



Role of the Sucrose Synthase Encoding PrSus1 Gene in the Development of the Parasitic Plant *Phelipanche ramosa* L. (Pomel)

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Titre Role of the Sucrose Synthase Encoding PrSus1 Gene in the Development of the Parasitic Plant *Phelipanche ramosa* L. (Pomel)

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Résumé en anglais *Phelipanche ramosa* L. (Pomel) is a major root-parasitic weed attacking many important crops. Success in controlling this parasite is rare and a better understanding of its unique biology is needed to develop new specific control strategies. In the present study, quantitative polymerase chain reaction experiments showed that sucrose synthase encoding PrSus1 transcripts accumulate at their highest level once the parasite is connected to the host (tomato) vascular system, mainly in the parasite tubercles, which bear numerous adventitious roots. In situ hybridization experiments revealed strong PrSus1 expression in both shoot and root apices, especially in shoot apical meristems and in the vascular tissues of scale leaves and stems, and in the apical meristems and developing xylem in roots. In addition, immunolocalization experiments showed that a sucrose synthase protein co-localized with cell-wall thickening in xylem elements. These findings highlight the role of PrSus1 in the utilization of host-derived sucrose in meristematic areas and in cellulose biosynthesis in differentiating vascular elements. We also demonstrate that PrSus1 is downregulated in response to 2,3,5-triodobenzoic acid-induced inhibition of polar auxin transport in the host stem, suggesting that PrSus1 activity in xylem maturation is controlled by host-derived auxin.

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