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ENZYMES ACTIVITY OF PHENYLPROPANOID PATHWAY IN RED FLESH APPLES

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Red flesh apples have the distinction of anthocianin pigment possessing in the flesh fruit. Anthocyanin pigments protect human cells against oxidative damage. They may also offer anti-cancer, anti-inflammatory and anti-viral properties. Anthocyanin synthesis occurs during phenylpropanoid pathway in apple. This study was conducted aimed to assay the specific *activities* of *phenylpropanoid pathway enzymes in red flesh apples.*A factorial experiment with three factors were performed in a randomized complete block design (RCBD) with 3 replicates. Factors were including genotypes of apples (5 red flesh apples and 3 white flesh apples) and part of plant (leaves, flesh and whole fruit (including skin, flesh and seeds)) and 3 sampling dates. The activity of phenylalanine ammonia Lyase (PAL), chalcone synthase (CHS), dihydro flavonol 4 redoctase (DFR), Flavanvn 3-hydroxylase (F3H or FHT) and flavonol synthase (FLS) were measured according to nkat (nano mol s^{-1}) kg^{-1} protein. Based on the obtained results, the pattern of specific activity of the enzymes was variable in different parts of the fruit, different genotypes and dates. However, it was observed that PAL in leaf, CHS and DFR in flesh and CHS and FLS in whole fruit presented a higher activity. In the second sampling time, the enzymes activity was much higher. In total, the enzymes activity and changes in enzymatic activity among genotypes showed a significant difference that this difference seemed to be due to genetic variation of apple genotypes.

Keywords: Apple, Malus, Enzyme activity, Protein, Phenol