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## Supplementary Material

# Effect of fire severity and presence of bamboo (Chusquea culeou) on soil chemical properties in Andean Patagonian forests of Argentina

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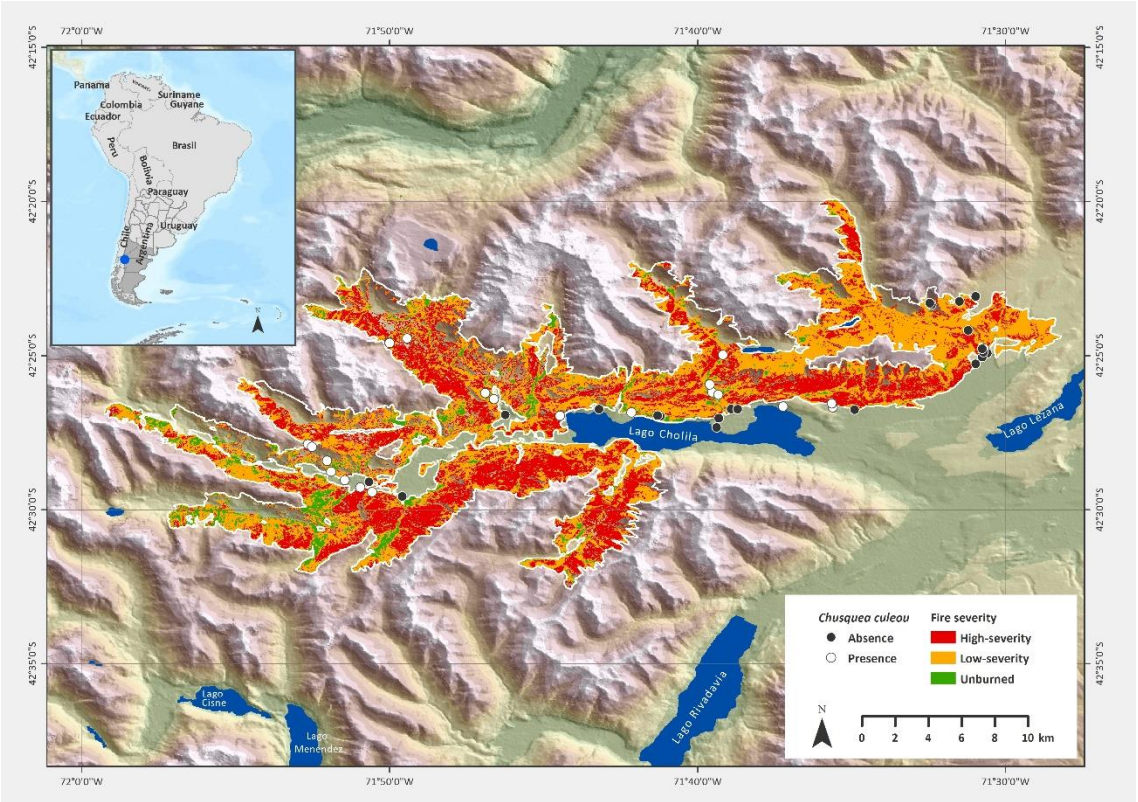


Supplementary material (S1). Burned area (delimited by white lines), with the fire severity classification based on normalised burn ratio (NBR) thresholds from SSB *et al.* (2015) and circles showing the surveyed plots for presence or absence of *Chusquea culeou*. Study area (point blue) located in Patagonia (grey area).

Table S2. Mean of the soil variables measured by forest type and by fire severity: unburned, low-severity and high-severity. Means with letters in common are not significantly different (LSD Fisher p > 0.05): uppercase for the severity main effect, lowercase for the forest main effect, and italic for the interaction.

| Variable / Statistics | Forest type | Fire severity | | |
|---|---|---|---|---|
| | | High | Low | Unburned |
| **pH** | | | | |
| p-values: forest x severity: 0.75; *forest: 0.008; severity: 0.006* | *Austrocedrus chilensis* | 7.3 Aa | 6.9 ABa | 6.6 Ba |
| f-values: forest x severity:0.62; forest: 4.20; severity: 6.09 | *Nothofagus dombeyi* | 6.9 Aabc | 6.4 ABabc | 6.2 Babc |
| | *Nothofagus pumilio* | 6.2 Ac | 6.7 ABc | 5.9 Bc |
| | *Mixed* | 7.2 Aa | 7.0 ABa | 6.8 Ba |
| | *Nothofagus antarctica* | 6.9 Aabc | 6.3 ABabc | 5.9 Babc |
| **Electrical conductivity (dS.m$^{-1}$)** | | | | |
| p-values: forest x severity: 0.95; forest: 0.08; severity: 0.04 | *Austrocedrus chilensis* | 0.21 A | 0.16 AB | 0.14 B |
| f-values: forest x severity: 0.32; forest: 2.36; severity: 3.55 | *Nothofagus dombeyi* | 0.17 A | 0.15 AB | 0.08 B |
| | *Nothofagus pumilio* | 0.10 A | 0.09 AB | 0.07 B |
| | *Mixed* | 0.14 A | 0.14 AB | 0.10 B |
| | *Nothofagus antarctica* | 0.18 A | 0.19 AB | 0.07 B |
| **Soil organic carbon (%)** | | | | |
| p-values: *forest x severity: 0.03;* forest: 0.04; severity: <0.001 | *Austrocedrus chilensis* | 5.2 *g* | 6.38 *ef* | 16.98 *a* |
| f-values: forest x severity: 2.49; forest: 2.97; severity: 15.78 | *Nothofagus dombeyi* | 6.91 *defg* | 9.71 *bcd* | 13.73 *ab* |
| | *Nothofagus pumilio* | 9.31 *bcd* | 8.83 *bcde* | 10.67 *b* |
| | Mixed | 5.31 *fg* | 6.07 *fg* | 10.28 *bc* |
| | *Nothofagus antarctica* | 6.98 *cdefg* | 9.96 *bcd* | 10.42 *bc* |
| **Total Nitrogen (%)** | | | | |
| p-values forest x severity: 0.28; forest: 0.12; *severity: 0.009* | *Austrocedrus chilensis* | 0.38 B | 0.48 AB | 0.76 A |
| f-values: forest x severity: 1.31; forest: 1.99; severity: 5.55 | *Nothofagus dombeyi* | 0.44 B | 0.55 AB | 0.68 A |
| | *Nothofagus pumilio* | 0.45 B | 0.44 AB | 0.41 A |
| | Mixed | 0.33 B | 0.38 AB | 0.45 A |
| | *Nothofagus antarctica* | 0.27 B | 0.55 AB | 0.49 A |
| **Carbon:Nitrogen ratio** | | | | |
| p-values: *forest x severity*: 0.02; forest: 0.003; severity: 0.0006 | *Austrocedrus chilensis* | 13.8 *gh* | 13.4 *h* | 23.2 *bcde* |
| f-values: forest x severity: 2.68; forest: 5.04; severity: 9.76 | *Nothofagus dombeyi* | 16.8 *defgh* | 17.6 *efgh* | 20.1 *bcdefgh* |
| | *Nothofagus pumilio* | 21.1 *bcdef* | 20.2 *cdef* | 25.8 *b* |
| | Mixed | 16.2 *fgh* | 16.6 *fgh* | 23.0 *bcd* |
| | *Nothofagus antarctica* | 41.0 *a* | 19.3 *cdefg* | 21.7 *bcdefg* |
| **Available Phosphorous (mg.kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.88; forest: 0.41; severity: 0.34 | *Austrocedrus chilensis* | 41.8 | 37.8 | 39.6 |
| f-values: forest x severity: 0.44; forest: 1.02; severity: 1.12 | *Nothofagus dombeyi* | 51.6 | 38.4 | 31.5 |
| | *Nothofagus pumilio* | 37.4 | 89.5 | 43.1 |
| | Mixed | 40.5 | 39.4 | 30.2 |
| | *Nothofagus antarctica* | 70.6 | 78.1 | 40.2 |
| **Calcium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.46; forest: 0.44; severity: 0.66 | *Austrocedrus chilensis* | 21.5 | 15.1 | 32.7 |
| f-values: forest x severity: 1.00; forest: 0.97; severity: 0.42 | *Nothofagus dombeyi* | 21.8 | 14.1 | 19.2 |
| | *Nothofagus pumilio* | 12.3 | 24.5 | 16.4 |
| | Mixed | 16.4 | 18.8 | 26.1 |
| | *Nothofagus antarctica* | 17.4 | 16.9 | 14.1 |
| **Magnesium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.35; forest: 0.38; severity: 0.21 | *Austrocedrus chilensis* | 3.8 | 3.2 | 7.0 |
| f-values: forest x severity: 1.17; forest: 1.09; severity: 1.66 | *Nothofagus dombeyi* | 4.5 | 4.0 | 6.7 |
| | *Nothofagus pumilio* | 5.5 | 2.3 | 2.4 |
| | Mixed | 4.2 | 3.2 | 4.5 |
| | *Nothofagus antarctica* | 3.0 | 4.6 | 4.4 |
| **Potassium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.92; forest 0.65; severity 0.86 | *Austrocedrus chilensis* | 1.1 | 1.1 | 1.5 |
| f-values: forest x severity: 0.38; forest: 0.62; severity: 0.15 | *Nothofagus dombeyi* | 1.1 | 0.9 | 1.2 |
| | *Nothofagus pumilio* | 1.1 | 0.9 | 1.0 |
| | Mixed | 1.2 | 1.2 | 1.3 |
| | *Nothofagus antarctica* | 1.4 | 1.4 | 1.1 |
| **Sodium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.25; *forest 0.0006*; severity: 0.36 | *Austrocedrus chilensis* | 0.8 abc | 0.8 abc | 1.0 abc |
| f-values: forest x severity: 1.37; forest: 6.73; severity: 1.06 | *Nothofagus dombeyi* | 0.6 cd | 0.9 cd | 1.0 cd |
| | *Nothofagus pumilio* | 1.1 a | 1.2 a | 1.0 a |
| | Mixed | 0.5 d | 0.7 d | 0.7 d |
| | *Nothofagus antarctica* | 1.0 ab | 0.8 ab | 0.8 ab |
| **Cation exchange capacity (cmol(+).kg$^{-1}$)** | | | | |
| p-values: forest x severity: 0.38; forest: 0.65; *severity: 0.01* | *Austrocedrus chilensis* | 29.2 B | 32.2 B | 46.6 A |
| f-values: forest x severity: 1.11; forest: 0.62; severity: 5.13 | *Nothofagus dombeyi* | 35.0 B | 41.0 B | 39.5 A |
| | *Nothofagus pumilio* | 33.0 B | 29.9 B | 37.4 A |
| | Mixed | 29.1 B | 33.9 B | 41.5 A |
| | *Nothofagus antarctica* | 36.1 B | 37.5 B | 36.1 A |

Table S3. Mean of the soil variables measured per *Chusquea culeou* (Cc) absence or presence, and fire severity: unburned, low-severity and high-severity. Means with letters in common are not significantly different (LSD Fisher p > 0.05): Lowercase and capital letters indicate *C. culeou* and fire severity.

| Variable / Statistics | *Chusquea culeou* | Fire severity | | |
|---|---|---|---|---|
| | | High | Low | Unburned |
| **pH** | | | | |
| p-values: Cc x severity: 0.97; Cc: 0.002; severity: 0.002 | Absence | 7.3 Aa | 6.9 ABa | 6.5 Ba |
| f-values: Cc x severity: 0.03; Cc: 10.71; severity: 7.75 | Presence | 6.7 Ab | 6.40 ABb | 6.0 Bb |
| **Electrical conductivity (dS.m$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.919; Cc: 0.394; severity: 0.019 | Absence | 0.18 A | 0.14 AB | 0.10 B |
| f-values: Cc x severity: 0.08; Cc: 0.74; severity: 4.40 | Presence | 0.15 A | 0.15 AB | 0.07 B |
| **Soil organic carbon (%)** | | | | |
| p-values: Cc x severity: 0.643; Cc: 0.315; severity: <0.001 | Absence | 5.81 B | 7.33 B | 12.18 A |
| f-values: Cc x severity: 0.45; Cc: 1.04; severity: 16.18 | Presence | 7.36 B | 9.18 B | 12.51 A |
| **Total Nitrogen (%)** | | | | |
| p-values: Cc x severity: 0.722; Cc: 0.429; severity: 0.02 | Absence | 0.38 B | 0.47 AB | 0.58 A |
| f-values: Cc x severity: 0.33; Cc: 0.64; severity: 4.32 | Presence | 0.37 B | 0.50 AB | 0.51 A |
| **Carbon:Nitrogen ratio** | | | | |
| p-values: Cc x severity: 0.415; Cc: 0.029; severity: 0.173 | Absence | 15.5 B | 15.9 B | 21.3 B |
| f-values: Cc x severity: 0.90; Cc: 5.17; severity: 1.84 | Presence | 35.4 A | 19.1 A | 25.1 A |
| **Available Phosphorous (mg.kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.109; Cc: 0.101; severity: 0.204 | Absence | 44.1 | 62.5 | 46.5 |
| f-values: Cc x severity: 2.35; Cc: 2.82; severity: 1.66 | Presence | 51.2 | 50.0 | 25.0 |
| **Calcium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.925; Cc: 0.007; severity: 0.779 | Absence | 21.8 a | 21.0 a | 25.5 a |
| f-values: Cc x severity: 0.08; Cc: 8.16; severity: 0.25 | Presence | 15.3 b | 14.3 b | 17.2 b |
| **Magnesium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.364; Cc: 0.28; severity: 0.232 | Absence | 5.2 | 3.4 | 4.9 |
| f-values: Cc x severity: 1.04; Cc: 1.20; severity: 1.52 | Presence | 3.5 | 3.6 | 4.8 |
| **Potasium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.644; Cc: 0.864; severity: 0.851 | Absence | 1.2 | 1.1 | 1.3 |
| f-values: Cc x severity: 0.44; Cc: 0.03; severity: 0.16 | Presence | 1.1 | 1.2 | 1.1 |
| **Sodium (cmol(+).kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.318; Cc: 0.274; severity: 0.544 | Absence | 0.7 | 0.9 | 0.9 |
| f-values: Cc x severity: 1.18; Cc: 1.23; severity: 0.62 | Presence | 0.9 | 0.9 | 1.0 |
| **Cation exchange capacity (cmol(+).kg$^{-1}$)** | | | | |
| p-values: Cc x severity: 0.538; Cc: 0.474; severity: 0.012 | Absence | 29.4 B | 33.7 B | 40.6 A |
| f-values: Cc x severity: 0.63; Cc: 0.52; severity: 5.01 | Presence | 25.9 B | 36.3 B | 39.8 A |