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# Seed mass and seed resources – testing the defense trade-off hypothesis in woody plants

## Supplementary Material

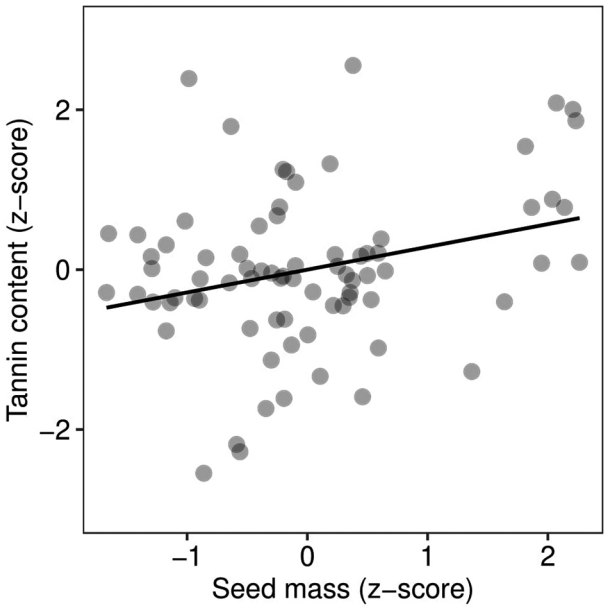


Fig. S1. The relationship between tannin content and seed mass. The slope was estimated based on simple regression

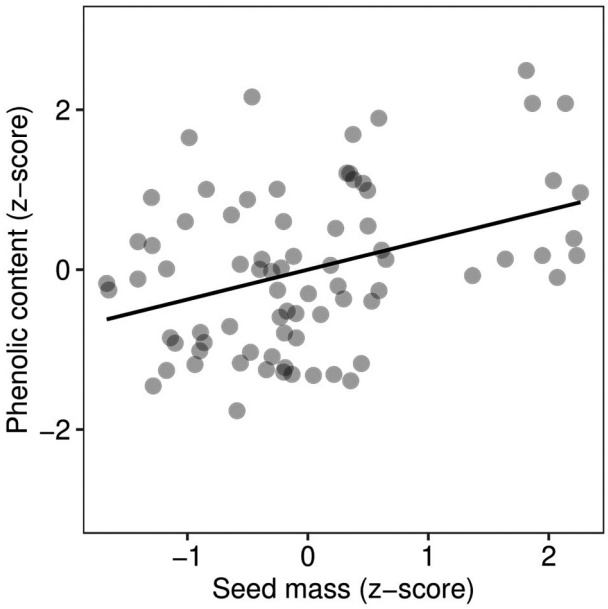


Fig. S2. The relationship between phenolic content and seed mass. The slope was estimated based on simple regression

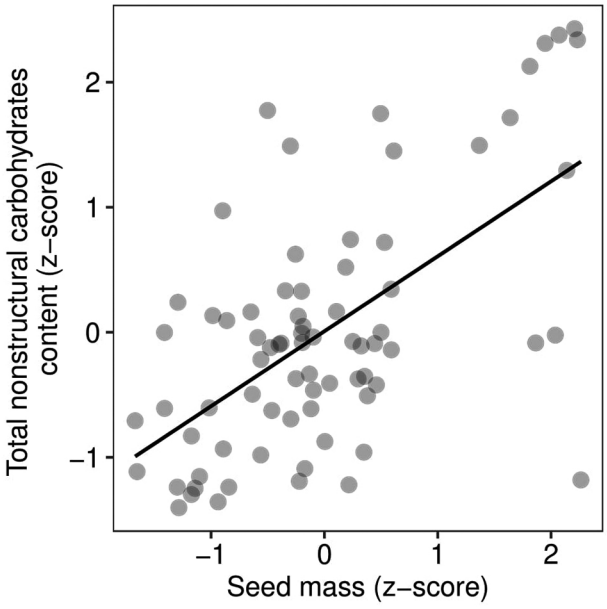


Fig. S3. The relationship between total non-structural carbohydrates (TNC) and seed mass. The slope was estimated based on simple regression

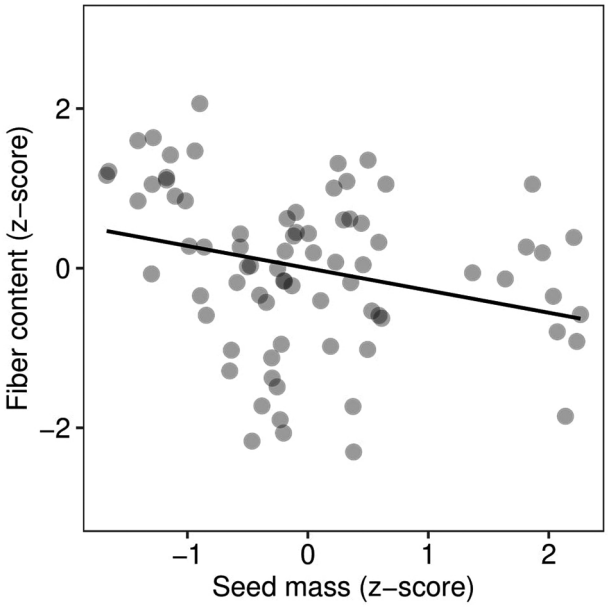


Fig. S4. The relationship between fiber content and seed mass. The slope was estimated based on simple regression

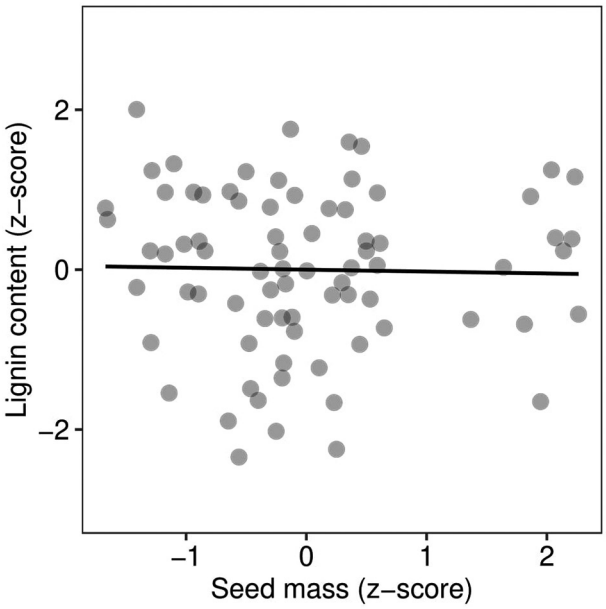


Fig. S5. The relationship between lignin content and seed mass. The slope was estimated based on simple regression

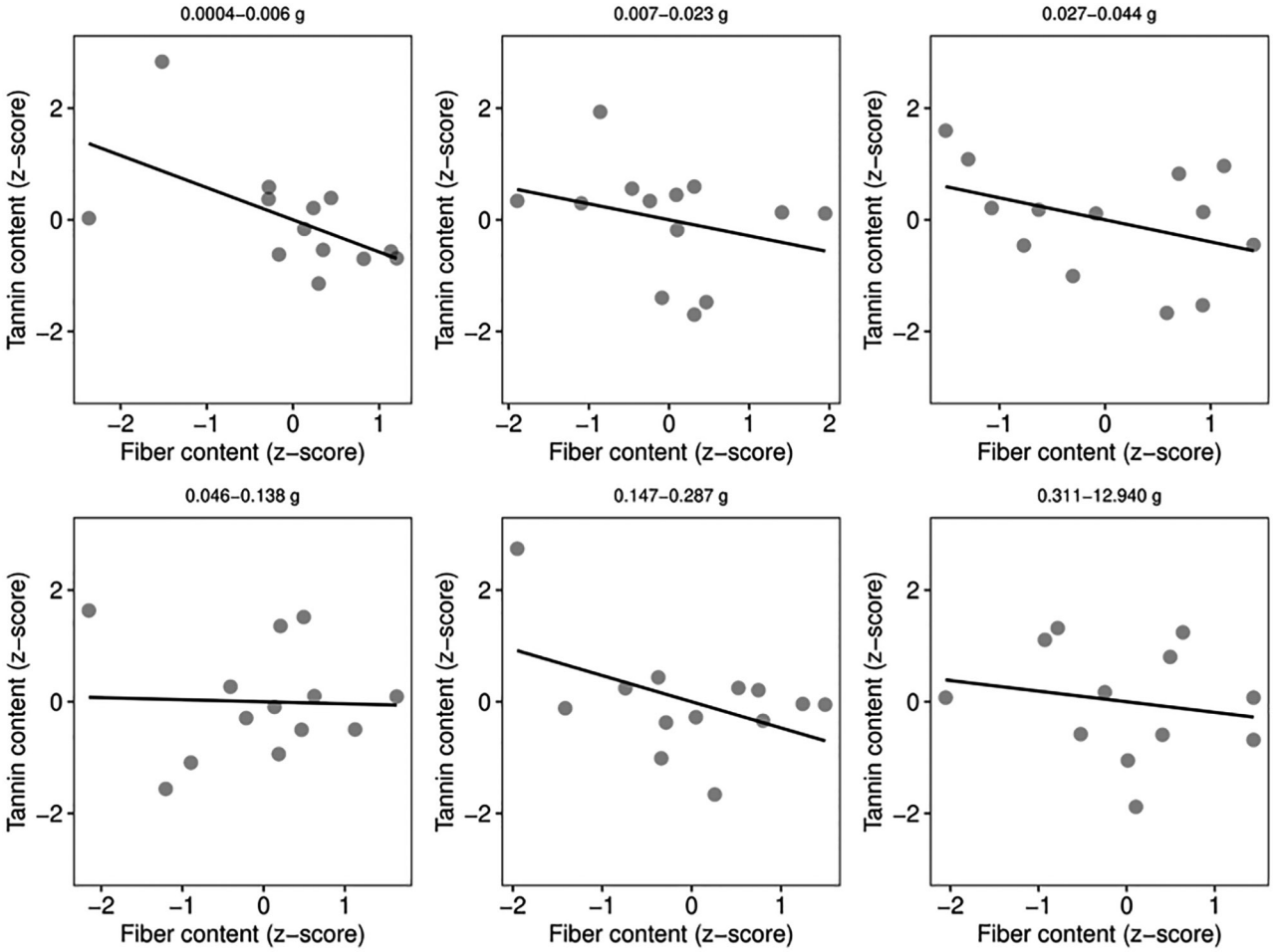


Fig. S6 The relationship between tannin content and fiber content across species for six seed mass windows. The slope was estimated based on simple regression

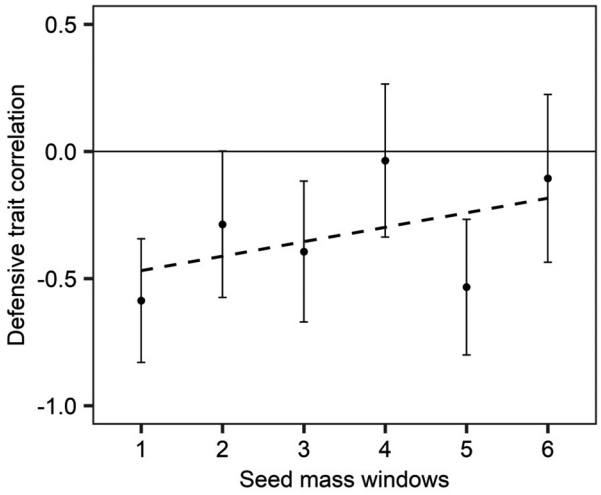


Fig. S7 Correlation between tannin and fiber contents across species for six seed mass windows (1: 0.0004–0.006 g; 2: 0.007–0.023 g; 3: 0.027–0.044 g; 4: 0.046–0.138 g; 5: 0.147–0.287 g; 6: 0.311–12.940 g

Table S1. List of woody plant species.

| Species | Genus | Family | Biome | Status in Europe |
|---|---|---|---|---|
| *Acer campestre* | *Acer* | Sapindaceae | Temperate | Native |
| *Acer japonicum* | *Acer* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Acer saccharinum* | *Acer* | Sapindaceae | Temperate | Introduced |
| *Acer negundo* | *Acer* | Sapindaceae | Temperate | Introduced |
| *Acer platanoides* | *Acer* | Sapindaceae | Temperate | Native |
| *Acer pseudoplatanus* | *Acer* | Sapindaceae | Temperate | Native |
| *Acer shirasawanum* | *Acer* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Aesculus glabra* | *Aesculus* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Aesculus hippocastanum* | *Aesculus* | Sapindaceae | Temperate | Introduced |
| *Aesculus parviflora* | *Aesculus* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Aesculus turbinata* | *Aesculus* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Alnus alnobetula* | *Alnus* | Betulaceae | Temperate | Native |
| *Alnus glutinosa* | *Alnus* | Betulaceae | Temperate | Native |
| *Berberis amurensis* | *Berberis* | Berberidaceae | Temperate | Not native and not naturalized* |
| *Berberis julianae* | *Berberis* | Berberidaceae | Temperate | Introduced |
| *Berberis vulgaris* | *Berberis* | Berberidaceae | Temperate | Native |
| *Betula pendula* | *Betula* | Betulaceae | Temperate | Native |
| *Callicarpa bodinieri* | *Callicarpa* | Lamiaceae | Temperate | Not native and not naturalized* |
| *Carpinus betulus* | *Carpinus* | Betulaceae | Temperate | Native |
| *Carpinus cordata* | *Carpinus* | Betulaceae | Temperate | Not native and not naturalized* |
| *Carpinus japonica* | *Carpinus* | Betulaceae | Temperate | Not native and not naturalized* |
| *Carpinus orientalis* | *Carpinus* | Betulaceae | Temperate | Native |
| *Carya cordiformis* | *Carya* | Juglandaceae | Temperate | Introduced |
| *Carya laciniosa* | *Carya* | Juglandaceae | Temperate | Not native and not naturalized* |
| *Carya ovata* | *Carya* | Juglandaceae | Temperate | Introduced |
| *Catalpa bignonioides* | *Catalpa* | Bignoniaceae | Temperate | Introduced |
| *Celtis occidentalis* | *Celtis* | Cannabaceae | Temperate | Introduced |
| *Chamaecyparis lawsoniana* | *Chamaecyparis* | Cupressaceae | Temperate | Introduced |
| *Cornus mas* | *Cornus* | Cornaceae | Temperate | Native |
| *Corylopsis veitchiana* | *Corylopsis* | Hamamelidaceae | Temperate | Not native and not naturalized* |
| *Crataegus laevigata* | *Crataegus* | Rosaceae | Temperate | Native |
| *Crataegus monogyna* | *Crataegus* | Rosaceae | Temperate | Native |
| *Crataegus submollis* | *Crataegus* | Rosaceae | Temperate | Not native and not naturalized* |

| Species | Genus | Family | Biome | Status in Europe |
|---|---|---|---|---|
| *Eleutherococcus henryi* | *Eleutherococcus* | Araliaceae | Temperate | Not native and not naturalized* |
| *Euonymus europaeus* | *Euonymus* | Celastraceae | Temperate | Native |
| *Euonymus verrucosus* | *Euonymus* | Celastraceae | Temperate | Native |
| *Fagus sylvatica* | *Fagus* | Fagaceae | Temperate | Native |
| *Fraxinus excelsior* | *Fraxinus* | Oleaceae | Temperate | Native |
| *Gleditsia japonica* | *Gleditsia* | Fabaceae | Temperate | Not native and not naturalized* |
| *Gleditsia triacantho* | *Gleditsia* | Fabaceae | Temperate | Introduced |
| *Hamamelis vernalis* | *Hamamelis* | Hamamelidaceae | Temperate | Not native and not naturalized* |
| *Hippophae rhamnoides* | *Hipphophae* | Elaeagnaceae | Temperate | Native |
| *Ilex aquifolium* | *Ilex* | Aquifoliaceae | Temperate | Native |
| *Juglans nigra* | *Juglans* | Juglandaceae | Temperate | Introduced |
| *Juniperus communis* | *Juniperus* | Cupressaceae | Temperate | Native |
| *Juniperus keteleeri* | *Juniperus* | Cupressaceae | Temperate | Introduced |
| *Kerria japonica* | *Kerria* | Rosaceae | Temperate | Introduced |
| *Koelreuteria paniculata* | *Koelreuteria* | Sapindaceae | Temperate | Introduced |
| *Koelreuteria bipinnata* | *Koelreuteria* | Sapindaceae | Temperate | Not native and not naturalized* |
| *Kolkwitzia amabilis* | *Kolkwitzia* | Caprifoliaceae | Temperate | Introduced |
| *Laburnum anagyroides* | *Laburnum* | Fabaceae | Temperate | Native |
| *Lonicera korolkowii* | *Lonicera* | Caprifoliaceae | Temperate | Not native and not naturalized* |
| *Magnolia grandiflora* | *Magnolia* | Magnoliaceae | Temperate | Not native and not naturalized* |
| *Magnolia ×sodangeana* | *Magnolia* | Magnoliaceae | Temperate | Not native and not naturalized* |
| *Magnolia tripetala* | *Magnolia* | Magnoliaceae | Temperate | Not native and not naturalized* |
| *Malus domestica* | *Malus* | Rosaceae | Temperate | Native |
| *Melia azedarach* | *Melia* | Meliaceae | Temperate/Tropical | Introduced |
| *Picea abies* | *Picea* | Pinaceae | Temperate | Native |
| *Picea abies cupressica* | *Picea* | Pinaceae | Temperate | Not native and not naturalized* |
| *Picea abies virgata* | *Picea* | Pinaceae | Temperate | Not native and not naturalized* |
| *Picea orientalis* | *Picea* | Pinaceae | Temperate | Introduced |
| *Pinus uncinata* | *Pinus* | Pinaceae | Temperate | Native |
| *Ptelea trifoliata* | *Ptelea* | Rutaceae | Temperate | Introduced |
| *Pterocarya fraxinifolia* | *Pterocarya* | Juglandaceae | Temperate | Introduced |
| *Pyracantha coccinea* | *Pyracantha* | Rosaceae | Temperate | Native |
| *Quercus petraea* | *Quercus* | Fagaceae | Temperate | Native |
| *Quercus robur* | *Quercus* | Fagaceae | Temperate | Native |
| *Quercus rubra* | *Quercus* | Fagaceae | Temperate | Introduced |
| *Robinia pseudoacacia* | *Robinia* | Fabaceae | Temperate | Introduced |
| *Sorbus intermedia* | *Sorbus* | Rosaceae | Temperate | Native |
| *Styrax japonicus* | *Styrax* | Styracaceae | Temperate | Not native and not naturalized* |
| *Symphoricarpos albus* | *Symphoricarpos* | Caprifoliaceae | Temperate | Introduced |
| *Tetradium daniellii* | *Tetradium* | Rutaceae | Temperate | Introduced |
| *Tilia americana* | *Tilia* | Malvaceae | Temperate | Not native and not naturalized* |
| *Tilia platyphyllos* | *Tilia* | Malvaceae | Temperate | Native |
| *Viburnum opulus* | *Viburnum* | Adoxaceae | Temperate | Native |
| *Wisteria speciosa* | *Wisteria* | Fabaceae | Temperate | Not native and not naturalized* |

*Species is not native and have been not naturalized in Europe, but cultivated in botanical collections and gardens.

Table S2 The results of the regression for correlation between TNC and phenolic content, TNC and tannin content, and TNC and fiber content across species for six seed mass windows

| | β | SE | F | p | R2 |
|---|---|---|---|---|---|
| Nutrient (TNC) – Chemical defensive (Phenolics) correlation | −0.115 | 0.07 | 2.34 | 0.201 | 0.21 |
| Nutrient (TNC) – Chemical defensive (Tannins) correlation | 0.018 | 0.07 | 0.06 | 0.812 | 0.02 |
| Nutrient (TNC) – Physical defensive correlation | −0.038 | 0.06 | 0.39 | 0.566 | 0.10 |