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Role of the UPS pathway in sexual reproduction : Screening for Arabidopsis gametophytic mutations affecting F-box protein genes.

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F-box proteins are central components of the SCF (SKP1-Cullin1-F-box) type of E3-Ubiquitin ligases, the enzymes that recognize target proteins, and allow their labelling with ubiquitin chain as a signal for their degradation by the proteasome. Almost 700 F-box protein genes have been reported in the Arabidopsis genome, and several transcriptomic data suggest that half of these F-box protein genes are expressed in the microspore and/or the pollen grain, i.e. the male gametophyte. Aiming at investigating the role of the Ubiquitin Proteasome System (UPS) in plant gametophytes development, we searched for gametophytic insertional mutations affecting genes encoding F-box protein in Arabidopsis. Gametophytic mutants are expected to show a transmission defect of the insertions FST (Flanking Sequence Tags) to the progeny, through either one or both gametophytes. In a first screen, we selected two F-box protein gene candidates, which insertion mutants showed altered transmission through the female gametophyte for one, and either male or female gametophyte for the other. In a second screen, we scored more gene candidates, based on their transcription profile in male gametophyte, by using available microarray data. However, because it has been shown that the expansion of the F-box protein gene family correlates with an increase in gene redundancy among those genes, we expect that gametophytes phenotype could be masked in single mutants. Therefore, we are combining our expression studies with phylogenetic studies in order to generate double and triple mutants for putative redundant F-box protein genes. First candidates will be presented.

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