**Supplementary material**

**Table S1.** Physical and chemical properties of the Oxisol, Inceptisol and Tropical Artificial Soil (TAS) used in laboratory experiments

|  |  |  |  |
| --- | --- | --- | --- |
| Attributes | Oxisol | Inceptisol | TAS |
| P - Mehlich (mg dm-3) | 1.1 | 2.6 | - |
| P - Remaining (mg dm-3) | 26.6 | 20.9 | - |
| K (mg dm-3) | 32.0 | 34.0 | - |
| Ca2+ (cmolc dm-3) | 0.3 | 1.6 | - |
| Mg2+ (cmolc dm-3) | 0.1 | 0.4 | - |
| Al3+ (cmolc dm-3) | 0.6 | 0.5 | - |
| Base saturation (%) | 9.6 | 34.0 | - |
| Effective cation exchange capacity (cmolc dm-3) | 1.1 | 2.6 | - |
| Al saturation (%) | 55.5 | 19.3 | - |
| S (mg dm-3) | 9.9 | 5.9 | - |
| Zn (mg dm-3) | 0.5 | 2.8 | - |
| B (mg dm-3) | 0.2 | 0.2 | - |
| Fe (mg dm-3) | 41.6 | 121.3 | - |
| Mn (mg dm-3) | 4.1 | 18.6 | - |
| Cu (mg kg-1) | 0.5 | 0.8 | - |
| Total Pb (mg dm-3) | 4.1 | 9.9 | - |

Analyzes according to methodology Teixeira et al. (2017) and Lead concentrations by methodology USEPA 3051A (USEPA, 2007).

**Table S2.** Differences in species forEC50 values in the tests with Pb acetate determined by the generalized likelihood ratio test (*p* < 0.05). \* - Statistically significant difference; ns - No statistically significant difference

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Soil | *E. crypticus* × *E. andrei* | *E. crypticus* × *F. candida* | *E. andrei* × *F. candida* | *Z. mays* × *P. vulgaris* |
|  | *t* | *p* |  | *t* | *p* |  | *t* | *p* |  | *t* | *p* |  |
| Oxisol | -1.90 | 2.15 | ns | -2.01 | 2.15 | ns | 1.90 | 2.15 | ns | -2.8013 | 2.15 | \* |
| Inceptisol | -2.87 | 2.15 | \* | -2.89 | 2.15 | \* | 2.80 | 2.15 | \* | -1.0434 | 2.15 | ns |
| TAS | -4.29 | 2.15 | \* | -5.38 | 2.15 | \* | 4.96 | 2.15 | \* |   |   |   |

**Table S3.** Differences in soils forEC50 values in the tests with Pb acetate determined by the generalized likelihood ratio test (*p* < 0.05). \* - Statistically significant difference; ns - No statistically significant difference

|  |  |  |  |
| --- | --- | --- | --- |
| Species | Oxisol × Inceptisol | Oxisol × TAS | Inceptisol × TAS |
|   | *t* | *p* |   | *t* | *p* |   | *t* | *p* |   |
| *E. andrei* | 0.65 | 2.15 | ns | 2.50 | 2.15 | \* | 2.25 | 2.15 | \* |
| *F. candida* | 1.17 | 2.15 | ns | 2.25 | 2.15 | \* | 0.67 | 2.15 | ns |
| *E. crypticus* | 0.94 | 2.15 | ns | -1.91 | 2.15 | ns | -2.27 | 2.15 | \* |
| *Z. mays* | -0.63 | 2.15 | ns |  |  |  |  |  |  |
| *P. vulgaris* | 0.99 | 2.15 | ns |  |  |   |  |  |   |

**Table S4.** EC50 and EC20 values (and respective 95% confidence intervals) for the effects on growth of *Z. mays* and *P. vulgaris* and reproduction of *E. andrei*, *F. candida,* and *E. crypticus*) exposed to an Oxisol, an Inceptisol, and a Tropical Artificial Soil (TAS) spiked with increasing concentrations of Pb acetate (AcPb). Values are expressed in mg of Pb kg-1 of soil

|  |  |  |  |
| --- | --- | --- | --- |
| Species | Soil | EC20 | EC50 |
|  |  | --------- mg kg-1 --------- |
| *E. andrei* | Oxisol | 43.8(3 - 84) | 90.4(31 - 150) |
|  | Inceptisol | NV 1 | 113.0(72 - 156) |
|  | TAS | 46.9(6-88) | 236.0(133 - 340) |
| *F. candida* | Oxisol | NV | 1168.8(23 - 2134) |
|  | Inceptisol | NV | 2296.9(719 - 3879) |
|  | TAS | 1306.0(415 - 2198) | 2931.0(1834 - 4029) |
| *E. crypticus* | Oxisol | NV | 33.3(19 - 48) |
|  | Inceptisol | NV | 46.0(22 - 109) |
|  | TAS | NV | 19.0(14 - 24) |
| *Z. mays* | Oxisol | 687.0(362 - 1011) | 973.0(569 - 1377) |
|  | Inceptisol | NV | 783.0(312 - 1253) |
| *P. vulgaris* | Oxisol | NV | 357.0(160 - 555) |
|  | Inceptisol | 64.0(6 - 122) | 511.0(263 - 759) |

1 NV – Data not validated by non-linear regression models (*p* < 0.05).

**Fig. S1**. Principal Component Analysis (PCA) for the EC50 values and soil properties for the effects on growth of plants and on reproduction of soil invertebrates shown in table 5. Data removed for TAS and effective cation exchange capacity at soil pH. OC values were converted to OM with the conversion fator of van Bemmelen (1.724), assuming that OM has 58% carbon

