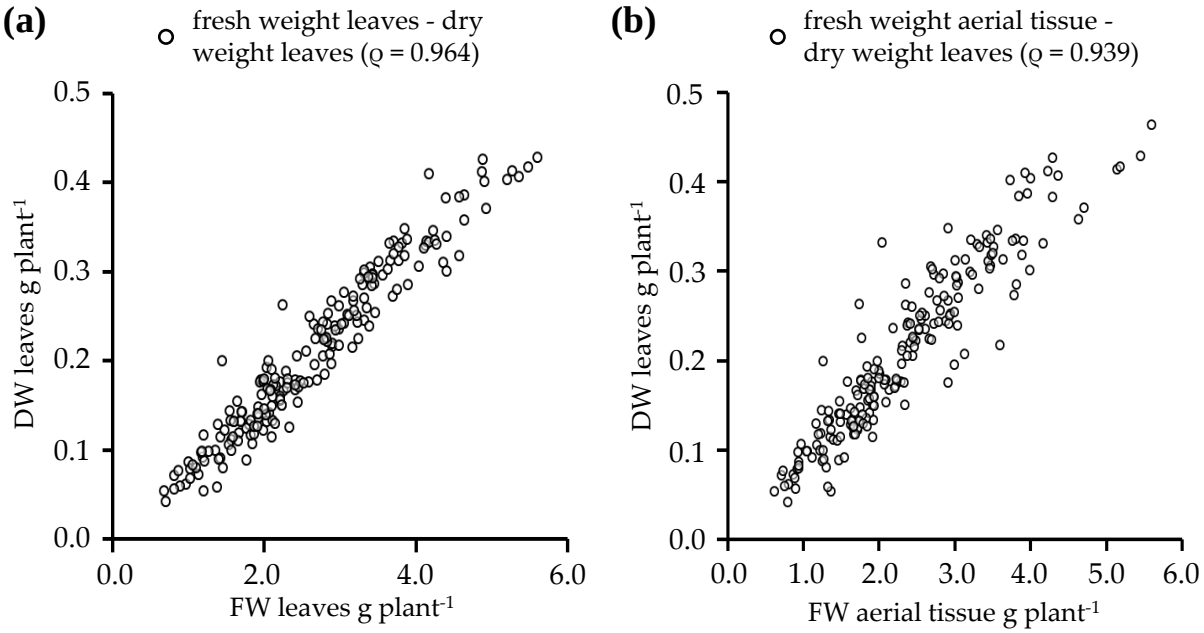
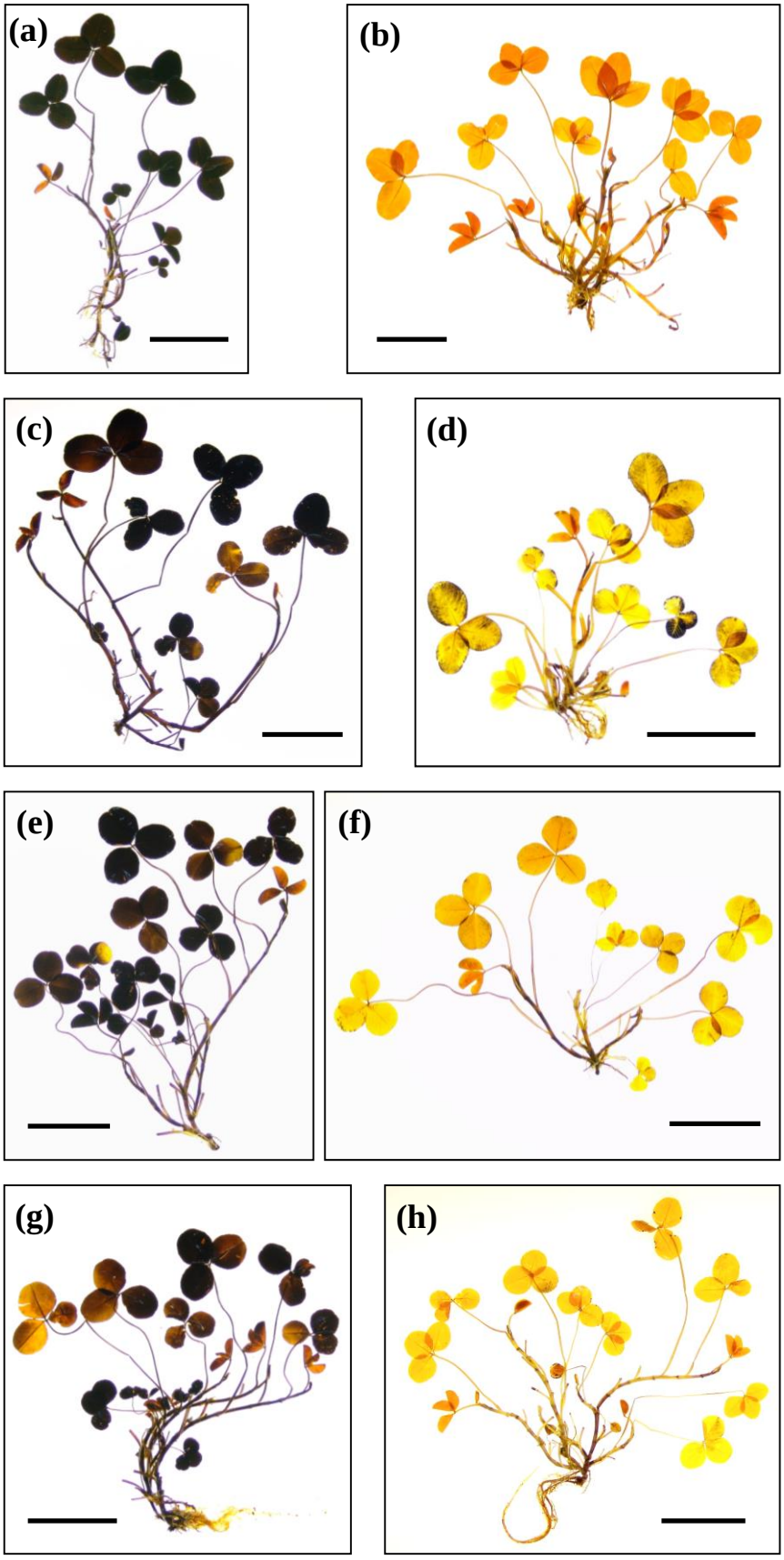
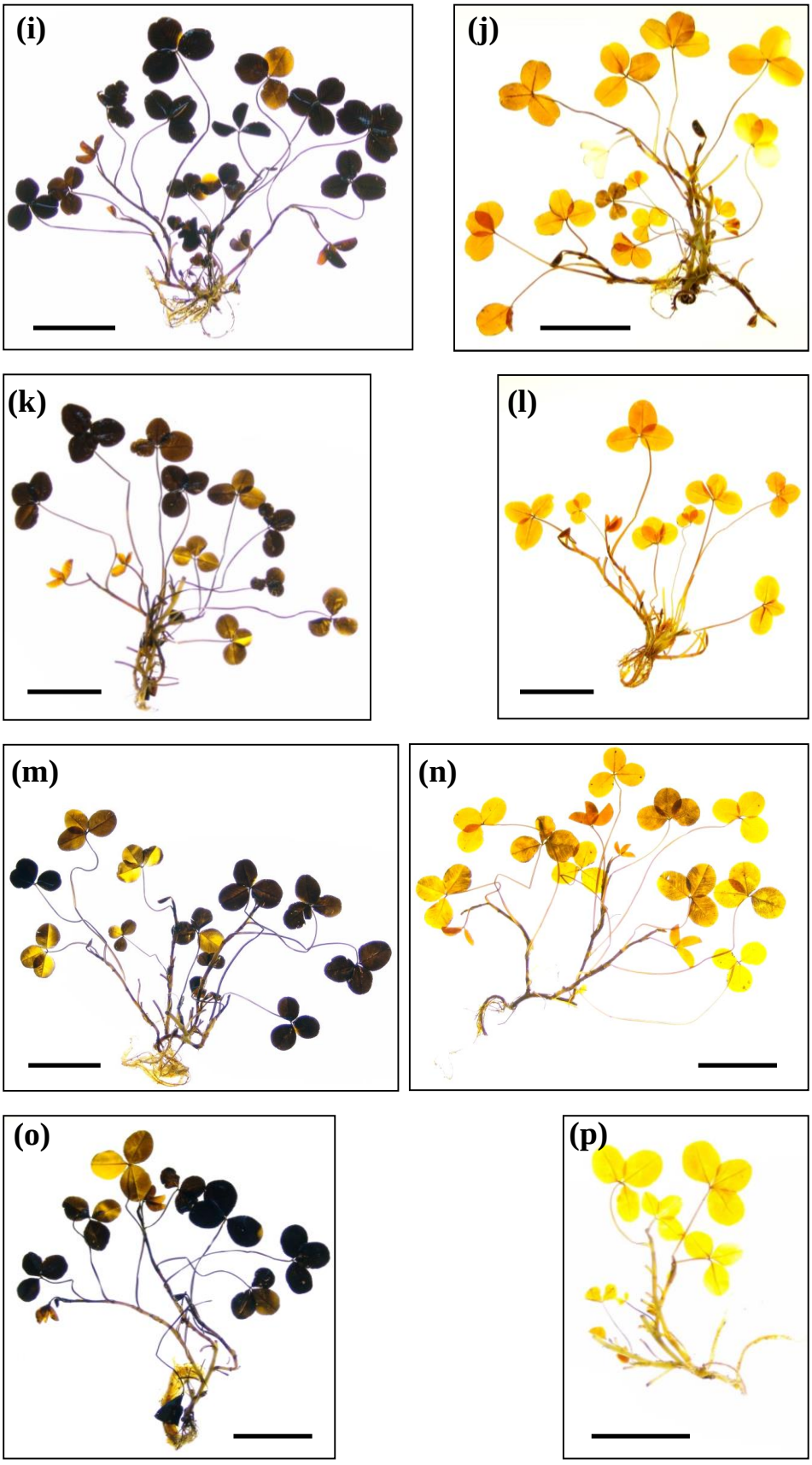


Supplemental figure 1: Relationship between the fresh weight (FW) of the leaves per plant **(a)** or FW of the aerial tissue per plant **(b)** and the dry weight (DW) of the leaves per plant of 185 individual genotypes harvested at end of day (ED). The Spearman-rank correlation coefficient (ϱ) is indicated. Fresh weight (FW) of the aerial tissue in **(b)** is the same as described in Figure 5.


(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)


(i)
(j)
(k)
(l)
(m)
(n)
(o)
(p)

Supplemental figure 2: Staining of starch in white clover leaves at the end of the day (ED) and at the end of the night (EN) shows different patterns of localization across genotypes. Starch is indicated by the dark purple to black color in the leaves. Genotypes *TrLB003* **(a)**, *TrLb170* **(c)**, *TrLB176* **(e)**, *TrLB070* **(g)**, *TrLB184* **(i)**, *TrLB082* **(k)**, *TrLB114* **(m)**, and *TrLB115* **(o)** stained at ED. Genotypes *TrLB003* **(b)**, *TrLb170* **(d)**, *TrLB176* **(f)**, *TrLB070* **(h)**, *TrLB184* **(j)**, *TrLB082* **(l)**, *TrLB114* **(n)**, and *TrLB115* **(p)** stained at EN. Bars = 5cm.

Supplemental Table S1: *F*-values, levels of significance and proportion of phenotypic variance (R^2) explained by ANOVA for the evaluation of the glasshouse effect on WSC and starch at ED and EN. The table corresponds to the ANOVA evaluation of the measurements described in Figure 2. * $p < 0.01$

	Glucose	Fructose	Sucrose	Starch
Glasshouse ED df	2	2	2	2
Error ED df	181	181	182	182
SS Error ED	75.2	64.5	36.6	19.5
SS Total ED	79.6	66.1	38.2	20.4
F - value ED	5.33*	2.26	3.87	4.26
R^2 ED	0.0556	0.0244	0.0407	0.0448
Glasshouse EN df	2	2	2	2
Error EN df	136	110	136	175
SS Error EN	55.7	81.1	59.2	95.0
SS Total EN	58.8	100	76.8	36.1
F - value EN	3.43	13.2*	20.2*	15.8*
R^2 EN	0.048	0.193	0.229	0.153

Supplemental Table S2: *F*-values, levels of significance and proportion of phenotypic variance explained (R^2) by ANOVA for the evaluation of the genotype effect on WSC and starch. The table corresponds to the ANOVA evaluation of the measurements described in Figure 6 and Table 1. * $p < 0.01$

	Glucose	Fructose	Sucrose	Starch	Biomass
Genotype ED df	11	11	11	11	11
Error ED df	77	77	77	78	78
SS Error ED	41.2	81.8	395	21700	0.854
SS Total ED	68.8	158	567	74900	1.33
F - value ED	4.70*	6.51*	3.04*	17.4*	3.91*
R^2 ED	0.402	0.482	0.303	0.790	0.356
Genotype EN df	11	11	11	11	11
Error EN df	75	75	75	74	75
SS Error EN	85.9	33.0	185	694	0.330
SS Total EN	104	41.3	251	1104	0.529
F - value EN	1.44	1.70	2.44	3.97*	4.13*
R^2 EN	0.175	0.199	0.264	0.371	0.377