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SUCROSE PROMOTES AXILLARY BUD OUTGROWTH IN ROSA HYBRIDA AND PLAYS A SIGNAL ROLE DURING THIS PROCESS

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Shoot branching is a developmental process by which axillary buds are released from dormancy and develop into new axes. Bud outgrowth is largely affected by a number of environmental factors such as temperature, air and soil humidity, gravitropism and light, conferring thus plasticity to the plant development. Control of bud outgrowth is thereby a key mechanism in the establishment of plant architecture in response to environment. Sugars, whose levels in plant are also highly dependent on the environment, have recently been shown to be implicated during bud outgrowth in *Rosa hybrida*. To test the impact of different sucrose levels on bud outgrowth, excised buds have been *in vitro* cultivated on MS media containing different sucrose concentrations. We then tested the impact of different non-metabolizable sucrose analogs to put in evidence a potential sucrose-signaling pathway in this process. Our results revealed that sucrose levels modulated bud outgrowth and that this disaccharide could also play a signal role during this event. Moreover, increasing sucrose supply to *in vitro* cultivated buds released the inhibitory effect of auxin on bud outgrowth, putting for the first time in evidence an antagonism between this nutrient and this hormone. Further analysis revealed that the polarization of the auxin transport between bud and stem, which is a prerequisite to allow bud to grow out, is a target of the antagonism between sucrose and auxin. This work proposes a model that integrates sucrose as an endogenous signal in the complex network that regulates bud outgrowth in response to environment.