A NOTE ON THE INHERITANCE OF ALBINISM IN OIL PALM

Keywords: Albino; Mendelian trait; Recessive gene; *Elaeis guineensis*

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*Albino seedlings were observed among selfings of oil palm (*Elaeis guineensis*) collected in Nigeria. Discrete phenotypic classes of pigmented plants and albinos conformed well with Mendelian ratios tested by Yate's corrected Chi-square. Albinism in the oil palm was found to be controlled by a recessive gene.*

INTRODUCTION

Albinism is the complete or nearly complete absence of pigment from tissues of plant or animal species (Sinnott *et al.*,1958). In plants, it is the absence of chlorophyll and other coloured substances such as anthocyanins. Albinism is relatively rare and is only expressed in homozygous recessive individuals. In the oil palm, *Elaeis guineensis*, Gascon and Meunier (1979) found 81 albino and 289 normal seedlings in the selfing of a *tenera* of Yangambi origin. They suggested that albinism may be a recessive monofactorial character. The occurrence of a relatively large number of albino seedlings in some selfed oil palm progenies in PORIM's breeding programme provided an opportunity to test the suggestion.

MATERIALS AND METHODS

In 1973, a prospection for *Elaeis guineensis* genetic materials was carried out in Nigeria (Rajanaidu *et al.*, 1979). The half-sibs were planted at Kluang, Malaysia in 1976. In 1988-89, several selections were selfed and the seeds were germinated using standard procedures for oil palm seed germination. At the nursery stage, albino individuals were detected among the normal green seedlings in two progenies (*Figure 1*). The phenotypic 3:1 ratio was tested for goodness-of-fit using Yate's corrected Chi-square.

RESULTS AND DISCUSSION

It is suggested that the albino offspring of the two progenies had normal parents that must have been carrier of alleles for albinism (*Cc*). The dominant allele, *C*, is necessary for the development

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Figure 1

of chlorophyll. These parents passed on a recessive allele (*c*) to each of the albino sibs. The goodness-of-fit of the 3:1 ratio (*Table 1*) indicated that the selfs segregated for one gene such that *CC* and *Cc* were pigmented while *cc* were albinos. Interestingly, albino offspring of tenera selfs were generally white, while those of *dura* selfs were pale yellow. In addition, polyembryonic seeds had both pigmented and albino individuals. These results indicated that the 'seeds' are polyzygotic.

TABLE 1. CHI-SQUARE (X^2) TEST FOR SEGREGATION OF ALBINISM

Parent	Fruit	Progeny	Observed* (G:A)	Corr.X^2 (3:1)
0.151/814	*Dura*	PK486	72:28	0.33
0.150/6566	*Tenera*	PK706	68:20	0.13

* G, A = pigmented plants and albinos respectively.

CONCLUSION

The influence of recessive alleles for albinism was detected among full sibs but not in their parents or other other relatives. On the average, one-fourth of the sibs were affected. Genetic hypothesis indicated that the segregating monohybrids fitted well into the classical 3:1 ratio.

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