

SUPPLEMENTARY DATA

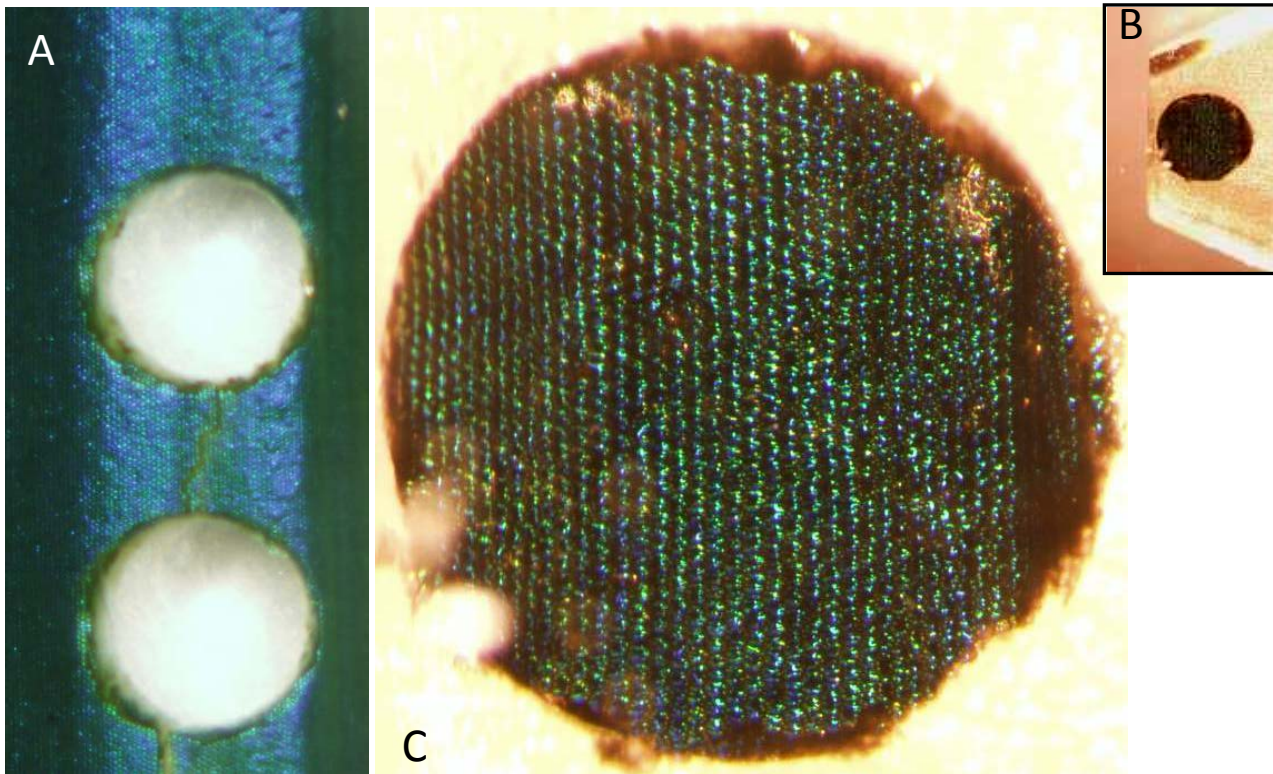


Fig. S1. (A) Iridescent leaves were punctured with a hole punching tool, producing a circular 2 mm disc of leaf material for freezing. (B) Leaf disc was frozen, followed by transfer into acetone at -80°C , osmium fixed, infiltrated and embedded in a flat embedding mold. (C) The iridescent surface of the leaf in the embedding flat retains characteristic iridescence pattern. Additional density of the leaf is the result of osmium fixation.

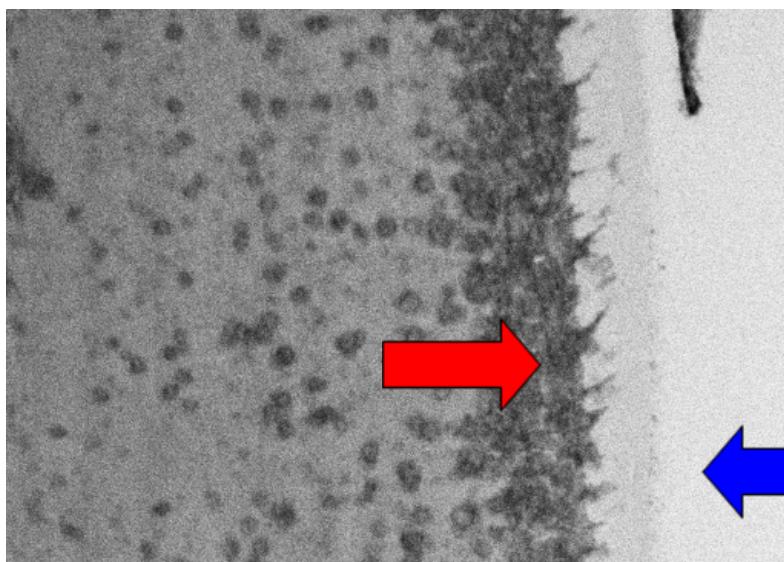


Fig. S2. TEM image of ultrarapidly frozen leaf epidermis from the adaxial surface showing the sample used for energy-dispersive x-ray analysis spectra in text **Fig. 3A**. Red arrow indicates electron dense particles in the uppermost leaf epidermal wall as compared with the control region (blue arrow) near the leaf surface.

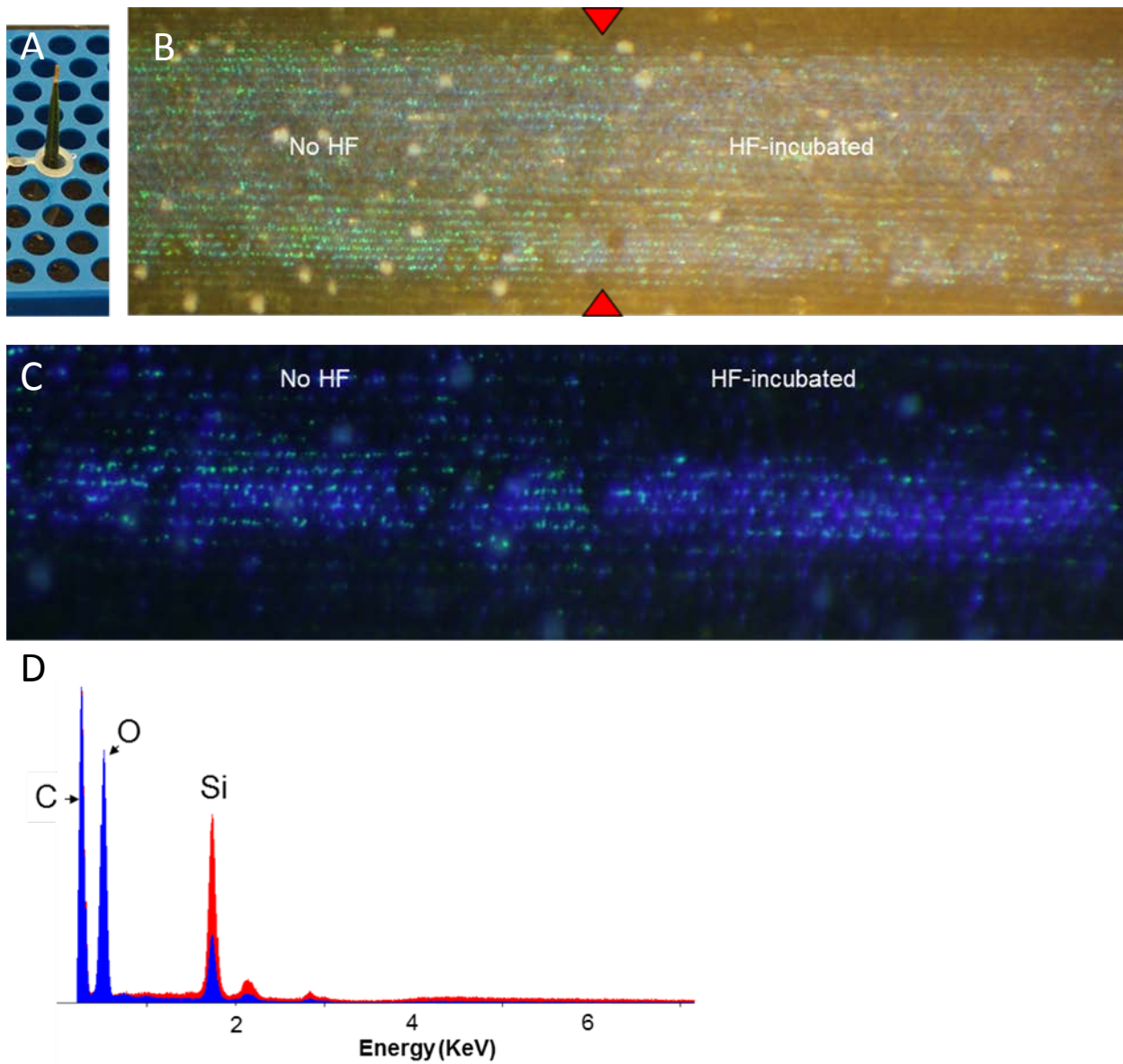


Fig. S3. **(A)** Leaves were immersed in 10% hydrofluoric acid solution for 15 min, as HF is known to dissolve Si compounds. **(B)** Although localized senescence was evident in HF-incubated leaves, reduced iridescence under white light was seen, particularly in green wavelengths. **(C)** To control for potential background color effects on iridescence, an LED with emission lines in blue wavelengths was used as a source. Green iridescent particles were observed most conspicuously in the area not immersed in HF. **(D)** EDXA spectra of HF-treated leaves indicate that Si was reduced to $\approx 1/3$ of prior amounts (red vs. blue peaks), though not completely removed by 15 min in HF. The C peak (carbon) was used as a control peak height for X-ray emission since it did not vary in quantity in the two samples.

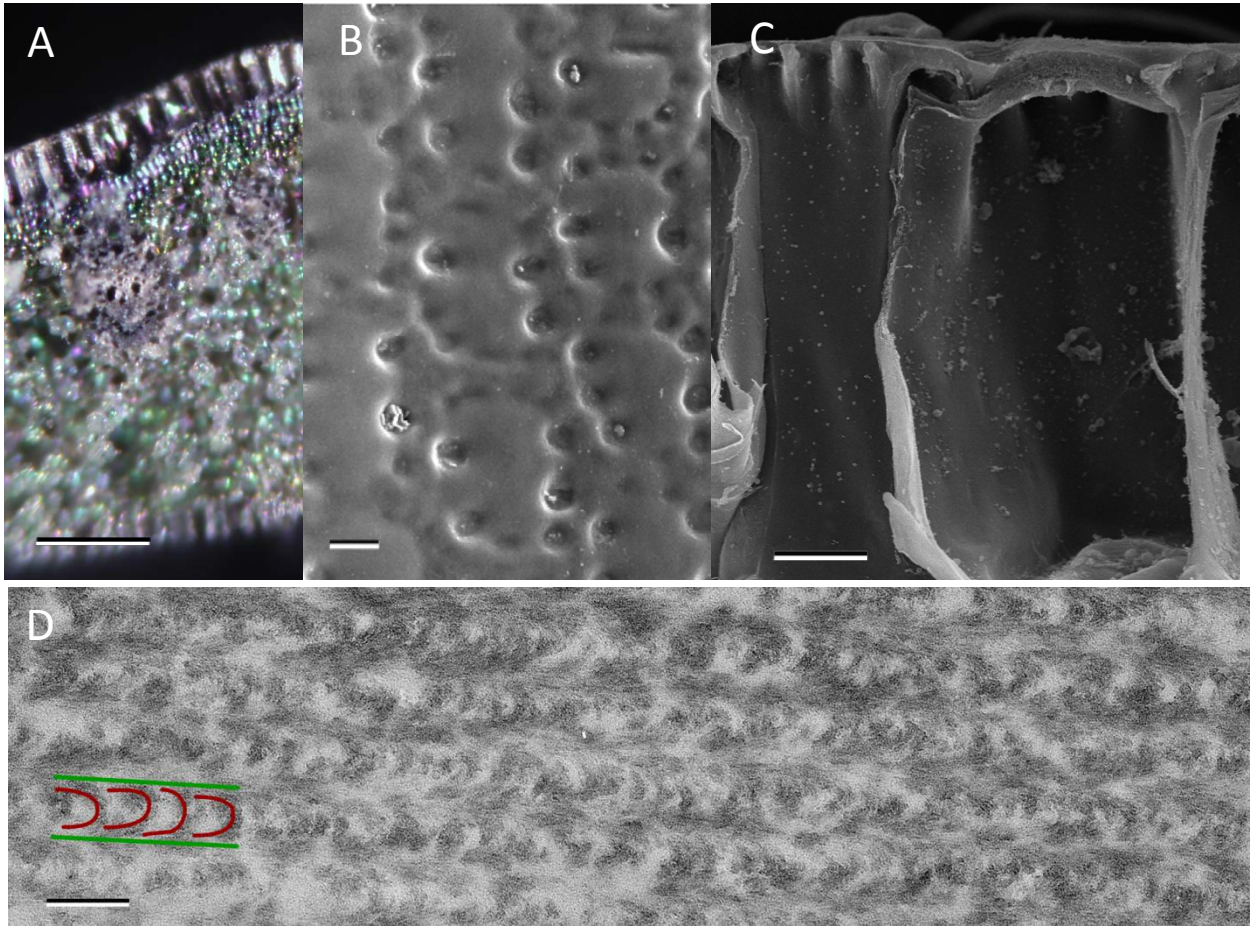


Fig. S4. (A) All cell walls of the leaves appear able to iridesce as indicated in this cut face of chemically-fixed material. Bar=100 nm. (B) Pavement cells are lobed and interlocked as is evident in LM of chemically-fixed material. Bar=25 nm. (C) SEM indicates pits in the cuticular surface at the interlocking cell junctions. Bar=10 nm. (D) Epidermal pavement cells display prominent vacuolar spaces and interlocking cell wall profiles. Helicoidal microfibrils are evident in the layered structures, as indicated by the red gyres, alternating with straighter green regions. Bar=200 nm.