



**Supplementary Figure S3** Defects in the morphology and transition from PSV to lytic vacuoles in double mutant *pat4-2 × pat2-2*.

(A-B) PSV in embryo root cells of control (A) and *pat4-2 × pat2-2* (B). (C) Quantification of the PSV morphology. Double mutant *pat4-2 × pat2-2* (gray bar) showed stronger PSVs fragmentation compared to wild-type seeds (black bar). (D-G) Accumulation of LysoTracker red after 1 hour (D, E) and 60 hours (F, G) of imbibition in wild-type (D, F) and double mutant (E, G) seeds. Stronger accumulation of the dye in double mutant cells (G, arrowheads) suggests defects in the acidification of PSVs. Scale bar =10 μm