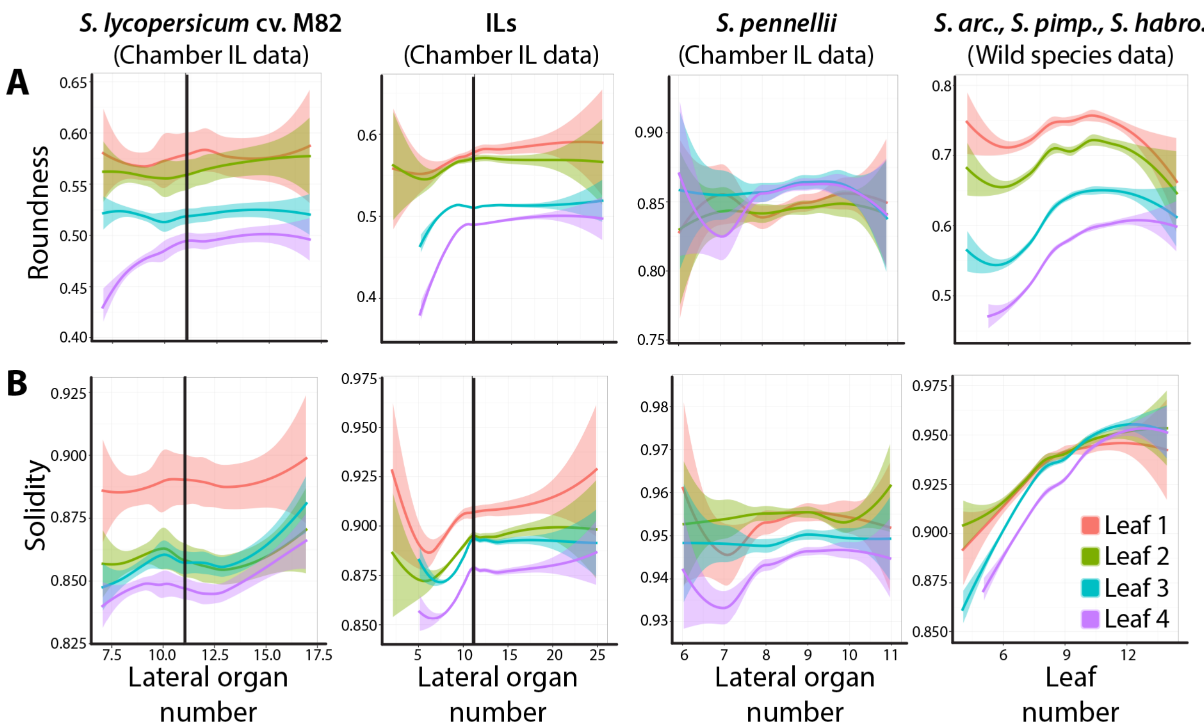
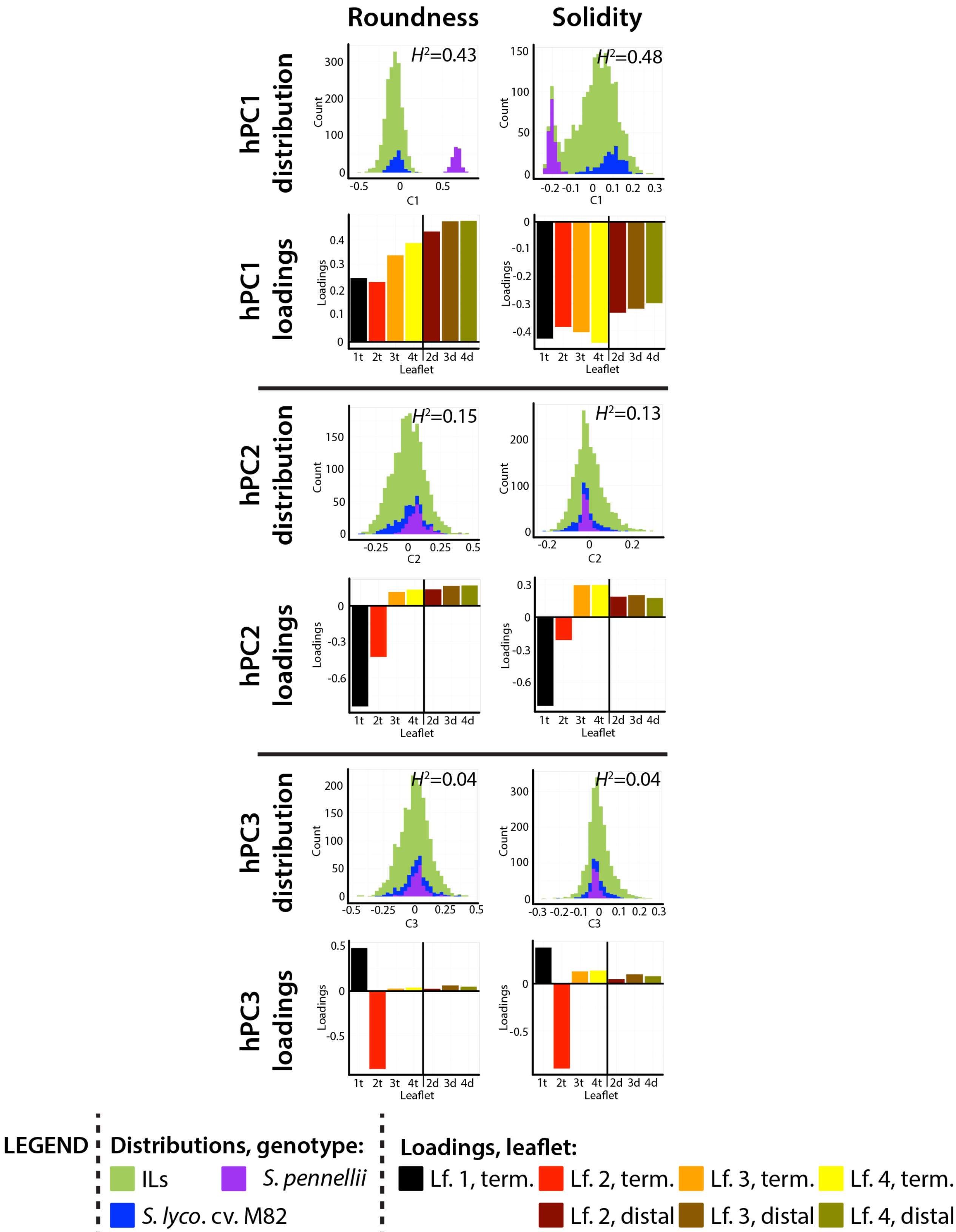
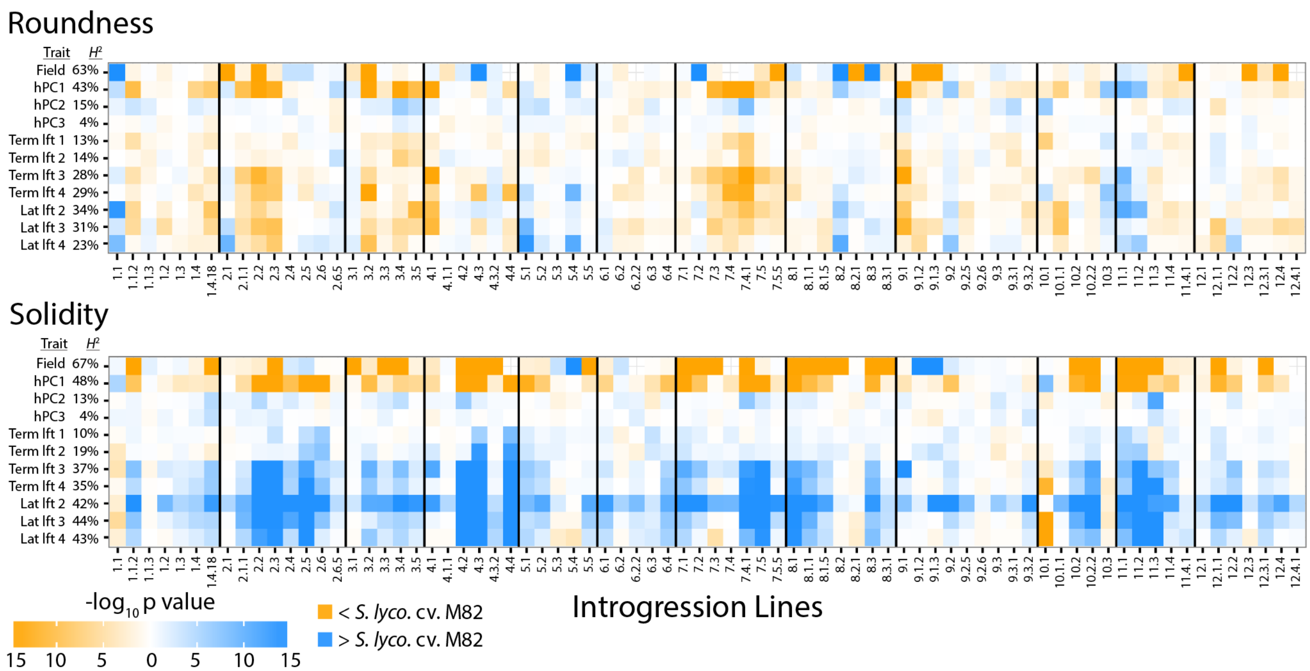


Supplemental Figure 1: Heteroblasty and ontogeny modulate leaf shape. As in Fig. 3, loess models are provided for A) Roundness and B) Solidity as a function of plant age measured in lateral organ number for leaves 1-4. Leaves 1-4 are indicated by red, green, blue, and purple, respectively, with 95% confidence bands.



Supplemental Figure 2: Genetic effects modulating the overall shape of all leaves versus the shape of specific leaves in the heteroblastic series. As in Fig. 4, hPCA information is provided for roundness (left) and solidity (right). For each hPC, the distribution of hPC values for S. lycopersicum (blue), S. pennellii (purple), and the ILs (green) is shown as a histogram and broad sense heritability (H2) values provided. Loadings for each hPC are also provided, showing the weighted contribution of shape attribute values for different leaflets to the hPC score. Black, leaf 1; red, leaf 2; orange, leaf 3; yellow, leaf 4; lighter shades of red, orange, and yellow represent terminal leaflets; darker shades of red, orange, and yellow represent distal lateral leaflets.



Supplemental Figure 3: Overlapping and distinct Quantitative Trait Loci (QTL) regulating leaf shape. As in Fig. 5, p values of QTLs regulating leaf shape in the S. pennellii ILs are shown by color. For each shape attribute, QTLs for leaf shape calculated from hPCs 1-3 (see Fig. 4) and terminal leaflets from leaves 1-4 ("term. lft.") and distal lateral leaflets 2-4 ("lat. lft.") are provided. Broad-sense heritability (H2) for each trait is shown. Additionally, shape QTL calculated in Chitwood et al. 2013a under field conditions are shown for comparison. Orange, p values for QTL decreasing trait values relative to the S. lycopersicum cv. M82 parent; Blue, p values for QTL increasing trait values relative to the domesticated parent.

PCA	Publication	Sources	Sampling	Germplasm
wildPCs	Chitwood et al. (2012a) *Plant Physiol.* **158:** 1230-4	Wild species	n=11,033	8 accessions each of *S. arcanum*, *S. habrochaites*, and *S. pimpinellifolium*
fieldPCs	Chitwood et al. (2013a) *Plant Cell* **25:** 2465-81	Field	n=11,268	76 *S. pennellii* ILs
allPCs	Chitwood et al. (2012a) *Plant Physiol.* **158:** 1230-4 Chitwood et al. (2013a) *Plant Cell* **25:** 2465-81 New leaflets from chamber-grown ILs	Chamber, wild species, field	n=56,139	Wild tomato germplasm, 76 ILs (from field), 76 ILs (new chamber-grown leaflets)
asymmetry PCs ("asymPCs")	Chitwood et al. (2012a) *Plant Physiol.* **158:** 1230-4 Chitwood et al. (2013a) *Plant Cell* **25:** 2465-81 New leaflets from chamber-grown ILs	Chamber, wild species, field	n=56,139	Wild tomato germplasm, 76 ILs (from field), 76 ILs (new chamber-grown leaflets)
heteroblasty PCs ("hPCs")	New leaflets from chamber-grown ILs	Chamber	n=14,028	76 ILs (new chamber-grown leaflets)
chamber-field PCs ("cfPCs")	New leaflets from chamber-grown ILs and Chitwood et al. (2013a) *Plant Cell* **25:** 2465-81	Chamber, field	n=45,106	76 ILs (from field), 76 ILs (new chamber-grown leaflets)

Supplemental Table 1: Principal Component Analyses (PCAs) used in this study. For each PCA in this study, the designated prefix used to denote PCs ("PCA"), the publications from which data is derived ("Publication"), the sources of leaflets used ("Sources"), the number of leaflets sampled ("Sampling"), the germplasm from which leaflets are derived ("Germplasm"), and the type of data analyzed in the PCA ("Analysis") is provided. See text for further details.