**Multiproxy analysis of permafrost preserved faeces provides an unprecedented insight into the diets and habitats of extinct and extant megafauna**

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*Supporting Information (3/3)*

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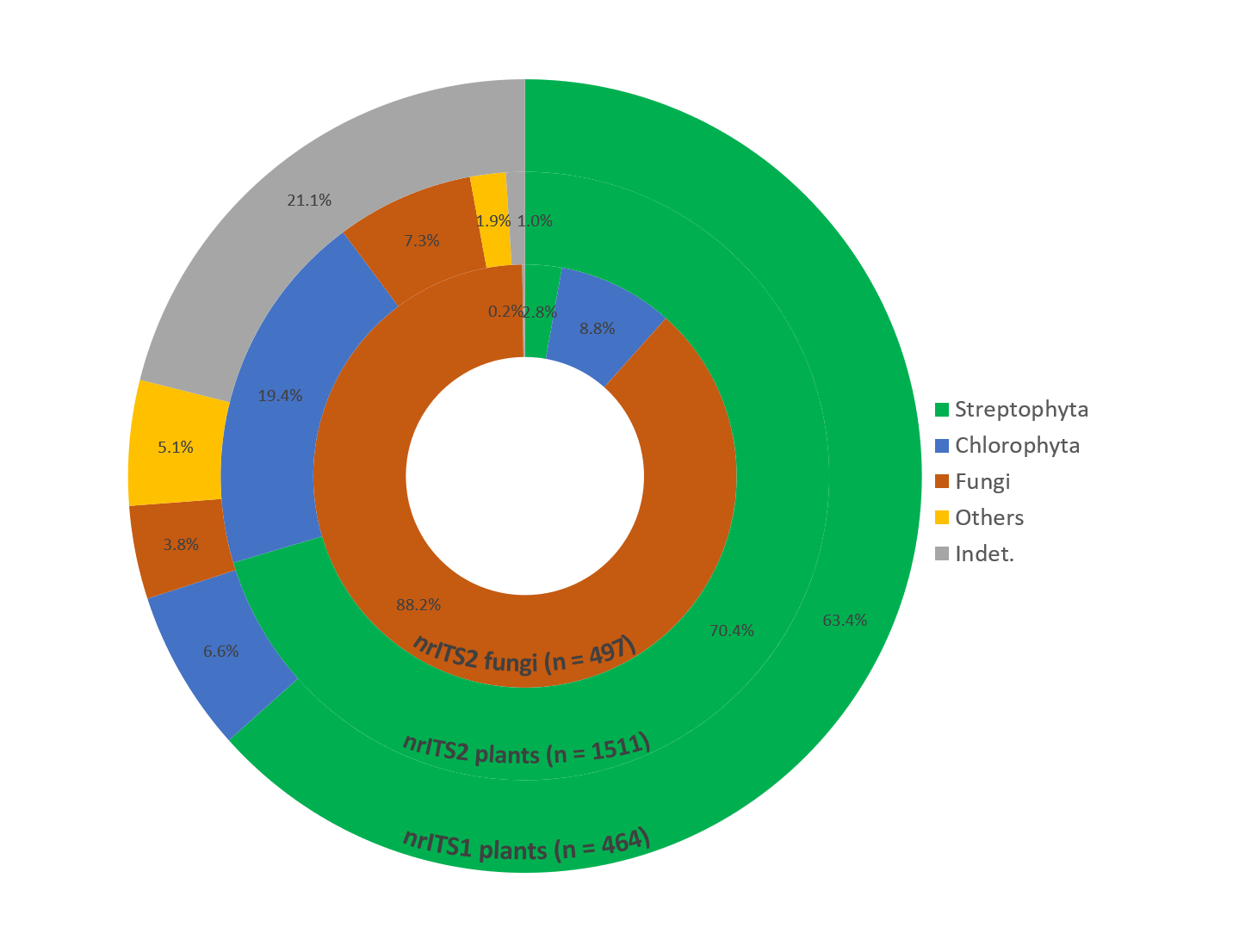
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## S15. Taxonomic resolution nrITS primers



**Figure S15**. Taxonomic results of the three nrITS markers for all samples. Numbers represent the percentage of OTUs that were assigned to the different clades. The group Others contains Bacteria, Eukaryota and Alveolata. N = number of OTUs found.

## S16. Sample read and OTU numbers

f\_nrITS2 = fungal nrITS2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Age**  **(kyr)** | **Average read counts** | | | | **no. of OTUs** | | | |
| ***trn*L** | **nrITS1** | **nrITS2** | **f\_nrITS2** | ***trn*L** | **nrITS1** | **nrITS2** | **f\_nrITS2** |
| **Selwyn A** | 0 | 6.4E+05 | 1.1E+05 | 1.6E+05 | 1.5E+05 | 56 | 28 | 40 | 26 |
| **Selwyn B** | ±1.5 | 3.6E+05 | 1.9E+05 | 1.0E+05 | 1.5E+05 | 30 | 18 | 17 | 37 |
| **Selwyn C** | ±2.7 | 1.3E+05 | 0 | 0 | 8.1E+04 | 23 | 0 | 0 | 13 |
| **Oyogas Yar** | ±5.4 | 1.8E+05 | 6.9E+02 | 5.4E+04 | 2.3E+05 | 12 | 11 | 16 | 11 |
| **Yakutian bison** | ±10.5 | 3.3E+05 | 8.6E+04 | 1.3E+05 | 7.5E+04 | 15 | 14 | 19 | 12 |
| **Cape Blossom** | ±14.4 | 4.7E+05 | 0 | 0 | 1.8E+05 | 44 | 0 | 0 | 38 |
| **Yukagir** | ±22.5 | 4.3E+05 | 5.8E+04 | 8.7E+04 | 1.3E+05 | 47 | 14 | 12 | 7 |
| **Adycha** | ±25.6 | 4.0E+05 | 1.8E+05 | 1.2E+05 | 3.2E+05 | 18 | 9 | 10 | 21 |
| **Yukon horse** | ±30.9 | 4.7E+04 | 0 | 0 | 9.1E+04 | 21 | 0 | 0 | 13 |
| **Abyland** | ±32.4 | 4.7E+05 | 6.2E+03 | 5.0E+04 | 2.0E+05 | 74 | 10 | 8 | 25 |
| **Maly Lyakhovsky** | ±32.7 | 4.0E+05 | 7.6E+04 | 3.3E+04 | 4.3E+04 | 47 | 15 | 15 | 19 |

## S17. Species habitat types

**Table S17.** Habitat types of all species and some genera for which clear habitat preference were identified. The habitat types used are steppe, dry disturbed sites, meadow (dry), meadow (saline), mountainous/rocks, tundra (arctic/alpine), snow patches, gravelly slopes, woods (dry), woods (wet), meadow (wet), wetland (along lakes, ponds, streams, rivers) and wetland (marsh, bog, fen, swamp).

| **Family** | **Taxon** | **DNA** | **Macro** | **Pollen** | **Selwyn caribou A** | **Selwyn caribou B** | **Selwyn caribou C** | **Oyogas Yar horse** | **Yakutian Bison** | **Cape Blossom mammoth** | **Yukagir mammoth** | **Adycha mammoth** | **Yukon horse** | **Abyland mammoth** | **Maly Lyakhovsky mammoth** | **Habitat type** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Adoxaceae | *Sambucus williamsii* |  |  |  |  |  |  |  | X |  |  |  |  |  |  | Gravelly slopes |
| Amaranthaceae | *Blitum nuttallianum* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Dry disturbed site |
| Amblystegiaceae | *Calliergon cf. giganteum* |  |  |  |  |  |  |  | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Amblystegiaceae | *Campylium stellatum* |  |  |  |  |  |  | X |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Amblystegiaceae | *Cratoneuron filicinum* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Amblystegiaceae | *Drepanocladus aduncus* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Amblystegiaceae | *Drepanocladus sordidus* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Amblystegiaceae | *Sanionia uncinata* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Anastrophyllaceae | *Barbilophozia barbata* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Mountainous/rocks |
| Apiaceae | *Cicuta virosa* |  |  |  |  |  |  | X | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Apiaceae | *Cymopterus sessiliflorus* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Gravelly slopes |
| Apiaceae | *Thalictrum* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Meadow (wet) |
| Asteraceae | *Artemisia* |  |  |  | X | X | X | X | X | X | X | X | X | X | X | Meadow (dry) |
| Asteraceae | *Artemisia gmelinii* |  |  |  |  |  | X |  |  | X | X |  | X | X |  | Steppe |
| Asteraceae | *Artemisia norvegica* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Asteraceae | *Artemisia scoparia* |  |  |  |  |  |  | X |  |  | X | X |  | X |  | Steppe |
| Asteraceae | *Endocellion sibiricum* |  |  |  |  |  |  | X | X |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Asteraceae | *Tripleurospermum maritimum* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Meadow (saline) |
| Aulacomniaceae | *Aulacomnium palustre* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Bartramiaceae | *Philonotis cf. arnellii* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Mountainous/rocks |
| Betulaceae | *Alnus crispa* |  |  |  |  |  |  |  |  |  |  |  | X |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Betulaceae | *Alnus incana* |  |  |  |  |  |  |  |  |  |  |  | X |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Boraginaceae | *Eritrichium* |  |  |  |  |  |  |  |  | X | X | X |  | X |  | Gravelly slopes |
| Boraginaceae | *Eritrichium sericeum* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Steppe |
| Boraginaceae | *Mertensia paniculata* |  |  |  | X |  | X |  |  | X |  |  |  | X |  | Woods (wet) |
| Boraginaceae | *Myosotis alpestris* |  |  |  |  |  |  |  |  | X | X |  |  | X |  | Meadow (dry) |
| Brachytheciaceae | *Tomentypnum nitens* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Brassicaceae | *Arabidopsis lyrata* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Tundra (arctic/alpine) |
| Brassicaceae | *Braya rosea* |  |  |  |  |  |  |  |  |  |  |  | X |  |  | Gravelly slopes |
| Brassicaceae | *Eutrema edwardsii* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Gravelly slopes |
| Brassicaceae | *Parrya nudicaulis* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Tundra (arctic/alpine) |
| Brassicaceae | *Sisymbrium linifolium* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Gravelly slopes |
| Brassicaceae | *Smelowskia alba* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Gravelly slopes |
| Bryaceae Ptychostomum pallescens | *Ptychostomum pallescens* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, |
| Calliergonaceae | *Warnstorfia sarmentosa* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Caryophyllaceae | *Cerastium arvense* |  |  |  |  |  |  |  |  |  | X |  |  | X |  | Meadow (dry) |
| Caryophyllaceae | *Cerastium maximum* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Meadow (dry) |
| Caryophyllaceae | *Eremogone capillaris* |  |  |  |  |  |  |  |  |  | X |  |  | X |  | Meadow (dry) |
| Caryophyllaceae | *Minuartia rubella* |  |  |  |  |  |  |  |  | X |  |  |  |  |  | Gravelly slopes |
| Caryophyllaceae | *Sagina nivalis* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Gravelly slopes |
| Caryophyllaceae | *Silene samojedorum* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Steppe |
| Caryophyllaceae | *Stellaria* |  |  |  |  | X | X |  |  |  |  | X |  | X | X | Meadow (wet) |
| Caryophyllaceae | *Stellaria borealis* |  |  |  |  |  |  |  |  |  |  |  |  | X | X | Meadow (wet) |
| Caryophyllaceae | *Stellaria longifolia* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Meadow (wet) |
| Crassulaceae | *Rhodiola integrifolia* |  |  |  | X |  |  |  |  |  |  |  |  | X |  | Mountainous/rocks |
| Crassulaceae | *Rhodiola rosea* |  |  |  |  |  |  |  |  |  | X |  |  |  | X | Mountainous/rocks |
| Cyperaceae | *Carex aquatilis* |  |  |  |  |  |  | X | X | X |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Carex chordorrhiza* |  |  |  |  |  |  |  | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Carex dioica* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Carex duriuscula* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Steppe |
| Cyperaceae | *Carex lachenalii* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Cyperaceae | *Carex maritima* |  |  |  |  |  |  |  |  | X |  | X |  |  |  | Meadow (saline) |
| Cyperaceae | *Carex microchaeta* |  |  |  | X |  |  |  |  | X |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Carex nardina* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Tundra (arctic/alpine) |
| Cyperaceae | *Carex nigra subsp. juncea* |  |  |  |  | X |  |  | X |  | X |  |  | X | X | Meadow (wet) |
| Cyperaceae | *Carex podocarpa* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Cyperaceae | *Carex rostrata* |  |  |  |  |  |  | X | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Carex vesicaria* |  |  |  |  |  |  |  | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Eriophorum* |  |  |  |  | X | X | X | X |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Cyperaceae | *Eriophorum angustifolium* |  |  |  |  |  |  | X | X |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Dicranaceae | *Dicranum bonjeanii* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Dicranaceae | *Dicranum fuscescens* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Ditrichaceae | *Ceratodon purpureus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  | n/a (various) |
| Elaeagnaceae | *Shepherdia canadensis* |  |  |  |  | X | X |  |  |  |  |  |  |  |  | Woods (dry) |
| Entodontaceae | *Entodon concinnus* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Meadow (dry) |
| Ericaceae | *Arctostaphylos uva-ursi* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Woods (dry) |
| Ericaceae | *Arctous alpina* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Arctous alpina/rubra* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Arctous rubra* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Cassiope tetragona* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Empetrum nigrum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Pyrola grandifolia* |  |  |  | X | X |  |  |  |  |  |  | X |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Vaccinium uliginosum* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ericaceae | *Vaccinium vitis-idaea* |  |  |  | X | X |  | X |  |  |  | X |  |  |  | Tundra (arctic/alpine) |
| Fabaceae | *Astragalus alpinus* |  |  |  |  |  |  |  |  |  | X | X |  |  |  | Tundra (arctic/alpine) |
| Fabaceae | *Oxytropis deflexa* |  |  |  |  |  |  |  |  |  | X |  |  |  | X | Meadow (dry) |
| Fabaceae | *Oxytropis splendens* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Meadow (dry) |
| Funariaceae | *Funaria* sp. |  |  |  |  |  |  |  |  |  |  | X |  |  | X | Dry disturbed sites |
| Grimmiaceae | *Niphotrichum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Mountainous/rocks |
| Hylocomiaceae | *Hylocomiastrum pyrenaicum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Hylocomiaceae | *Hylocomium splendens* |  |  |  | X | X |  |  |  |  |  | X |  |  |  | Woods (wet) |
| Hylocomiaceae | *Pleurozium schreberi* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Woods (dry) |
| Juncaceae | *Juncus* |  |  |  |  | X | X |  |  |  | X |  | X | X |  | Wetland (along lakes, ponds, streams, rivers) |
| Juncaceae | *Juncus alpinoarticulatus* |  |  |  |  | X |  |  |  |  |  |  | X | X |  | Meadow (wet) |
| Juncaceae | *Juncus biglumis* |  |  |  |  |  |  |  |  |  |  | X |  |  | X | Wetland (along lakes, ponds, streams, rivers) |
| Juncaceae | *Juncus effusus* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Meadow (wet) |
| Juncaceae | *Juncus oxymeris* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Juncaginaceae | *Triglochin palustris* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Liliaceae | *Gagea serotina* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Mountainous/rocks |
| Menyanthaceae | *Menyanthes trifoliata* |  |  |  | X |  |  | X | X | X | X |  |  | X | X | Wetland (marsh, bog, fen, swamp) |
| Mniaceae | *Cinclidium stygium* |  |  |  |  |  |  |  |  |  |  |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Mniaceae | *Plagiomnium cf. ellipticum* |  |  |  |  |  |  | X |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Mniaceae | *Rhizomnium cf. pseudopunctatum* |  |  |  |  |  |  | X |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Onagraceae | *Chamaenerion angustifolium* |  |  |  | X |  | X |  |  | X |  | X |  | X |  | Meadow (wet) |
| Onagraceae | *Chamaenerion latifolium* |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Onagraceae | *Epilobium palustre* |  |  |  | X |  |  | X | X |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Orobanchaceae | *Pedicularis capitata* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Meadow (wet) |
| Orobanchaceae | *Pedicularis sudetica* |  |  |  | X | X |  | X |  |  | X |  | X | X | X | Meadow (wet) |
| Orobanchaceae | *Pedicularis verticillata* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | Meadow (wet) |
| Plantaginaceae | *Hippuris* |  |  |  |  |  |  | X | X |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Plantaginaceae | *Plantago media/canescens* |  |  |  |  |  |  |  |  | X | X |  |  | X |  | Meadow (wet) |
| Plantaginaceae | *Veronica wormskjoldii* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Plumbaginaceae | *Armeria-type* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Meadow (saline) |
| Poaceae | *Alopecurus magellanicus* |  |  |  | X |  |  |  |  |  |  | X |  | X | X | Meadow (wet) |
| Poaceae | *Arctagrostis latifolia* |  |  |  |  | X |  | X |  |  |  | X |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Poaceae | *Arctophila fulva* |  |  |  | X |  |  | X | X |  |  |  |  |  | X | Wetland (along lakes, ponds, streams, rivers) |
| Poaceae | *Arctophila fulva/Dupontia fisheri* |  |  |  |  |  |  | X |  |  |  |  |  |  | X | Wetland (along lakes, ponds, streams, rivers) |
| Poaceae | *Bromus pumpellianus* |  |  |  |  |  |  |  |  | X |  | X | X | X | X | Meadow (dry) |
| Poaceae | *Calamagrostis stricta* |  |  |  |  |  |  | X |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Poaceae | *Deschampsia cespitosa* |  |  |  | X |  |  |  |  |  | X | X |  | X | X | Meadow (wet) |
| Poaceae | *Dupontia fisheri* |  |  |  |  |  |  | X | X |  |  | X |  |  | X | Wetland (along lakes, ponds, streams, rivers) |
| Poaceae | *Festuca altaica* |  |  |  | X |  |  |  |  |  |  |  |  | X | X | Gravelly slopes |
| Poaceae | *Festuca kolymensis* |  |  |  |  |  |  |  |  | X | X |  |  | X |  | Steppe |
| Poaceae | *Festuca ovina* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Steppe |
| Poaceae | *Koeleria asiatica* |  |  |  |  |  |  |  |  | X |  |  |  | X |  | Meadow (dry) |
| Poaceae | *Pleuropogon sabinei* |  |  |  |  |  |  |  |  |  | X |  |  |  | X | Wetland (marsh, bog, fen, swamp) |
| Poaceae | *Poa arctica* |  |  |  |  | X |  | X |  |  |  | X |  |  |  | Meadow (wet) |
| Poaceae | *Poa glauca* |  |  |  | X |  |  |  |  |  | X |  |  |  |  | Meadow (dry) |
| Poaceae | *Puccinellia* |  |  |  |  |  |  |  |  |  |  | X |  |  | X | Meadow (saline) |
| Poaceae | *Puccinellia tenuiflora / vahliana* |  |  |  |  |  |  |  |  |  |  | X |  | X |  | Meadow (saline) |
| Poaceae | *Puccinellia vahliana* |  |  |  |  |  |  |  |  |  |  | X |  |  | X | Meadow (saline) |
| Polemoniaceae | *Phlox hoodii* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Steppe |
| Polemoniaceae | *Polemonium boreale* |  |  |  |  |  |  |  |  | X |  |  |  |  |  | Gravelly slopes |
| Polygonaceae | *Bistorta vivipara* |  |  |  | X | X | X |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Polygonaceae | *Oxyria digyna* |  |  |  | X |  | X |  |  |  |  |  |  |  |  | Snow patches |
| Polygonaceae | *Rumex acetosella* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Dry disturbed sites |
| Polygonaceae | *Rumex aquaticus-type* |  |  |  |  |  |  |  |  | X |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Polytrichaceae | *Polytrichastrum alpinum* |  |  |  | X |  |  | X |  |  | X |  |  |  | X | Woods (dry) |
| Polytrichaceae | *Polytrichum cf. strictum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Polytrichaceae | *Polytrichum commune* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Polytrichaceae | *Polytrichum juniperinum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Woods (dry) |
| Polytrichaceae | *Polytrichum piliferum* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Potamogetonaceae | *Stuckenia* |  |  |  |  |  |  |  |  |  | X |  |  | X |  | Wetland (marsh, bog, fen, swamp) |
| Pottiaceae | *Barbula unguiculata* |  |  |  |  |  |  |  |  |  |  |  |  | X |  | n/a (various) |
| Pottiaceae | *Didymodon icmadophilus* |  |  |  |  |  |  |  |  |  |  |  |  | X | X | n/a (various) |
| Primulaceae | *Androsace lehmanniana* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Mountainous/rocks |
| Primulaceae | *Androsace septentrionalis* |  |  |  |  |  |  |  |  |  |  |  | X |  |  | Meadow (dry) |
| Primulaceae | *Primula frigida* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Meadow (wet) |
| Ranunculaceae | *Anemonastrum narcissiflora* |  |  |  | X | X | X |  |  |  | X |  | X | X | X | Tundra (arctic/alpine) |
| Ranunculaceae | *Anemone patens* |  |  |  | X |  |  |  | X |  |  |  |  | X | X | Meadow (dry) |
| Ranunculaceae | *Anemone richardsonii* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Ranunculaceae | *Caltha palustris* |  |  |  | X |  |  | X | X | X | X |  |  | X | X | Wetland (marsh, bog, fen, swamp) |
| Ranunculaceae | *Ranunculus nivalis* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Snow patches |
| Ranunculaceae | *Ranunculus pedatifidus var. affinis* |  |  |  |  |  |  |  |  |  | X |  |  |  | X | Meadow (dry) |
| Ranunculaceae | *Ranunculus pygmaeus* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Snow patches |
| Ranunculaceae | *Ranunculus trichophyllus Chaix* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Rosaceae | *Comarum palustre* |  |  |  | X | X |  | X | X | X |  |  |  | X | X | Wetland (marsh, bog, fen, swamp) |
| Rosaceae | *Dryas* |  |  |  | X | X | X |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Rosaceae | *Dryas octopetala* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Rosaceae | *Geum aleppicum* |  |  |  | X | X |  |  |  |  |  |  |  |  |  | Wetland (along lakes, ponds, streams, rivers) |
| Rosaceae | *Potentilla hookeriana* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Mountainous/rocks |
| Rosaceae | *Potentilla hyparctica* |  |  |  |  |  |  |  |  |  | X |  |  |  |  | Gravelly slopes |
| Rosaceae | *Rubus arcticus* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Rosaceae | *Sanguisorba officinalis* |  |  |  |  |  |  |  |  | X | X |  | X | X |  | Meadow (wet) |
| Rosaceae | *Sibbaldia procumbens* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Snow patches |
| Rosaceae | *Spiraea stevenii* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Meadow (wet) |
| Salicaceae | *Salix alaxensis* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Saxifragaceae | *Micranthes* |  |  |  | X |  | X |  |  |  | X |  |  |  | X | Tundra (arctic/alpine) |
| Saxifragaceae | *Micranthes nelsoniana* |  |  |  |  |  | X |  |  |  |  |  |  |  |  | Tundra (arctic/alpine) |
| Saxifragaceae | *Saxifraga sibirica* |  |  |  |  |  |  |  |  |  |  | X |  |  | X | Gravelly slopes |
| Scapaniaceae | *Douinia ovata* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Mountainous/rocks |
| Sphagnaceae | *Sphagnum* |  |  |  |  | X | X | X | X | X |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Sphagnaceae | *Sphagnum cf. magellanicum* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |
| Taxaceae | *Taxus canadensis* |  |  |  |  | X |  |  |  |  |  |  |  |  |  | Woods (wet) |
| Thuidiaceae | *Thuidium abietinum* |  |  |  |  |  |  |  |  | X |  |  |  |  |  | Meadow (dry) |
| Violaceae | *Viola epipsila var. repens* |  |  |  | X |  |  |  |  |  |  |  |  |  |  | Wetland (marsh, bog, fen, swamp) |

## S18. Lichen phycobionts

Identified using plant nrITS2 (only showing Selwyn Caribou samples, as no phycobionts were identified in any of the other samples, or using nrITS1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **OTU** | **#Identity percentage** | **#Coverage** | **maxid** | **Selwyn A** | **Selwyn B** | **Selwyn C** |
| Otu792 | 99,202 | 100 | *Asterochloris* | 1 | 0 | 0 |
| Otu227 | 100,000 | 100 | *Asterochloris (pseudo)irregularis* | 1 | 0 | 0 |
| Otu428 | 100,000 | 100 | *Asterochloris phycobiontica* | 1 | 0 | 0 |
| Otu089 | 99,505 | 100 | *Coccomyxa solorinae* | 1 | 1 | 1 |
| Otu499 | 100,000 | 100 | *Coccomyxa* sp. gbA3 | 1 | 0 | 0 |
| Otu896 | 96,552 | 99 | *Coccomyxa* sp. NEM-1 | 1 | 0 | 0 |
| Otu907 | 98,473 | 100 | *Coccomyxa subellipsoidea* | 1 | 0 | 0 |
| Otu355 | 99,229 | 96 | *Elliptochloris bilobata* | 1 | 1 | 0 |
| Otu203 | 92,647 | 100 | *Elliptochloris* sp. | 0 | 1 | 0 |
| Otu349 | 91,803 | 95 | *Symbiochloris* sp. | 1 | 0 | 0 |
| Otu493 | 99,496 | 100 | *Trebouxia impressa* | 1 | 0 | 0 |
| Otu362 | 100,000 | 100 | *Trebouxia* sp. | 1 | 0 | 0 |
| Otu599 | 99,501 | 100 | *Trebouxia vagua* | 1 | 0 | 0 |

## S19. Caribou diet selection

**Table S19.** Comparison of known caribou dietary preferences (Denryter et al., 2017) as detected using the different proxies.

\*for the modern caribou, insufficient material was available for a detailed analysis of plant macroremains.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Caribou Diet**  **preference** | **Pollen**  **(%)** | **Macro**  **(%)** | ***trn*L**  **(%)** | **ITS1**  **(%)** | **ITS2**  **(%)** |
| **Selwyn caribou A** | - Selected | 28.0 | ++\* | 97.7 | 98.1 | 95.9 |
| - Neutral | 11.0 | + | 1.3 | 0.3 | 0.4 |
| - Avoided | 47.0 |  | 0.3 | 1.6 | 3.4 |
| - Unknown | 14.0 |  | 0.6 | 0.0 | 0.3 |
| **Selwyn caribou B** | - Selected | 0.0 | 22.4 | 92.6 | 86.0 | 89.6 |
| - Neutral | 41.0 | 46.0 | 6.6 | 4.5 | 1.7 |
| - Avoided | 29.0 | 21.0 | 0.3 | 3.0 | 5.1 |
| - Unknown | 30.0 | 10.6 | 0.4 | 6.4 | 3.5 |
| **Selwyn caribou C** | - Selected | 4.0 | 25.8 | 11.4 |  |  |
| - Neutral | 5.0 | 30.5 | 44.4 | n/a | n/a |
| - Avoided | 27.0 | 20.7 | 1.4 |  |  |
| - Unknown | 64.0 | 23.0 | 42.7 |  |  |

## S20 Sample metadata

*trn*L (run ERR5880341)  
nrITS (run ERR5881895)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample** | **Rep** | ***trn*L tag combination** | **nrITS tag combination** | **nrITS2 tag combination** | **Fungal nrITS2 tag combination** |
| Abyland | 1 | TGCAGATCCAAC:CCTATGTGATGG | TGCAGATCCAAC:CCTATGTGATGG | TGCAGATCCAAC:CCTATGTGATGG | TGCAGATCCAAC:CCTATGTGATGG |
| Abyland | 2 | TGCAGATCCAAC:CTCCCATACCAC | TGCAGATCCAAC:CTCCCATACCAC | TGCAGATCCAAC:CTCCCATACCAC | TGCAGATCCAAC:CTCCCATACCAC |
| Abyland | 3 | TGCAGATCCAAC:CACCCTTAAAGT | TGCAGATCCAAC:CACCCTTAAAGT | TGCAGATCCAAC:CACCCTTAAAGT | TGCAGATCCAAC:CACCCTTAAAGT |
| Adycha | 1 | TGCAGATCCAAC:AGAAACGCAACA | TGCAGATCCAAC:AGAAACGCAACA | TGCAGATCCAAC:AGAAACGCAACA | TGCAGATCCAAC:AGAAACGCAACA |
| Adycha | 2 | CCATCACATAGG:CCGTAGTTTAGG | CCATCACATAGG:CCGTAGTTTAGG | CCATCACATAGG:CCGTAGTTTAGG | CCATCACATAGG:CCGTAGTTTAGG |
| Adycha | 3 | CCATCACATAGG:GTTGGATCTGCA | CCATCACATAGG:GTTGGATCTGCA | CCATCACATAGG:GTTGGATCTGCA | CCATCACATAGG:GTTGGATCTGCA |
| Bison | 1 | TGTTGCGTTTCT:CTCCCATACCAC | TGTTGCGTTTCT:CTCCCATACCAC | TGTTGCGTTTCT:CTCCCATACCAC | TGTTGCGTTTCT:CTCCCATACCAC |
| Bison | 2 | TGTTGCGTTTCT:CACCCTTAAAGT | TGTTGCGTTTCT:CACCCTTAAAGT | TGTTGCGTTTCT:CACCCTTAAAGT | TGTTGCGTTTCT:CACCCTTAAAGT |
| Bison | 3 | TGTTGCGTTTCT:AGGATGTTGCTC | TGTTGCGTTTCT:AGGATGTTGCTC | TGTTGCGTTTCT:AGGATGTTGCTC | TGTTGCGTTTCT:AGGATGTTGCTC |
| Selwyn A | 1 | GTGGTATGGGAG:CACCCTTAAAGT | GTGGTATGGGAG:CACCCTTAAAGT | GTGGTATGGGAG:CACCCTTAAAGT | GTGGTATGGGAG:CACCCTTAAAGT |
| Selwyn A | 2 | GTGGTATGGGAG:AGGATGTTGCTC | GTGGTATGGGAG:AGGATGTTGCTC | GTGGTATGGGAG:AGGATGTTGCTC | GTGGTATGGGAG:AGGATGTTGCTC |
| Selwyn A | 3 | GTGGTATGGGAG:AGAAACGCAACA | GTGGTATGGGAG:AGAAACGCAACA | GTGGTATGGGAG:AGAAACGCAACA | GTGGTATGGGAG:AGAAACGCAACA |
| Selwyn B | 1 | ACTTTAAGGGTG:GTTGGATCTGCA | ACTTTAAGGGTG:GTTGGATCTGCA | ACTTTAAGGGTG:GTTGGATCTGCA | ACTTTAAGGGTG:GTTGGATCTGCA |
| Selwyn B | 2 | ACTTTAAGGGTG:CCTATGTGATGG | ACTTTAAGGGTG:CCTATGTGATGG | ACTTTAAGGGTG:CCTATGTGATGG | ACTTTAAGGGTG:CCTATGTGATGG |
| Selwyn B | 3 | ACTTTAAGGGTG:CTCCCATACCAC | ACTTTAAGGGTG:CTCCCATACCAC | ACTTTAAGGGTG:CTCCCATACCAC | ACTTTAAGGGTG:CTCCCATACCAC |
| Selwyn C | 1 | ACTTTAAGGGTG:AGGATGTTGCTC | ACTTTAAGGGTG:AGGATGTTGCTC | ACTTTAAGGGTG:AGGATGTTGCTC | ACTTTAAGGGTG:AGGATGTTGCTC |
| Selwyn C | 2 | GAGCAACATCCT:CCGTAGTTTAGG | GAGCAACATCCT:CCGTAGTTTAGG | GAGCAACATCCT:CCGTAGTTTAGG | GAGCAACATCCT:CCGTAGTTTAGG |
| Selwyn C | 3 | GAGCAACATCCT:GTTGGATCTGCA | GAGCAACATCCT:GTTGGATCTGCA | GAGCAACATCCT:GTTGGATCTGCA | GAGCAACATCCT:GTTGGATCTGCA |
| Cape Blossom | 1 | CCTAAACTACGG:AGGATGTTGCTC | CCTAAACTACGG:AGGATGTTGCTC | CCTAAACTACGG:AGGATGTTGCTC | CCTAAACTACGG:AGGATGTTGCTC |
| Cape Blossom | 2 | CCTAAACTACGG:AGAAACGCAACA | CCTAAACTACGG:AGAAACGCAACA | CCTAAACTACGG:AGAAACGCAACA | CCTAAACTACGG:AGAAACGCAACA |
| Cape Blossom | 3 | TGCAGATCCAAC:CCGTAGTTTAGG | TGCAGATCCAAC:CCGTAGTTTAGG | TGCAGATCCAAC:CCGTAGTTTAGG | TGCAGATCCAAC:CCGTAGTTTAGG |
| Yukon horse | 1 | GTGGTATGGGAG:CCGTAGTTTAGG | GTGGTATGGGAG:CCGTAGTTTAGG | GTGGTATGGGAG:CCGTAGTTTAGG | GTGGTATGGGAG:CCGTAGTTTAGG |
| Yukon horse | 2 | GTGGTATGGGAG:GTTGGATCTGCA | GTGGTATGGGAG:GTTGGATCTGCA | GTGGTATGGGAG:GTTGGATCTGCA | GTGGTATGGGAG:GTTGGATCTGCA |
| Yukon horse | 3 | GTGGTATGGGAG:CCTATGTGATGG | GTGGTATGGGAG:CCTATGTGATGG | GTGGTATGGGAG:CCTATGTGATGG | GTGGTATGGGAG:CCTATGTGATGG |
| Maly Lyakh. | 1 | CCATCACATAGG:CTCCCATACCAC | CCATCACATAGG:CTCCCATACCAC | CCATCACATAGG:CTCCCATACCAC | CCATCACATAGG:CTCCCATACCAC |
| Maly Lyakh. | 2 | CCATCACATAGG:CACCCTTAAAGT | CCATCACATAGG:CACCCTTAAAGT | CCATCACATAGG:CACCCTTAAAGT | CCATCACATAGG:CACCCTTAAAGT |
| Maly Lyakh. | 3 | CCATCACATAGG:AGGATGTTGCTC | CCATCACATAGG:AGGATGTTGCTC | CCATCACATAGG:AGGATGTTGCTC | CCATCACATAGG:AGGATGTTGCTC |
| Oyogas Yar | 1 | TGTTGCGTTTCT:CCGTAGTTTAGG | TGTTGCGTTTCT:CCGTAGTTTAGG | TGTTGCGTTTCT:CCGTAGTTTAGG | TGTTGCGTTTCT:CCGTAGTTTAGG |
| Oyogas Yar | 2 | TGTTGCGTTTCT:GTTGGATCTGCA | TGTTGCGTTTCT:GTTGGATCTGCA | TGTTGCGTTTCT:GTTGGATCTGCA | TGTTGCGTTTCT:GTTGGATCTGCA |
| Oyogas Yar | 3 | TGTTGCGTTTCT:CCTATGTGATGG | TGTTGCGTTTCT:CCTATGTGATGG | TGTTGCGTTTCT:CCTATGTGATGG | TGTTGCGTTTCT:CCTATGTGATGG |
| Yukagir | 1 | CCTAAACTACGG:GTTGGATCTGCA | CCTAAACTACGG:GTTGGATCTGCA | CCTAAACTACGG:GTTGGATCTGCA | CCTAAACTACGG:GTTGGATCTGCA |
| Yukagir | 2 | CCTAAACTACGG:CCTATGTGATGG | CCTAAACTACGG:CCTATGTGATGG | CCTAAACTACGG:CCTATGTGATGG | CCTAAACTACGG:CCTATGTGATGG |
| Yukagir | 3 | CCTAAACTACGG:CTCCCATACCAC | CCTAAACTACGG:CTCCCATACCAC | CCTAAACTACGG:CTCCCATACCAC | CCTAAACTACGG:CTCCCATACCAC |
| Pos. Control |  | ATGTCCGACCAA:CCGTAGTTTAGG | ATGTCCGACCAA:CCGTAGTTTAGG | ATGTCCGACCAA:CCGTAGTTTAGG | ATGTCCGACCAA:CCGTAGTTTAGG |
| Neg. Control |  | ATGTCCGACCAA:GTTGGATCTGCA | ATGTCCGACCAA:GTTGGATCTGCA | ATGTCCGACCAA:GTTGGATCTGCA | ATGTCCGACCAA:GTTGGATCTGCA |
| ExBl | 1 | TGCAGATCCAAC:GTTGGATCTGCA | TGCAGATCCAAC:GTTGGATCTGCA | TGCAGATCCAAC:GTTGGATCTGCA | CCATCACATAGG:AGAAACGCAACA |
| ExBl | 2 | TGCAGATCCAAC:AGGATGTTGCTC | TGCAGATCCAAC:AGGATGTTGCTC | TGCAGATCCAAC:AGGATGTTGCTC | CCTAAACTACGG:CACCCTTAAAGT |
| ExBl | 3 | GTGGTATGGGAG:CTCCCATACCAC | GTGGTATGGGAG:CTCCCATACCAC | GTGGTATGGGAG:CTCCCATACCAC | ACTTTAAGGGTG:CCGTAGTTTAGG |
| ExBl | 4 | ACTTTAAGGGTG:CCGTAGTTTAGG | CCATCACATAGG:CCTATGTGATGG | CCATCACATAGG:CCTATGTGATGG | CCATCACATAGG:CCTATGTGATGG |
| ExBl | 5 | TGCAGATCCAAC:AGGATGTTGCTC | TGCAGATCCAAC:AGGATGTTGCTC | TGCAGATCCAAC:AGGATGTTGCTC | TGCAGATCCAAC:AGGATGTTGCTC |

# Supplementary Reference

Denryter, K.A., Cook, R.C., Cook, J.G., Parker, K.L., 2017. Straight from the caribou’s (*Rangifer tarandus*) mouth: detailed observations of tame caribou reveal new insights into summer–autumn diets. Canadian Journal of Zoology 95, 81-94.