**Appendix S1** Study locations and cushion species sampled.

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| --- | --- | --- | --- | --- |
| Cushion species | Country | Latitude | Longitude | Altitude (m) |
| *Xenophyllum rigidum* | Ecuador | -0.47171 | -78.1582 | 4700 |
| *Azorella aretioides* | Ecuador | -0.46746 | -78.1668 | 4550 |
| *Azorella aretioides* | Ecuador | -0.47227 | -78.1586 | 4700 |
| *Picnophyllum bryoides* | Chile | -22.5756 | -68.037 | 4300 |
| *Adesmia subterranea* | Chile | -30.4175 | -70.2631 | 3744 |
| *Adesmia subterranea* | Chile | -30.3942 | -70.2419 | 3922 |
| *Azorella madreporica* | Chile | -33.3192 | -70.2597 | 3600 |
| *Azorella madreporica* | Chile | -33.3161 | -70.2358 | 3625 |
| *Laretia acaulis* | Chile | -33.3261 | -70.2833 | 3000 |
| *Laretia acaulis* | Chile | -33.3292 | -70.2667 | 3300 |
| *Oreopolus glacialis* | Chile | -37.4592 | -71.1228 | 2052 |
| *Azorella trifurcata* | Chile | -37.4633 | -71.3167 | 1400 |
| *Mulinum leptacanthum* | Argentina | -41.2675 | -71.3031 | 1700 |
| *Oreopolus glacialis* | Argentina | -41.2675 | -71.3031 | 1700 |
| *Discaria nana* | Argentina | -41.2675 | -71.3031 | 1700 |
| *Azorella monantha* | Chile | -50.8244 | -73 | 710 |
| *Bolax gummiferia* | Chile | -50.8239 | -72.9979 | 750 |
| *Azorella monantha* | Chile | -50.8153 | -72.9922 | 890 |
| *Bolax gummiferia* | Chile | -50.8173 | -72.9886 | 920 |
| *Silene acaulis* | USA | 44.96947 | -109.44 | 3263 |
| *Trifolium nanum* | USA | 44.9722 | -109.448 | 3231 |
| *Antennaria umbrinella* | USA | 47.07824 | -112.372 | 1796 |
| *Eriogonum ovalifolium* | USA | 46.88348 | -113.983 | 1117 |
| *Eriogonum ovalifolium* | USA | 46.86773 | -113.964 | 1232 |
| *Eriogonum umbellatum* | USA | 40.69498 | -110.905 | 3550 |
| *Geum rossii* | USA | 35.34119 | -111.684 | 3650 |
| *Geum rossii* | USA | 35.3425 | -111.682 | 3800 |
| *Raoulia sp* | New Zealand | -43.5093 | 171.5442 | 1518 |
| *Dracophyllum sp* | New Zealand | -45.3223 | 169.2077 | 1678 |
| *Phyllacne colensoi* | New Zealand | -45.7524 | 167.3995 | 1456 |
| *Onobrychis cornuta* | Lebanon | 33.97534 | 35.84794 | 2222 |
| *Astragalus zachlensis* | Lebanon | 33.97746 | 35.84816 | 2223 |
| *Astragalus macrosemius* | Iran | 35.89417 | 51.40694 | 3676 |
| *Silene acaulis* | Slovakia | 49.23583 | 20.21917 | 1982 |
| *Silene acaulis* | Norway, Svalbard | 78.91226 | 12.01743 | 30 |
| *Silene acaulis* | Switzerland | 46.47778 | 9.582778 | 2484 |
| *Silene acaulis* | Switzerland | 46.42502 | 7.6292 | 2297 |
| *Minuartia recurva* | Spain | 40.80001 | -3.93339 | 2340 |
| *Azorella madreporica* | Chile | -33.3339 | -70.2467 | 3258 |
| *Azorella madreporica* | Chile | -33.3253 | -70.2386 | 3394 |
| *Azorella madreporica* | Chile | -30.4175 | -70.2631 | 3744 |
| *Azorella madreporica* | Chile | -30.3942 | -70.2419 | 3922 |
| *Laretia acaulis* | Chile | -33.3339 | -70.2467 | 3259 |
| *Phlox condensata* | USA | 37.53341 | -118.205 | 3603 |
| *Townsendia leptotes* | USA | 37.54965 | -118.215 | 3563 |
| *Azorella monantha* | Chile | -51.1758 | -72.8483 | 720 |
| *Sibbaldia sp* | USA | 48.48485 | -113.322 | 2290 |
| *Silene acaulis* | Canada | 49.05713 | -120.22 | 2476 |
| *Silene acaulis* | Canada | 49.05052 | -120.218 | 2510 |
| *Silene acaulis* | Canada | 51.20939 | -122.562 | 2191 |
| *Silene acaulis* | Canada | 57.06065 | -122.864 | 1754 |
| *Saponaria caespitosa* | Spain | 42.69026 | 0.648889 | 2318 |
| *Silene acaulis* | Spain | 42.68947 | 0.646014 | 2318 |
| *Silene acaulis* | Canada | 50.03248 | -122.571 | 2100 |
| *Silene acaulis* | Canada | 50.03243 | -122.571 | 2100 |
| *Arenaria tetraquetra-amabilis* | Spain | 37.03642 | -3.30325 | 2575 |
| *Arenaria tetraquetra-amabilis* | Spain | 36.99721 | -3.31251 | 3110 |
| *Arenaria tetraquetra-amabilis* | Spain | 37.08134 | -3.38127 | 2750 |
| *Arenaria tetraquetra-amabilis* | Spain | 37.05082 | -3.37096 | 3239 |
| *Plantago holosteum* | Spain | 37.08134 | -3.38127 | 2750 |
| *Arenaria kansuensis* | China | 39.30208 | 96.30286 | 4239 |
| *Rhodiola juparensis* | China | 39.3546 | 96.26245 | 3709 |
| *Astragalus strictus* | Nepal | 28.13581 | 85.34395 | 4265 |
| *Silene acaulis* | USA | 48.78032 | -113.767 | 2273 |
| *Silene acaulis* | USA | 48.78443 | -113.767 | 2515 |
| *Dasiphora fruticosa* | USA | 48.47894 | -113.332 | 2241 |
| *Silene acaulis* | Sweden | 68.35748 | 18.49861 | 1050 |
| *Silene acaulis* | Italy | 46.50636 | 12.02 | 2357 |
| *Minuartia sp* | Italy | 46.53018 | 12.00271 | 2734 |
| *Cerastium alpinum* | Italy | 46.50216 | 11.80855 | 2913 |
| *Silene acaulis* | Italy | 46.52964 | 12.01633 | 2473 |
| *Silene acaulis* | USA | 48.72482 | -113.682 | 2143 |
| *Silene acaulis* | Canada | 50.61065 | -114.976 | 2516 |
| *Silene acaulis* | USA | 48.47922 | -113.329 | 2280 |
| *Saxifraga oppositifolia* | Canada | 49.05052 | -120.218 | 2510 |
| *Minuartia sedoides* | Slovakia | 49.23583 | 20.21917 | 1982 |
| *Eriogonum gracilipes* | USA | 37.55092 | -118.224 | 3726 |