**Supplementary Material**

**Title: *Acacia* invasion triggers cascading effects above- and belowground in fragmented forests**

**Running head:** *Acacia* invasion alters above- and belowground dynamics

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Table S1: Cover (%) of each plant taxon at each of the 1 km2 sampling points in the regular 25 km2-grid at the Lousã mountains. Each taxon is classified according to respective growth form (i.e., tree, shrub or herb) and family. Taxa are ordered first by growth form and then alphabetically. The *Acacia*-invaded points are shown in orange, and the non-invaded ones in green.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **Sampling point** | | | | | | | | | | | | | | | | | | | | | | | | |
| **Growth form** | **Family** | **Taxon** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** |
| Tree | Fabaceae | *Acacia dealbata* Link | 30 | 0 | 100 | 95 | 0 | 0 | 0 | 15 | 95 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Tree | Fabaceae | *Acacia melanoxylon* R. Br. | 15 | 0 | 0 | 40 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Ericaceae | *Arbutus unedo* L. | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Betulaceae | *Betula pubescens* Ehrh. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| Tree | Fagaceae | *Castanea sativa* Mill. | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| Tree | Cupressaceae | *Chamaecyparis lawsoniana* (A.Murray bis) Parl. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Rhamnaceae | *Frangula alnus* Mill. | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Lauraceae | *Laurus nobilis* L. | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Pinaceae | *Pinus nigra* J.F.Arnold | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 90 | 0 | 0 | 40 |
| Tree | Pinaceae | *Pinus pinaster* Aiton | 70 | 0 | 0 | 0 | 0 | 10 | 70 | 70 | 0 | 15 | 40 | 0 | 90 | 15 | 0 | 0 | 0 | 50 | 80 | 20 | 0 | 0 | 0 | 5 | 0 |
| Tree | Pinaceae | *Pinus sylvestris* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Pinaceae | *Pseudotsuga menziesii* (Mirb.) Franco | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| Tree | Fagaceae | *Quercus orocantabrica* Rivas Mart., Penas, T.E.Díaz & Llamas | 1 | 10 | 0 | 0 | 25 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tree | Fagaceae | *Quercus suber* L. | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Ericaceae | *Calluna vulgaris* (L.) Hull | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Cistaceae | *Cistus inflatus* Pourr. ex Demoly | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Fabaceae | *Cytisus striatus* (Hill) Rothm. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Ericaceae | *Erica arborea* L. | 3 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Ericaceae | *Erica cinerea* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| Shrub | Ericaceae | *Erica scoparia* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Ericaceae | *Erica umbellata* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 5 | 35 | 0 | 0 | 0 | 35 | 0 |
| Shrub | Fabaceae | *Genista triacanthos* Brot. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Boraginaceae | *Glandora prostrata* (Loisel.) D.C.Thomas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| Shrub | Oleaceae | *Phillyrea latifolia* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shrub | Fabaceae | *Genista tridentata* L. | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 30 | 0 | 10 | 40 | 40 | 0 | 0 | 0 | 75 | 50 | 0 | 0 | 0 | 0 | 0 | 10 |
| Shrub | Fabaceae | *Ulex minor* Roth | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 35 | 0 | 0 | 0 | 80 | 70 |
| Shrub | Rosaceae | *Rubus ulmifolius* Schott | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 3 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Asphodelaceae | *Asphodelus* sp. | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Aspleniaceae | *Asplenium onopteris* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| Herb | Polypodiaceae | *Polystichum setiferum* (Forssk.) T.Moore ex Woynar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Helictochloa albinervis* (Boiss.) Romero Zarco subsp. *albinervis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Bromus hordeaceus* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Cyperaceae | *Carex pilulifera* L. subsp. *pilulifera* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 |
| Herb | Asteraceae | *Crepis capillaris* (L.) Wallr. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Caryophyllaceae | *Dianthus lusitanus* Brot. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Plantaginaceae | *Digitalis purpurea* L. subsp. *purpurea* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| Herb | Araliaceae | *Hedera* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Hypericaceae | *Hypericum humifusum* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| Herb | Asteraceae | *Logfia minima* (Sm.) Dumort. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Lolium rigidum* Gaudin | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Caprifoliaceae | *Lonicera periclymenum* L. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Juncaceae | *Luzula campestris* (L.) DC. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Juncaceae | *Luzula forsteri* (Sm.) DC. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Dactylis glomerata* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | Poaceae | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 30 | 0 | 70 | 15 | 0 | 0 | 0 | 0 | 70 | 0 | 0 |
| Herb | Poaceae | *Arrhenatherum longifolium* (Thore) Dulac | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 35 | 0 | 25 | 0 | 3 | 10 |
| Herb | Dennstaedtiaceae | *Pteridium aquilinum* (L.) Kuhn | 5 | 15 | 0 | 0 | 0 | 60 | 25 | 0 | 0 | 10 | 25 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 3 | 0 | 0 |
| Herb | Ranunculaceae | *Ranunculus ollissiponensis* Pers. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Rubiaceae | *Rubia peregrina* L. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Rosaceae | *Rubus* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Alpagrostis setacea* (Poir.) P.M.Peterson, Romasch., Soreng & Sylvester | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 0 | 10 |
| Herb | Crassulaceae | *Sedum arenarium* Brot. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Asphodelaceae | *Simethis mattiazzii* (Vand.) Sacc. | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 |
| Herb | Plantaginaceae | *Veronica officinalis* L. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Herb | Violaceae | *Viola riviniana* Rchb. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Crassulaceae | *Sedum brevifolium* DC. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Asteraceae | *Leontodon rothii* Ball | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Crassulaceae | *Umbilicus rupestris* (Salisb.) Dandy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herb | Poaceae | *Vulpia* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Eco-morphological traits** | | | | |  |  |  |
| **Functional type code** | **Total (n)** | **Ocelli** | **Antennae** | **Furca** | **Scales** | **Pigment** | **Composite trait** | **Continuous value1** | **Gisin classification2** |
| m02000 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0.1 | Epigeic |
| m02002 | 13 | 0 | 2 | 0 | 0 | 2 | 4 | 0.2 | Epigeic |
| m04000 | 8 | 0 | 4 | 0 | 0 | 0 | 4 | 0.2 | Epigeic |
| m02040 | 6 | 0 | 2 | 0 | 4 | 0 | 6 | 0.3 | Epigeic |
| m04002 | 22 | 0 | 4 | 0 | 0 | 2 | 6 | 0.3 | Epigeic |
| m04004 | 15 | 0 | 4 | 0 | 0 | 4 | 8 | 0.4 | Hemiedaphic |
| m02042 | 43 | 0 | 2 | 0 | 4 | 2 | 8 | 0.4 | Hemiedaphic |
| m04042 | 357 | 0 | 4 | 0 | 4 | 2 | 10 | 0.5 | Hemiedaphic |
| m44004 | 2 | 4 | 4 | 0 | 0 | 4 | 12 | 0.6 | Hemiedaphic |
| m04242 | 946 | 0 | 4 | 2 | 4 | 2 | 12 | 0.6 | Hemiedaphic |
| m04442 | 10 | 0 | 4 | 4 | 4 | 2 | 14 | 0.7 | Euedaphic |
| m44044 | 268 | 4 | 4 | 0 | 4 | 4 | 16 | 0.8 | Euedaphic |
| m44244 | 48 | 4 | 4 | 2 | 4 | 4 | 18 | 0.9 | Euedaphic |
| m44444 | 632 | 4 | 4 | 4 | 4 | 4 | 20 | 1 | Euedaphic |

Table S2: Springtail functional type codes showing different morphotypes (from m02000 to m44444) and the total number of specimens (n) identified across the regular 25 km2-grid at the Lousã mountains. Springtails are categorized in morphotypes with different codes according to the trait scores (0, 2 or 4) of five eco-morphological traits (i.e., presence or absence of ocelli, antennae length, furca characteristics, presence of scales or thick hairs along the body, and body pigmentation; one value for each trait; with lower trait scores indicating absence and higher scores indicating presence of those particular traits). The respective composite trait of life-form is based on the sum of the trait scores.

1Values of the composite trait after dividing the sum of the score numbers by 20 (i.e., maximum value that can be reached). Higher scores indicating a greater adaptation of springtails to the soil profile (i.e., from 0 to 0.3 for epigeic springtails; from 0.4 to 0.6 for hemiedaphic springtails; and from 0.7 to 1 for euedaphic springtails).

2The springtail life-form classification depending on the adaptation to the soil follows Gisin (1960).

Table S3: Spearman correlation coefficients (ρ) showing the relationships between the proportion of *Acacia* (*A. dealbata* + *A. melanoxylon*) cover and latitude, longitude, elevation, slope and aspect. Significant relationships (p-value < 0.05) are highlighted in bold.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Latitude | Longitude | Elevation | Slope | Aspect |
| Proportion of *Acacia* cover | **0.497** | 0.192 | **-0.544** | 0.256 | 0.04 |
| **p-value = 0.012** | (p-value > 0.05) | **(p-value = 0.005)** | (p-value > 0.05) | (p-value > 0.05) |

Table S4: Model selection for each response variable and for each tested hypothesis (H1, H2, and H3). Selected models for each response variable are highlighted in bold.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Response variable** | **Predictor variables** | **AIC** | **logLik** | **p-value** | **d.f.residuals** |
|  |  |  |  |  |  |  |
|  | Herb Cover | **Proportion of *Acacia* cover + Latitude + Elevation** | **218.1** | **-104.1** |  | **20** |
|  |  | Proportion of *Acacia* cover + Latitude | 221 | -106.5 | 0.027 | 21 |
|  |  | Proportion of *Acacia* cover + Elevation | 221.4 | -106.7 | 0.022 | 21 |
|  |  | Proportion of *Acacia* cover | 219.5 | -106.7 | 0.07 | 22 |
|  |  |  |  |  |  |  |
| Hypothesis 1a | Shrub Cover | Proportion of *Acacia* cover + Latitude + Elevation | 207.0 | -98.5 |  | 20 |
|  |  | Proportion of *Acacia* cover + Latitude | 207.5 | -99.8 | 0.114 | 21 |
|  |  | Proportion of *Acacia* cover + Elevation | 207.1 | -99.5 | 0.151 | 21 |
|  |  | **Proportion of *Acacia* cover** | **205.7** | **-99.8** | **0.261** | **22** |
|  |  |  |  |  |  |  |
|  | Plant Species Richness | Proportion of *Acacia* cover + Latitude + Elevation | 130.3 | -60.2 |  | 20 |
|  |  | Proportion of *Acacia* cover + Latitude | 130.4 | -61.2 | 0.153 | 21 |
|  |  | Proportion of *Acacia* cover + Elevation | 131.4 | -61.7 | 0.080 | 21 |
|  |  | **Proportion of *Acacia* cover** | **129.7** | **-61.8** | **0.188** | **22** |
|  |  |  |  |  |  |  |
|  | Litter C/N ratio | **Proportion of *Acacia* cover + Latitude + Elevation** | **364.6** | **-177.3** |  | **45** |
|  |  | Proportion of *Acacia* cover + Latitude | 371.4 | -181.7 | 0.003 | 46 |
|  |  | Proportion of *Acacia* cover + Elevation | 369.3 | -180.7 | 0.01 | 46 |
| Hypothesis 2b |  | Proportion of *Acacia* cover | 369.5 | -181.7 | 0.012 | 47 |
|  |  |  |  |  |  |  |
|  | SOC | Proportion of *Acacia* cover + Latitude + Elevation | 358.0 | -174.0 |  | 45 |
|  |  | Proportion of *Acacia* cover + Latitude | 371.4 | -181.7 | <0.001 | 46 |
|  |  | Proportion of *Acacia* cover + Elevation | 357.6 | -174.8 | 0.115 | 46 |
|  |  | **Proportion of *Acacia* cover** | **358.2** | **-176.1** | **0.127** | **47** |
|  |  |  |  |  |  |  |
|  | Springtail Abundance | Proportion of *Acacia* cover + Latitude + Elevation | 304.6 |  |  | 140 |
| Hypothesis 3b |  | Proportion of *Acacia* cover + Latitude | 303.4 | -142.7 | 0.388 | 141 |
|  |  | Proportion of *Acacia* cover + Elevation | 302.7 | -142.3 | 0.870 | 141 |
|  |  | **Proportion of *Acacia* cover** | **303.8** | **-143.9** | **0.205** | **142** |
|  |  |  |  |  |  |  |

AIC: Akaike Information Criteria; logLik: log-likelihood; d.f.residuals: degrees of freedom of the residuals of each model.

an = 25, bn = 50, cn = 50

Table S5: Similarity percentage (SIMPER) analysis of plant community assemblages in *Acacia*-invaded (n = 9) *versus* non-invaded (n = 16) sampling points. Average dissimilarity between *Acacia*-invaded and non-invaded sampling points = 90.41%. Only species exceeding the 90% cumulative contribution threshold are included in the table, ranked in descending order of average dissimilarity.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ***Acacia*-invaded** | **Non-invaded** |  |  |  |  |
| **Plant Species** | **Proportional abundance** | **Proportional abundance** | **Average Dissimilarity** | **Dissimilarity/SD** | **Contribution (%)** | **Cumulative Contribution (%)** |
| *Acacia dealbata* | 42.22 | 0.00 | 16.57 | 1.02 | 18.33 | 18.33 |
| *Pinus pinaster* | 22.22 | 20.94 | 11.35 | 1.04 | 12.56 | 30.88 |
| *Genista tridentata* | 9.78 | 11.56 | 6.18 | 0.84 | 6.83 | 37.72 |
| *Ulex minor* | 3.89 | 10.94 | 5.11 | 0.53 | 5.65 | 43.37 |
| *Pteridium aquilinum* | 8.33 | 7.06 | 4.83 | 0.70 | 5.34 | 48.71 |
| *Pinus nigra* | 0.00 | 10.94 | 4.64 | 0.44 | 5.13 | 53.84 |
| *Poaceae* | 1.11 | 11.75 | 4.25 | 0.53 | 4.70 | 58.54 |
| *Castanea sativa* | 0.33 | 8.13 | 2.81 | 0.46 | 3.11 | 61.64 |
| *Pseudotsuga menziesii* | 0.00 | 6.25 | 2.75 | 0.26 | 3.05 | 64.69 |
| *Erica umbellata* | 5.56 | 2.50 | 2.68 | 0.58 | 2.96 | 67.65 |
| *Acacia melanoxylon* | 7.22 | 0.00 | 2.62 | 0.57 | 2.90 | 70.55 |
| *Helictotrichon thorei* | 4.22 | 3.31 | 2.46 | 0.61 | 2.72 | 73.27 |
| *Chamaecyparis lawsoniana* | 0.00 | 4.69 | 2.04 | 0.35 | 2.26 | 75.53 |
| *Quercus orocantabrica* | 0.11 | 5.06 | 1.94 | 0.55 | 2.15 | 77.67 |
| *Rubus ulmifolius* | 2.00 | 3.13 | 1.88 | 0.40 | 2.08 | 79.75 |
| *Erica arborea* | 2.56 | 3.31 | 1.81 | 0.57 | 2.00 | 81.76 |
| *Cistus inflatus* | 0.00 | 3.75 | 1.58 | 0.26 | 1.75 | 83.51 |
| *Sedum arenarium* | 0.00 | 3.13 | 1.36 | 0.26 | 1.51 | 85.02 |
| *Arbutus unedo* | 0.00 | 3.75 | 1.22 | 0.26 | 1.35 | 86.37 |
| *Betula pubescens* | 0.00 | 3.13 | 1.03 | 0.26 | 1.14 | 87.50 |
| *Alpagrostis setacea* | 1.67 | 1.56 | 0.95 | 0.72 | 1.05 | 88.56 |
| *Simethis mattiazzii* | 1.67 | 1.00 | 0.83 | 0.79 | 0.92 | 89.48 |
| *Lolium rigidum* | 0.00 | 1.75 | 0.74 | 0.29 | 0.82 | 90.30 |

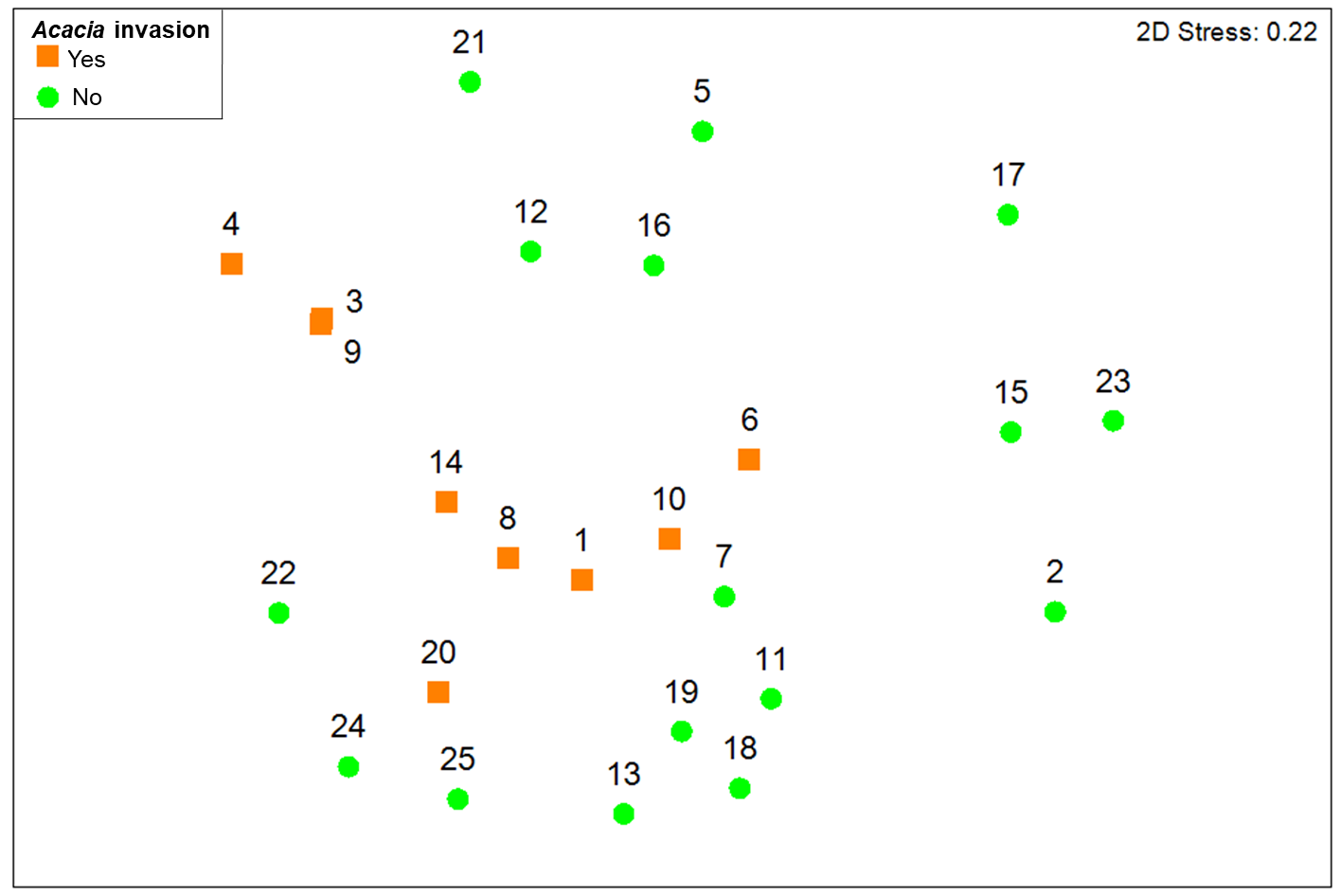


Figure S1: Non-metric multidimensional scaling (NMDS) ordination based on Bray-Curtis similarity index of the plant community assemblages in *Acacia*-invaded (n = 9) and non-invaded (n = 16) sampling points. Each sampling point is labeled with its corresponding number. The *Acacia*-invaded points are shown in orange, and the non-invaded ones in green.

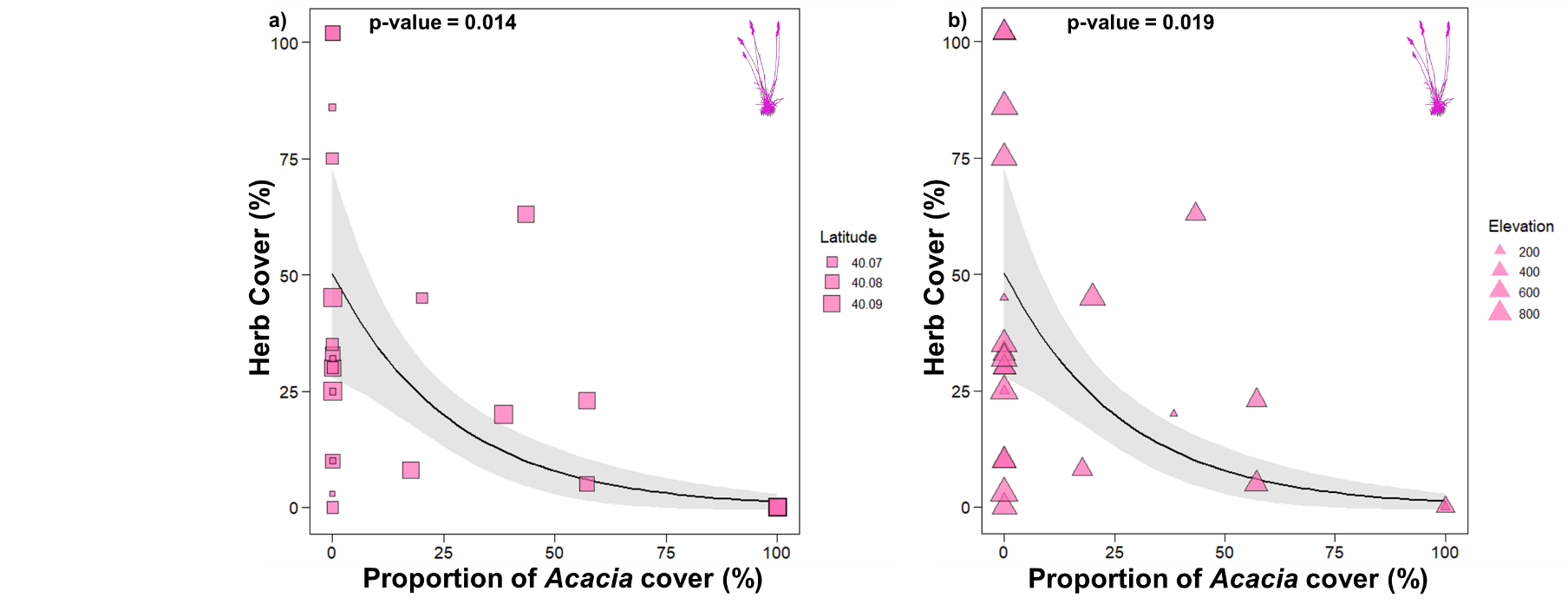


Figure S2: Scatterplots showing the relationships between the proportion of *Acacia* (*A. dealbata* + *A. melanoxylon*)relative to total tree abundance with herb cover. In panel (a), sampling points are shown as squares with size proportional to latitude; in panel (b), sampling points are shown as triangles with size proportional to elevation. The regression lines of best fit are derived from each GLM analysis. The solid line shows the model prediction, and the grey shaded region represents the 95% confidence interval for those predictions. P-values show a significant effect of a) latitude and b) elevation.

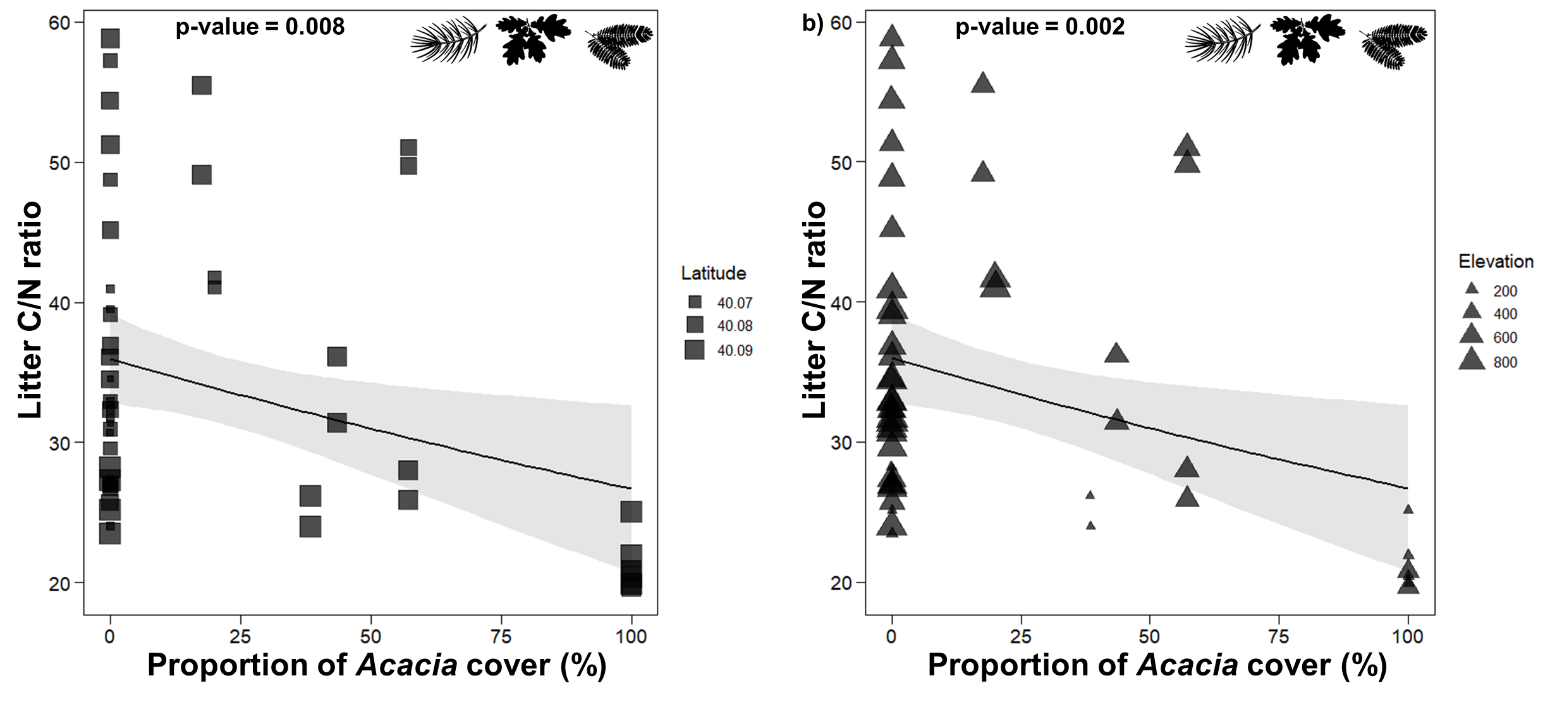


Figure S3: Scatterplots showing the relationships between the proportion of *Acacia* (*A. dealbata* + *A. melanoxylon*)relative to total tree abundance with litter C/N ratio. In panel (a), sampling points are shown as squares with size proportional to latitude; in panel (b), sampling points are shown as triangles with size proportional to elevation. The regression lines of best fit are derived from each GLM analysis. The solid line shows the model prediction, and the grey shaded region represents the 95% confidence interval for those predictions. P-values show a significant effect of a) latitude and b) elevation.