

isolated adenine after charcoal treatment is certainly negligible.

Our work, therefore, does not support the conclusion reached by BOWNE² that hypoxanthine and adenine interact with each other in concentrated ammonium phosphate solutions at pH 6 to form adenine.

Materials. Hypoxanthine (puriss) and adenine (puriss) were purchased from Fluka. Radioactive C¹⁴-hypoxanthine was obtained from Schwarz Bioresearch Inc. The ammonium phosphates were purchased from Mallinkrodt Chemical Works.

Method. A 1.5 M ammonium phosphate pH 6 solution mixture (10 ml) containing adenine and C¹⁴-hypoxanthine (10 μ curie), at the final concentration of $1.5 \cdot 10^{-3}$ M for hypoxanthine and $1 \cdot 10^{-3}$ M for adenine, was incubated under N₂ gas with gentle shaking for 100 h at room temperature. (Solubility of the ammonium phosphates in H₂O is limited to a concentration of about 1.8 M.) The mixture was then evaporated to dryness in vacuo at 40 °C and the residue extracted 3 times with 10 ml each of 0.5 M ammonium hydroxide in ethanol. This solution was prepared with concentrated aqueous ammonium hydroxide in absolute ethanol. The extraction volumes were combined and concentrated to dryness. The method of extraction was essentially quantitative. The residue containing no inorganic salts was dissolved in the minimal amount of 0.05 M aqueous ammonium hydroxide, applied to Whatman 3 MM paper, and submitted to descending chromatography with a mixture of *n*-butanol-H₂O (86:14) for 24 h. On the dry paper, the bases were visualized by an UV-lamp. The distribution of radioactivity was deter-

mined by placing the paper on non-screen X-ray film for 1 week. The specific activity of the components was determined in a scintillation counter after their elution from the paper chromatogram with 0.1 M HCl. Controls were strips of paper from both sides of the adenine spot which were eluted in the same way as the nucleic acid bases. Both the control paper strips and the paper strip containing the adenine component were of equal area.

Radioactive contaminants from the paper were removed by concentrating the acid eluates to dryness. The residue, dissolved in H₂O, was adsorbed in 100 mg of Darco G-60 and Cellite (1:1). After several washings with H₂O, the bases were desorbed by 25% ethanol in H₂O.

Résumé. Une conversion non-enzymatique d'hypoxanthine en adénine fut proposée sur la base d'observations spectrophotométriques obtenues de solutions contenant adénine et hypoxanthine dans 1-5 M de phosphate d'ammonium. Les résultats fournis par les expériences sur la radioactivité ne confirment pas la conclusion émise par BOWNE² que hypoxanthine et adénine agissent l'une sur l'autre en solution concentrée de phosphate d'ammonium pour former de l'adénine.

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Chlorophyll Stability Index, a Suitable Criterion for Rapid Screening of Tree Provenance in Arid Zones

Information on the provenance of a species is important in determining the best available sources of seeds to give well-adapted productive trees and in directing the breeding of interracial and interspecific hybrids towards adaptation to particular localities¹. The development of provenance research to assist in the selection of a suitable provenance of a species in any afforestation and reforestation programme therefore ranks high. Among the different species of *Eucalyptus* tried, *Eucalyptus camaldulensis* has shown good promise for introduction into arid zones². This species has a very wide range of distribution in its native home (Australia) and, as such, offers great scope for selection of suitable provenance which may be best adapted to the arid environment of western Rajasthan in India. In provenance trials, however, it becomes difficult at times to test all the required material in the field for either want of adequate space or of funds. It is, therefore, necessary that some criterion should be established for carrying out rapid screening of a large number of provenances, even in the nursery stage, for selecting the most promising ones for field trials. It is with this objective that the present study on 16 provenances of *E. camaldulensis* was taken up in the nursery of this Institute at Jodhpur to determine whether any relationship exists between the environmental characteristics, viz. mean annual rainfall and mean temperature of these

provenances in Australia, with the % seedling survival and drought hardness as expressed by the chlorophyll stability index³ (CSI), recorded in the nursery at Jodhpur where seedlings from these provenances were grown under

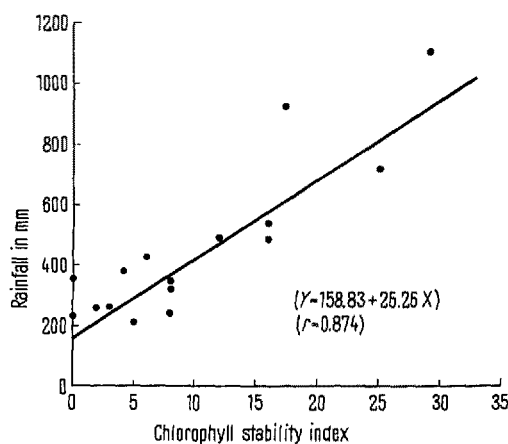


Fig. 1. Relation between chlorophyll stability index and rainfall of different donor localities of *E. camaldulensis*.

¹ R. Z. CALLAHAM, *Unasylva* 78, 2 (1963).

² R. N. KAUL and K. T. N. NAMBIAR, *Indian Fmg* 10, 5 (1965).

³ S. A. KALOYERAS, *Pl. Physiol.*, Lancaster 33, 232 (1958).

identical conditions. The data on the environmental characteristics of different donor localities and the CSI values of seedlings of different provenances of *E. camaldulensis* revealed that by and large the plants with lower CSI values belong to habitats which receive relatively less rainfall compared with those which have higher CSI values. The CSI and the mean ambient temperatures of the donor localities appear to be independent of each other ($r = -0.354$). The CSI values are found to be

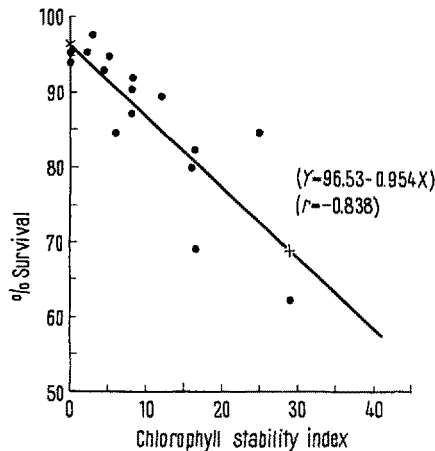


Fig. 2. Relation between chlorophyll stability index and survival % of seedling of *E. camaldulensis*.

highly correlated with the mean annual rainfall ($r = +0.874$) of the different localities from which these seeds were obtained (Figure 1) and the % seedling survival ($r = -0.838$) (Figure 2).

It therefore follows that in the arid zones, where drought is of common occurrence and trees grow at the threshold of their survival, CSI can be taken as a valid criterion for making an initial selection of the drought-hardy provenance of a species in the nursery stage; thus narrowing the number of available provenances to a few likely promising ones for further intensive field trials. Further research on these lines is promising. A full account of this and related investigations will be given elsewhere.

Zusammenfassung. Als Mass für die Herkunft einer Baumrasse wird der Chlorophyllstabilitätsindex verwendet. Für *Eucalyptus camaldulensis* steht dieser in Korrelation mit der Überlebensrate der Keimlinge und mit der jährlichen Niederschlagsmenge am Herkunftsort.

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Erregungsübertragung von Riesenfasern auf Motoneurone bei der Schabe *Periplaneta americana* L.

Bei seinen Untersuchungen über den Cercal-Fluchtreflex (CFR) der Schabe *Periplaneta americana* L. reizte ROEDER¹ einen Cercalnerv elektrisch und leitete die Antwort vom Hauptbeinnerven des Metathoraxganglions extrazellulär ab. Er konnte rhythmische motorische Entladungen beobachten; sie waren aber dem Reiz zeitlich nicht reproduzierbar zuzuordnen und nur für wenige Minuten nach der Präparation der Nerven auszulösen. Von den übrigen Abschnitten der als disynaptisch beschriebenen Reflexbahn des CFR konnte er reproduzierbare und nicht oder wenig ermüdbare Antworten erhalten. Er vermutete deshalb^{2,3}, die beobachtete Labilität beruhe auf der Eigenschaft der Riesenfaser-Motoneuron-Synapsen im Metathorakalganglion, gegenüber afferenten und zentralnervösen (aber auch präparativen) Einflüssen besonders empfindlich zu sein, und er sprach die Hypothese aus, die Labilität sei die Ursache für die Ermüdbarkeit des CFR am intakten Tier. Wegen der Labilität sind die Eigenschaften dieser Thorakal-Synapsen noch nicht enauer ermittelt, sondern indirekt erschlossen worden². Im Rahmen einer anderen Fragestellung ist der Zusammenhang zwischen Riesenfaseraktivität und Motoneuron-Efferenz an diesem Präparat erneut und mit abweichendem Ergebnis untersucht worden.

Erwachsene weibliche und männliche Schaben wurden kurzzeitig narkotisiert und mit Klebwachs dorsal auf einer Plexiglasplatte festgelegt. Dann wurde Nerv 5⁴ des

Mesothoraxganglions freigelegt. Vorversuche hatten ergeben, dass seine Antworten mit denen des Hauptbeinnerven des Metathoraxganglions im Prinzip übereinstimmen. Die Aktionspotentiale seiner Fasern wurden mit chlorierten Silberdrähten abgegriffen, verstärkt und mit Oszillograph und Lautsprecher beobachtet und registriert. Über ein weiteres Elektrodenpaar konnte das Präparat an bestimmten Stellen des Nervensystems mit elektrischen Impulsen variabler Dauer und Amplitude gereizt werden (Figur 1). Es wurden nur solche Präparate verwendet, bei denen sich die Aktivität einer Faser von der der übrigen abhob.

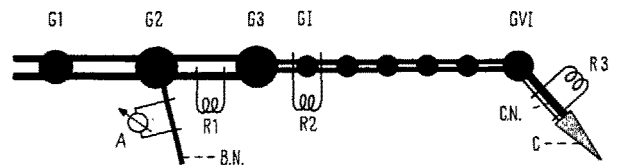


Fig. 1. Schema zur Kennzeichnung der verschiedenen Elektrodenpositionen bei den Versuchen. G1, 2, 3 = Pro-, Meso-, Metathoraxganglion; G4-G8 = I.-VI. Abdominalganglion; B.N. = Beinnerv 5; C.N. = Cercalnerven; C = Cercus; R1-3 = Reizelektroden; A = Ableitelektroden.

¹ K. D. ROEDER, J. exp. Zool. 100, 95 (1948).

² K. D. ROEDER, Smithsonian. misc. Collns 137, 287 (1959).

³ K. D. ROEDER, Am. Zoologist 2, 105 (1962).

⁴ J. W. S. PRINGLE, J. exp. Biol. 16, 220 (1939).