**Table S1** Geographic and climatic information, δ18O of precipitation, and community △18O for sampling sites in Loess (LP), Inner Mongolia (MP), and Tibetan (TP), Plateau.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Site | Longitude  (°E) | Latitude  (°N) | Elevation  (m) | Aridity | Temperature  (℃) | | Tempmax  (℃) | Precipitation  (mm) | | Solar radiation  (kJ m-2 day-1) | | VPD  (kPa) | | SM  (m3 m-3) | δ18OP (‰) | | △18O(‰) |
| Year | GSW |  | Year | GS | Year | GS | Year | GS | GS | Year | GS |  |
| LP01 | 113.36 | 36.29 | 804 | 0.57 | 11.85 | 18.19 | 29.6 | 599 | 546 | 12.95 | 15.60 | 4.78 | 7.53 | 0.16 | -8.70 | -6.92 | 26.82±0.84 |
| LP02 | 112.29 | 35.99 | 894 | 0.60 | 9.96 | 17.60 | 29.2 | 549 | 501 | 13.31 | 16.04 | 3.57 | 7.41 | 0.17 | -8.80 | -6.86 | 28.78±1.73 |
| LP03 | 111.64 | 35.99 | 833 | 0.64 | 10.66 | 18.61 | 30.0 | 520 | 475 | 12.69 | 15.65 | 4.04 | 8.59 | 0.13 | -8.70 | -6.79 | 30.30±1.77 |
| LP04 | 110.18 | 36.07 | 966 | 0.63 | 10.72 | 18.03 | 29.9 | 519 | 478 | 14.25 | 17.02 | 4.52 | 8.45 | 0.15 | -9.10 | -7.09 | 29.68±1.00 |
| LP05 | 109.24 | 36.74 | 1268 | 0.65 | 9.50 | 16.99 | 28.7 | 492 | 458 | 15.34 | 18.28 | 4.13 | 8.00 | 0.12 | -9.20 | -7.18 | 27.64±0.96 |
| LP06 | 107.92 | 36.93 | 1383 | 0.68 | 7.46 | 15.71 | 27.8 | 424 | 394 | 15.32 | 18.31 | 2.53 | 6.44 | 0.12 | -8.60 | -6.74 | 28.75±1.39 |
| LP07 | 107.19 | 37.58 | 1535 | 0.75 | 5.23 | 15.61 | 27.6 | 340 | 311 | 15.62 | 18.97 | 1.88 | 7.51 | 0.07 | -7.70 | -6.01 | 32.42±0.86 |
| LP08 | 105.78 | 37.42 | 1293 | 0.85 | 5.87 | 16.94 | 28.8 | 222 | 211 | 15.53 | 18.95 | 2.01 | 8.71 | 0.10 | -6.80 | -5.08 | 30.77±1.95 |
| LP09 | 104.92 | 37.44 | 1378 | 0.87 | 7.56 | 16.50 | 28.1 | 196 | 183 | 15.49 | 18.74 | 3.99 | 9.44 | 0.10 | -6.30 | -4.69 | 32.00±2.38 |
| LP10 | 104.44 | 37.46 | 1714 | 0.87 | 7.71 | 15.31 | 26.8 | 189 | 179 | 15.56 | 18.77 | 4.75 | 9.06 | 0.10 | -6.70 | -4.83 | 34.60±1.39 |
| Trend |  |  |  |  | 0.009 | 0.035 | 0.024 | <0.001 | <0.001 | 0.012 | 0.005 | 0.445 | 0.058 | 0.007 | <0.001 | <0.001 |  |
| NM01 | 123.51 | 44.59 | 144 | 0.68 | 5.10 | 16.60 | 29.6 | 425 | 410 | 13.67 | 17.28 | 1.11 | 6.98 | 0.17 | -9.20 | -7.14 | 32.54±0.90 |
| NM02 | 121.04 | 44.52 | 269 | 0.73 | 5.80 | 16.66 | 30 | 393 | 378 | 14.73 | 18.44 | 2.56 | 8.59 | 0.11 | -9.60 | -7.52 | 32.49±0.71 |
| NM03 | 120.33 | 45.11 | 660 | 0.71 | 3.72 | 13.60 | 27.4 | 387 | 372 | 14.94 | 18.81 | 2.30 | 6.74 | 0.15 | -10.60 | -8.36 | 32.28±0.65 |
| NM04 | 118.36 | 44.77 | 1019 | 0.71 | 0.56 | 12.03 | 26.2 | 345 | 320 | 15.09 | 19.20 | 1.11 | 5.96 | 0.14 | -11.40 | -8.84 | 34.23±0.39 |
| NM05 | 116.52 | 44.26 | 1129 | 0.77 | 1.17 | 12.27 | 26.2 | 283 | 267 | 15.21 | 19.35 | 1.53 | 6.50 | 0.11 | -11.40 | -8.67 | 34.22±1.52 |
| NM06 | 116.67 | 43.55 | 1272 | 0.73 | 0.16 | 11.74 | 25.4 | 321 | 304 | 15.34 | 19.31 | 1.03 | 5.95 | 0.11 | -11.60 | -8.80 | 33.00±0.79 |
| NM07 | 117.68 | 44.51 | 1024 | 0.73 | 1.96 | 12.10 | 26.3 | 319 | 298 | 14.88 | 18.99 | 1.70 | 5.94 | 0.14 | -11.30 | -8.56 | 34.31±0.37 |
| NM08 | 114.89 | 44.01 | 1101 | 0.83 | 0.10 | 12.94 | 27.4 | 228 | 219 | 15.36 | 19.53 | 1.33 | 7.67 | 0.09 | -10.40 | -7.87 | 36.17±0.29 |
| NM09 | 113.50 | 43.84 | 1022 | 0.86 | 2.47 | 14.20 | 28.3 | 199 | 190 | 15.59 | 19.76 | 2.49 | 9.00 | 0.06 | -9.00 | -7.16 | 35.59±0.63 |
| NM10 | 112.15 | 43.63 | 955 | 0.88 | 3.69 | 14.87 | 30.1 | 183 | 169 | 15.35 | 19.57 | 2.96 | 9.46 | 0.06 | -8.40 | -6.48 | 35.56±0.21 |
| Trend |  |  |  |  | 0.626 | 0.995 | 0.450 | <0.001 | <0.001 | 0.026 | 0.018 | 0.104 | 0.015 | <0.001 | 0.134 | 0.101 |  |
| TP01 | 95.45 | 31.46 | 4104 | 0.40 | 0.41 | 5.70 | 17.2 | 606 | 572 | 17.76 | 19.94 | 1.71 | 2.61 | 0.19 | -16.40 | -14.22 | 31.53±1.35 |
| TP02 | 93.53 | 31.85 | 4509 | 0.37 | -1.50 | 3.14 | 15.4 | 593 | 560 | 17.57 | 20.02 | 1.72 | 2.17 | 0.21 | -17.70 | -15.86 | 32.25±1.65 |
| TP03 | 92.01 | 31.64 | 4587 | 0.61 | -4.37 | 4.40 | 17 | 430 | 414 | 18.62 | 20.91 | 1.06 | 3.39 | 0.26 | -18.00 | -16.50 | 34.00±0.17 |
| TP04 | 90.74 | 31.38 | 4617 | 0.65 | -6.76 | 5.89 | 17.8 | 426 | 414 | 18.99 | 21.41 | 0.34 | 4.27 | 0.17 | -18.40 | -16.57 | 39.17±1.41 |
| TP05 | 89.72 | 31.54 | 4588 | 0.67 | -3.06 | 6.93 | 19.2 | 426 | 412 | 18.80 | 21.27 | 1.51 | 4.94 | 0.15 | -18.20 | -16.39 | 37.77±0.51 |
| TP06 | 87.82 | 31.87 | 4570 | 0.79 | -2.57 | 6.77 | 19.2 | 286 | 261 | 19.27 | 22.01 | 2.18 | 5.50 | 0.15 | -16.50 | -14.99 | 39.07±1.32 |
| TP07 | 85.84 | 31.92 | 4938 | 0.90 | -3.77 | 3.74 | 17.6 | 125 | 95 | 19.28 | 22.22 | 2.49 | 4.70 | 0.13 | -15.20 | -13.71 | 35.54±0.74 |
| TP08 | 83.34 | 32.41 | 4578 | 0.94 | -3.90 | 5.71 | 20.1 | 75 | 62 | 18.99 | 22.08 | 2.32 | 5.77 | 0.11 | -14.40 | -12.85 | 38.56±1.43 |
| TP09 | 81.23 | 32.30 | 4558 | 0.92 | -3.49 | 5.29 | 19.3 | 102 | 89 | 19.41 | 22.50 | 2.37 | 5.45 | 0.07 | -15.10 | -12.78 | 36.99±0.51 |
| TP10 | 80.15 | 32.48 | 4328 | 0.93 | -1.27 | 6.73 | 21.5 | 89 | 78 | 19.86 | 23.12 | 3.10 | 6.33 | 0.09 | -14.70 | -12.41 | 42.34±0.60 |
| Trend |  |  |  |  | 0.356 | 0.360 | 0.006 | <0.001 | <0.001 | <0.001 | <0.001 | 0.069 | <0.001 | 0.006 | 0.027 | 0.039 |  |

Tempmax, maximum temperature ; VPD, vapor deficit pressure; SM, soil moisture; δ18OP, the δ18O of precipitation; GSW, growing season. Trend indicates variation in variables along the aridity gradient.

**Table S2** Differences in climatic variables among three transects.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Transect | Period | Mean | Standard deviation |  | Minimum | Maximum | P value |
| Aridity | LP | Year | 0.71 | 0.12 |  | 0.57 | 0.87 | 0.693 |
| MP | 0.76 | 0.07 |  | 0.68 | 0.88 |
| TP | 0.72 | 0.21 |  | 0.37 | 0.94 |
| Precipitation | LP | Year | 405 | 157 |  | 189 | 599 | 0.329 |
| MP | 308 | 84 |  | 183 | 425 |
| TP | 316 | 208 |  | 75 | 606 |
| LP | Growing  season | 374 | 141 |  | 179 | 546 | 0.408 |
| MP | 293 | 82 |  | 169 | 410 |
| TP | 296 | 204 |  | 62 | 572 |
| Soil  moisture | LP | Growing  season | 0.12 | 0.03 |  | 0.07 | 0.17 | 0.148 |
| MP | 0.11 | 0.04 |  | 0.06 | 0.17 |
| TP | 0.15 | 0.06 |  | 0.07 | 0.26 |
| Vapor  Pressure  deficit | LP | Year | 3.62a | 1.10 |  | 1.88 | 4.78 | <0.001 |
| MP | 1.81b | 0.71 |  | 1.03 | 2.96 |
| TP | 1.88b | 0.79 |  | 0.34 | 3.10 |
| LP | Growing  season | 8.11a | 0.91 |  | 6.44 | 9.44 | <0.001 |
| MP | 7.28a | 1.33 |  | 5.94 | 9.46 |
| TP | 4.51b | 1.39 |  | 2.17 | 6.33 |
| Solar  radiation | LP | Year | 14.61b | 1.19 |  | 12.69 | 15.62 | <0.001 |
| MP | 15.02b | 0.54 |  | 13.67 | 15.59 |
| TP | 18.86a | 0.72 |  | 17.57 | 19.86 |
| LP | Growing  season | 17.63c | 1.41 |  | 15.60 | 18.97 | <0.001 |
| MP | 19.02b | 0.72 |  | 17.28 | 19.76 |
| TP | 21.55a | 1.04 |  | 19.94 | 23.12 |
| Temperature | LP | Year | 8.65c | 2.21 |  | 5.23 | 11.85 | <0.001 |
| MP | 2.47b | 2.04 |  | 0.10 | 5.80 |
| TP | -3.03a | 1.96 |  | -6.76 | 0.41 |
| LP | Growing  season | 16.95c | 1.16 |  | 15.31 | 18.61 | <0.001 |
| MP | 13.70b | 1.84 |  | 11.74 | 16.66 |
| TP | 5.43a | 1.30 |  | 3.14 | 6.93 |
| Maximum  temperature | LP |  | 28.65a | 1.06 |  | 26.80 | 30.00 | <0.001 |
| MP | 27.69a | 1.73 |  | 25.40 | 30.10 |
| TP | 18.43b | 1.76 |  | 15.40 | 21.50 |

LP: Loess Plateau; MP, Inner Mongolia Plateau; TP, Tibet Plateau. Lowercase letters indicate significant differences among transects (P<0.05).

**Table S3** Species’ information in Loess (LP), Inner Mongolia (MP), and Tibetan (TP), Plateau.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Transect | Site | Species | Genus | Family |
| LP | 1 | Allium tenuissimum | Allium | Amaryllidaceae |
| LP | 1 | Artemisia annua | Artemisia | Compositae |
| LP | 1 | Artemisia scoparia | Artemisia | Compositae |
| LP | 1 | Bothriochloa ischaemum | Bothriochloa | Poaceae |
| LP | 1 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 1 | Cirsium arvense | Cirsium | Compositae |
| LP | 1 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 1 | Cynanchum thesioides | Cynanchum | Apocynaceae |
| LP | 1 | Erigeron canadensis | Erigeron | Compositae |
| LP | 1 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 1 | Lespedeza bicolor | Lespedeza | Fabaceae |
| LP | 1 | Leymus chinensis | Leymus | Poaceae |
| LP | 1 | Medicago ruthenica | Medicago | Fabaceae |
| LP | 1 | Polygala tenuifolia | Polygala | Polygalaceae |
| LP | 1 | Rubia cordifolia | Rubia | Rubiaceae |
| LP | 1 | Salix gordejevii | Salix | Salicaceae |
| LP | 1 | Ulmus pumila | Ulmus | Ulmaceae |
| LP | 1 | Vicia amoena | Vicia | Fabaceae |
| LP | 1 | Viola philippica | Viola | Violaceae |
| LP | 1 | Youngia japonica | Youngia | Compositae |
| LP | 1 | Ziziphus jujuba | Ziziphus | Rhamnaceae |
| LP | 1 |  |  | Scrophulariaceae |
| LP | 2 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 2 | Agropyron cristatum | Agropyron | Poaceae |
| LP | 2 | Anemone chinensis | Anemone | Ranunculaceae |
| LP | 2 | Artemisia lavandulifolia | Artemisia | Asteraceae |
| LP | 2 | Astragalus scaberrimus | Astragalus | Fabaceae |
| LP | 2 | Bothriochloa ischaemum | Bothriochloa | Poaceae |
| LP | 2 | Caragana sinica | Caragana | Fabaceae |
| LP | 2 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 2 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 2 | Cleistogenes songorica | Cleistogenes | Poaceae |
| LP | 2 | Dianthus chinensis | Dianthus | Caryophyllaceae |
| LP | 2 | Echinops sphaerocephalus | Echinops | Compositae |
| LP | 2 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| LP | 2 | Incarvillea sinensis | Incarvillea | Bignoniaceae |
| LP | 2 | Lespedeza davurica | Lespedeza | Fabaceae |
| LP | 2 | Lespedeza juncea | Lespedeza | Fabaceae |
| LP | 2 | Patrinia scabiosifolia | Patrinia | Caprifoliaceae |
| LP | 2 | Periploca sepium | Periploca | Apocynaceae |
| LP | 2 | Plantago depressa | Plantago | Plantaginaceae |
| LP | 2 | Poa annua | Poa | Poaceae |
| LP | 2 | Polygala tenuifolia | Polygala | Polygalaceae |
| LP | 2 | Potentilla supina | Potentilla | Rosaceae |
| LP | 2 | Rosa xanthina | Rosa | Rosaceae |
| LP | 2 | Rubia cordifolia | Rubia | Rubiaceae |
| LP | 2 | Saussurea japonica | Saussurea | Compositae |
| LP | 2 | Scorzonera sinensis | Scorzonera | Compositae |
| LP | 2 | Setaria viridis | Setaria | Poaceae |
| LP | 2 | Themeda triandra | Themeda | Poaceae |
| LP | 2 | Thymus mongolicus | Thymus | Lamiaceae |
| LP | 2 | Tripolium pannonicum | Tripolium | Compositae |
| LP | 2 | Viola philippica | Viola | Violaceae |
| LP | 2 | Ziziphus jujuba | Ziziphus | Rhamnaceae |
| LP | 3 | Agropyron cristatum | Agropyron | Poaceae |
| LP | 3 | Artemisia leucophylla | Artemisia | Compositae |
| LP | 3 | Astragalus scaberrimus | Astragalus | Fabaceae |
| LP | 3 | Bothriochloa ischaemum | Bothriochloa | Poaceae |
| LP | 3 | Bupleurum chinense | Bupleurum | Apiaceae |
| LP | 3 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 3 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 3 | Cleistogenes songorica | Cleistogenes | Poaceae |
| LP | 3 | Echinops sphaerocephalus | Echinops | Compositae |
| LP | 3 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 3 | Lespedeza davurica | Lespedeza | Fabaceae |
| LP | 3 | Poa annua | Poa | Poaceae |
| LP | 3 | Poa sphondylodes | Poa | Poaceae |
| LP | 3 | Polygala tenuifolia | Polygala | Polygalaceae |
| LP | 3 | Potentilla discolor | Potentilla | Rosaceae |
| LP | 3 | Potentilla tanacetifolia | Potentilla | Rosaceae |
| LP | 3 | Selaginella tamariscina | Selaginella | Selaginellaceae |
| LP | 3 | Serratula centauroides | Serratula | Compositae |
| LP | 3 | Stipa sibirica | Stipa | Poaceae |
| LP | 3 | Themeda triandra | Themeda | Poaceae |
| LP | 3 | Tripolium pannonicum | Tripolium | Compositae |
| LP | 3 | Viola philippica | Viola | Violaceae |
| LP | 3 | Vitex negundo | Vitex | Lamiaceae |
| LP | 3 | Wikstroemia chamaedaphne | Wikstroemia | Thymelaeaceae |
| LP | 3 | Ziziphus jujuba | Ziziphus | Rhamnaceae |
| LP | 4 | Agropyron cristatum | Agropyron | Poaceae |
| LP | 4 | Agropyron desertorum | Agropyron | Poaceae |
| LP | 4 | Artemisia annua | Artemisia | Compositae |
| LP | 4 | Artemisia argyi | Artemisia | Compositae |
| LP | 4 | Artemisia argyi | Artemisia | Compositae |
| LP | 4 | Artemisia dalailamae | Artemisia | Compositae |
| LP | 4 | Astragalus melilotoides | Astragalus | Fabaceae |
| LP | 4 | Astragalus scaberrimus | Astragalus | Fabaceae |
| LP | 4 | Bothriochloa ischaemum | Bothriochloa | Poaceae |
| LP | 4 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 4 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 4 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| LP | 4 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 4 | Ixeris polycephala | Ixeris | Compositae |
| LP | 4 | Lespedeza bicolor | Lespedeza | Fabaceae |
| LP | 4 | Poa annua | Poa | Poaceae |
| LP | 4 | Polygala sibirica | Polygala | Polygalaceae |
| LP | 4 | Polygala tenuifolia | Polygala | Polygalaceae |
| LP | 4 | Potentilla discolor | Potentilla | Rosaceae |
| LP | 4 | Potentilla tanacetifolia | Potentilla | Rosaceae |
| LP | 4 | Rosa xanthina | Rosa | Rosaceae |
| LP | 4 | Scorzonera sinensis | Scorzonera | Compositae |
| LP | 4 | Vicia amoena | Vicia | Fabaceae |
| LP | 4 | Viola philippica | Viola | Violaceae |
| LP | 4 | Wikstroemia chamaedaphne | Wikstroemia | Thymelaeaceae |
| LP | 4 | Yulania denudata | Yulania | Magnoliaceae? |
| LP | 4 | Ziziphus jujuba | Ziziphus | Rhamnaceae |
| LP | 5 | Artemisia annua | Artemisia | Compositae |
| LP | 5 | Artemisia argyi | Artemisia | Compositae |
| LP | 5 | Artemisia frigida | Artemisia | Compositae |
| LP | 5 | Artemisia japonica | Artemisia | Compositae |
| LP | 5 | Artemisia scoparia | Artemisia | Compositae |
| LP | 5 | Astragalus scaberrimus | Astragalus | Fabaceae |
| LP | 5 | Bothriochloa ischaemum | Bothriochloa | Poaceae |
| LP | 5 | Caragana microphylla | Caragana | Fabaceae |
| LP | 5 | Carduus nutans | Carduus | Compositae |
| LP | 5 | Cirsium arvense | Cirsium | Compositae |
| LP | 5 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 5 | Cleistogenes serotina | Cleistogenes | Poaceae |
| LP | 5 | Cynanchum thesioides | Cynanchum | Apocynaceae |
| LP | 5 | Dracocephalum moldavica | Dracocephalum | Lamiaceae |
| LP | 5 | Eragrostis pilosa | Eragrostis | Poaceae |
| LP | 5 | Erigeron annuus | Erigeron | Compositae |
| LP | 5 | Glycyrrhiza uralensis | Glycyrrhiza | Fabaceae |
| LP | 5 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| LP | 5 | Incarvillea sinensis | Incarvillea | Bignoniaceae |
| LP | 5 | Ixeris polycephala | Ixeris | Compositae |
| LP | 5 | Kalimeris hispida | Kalimeris | Compositae |
| LP | 5 | Koeleria pyramidata | Koeleria | Poaceae |
| LP | 5 | Lespedeza davurica | Lespedeza | Fabaceae |
| LP | 5 | Lespedeza juncea | Lespedeza | Fabaceae |
| LP | 5 | Leymus chinensis | Leymus | Poaceae |
| LP | 5 | Oxytropis myriophylla | Oxytropis | Fabaceae |
| LP | 5 | Poa annua | Poa | Poaceae |
| LP | 5 | Poa sphondylodes | Poa | Poaceae |
| LP | 5 | Polygala sibirica | Polygala | Polygalaceae |
| LP | 5 | Potentilla supina | Potentilla | Rosaceae |
| LP | 5 | Potentilla tanacetifolia | Potentilla | Rosaceae |
| LP | 5 | Rubia cordifolia | Rubia | Rubiaceae |
| LP | 5 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| LP | 5 | Sonchus arvensis | Sonchus | Compositae |
| LP | 5 | Taraxacum mongolicum | Taraxacum | Compositae |
| LP | 5 | Tripolium pannonicum | Tripolium | Compositae |
| LP | 5 | Viola philippica | Viola | Violaceae |
| LP | 5 | Ziziphus jujuba | Ziziphus | Rhamnaceae |
| LP | 6 | Allium senescens | Allium | Liliaceae |
| LP | 6 | Anemone chinensis | Anemone | Ranunculaceae |
| LP | 6 | Artemisia argyi | Artemisia | Compositae |
| LP | 6 | Artemisia japonica | Artemisia | Compositae |
| LP | 6 | Astragalus scaberrimus | Astragalus | Fabaceae |
| LP | 6 | Carduus nutans | Carduus | Compositae |
| LP | 6 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 6 | Cleistogenes serotina | Cleistogenes | Poaceae |
| LP | 6 | Echinops sphaerocephalus | Echinops | Compositae |
| LP | 6 | Elymus dahuricus | Elymus | Poaceae |
| LP | 6 | Imperata cylindrica | Imperata | Poaceae |
| LP | 6 | Kalimeris hispida | Kalimeris | Compositae |
| LP | 6 | Lappula myosotis | Lappula | Boraginaceae |
| LP | 6 | Leontopodium leontopodinum | Leontopodium | Compositae |
| LP | 6 | Lespedeza bicolor | Lespedeza | Fabaceae |
| LP | 6 | Linum usitatissimum | Linum | Linaceae |
| LP | 6 | Medicago ruthenica | Medicago | Fabaceae |
| LP | 6 | Patrinia heterophylla | Patrinia | Caprifoliaceae |
| LP | 6 | Phlomoides umbrosa | Phlomoides | Lamiaceae |
| LP | 6 | Phragmites australis | Phragmites | Poaceae |
| LP | 6 | Poa sphondylodes | Poa | Poaceae |
| LP | 6 | Polygala tenuifolia | Polygala | Polygalaceae |
| LP | 6 | Potentilla chinensis | Potentilla | Rosaceae |
| LP | 6 | Potentilla sericea | Potentilla | Rosaceae |
| LP | 6 | Ranunculus japonicus | Ranunculus | Ranunculaceae |
| LP | 6 | Rubia cordifolia | Rubia | Rubiaceae |
| LP | 6 | Setaria viridis | Setaria | Poaceae |
| LP | 6 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| LP | 6 | Sonchus arvensis | Sonchus | Compositae |
| LP | 6 | Stipa bungeana | Stipa | Poaceae |
| LP | 6 | Stipa capillata | Stipa | Poaceae |
| LP | 6 | Taraxacum mongolicum | Taraxacum | Compositae |
| LP | 6 | Tripolium pannonicum | Tripolium | Compositae |
| LP | 7 | Agropyron cristatum | Agropyron | Poaceae |
| LP | 7 | Artemisia argyi | Artemisia | Compositae |
| LP | 7 | Artemisia scoparia | Artemisia | Compositae |
| LP | 7 | Astragalus adsurgens | Astragalus | Fabaceae |
| LP | 7 | Astragalus galactites | Astragalus | Fabaceae |
| LP | 7 | Astragalus melilotoides | Astragalus | Fabaceae |
| LP | 7 | Astragalus propinquus | Astragalus | Fabaceae |
| LP | 7 | Bassia scoparia | Bassia | Amaranthaceae |
| LP | 7 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 7 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 7 | Cleistogenes songorica | Cleistogenes | Poaceae |
| LP | 7 | Convolvulus arvensis | Convolvulus | Convolvulaceae |
| LP | 7 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| LP | 7 | Haplophyllum dauricum | Haplophyllum | Rutaceae |
| LP | 7 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 7 | Ixeris polycephala | Ixeris | Compositae |
| LP | 7 | Koeleria pyramidata | Koeleria | Poaceae |
| LP | 7 | Lespedeza bicolor | Lespedeza | Fabaceae |
| LP | 7 | Leymus chinensis | Leymus | Poaceae |
| LP | 7 | Medicago ruthenica | Medicago | Fabaceae |
| LP | 7 | Medicago sativa | Medicago | Fabaceae |
| LP | 7 | Melilotus?albus | Melilotus | Leguminosae |
| LP | 7 | Polygonum sibiricum | Polygonum | Polygonaceae |
| LP | 7 | Scorzonera sinensis | Scorzonera | Compositae |
| LP | 7 | Setaria viridis | Setaria | Poaceae |
| LP | 7 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| LP | 7 | Sonchus arvensis | Sonchus | Compositae |
| LP | 7 | Stipa capillata | Stipa | Poaceae |
| LP | 7 | Stipa splendens | Stipa | Poaceae |
| LP | 7 | Suaeda glauca | Suaeda | Amaranthaceae |
| LP | 7 | Taraxacum mongolicum | Taraxacum | Compositae |
| LP | 7 | Thermopsis lanceolata | Thermopsis | Fabaceae |
| LP | 8 | Allium tenuissimum | Allium | Amaryllidaceae |
| LP | 8 | Alopecurus aequalis | Alopecurus | Poaceae |
| LP | 8 | Artemisia scoparia | Artemisia | Compositae |
| LP | 8 | Astragalus galactites | Astragalus | Fabaceae |
| LP | 8 | Astragalus propinquus | Astragalus | Fabaceae |
| LP | 8 | Bassia dasyphylla | Bassia | Amaranthaceae |
| LP | 8 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 8 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 8 | Convolvulus ammannii | Convolvulus | Convolvulaceae |
| LP | 8 | Echinochloa crus-galli | Echinochloa | Poaceae |
| LP | 8 | Eragrostis pilosa | Eragrostis | Poaceae |
| LP | 8 | Peganum harmala | Peganum | Nitrariaceae |
| LP | 8 | Reaumuria soongarica | Reaumuria | Tamaricaceae |
| LP | 8 | Stipa capillata | Stipa | Poaceae |
| LP | 8 | Tragus racemosus | Tragus | Poaceae |
| LP | 8 | Tribulus terrestris | Tribulus | Zygophyllaceae |
| LP | 8 | Zygophyllum mucronatum | Zygophyllum | Zygophyllaceae |
| LP | 9 | Allium mongolicum | Allium | Amaryllidaceae |
| LP | 9 | Allium polyrhizum | Allium | Amaryllidaceae |
| LP | 9 | Artemisia annua | Artemisia | Compositae |
| LP | 9 | Artemisia argyi | Artemisia | Compositae |
| LP | 9 | Artemisia capillaris | Artemisia | Compositae |
| LP | 9 | Artemisia scoparia | Artemisia | Compositae |
| LP | 9 | Asparagus cochinchinensis | Asparagus | Asparagaceae |
| LP | 9 | Astragalus galactites | Astragalus | Fabaceae |
| LP | 9 | Caragana stenophylla | Caragana | Fabaceae |
| LP | 9 | Chloris virgata | Chloris | Poaceae |
| LP | 9 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| LP | 9 | Convolvulus ammannii | Convolvulus | Convolvulaceae |
| LP | 9 | Convolvulus arvensis | Convolvulus | Convolvulaceae |
| LP | 9 | Convolvulus tragacanthoides | Convolvulus | Convolvulaceae |
| LP | 9 | Echinochloa crus-galli | Echinochloa | Poaceae |
| LP | 9 | Euphorbia humifusa | Euphorbia | Euphorbiaceae |
| LP | 9 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 9 | Reaumuria soongarica | Reaumuria | Tamaricaceae |
| LP | 9 | Salsola collina | Salsola | Amaranthaceae |
| LP | 9 | Salsola passerina | Salsola | Amaranthaceae |
| LP | 9 | Stipa capillata | Stipa | Poaceae |
| LP | 9 | Suaeda glauca | Suaeda | Amaranthaceae |
| LP | 9 | Tribulus terrestris | Tribulus | Zygophyllaceae |
| LP | 9 | Zygophyllum mucronatum | Zygophyllum | Zygophyllaceae |
| LP | 10 | Heteropappus altaicus | Heteropappus | Compositae |
| LP | 10 | Lepidium apetalum | Lepidium | Brassicaceae |
| LP | 10 | Saussurea japonica | Saussurea | Compositae |
| LP | 10 | Alopecurus aequalis | Alopecurus | Poaceae |
| LP | 10 | Artemisia ordosica | Artemisia | Compositae |
| LP | 10 | Reaumuria soongarica | Reaumuria | Tamaricaceae |
| LP | 10 | Eragrostis pilosa | Eragrostis | Poaceae |
| LP | 10 | Allium polyrhizum | Allium | Amaryllidaceae |
| LP | 10 | Suaeda glauca | Suaeda | Amaranthaceae |
| LP | 10 | Alopecurus aequalis | Alopecurus | Poaceae |
| LP | 10 | Chenopodium album | Chenopodium | Amaranthaceae |
| LP | 10 | Carex korshinskyi | Carex | Cyperaceae |
| LP | 10 | Artemisia capillaris | Artemisia | Compositae |
| LP | 10 | Salsola passerina | Salsola | Amaranthaceae |
| LP | 10 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 1 | Heteropappus altaicus | Heteropappus | Compositae |
| MP | 1 | Echinochloa crus-galli | Echinochloa | Poaceae |
| MP | 1 | Setaria viridis | Setaria | Poaceae |
| MP | 1 | Incarvillea sinensis | Incarvillea | Bignoniaceae |
| MP | 1 | Artemisia ordosica | Artemisia | Compositae |
| MP | 1 | Chloris virgata | Chloris | Poaceae |
| MP | 1 | Chenopodium glaucum | Chenopodium | Amaranthaceae |
| MP | 1 | Bassia scoparia | Bassia | Amaranthaceae |
| MP | 1 | Lactuca sativa | Lactuca | Compositae |
| MP | 1 | Phragmites australis | Phragmites | Poaceae |
| MP | 1 | Medicago sativa | Medicago | Fabaceae |
| MP | 1 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 1 | Calystegia pellita | Calystegia | Convolvulaceae |
| MP | 1 | Polygonum sibiricum | Polygonum | Polygonaceae |
| MP | 1 | Leymus chinensis | Leymus | Poaceae |
| MP | 1 | Artemisia sphaerocephala | Artemisia | Compositae |
| MP | 1 | Aeluropus littoralis | Aeluropus | Poaceae |
| MP | 1 | Medicago sativa | Medicago | Fabaceae |
| MP | 2 | Adenophora stricta | Adenophora | Campanulaceae |
| MP | 2 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 2 | Allium anisopodium | Allium | Amaryllidaceae |
| MP | 2 | Allium ramosum | Allium | Amaryllidaceae |
| MP | 2 | Amethystea caerulea | Amethystea | Lamiaceae |
| MP | 2 | Anemarrhena asphodeloides | Anemarrhena | Asparagaceae |
| MP | 2 | Artemisia desertorum | Artemisia | Compositae |
| MP | 2 | Artemisia lavandulifolia | Artemisia | Asteraceae |
| MP | 2 | Artemisia sieversiana | Artemisia | Compositae |
| MP | 2 | Artemisia sphaerocephala | Artemisia | Compositae |
| MP | 2 | Atraphaxis manshurica | Atraphaxis | Polygonaceae |
| MP | 2 | Carex pediformis | Carex | Cyperaceae |
| MP | 2 | Chenopodium acuminatum | Chenopodium | Amaranthaceae |
| MP | 2 | Chloris virgata | Chloris | Poaceae |
| MP | 2 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 2 | Clematis hexapetala | Clematis | Ranunculaceae |
| MP | 2 | Corispermum mongolicum | Corispermum | Amaranthaceae |
| MP | 2 | Cynanchum thesioides | Cynanchum | Apocynaceae |
| MP | 2 | Dysphania aristata | Dysphania | Amaranthaceae |
| MP | 2 | Enneapogon desvauxii | Enneapogon | Poaceae |
| MP | 2 | Ephedra sinica | Ephedra | Ephedraceae |
| MP | 2 | Eriochloa villosa | Eriochloa | Poaceae |
| MP | 2 | Erodium stephanianum | Erodium | Geraniaceae |
| MP | 2 | Euphorbia humifusa | Euphorbia | Euphorbiaceae |
| MP | 2 | Glycyrrhiza uralensis | Glycyrrhiza | Fabaceae |
| MP | 2 | Iris tenuifolia | Iris | Iridaceae |
| MP | 2 | Lespedeza davurica | Lespedeza | Fabaceae |
| MP | 2 | Medicago ruthenica | Medicago | Fabaceae |
| MP | 2 | Phragmites australis | Phragmites | Poaceae |
| MP | 2 | Salsola collina | Salsola | Amaranthaceae |
| MP | 2 | Serratula centauroides | Serratula | Compositae |
| MP | 2 | Setaria viridis | Setaria | Poaceae |
| MP | 2 | Stipa capillata | Stipa | Poaceae |
| MP | 2 | Stipa sibirica | Stipa | Poaceae |
| MP | 2 | Thalictrum squarrosum | Thalictrum | Ranunculaceae |
| MP | 2 | Tribulus terrestris | Tribulus | Zygophyllaceae |
| MP | 3 | Allium tenuissimum | Allium | Amaryllidaceae |
| MP | 3 | Anemarrhena asphodeloides | Anemarrhena | Asparagaceae |
| MP | 3 | Artemisia annua | Artemisia | Compositae |
| MP | 3 | Artemisia lavandulifolia | Artemisia | Asteraceae |
| MP | 3 | Astragalus adsurgens | Astragalus | Fabaceae |
| MP | 3 | Astragalus propinquus | Astragalus | Fabaceae |
| MP | 3 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 3 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 3 | Convolvulus arvensis | Convolvulus | Convolvulaceae |
| MP | 3 | Eriochloa villosa | Eriochloa | Poaceae |
| MP | 3 | Erodium stephanianum | Erodium | Geraniaceae |
| MP | 3 | Euphorbia humifusa | Euphorbia | Euphorbiaceae |
| MP | 3 | Gerbera anandria | Gerbera | Compositae |
| MP | 3 | Heteropappus altaicus | Heteropappus | Compositae |
| MP | 3 | Leontopodium leontopodinum | Leontopodium | Compositae |
| MP | 3 | Lespedeza davurica | Lespedeza | Fabaceae |
| MP | 3 | Lespedeza juncea | Lespedeza | Fabaceae |
| MP | 3 | Leymus chinensis | Leymus | Poaceae |
| MP | 3 | Linum stelleroides | Linum | Linaceae |
| MP | 3 | Miscanthus sacchariflorus | Miscanthus | Poaceae |
| MP | 3 | Polygala tenuifolia | Polygala | Polygalaceae |
| MP | 3 | Polygonum divaricatum | Polygonum | Polygonaceae |
| MP | 3 | Potentilla betonicifolia | Potentilla | Rosaceae |
| MP | 3 | Potentilla verticillaris | Potentilla | Rosaceae |
| MP | 3 | Salsola collina | Salsola | Amaranthaceae |
| MP | 3 | Sanguisorba officinalis | Sanguisorba | Rosaceae |
| MP | 3 | Serratula centauroides | Serratula | Compositae |
| MP | 3 | Stipa sibirica | Stipa | Poaceae |
| MP | 3 | Thalictrum petaloideum | Thalictrum | Ranunculaceae |
| MP | 4 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 4 | Allium bidentatum | Allium | Amaryllidaceae |
| MP | 4 | Anemarrhena asphodeloides | Anemarrhena | Asparagaceae |
| MP | 4 | Bassia prostrata | Bassia | Amaranthaceae |
| MP | 4 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 4 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 4 | Dysphania aristata | Dysphania | Amaranthaceae |
| MP | 4 | Iris tenuifolia | Iris | Iridaceae |
| MP | 4 | Koeleria pyramidata | Koeleria | Poaceae |
| MP | 4 | Lappula myosotis | Lappula | Boraginaceae |
| MP | 4 | Leymus chinensis | Leymus | Poaceae |
| MP | 4 | Medicago ruthenica | Medicago | Fabaceae |
| MP | 4 | Potentilla acaulis | Potentilla | Rosaceae |
| MP | 4 | Salsola collina | Salsola | Amaranthaceae |
| MP | 4 | Scorzonera sinensis | Scorzonera | Compositae |
| MP | 4 | Stipa capillata | Stipa | Poaceae |
| MP | 4 | Veratrum nigrum | Veratrum | Melanthiaceae |
| MP | 5 | Allium anisopodium | Allium | Amaryllidaceae |
| MP | 5 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 5 | Cymbaria daurica | Cymbaria | Orobanchaceae |
| MP | 5 | Chenopodium glaucum | Chenopodium | Amaranthaceae |
| MP | 5 | Chenopodium acuminatum | Chenopodium | Amaranthaceae |
| MP | 5 | Artemisia frigida | Artemisia | Compositae |
| MP | 5 | Bassia prostrata | Bassia | Amaranthaceae |
| MP | 5 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 5 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 5 | Allium tenuissimum | Allium | Amaryllidaceae |
| MP | 5 | Leymus chinensis | Leymus | Poaceae |
| MP | 5 | Stipa capillata | Stipa | Poaceae |
| MP | 5 | Salsola collina | Salsola | Amaranthaceae |
| MP | 6 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 6 | Cleistogenes squarrosa | Cleistogenes | Poaceae |
| MP | 6 | Ephedra sinica | Ephedra | Ephedraceae |
| MP | 6 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| MP | 6 | Allium condensatum | Allium | Amaryllidaceae |
| MP | 6 | Artemisia annua | Artemisia | Compositae |
| MP | 6 | Chenopodium glaucum | Chenopodium | Amaranthaceae |
| MP | 6 | Artemisia frigida | Artemisia | Compositae |
| MP | 6 | Bassia prostrata | Bassia | Amaranthaceae |
| MP | 6 | Thermopsis lanceolata | Thermopsis | Fabaceae |
| MP | 6 | Koeleria pyramidata | Koeleria | Poaceae |
| MP | 6 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| MP | 6 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 6 | Allium tenuissimum | Allium | Amaryllidaceae |
| MP | 6 | Iris tenuifolia | Iris | Iridaceae |
| MP | 6 | Leymus chinensis | Leymus | Poaceae |
| MP | 6 | Allium ramosum | Allium | Amaryllidaceae |
| MP | 6 | Stipa sibirica | Stipa | Poaceae |
| MP | 6 | Poa annua | Poa | Poaceae |
| MP | 6 | Stipa capillata | Stipa | Poaceae |
| MP | 6 | Axyris amaranthoides | Axyris | Amaranthaceae |
| MP | 6 | Salsola collina | Salsola | Amaranthaceae |
| MP | 7 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 7 | Scutellaria scordiifolia | Scutellaria | Lamiaceae |
| MP | 7 | Astragalus melilotoides | Astragalus | Fabaceae |
| MP | 7 | Cymbaria daurica | Cymbaria | Orobanchaceae |
| MP | 7 | Euphorbia fischeriana | Euphorbia | Euphorbiaceae |
| MP | 7 | Koeleria pyramidata | Koeleria | Poaceae |
| MP | 7 | Astragalus galactites | Astragalus | Fabaceae |
| MP | 7 | Allium bidentatum | Allium | Amaryllidaceae |
| MP | 7 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 7 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 7 | Allium tenuissimum | Allium | Amaryllidaceae |
| MP | 7 | Iris tenuifolia | Iris | Iridaceae |
| MP | 7 | Leymus chinensis | Leymus | Poaceae |
| MP | 7 | Stipa capillata | Stipa | Poaceae |
| MP | 7 | Anemarrhena asphodeloides | Anemarrhena | Asparagaceae |
| MP | 8 | Heteropappus altaicus | Heteropappus | Compositae |
| MP | 8 | Agropyron cristatum | Agropyron | Poaceae |
| MP | 8 | Cymbaria daurica | Cymbaria | Orobanchaceae |
| MP | 8 | Artemisia annua | Artemisia | Compositae |
| MP | 8 | Chenopodium acuminatum | Chenopodium | Amaranthaceae |
| MP | 8 | Allium polyrhizum | Allium | Amaryllidaceae |
| MP | 8 | Artemisia frigida | Artemisia | Compositae |
| MP | 8 | Asparagus schoberioides | Asparagus | Asparagaceae |
| MP | 8 | Bassia prostrata | Bassia | Amaranthaceae |
| MP | 8 | Astragalus galactites | Astragalus | Fabaceae |
| MP | 8 | Allium bidentatum | Allium | Amaryllidaceae |
| MP | 8 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 8 | Cleistogenes hackelii | Cleistogenes | Poaceae |
| MP | 8 | Allium tenuissimum | Allium | Amaryllidaceae |
| MP | 8 | Iris tenuifolia | Iris | Iridaceae |
| MP | 8 | Leymus chinensis | Leymus | Poaceae |
| MP | 8 | Allium ramosum | Allium | Amaryllidaceae |
| MP | 8 | Convolvulus ammannii | Convolvulus | Convolvulaceae |
| MP | 8 | Stipa capillata | Stipa | Poaceae |
| MP | 8 | Neopallasia pectinata | Neopallasia | Compositae |
| MP | 8 | Salsola collina | Salsola | Amaranthaceae |
| MP | 9 | Artemisia argyi | Artemisia | Compositae |
| MP | 9 | Scorzonera sinensis | Scorzonera | Compositae |
| MP | 9 | Eragrostis pilosa | Eragrostis | Poaceae |
| MP | 9 | Tribulus terrestris | Tribulus | Zygophyllaceae |
| MP | 9 | Allium polyrhizum | Allium | Amaryllidaceae |
| MP | 9 | Asparagus schoberioides | Asparagus | Asparagaceae |
| MP | 9 | Peganum harmala | Peganum | Nitrariaceae |
| MP | 9 | Iris lactea | Iris | Iridaceae |
| MP | 9 | Corispermum mongolicum | Corispermum | Amaranthaceae |
| MP | 9 | Allium bidentatum | Allium | Amaryllidaceae |
| MP | 9 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 9 | Cleistogenes songorica | Cleistogenes | Poaceae |
| MP | 9 | Caragana stenophylla | Caragana | Fabaceae |
| MP | 9 | Convolvulus ammannii | Convolvulus | Convolvulaceae |
| MP | 9 | Stipa capillata | Stipa | Poaceae |
| MP | 9 | Salsola collina | Salsola | Amaranthaceae |
| MP | 10 | Setaria viridis | Setaria | Poaceae |
| MP | 10 | Tribulus terrestris | Tribulus | Zygophyllaceae |
| MP | 10 | Asparagus schoberioides | Asparagus | Asparagaceae |
| MP | 10 | Corispermum mongolicum | Corispermum | Amaranthaceae |
| MP | 10 | Allium bidentatum | Allium | Amaryllidaceae |
| MP | 10 | Carex korshinskyi | Carex | Cyperaceae |
| MP | 10 | Cleistogenes songorica | Cleistogenes | Poaceae |
| MP | 10 | Iris tenuifolia | Iris | Iridaceae |
| MP | 10 | Caragana stenophylla | Caragana | Fabaceae |
| MP | 10 | Stipa capillata | Stipa | Poaceae |
| MP | 10 | Salsola collina | Salsola | Amaranthaceae |
| TP | 1 | Allium przewalskianum | Allium | Amaryllidaceae |
| TP | 1 | Allium ramosum | Allium | Amaryllidaceae |
| TP | 1 | Anaphalis xylorhiza | Anaphalis | Compositae |
| TP | 1 | Androsace tapete | Androsace | Primulaceae |
| TP | 1 | Androsace umbellata | Androsace | Primulaceae |
| TP | 1 | Arenaria brevipetala | Arenaria | Caryophyllaceae |
| TP | 1 | Artemisia argyi | Artemisia | Compositae |
| TP | 1 | Aster tataricus | Aster | Compositae |
| TP | 1 | Astragalus propinquus | Astragalus | Fabaceae |
| TP | 1 | Calamagrostis lahulensis | Calamagrostis | Poaceae |
| TP | 1 | Caragana sinica | Caragana | Fabaceae |
| TP | 1 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 1 | Chenopodium glaucum | Chenopodium | Amaranthaceae |
| TP | 1 | Elymus dahuricus | Elymus | Poaceae |
| TP | 1 | Eragrostis pilosa | Eragrostis | Poaceae |
| TP | 1 | Euphorbia stracheyi | Euphorbia | Euphorbiaceae |
| TP | 1 | Gentiana scabra | Gentiana | Gentianaceae |
| TP | 1 | Gentiana straminea | Gentiana | Gentianaceae |
| TP | 1 | Gentiana szechenyii | Gentiana | Gentianaceae |
| TP | 1 | Gentianopsis paludosa | Gentianopsis | Gentianaceae |
| TP | 1 | Geranium wilfordii | Geranium | Geraniaceae |
| TP | 1 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| TP | 1 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| TP | 1 | Heracleum hemsleyanum | Heracleum | Apiaceae |
| TP | 1 | Heteropappus altaicus | Heteropappus | Compositae |
| TP | 1 | Incarvillea sinensis | Incarvillea | Bignoniaceae |
| TP | 1 | Iris tectorum | Iris | Iridaceae |
| TP | 1 | Kobresia littledalei | Kobresia | Cyperaceae |
| TP | 1 | Leontopodium leontopodinum | Leontopodium | Compositae |
| TP | 1 | Phlomis younghusbandii | Phlomis | Lamiaceae |
| TP | 1 | Plantago depressa | Plantago | Plantaginaceae |
| TP | 1 | Poa annua | Poa | Poaceae |
| TP | 1 | Polygonum divaricatum | Polygonum | Polygonaceae |
| TP | 1 | Potentilla chinensis | Potentilla | Rosaceae |
| TP | 1 | Potentilla multifida | Potentilla | Rosaceae |
| TP | 1 | Potentilla saundersiana | Potentilla | Rosaceae |
| TP | 1 | Przewalskia tangutica | Przewalskia | Solanaceae |
| TP | 1 | Scorzonera sinensis | Scorzonera | Compositae |
| TP | 1 | Scrophularia ningpoensis | Scrophularia | Scrophulariaceae |
| TP | 1 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 1 | Silene gallica | Silene | Caryophyllaceae |
| TP | 1 | Stipa capillata | Stipa | Poaceae |
| TP | 1 | Stipa purpurea | Stipa | Poaceae |
| TP | 1 | Taraxacum mongolicum | Taraxacum | Compositae |
| TP | 1 | Vicia amoena | Vicia | Fabaceae |
| TP | 2 | Anaphalis xylorhiza | Anaphalis | Compositae |
| TP | 2 | Artemisia argyi | Artemisia | Compositae |
| TP | 2 | Aster souliei | Aster | Compositae |
| TP | 2 | Aster tataricus | Aster | Compositae |
| TP | 2 | Astragalus strictus | Astragalus | Fabaceae |
| TP | 2 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 2 | Elsholtzia densa | Elsholtzia | Lamiaceae |
| TP | 2 | Eragrostis alta | Eragrostis | ?Poaceae |
| TP | 2 | Euphorbia fischeriana | Euphorbia | Euphorbiaceae |
| TP | 2 | Geranium wilfordii | Geranium | Geraniaceae |
| TP | 2 | Gueldenstaedtia verna | Gueldenstaedtia | Fabaceae |
| TP | 2 | Heracleum hemsleyanum | Heracleum | Apiaceae |
| TP | 2 | Kobresia pygmaea | Kobresia | Cyperaceae |
| TP | 2 | Lancea tibetica | Lancea | Phrymaceae |
| TP | 2 | Lasiocaryum densiflorum | Lasiocaryum | Boraginaceae |
| TP | 2 | Persicaria vivipara | Persicaria | Polygonaceae |
| TP | 2 | Phlomoides rotata | Phlomoides | Lamiaceae |
| TP | 2 | Poa annua | Poa | Poaceae |
| TP | 2 | Polygonum sibiricum | Polygonum | Polygonaceae |
| TP | 2 | Potentilla anserina | Potentilla | Rosaceae |
| TP | 2 | Potentilla parvifolia | Potentilla | Rosaceae |
| TP | 2 | Potentilla saundersiana | Potentilla | Rosaceae |
| TP | 2 | Przewalskia tangutica | Przewalskia | Solanaceae |
| TP | 2 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 2 | Stipa capillata | Stipa | Poaceae |
| TP | 2 | Taraxacum mongolicum | Taraxacum | Compositae |
| TP | 2 | Urtica hyperborea | Urtica | Urticaceae |
| TP | 3 | Astragalus propinquus | Astragalus | Fabaceae |
| TP | 3 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 3 | Eragrostis alta | Eragrostis | Poaceae |
| TP | 3 | Kobresia pygmaea | Kobresia | Cyperaceae |
| TP | 3 | Lancea tibetica | Lancea | Phrymaceae |
| TP | 3 | Leontopodium leontopodinum | Leontopodium | Compositae |
| TP | 3 | Poa annua | Poa | Poaceae |
| TP | 3 | Potentilla anserina | Potentilla | Rosaceae |
| TP | 3 | Potentilla saundersiana | Potentilla | Rosaceae |
| TP | 3 | Saussurea japonica | Saussurea | Compositae |
| TP | 3 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 3 | Taraxacum mongolicum | Taraxacum | Compositae |
| TP | 4 | Astragalus arnoldii | Astragalus | Fabaceae |
| TP | 4 | Callianthemum pimpinelloides | Callianthemum | Ranunculaceae |
| TP | 4 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 4 | Eragrostis alta | Eragrostis | Poaceae |
| TP | 4 | Euphorbia fischeriana | Euphorbia | Euphorbiaceae |
| TP | 4 | Heteropappus boweri | Heteropappus | Compositae |
| TP | 4 | Kobresia pygmaea | Kobresia | Cyperaceae |
| TP | 4 | Leontopodium leontopodinum | Leontopodium | Compositae |
| TP | 4 | Oxytropis stracheyana | Oxytropis | Fabaceae |
| TP | 4 | Pedicularis alaschanica | Pedicularis | Scrophulariaceae? |
| TP | 4 | Poa setulosa | Poa | Poaceae |
| TP | 4 | Przewalskia tangutica | Przewalskia | Solanaceae |
| TP | 4 | Rhodiola smithii | Rhodiola | Crassulaceae |
| TP | 4 | Saussurea japonica | Saussurea | Compositae |
| TP | 4 | Stipa capillata | Stipa | Poaceae |
| TP | 4 | Taraxacum mongolicum | Taraxacum | Compositae |
| TP | 5 | Arenaria edgeworthiana | Arenaria | Caryophyllaceae |
| TP | 5 | Astragalus adsurgens | Astragalus | Fabaceae |
| TP | 5 | Astragalus tribulifolius | Astragalus | Fabaceae |
| TP | 5 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 5 | Carex?littledalei | Carex | Cyperaceae |
| TP | 5 | Dolomiaea souliei | Dolomiaea | Compositae |
| TP | 5 | Dracocephalum heterophyllum | Dracocephalum | Lamiaceae |
| TP | 5 | Eragrostis pilosa | Eragrostis | Poaceae |
| TP | 5 | Heteropappus boweri | Heteropappus | Compositae |
| TP | 5 | Kobresia pygmaea | Kobresia | Cyperaceae |
| TP | 5 | Leontopodium leontopodinum | Leontopodium | Compositae |
| TP | 5 | Poa annua | Poa | Poaceae |
| TP | 5 | Potentilla chinensis | Potentilla | Rosaceae |
| TP | 5 | Potentilla?supina | Potentilla | Rosaceae |
| TP | 5 | Rhodiola smithii | Rhodiola | Crassulaceae |
| TP | 5 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 5 | Stipa capillata | Stipa | Poaceae |
| TP | 5 | Stipa purpurea | Stipa | Poaceae |
| TP | 5 | Youngia japonica | Youngia | Compositae |
| TP | 6 | Astragalus adsurgens | Astragalus | Fabaceae |
| TP | 6 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 6 | Dracocephalum heterophyllum | Dracocephalum | Lamiaceae |
| TP | 6 | Heteropappus boweri | Heteropappus | Compositae |
| TP | 6 | Incarvillea lutea | Incarvillea | Bignoniaceae |
| TP | 6 | Lagotis brachystachya | Lagotis | Plantaginaceae |
| TP | 6 | Oxytropis microphylla | Oxytropis | Fabaceae |
| TP | 6 | Przewalskia tangutica | Przewalskia | Solanaceae |
| TP | 6 | Rhodiola smithii | Rhodiola | Crassulaceae |
| TP | 6 | Sibbaldia parviflora | Sibbaldia | Rosaceae |
| TP | 6 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 6 | Stipa capillata | Stipa | Poaceae |
| TP | 6 | Stipa purpurea | Stipa | Poaceae |
| TP | 7 | Androsace tapete | Androsace | Primulaceae |
| TP | 7 | Arenaria brevipetala | Arenaria | Caryophyllaceae |
| TP | 7 | Astragalus propinquus | Astragalus | Fabaceae |
| TP | 7 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 7 | Eragrostis pilosa | Eragrostis | Poaceae |
| TP | 7 | Kalimeris hispida | Kalimeris | Compositae |
| TP | 7 | Kobresia pygmaea | Kobresia | Cyperaceae |
| TP | 7 | Lagotis brachystachya | Lagotis | Plantaginaceae |
| TP | 7 | Lasiocaryum densiflorum | Lasiocaryum | Boraginaceae |
| TP | 7 | Leontopodium leontopodinum | Leontopodium | Compositae |
| TP | 7 | Lepidium capitatum | Lepidium | Brassicaceae |
| TP | 7 | Poa annua | Poa | Poaceae |
| TP | 7 | Polygonum sibiricum | Polygonum | Polygonaceae |
| TP | 7 | Potentilla parvifolia | Potentilla | Rosaceae |
| TP | 7 | Potentilla plumosa | Potentilla | Rosaceae |
| TP | 7 | Pycnoplinthus uniflora | Pycnoplinthus | Brassicaceae |
| TP | 7 | Sibbaldia parviflora | Sibbaldia | Rosaceae |
| TP | 7 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 7 | Stipa purpurea | Stipa | Poaceae |
| TP | 7 | Taraxacum mongolicum | Taraxacum | Compositae |
| TP | 8 | Artemisia desertorum | Artemisia | Compositae |
| TP | 8 | Astragalus propinquus | Astragalus | Fabaceae |
| TP | 8 | Astragalus tribulifolius | Astragalus | Fabaceae |
| TP | 8 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 8 | Heteropappus boweri | Heteropappus | Compositae |
| TP | 8 | Oxytropis microphylla | Oxytropis | Fabaceae |
| TP | 8 | Poa annua | Poa | Poaceae |
| TP | 8 | Ptilotrichum canescens | Ptilotrichum | Brassicaceae |
| TP | 8 | Stipa capillata | Stipa | Poaceae |
| TP | 9 | Artemisia desertorum | Artemisia | Compositae |
| TP | 9 | Astragalus hendersonii | Astragalus | Fabaceae |
| TP | 9 | Carex korshinskyi | Carex | Cyperaceae |
| TP | 9 | Oxytropis glacialis | Oxytropis | Fabaceae |
| TP | 9 | Oxytropis microphylla | Oxytropis | Fabaceae |
| TP | 9 | Ptilotrichum canescens | Ptilotrichum | Brassicaceae |
| TP | 9 | Sibbaldianthe bifurca | Sibbaldianthe | Rosaceae |
| TP | 9 | Stipa tianschanica | Stipa | Poaceae |
| TP | 10 | Stipa tianschanica | Stipa | Poaceae |
| TP | 10 | Ajania fruticulosa | Ajania | Compositae |
| TP | 10 | Oxytropis microphylla | Oxytropis | Fabaceae |

**Table S4** Characteristics of leaf δ18O and △18O at species level for sampling sites in Loess (LP), Inner Mongolia (MP), and Tibetan (TP) Plateau.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sites | Number | Leaf δ18O | | | | | △18O | | | | |
| Mean | Max | Min | STD | CV | Mean | Max | Min | STD | CV |
| LP01 | 22 | 19.70 | 26.12 | 14.70 | 2.86 | 0.15 | 26.79 | 33.18 | 21.69 | 2.92 | 0.11 |
| LP02 | 32 | 22.72 | 28.13 | 14.97 | 2.81 | 0.12 | 29.64 | 35.10 | 21.96 | 2.83 | 0.10 |
| LP03 | 25 | 23.43 | 28.31 | 17.69 | 2.96 | 0.13 | 30.44 | 35.20 | 24.37 | 2.87 | 0.09 |
| LP04 | 27 | 22.84 | 31.46 | 18.59 | 3.61 | 0.16 | 29.99 | 38.66 | 25.70 | 3.63 | 0.12 |
| LP05 | 38 | 21.01 | 31.46 | 15.70 | 3.27 | 0.16 | 28.15 | 38.66 | 22.85 | 3.29 | 0.12 |
| LP06 | 33 | 20.90 | 30.01 | 16.48 | 3.34 | 0.16 | 27.88 | 38.89 | 23.16 | 3.39 | 0.12 |
| LP07 | 32 | 24.73 | 31.23 | 18.33 | 3.20 | 0.13 | 30.79 | 36.24 | 24.58 | 3.07 | 0.10 |
| LP08 | 17 | 27.43 | 32.96 | 20.25 | 3.27 | 0.12 | 32.58 | 37.99 | 25.21 | 3.09 | 0.09 |
| LP09 | 24 | 26.51 | 35.35 | 19.58 | 4.35 | 0.16 | 31.37 | 39.99 | 24.15 | 4.24 | 0.14 |
| LP10 | 15 | 25.73 | 32.68 | 22.04 | 3.48 | 0.14 | 30.43 | 37.31 | 26.76 | 3.47 | 0.11 |
| LP | 265 | 22.69 | 35.35 | 12.07 | 4.42 | 0.19 | 32.29 | 43.89 | 21.69 | 4.4 | 0.14 |
| MP01 | 18 | 23.04 | 29.24 | 17.42 | 3.57 | 0.15 | 30.61 | 36.58 | 24.68 | 3.87 | 0.13 |
| MP02 | 36 | 23.48 | 28.73 | 18.69 | 2.26 | 0.10 | 31.18 | 36.44 | 25.87 | 2.21 | 0.07 |
| MP03 | 29 | 23.54 | 30.97 | 19.31 | 2.71 | 0.12 | 31.95 | 39.55 | 27.80 | 2.82 | 0.09 |
| MP04 | 17 | 22.85 | 28.10 | 17.46 | 3.25 | 0.14 | 31.83 | 37.13 | 26.41 | 3.26 | 0.10 |
| MP05 | 13 | 26.54 | 31.73 | 22.60 | 2.59 | 0.10 | 35.27 | 40.62 | 31.12 | 2.66 | 0.08 |
| MP06 | 22 | 25.85 | 32.65 | 21.14 | 3.25 | 0.13 | 34.62 | 41.68 | 28.42 | 3.47 | 0.10 |
| MP07 | 15 | 24.03 | 27.40 | 21.24 | 2.27 | 0.09 | 32.76 | 36.14 | 29.92 | 2.29 | 0.07 |
| MP08 | 21 | 27.59 | 31.71 | 21.71 | 3.05 | 0.11 | 35.57 | 39.73 | 29.65 | 3.08 | 0.09 |
| MP09 | 16 | 28.23 | 31.56 | 23.18 | 2.36 | 0.08 | 35.41 | 39.57 | 30.37 | 2.22 | 0.06 |
| MP10 | 11 | 29.16 | 32.33 | 21.36 | 2.90 | 0.10 | 36.13 | 41.23 | 30.04 | 2.65 | 0.07 |
| MP | 198 | 25.07 | 32.65 | 17.42 | 3.46 | 0.14 | 33.17 | 41.68 | 24.68 | 3.42 | 0.1 |
| TP01 | 45 | 18.45 | 27.91 | 12.07 | 3.79 | 0.21 | 33.51 | 42.07 | 26.49 | 4.40 | 0.13 |
| TP02 | 27 | 18.86 | 27.91 | 13.12 | 4.15 | 0.22 | 34.85 | 42.07 | 29.31 | 4.27 | 0.12 |
| TP03 | 12 | 18.63 | 25.90 | 14.16 | 4.25 | 0.23 | 35.00 | 42.07 | 28.22 | 4.41 | 0.13 |
| TP04 | 16 | 20.28 | 25.90 | 14.16 | 3.90 | 0.19 | 36.93 | 42.07 | 28.22 | 4.11 | 0.11 |
| TP05 | 19 | 19.72 | 25.90 | 14.90 | 2.60 | 0.13 | 36.34 | 41.29 | 31.71 | 2.34 | 0.06 |
| TP06 | 13 | 19.38 | 25.24 | 12.07 | 3.19 | 0.16 | 34.84 | 41.29 | 26.49 | 3.62 | 0.10 |
| TP07 | 20 | 20.06 | 30.81 | 13.73 | 4.12 | 0.21 | 34.28 | 43.74 | 27.70 | 3.63 | 0.11 |
| TP08 | 9 | 23.88 | 26.37 | 21.27 | 2.03 | 0.09 | 37.06 | 39.16 | 34.47 | 1.99 | 0.05 |
| TP09 | 8 | 24.62 | 29.61 | 19.05 | 3.11 | 0.13 | 37.83 | 42.89 | 32.19 | 3.15 | 0.08 |
| TP10 | 3 | 29.09 | 30.95 | 27.40 | 1.78 | 0.06 | 42.00 | 43.89 | 40.29 | 1.80 | 0.04 |
| TP | 172 | 19.72 | 30.95 | 12.07 | 4.13 | 0.21 | 35.08 | 43.89 | 26.49 | 4.15 | 0.12 |
| Three Plateau | 635 | 22.69 | 35.35 | 12.07 | 4.42 | 0.19 | 32.29 | 43.89 | 21.69 | 4.4 | 0.14 |

**Table S5** Results of standardized major axis (SMA) line-fitting for the relationship between canopy stomatal conductance (using 1/△18O as proxy) and aridity.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Intercept | slope | r2 | P |
| Loess Plateau | Estimate | 0.047 | -0.196 | 0.68 | 0.003 |
| Lower | 0.043 | -0.027 |
| Upper | 0.052 | -0.014 |
| Inner Mongolia  Plateau | Estimate | 0.044 | -0.020 | 0.72 | 0.002 |
| Lower | 0.040 | -0.027 |
| Upper | 0.049 | -0.014 |
| Tibet Plateau | Estimate | 0.038 | -0.015 | 0.60 | 0.008 |
| Lower | 0.034 | -0.022 |
| Upper | 0.042 | -0.011 |

Different letters indicate significant differences (P < 0.001) among transects in intercepts and slopes.

**Table S6** Pearson coefficients for correlations among canopy stomatal conductance (Gs) and environmental factors and plant properties.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transect | Variables | Gs | Aridity | Precipitation | SM | VPD | SR | MAT | MATMAX | LA | SLA |
| Loess Plateau | Gs | 1 |  |  |  |  |  |  |  |  |  |
| Aridity | -0.848\*\* | 1 |  |  |  |  |  |  |  |  |
| Precipitation | 0.856\*\* | -.997\*\* | 1 |  |  |  |  |  |  |  |
| SM | 0.719\* | -.781\*\* | .795\*\* | 1 |  |  |  |  |  |  |
| VPD | -0.554 | 0.616 | -0.563 | -0.251 | 1 |  |  |  |  |  |
| SR | -0.639\* | 0.810\*\* | -.827\*\* | -.851\*\* | 0.217 | 1 |  |  |  |  |
| Tempmean | 0.641\* | -0.665\* | .710\* | .766\*\* | 0.074 | -.849\*\* | 1 |  |  |  |
| Tempmax | 0.678\* | -0.698\* | .737\* | .751\* | -0.026 | -.795\*\* | .980\*\* | 1 |  |  |
| LA | .757\* | -.881\*\* | .863\*\* | 0.567 | -.751\* | -.637\* | 0.425 | 0.481 | 1 |  |
| SLA | -0.519 | 0.460 | -0.454 | -0.499 | 0.356 | 0.422 | -0.433 | -0.483 | -0.533 | 1 |
| Inner Mongolia Plateau | Gs | 1 |  |  |  |  |  |  |  |  |  |
| Aridity | -.843\*\* | 1 |  |  |  |  |  |  |  |  |
| Precipitation | .919\*\* | -.945\*\* | 1 |  |  |  |  |  |  |  |
| SM | .707\* | -.941\*\* | .877\*\* | 1 |  |  |  |  |  |  |
| VPD | -0.384 | .736\* | -0.490 | -.741\* | 1 |  |  |  |  |  |
| SR | -.728\* | .725\* | -.846\*\* | -.751\* | 0.196 | 1 |  |  |  |  |
| Tempmean | 0.303 | -0.002 | 0.298 | -0.009 | .647\* | -0.615 | 1 |  |  |  |
| Tempmax | 0.038 | 0.270 | 0.018 | -0.235 | .814\*\* | -0.386 | .943\*\* | 1 |  |  |
| LA | .913\*\* | -.721\* | .875\*\* | 0.625 | -0.218 | -.731\* | 0.434 | 0.189 | 1 |  |
| SLA | -0.576 | .803\*\* | -0.627 | -.681\* | .849\*\* | 0.310 | 0.397 | 0.628 | -0.410 | 1 |
| Tibetan Plateau | Gs | 1 |  |  |  |  |  |  |  |  |  |
| Aridity | -.773\*\* | 1 |  |  |  |  |  |  |  |  |
| Precipitation | .675\* | -.978\*\* | 1 |  |  |  |  |  |  |  |
| SM | .659\* | -.787\*\* | .795\*\* | 1 |  |  |  |  |  |  |
| VPD | -.912\*\* | .931\*\* | -.868\*\* | -.820\*\* | 1 |  |  |  |  |  |
| SR | -.850\*\* | .963\*\* | -.936\*\* | -.801\*\* | .943\*\* | 1 |  |  |  |  |
| Tempmean | -.670\* | 0.325 | -0.189 | -0.454 | 0.622 | 0.393 | 1 |  |  |  |
| Tempmax | -.852\*\* | .795\*\* | -.740\* | -.795\*\* | .935\*\* | .832\*\* | .760\* | 1 |  |  |
| LA | 0.610 | -0.620 | 0.504 | 0.219 | -0.624 | -.658\* | -0.401 | -0.536 | 1 |  |
| SLA | -.648\* | 0.558 | -0.486 | -.779\*\* | .715\* | 0.516 | .724\* | .729\* | -0.078 | 1 |

\*\*, P<0.01; \*, P<0.05. gs, stomatal conductance; SM, soil moisture; VPD, vapor pressure deficit; SR, total solar radiation; Tempmean, mean temperature; Tempmax, maximum temperature; LA, log-transformed leaf area; SLA, log-transformed specific leaf area.



Figure S1. Comparison of annual mean precipitation (mm) (a), vapor pressure deficit (VPD) (b), solar radiation (SR) (c), and air temperature (℃) (d) among three transects. LP: Loess Plateau; MP, Inner Mongolia Plateau; TP, Tibet Plateau. Lowercase letters indicate significant differences among transects (P<0.05). Error bars indicate standard error of the mean.



Figure S2. Patterns of leaf δ18O and △18O at species level along aridity gradient in Loess (LP), Inner Mongolia (MP), and Tibetan (TP), Plateau. m, slope of the linear regression; b, intercept of the linear regression.



Figure S3. Hypothetical structural equation models of abiotic factors explaining 1/△18O in Loess Plateau (LP) (a), Inner Mongolia Plateau (MP) (b) and Tibet Plateau (TP) (c). △18O, 18O enrichment of leaf organic matter above source water; Tempmax: maximum temperature; SR, solar radiation; SM, soil moisture; VPD, vapor pressure deficit.



Figure S4. Hypothetical structural equation models of abiotic and biotic factors explaining 1/△18O in Loess Plateau (LP) (a), Inner Mongolia Plateau (MP) (b) and Tibet Plateau (TP) (c). △18O, 18O enrichment of leaf organic matter above source water; Tempmax: maximum temperature; SR, solar radiation; SM, soil moisture; VPD, vapor pressure deficit. LA, log-transformed leaf area; SLA, log-transformed specific leaf area.



Figure S5. Relationship between community 1/△18O and log-transformed leaf area (LA) (a) and specific leaf area (SLA) (b).