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Precocious Flowering of 2–3-year old Japanese Red Pine saplings at Dehra Dun

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Summary

Precocious flowering at only 2–3 years age of *Pinus densiflora* introduced at Dehra Dun, is reported. Similar early flowering records in this and other pines of the *Lariciones* group from other parts of the world, are briefly reviewed; and its value in breeding work indicated.

Key words: Precocious flowering; *Pinus* densiflora SIEB et Zucc.; Japanese Red Pine.

Zusammenfassung

Bei eingetopften Kiefern (Pinus densijlora SIEB. et Zucc.) konnten im 3. Jahr nach der Aussaat weibliche und männliche Blüten beobachtet werden.

Introduction

The temperate Japanese Red pine (Pinus densijlora SIEB. et ZUCC.), either by itself or in hybridization with other Pines, is of potential commercial importance in Japan, Korea and some parts of the U.S.A. (TODA, 1974; WRIGHT, 1976). As for India, earlier introductions indicate the suitability of this exotic species only for the higher temperate altitudes (above 2400 m.) of the Himalayas. It grows there much faster than the native Firs and hence could serve well for high altitude afforestation in the Fir-zone. At lower elevations, such as at Dehra Dun (640 m.), a few isolated old trees still surviving in local gardens show very poor form and extremely stunted growth. So it seems that this high latitude temperate species is not suited for subtropical conditions at Dehra Dun.

Material

Recently, a small seed sample of an unknown provenance from Japan had been received. Out of the 400 seeds initially sown of this lot in nursery beds at New Forest, Dehra Dun (30° 30' 40'' N.Lat.) on 18th February, 1975, 138 seedlings had resulted. These had been pricked out on 12th March of the same year into polybag containers and transferred a year later into 22 *c m* wide earthen pots, and thus

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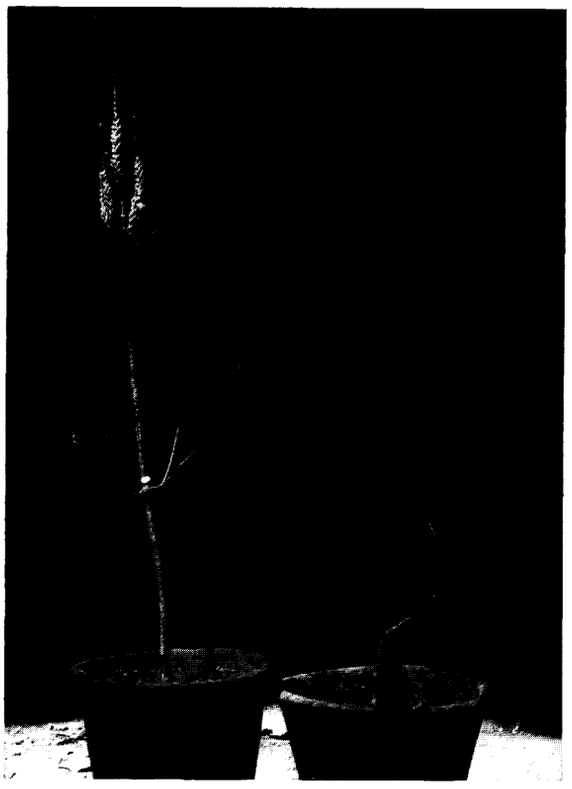

Figure 1. — Two potted saplings one bearing male (left) and the other female (right) strobili.

Figure 2. — Close-up view of female (left) and male (right) strobili clusters.

maintained, with minimal care, in the plant introduction nursery.

Observations

Early in April 1978, that is three years later, it was noticed that several of the saplings in the above mentioned potted lot had initiated male and female strobili *(figs. 1—2)*. A census at this stage revealed that out of a total of 71 saplings, 32 (45.1%) had flowered. Of those that had flowered, 22 bore only male strobili and 7 only female; 3 had developed both male and female strobili on separate shoots. The combined average height of the flowering and non-flowering saplings at this age was 44.2 cm. A student 't' test revealed that within this potted lot, plants that had flowered were significantly (1% level) taller than those that had not ($t = 3.8$ at 70 d.f.). In another younger 2 year old lot, still remaining in polybag containers, only 5 of the 69 saplings have flowered so far, bearing only male strobili. Average height of the saplings in this other lot is 23.1 cm.

Discussion

Previously, precocious flowering in this species at age 2, and also production of functional seed at age 3, had been recorded by RIGHTER (1939), from Placerville, Calif., where the mild climate and long growing season were considered generally quite favourable to reproductive precocity of temperate (but not of tropical) pines. This seems apparently true of Dehra Dun also, at least in regard to this particular pine. So far as Japan is concerned, only Gibberellin-induced early flowering at age 2 in this native pine has been reported (SATO, 1963).

Besides *P. densiflora*, many other pine species of the *Lariciones* group including Scots pine *(P. sylvestris* L.) are known to show a natural propensity for precocious flowering, which, moreover, has been shown to be strongly inherited in the latter species (HEIMBURGER and FOWLER, 1969; TEICH and HOLST, 1969). This gives scope for shortening the breeding cycle by genetical means, which, along with artificially induced flowering precocity, might accelerate improvement programmes on these pines.

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