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The Development of Molecular Markers in Avocado

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Abstract. **We have cloned random DNA fragments from *Persea americana* cv*.* Hass into a plasmid vector (pUC18), and we have selected 404 recombinant clones for characterization. We have screened this large set and have obtained 21 clones that are polymorphic when tested against Southern transfers of DNAs representing the three major avocado varieties. These 21 clones yield simple "single-copy" hybridization patterns and are thus good RFLP markers. In addition, we have characterized 7 multiple-copy sequences that appear to be highly polymorphic between cultivars within varieties. These highly polymorphic probes may be especially useful in cultivar identification.**

Total cellular DNA has been isolated from 42 avocado cultivars. We have begun to use our DNA probes to screen 14 cultivars. (The cultivars screened are Hass, H670, H287, Reed, Gwen, Thille, Nabal, Whitsell, Esther, Pinkerton, HX48, Fuerte, Bacon, and Zutano.) To date, this panel has been screened with 10 probes (8 single-copy and 2 multicopy). The results show that many cultivars can be distinguished based on their multilocus genotype. In addition, it is possible to exclude certain cultivars as possible pollen parents of 'Gwen'.

We are exploring the use of the polymerase chain reaction technique (PCR) for the production of DNA-based markers in avocado. Our initial experiments utilizing cellulase gene-specific primers have been successful. This will permit the very rapid screening of avocado DNAs for variation associated with cellulase genes. Of particular interest is a new PCR application called the RAPD method that allows the generation of DNA fragments based on small random primer molecules. We have begun efforts to adapt this new method to avocado.