**Table S1.** Regression analysis testing for plasticity cost in *I. pumila* leaf traits to high irradiance. Standardized multivariate regression coefficients (β) of leaf traits and their plasticities (*PI*) on performance proxy (mSLA) in Dune and Woods populations. SE = standard error; t = estimate divided by its standard error; *p* = significance level. Bold type indicates regression coefficients (β) significant at the $p < 0.05$ level.

| Trait / *PI* | DUNE | | | | WOODS | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate (β) | SE | t-value | *p* | Estimate (β) | SE | t-value | *p* |
| LDMC | -0.097 | 0.031 | -3.11 | **0.006** | -0.103 | 0.040 | -2.53 | **0.021** |
| SLWC | -0.092 | 0.032 | -2.91 | **0.001** | -0.155 | 0.029 | -5.32 | **<.0001** |
| Chl a | 0.040 | 0.038 | 1.04 | 0.312 | 0.033 | 0.049 | 0.68 | 0.503 |
| Chl b | 0.027 | 0.038 | 0.71 | 0.489 | 0.013 | 0.050 | 0.27 | 0.793 |
| Chl tot | 0.036 | 0.038 | 0.94 | 0.359 | 0.026 | 0.049 | 0.54 | 0.599 |
| Chl a/b ratio | 0.073 | 0.034 | 2.12 | **0.049** | 0.111 | 0.040 | 2.80 | **0.012** |
| Cars | -0.024 | 0.038 | -0.61 | 0.550 | -0.046 | 0.047 | -0.99 | 0.337 |
| POD | -0.079 | 0.032 | -2.41 | **0.028** | -0.122 | 0.039 | -3.11 | **0.006** |
| GR | -0.073 | 0.034 | -2.16 | **0.045** | -0.079 | 0.052 | -1.52 | 0.147 |
| ANTH | -0.110 | 0.027 | -4.01 | **0.001** | -0.061 | 0.045 | -1.35 | 0.194 |
| PHEN | -0.030 | 0.037 | -0.81 | 0.428 | -0.036 | 0.046 | -0.78 | 0.446 |
| ODAC | 0.040 | 0.037 | 1.09 | 0.290 | 0.038 | 0.058 | 0.65 | 0.525 |
| | | | | | | | | |
| *PI* LDMC | -0.008 | 0.031 | -0.27 | 0.788 | 0.023 | 0.040 | 0.58 | 0.570 |
| *PI* SLWC | 0.016 | 0.032 | 0.49 | 0.627 | 0.036 | 0.029 | 1.24 | 0.230 |
| *PI*Chl a | 0.030 | 0.038 | 0.78 | 0.449 | -0.016 | 0.049 | -0.33 | 0.746 |
| *PI* Chl b | 0.020 | 0.038 | 0.53 | 0.601 | -0.016 | 0.050 | -0.32 | 0.753 |
| *PI* Chl tot | 0.027 | 0.038 | 0.70 | 0.495 | -0.017 | 0.049 | -0.35 | 0.730 |
| *PI* Chl a/b ratio | 0.039 | 0.034 | 1.15 | 0.267 | 0.030 | 0.040 | 0.75 | 0.466 |
| *PI* Cars | -0.002 | 0.038 | -0.05 | 0.959 | -0.008 | 0.047 | -0.17 | 0.870 |
| *PI* POD | 0.038 | 0.033 | 1.18 | 0.256 | 0.003 | 0.039 | 0.09 | 0.932 |
| *PI* GR | -0.047 | 0.034 | -1.38 | 0.184 | 0.046 | 0.052 | 0.89 | 0.385 |
| *PI* ANTH | -0.011 | 0.027 | -0.43 | 0.670 | -0.026 | 0.045 | -0.58 | 0.570 |
| *PI* PHEN | 0.015 | 0.037 | 0.40 | 0.694 | 0.028 | 0.046 | 0.60 | 0.557 |
| *PI* ODAC | 0.017 | 0.037 | 0.47 | 0.645 | 0.005 | 0.058 | 0.09 | 0.933 |

**Table S2.** Spearman's correlation coefficients (ϱ) and *p*-values for plasticity indices of *I. pumila* genotypes originating from Dune and Woods populations. The lower triangular part of the table presents correlation coefficients for genotypes from the dune population, whereas the upper triangular part presents those for genotypes from the forest population. Statistically significant correlations ($p < 0.05$) are shown in bold, while marginally significant correlations ($0.05 < p < 0.10$) are shown in italics. For trait acronyms and measurement units see Table 1.

| | ***PIv* SLA** | ***PIv* LDMC** | ***PIv* SLWC** | ***PIv* Chl tot** | ***PIv* Chl a/b** | ***PIv* Cars** | ***PIv* POD** | ***PIv* GR** | ***PIv* ANTH** | ***PIv* PHEN** | ***PIv* ODAC** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***PIv* SLA** | | -0.200<br>0.580 | 0.479<br>0.162 | **-0.770**<br>**0.009** | -0.515<br>0.128 | -0.491<br>0.150 | 0.079<br>0.829 | -0.091<br>0.803 | 0.030<br>0.934 | 0.479<br>0.162 | -0.371<br>0.292 |
| ***PIv* LDMC** | -0.321<br>0.366 | | *-0.612*<br>*0.060* | 0.152<br>0.676 | -0.418<br>0.229 | -0.188<br>0.603 | 0.176<br>0.627 | 0.224<br>0.533 | -0.103<br>0.777 | 0.236<br>0.511 | 0.377<br>0.283 |
| ***PIv* SLWC** | 0.430<br>0.214 | -0.345<br>0.328 | | -0.127<br>0.726 | 0.418<br>0.229 | -0.030<br>0.934 | -0.345<br>0.328 | 0.042<br>0.907 | -0.321<br>0.366 | 0.273<br>0.446 | **-0.802**<br>**0.005** |
| ***PIv* Chl tot** | **-0.624**<br>**0.050** | 0.430<br>0.214 | -0.430<br>0.214 | | *0.588*<br>*0.074* | **0.721**<br>**0.019** | 0.127<br>0.726 | 0.345<br>0.328 | -0.394<br>0.260 | -0.212<br>0.556 | 0.055<br>0.881 |
| ***PIv* Chl a/b** | *-0.612*<br>*0.060* | 0.248<br>0.489 | -0.491<br>0.150 | *0.564*<br>*0.089* | | 0.418<br>0.229 | -0.358<br>0.310 | 0.212<br>0.556 | -0.394<br>0.260 | -0.164<br>0.652 | -0.340<br>0.336 |
| ***PIv* Cars** | -0.127<br>0.726 | 0.054<br>0.881 | 0.285<br>0.425 | 0.491<br>0.150 | 0.515<br>0.128 | | -0.018<br>0.960 | -0.115<br>0.751 | 0.067<br>0.855 | 0.091<br>0.803 | -0.097<br>0.789 |
| ***PIv* POD** | -0.321<br>0.366 | **0.697**<br>**0.025** | -0.139<br>0.701 | 0.212<br>0.556 | 0.176<br>0.627 | -0.200<br>0.580 | | *0.564*<br>*0.089* | -0.127<br>0.726 | -0.212<br>0.556 | *0.559*<br>*0.093* |
| ***PIv* GR** | -0.248<br>0.489 | -0.212<br>0.556 | 0.479<br>0.161 | -0.006<br>0.987 | -0.067<br>0.855 | 0.054<br>0.881 | 0.200<br>0.580 | | -0.382<br>0.276 | 0.018<br>0.960 | 0.194<br>0.590 |
| ***PIv* ANTH** | 0.224<br>0.533 | -0.090<br>0.803 | 0.139<br>0.701 | **-0.745**<br>**0.013** | **-0.697**<br>**0.025** | **-0.661**<br>**0.038** | -0.103<br>0.777 | -0.176<br>0.627 | | 0.091<br>0.803 | 0.194<br>0.590 |
| ***PIv* PHEN** | 0.321<br>0.366 | 0.248<br>0.489 | -0.030<br>0.934 | 0.261<br>0.467 | 0.224<br>0.533 | 0.370<br>0.293 | -0.164<br>0.652 | -0.321<br>0.366 | -0.248<br>0.489 | | -0.371<br>0.292 |
| ***PIv* ODAC** | 0.164<br>0.652 | 0.297<br>0.405 | 0.370<br>0.293 | 0.333<br>0.347 | 0.309<br>0.385 | 0.527<br>0.117 | -0.152<br>0.676 | -0.054<br>0.881 | -0.236<br>0.511 | **0.624**<br>**0.043** | |

**Table S3.** Pearson's correlation coefficients (r) and *p*-values for leaf traits of *I. pumila* genotypes originating from Dune and Woods populations, growing in open (A) and shaded (B) natural habitats. The lower triangular part of the table presents correlation coefficients for genotypes from the dune population, whereas the upper triangular part presents those for genotypes from the forest population. Statistically significant correlations ($p < 0.05$) are shown in bold, while marginally significant correlations ($0.05 < p < 0.10$) are shown in italics. For trait acronyms and measurement units see Table 1.

| A. | SLA | LDMC | SLWC | Chl tot | Chl a/b | Cars | POD | GR | ANTH | PHEN | ODAC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SLA** | | 0.512<br>0.131 | **-0.872**<br>**0.001** | **-0.802**<br>**0.005** | -0.427<br>0.218 | **-0.752**<br>**0.012** | -0.300<br>0.400 | 0.249<br>0.487 | -0.462<br>0.178 | 0.378<br>0.281 | -0.255<br>0.476 |
| **LDMC** | -0.116<br>0.750 | | **-0.837**<br>**0.003** | -0.283<br>0.429 | 0.418<br>0.229 | -0.322<br>0.364 | 0.073<br>0.841 | -0.124<br>0.732 | 0.126<br>0.728 | 0.438<br>0.206 | 0.277<br>0.439 |
| **SLWC** | **-0.699**<br>**0.024** | -0.427<br>0.218 | | **0.659**<br>**0.038** | 0.079<br>0.829 | **0.642**<br>**0.046** | 0.034<br>0.861 | -0.023<br>0.950 | 0.235<br>0.513 | -0.446<br>0.196 | 0.004<br>0.991 |
| **Chl tot** | **-0.806**<br>**0.005** | -0.028<br>0.940 | 0.526<br>0.118 | | *0.558*<br>*0.093* | **0.948**<br>**<.0001** | 0.315<br>0.374 | -0.269<br>0.453 | **0.741**<br>**0.014** | 0.052<br>0.885 | 0.121<br>0.740 |
| **Chl a/b** | **-0.760**<br>**0.011** | 0.071<br>0.846 | 0.321<br>0.365 | **0.880**<br>**0.001** | | 0.465<br>0.176 | 0.271<br>0.449 | -0.174<br>0.631 | **0.621**<br>**0.050** | 0.305<br>0.392 | 0.301<br>0.398 |
| **Cars** | **-0.775**<br>**0.008** | -0.051<br>0.888 | *0.540*<br>*0.107* | **0.991**<br>**<.0001** | **0.857**<br>**0.002** | | 0.360<br>0.307 | -0.256<br>0.475 | **0.838**<br>**0.003** | 0.174<br>0.630 | -0.009<br>0.980 |
| **POD** | -0.202<br>0.576 | **0.788**<br>**0.007** | -0.120<br>0.741 | 0.187<br>0.605 | 0.238<br>0.507 | 0.197<br>0.585 | | 0.118<br>0.746 | -0.178<br>0.623 | 0.332<br>0.349 | -0.422<br>0.224 |
| **GR** | 0.135<br>0.710 | -0.154<br>0.670 | 0.059<br>0.872 | -0.255<br>0.477 | -0.279<br>0.435 | -0.252<br>0.483 | -0.352<br>0.319 | | -0.178<br>0.323 | 0.332<br>0.349 | **-0.688**<br>**0.028** |
| **ANTH** | -0.415<br>0.233 | -0.150<br>0.679 | 0.316<br>0.374 | **0.795**<br>**0.006** | **0.672**<br>**0.033** | **0.860**<br>**0.001** | 0.119<br>0.744 | -0.262<br>0.464 | | 0.510<br>0.132 | 0.019<br>0.959 |
| **PHEN** | **-0.738**<br>**0.015** | 0.037<br>0.920 | 0.464<br>0.177 | **0.890**<br>**0.001** | **0.826**<br>**0.003** | **0.907**<br>**0.0003** | 0.301<br>0.399 | -0.481<br>0.159 | **0.812**<br>**0.004** | | *-0.571*<br>*0.085* |
| **ODAC** | **0.843**<br>**0.002** | -0.182<br>0.615 | -0.436<br>0.208 | **-0.674**<br>**0.032** | **-0.749**<br>**0.013** | **-0.652**<br>**0.041** | -0.141<br>0.698 | 0.122<br>0.736 | -0.428<br>0.217 | **-0.767**<br>**0.010** | |

| B. | SLA | LDMC | SLWC | Chl tot | Chl a/b | Cars | POD | GR | ANTH | PHEN | ODAC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SLA** | | -0.274<br>0.443 | **-0.767**<br>**0.010** | -0.446<br>0.196 | 0.242<br>0.500 | -0.482<br>0.159 | **-0.643**<br>**0.045** | 0.139<br>0.702 | -0.412<br>0.237 | -0.140<br>0.699 | 0.507<br>0.135 |
| **LDMC** | -0.223<br>0.535 | | -0.354<br>0.316 | -0.011<br>0.977 | 0.280<br>0.433 | -0.026<br>0.943 | 0.500<br>0.141 | -0.132<br>0.716 | -0.155<br>0.668 | 0.008<br>0.983 | 0.404<br>0.247 |
| **SLWC** | -0.416<br>0.231 | *-0.584*<br>*0.076* | | 0.498<br>0.143 | -0.295<br>0.408 | *0.551*<br>*0.099* | 0.310<br>0.384 | -0.292<br>0.413 | 0.525<br>0.119 | 0.335<br>0.343 | *-0.593*<br>*0.070* |
| **Chl tot** | -0.270<br>0.451 | 0.160<br>0.660 | 0.324<br>0.361 | | 0.474<br>0.166 | **0.995**<br>**<.0001** | 0.383<br>0.274 | -0.278<br>0.436 | 0.416<br>0.232 | 0.486<br>0.154 | -0.070<br>0.847 |
| **Chl a/b** | 0.292<br>0.414 | -0.116<br>0.751 | 0.051<br>0.889 | -0.418<br>0.229 | | 0.440<br>0.203 | -0.080<br>0.826 | -0.467<br>0.174 | -0.169<br>0.634 | 0.520<br>0.123 | **0.675**<br>**0.032** |
| **Cars** | -0.249<br>0.488 | 0.230<br>0.522 | 0.294<br>0.409 | **0.990**<br>**<.0001** | -0.322<br>0.364 | | 0.390<br>0.265 | -0.324<br>0.360 | 0.453<br>0.189 | 0.512<br>0.128 | -0.068<br>0.852 |
| **POD** | -0.110<br>0.762 | **0.742**<br>**0.014** | -0.290<br>0.416 | *0.574*<br>*0.083* | -0.130<br>0.720 | **0.656**<br>**0.039** | | -0.163<br>0.652 | *0.598*<br>*0.068* | 0.168<br>0.642 | -0.214<br>0.552 |
| **GR** | 0.223<br>0.535 | -0.220<br>0.542 | 0.266<br>0.458 | 0.251<br>0.485 | -0.058<br>0.874 | 0.215<br>0.550 | -0.209<br>0.563 | | -0.264<br>0.460 | **-0.868**<br>**0.001** | -0.473<br>0.168 |
| **ANTH** | -0.240<br>0.505 | 0.075<br>0.837 | -0.127<br>0.726 | *0.586*<br>*0.075* | -0.525<br>0.119 | 0.539<br>0.108 | -0.179<br>0.620 | -0.179<br>0.620 | | 0.504<br>0.138 | -0.410<br>0.239 |
| **PHEN** | 0.326<br>0.357 | 0.191<br>0.598 | 0.121<br>0.739 | 0.231<br>0.521 | 0.371<br>0.291 | 0.328<br>0.355 | 0.212<br>0.557 | 0.212<br>0.557 | -0.361<br>0.306 | | 0.280<br>0.433 |
| **ODAC** | -0.114<br>0.755 | -0.438<br>0.206 | 0.042<br>0.907 | -0.511<br>0.131 | 0.084<br>0.817 | *-0.572*<br>*0.084* | **-0.674**<br>**0.032** | -0.465<br>0.175 | -0.018<br>0.960 | **-0.765**<br>**0.010** | |