DEVELOPMENT AND GROWTH REGULATION

Regulation of Glutamate Dehydrogenase and Glutamine Synthetase in Avocado Fruit during Development and Ripening

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The activity, protein, and isoenzymic profiles of glutamate de-hydrogenase (GDH) and glutamine synthetase (GS) were studied during development and ripening of avocado (Percea americana Mill. cv Hass) fruit. During fruit development, the activity and protein content of both GDH and GS remained relatively constant. In contrast, considerable changes in these enzymes were observed during ripening of avocado fruit. The specific activity of GDH increased about 4-fold, coincident with a similar increase in GDH protein content and mRNA levels. On the other hand, GS specific activity showed a decline at the end of the ripening process. On the isoenzymic profile of GDH, changes in the prevalence of the seven isoenzymes were found, with a predominance of the more cathodal isoenzymes in the unripe and of the most anodal isoenzymes in the ripe fruit. Two-dimensional electrophoresis revealed that avocado fruit GDH consists of two subunits whose association gives rise to seven isoenzymes. The results support the view that the predominance of the more anodal isoenzymes in the overripe fruit was due to the accumulation of the [alpha]-polypeptide.