temperature. In (*rr*) eyes melanin deposition occurs generally quickly at 28° C and very slowly at 14° C. Thus the eye colour in amphipods is controlled both phenotypically and genotypically. Wolsky and Huxley[3] and Huxley and Wolsky[4] showed that there occurs in this amphipod another variety of eye (*cc*) which is the albino. In this case there is not only loss of colour (both black-brown and red lipochrome pigments being absent) but malformation of the eye structure due to delay in optic tract development occurs.

In the present study the eye of the mutant *Elasmopus pectenicrus* was red in life thus the presence of red lipochrome is indicated and nothing abnormal in the structure of the eye could be observed. It is of course puzzling to note why all Hawaiian members of *E. pectenicrus* are red eyed while those at Waltair are usually black-brown eyed. Both Hawaii and Waltair are situated close to 18° and 17° north latitude respectively and therefore temperature effect may not be significant.

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K. HANUMANTHA RAO.
K. SHYAMASUNDARI.

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## EFFECT OF TWO PLANT GROWTH SUBSTANCES ON CASHEW AIR-LAYERS

PROPAGATION of Cashew (*Anacardium occidentale* L.) is generally done through seeds. Since a high percentage of cross-pollination occurs, it is difficult to obtain progenies of unchanged germ plasm. Therefore, vegetative method of propagation is resorted to as it enables the plant to perpetuate and produce fruits of superior quality true to the parent. In such propagation generally the endogenous auxins are utilised for causing root formations. But it has been reported[1-3] that external application of plant growth substances in proper concentration can improve further the effectiveness of such macro-rooting. As very little work has been done on air-layering of cashew with the application of plant growth substances the present study was undertaken to find out the effect of two plant growth substances, indole 3 butyric acid and naphthalene acetic acid, each in 3 concentrations (100,200 and 300 ppm) prepared in white petroleum jelly on cashew air-layers.

A ring of bark 0·3–0·6 cm wide was removed from pencil thick shoots of the selected parent tree about 15–25 cm from the tip of the shoot. The growth regulators were applied at the upper end of the ring. Sawdust kept wet for 24 hours were placed around it slightly pressed by hand and a piece of alkalthene plastic film was then wrapped around it with both ends properly secured. In the control treatment all operations were done except the application of growth promoting substances. Altogether 7 treatments with 13 replications were included in a randomised block design. Layers were taken out after 80 days and their rooting characters were studied which are presented in Table I.

TABLE I

*Effect of growth regulators on rooting characteristics of Cashew*

| Treatment | Percentage of successful air-layers | Av. No. of root/ marcot | Av. length of longest root/ marcot in cm | Av. No. of days required for root emergence |
|---|---|---|---|---|
| IBA 100 ppm .. | 61·5 | 12·1 | 6·8 | 37·5 |
| IBA 200 ppm .. | 76·9 | 17·1 | 8·0 | 35·0 |
| IBA 300 ppm .. | 84·6 | 19·5 | 8·9 | 32·0 |
| NAA 100 ppm .. | 46·2 | 7·5 | 3·9 | 40 |
| NAA 200 ppm .. | 61·5 | 10·8 | 5·1 | 40 |
| NAA 300 ppm .. | 61·5 | 11·9 | 5·1 | 38 |
| Control .. | 46·2 | 6·4 | 3·4 | 42 |
| S.Em ± .. | .. | 2·11 | 0·72 | .. |
| C.D. (0·05) .. | .. | 5·96 | 2·05 | .. |

300 ppm IBA gave maximum successful air-layers followed by 200 ppm IBA. 100 ppm IBA did not increase the number of root per marcot significantly but it had significant favourable influence on the length of longest root. IBA at 200 and 300 ppm had significantly increased both these characters and the effects of both the treatments are statistically on par. NAA at these concentration did not have significant effect even though there was a progressive increase in these characters and percentage of successful air-layers.

Application of these growth promotors had initiated earlier root formation. IBA at 300 ppm had shortened the period of root emergence by about 10 days closely followed by IBA at 200 ppm. Considering all these characters it is found that preferably 200 ppm. IBA can be recommended for getting successful Cashew air-layers.

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Soil Conservation Research Laboratory,
Bhubaneswar, *February* 26, 1972.

N. ACHARYYA.*
P. C. DASH.

* **Present Address:** Soil Physicist, Irrigation Research Centre, Chakuli, Sambalpur, Orissa.

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## A CASE OF COMPLETE INTER-VARIETAL HYBRID STERILITY IN RICE (*ORYZA SATIVA* L.)

HYBRID sterility of varying degrees is commonly observed in crosses where parents are not completely related. The interspecific hybrids generally show sterility of higher order. But, in general, inter-varietal hybrids are fertile due to genetic and chromosomal coherence. In rice, the hybrids of three subspecies (*Indica*, *Japonica* and *Javanica*) show varying degress of sterility. The nature of differentiation in these sub-species is not clearly understood. It is believed that differentiation in the sub-species of this taxon is largely through translocations, deficiencies and inversions in chromosomes (Sastry and Misra, 1961). More recently, mutational evidence to explain this was put forth with experimental evidence (Swaminathan *et al.*, 1969). Although interracial hybrid sterility is common in rice, the intervarietal or intraracial crosses normally result in fertile hybrids. But an exception to this phenomenon was noticed in our hybridisation programme.

An intensive crossing programme in rice was undertaken in 1970 involving local cultivars representing different agroclimatic regions of Mysore State with IR 8 and Jaya as female parents at the Regional Research Station, Mandya. The important male parents used are Ch 2, S. 317, J. 192 and C. 435 (Jeerigesanna). While J. 192 and Ch 2 crosses showed normal (88% and 78%, respectively) seed setting, crosses involving S. 317 and C. 435 failed to do so. Jaya × S. 317 showed 2·4% seed setting while IR 8 × C. 435 did not set any seed.

The $F_1$s of IR8 and C. 435 were planted in January 1971. The emergence of panicle was prolonged perhaps due to the dominance of photo-sensitivity of the male parent C. 435. However even after the emergence of panicles, there was no seed setting. The $F_1$ stubbles were again planted in 1971 *Kharif*. Even in this season there was no seed setting and the spikelets were hundred per cent chaffy.

This peculiar nature of hybrid was puzzling and tempted the authors to study the pollen sterility and meiosis. The study of pollen fertility by acetocarmine stainability test revealed that hybrid was complete sterile. Meiosis in the hybrid was studied by fixing flower buds of appropriate size in the acetic alcohol (1 : 3). This revealed that meiosis was completely normal with 12 II both in diakinesis and Metaphase I. The later stages of meiosis revealed normal disjunction in Anaphase I and Anaphase II. This suggested that sterility in the present case is not due to aberrent meiosis. Similar results have also been obtained at IRRI in a cytological study of sterility in *indica* × *indica* hybrids (Anon., 1969). When dusted with outside pollen in *Rabi* (1971–72) season, a few seeds were set indicating that the female side is fertile.

Shinjyo and Omura (1966) and Shinjyo (1969) demonstrated in rice that the *indica* variety, Chinsurah Boro II, possesses a sterile cytoplasm. Erickson (1969) reported that another *indica* variety PI 279120 (Biro-co), is a source of sterile cytoplasm. It is also shown by Athwal (1971) that the semi dwarf variety, T (N) 1, is also a source of male-sterile cytoplasm. Hence, it is possible that IR 8 may possess a similar male-sterile cytoplasm which, in certain hybrid combinations, as in the present, may lead to sterile hybrids due to possible cytoplasmic-genic interaction. However, repeated crossing and back crossing is needed to determine whether the cause is due to cytoplasmic or cytoplasmic gene interaction.

Univ. of Agricultural Sciences,
Hebbal, Bangalore-24,
*March* 13, 1972.

B. T. SHANKARA GOWDA.
M. MAHADEVAPPA.
A. SEETHARAM.

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