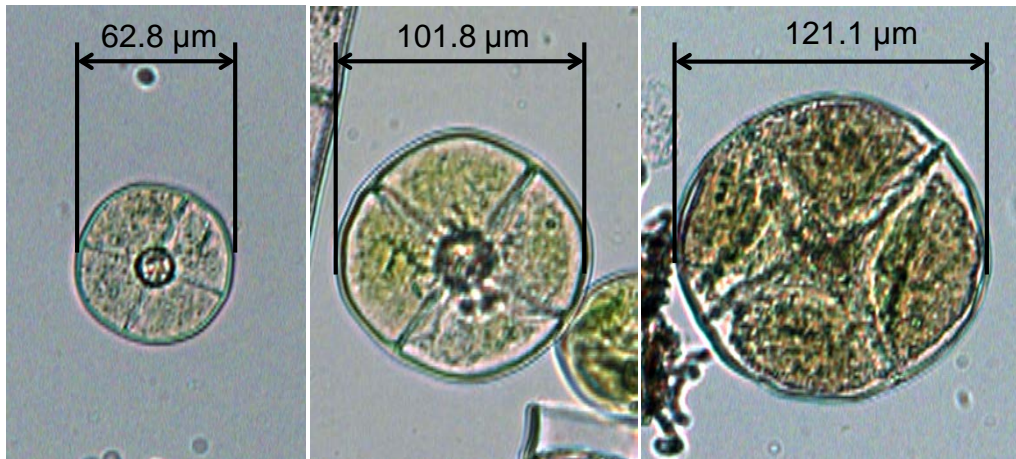
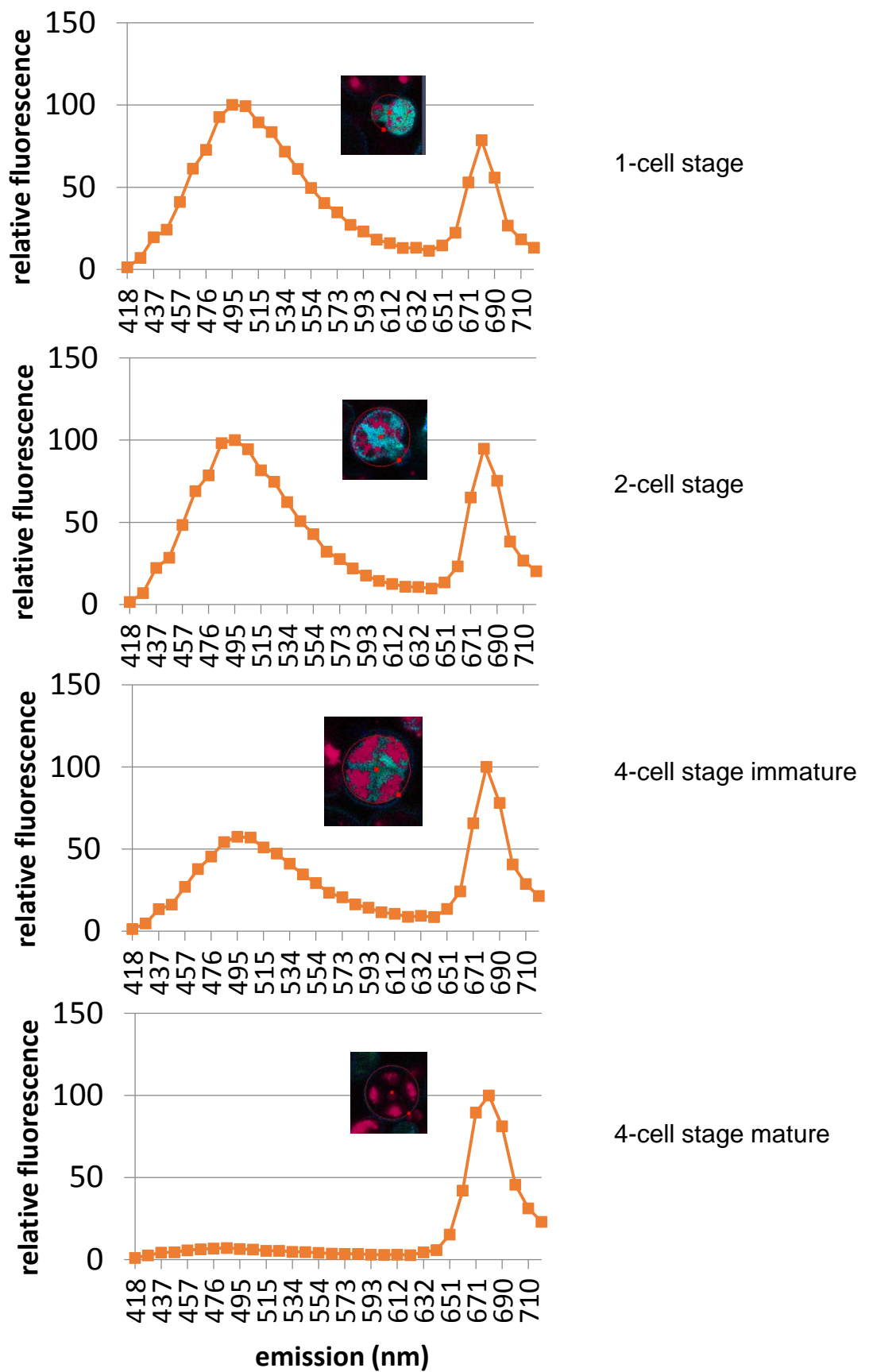


Supplemental Figure 1. ESEM view of an apex from a *S. habrochaites* LA 1777 plant. Three overlapping images were assembled. Type VI trichomes of different development stages can be observed. M: mature type VI trichome. T: two-glandular cell stage. Developing type I (I) and type VII (VII) trichomes can also be observed. A: Apex.



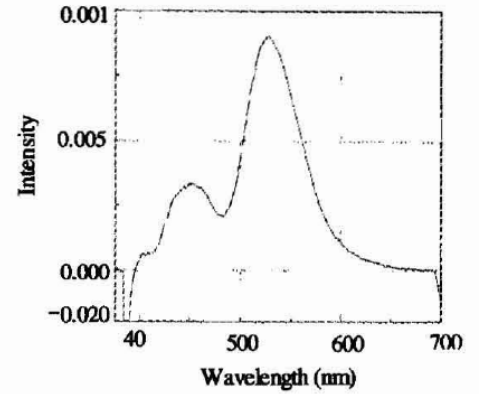
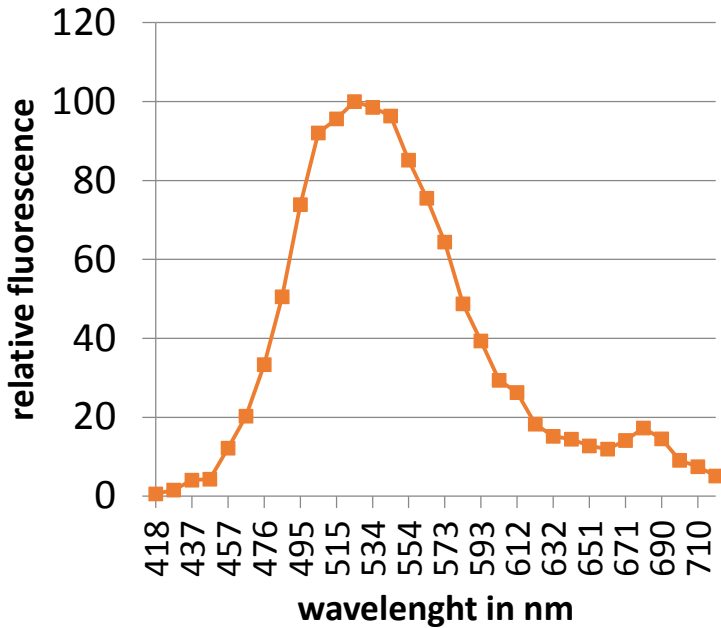
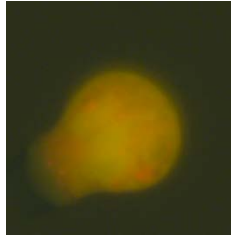
Supplemental Figure 2. Exceptionally large type VI trichomes in *S. habrochaites*.

The type VI trichome on the left panel is representative of the average size. Trichomes in the middle and right panels are exceptionally large trichomes.

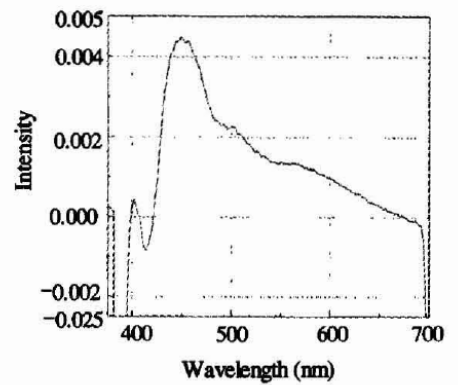


Supplemental Figure 3: Fluorescence emission spectra of developing type VI trichomes in *S. habrochaites*. The emission maximum at around 500 nm (white arrow) is highest in the early stages, goes down from the young 4-cell stage onwards and is absent from mature trichomes.

1-cell stage
type VI
trichome

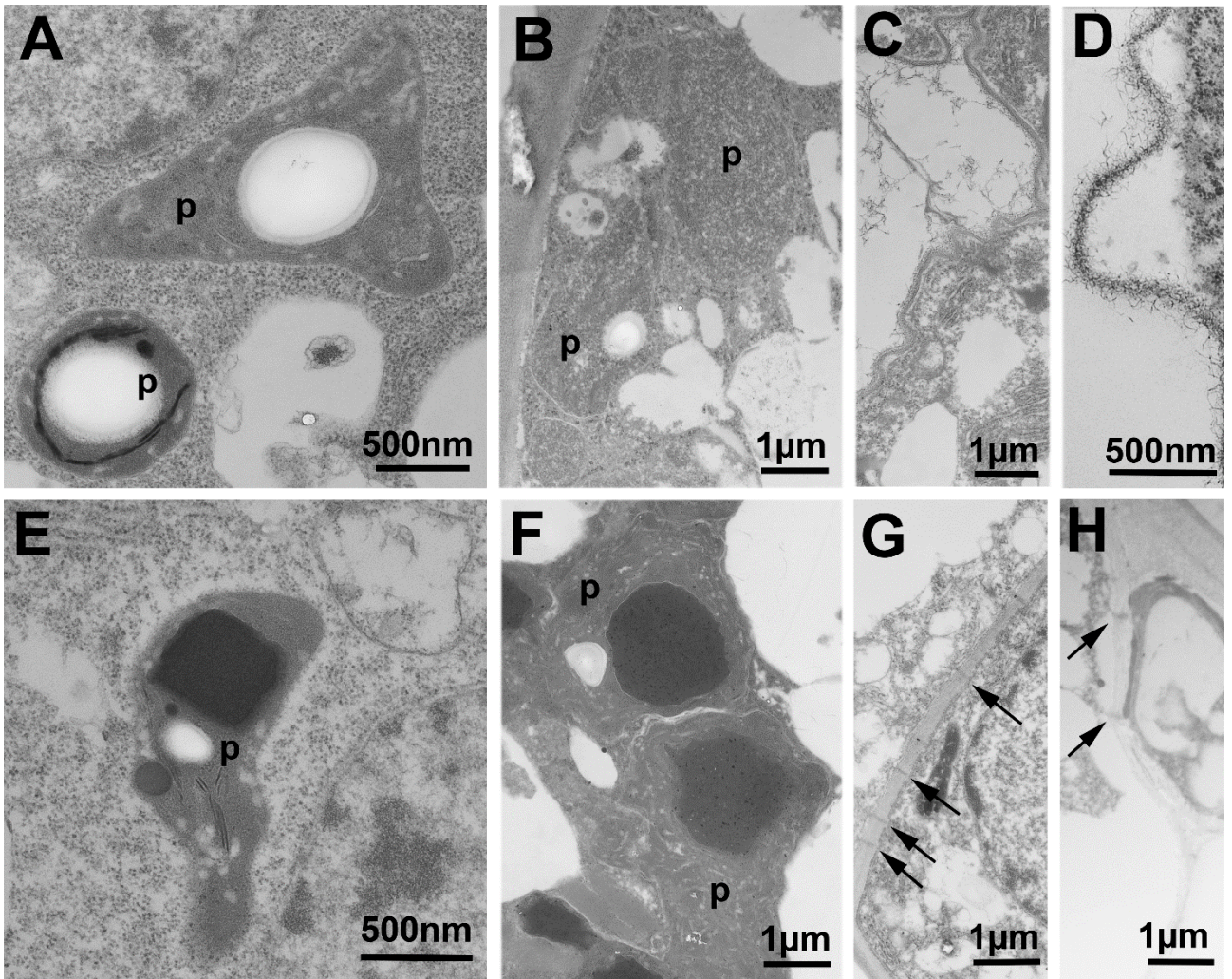


Quercetin

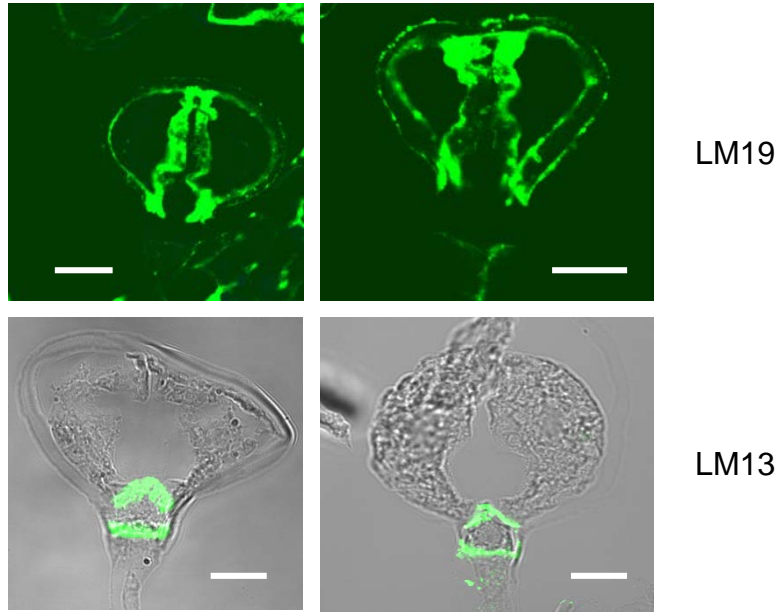


Rutin

Supplemental Figure 4: Comparison of the emission spectrum of developing type VI trichomes in *S. habrochaites* with that of known flavonoid substances. The emission maximum slightly above 500 nm is more similar to that of quercetin than to that of rutin. The fluorescence spectra of rutin and quercetin are from Komori *et al.* (2007) Measurement of Rutin and Quercetin in Tartary Buckwheat Flour by Ultraviolet-Induced Fluorescence. *Proceedings of the International Symposium on Buckwheat 2007* pp 403-409.



Supplemental Figure 5: Transmission electron microscopy of type VI trichomes in *S. habrochaites* LA1777 (A-D) and *S. lycopersicum* LA4024 (E-F). Details of chloroplasts (p) at the 2-cell stage (A and E). Starch granules are clearly visible. Thylakoids do not build extensive stacks (= grana) as in leaf chloroplasts. At the 4-cell stage (B and F), the thylakoid membranes are hardly visible any more, starch grains can still be seen. Chloroplasts of LA4024 have large electron dense particles (E and F), whereas those are not present in LA1777 in the mature stage (B). C and D: details of the cell wall material during the formation of the intercellular cavity in LA1777. Remains of fibrillous cell wall can be seen. G and H: details of plasmodesmata seen in trichomes of LA4024. G: between the intermediate and the stalk cells. H: between the intermediate and secretory cells. Plasmodesmata are indicated by black arrows.



Supplemental Figure 5: Immuno-labelling of type VI trichomes from *S. habrochaites* LA1777. Top row: labelling with LM19, which recognizes homogalacturonan with a preference for unesterified homogalacturonan and LM13 which recognizes linear arabinan. The horizontal bar corresponds to 10 μm.