Short Note: Natural chlorophyll mutants in a Himalayan Pine

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Introduction

Spontaneous chlorophyll mutations detected as white, yellow or light green seedlings have been recorded in several northern temperate conifers. A literature review on this subject, so far as the Pinaceae is concerned, has been presented by FRANKLIN (1970). However, none of the pine or other coniferous species of the Himalayas find mention in this or any other earlier or subsequent reports.

Material

There exists in the Champion block of the New Forest, a provenance trial of Pinus roxburghii SARG. the common timber and oleo-resin yielding low altitude 3-needle Himalayan pine. Thirteen seed sources derived mostly from the Western Himalayas including the areas now falling in Pakistan are represented in this trial which was established in the year 1927. Open pollinated seeds harvested off individual trees as well as bulk samples from this block had been used for seed vigour studies by one of us (R.C.T.), when chlorophyll mutants were detected in some of the seedling progenies. It is these that are reported upon in this short article.

Observations

Initially, a few (1—3%) chlorophyll deficient seedlings appeared among wind pollinated progenies that had been raised from three individual parent trees. Two of these trees which belong to the Rawalpindi seed origin grew only a few metres of each other in the same provenance plot, whereas the third belonging to the Hazara origin stands a considerable distance away in another plot of the same block. All these three trees must be heterozygous for this mutant trait, the chlorophyll deficient seedlings observed in their open pollinated progeny being the result of either natural selfing or crossing inter se between two such heterozygous trees. The latter could very easily have occurred in the case of the two Rawalpindi trees which, as already mentioned, grow very close to each other.

Additionally, progenies raised out of-seed from a single cone of a local bulk sample contained an even higher proportion of similar mutant seedlings. There were 37 normal green seedlings as against 13 chlorophyll deficient ones in this single cone family. This being close to a 3 : 1 Mendelian ratio a single recessive gene inheritance may be inferred for this trait as is also true of many similar chlorophyll mutations in other conifers. Presumably this seed cone had by chance rasulted entirely from natural selfing on a tree which was heterozygous for the deviant trait.

Discussion

It is interesting though not surprising that natural chlorophyll mutants of the type previously reported in high latitude northern pines and conifers should also occur in a subtropical low altitude Himalayan pine as herein reported. What is even more interesting is that all the three trees identified as heterozygous carriers of this particular mutant trait in the present case should be derived either from the same or two different but geographically contiguous Rawalpindi and Hazara areas of Pakistan in the N.W. Himalayas. This may be more than mere coincidence because previous findings of EICHE (1955) in Scots pine and SQUILLACE and KRAUS (1963) in Slash pine indicate that parents of chlorophyll deficient progenies in those species also tended to form geographical clusters.

Summary

Occurrence of natural chlorophyll mutants in Pinus roxburghii SARG. the common 3-needle low altitude Himalayan pine, is reported. This is perhaps the first record of such mutants for any Himalayan pine or other native conifer of the Indian subcontinent.

Key words: Himalayan Pine, Chlorophyll mutants.

Zusammenfassung

Es wird über Chlocophyll-Mutanten bei Pinus roxburghii SARG, berichtet, die in Nachkommenschaften von frei abgeblühten Herkünften eines Provenienzversuchs gefunden wurden.

Literature Cited

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Announcements

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Satellite Program in Statistical Ecology

The International Statistical Ecology Program of the International Association for Ecology, the Biometric Society, and the International Statistical Institute has planned a Satellite Program in Statistical Ecology in connection with the forthcoming Second International Ecological Con-

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