Table S1. Crosses used to evaluate gametophyte reproduction (3 selfed and 6 outcrossed). The crosses used to evaluate thermal plasticity of microscopic F1 sporophytes are highlighted in bold (3 selfed and 3 outcrossed).

Strain	♀1	♀3	♀6
♂1	**Selfed**	**Outcrossed**	Outcrossed
♂3	Outcrossed	**Selfed**	**Outcrossed**
♂6	**Outcrossed**	Outcrossed	**Selfed**

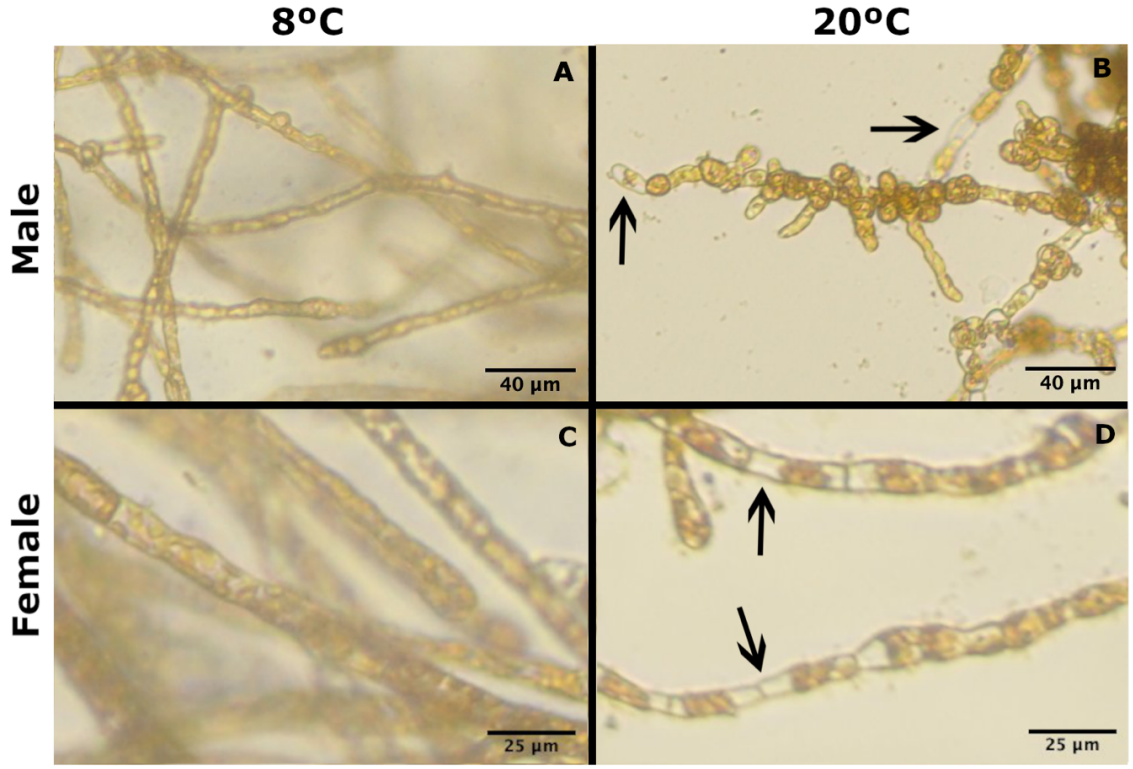

Figure S1: Gametophytes of *Laminaria pallida* after ~3.5 months of temperature exposure at 8°C and 20°C. A, B. Male gametophyte cells. C, D. Female gametophyte cells. Arrows indicate dead or damaged cells.

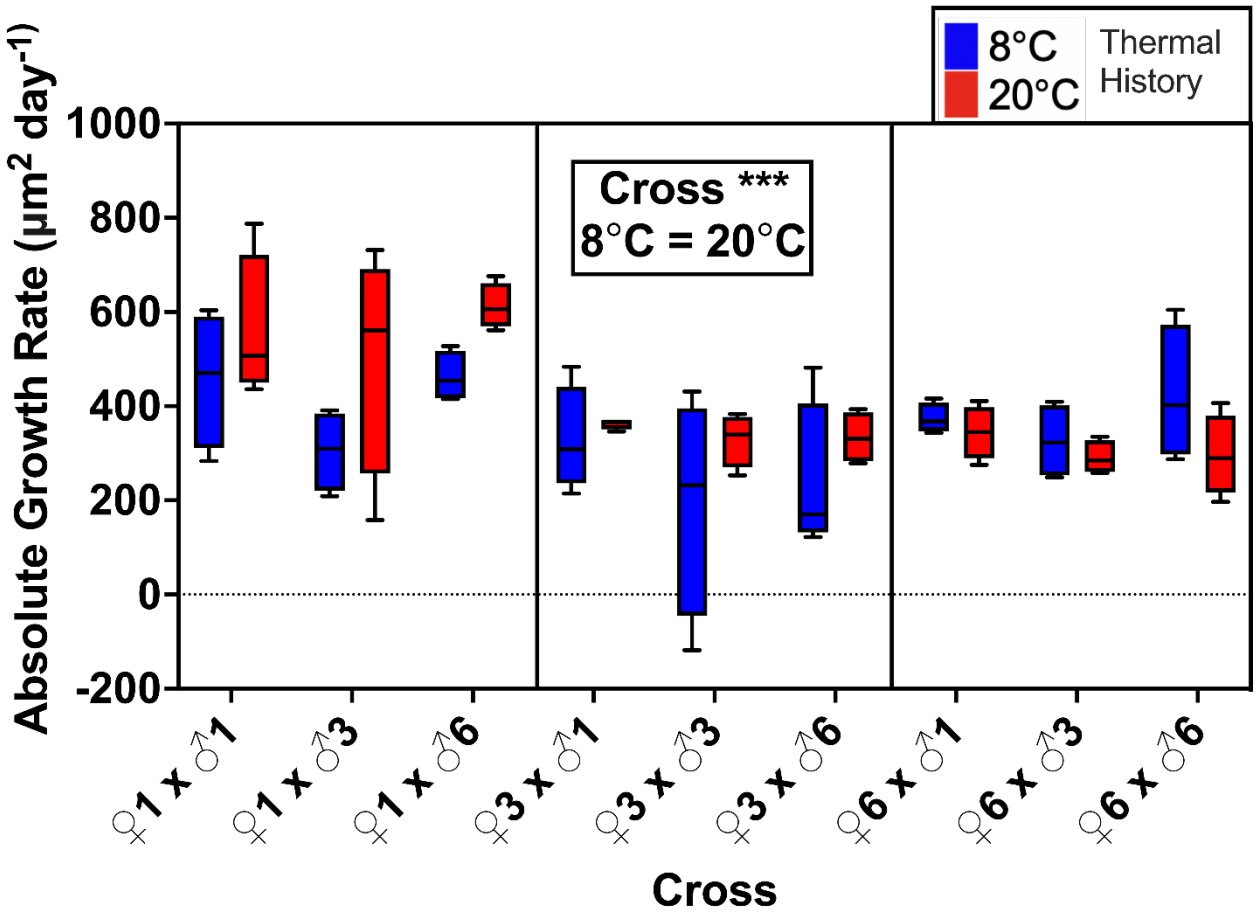

Figure S2: Effect of thermal history on the absolute growth rate of gametophytes from different *L. pallida* crosses after 6 days under gametogenic conditions. Box plots with median, boxes for 25th and 75th percentiles and whiskers indicating min and max values (n = 4). Panels separate crosses with different females. ***p < 0.001.

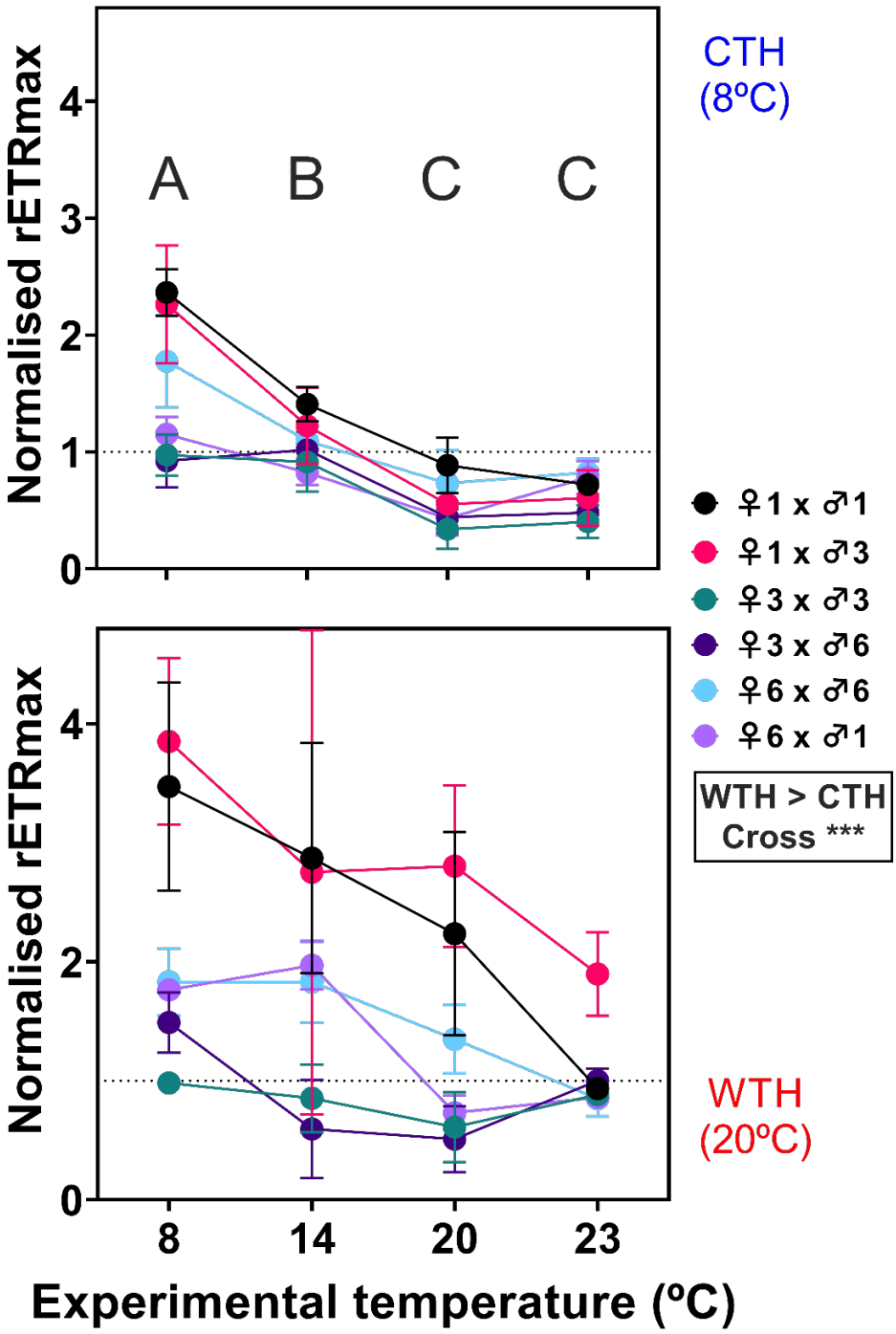

Figure S3: Effect of parental thermal history on the sporophyte relative maximum electron transport rate (rETRmax) of different *L. pallida* crosses after 16 days in experimental temperatures (8ºC, 14ºC, 20ºC and 23ºC). Connected mean plots with standard error of the mean (n = 4). Each plot corresponds to a thermal history. Different letters indicate significant differences between experimental temperatures, irrespective of thermal history and cross ($p < 0.05$). CTH = Cold Thermal History, WTH = Warm Thermal History. ***$p < 0.001$. See Table 2b for statistics.