Impact of in vitro propagation on genetic stability of two *Vaccinium corymbosum* varieties

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Blueberries (*Vaccinium corymbosum*) are recognized for their beneficial properties, due to their high content of antioxidants such as anthocyanins, flavonoids, and phenolic acids. These bioactive compounds play a crucial role in neutralizing free radicals, thus mitigating oxidative stress and inflammation, both implicated in several chronic diseases, including cardiovascular disease (CVD), neurodegenerative disorders and cancer. With the increasing interest in functional foods and natural health products, blueberries stand out for their health-promoting properties.

In recent years, advances in biotechnology have enabled the rapid propagation of plants through in vitro culture techniques. Micropropagation, in particular, offers the possibility of cloning plants efficiently, thereby facilitating the preservation and dissemination of desirable traits. However, the in vitro culture process may inadvertently introduce genetic variations in plants, potentially impacting their molecular characteristics and, consequently, their metabolic profile, content of bioactive compounds, and gene expression.

In this context, the present study aims to investigate the impact of in vitro propagation on the genetic stability of two commercially important blueberry varieties, namely *Duke* and *Bluecrop*. Using molecular markers, namely inter simple sequence repeats (ISSRs), we try to find genetic variation induced by in vitro culture.

Comparing amplification patterns, genomic stability was verified in samples obtained by micropropagation, when compared to the field plant. The most significant effects were observed in plants obtained in the presence of growth regulators. These findings underscore the importance of maintaining genomic integrity for blueberry offering insights into mitigating genetic instability in micropropagation practices.

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