

Thesis Title Differences in Seed Structure on Breakdown of Genotypic
Resistance to *Aspergillus flavus* in Groundnut

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Abstract

It was found by Karladee and Yingthongchai (1991) that the groundnut genotype which is resistance to *A. flavus* in the field experiment, could not exhibit its resistance under the laboratory test after a period of storage in ambient condition. It was assumed that some of the seed characters tend to be the causes of resistance mechanism. Therefore this experiment's hypothesis was made that factor as seed structure such as seed coat and some of the seed chemical composition may involved in this genetic resistance breakdown. Experiments were set up to investigate the relationship between the invasion of this fungus and the differences of seed coat structure from 6 varieties of groundnut which have difference degree resistance to *A. flavus*. Seed coat was measured and tested for resistance under both inoculated and uninoculated conditions, then seed were kept in 2 layers sealed plastic bags with the seed moisture content lower than 10 percent and kept under room temperature.

Each month after storage, seed were sampled and tested for resistance to the *A. flavus*, viability using the dehydrogenase enzyme determination and total carbohydrate. It was found that the thickness of seed coat has no correlation with the resistance to *A. flavus*. However, cross-sectioned photographs from seed coat during a various period of time after inoculated the fungus showed that the resistance genotypes (CMU collection 1 and J11) have shown an unchanged seed coat structure which in contrast, the susceptible genotypes (RCM 387 and Tainan 9) shown a breakdown in its seed coat structure. This phenomenon indicated that the seed coat of the resistance genotypes may compose of some chemical or tissues which could block the pathway and inhibit the spreading of the fungus's toxicity. In another word, its seed coat could characterize a cellular defense structure. Seed moisture content which lower than 10 percent stored for a period of 6 months were reducing infection of the fungus in all tested genotypes. Furthermore, it was observed that the genotypic breakdown genotypes (RCM 387 and Tainan 9) have markedly higher carbohydrate content than the non-genotypic breakdown one. Conclusion could therefore, be made that chemical and other structure of the seed coat except the seed thickness may play the important roles of this resistance. Also, the storage condition is another important external factor.