

Functional Development and Maturation of Coffee (*Coffea arabica*) Fruit and Seeds

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SUMMARY

Despite the global economic importance of coffee, little is known about the factors that are essential for the establishment of the mature coffee seed and final crop yield. Genomic gene expression studies show great potential and appear essential to unravel the complex molecular mechanisms and regulatory programs that act during coffee fruit and seed development. However, the success of this type of study is largely dependent on the precise identification, timing and positioning of the developmental events under study. The present study provides a functional overview of coffee fruit and seed development, as a pre-requisite to assist in gene expression studies. We have focused on cell and tissue structure (light microscopy), cell cycle activity coupled to tubulin accumulation (western blotting) and microtubular cytoskeleton configurations (immunocytochemistry), in relation to the timing of physiological events during development, pre-maturation and maturation (dry weight, water content, germinability, desiccation tolerance). The present study clarifies the origin of the different tissues, and allows a precise definition of organogenesis and phases of development in relation to seed physiology and anatomy.