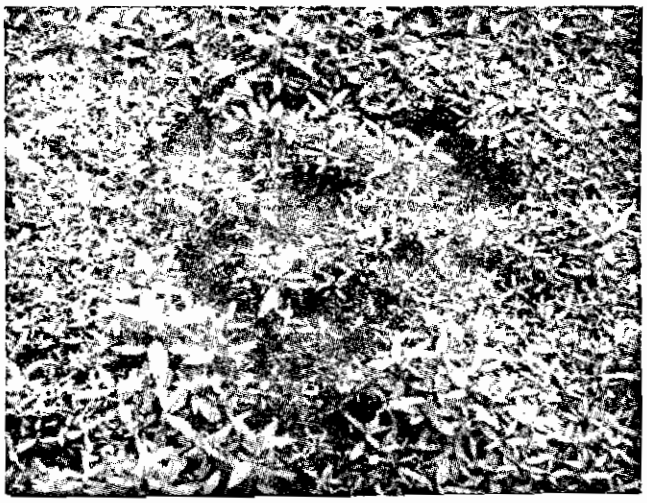


Fig. 2. Patches of dead seedlings of E. tereticornis *caused by damping-off.*

3. Seedling blight

This disease which may result in heavy mortality of seedlings is caused by two predominant species of *Cylindrocladium* viz. *C. quinqueseptatum* and *C. ilicicola*. Usually seedling blight has been observed in 1-month-old seedlings and it may continue to affect the seed beds for 15–20 days after appearance. Infection of stem near the soil level (just above the root collar region) results in seedling blight. The affected seedlings turn brown and die (Fig. 3). Under high humidity conditions profuse conidial growth may be observed on the dead seedlings which helps in increasing the inoculum potential of the pathogen and consequently spread of disease.

Fig. 3. *35-day old seedlings of* E. tereticornis *severey affected by seedling blight caused by* Cylindrocladium.

Diseases in container seedlings

After the seedlings are transplanted into polythene containers, *Cylindrocladium* spp. pose the main threat to survival of seedlings especially after the premonsoon showers, by causing various diseases such as stem infection and leaf and shoot blights.

1. Seedling stem infection

Seedling stem infection which may result in a canker is frequentlv observed in 2-3 month old seedlings. The infection develops at any place on the lower half of the stem. The affected seedlings which primarily show typical symptoms of physiological wilting such as flaccidity of leaves and of apical shoot (Fig. 4) are eventually killed. Some of the diseased seedlings may survive if epicormic shoots arise from the portion below the canker.

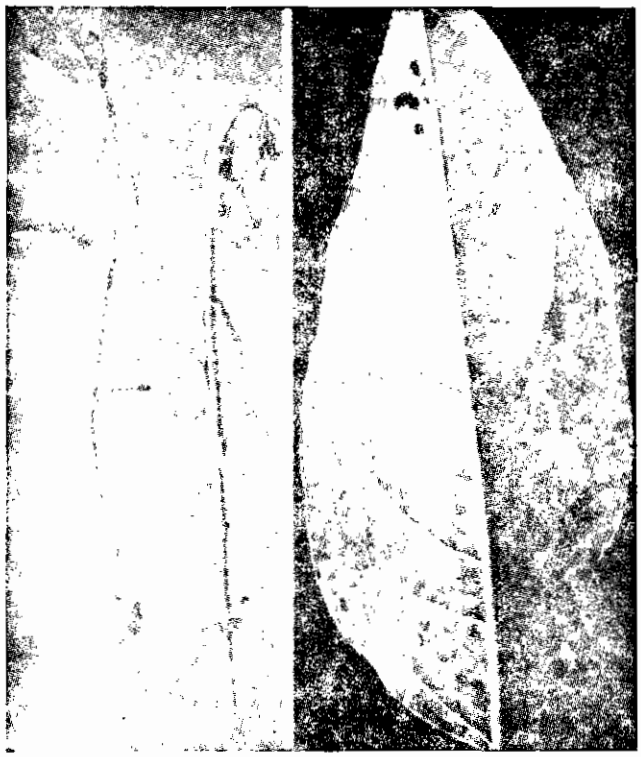


Fig. 4. 60-day old seedlings of E. tereticornis *affected with stem infection caused by* Cylindrocladium. *Note the infection site (arrow) just above the ground level.*

Fig. 5. A leaf of E. tereticornis *showing typical leaf infection caused by* Cylindrocladium *which appears in the form of minute greyish-black water-soaked lesions.*

2. Leaf spot

Leaf spots caused by *Cylindrocladium* spp. appear first as minute, greyish-black water soaked lesions (Fig. 5) on young as well as older leaves. Later, these lesions coalesce to form larger necrotic areas which on drying, turn brown giving typical blighted appearance. Under high humidity, the initial symptoms are generally large greyish-black irregular spots, sometimes covering the entire leaf. Such heavy foliage infection causes premature defoliation which weakens the seedlings.

3. Shoot blight

Shoot blight of eucalypt seedlings is caused by multiple infection of *Cylindrocladium*, affecting apical bud, stem (causing stem canker) and leaves. Such seedlings which become leafless are killed outright. Shoot blight has generally been found responsible for over 50% casualty in container seedlings.

Control measures

Since these nursery diseases are caused by several pathogenic fungi, it is not possible to control them by one fungicide or one combined application of different fungicides. Trials conducted during 1980-82 have indicated that the nursery disease complex of eucalypts can be controlled effectively by proper management of nursery and prophylactic application of fungicides.

Proper management of nursery includes adequate shade with dispersed light, medium density of seedlings in the bed (about 200 per 30 × 30 cm area) and right quantity of water per bed (40 liters at a time per standard bed, 12m × 1m). The frequency of watering may range from 1 to 3 times a day depending on climatic conditions and growth stage of seedlings. These measures will prevent the appearance of the disease to some extent and also check the development of the diseases into serious epidemic proportions.

Prophylactic application of fungicides at proper time, will control development of these diseases. Chemical control studies using selected fungicides are in progress and we hope to bring out specific recommendations for control of this disease complex before the end of this year.

Division of Pathology

(Fungal Diseases)

Dream of a Naturalist

There

far from the asphalt
the endless noise
far from the cobwebs
and the dust of everyday life

There

where everything is green
and gold and light and shadow
where our beautiful animal instincts
awaken the roots deep within us
making fun of our superficiality

There

where the breeze multiplies the green
and their crystals and ripens
all the fruits of life within us
like little flames and our hearts
become fragile, as fragile
as the mirror of a river

There

far away ..... on the grass
in the lightning green of life
to be reborn
every moment.

—Sankar

Expert Group Meeting on Tropical Forests

Dr. P. M. Ganapathy, Director, KFRI, represents India

An expert group meeting on tropical forests jointly sponsored by FAO, UNESCO and UNEP was held at Rome from 12 to 15 January 1982. Dr. P. M. Ganapathy, Director, KFRI was one of the 21 experts from participating countries. His participation was sponsored by the United Nations Environmental Programme (UNEP), as nominee of the Govt. of India.

In addition to experts from various countries, several international organisations like IUFRO, IUCN, ICRAF, etc., were represented in the meeting. According to Dr. Ganapathy, various aspects of management of tropical forest resources were discussed including research priorities. Recommendations were drawn up to harmonise international action in support of national efforts. A document highlighting the tropical forest situation and specifying the area for action by international agencies, drafted by the expert group on the basis of discussions and information provided by FAO is expected to be released shortly by the United Nations.

It is understood that the achievements of KFRI were projected in the discussions and some UN Organisations showed interest to sponsor projects to be undertaken by KFRI, subject to approval by the Govt. of India.

—Ed

Our Vanishing Medicinal Trees - 2: *Stereospermum* spp.

V. P. K. Nambiar

Stereospermum species are known as 'Patala' (പാടല) and 'Patali' (പാടലി) in Sanskrit. Different varieties of 'Patala' are mentioned in ancient Ayurvedic treatises. For example, in 'Bhavaprakasa' there is mention of 'Krishnapatala' and 'Swethapatala'. In other compilations, names like 'Drumapatala', 'Kshudrapatala' and 'Valleepatala' are also given. But according to Vagbhata, Charaka and Sushruta, there are only two varieties — 'Krishnapatali' and 'Shuklapatali'. In practice, two varieties, known in Malayalam as 'pathiri' (പാതിരി) and 'poopathiri' (പൂപ്പാതിരി) are used by physicians for Ayurvedic preparations. The scientific name of 'pathiri' is *Stereospermum colais* (Buch. — Ham. ex Dillw.) Mabberley and of 'poopathiri', *S. chelonoides* (Linn.f.)D C. (family Bignonaceae). In older literature the same species have been referred to under different names by different authors. The list given below may be used to resolve possible confusion.

Stereospermum colais **(Buch. Ham. ex Dillw) Mabberley**

[പാതിരി, 'pathiri']

Synonyms: *S. personatum* (Hassk.) Chatterjee

S. tetragonum A. DC.

Bignonia colais Buch.-Ham. ex Dillw.

Dipterosperma personatum Hassk.

Stereospermum chelonoides (Linn. f.) DC.
[പൂപ്പാതിരി, Poopathiri]

Synonyms : *S. suaveolens* (Roxb.) DC.

Bignonia chelonoides Linn. f.

B. suaveolens Roxb.

Troupe (The Silviculture of Indian Trees, Vol. II 1921) uses the name *S. suaveolens* DC. to refer to *S. chelonoides* (Linn. f.) DC. (പൂപ്പാതിരി). *S. chelonoides* DC. mentioned by Troupe actually refers to *S. colais* (Buch.—Ham. ex Dillw.) Mabberley (പാതിരി). Of the two species, *S. colais* is common in Kerala; *S. chelonoides* is scarce.

The roots of these species form one of the constituents of 'Dasamoola' and 'Panchamoola'. Root bark is considered to be cooling, diuretic and tonic. Root decoction is used for treatment of excessive thirst, vomiting, lung disorders and inflammation.

Leaf juice mixed with lime juice is used to treat maniacal cases.

Flowers are aphrodisiac and febrifuge. If is used in the preparation of 'asavas' and 'arishtas' prescribed for toning up the liver and lungs.

There is mention about the flowers in 'Raghuvamsa (രഘുവംശം) and 'Naishadha' (നൈഷധം). In 'Naishadha', the flower bunches are described as symbolising the 'arrow' of 'Kamadeva'.

Stereospermum spp. are medium to large-sized trees. The bark is brown to greyish-brown, smooth in *S. colias* and with large irregular flakes in *S. chelonoides*. Leaves opposite, pinnate, leaflets

7-11, elliptic (caudate acuminate and glabrous in *S. colais*, acuminate and viscid pubescent beneath in *S. chelonoides*). Flowers are slightly fragrant, in showy panicles. Fruit is a capsule 25-50 cm long (subquadrangular and curved in *S. colais*, cylindrical and straight with elevated white specks in *S. chelonoides*). Seeds are numerous with membranous wings.

Both species occur in mixed deciduous forests. The phenology and silvicultural characters of both species are similar. Leaf shedding occurs from February to April, flowering from March to April and fruiting from November to December. The tree is a moderate light demander. Young plants have good power of recovery from fire damage. Natural regeneration occurs through seedlings and suckers. For artificial regeneration direct line-sowing as well as planting out seedlings from the nursery can be carried out successfully. Freshly collected seeds should be sown in nursery beds in April-May, preferably in light sandy soil and regularly watered. The seeds germinate in about two weeks. Outplanting can be done in the first rainy season.

Wood of *S. colais* is light grey, sapwood and heartwood not distinct, somewhat difficult to saw and work, but gives good finish, moderately durable; used for tool handles, low quality furniture and for railway sleepers after treatment. In the case of *S. chelonoides* sapwood is grey with faint yellwoish cast, heartwood yellowish brown, fairly lustrous, moderately hard, moderately heavy, moderately durable not difficult to saw and work; used for construction work, furniture and cabinets, tool handles, railway sleepers, cart and carriages and for good quality charcoal.

As *Stereospermum* spp. are in great demand as raw material for Ayurvedic preparations and as the trees yield valuable timber, attempts should be made to raise plantations of these species. Once common throughout India in mixed deciduous forests, these trees are now fast disappearing, leading to acute shortage of medicinal raw material.

□

How fast do bamboos grow?

Bamboo culms are known to grow phenomenally fast during their active growth phase. We had occasion to confirm this by our own measurements last October, when some of the successfully rooted culm cuttings of *Bambusa arundinacea* in nursery beds at KFRI put forth new juvenile culms. Height measured at 3 p. m. every day from 19 to 30 October 1981 are tabulated below.

Date of measurement in Oct. 1981	No. of visible internodes	Total height of culm (cm)	Height increment for the previous 24 hr (cm)
19	9	122	-
20	10	147	25
21	11	173	26
22	13	197	24
23	15	224	27
24	16	246	22
25	18	270	24
26	19	292	22
27	20	318	26
28	22	346	28
29	23	372	26
30	24	397	25

It can be seen that height increment ranged from 22 to 28 cm per day. with an average growth rate of 1. 04 cm per hour. Everyday, between the time we came to office in the morning and the time we left in the evening there was visible increase in culm height. We could thus literally see it grow. Time lapse photography will give remarkable pictures of this phenomenal growth (see *National Geographic* magazine of October 1980, p. 515).

It is interesting to note that much of the growth was intercalary, not apical, brought about by elongation of the internodes already formed. As growth progressed, one or two internodes were added per day.

Within a three month period a bamboo culm can grow 40 m, that is about 44 cm per day. Some previous records of daily height increment for bamboo are as follows: 91.3 cm in *Bambusa arundinacea* (Kew, England) 119 cm in *Phyllostachys edulis* (Japan), 121 cm in *P. reticulata* (Japan) and 30 cm in *Dendrocalamus strictus* (India).

No other plant (or animal) can grow as fast as the bamboo. □

—Divison of Botany (Physiology)

"Be biased, but biased towards truth"

Dr. K. I. Vasu tells scientists

Dr. K. I. Vasu, Professor of Metallurgy, Indian Institute of Science, Bangalore and formerly Chairman of both the State Committee on Science and Technology and the Executive Committee of KFRI was interviewed on 1 March 1982 by Dr. R. Gnanaharan, Shri Mathew Koshi and Dr. C. T. S. Nair, on behalf of **Evergreen**.

Evergreen: To begin with, would you tell us something about the set-up of the State Committee on Science and Technology?

KIV.: In early 70's, the Government of India set up the Department of Science and Technology and the National Committee on Science and Technology, or NCST, as it is popularly known. As part of the 5th Plan proposals, NCST prepared a plan to ensure the impact of science and technology in the planning process During that period, the Govt. of India also advised all the States to form State Committees on Science and Technology.

One of the earliest to establish a State Committee on Science and Technology was Kerala, mainly because of interest taken by Shri C. Achutha Menon, the then Chief Minister and Dr. P. K. Gopalakrishnan, the then Member Secretary of the State Planning Board and Secretary of the Department of Planning.

The functions of the State Committee are, broadly

to establish and nurture R & D Centres of Excellence;

to support R&D projects initiated by individuals and institutions;

to set up Task Groups in identified areas for continuous review and to sponsor activities in the area; and

to disseminate scientific knowledge.

One of the major tasks of the Committee was to establish Centres of excellence in various aspects of science and technology. This became necessary because Central Government establishments in Kerala were only few and Kerala needed a larger input of science and technology.

Evergreen: What are the Centres already established?

KIV: The first one was the Centre for Development Studies, under the leadership of an eminent Economist, Dr. K. N Raj, and it is now one of the well-known Centres in Social Sciences in India. The next was the Sree Chithira Tirunal Institute of Medical Sciences and Technology, headed by an eminent cardiologist, Dr. M. S. Valliathan. Within a few years, it came to national eminence, and on 1st March 1981, by an Act of Parliament, it was taken over by Govt. of India. The other Centers established are the Kerala Forest Research Institute, the Centre for Water Resources Development and Management, the Centre for Earth Science Studies, and the Tropical Botanic Gardens and Research Institute. In addition to these main institutes, some smaller institutes have also been set up. These include the Electronics Research and Development Centre and the National Traffic Planning and Automation Centre, both now functioning as part of KELTRON and largely funded by the Central Government. Another Centre set up is the Lal Bahadur Sastri Engineering Research and Consultancy Centre.

Evergreen: How does the Committee on Science and Technology co-ordinate the activities of these various Institutes?

KIV: All these Institutes are autonomous and each institute will have its own objectives, rules and regulations, bye-laws, etc., and is registered as a Society in the State. At present very little coordination is possible because each institute is autonomous in its nature. The Executive Committee and the Governing Councils of these institutes are also constituted in different ways. Although the Chairman of the State Committee on Science

and Technology is also the Chairman of the Executive Committee of some institutes, he is not represented in the Executive Committee or the Governing Council of the other institutes. Therefore the Committee on Science and Technology can exert very little control to bring about coordination.

Evergreen: How do the Institutes get their funds?

KIV: Funding comes from the State Plan funds and in the 6th Plan, Rs. 12 crores have been set apart for Science and Technology work in the State. It is a substantial amount of money. The Institutes send their proposals to the Planning Department. The State Committee on Science and Technology is part of the Planning Department. So they handle the papers connected with the Institute.

Evergreen: What is your view on autonomy versus accountability?

KIV: I do not have a fixed view on this. It depends on how the Institutes work. Take the example of Kerala Forest Research Institute. Its Executive Committee is essentially a Committee of specialists in the area of forestry. So when projects are presented to them by the scientific community, they are able to make meaningful inputs to ensure relevance and accountability.

Another crucial point is, the institutions ought to be headed by scientists. Unfortunately, that is not the tradition in India. We should be careful to choose the right person to head and he should have the leadership quality. He should be a well-known scientist, so that he gets respectability from the scientific community, especially the scientists in the organisation. If that is done, the institute will grow; otherwise it will decay Administrative people heading a science organisation will look more to the administrative aspects and neglect the technological or scientific growth of the Institute.

Evergreen: How about participation of internal scientists in the Executive Committee?

KIV: In fact, that is exactly what should be done. But one has to give a lot of thinking in this matter. Representation for internal scientists in the Executive Committee can help build up better rapport between the various categories of staff and the management. But there is danger that the selection mechanism may lead to pressure grouping or groupings within the scientific community. Appropriate methods must therefore be chosen to select scientists to participate in the deliberations No structure has so far been developed for this in any of these institutions. The importance of participatory administration must be recognised by all concerned; then only things will improve.

Evergreen: What is your opinion on the future of these institutions?

KIV: Well, the Executive Committee of the State Committee on Science and Technology is being kept informed of the various activities of these institutions. And an image has been created in the Executive Committee that the development of these Centres will be very useful for the State. I was expecting that the Executive Committee of the State Committee for Science and Technology will be reconstituted with all Directors of these Institutes as members in addition to Scientist - Vice-Chancellors of Universities. The term of the Committee is 3 years.

Evergreen: Will it not be good if the Committee members have a longer term than three years?

KIV: It is better to give a shorter term. If they are doing well, give them another term and continue that. Otherwise, you will be stuck with a wrong leader, and that is the end of the whole programme.

Evergreen: As you are aware, during the last five years KFRI has taken up a large number of projects. What is your opinion on the research direction of these projects?

KIV: In a research institute, there are two aspects of research. One is, the researcher must build up competence in his particular field. That involves a lot of fundamental work. For this the Institute as well as the researcher should be given sufficient freedom to develop competence and field of work. And the second, after building up the competence he must apply himself to problem-solving research. In problem-solving research, there must be a major input from outside. The reseach effort should be directed and the direction should come from outside, from the Forest department or the leadership of the scientific community.

In India universities rarely touch forestry as a feild of study. They have not understood the importance of that. We should have a concept of what a forest should be, in its totality. But that integrated concept is lacking in many people in the Forest Department or Forest Research Institute. For example, someone will be interested in wildlife and he thinks that that is forestry Another person will be

interested in teak plantations and he will be interested in talking about that only. That is why we have not been able to evolve a forestry discipline in its totality. There should be multidisciplinary and interdisciplinary activities these days. If you want to have a breakthrough in any discipline, you should draw inputs from all other disciplines. That is my reading of the situation.

The whole science and technology planning, i e. the whole planning process in India, is faced with this difficulty of lack of perception of the situation in totality. All our approaches to the problems are ad hoc. So the State Committee on Science and Technology was looking at the State problems in that perspective. In fact, the work in the past one year has been towards evolving the areas of relevance. For this, the State Committee set up several Task Groups. These groups analyse the situation in each field and suggest the areas where scientific or technological work should be taken up.

Evergreen: Will the Task Groups decide priorities in research?

KIV: The Task Groups submit their reports to the State Committee on Science and Technology. The Committee analyse the reports and prepare a full document in various areas of forestry, agriculture, agroforestry, fisheries, water resources, transportation, metals and minerals, electronic industries, chemical industries, etc. In India, if the priorities are wrongly chosen, naturally people will be agitated.

But many of the problems of the country are not due to lack of scientific or technological knowledge. Answers are already available, but we are not able to do anything on that. For example, for water purification for drinking, much science and technology is not necessary. But the administration is not able to do anything on that. They will say that scientists are not devising simpler methods, simpler water treatment plants or simpler bore wells, etc. Well, we can work on that. But that will not help. The technologies are already known, but application is not made. Or take the case of cheaper construction materials or methods These are known; what is needed is only to popularise and make use of them.

Evergreen: As most of the research institutions are financed by Government, some may argue that research work should conform to the objectives laid down by the Government. But often you find divergence between Government objectives and the larger interest of society. In such situations what will be your advice to scientists ? Should they pursue 'committed research' or should they follow options which are of importance to the society at large?

KIV: See, it involves several aspects. Certainly when we are asked to do certain things, we should do. That doesn't mean that we cannot go into the depth of the problems of importance and collect information and speak on public platform what we feel about the work. A scientist is equally a citizen and he has his responsibility. What happens in India is that scientists themselves hide some of the facts and project only certain facts which will suit certain circumstances. And that way the scientific community has lost heavily in this process. Unless the basic honesty towards the objectivity that we envisage in the scientific research is preserved, we are losing our credibility. Now this has happened on many occasions. When we give an opinion in any field, we should be bold enough to say that with facts and figures, unbiased with our own personal likes and dislikes. A scientist can be biased, but biased towards truth alone.

Evergreen: Is there any plan to set up more institutions of this sort?

KIV: There is need for one for agro-processing and post harvest technology. Kerala is still an agricultural land and if we want to get the full benefit of the agricultural products, we should go in for an Institute of this type, similar to the Tropical Products Institute in London, dealing with all agricultural products of Kerala. Another is for minerals and metallurgy. In Kerala, we have monozite, ilmenite, graphite, gold ore, precious stones, etc. These are not processed in the State at present to the final stages. So research in that field will add highly to the economy of the State.

Evergreen: Do you have in mind projects of relevance to the people of Kerala which KFRI could take up?

KIV: Well, I have in mind some research priorities connected with forestry. One is urban forestry. KFRI should look into the possibility of raising forest, say in about 20-25 ha land in cities. This will help in educating the public and politicians about the benefits of forests and to make them realise that forests are not confined to mountains.

We should look at forestry in its totality. We should know the type of trees and animals in our forests. We have to study the environmental factors like rain fall, temperature, etc. and then evolve a pattern for planting. We need to concentrate on

soil conservation as an important part of forest conservation.

Then, we have to see forests from the angle of products. People should be able to get cheap and quality wood. Also, KFRI should evolve simple and efficient working methodology in logging, transporation, etc.

Another task is to meet the fuelwood demand by selecting appropriate fast-growing species for different locations.

Forest is not wood alone. Other things like honey, resin, medicinal plants are also there. Scientific management for efficient tapping of these products must be developed.

Evergreen: Do you have any concluding remarks or advice to KFRI Scientists ?

KIV: KFRI is doing extremely well, in their own merit and in comparison with others. I'm sure they can contribute substantially. They should have all the facilities and proper atmosphere should be given for work. A man who does M.Sc. and Ph.D. with considerable effort, must not be stuck in certain positions without avenue for promotion and monetary benefits. □

Seminar on Medicinal Plants

A seminar on medicinal plants was held in KFRI on 17 December 1981. In this seminar, organised by the Botany (Taxonomy) Division, under the leadership of Prof. V. P. K. Nambiar, about 200 people participated. Dr. K. I. Vasu Chairman of the State Committee on Science and Technology inaugurated the seminar. Dr. Vayaskara N. S. Mooss, Kottayam, gave the key-note address.

Twelve papers were presented in two sessions, covering various aspects of medcinal plants in relation to Ayurvedic practice, including identity of medicinal plants and products, availability and adulteration of raw materials, biodeterioration of seeds, standardization of drugs, and modernisation of manufacturing processes. The morning session was presided over by Vaidyabhooshanam Raghavan Thirumulpad and the afternoon session by Dr. P. K. Warrier.

The primary aim of the seminar was to bring together learned Ayurvedic physicians, plant scientists and foresters. After detailed discussions, the concluding session drew up recommendations for action, which included a detailed survey of medicinal plant resources of Kerala forests, commercial scale cultivation of selected medicinal plants in forest plantaions and taxonomic studies to settle nomenclatural problems.

For additional information on the seminar, write to Botany (Taxonomy) Division, KFRI.

— Ed.

BOOKS OF INTEREST

Tropical Legumes: Resources for the Future, National Academy of Sciences, Washington, D. C. 1979. (Third printing 1981). 331 pp.

This is the fourth book in a series that aims at identifying unconventional scientific subjects with promise for developing countries, brought out by the U. S. National Academy of Sciences. The previous ones were (1) Winged bean: A high protein crop for the tropics, (2) *Leucaena leucocephala:* new forage and tree crop for the tropics; and (3) Underexploited tropical plants with promising economic value. This report, prepared by a panel of experts, gives a brief introduction to about 200 species of the family Leguminosae, selected on the bssis of potential economic importance to the tropics.

As is well known, most legumes have the capacity to grow on nitrogen-poor soil because their nitrogen requirements are met by root nodule bacteria which convert atmospheric nitrogen into soluble compounds that the plants can absorb. Leguminosae provide a variety of products—edible roots, pulses, fruits, fodder, timber, etc.

The plants discussed in the book are essentially to serve as complements to, not as substitutes for conventional tropical crops Besides leguminaceous species of agricultural importance, the book deals with fast-growing forage shrub and tree species, luxury timber species, fibre and ornamental tree species and fibre and gum yielding tree species. *Desmodium* spp., *Acacia* spp. and *Prosopis* spp. for fodder and small timber; *Sesbania* spp. and *Albizia* spp. for fodder and pulp; *Calliandra calothyrsus* and *Leucaena leucocephala* for fodder, small timber and pulp; fast growing species of *Dalbergia* spp., *Enterolobium* spp., *Mimosa scabrella* and *Tipuana tipu* for timber; *Pericopsis* spp., *Intsia* spp., *Pterocarpus* spp. and *Dalbergia* spp. for luxury timber; *Bauhinia* spp., *Cassia* spp., *Mucuna* spp., *Sophora microphylla*, *Saraca indica* and *Caesalpinia echinata* for shade and beautification, are among the tropical legumes described.

The natural habitat, well known introductions, methods of cultivation, limitations including those due to reported pests and diseases, uses, research needs, selected bibliography and addresses for contacts have been given for most of the species listed.

The enormous resources of legumes are of particular importance to foresters as a number of tree legumes have a wide range of adaptability for productive, protective, aesthetic and amenity forestry.

—C. S. Venkatesh

Orchids as Medicinal Plants

Man has been associated with orchids from the dawn of human civilisation. There is evidence to show that the orchids were cultivated as early as 500 B. C. The term orchid has its origin from the Greek word 'orchis', meaning testicles, referring to the paired underground tubers of the terrestrial orchids which in his fertile imagination, Theophrastus compared to the testicles of a dog Later, Dioscorides, the Greek herbalist, who lived in the 1st Century A. D. adopted this name to be included in his Materia Medica, where 500 species of medicinal plants were described among which 5 species of orchids were included. In several Indian Pharmacopeas the aphrodisiac property of the orchid tubers have been mentioned. As per the 'Doctrine of Signatures', Dioscorides proclaimed that a plant will bear on its body some indication of its use Therefore, the similarity of orchid tubers to testicles endowed the orchid plant with mysterious powers to enhance the sexual prowess and fertility of man. It was even thought that married people by consuming varied quantities of orchid roots could pre-determine the sex of the child.

Some orchids are reported to induce sterility among women. In Queensland, the native inhabitants use the seeds of *Cymbidium maddidum* as an oral contraceptive and the plant is called by them as 'sterility plant' In Fiji, the grated pseudobulb of *Dendrobium tokai* along with the paste obtained from ground *Hibiscus* leaves (Malvaceae) is used as an abortive. The inhabitants of the Indonesian island of Amboina, use the paste of *Gramatophyllum* to cure sores. In Malaysia, a drug prepared from a species of *Dendrobium* is applied for the treatment of skin diseases. In South America, *Epidendrum bifidum* is used to expel tapeworm from the intestine. A species of *Spiranthes* is used as a diuretic. *Cymbidium canaliculatum* and *C. maddidum* are used for the treatment of dysentery.

In southern India. 64 genera, with 255 species of orchids are known to occur, of which 150 species are represented in Kerala forests. Among the orchids of Kerala a few are medicinally important. *Acampe praemorsa* is used in the treatmant of rheumatism. The fruits of *Cymbidium aloifolium* is used for earache and the whole plant is used as a purgative and to induce vomiting. The plant juice of *Dendrobium ovatum* is used as a laxative and to excite the flow of bile. *Ephemerantha macraei* is used in the treatment of asthma, bronchitis, tuberculosis, burning sensations and diseases of blood. The fruit of this plant is cosidered to be aphrodisiac. The tuber of *Eulophia epidendraea* and *E. nuda* is used to expel worms. Drug made out of the tuber of the latter is used for treatment of tumors and tuberculous glands of the neck. It is used in the treatment of bronchitis and diseases of blood also. Tubers of *Pecteilis susannae* is used in the treatment of blisters occurring in the palm of hand. A paste made from the leaves of *Vanda tessellata* is applied to the body during fever and juice of the plant is used as a remedy for infection of the ear. The roots of this plant is used as an ingredient of various medicinal oils for external application in nervous disorders. Flowers of *Vanda spathulata* are given as cure for asthma and mental illness.

A large number of Indian orchids are being cultivated for ornamental purposes by commercial growers but they have not been exploited for their medicinal value. Collection of medicinal orchids from the natural forests and their cultivation in green houses should be encouraged to ensure their ready availability for medicinal purposes.

Muktesh Kumar
Botany (Taxonomy) Division

What's in a name?

Plant taxonomists have changed the name of *Eupatorium odoratum to Chromolaena odorata.* This pernicious weed known in Kerala under the nicknames "Communist Pacha", "Assam pacha," etc., is a native of Central America, but is now widespread in other tropical regions.

Why does a botanical name change? And When? For answers please await the next issue of **Evergreen**.

- Ed.

RECENT PUBLICATIONS

Published in Journals

Balagopalan, M. and Alexander, T. G. 1981. Shoot and root growth in *Eucalyptus tereticornis* seedlings. Indian J. Forestry, 4:(3)238.

Sasidharan, N. and Nambiar, V. P. K. 1981. *Eleutheranthera ruderalis* (Sw.) Soh. - Bip. (Compositae) A new record for South India. Indian J. Forestry, 4(3): 240-241.

Sharma, J.K. and Mohan, C. 1981. Spermoplane mycoflora of stored seeds of *Tectona grandis*, *Bombax ceiba* and *Eucalyptus* spp. in relation to germinability. Proc. Int. Symp. on "Tree Seed Storage Problems" held at Petawawa National Forestry Institute, Chalk River, Canada, September 1980.

Swarupanandan, K.; Menon, A. R. R. and Balasubramanyan, K. 1981. A new key for biological identification. Gardens' Bulletin, Singapore, 34(1): 161-169.

Venkatesh, C. S. 1981. Strategies of genetic gain through seed orchards. pp. 39-46. *In* P. K. Khosla, ed., Advances in Forest Genetics. Ambika Publications, New Delhi.

KFRI Research Reports

Nazma; Ganapathy, P. M.; Sasidharan, N.; Bhat, K. M. and Gnanaharan, R. A Handbook of Kerala Timbers. KFRI Research Report No. 9. Final Report of Research Project Wood 01/1979, June 1981. 260p.

KFRI Information Bulletin

Medicinal plants of Kerala Forest (A tentative check list) - KFRI Information Bulletin No.4, July 1981. (Division of Botany, Taxonomy)

SEMINAR, CONGRESS, LECTURE .....

Shri K. C. Chacko, (Silviculture), attended a workshop on 'Modern techniques on site identification for afforestation and pasture development' held at Indian Photo Interpretation Institute, Dehra Dun, from 21-22 October 1981.

Dr. K. Balasubramanyan, (Ecology), presented two papers entitled (1) Is the forest of southeast coast of India dry evergreen?' A case study of Marakkanam RF, Coromandal Coast and (2) Management of tropical evergreen forest - certain biological lacunae, at the Silver Jubilee Symposium of International Society for Tropical Ecology, held at Bhopal during October 1981.

Shri N. Gopalakrishnan Nair, (Botany Taxonomy), attended the Seminar on Island Biology, held at Port Blair on 12 November 1981.

Dr. J. K. Sharma, (Pathology F.), presented a poster-paper entitled 'A disease complex of *Eucalyptus* caused by *Pythium, Rhizoctonia* and *Cylindrocladium* and its possible control' by J. K. Sharma and C. Mohanan at the International Symposium on Plant Pathology held at Indian Agricultural Research Institute, New Delhi from 14-18 December 1981.

Shri C. Mohanan, (Pathology F), presented a paper entitled 'Seed microflora of some important medicinal plants and their possible role in biodeterioration' by C. Mohanan, J. K. Sharma and K. Jyothilal, at the Seminar on Medicinal plants held at KFRI on 17 December 1981.

Dr. P. M. Ganapathy, (Director), **Dr. C. T. S. Nair,** (Economics), and **Dr. K. S. S. Nair,** (Entomology), attended a seminar on Resources potential of Kerala held at Calicut from 19-20 December 1981. Dr. C. T. S. Nair presented a paper on Forest Resources of Kerala.

Shri Muktesh Kumar, Kum. C. Renuka and **Shri N. Sasidharan,** (Botany Taxonomy), participated in the IV All India Botanical Conference and Symposium on 'Basic research in Botany in relation to National development' at Calicut from 28-30 December 1981.

Shri K. K. Ramachandran, (Wildlife), attended a workshop on 'Techniques in Wildlife Research and Management' held at Kanha National Park in January 1982.

Dr. C. T. S. Nair, (Economics) and **Shri. K. Ravindran,** (Library), participated in the Seminar on 'Resources sharing among Social Science Research Libraries' held at Trivandrum from 23-24 February 1982.

Dr. S. K. Ghosh (Pathology - NF), **Dr. K. S.S. Nair** (Entomology) and **Dr. J. K. Sharma** (Pathology-F) participated in the All India Symposium on 'Vector and vector borne diseases' held at Trivandrum from 26-28 February 1982. Dr. Nair chaired the session on Biology of vectors and host parasite relationships. Dr. Sharma presented a paper on 'Possible role of insects in spreading diseases of trees caused by fungi in Kerala' by J. K. Sharma, C. Mohanan and Maria Florence.

Dr. K. Balasubramanyan, (Ecology), participated in the Indo - U. S. Bi-national Workshop on 'Conservation and management of biological diversity' at Indian Institute of Science Bangalore from 2-6 March 1982.

Dr. C. T. S. Nair, (Economics) and **Dr. K. S. S. Nair,** (Entomology), partcipated in the 'Marketing analysis programme on bamboo craft' held at Trichur on 11 March 1982.

Dr. J. K. Sharma (Pathology-F), presented a paper on 'Chemical control of damping-off, and seedling and shoot blight caused by *Cylindrocladium* in eucalpyt nurseries' by J. K. Sharma and C. Mohanan, at the National seminar on advanced research on fungicides held at Centre of Advanced Studies on Botany, University of Madras.

Await !

A booklet entitled 'How to Establish Seed Orchards of Teak' prepared by the Genetics Division will shortly be released as KFRI Information Bulletin.

Campus news * Campus news

Dr. K. M. Bhat, Scientist, Wood Science Division, who was away on leave for study purposes returned to KFRI in December 1981 after his doctoral programme at the University of Helsinki, Finland.

Shri C. K. Soman, Field Assistant, Botany (Physiology) left KFRI in September 1981 on leave for study purposes for post-graduate studies at Sardar Patel University, Gujarat.

Campus news * Campus news

More move to Campus

KFRI Campus has become more lively as more families have moved into Type II and Type III quarters.

Joined KFRI recently

Scientific Staff

C. T. S. Nair, AIFC (Hons), Ph.D. — Forest Economist

E. A. Jayson, M.Sc. — Research Assistant (Wildlife)

Y. Salahudin, M.Sc. — Research Fellow (DST Project)

K. Sasidharan, M.Sc. — Research Fellow (DST Project)

P. K. Subramanian, M.Sc. — Research Fellow (DST Project)

Technical Staff

K. H. Hussain, B.Sc., B.Lib. Sc. — Library Assistant

James Mathew, B.Sc. — Field Assistant

Administrative Staff

P. V. Sankaran Unni, B.Sc. — Office Assistant

Kunjukunju Vijayan — Driver

R. A. Unni — Watcher

Left KFRI recently

Scientific Staff

Prof. V. P. K. Nambiar M.A., M.Sc. — Scientist (Botany Division)

Technical Staff

Kum. A. K. Sumam, B.Sc., B. Lib. Sc. — Library Assistant

Shri K. G. Sujit, B.Sc. — Field Assistant

Administrative Staff

Shri K. M. Muhammad, B.A. — Office Assistant

KFRI bags Zonal Championship

KFRI has brought surprise by securing the Championship at the Central Circle Sports Meet conducted in connection with the Forest Convention - 1982.

KFRI also stood first in certain events at the State Level Meet held at Trivandrum. Here is the list of winners. Cheers to the winners!

Circle Level Meet, Trichur.

Track And Field

Name	Event	Place
Dhorai Raj, K.	100 m. Race	I
Vincent, D. K.	200 m. Race	I
Chandran, K.	200 m. Race	II
Dhorai Raj, K.	500 m. Race	II
Vincent, C. K.	1500 m. Race	I
Thomas P. Thomas	1500 m. Race	II
Vincent, C. K.	Sack Fight	I
Sankaran Kutty, P. A.	Sack Race	I
Vincent, C. K.	Sack Race	II
Sankara Pillai, K.	Pillow Fight	I
Dhorai Raj, K. & Vincent, C K.	Three-legged Race	I
Mohan, C. & Sankara Pillai, K.	Three-legged Race	II
Dhorai Raj, K.; Vincent, C. K.; Balagopalan, M. & Chandran, K.	4×100 m. Relay	II
Sankara Pillai, K.	Hammer Throw	II

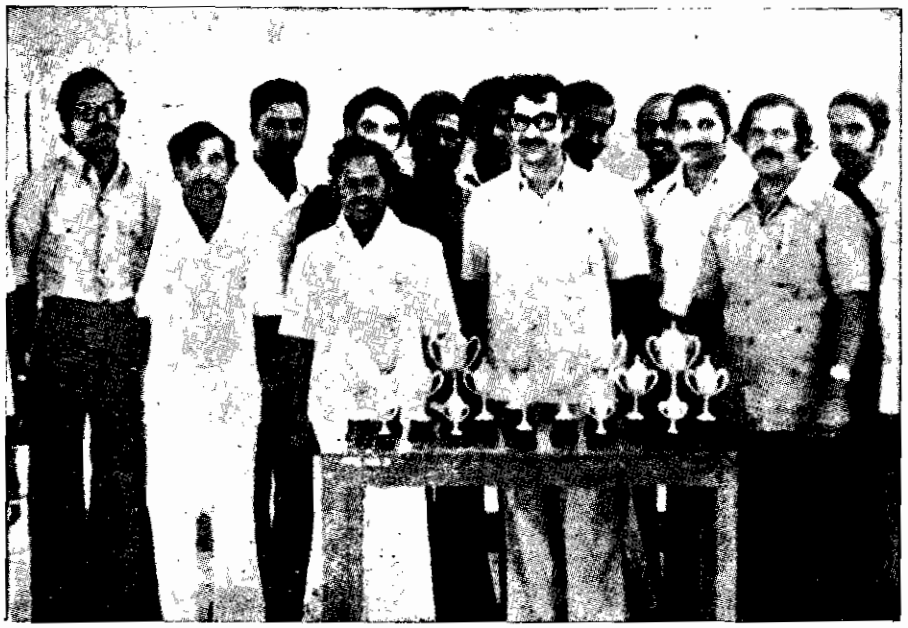
Games

Name	Event	Place
Chacko K. C.	Shuttle (Singles)	I
Balasundaram, M.	Shuttle (Singles)	II
Chacko, K. C. & Balasundaram, M.	Shuttle (Doubles)	I
Sankara Pillai, K. & Surendran, T.	Shuttle (Doubles)	II
Balasundaram, M.	Table Tennis (Singles)	II
Chacko K. C. & Balasundaram, M.	Table Tennis (Doubles)	II
Surendran. T. & Prabhakaran, T.	Carroms (Doubles)	II
Sankar, S.	Chess	I
Sankara Pillai, K.; Gopalan, K. S. & Kuttykrishnan, E. T.	Cards play-18 (6 persons)	I
Isaac, E. V.; Gopalan, K. S. & Raman, P. S.	Cards play-56 (6 persons)	I
Isaac, E. V.; Gopalan, K. S. & Raman, P. S.	Cards play-support (6 persons)	I
Isaac, E. V.	Rummy	II

State Level Meet, Trivandrum

Name	Event	Place
Sankar, S.	Chess	I
Sankarankutty, P. A	Sack Race	III
Sankara Pillai, K.; Gopalan, K. S. & Kuttikrishnan, E. T.	Cards play-28 (6 persons)	I
Isaac, E. V.; Gopalan, K. S. & Raman, P. S.	Cards play-support (6 persons)	I

Seminar on medicinal plants — On the left, Dr. Vayaskara Mooss delivering the Keynote address. On the right, a view of the dais at the inaugural session (From left to right are Prof. V P. K. Nambiar, District Collector Shri V. Vijayachandran, Prof. K. I· Vasu, Dr. Vayaskara Mooss, Dr Raghavan Thirumulpad and Dr. P. K. Warrier).



Forest Convention- 1982 : KFRI participants in the Central Circle Sports and Games Meet, with Director.

Left to right: Balagopalan, Chandran, Jose, Sankarankutty, Vincent, Dhorai Raj, Padmanabhan, Director, Radhakrishnan, Balasundaram, Surendran, Sankara Pillai (Team captain), Prabhakaran.