

**Supplement S2.** Frequency table of species in different pine forest communities of Germany (1-5), Poland (6-10), South Western Siberia (11-13) and South Central Siberia (14-16). Species are sorted by structural layer, then arranged by frequency in the different regions. Only species with frequency >1 were considered. Note that some species from German or Siberian communities not displayed for Poland may occur here with low frequencies (≤1). For number 14-16 only species shared with communities 1-13 were considered. Species not occurring in Tyumen Oblast (Western Siberia, Russia) are marked in bold. Species not or rarely occurring in Germany or Poland highlighted in grey.

**Anhang S2.** Übersichtstabelle von häufigen Arten in verschiedenen Kiefernwäldern Deutschlands (1-5), Polens (6-10), Südwest Sibiriens (11-13) und Zentralsibiriens (14-16). Arten wurden erst nach Strukturschicht, dann nach Häufigkeit in den verschiedenen Regionen sortiert. Es wurden nur Arten mit einer Stetigkeit >1 berücksichtigt. Es ist zu beachten, dass eine Reihe von Arten der deutschen und sibirischen Gesellschaften, für die in Polen keine Eintragungen vorhanden sind, hier mit geringen Stetigkeiten (≤1) vorkommen dürften. Für Nummer 14-16 wurden nur gemeinsame Arten mit Nummer 1-13 berücksichtigt. Arten die nicht im Oblast Tyumen (Russland) vorkommen sind fettgedruckt. Arten die nicht oder nur sehr selten in Deutschland oder Polen vorkommen sind grau hervorgehoben.

1-5 HEINKEN (2008): *Peucedano-Pinetum*

1= *ligustretosum*, 2= *callunetosum*, vicariant *Vaccinium myrtillus*, 3= *callunetosum*, vicariant *Vaccinium vitis-idaea-V. myrtillus*, 4= *callunetosum*, vicariant *Picea abies-V. myrtillus* 5= *callunetosum*, vicariant without differential species

6-10 MATUSZKIEWICZ & MATUSZKIEWICZ (1973): *Peucedano-Pinetum*

6= *pulsatilletosum*, sarmatic race, 7= *pulsatilletosum*, subboreal race, 8= *typicum*, sarmatic race, 9= *typicum*, subboreal race, 10= *typicum*, subboreal race;

11-13 this study

11= '*Eremogone saxatilis* – *Pinus sylvestris*'-type, 12= '*Calamagrostis epigeios* – *Pinus sylvestris*'-type, 13= '*Cnidium dubium* – *Pinus sylvestris*'-type;

14-16 POLYAKOVA et al. (2008), POLYAKOVA & ERMAKOV (2008)

14= *Oxytropido-Pinetum* var. *Caragana arborescens*, 15= *Oxytropido-Pinetum sylvestris* 16= *Ptilio-Pinetum*

| Community-Number  | 1         | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |
|---|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| N   | 15        | 25  | 40  | 27  | 42  | 32  | 72  | 153 | 170 | 123 | 9   | 15  | 9   | 8   | 24  | 24  |
| Country   | DE        | DE  | DE  | DE  | DE  | PL  | PL  | PL  | PL  | PL  | RU  | RU  | RU  | RU  | RU  | RU  |
|   | Frequency |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Trees</b>  |           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Pinus sylvestris</i>   | V         | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   | V   |
| <i>Betula pendula</i>   | +         | II  | II  | I   | r   | r   | II  | II  | II  | IV  | .   | I   | III | III | II  | II  |
| <i>Quercus robur</i>  | IV        | I   | II  | III | V   | +   | .   | +   | r   | +   | .   | .   | .   | .   | I   | I   |
| <i>Populus tremula</i>  | .         | .   | II  | I   | .   | .   | r   | .   | r   | +   | .   | .   | .   | .   | .   | .   |
| <i>Picea abies</i>  | .         | .   | .   | III | .   | .   | III | +   | IV  | V   | .   | .   | .   | .   | .   | .   |
| <i>Fagus sylvatica</i>  | II        | I   | r   | II  | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Acer pseudoplatanus</i>  | II        | .   | +   | r   | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Tilia cordata</i>  | I         | .   | r   | .   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Carpinus betulus</i>   | .         | I   | .   | r   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Juglans regia</i>  | II        | .   | r   | .   | +   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Acer platanoides</i>   | +         | .   | II  | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <b>Shrubs</b>   |           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sorbus aucuparia</i>   | .         | IV  | IV  | II  | r   | II  | III | III | V   | V   | .   | I   | III | .   | .   | .   |
| <i>Frangula alnus</i>   | .         | III | III | II  | .   | III | III | IV  | III | IV  | .   | I   | I   | .   | .   | .   |
| <i>Juniperus communis</i>   | .         | +   | I   | +   | .   | V   | V   | V   | V   | III | .   | .   | .   | .   | .   | .   |
| <i>Rosa canina</i>  | I         | I   | II  | r   | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Ligustrum vulgare</i>  | IV        | +   | +   | r   | +   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Crataegus monogyna</i>   | II        | +   | II  | r   | III | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Corylus avellana</i>   | .         | r   | +   | I   | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Berberis vulgaris</i>  | II        | .   | .   | II  | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Mahonia aquifolium</i>   | +         | +   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Cytisus scoparius</i>  | .         | .   | +   | III | IV  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Sambucus nigra</i>   | II        | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Lonicera xylosteum</i>   | III       | .   | .   | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Viburnum lantana</i>   | II        | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <b>Field layer</b>  |           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Orthilia secunda</i>   | +         | II  | II  | II  | r   | +   | +   | III | II  | III | III | V   | V   | V   | IV  | V   |
| <i>Chimaphila umbellata</i>   | I         | I   | II  | II  | I   | IV  | III | II  | III | III | V   | V   | V   | III | III | IV  |
| <i>Carex ericetorum</i>   | II        | .   | III | II  | III | IV  | III | III | II  | +   | V   | V   | III | II  | IV  | I   |
| <i>Polygonatum odoratum</i>   | III       | r   | I   | I   | +   | V   | III | III | II  | II  | V   | III | III | III | V   | IV  |
| <i>Dicranum polysetum</i>   | III       | I   | +   | IV  | I   | V   | V   | V   | V   | V   | II  | V   | II  | V   | V   | III |
| <i>Hylocomium splendens</i>   | +         | .   | +   | IV  | I   | V   | V   | V   | V   | V   | .   | IV  | III | V   | IV  | V   |
| <i>Pleurozium schreberi</i>   | V         | III | V   | V   | V   | V   | V   | V   | V   | V   | III | V   | IV  | V   | V   | V   |
| <i>Antennaria dioica</i>  | .         | .   | +   | II  | r   | II  | II  | +   | +   | r   | V   | IV  | III | II  | IV  | III |
| <i>Hieracium umbellatum</i>   | I         | .   | II  | II  | II  | I   | I   | +   | +   | +   | V   | V   | IV  | III | V   | III |
| <i>Pyrola chlorantha</i>  | +         | I   | II  | II  | I   | .   | II  | r   | I   | I   | IV  | III | III | II  | III | III |
| <i>Solidago virgaurea</i>   | .         | +   | II  | I   | III | V   | IV  | IV  | III | V   | V   | V   | V   | II  | III | III |
| <i>Vaccinium vitis-idaea</i>  | .         | .   | IV  | II  | .   | V   | V   | V   | V   | V   | II  | II  | V   | V   | IV  | V   |
| <i>Vaccinium myrtillus</i>  | .         | III | III | III | .   | IV  | V   | V   | V   | V   | I   | II  | IV  | .   | .   | II  |
| <i>Calamagrostis epigeios</i>                                       | IV        | IV  | IV  | I   | II  | IV  | IV  | I   | I   | r   | III | V   | II  | .   | I   | .   |
| <i>Goodyera repens</i>  | I         | +   | .   | I   | r   | .   | II  | .   | II  | III | II  | III | I   | III | III | II  |
| <i>Pteridium aquilinum</i>  | .         | r   | +   | .   | .   | r   | r   | II  | I   | IV  | .   | I   | III | .   | .   | III |
| <i>Cladonia rangiferina</i>   | .         | .   | +   | r   | .   | III | IV  | I   | +   | r   | .   | .   | .   | .   | II  | I   |
| <i>Cladonia arbuscula</i>   | .         | r   | .   | r   | .   | II  | III | I   | r   | .   | .   | I   | .   | .   | III | .   |
| <i>Viola rupestris</i>  | III       | .   | .   | I   | II  | .   | .   | .   | .   | .   | III | III | III | II  | III | I   |
| <i>Galium verum</i>   | II        | I   | II  | I   | I   | .   | .   | .   | .   | .   | .   | I   | I   | .   | I   | r   |
| <i>Calluna vulgaris</i>   | I         | II  | IV  | IV  | IV  | V   | V   | V   | IV  | IV  | I   | I   | I   | .   | .   | .   |
| <i>Festuca ovina</i> agg. (WSIB: <i>F. rupicola</i> )               | II        | IV  | IV  | IV  | V   | V   | V   | V   | IV  | IV  | I   | I   | .   | .   | .   | .   |
| <i>Viola canina</i> et <i>rivintiana</i> (WSIB: <i>V. montana</i> ) | III       | III | III | I   | IV  | II  | II  | II  | III | III | .   | I   | IV  | .   | .   | .   |
| <i>Agrostis capillaris</i>  | II        | III | III | II  | II  | .   | I   | III | +   | +   | I   | I   | II  | .   | .   | .   |
| <i>Luzula pilosa</i>  | .         | I   | I   | II  | I   | IV  | V   | IV  | V   | V   | I   | I   | II  | .   | .   | .   |
| <i>Melampyrum pratense</i>  | .         | II  | III | III | IV  | V   | V   | V   | IV  | .   | II  | IV  | .   | .   | .   | .   |
| <i>Hieracium pilosella</i>  | II        | III | IV  | IV  | IV  | V   | IV  | IV  | II  | I   | I   | .   | .   | .   | .   | .   |
| <i>Dryopteris carthusiana</i>                                       | +         | I   | +   | .   | .   | r   | .   | II  | I   | II  | .   | I   | II  | .   | .   | .   |
| <i>Achillea millefolium</i>   | +         | II  | I   | .   | II  | .   | .   | .   | .   | .   | I   | I   | III | .   | .   | .   |
| <i>Pimpinella saxifraga</i>   | II        | I   | +   | III | II  | .   | .   | .   | .   | .   | .   | I   | II  | .   | .   | .   |
| <i>Silene nutans</i>  | I         | .   | .   | II  | I   | .   | .   | .   | .   | .   | II  | I   | III | .   | .   | .   |
| <i>Pyrola rotundifolia</i>  | .         | .   | .   | I   | .   | .   | .   | .   | r   | r   | .   | I   | III | .   | .   | .   |
| <i>Fragaria vesca</i>   | V         | II  | IV  | II  | I   | III | III | III | III | III | .   | .   | .   | V   | IV  | IV  |
| <i>Pulsatilla patens</i>  | .         | .   | .   | +   | .   | IV  | IV  | +   | +   | r   | IV  | IV  | III | I   | IV  | III |
| <i>Calamagrostis arundinacea</i>                                    | .         | r   | .   | r   | .   | IV  | III | III | V   | V   | IV  | IV  | V   | II  | III | V   |
| <i>Maianthemum bifolium</i>   | +         | +   | .   | +   | .   | .   | r   | I   | I   | IV  | I   | II  | V   | IV  | III | V   |
| <i>Equisetum hyemale</i>  | .         | .   | .   | r   | .   | .   | II  | r   | r   | r   | III | IV  | I   | III | II  | III |
| <i>Rubus saxatilis</i>  | .         | .   | r   | r   | .   | II  | +   | II  | II  | IV  | .   | III | V   | V   | III | V   |
| <i>Anthoxanthum odoratum</i>  | I         | I   | II  | II  | IV  | I   | I   | II  | I   | +   | .   | .   | .   | .   | .   | .   |
| <i>Thymus serpyllum</i>   | .         | I   | III | II  | r   | IV  | V   | II  | I   | +   | .   | .   | .   | .   | r   | .   |
| <i>Rumex acetosella</i>   | I         | II  | II  | I   | II  | III | II  | III | .   | I   | .   | .   | .   | .   | .   | .   |
| <i>Danthonia decumbens</i>  | I         | I   | III | III | III | II  | I   | II  | +   | +   | .   | .   | .   | .   | .   | .   |
| <i>Campanula rotundifolia</i>                                       | IV        | II  | II  | II  | IV  | +   | r   | II  | +   | r   | .   | .   | .   | .   | .   | .   |
| <i>Peucedanum oreoselinum</i>                                       | I         | r   | r   | IV  | III | V   | V   | IV  | III | IV  | .   | .   | .   | .   | .   | .   |
| <i>Deschampsia flexuosa</i>   | III       | V   | V   | IV  | III | III | r   | +   | I   | +   | .   | .   | .   | .   | .   | .   |
| <i>Veronica officinalis</i>   | IV        | II  | IV  | II  | IV  | III | III | III | II  | II  | .   | .   | .   | .   | .   | .   |
| <i>Dicranum scoparium</i>   | II        | I   | I   | II  | +   | III | II  | II  | I   | II  | .   | .   | .   | .   | .   | .   |
| <i>Convallaria majalis</i>  | +         | .   | I   | +   | I   | V   | V   | III | V   | IV  | .   | .   | .   | .   | .   | .   |
| <i>Polytrichum formosum</i>   | II        | I   | I   | I   | II  | .   | +   | r   | I   | II  | .   | .   | .   | .   | .   | .   |
| <i>Luzula campestris</i>  | .         | II  | II  | II  | II  | II  | +   | II  | +   | +   | .   | .   | .   | .   | .   | .   |
| <i>Moneses uniflora</i>   | +         | I   | II  | +   | r   | .   | .   | r   | r   | r   | .   | .   | .   | .   | .   | .   |
| <i>Anthericum ramosum</i>   | .         | r   | r   | .   | III | III | II  | II  | II  | II  | .   | .   | .   | .   | .   | .   |
| <i>Monotropa hypopitys</i>  | .         | r   | r   | I   | .   | +   | I   | II  | I   | II  | .   | .   | .   | .   | .   | .   |
| <i>Polytrichum juniperinum</i>                                      | .         | r   | r   | II  | .   | II  | III | II  | I   | I   | .   | .   | .   | .   | .   | .   |
| <i>Scorzonera humilis</i>   | .         | .   | +   | +   | .   | V   | V   | III | IV  | IV  | .   | .   | .   | .   | .   | .   |
| <i>Cytisus nigricans</i>  | .         | .   | .   | +   | .   | II  | .   | II  | .   | r   | .   | .   | .   | .   | .   | .   |
| <i>Lycopodium clavatum</i>  | .         | .   | .   | r   | .   | +   | +   | I   | I   | I   | I   | II  | III | .   | .   | .   |
| <i>Diphasiastrum complanatum</i>                                    | .         | .   | .   | .   | .   | II  | III | +   | I   | +   | I   | II  | II  | .   | .   | .   |
| <i>Hypochaeris maculata</i>   | .         | .   | .   | .   | .   | r   | I   | r   | r   | .   | .   | I   | II  | .   | r   | .   |
| <i>Trientalis europaea</i>  | .         | .   | .   | .   | .   | II  | II  | III | IV  | V   | .   | .   | IV  | .   | .   | .   |
| <i>Galium boreale</i>   | .         | .   | .   | r   | .   | .   | .   | .   | .   | .   | .   | I   | I   | III | IV  | II  |
| <i>Lathyrus vernus</i>  | .         | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | I   | I   | III | I   | II  |
| <i>Lupinaster pentaphyllus</i>                                      | .         | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | V   | V   | V   | I   | IV  |
| <i>Dianthus versicolor</i>  | .         | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | III | III | .   | .   | I   |
| <i>Rubus fruticosus</i> agg.  | IV        | II  | III | +   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Hieracium sylvaticum</i>   | III       | II  | +   | III | III | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Hypericum perforatum</i>   | II        | III | III | .   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Carex pilulifera</i>   | .         | III | II  | +   | III | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Euphorbia cyparissias</i>  | IV        | I   | I   | II  | III | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Brachypodium sylvaticum</i>                                      | V         | II  | II  | +   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Rubus idaeus</i>   | I         | III | II  | +   | +   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Mycelis muralis</i>  | III       | III | I   | +   | r   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Asparagus officinalis</i>  | II        | +   | +   | r   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Moehringia trinervia</i>   | III       | I   | I   | r   | I   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Hypochaeris radicata</i>   | .         | I   | I   | II  | r   | .   | .   | r   | .   | r   | .   | .   | .   | .   | .   | .   |
| <i>Dianthus carthusianorum</i>                                      | I         | r   | .   | I   | II  | +   | .   | +   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Scabiosa canescens</i>   | II        | .   | .   | .   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Pulsatilla verna</i>   | .         | .   | .   | II  | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| <i>Geranium sanguineum</i>  | +         | .   | .   | .   | .   | I   | II  | I   | I   | II  | .   | .   | .   | .   | .   | .   |
| <i>Cytisus ruthenicus</i>   | .         | .   | .   | .   | .   | .   | r   | I   | +   | II  | .   | .   | .   | .   | .   | .   |
| <i>Oxalis acetosella</i>  | .         | .   | .   | .   | .   | .   | r   | +   | r   | IV  | .   | .   | .   | .   | .   | .   |
| <i>Arctostaphylos uva-ursi</i>                                      | .         | .   | .   | .   | .   | IV  | IV  | +   | I   | r   | .   | .   |     |     |     |     |