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***Identification and characterization of RIPENINGLESS, a key transcription factor in the regulation of fruit development and ripening in the cultivated strawberry *Fragaria × ananassa****

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Despite the advances that have allowed to elucidate transcription factors (TFs) involved in the development and ripening of non-climacteric strawberry fruits, key regulators of these processes remain to be identified. Among the plant TFs, the BEL class of Homeobox genes has been shown to control meristem formation and/or maintenance, organ morphogenesis, organ position, and several aspects of the reproductive phase in *Arabidopsis thaliana* (Bhatt et al., 2004; Byrne et al., 2003; Roeder et al., 2003; Smith and Hake, 2003). In this work, we have identified RIPENINGLESS (*FaRPL*), a BEL-like Homeodomain TF of the cultivated strawberry (*Fragaria × ananassa*), that shows an increase in its expression during ripening, peaking at the turning stage. To functionally characterize the role of *FaRPL*, we have established stable silencing (RNAi) and over-expression lines under the 35S promoter. *FaRPL*-RNAi lines showed a high rate of abortions. However, some lines achieved to develop full fruits, being firmer and with a lower water content than those of the control. Furthermore, the ripening progress was significantly delayed in these RNAi lines, in which a high percentage of fruits displayed a complete blockage at a stage similar to the turning stage in wt. Interestingly, fruits overexpressing *FaRPL* showed aberrant shapes, being enlarged in the base of the receptacles. All these results support an important role of this TF in fruit development and ripening. Finally, gene expression and hormone analyses point to an essential role of *FaRPL* in the regulation of ABA biosynthesis, being this phytohormone the main promoter of strawberry fruit ripening.

*References*

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