**Table S6** Correlation analysis between genetic diversity and climatic factors by Mantel test.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **overall** | | | | | | **XJ** | | | | | | |
|  | | GD | Hj | Ho | Ne | NPL | | GD | Hj | Ho | Ne | NPL |
| Climate (all) | | 0.6201\*\* | 0.2546 | 0.2528 | 0.2727 | 0.2126 | | -0.4699 | 0.2469 | -0.2098 | 0.0108 | -0.3200 |
| AMT | | 0.1747 | 0.0326 | -0.0135 | -0.0072 | -0.0536 | | -0.9710\* | -0.0228 | -0.3100 | -0.4334 | -0.0293 |
| Alt | | 0.4873\*\* | 0.1346 | 0.0809 | 0.0868 | 0.0549 | | -0.8443 | -0.1956 | -0.0846 | -0.3466 | -0.0155 |
| MTW | | 0.3345\*\* | 0.1429 | -0.0943 | -0.0738 | -0.1347 | | -0.9307\* | -0.1709 | -0.3488 | -0.4853 | -0.3219 |
| MTC | | -0.0111 | 0.1965 | -0.0790 | -0.0624 | -0.1181 | | -0.9759\* | 0.0459 | -0.3611 | -0.3664 | -0.2321 |
| MTD | | 0.6463\*\* | 0.4139\* | -0.0132 | -0.0085 | -0.0514 | | -0.9249\* | 0.1217 | -0.2198 | -0.2780 | -0.2321 |
| PD | | 0.3121\* | -0.1185 | 0.4354\*\* | 0.4241\*\* | 0.4676\*\* | | -0.2203 | 0.3136 | 0.0866 | 0.2824 | -0.0417 |
| PC | | 0.3752\* | -0.0875 | 0.4114\*\* | 0.4155\*\* | 0.4040\*\* | | -0.2203 | 0.3136 | 0.0866 | 0.2824 | -0.0417 |
| MTmax | | 0.2780\* | 0.1081 | -0.1060 | -0.0856 | -0.1456 | | -0.9408\* | -0.1384 | -0.3369 | -0.4757 | -0.3107 |
| MTmin | | 0.2458 | 0.1260 | -0.1520 | -0.1350 | -0.1855 | | -0.9811\* | -0.9811\* | -0.3439 | -0.4514 | -0.3320\* |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **KZ** | | | | | | **MGL** | | | | | |
|  | GD | Hj | Ho | Ne | NPL | GD | | Hj | Ho | Ne | NPL |
| Climate (all) | 0.2201 | 0.5055 | 0.3386 | 0.2685 | 0.4938 | 0.9968 | | 0.9803 | 0.8636 | 0.8317 | 0.9236 |
| AMT | -0.2535 | -0.0517 | 0.5514 | 0.4958 | 0.6122 | 0.0208 | | -0.2555 | -0.5548 | -0.6039 | -0.4379 |
| Alt | -0.0875 | -0.1186 | 0.7092 | 0.6344 | 0.7991 | 0.9749 | | 0.9985 | 0.9271 | 0.9028 | 0.9691 |
| MTW | -0.0188 | -0.2846 | 0.7820 | 0.7287 | 0.8139 | 0.7615 | | 0.5534 | 0.2540 | 0.1952 | 0.3817 |
| MTC | -0.0590 | 0.4452 | -0.3442 | -0.3953 | -0.1986 | 0.7829 | | 0.5812 | 0.2864 | 0.2281 | 0.4126 |
| MTD | 0.3739 | -0.5073 | 0.9815 | 0.9331 | 0.9957 | 0.9439 | | 0.8164 | 0.5855 | 0.5355 | 0.6892 |
| PD | -0.2314 | -0.1991 | 0.7155 | 0.6621 | 0.7585 | -0.7557 | | -0.9069 | -0.9945 | -0.9990 | -0.9713 |
| PC | 0.1943 | -0.4625 | 0.4737 | 0.3780 | 0.5196 | -0.8660 | | -0.9703 | -0.9964 | -0.9894 | -0.9988 |
| MTmax | -0.0939 | -0.2096 | 0.7182 | 0.6671 | 0.7561 | 0.7850 | | 0.5839 | 0.2897 | 0.2314 | 0.4157 |
| MTmin | -0.0430 | -0.2752 | 0.7565 | 0.7007 | 0.7908 | 0.7808 | | 0.5784 | 0.2832 | 0.2248 | 0.4095 |

Note: AMT, Annual mean temperature; MTW, Max temperature of warmest month; MTC, Mean temperature of coldest quarter; MTD, Mean temperature of driest quarter; PD, Precipitation of driest quarter; PC, Precipitation of coldest quarter; MTmax, Mean maximum temperature from May to August; MTmin, Mean minimum temperature from May to August; GD, Genetic distance; Climate (all), comprehensive climate, namely the combination of all climate factors. \* = *P* ＜ 0.05, \*\* = *P* ＜ 0.01.