PrCYP707A1, an ABA catabolic gene, is a key component of Phelipanche ramosa seed germination in response to the strigolactone analogue GR24

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Résumé en anglais	After a conditioning period, seed dormancy in obligate root parasitic plants is released by a chemical stimulus secreted by the roots of host plants. Using Phelipanche ramosa as the model, experiments conducted in this study showed that seeds require a conditioning period of at least 4 d to be receptive to the synthetic germination stimulant GR24. A cDNA-AFLP procedure on seeds revealed 58 transcript-derived fragments (TDFs) whose expression pattern changed upon GR24 treatment. Among the isolated TDFs, two up-regulated sequences corresponded to an abscisic acid (ABA) catabolic gene, PrCYP707A1, encoding an ABA 8'-hydroxylase. Using the rapid amplification of cDNA ends method, two full-length cDNAs, PrCYP707A1 and PrCYP707A2, were isolated from seeds. Both genes were always expressed at low levels during conditioning during which an initial decline in ABA levels was recorded. GR24 application after conditioning triggered a strong up-regulation of PrCYP707A1 during the first 18h, followed by an 8-fold decrease in ABA levels detectable 3 d after treatment. In situ hybridization experiments on GR24-treated seeds revealed a specific PrCYP707A1 mRNA accumulation in the cells located between the embryo and the micropyle. Abz-E2A, a specific inhibitor of CYP707A enzymes, significantly impeded seed germination, proving to be a non-competitive antagonist of GR24 with reversible inhibitory activity. These results demonstrate that P. ramosa seed dormancy release relies on ABA catabolism mediated by the GR24-dependent activation of PrCYP707A1. In addition, in situ hybridization corroborates the putative location of cells receptive to the germination stimulants in seeds.

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