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Fleshy fruit growth and mechanical properties impacting texture quality depend on the close interplay between cellular water partition and cell wall mechanical properties regulating turgor pressure all along fruit development and ripening. Besides known changes in cell wall pectin composition during these events, the fate of hemicelluloses is yet to be studied as these polysaccharides contribute notably to the control of cell wall expansion. In a first study, the cell wall hemicellulose structural profile was assessed in developing and ripening Ariane and Rome Beauty apple by MALDI-TOF MS analysis of cell wall enzymatic digest. The results showed that the major xyloglucan (XgG), the minor galactoglucomannan (GgM) and the trace glucuronoarabinoxylan (GAX) hemicelluloses structures were significantly and differently affected during cell division and expansion phases. The two varieties significantly differed in their hemicellulose structure profile either during early development or during ripening. In a second study, cell wall hemicellulose structural profiling was coupled to gene expression in developing apple hybrids fruit. The results revealed that the shared early expressed genes between the hybrids mainly concern hemicellulose biosynthesis and modifications. In particular, the marked fine structural evolution of GgM was strongly correlated with mannan synthase, glucanase (GH9) and β-galactosidase gene expression.
The results question the function of the remarkable changes in cell wall hemicellulose composition and structure occurring at the cell division/elongation switch. Candidate genes are now available to further assess the role of these hemicelluloses structures on fruit growth and its impact on texture.

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