

E. J. Schreiner in memoriam

ERNST J. SCHREINER, pioneer in forest tree breeding research, died March 29 in Raleigh, N.C. He was 83 years old.

A native of Brooklyn, N.Y., Schreiner was a 36-year veteran of the USDA Forest Service. He received a bachelor's degree from New York State College of Forestry at Syracuse in 1926 and a Ph.D. from Columbia University in 1931. From 1924 to 1935, he was employed as a research forester to start the Cooperative Oxford Paper Company — New York Botanical Garden Poplar Hybridization Project, the first large-scale breeding project in the world devoted exclusively to the improvement of forest trees. Then he spent a year with the Tree Crop Unit of the Forestry Division, Tennessee Valley Authority. When Oxford Paper Company transferred all of its hybrids and breeding records to the U.S. Forest Service in 1936, SCHREINER joined the Forest Service's Northeastern Station in New Haven,

Conn., to start and take charge of a new project in forest genetics. SCHREINER retired from the Forest Service in 1971.

He organized the Northeastern Forest Tree Improvement Conference, the first organization of its type in North America, and served as its executive secretary for 18 years. Active in international forestry efforts, his assignments included 3 months in Guatemala and a 1-year Fulbright Research Fellowship in the Netherlands.

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Ib Thulin in memoriam

IB THULIN, pioneer tree breeder in New Zealand, died on 7 December 1983 at his home in Rotorua. Poor health had forced him to retire from the Forest Research Institute in April 1983. He was a man of great character and courage whose mark on New Zealand forestry will remain indelibly stamped through his work with genetic improvement of forest trees and by the memory of his ebullient personality.

He was born in Denmark in 1922 and obtained his MSc in Forestry from the Royal Veterinary and Agricultural College in Copenhagen in 1945. His mentor was the illustrious SYRACH LARSEN. As well as a thorough grounding in Silviculture and Forest Genetics, Ib got his introduction to bridge while at University. The game was to be a life-long passion for him and he became a very fine competitive player and stalwart of the local club.

Ib had his first taste of overseas travel in 1946 when he went as a surveyor on an expedition to Greenland. He subsequently worked as a tree breeder from 1946—50 at the Forest Experiment Station in Denmark before emigrating to New Zealand with his young family in October 1950. Employed initially under the designation of Assistant Forester at the Forest Research Institute in Rotorua, he was in 1954 officially appointed as Forest Geneticist in the New Zealand Forest Service with the task of developing a tree breeding programme in radiata pine and conducting provenance research in other conifers.

The scope for tree improvement in New Zealand was considerable. Vast untended forests of *Pinus radiata* displayed a bewildering array of phenotypic variation: the need and opportunity for tree breeding was obvious. There were also large areas of other pines such as *P. ponderosa*, *P. nigra*, and *P. contorta*, often of evidently poor provenance. Some of Ib's first experiments were provenance trials of *P. taeda*, *P. pinaster*, *P. elliotii* and *P. nigra*. Seed was obtained by personal contact with fellow breeders in Europe, Australia, and the USA, resulting in comprehensive provenance experiments of great scientific value. In 1956, a colleague, the late EGON LARSEN, was sent to the USA where he collected provenance seedlots of *Pinus contorta*, Douglas fir, *Abies* and various other species. There were no IUFRO collections at that time so the NZ Forest Service organised its own.

The first plus trees of radiata pine were selected in the early 1950s, the first open-pollinated progeny test planted in 1955, and the first seed orchards planted in 1957. Today, these first-generation clones are still the mainstay of New Zealand's seed supply from orchards.

In 1966, Ib launched a project to grow radiata pine plantations from cuttings of selected clones. It did not work because by the time the clones had been evaluated in clonal tests, the archives had aged considerably and cuttings had lost vigour and could no longer be readily rooted. In this first project, the ortets were 6-year-old trees selected in routine plantations. Another project was initiated, this time using 3-to-5 year old ortets selected in controlled-pollinated full-sib families, with clonal archives maintained in a juvenile condition as clipped hedges. Cuttings of his best tested clones from these sources are being planted out in 1984, though numbers are small.

From July 1963 to July 1964, Ib was seconded to FAO in Mexico to advise on seed collection practices and to train local technicians. Despite certain frustrations, he regarded this year as one of the highlights of his career. For his services, he was made in 1976 an Honorary Academic Member of the National Academy of Forestry Science, Mexico. Needless to say, he returned with seed of various Mexican conifers, the most notable find being *Abies religiosa*. His interest in Mexican species had been kindled earlier when he established a large network of trials with Mexican pines from seed collected by H. V. HINDS and E. LARSEN.

In February—March 1965 he visited Ceylon on an FAO assignment, to advise on the introduction of exotic conifers.

He built up a long list of friends and contacts through his attendance at international meetings and in correspondence about seed, and believed that the international exchange of breeding material could bring considerable benefits. Thus, scions, of many of New Zealand's plus trees were sent to Australia.

He made one other extended overseas trip, from August to October 1974, when he used his long-service leave to serve as a Consultant on tree improvement to the US Forest Service in California.

In his last years I^B's greatest achievement was the teamwork and spirit he built up in the staff he recruited and trained. He was a most astute leader and administrator and he loved to talk, but he found writing up his results very irksome; he reckoned he was paid to produce improved seed not to write papers. Refractory by nature, he enjoyed a good battle with the "administration". But beneath the

sometimes gruff exterior lay a sensitive and generous man, highly dedicated to his work, a great believer in genetic improvement of trees, and a tremendous inspiration to we who had the benefit and pleasure of working with him.

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Hybrids between *Eucalyptus citriodora* Hook. and *E. torelliana* F. v. Muell. in India

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Summary

Spontaneous hybrids between *E. citriodora* and *E. torelliana* belonging to subgenus *Corymbia* have been reported for the first time from India. Marker characters such as presence or absence of lignotubers, shape of the leaves and aroma of crushed leaves were used as diagnostic features for detection of F₁ hybrids in the nursery. Hybrids were compared with the parent species for various characters. Segregation in F₂ generation was observed for various morphological traits. The potential use of the hybrids has been discussed.

Key words: *Eucalyptus citriodora*, *Eucalyptus torelliana*, Hybridization, Marker characters, Segregation.

Zusammenfassung

Über spontane Hybriden zwischen *Eucalyptus citriodora* und *Eucalyptus torelliana*, die zur Untergattung *Corymbia* gehören, wurde zum ersten Male aus Indien berichtet. Markante Erkennungsmerkmale, wie das Vorhanden- oder Nicht-Vorhandensein von Stammknollen, Blattform und das Aroma zerkleinerter Blätter wurden als diagnostische Merkmale zur Auffindung von F₁-Hybriden in der Baumschule benutzt. Die Hybriden wurden mit den Elternarten hinsichtlich verschiedener Merkmale verglichen. Die Aufspaltung in der F₂-Generation wurde für verschiedene morphologische Merkmale beobachtet. Die Möglichkeiten der Verwendung der Hybriden werden diskutiert.

Introduction

In Eucalypts the occurrence of inter-specific hybrids is common when the species are planted together as exotics (PRYOR, 1976, 1978; FAO, 1981). Some of the commoner spontaneous hybrids reported by different authors (SHELBORNE, 1963; BODEN, 1964; COOLING, 1966; VENKATESH and SHARMA, 1976, 1977, 1978 & 1979) mostly involve the species of subgenus *Symphomyrtus*. But in subgenus *CORYMBIA* (PRYOR and JOHNSON, 1971) hybrids have only been reported between *E. gummifera* × *E. maculata* (PRYOR, 1976); nevertheless it is of significance and considerable interest that the species *E. citriodora* and *E. torelliana* belonging to the subgenus *Corymbia* have also been observed to cross and produce natural hybrids in India which are being reported here for the first time.

Background

Seeds were collected separately from few trees of *E. citriodora* in 1976 and their progenies were raised for treating

them with colchicine under polyploidy studies. But incidentally two hybrid plants were spotted in the open-pollinated progeny of a tree of *E. citriodora* out of many seedlings, based on the apparent difference in their leaf morphology which was observed at the age of 6 months. This observation created interest and prompted the authors to inspect the place of seed collection (New Forest Estate, Dehra Dun, altitude 610M, latitude 30° N, longitude 78° E, Annual R.F. 216cms). As visualised a group of twelve mature trees of *E. torelliana* at about 50 meters distance from a group of about ten trees of *E. citriodora* along the road side was located. The occurrence of two species in close vicinity and their synchronized flowering periods were the main features which perhaps caused natural cross pollination and production of hybrids in the population of some of the trees. Thus, to confirm this, seeds were collected for the second time from these trees.

Material and Methods

Seeds were collected for the second time in 1977 from two trees each of the above mentioned species growing in close vicinity including the tree which produced hybrids in 1976. In the same year in October seeds were sown in pots (150 seeds × 3 pots) to raise the progenies. Hybrids were picked up from this lot again based on marker characters. At 6th leaf stage the hybrids were transplanted in polypots (23 cms × 18 cms) and kept in a net house for further observations. The hybrids were out planted in the field in rows along with their parents serving as control at 2 M × 2 M spacing during monsoon rains in the month of July in 1978 for growth measurements. Observations were recorded on juvenile and mature leaves, flowers, fruits, seeds, height and diameter of the hybrids and the non-hybrid controls of both the parent species. Seed was collected from the F₁ hybrids (*E. cit.* × *E. tor.*) identified in 1976 which exhibited segregation in seed coat colour. F₂ population was raised which segregated for cotyledon colour, lignotubers, leaf shape and aroma of crushed leaves. The results on segregation pattern are not being reported here but will be published elsewhere.

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