**Table S1:** Genetic basis to willow-gall and gall-parasitoid interaction networks.

|  |  |  |  |
| --- | --- | --- | --- |
| **Response** | **df** | ***F*** or **χ2** | ***P*** |
| Gall size1 |  |  |  |
| Leaf gall | 23,57 | 2.17 | **0.009** |
| Bud gall | 21,44 | 0.98 | 0.504 |
| apical-Stem gall | 16,12 | 0.29 | 0.988 |
| Gall abundance2 | 25,119 | 202.40 | **0.001** |
| Leaf gall |  | 74.60 | **0.001** |
| Bud gall |  | 55.02 | **0.006** |
| apical-Stem gall |  | 44.47 | **0.042** |
| mid-Stem gall |  | 28.27 | 0.295 |
| Gall composition3 | 22,89 | 1.96 | **0.001** |
| Gall-parasitoid link abundance2 | 25,119 | 357.10 | **0.001** |
| Leaf gall |  |  |  |
| *Platygaster* sp. |  | 79.51 | **0.001** |
| Mesopolobus sp. |  | 50.00 | **0.009** |
| *Torymus* sp. |  | 60.11 | **0.001** |
| Eulophid |  | 32.96 | 0.105 |
| Mymarid |  | 6.37 | 0.448 |
| Bud gall |  |  |  |
| *Platygaster* sp. |  | 18.04 | 0.276 |
| *Mesopolobus* sp. |  | 6.37 | 0.497 |
| *Torymus* sp. |  | 39.81 | *0.079* |
| Eulophid |  | 18.09 | 0.492 |
| *Lestodiplosis* sp. |  | 16.05 | 0.552 |
| apical-Stem gall |  |  |  |
| *Torymus* sp. |  | 23.13 | **0.048** |
| mid-Stem gall |  |  |  |
| *Platygaster* sp. |  | 6.64 | 0.452 |
| Gall-parasitoid composition3 | 12,45 | 1.57 | **0.007** |
| Gall parasitism4 |  |  |  |
| Leaf gall | 23,58 | 75.79 | **<0.001** |
| *Platygaster* sp. |  | 93.47 | **<0.001** |
| *Mesopolobus* sp. |  | 42.56 | **0.008** |
| *Torymus* sp. |  | 42.92 | **0.007** |
| Eulophid |  | 29.55 | 0.163 |
| Mymarid |  | 3.97 | 0.999 |
| Bud gall | 21,46 | 49.84 | *0.072* |
| apical-Stem gall | 18,12 | 15.69 | 0.614 |
| Plant-insect food web composition3 | 22,89 | 1.90 | **0.001** |

Notes: 1GLM (error distribution = Gaussian, link function = identity), log-transformed; 2multivariate GLM (error distribution = negative binomial, link function = log); 3PERMANOVA on Bray-Curtis dissimilarities (999 permutations);

4GLM (error distribution = binomial, link function = logit). P-values in bold (P < 0.05), italics (P < 0.10), and normal font (P > 0.10) denote degree of statistical significance.

**Table S2:** Pearson correlations (*r*) of gall sizes and abundances that varied among willow genotypes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | LG size | LG abundance | BG abundance | ASG abundance |
| Leaf gall size | 1 | 0.03 | -0.11 | -0.04 |
| Leaf gall  abundance | *0.02* | 1 | **0.19** | 0.03 |
| Bud gall  abundance | *0.08* | ***0.44*** | 1 | 0.13 |
| Apical-Stem gall  abundance | *0.02* | *0.31* | *0.30* | 1 |

Notes: Italicized values below the diagonal represent genetic correlations (n = 24 between leaf gall size and gall abundances, n = 26 between gall abundances), while values above the diagonal represent phenotypic correlations (n = 81 between leaf gall size and gall abundances, n = 145 between gall abundances). Statistically significant correlations (*P* < 0.05) are indicated in boldface type.

**Table S2:** Models explaining insect food web responses to genetic variation in coastal willow (*Salix hookeriana*). Final models were determined using AIC and likelihood-ratio tests.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Response** | **Predictors** | | | |
| **Gall size1** | **Salicylates/**  **Tannins PC1** | **Flavones/**  **Flavonols PC1** |  |  |
| Leaf gall | **-0.20** | **-0.26** |  |  |
| **Gall abundance2** | **C:N** | **Flavanones/**  **Flavanonols PC1** | **Plant size** |  |
| Leaf gall | *0.04* | -0.03 | -0.36 |  |
| Bud gall | *0.08* | -0.07 | **-1.01** |  |
| apical-Stem gall | 0.01 | **0.46** | 0.26 |  |
| mid-Stem gall | 0.02 | -1.81 | -*4.77* |  |
| **Gall-parasitoid link abundance2** | **Leaf gall**  **size** | **Leaf gall abundance** | **Bud gall abundance** | **apical-Stem gall abundance** |
| Leaf gall |  |  |  |  |
| *Platygaster* sp. | **-0.22** | **1.22** | 0.20 | -0.15 |
| *Mesopolobus* sp. | **-0.27** | **0.90** | -0.26 | 0.44 |
| *Torymus* sp. | *0.19* | **0.76** | -0.30 | 0.72 |
| Eulophid | -*0.24* | 0.71 | 0.45 | -1.09 |
| Mymarid | -1.67 | **20.83** | -2.07 | 3.35 |
| Bud gall |  |  |  |  |
| *Platygaster* sp. | 0.43 | 0.23 | **5.81** | -14.25 |
| *Mesopolobus* sp. | 0.16 | 0.30 | 0.77 | 1.95 |
| *Torymus* sp. | **-0.17** | 0.31 | **1.39** | -0.43 |
| Eulophid | 0.15 | 0.51 | **1.83** | 0.08 |
| *Lestodiplosis* sp. | 0.04 | -0.61 | *1.46* | 1.75 |
| apical-Stem gall |  |  |  |  |
| *Torymus* sp. | -0.12 | 0.05 | -0.64 | **4.09** |
| mid-Stem gall |  |  |  |  |
| *Platygaster* sp. | 1.54 | -*15.03* | 0.53 | -9.23 |

Notes: 1GLM (error distribution = Gaussian, link function = identity), log-transformed; 2multivariate GLM (error distribution = negative binomial, link function = log). P-values in bold (P < 0.05), italics (P < 0.10), and normal font (P > 0.10) denote degree of statistical significance.

**Table S3:** Models explaining the proportion of leaf galls parasitized.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Response** | **Predictor** | **df** | **χ2** | ***P*** |
| Total parasitism | Gall size | 1,79 | 22.28 | **<0.001** |
| *Platygaster* sp. | Gall size | 1,77 | 17.58 | **<0.001** |
|  | Gall abundance | 1,77 | 0.73 | 0.394 |
|  | Gall size x abundance | 1,77 | 8.71 | **0.003** |
| *Mesopolobus* sp. | Gall size | 1,77 | 7.28 | **0.007** |
|  | Gall abundance | 1,77 | 0.29 | 0.588 |
|  | Gall size x abundance | 1,77 | 4.21 | **0.040** |
| *Torymus* sp. | Gall size | 1,78 | 3.83 | *0.050* |
|  | Gall abundance | 1,78 | 5.24 | **0.022** |