Bioactive Gibberellins Show Differential Abundance at Key Phenological Stages for Berry Growth in Table Grapes

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Resumen
Berry size is an important trait for table grape production and is affected by complex physiological and biochemical events that occur from anthesis to ripening. Gibberellins (GAs) play a crucial role in the regulation of this process, as widely demonstrated by exogenous application of gibberellin acid (GA(3)), but the endogenous change in concentration and its relationship with berry size are poorly understood. Using berries from a crossing of Ruby Seedless x Sultanina (RxS) with different phenotypes for berry and seed size, we analyzed GA metabolites at four key phenological stages for berry growth: 50% flowering (FL50), 2 to 4 mm (CU24), 2 to 4 mm plus one week (CU24+1), and 6 to 8 mm. Our results showed that both bioactive metabolites GA(1) and GA(4) were produced, demonstrating that both the 13-hydroxylation and the non-13-hydroxylation GA biosynthetic routes were functional in grape berries. The variable abundance of both bioactive GAs throughout berry growth suggests complex regulation of this pathway. GA(1) had a higher concentration than GA(4) during the FL50 to CU24+1 stages, whereas GA(4) concentration increased later during the berry-setting stage and was relatively constant to the 6 to 8 mm stage. Accumulation of GA(1) was greater than with GA(4), with a three-fold higher concentration at CU24+1. In addition, our results suggested that synthesis of GAs occurred in small seedless berries, but accumulation of GA(4) occurred slightly later than in larger berries with full seeds.

Palabras clave
Palabras clave de autor: berry size; GC-MS; gibberellins; seed content; table grapes
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