Examining Potential False Positives for Genetic Modification in Taro

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Taro is an important crop to many nations, especially Hawaii where myth labels it the elder sibling of all Hawaiians. Being isolated, Hawaiian varieties of taro were susceptible to many foreign diseases, so genetic modification (GM) was considered a viable preservation effort when faced with epidemics. Few in the public agreed as many considered the modification of taro to be desecration, so a ten-year moratorium of the GM of taro was established in 2009. However some samples of taro have tested positive for GM using a commercial kit, though no GM taro was ever released. PCR was used to determine the validity of these positives. Twenty-eight samples of taro were tested. No samples contained the NOS terminator sequence nor the rice chitinase sequence, used in a previous GM of taro, but two samples did contain the CaMV 35S promoter sequence which is common to 85% of genetically modified crops along with the NOS terminator sequence. A temperature gradient was applied to the annealing temperature of the commercial kit (as well as non-proprietary CaMV 35S primers), and samples continued to be amplified by the PCR until the annealing temperature was 2ºC below the extension temperature. When sequenced the sample tested had extreme similarity to the positive control and the CaMV 35S, while showing little similarity to a virus from the same family that affects taro. The positives are not due to the presence of the NOS terminator or the rice chitinase gene but most likely to the presence of CaMV 35S.

Awards Won:

Third Award of $1,000