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**A STUDY OF THE PHYSICOCHEMICAL CHARACTERISTICS OF  
BANANA AND RESPONSE TO POSTHARVEST ACID AND  
CALCIUM TREATMENT**

**A THESIS PRESENTED  
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**ABSTRACT**

Some physicochemical characteristics (peel thickness, firmness, peel to pulp ratio, pH, % titratable acidity, and soluble solids content) were determined in six local cultivars of banana; 'Ambon' (AAA), 'Embul' (AAB), 'Kolikuttu' (AAB), 'Seenikehel' (ABB) 'Puwalu' (AAB) and 'Anamalu' (AAA). These characteristics were comparable to those of some commercially important cultivars in other countries. A tendency to a positive correlation ( $p \leq 0.1$ ) was observed between pairs of physical parameters (peel thickness, firmness and peel:pulp). The lowest peel thickness was observed in 'Kolikuttu' (1.27 mm) and highest in 'Anamalu' (2.73 mm). These cultivars also recorded the lowest, ('Kolikuttu'  $0.91 \text{ kg cm}^{-2}$ ) and the highest ('Anamalu'  $2.01 \text{ kg cm}^{-2}$ ) firmness values, determined by a hand held penetrometer. Anthracnose development was most rapid in 'Kolikuttu'. In 'Puwalu' anthracnose development and spreading of lesions were also comparatively slow. The correlation between lesion diameters and each physical parameter was negative without statistical significance.

In this study, the effects of alternatives to pesticide usage were tried out, to delay ripening and disease development. Pressure infiltration treatments with 0.2% acetic acid and 0.05% citric acid effectively reduced disease development although ripening process detected by peel colour change was not affected. The bananas pressure infiltrated with 0.2% acetic acid showed a significantly ( $p < 0.05$ ) higher firmness. A combined treatment of 0.1% acetic acid, 0.025% citric acid and 0.06% benlate reduced both anthracnose induced by inoculating *Colletotrichum musae* and total disease. The results of this study suggested that the effect of acetic acid on fruit firmness was not affected by the ethylene controlled ripening physiology.

When compared with the effect of benlate, the individual actions of these acids was not as effective. However their combined effect with half the active strength of benlate significantly ( $p < 0.01$ ) reduced total disease development and anthracnose development.

However dipping, pressure infiltration and vacuum infiltration of unripe bananas in 4%  $\text{CaCl}_2$  solutions enhanced ripening and disease development of bananas ruling out the use of  $\text{CaCl}_2$  for extending their shelf life.