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SUMMARY

Previous studies in this laboratory had shown the presence in the fruit tissues of Citrus acida of the enzymes of the TCA cycle. These studies also suggested that the formation and accumulation of citric acid in this fruit is due to the increased activity of citrate synthase and a decrease in that of aconitate hydratase with the development of the fruit. This suggestion presupposes a continuous supply of pyruvate and oxaloacetate for citrate synthesis. It would be reasonable to presume that pyruvate is formed from glucose via the glycolytic cycle. The present studies were undertaken in this context to investigate the presence of glycolytic enzymes and intermediates in fruit tissues of Citrus acida, their distribution in different parts of the fruit and variations in the same with the development of the fruit. Parallel studies were made on enzymes involved in the synthesis and oxidation of ascorbic acid. The parts of the fruit studied were green skin, white skin, septa and vesicles. Except in the case of the juice all the enzymes and intermediates of the glycolytic cycle were present in the parts studied which confirms the hypothesis that the glycolytic cycle operates in the fruit tissue and that the same is a fully active metabolic site capable of synthesizing citric acid. The juice was not found to show any enzyme activity and to contain small quantities of glycolytic intermediates which

may be spilled over from the vesicles suggesting that it is a secretory product.

On the basis of enzyme activity, the green skin and the vesicles were found to be metabolically more active than the septa. The white skin appeared to be a site of comparatively low metabolic activity although it may have an important role in the transmission of glucose synthesized by the green skin to the vesicles.

Both the green skin and the vesicles were found to possess the enzyme machinery for the formation of ascorbic acid. The concentration of the same as well as the activity of the related enzymes were found to decrease as citric acid content increased with the development of the fruit.

These studies suggest that fruit tissue is an independent metabolic entity with regard to the utilization of glucose for the production of citrate and ascorbate.