



DIE ERDE

Journal of the Geographical Society of Berlin

DIE ERDE

Journal of the
Geographical Society
of Berlin

Supplementary information for

Plant species diversity of pastures in the Naryn Oblast (Kyrgyzstan)

Franziska Hoppe^{1}, Udo Schickhoff¹, Jens Oldeland²*

¹CEN Center for Earth System Research and Sustainability, Institute of Geography, University of Hamburg, Bundesstraße 55, 20146 Hamburg, Germany, Franziska.hoppe@uni-hamburg.de, hopfra3@web.de, schickhoff@geowiss.uni-hamburg.de, udo.schickhoff@uni-hamburg.de

²Biodiversity, Evolution and Ecology of Plants, Institute of Plant Science and Microbiology, University of Hamburg, Ohnhorststr. 18, 22609 Hamburg, Germany, jens.oldeland@uni-hamburg.de

* Corresponding author

published 19 December 2018, DIE ERDE 149 (4), doi:10.12854/erde-2018-384

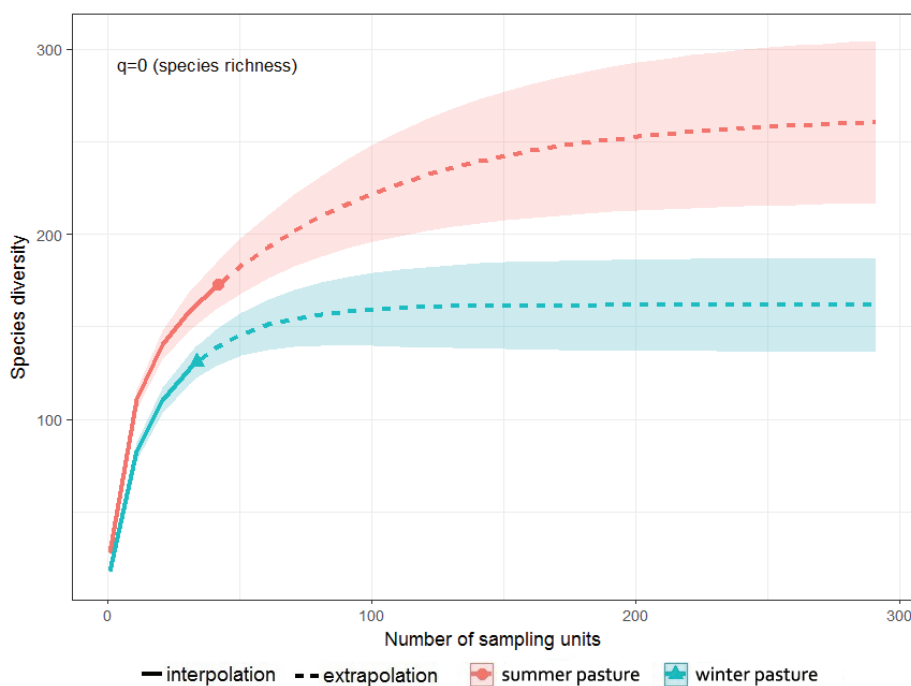


Fig. S.1 Sample-size-based R/E curve, extrapolated up to 300 to illustrate the asymptotic diversity estimates. Source: own elaboration

Supplementary information for: Plant species diversity of pastures in Kyrgyzstan

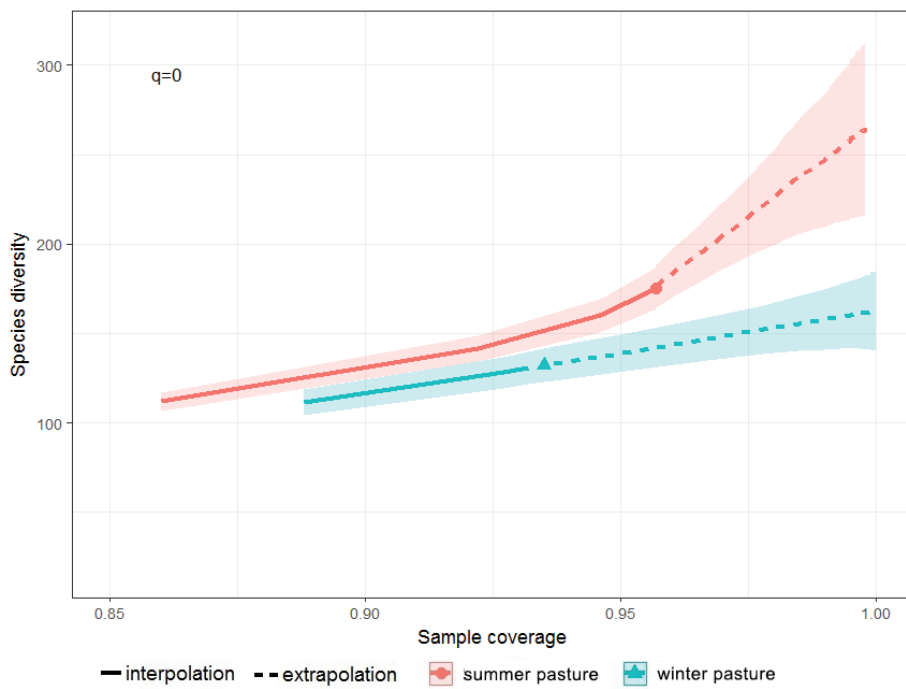


Fig. S.2 The coverage-based R/E curve shows similar results as the sample-size-based curve in terms of the asymptotic diversity estimates. Source: own elaboration

Table S.1 see next page

Supplementary information for: Plant species diversity of pastures in Kyrgyzstan

Table S.1 The species-by-sampling-unit incidence matrix has been extended by species names and the pasture type. The first block includes the companion species, the second diagnostic species of winter pastures and the third diagnostic species of summer pastures. Species that only occurred one or two times, i.e. singletons and doubletons, are bordered at the end of the matrix and the endemic species (according to Czerepanov) are written in bold. Source: own elaboration

| | summer pastures (42 plots) | winter pastures (34 plots) | | |
|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|----|
| Companion species | | | | |
| <i>Festuca valesiaca</i> | 36 | 31 | <i>Gentiana kaufmanniana</i> | 16 |
| <i>Taraxacum maracandicum</i> | 26 | 15 | <i>Parnassia laxmannii</i> | 11 |
| <i>Leontopodium ochroleucum</i> | 32 | 28 | <i>Lomatogonium carinthiacum</i> | 8 |
| <i>Potentilla multifida</i> | 17 | 22 | <i>Draba altaica</i> | 10 |
| <i>Euphorbia alata</i> | 26 | 8 | <i>Primula algida</i> | 10 |
| <i>Kobresia humilis</i> | 19 | 17 | <i>Rhodiola linearifolia</i> | 8 |
| <i>Potentilla nivea</i> | 16 | 14 | <i>Gentiana algida</i> | 7 |
| <i>Erigeron lachnocephalus</i> | 13 | 13 | <i>Gentianopsis barbata</i> | 6 |
| <i>Aster serpentimontanus</i> | 13 | 15 | <i>Oxytropis penduliflora</i> | 6 |
| <i>Galium verum</i> | 6 | 10 | <i>Schmalhausenia nidulans</i> | 5 |
| <i>Helictotrichon schellianum</i> | 15 | 8 | <i>Tulipa heterophylla</i> | 5 |
| | | | <i>Bromopsis paulsenii</i> | 4 |
| | | | <i>Caragana jubata</i> | 4 |
| | | | <i>Ranunculus songaricus</i> | 4 |
| Winter pastures | | | | |
| <i>Bupleurum thianschanicum</i> | 2 | 32 | <i>Elytrigia gmelinii</i> | 7 |
| <i>Androsace dasyphylla</i> | 0 | 18 | <i>Kobresia capilliformis</i> | 12 |
| <i>Plantago arachnoidea</i> | 1 | 15 | <i>Rumex acetosa</i> | 12 |
| <i>Koeleria cristata</i> | 7 | 23 | <i>Stellaria brachypetala</i> | 12 |
| <i>Stipa purpurea</i> | 0 | 13 | <i>Myosotis alpestris</i> | 17 |
| <i>Potentilla moorcroftii</i> | 0 | 11 | <i>Alchemilla retropilosa</i> | 10 |
| <i>Stipa caucasica</i> | 0 | 7 | <i>Artemisia aschurbajewii</i> | 13 |
| <i>Oxytropis globiflora</i> | 2 | 12 | <i>Oxytropis lapponica</i> | 13 |
| <i>Helictotrichon desertorum</i> | 5 | 8 | <i>Allium platyspathum</i> | 9 |
| <i>Hordeum brevisubulatum</i> | 4 | 13 | <i>Thalictrum alpinum</i> | 12 |
| <i>Scutellaria oligodonta</i> | 0 | 6 | <i>Poaceae</i> | 9 |
| <i>Astragalus tibetanus</i> | 2 | 7 | <i>Euphrasia regelii</i> | 7 |
| <i>Elytrigia batalinii</i> | 2 | 6 | <i>Astragalus alpinus</i> | 10 |
| <i>Potentilla pamiroalaika</i> | 0 | 4 | <i>Pedicularis dolichorhiza</i> | 7 |
| <i>Viola dessecta</i> | 1 | 5 | <i>Stipa regeliana</i> | 5 |
| <i>Potentilla orientalis</i> | 1 | 4 | <i>Carex turkestanica</i> | 4 |
| <i>Saussurea caespitans</i> | 1 | 4 | <i>Oxytropis sp.</i> | 5 |
| <i>Bromopsis inermis</i> | 0 | 3 | <i>Cirsium esculentum</i> | 4 |
| <i>Ephedra fedtschenkoae</i> | 0 | 3 | <i>Bistorta elliptica</i> | 7 |
| <i>Iris loczyi</i> | 0 | 3 | <i>Poa supina</i> | 4 |
| | | | <i>Alfredia acantholepsis</i> | 8 |
| Summer pastures | | | <i>Carex sp.</i> | 4 |
| <i>Trisetum spicatum</i> | 36 | 2 | <i>Euphrasia pectinata</i> | 6 |
| <i>Cerastium pusillum</i> | 27 | 3 | <i>Viola tianschanica</i> | 5 |
| <i>Ptilagrostis mongholica</i> | 18 | 0 | <i>Artemisia dracunculus</i> | 0 |
| <i>Trollius dschungaricus</i> | 23 | 0 | <i>Dichodon cerastoides</i> | 7 |
| <i>Bistorta vivipara</i> | 19 | 0 | <i>Corydalis gortschakovii</i> | 7 |
| <i>Festuca alata</i> | 22 | 1 | <i>Pedicularis ludwigii</i> | 2 |
| <i>Hedysarum kirgisorum</i> | 20 | 0 | <i>Aconogonon songaricum</i> | 8 |
| <i>Carex stenocarpa</i> | 23 | 3 | <i>Potentilla sp.</i> | 3 |
| <i>Gastrolychnis apetala</i> | 20 | 3 | <i>Galium turkestanicum</i> | 3 |
| <i>Saussurea sordida</i> | 24 | 3 | <i>Allium atosanguineum</i> | 7 |
| <i>Aconitum rotundifolium</i> | 25 | 2 | <i>Papaver croceum</i> | 7 |
| <i>Gentiana karelinii</i> | 23 | 3 | <i>Dianthus superbus</i> | 4 |
| <i>Phlomooides oreophila</i> | 24 | 2 | <i>Poa sp.</i> | 4 |
| <i>Ligularia alpigena</i> | 22 | 2 | <i>Potentilla asiatica</i> | 5 |
| <i>Gentianella turkestanorum</i> | 19 | 3 | <i>Pedicularis oederi</i> | 6 |
| <i>Geranium saxatile</i> | 23 | 7 | <i>Schulzia albiflora</i> | 5 |
| <i>Allium semenovii</i> | 12 | 0 | <i>Alchemilla sibirica</i> | 4 |
| <i>Seseli mucronatum</i> | 14 | 1 | <i>Allium schoenoprasoides</i> | 0 |
| <i>Ranunculus alberti</i> | 17 | 2 | | 4 |

Supplementary information for: Plant species diversity of pastures in Kyrgyzstan

| | | | | | |
|---------------------------------------|---|---|--|---|---|
| <i>Aster sp.</i> | 1 | 5 | <i>Thalictrum simplex</i> | 1 | 0 |
| <i>Festuca rubra</i> | 3 | 2 | <i>Valeriana dubia</i> | 1 | 0 |
| <i>Gentiana sp.</i> | 3 | 3 | <i>Viola rupestris</i> | 1 | 0 |
| <i>Poa pratensis</i> | 3 | 1 | <i>Botrychium lunaria</i> | 1 | 0 |
| <i>Alopecurus pratensis</i> | 3 | 0 | <i>Calamagrostis compacta</i> | 1 | 0 |
| <i>Pedicularis sp.</i> | 3 | 2 | <i>Carex sp.</i> | 1 | 0 |
| <i>Plantago depressa</i> | 2 | 1 | <i>Carex sp.1</i> | 1 | 0 |
| <i>Poa alpina</i> | 3 | 0 | <i>Carex sp.2</i> | 1 | 0 |
| <i>Potentilla hololeuca</i> | 3 | 2 | <i>Erigeron aurantiacus</i> | 1 | 0 |
| <i>Pulsatilla campanella</i> | 2 | 2 | <i>Eritrichium villosum</i> | 1 | 0 |
| <i>Pyrethrum karelinii</i> | 4 | 1 | <i>Hedysarum neglectum</i> | 1 | 0 |
| <i>Silene graminifolia</i> | 1 | 1 | <i>Iris sp.</i> | 1 | 0 |
| <i>Tragopogon turkestanicus</i> | 1 | 2 | <i>Lagotis integrifolia</i> | 1 | 0 |
| <i>Veronica ciliata</i> | 3 | 2 | <i>Myosotis sp</i> | 1 | 0 |
| <i>Carex melanantha</i> | 3 | 0 | <i>Achoriphragma lancifolium</i> | 1 | 0 |
| <i>Erigeron allochrous</i> | 3 | 1 | <i>Oxytropis nutans</i> | 1 | 0 |
| <i>Erigeron pseudoseravschanicus</i> | 1 | 1 | <i>Oxytropis platysema Schrenk</i> | 1 | 0 |
| <i>Poa relaxa</i> | 3 | 1 | <i>Pulsatilla sp.</i> | 1 | 0 |
| <i>Thalictrum minus</i> | 1 | 2 | <i>Ranunculus popovii</i> | 1 | 0 |
| <i>Triglochin maritimum</i> | 1 | 2 | <i>Rosa alberti</i> | 1 | 0 |
| <i>Achillea millefolium</i> | 3 | 0 | <i>Serratula marginata</i> | 1 | 0 |
| <i>Allium sp.</i> | 3 | 0 | <i>Taraxacum glabrum</i> | 1 | 0 |
| <i>Carex aterrima</i> | 3 | 0 | <i>Trollius altaicus</i> | 1 | 0 |
| <i>Draba subamplexicaulis</i> | 3 | 0 | <i>Viola sp.</i> | 1 | 0 |
| <i>Comastoma falcatum</i> | 3 | 0 | <i>Allium tianschanicum</i> | 0 | 2 |
| <i>Helictotrichon pubescens</i> | 3 | 0 | <i>Androsace sericea</i> | 0 | 2 |
| <i>Helictotrichon sp.</i> | 1 | 2 | <i>Artemisia rhodantha</i> | 0 | 2 |
| <i>Elymus tschimganicus</i> | 3 | 5 | <i>Aster vvedenskyi</i> | 0 | 2 |
| <i>Inula rhizocephala</i> | 3 | 0 | <i>Blysmus compressus</i> | 0 | 2 |
| <i>Lindelofia stylosia</i> | 2 | 1 | <i>Leymus flexisi</i> | 0 | 2 |
| <i>Gentiana kirilowii</i> | 1 | 3 | <i>Goniolimon ortocladum</i> | 0 | 2 |
| <i>Arctopoa tibetica</i> | 3 | 0 | <i>Potentilla sericea</i> | 0 | 2 |
| <i>Trollius lilacinus</i> | 3 | 0 | <i>Adenophora himalayana</i> | 0 | 2 |
| <i>Potentilla gelida</i> | 3 | 0 | <i>Ligularia narynensis</i> | 0 | 2 |
| <i>Potentilla tergemina</i> | 1 | 2 | <i>Eremogone meyeri</i> | 0 | 1 |
| <i>Saussurea leucophylla</i> | 3 | 0 | <i>Dracocephalum integrifolium</i> | 0 | 1 |
| <i>Erigeron sp.</i> | 1 | 1 | <i>Lappula rupestris</i> | 0 | 1 |
| <i>Poa litvinoviana</i> | 1 | 1 | <i>Allium hymenorhizum</i> | 0 | 1 |
| <i>Lappula microcarpa</i> | 1 | 1 | <i>Artemisia pamirica</i> | 0 | 1 |
| <i>Minuartia verna</i> | 2 | 0 | <i>Artemisia vulgaris</i> | 0 | 1 |
| <i>Cerastium bungeanum</i> | 2 | 0 | <i>Kobresia sp.</i> | 0 | 1 |
| <i>Rhodiola gelida</i> | 2 | 0 | <i>Asteraceae</i> | 0 | 1 |
| <i>Linum pallescens</i> | 2 | 0 | <i>Asterosea sp.</i> | 0 | 1 |
| <i>Erigeron heterochaeta</i> | 2 | 0 | <i>Astragalus nivalis</i> | 0 | 1 |
| <i>Doronicum sp.</i> | 2 | 0 | <i>Dracocephalum sp.</i> | 0 | 1 |
| <i>Tragopogon vvedenskyi</i> | 1 | 0 | <i>Psathyrostachys kronenburgii</i> | 0 | 1 |
| <i>Anemonastrum protractum</i> | 1 | 0 | <i>Ephedra regeliana</i> | 0 | 1 |
| <i>Androsace septentrionalis</i> | 1 | 0 | <i>Hordeum sp.</i> | 0 | 1 |
| <i>Astragalus sp.</i> | 1 | 0 | <i>Festuca olgae</i> | 0 | 1 |
| <i>Crepis multicaulis</i> | 1 | 0 | <i>Ligularia sp.</i> | 0 | 1 |
| <i>Draba nemorosa</i> | 1 | 0 | <i>Plantago lanceolata</i> | 0 | 1 |
| <i>Poa tianschanica</i> | 1 | 0 | <i>Ranunculus sp.</i> | 0 | 1 |
| <i>Polygana comosa</i> | 1 | 0 | <i>Stipa capillata</i> | 0 | 1 |
| <i>Pedicularis macrochila</i> | 1 | 0 | <i>Stipa krylovii</i> | 0 | 1 |
| <i>Stachyopsis oblongata</i> | 1 | 0 | <i>Neotorularia humilis</i> | 0 | 1 |
| <i>Stellaria soongorica</i> | 1 | 0 | <i>Veronica sp.</i> | 0 | 1 |