

Supplementary materials

Table A

Comparison of the initial earthworm weights (n=85) collected from the conventional and organically treated fields for use in the container experiment. Five earthworms were selected from each group and analysed for total glycogen, soluble proteins, lipids and basal respiration rate measured. Results are expressed as the mean \pm standard deviation.

Worms from field	Initial weight g FW	Glycogen mg g ⁻¹ dry worm	Proteins mg g ⁻¹ dry worm	Lipids mg g ⁻¹ dry worm	CO ₂ μg CO ₂ g-1 FW d-1
Organic	0.60 \pm 0.14 _a	36.6 \pm 17.5 _a	96.6 \pm 20.1 _a	169.6 \pm 20.3 _a	44.7 \pm 32.3 _a
Conventional	0.28 \pm 0.04 _b	33.0 \pm 24.8 _a	89.9 \pm 21.6 _a	178.6 \pm 31.9 _a	62.2 \pm 35.2 _a

Significant differences between the two populations are indicated by different letters in the same column (Student t-tests, p<0.05).

Table B

Fungicide contents in soil used for the experiment, and in treated soil with and without earthworms at day 0, 7 and 28. Measurements were realised in triplicates (extraction and analyse) from the same sample of soil. Results are expressed as mean \pm standard deviation.

Soil	Epoxiconazole levels (ng.g ⁻¹ dry soil)		
	Day 0	Day 7	Day 28
Un-treated (control)	nd	-	-
Fungicide-treated without earthworms		62.7 _a \pm 12.6	57.8 _a \pm 8.3
Fungicide-treated with naïve <i>A.caliginosa</i>	79.8 _a \pm 6.9	70.1 _a \pm 23.5	58.6 _a \pm 14.8
Fungicide-treated with pre-exposed <i>A.caliginosa</i>		57.8 _b \pm 5.3	52.6 _b \pm 8.6

Significant decrease in pesticide concentration from the initial day 0 value (One way ANOVA with time as factor followed by Tukey post-hoc tests, p<0.05).

nd = not detected

Table C

Weight change of pre-exposed and naïve earthworms at days 7 and 28. Values are mean out of 5 replicates (N=5) \pm standard deviation (SD) per group. No significant effect of time on earthworm weight throughout the study was observed (one way anova with time as factor).

Population	Soil treatment	Weight change after exposure in % initial weight	
		Day 7	Day 28
Pre-exposed	Epoxiconazole	98.3% \pm 13.1%	111.4% \pm 24.7%
	Control	95.2% \pm 20.6%	81.0% \pm 12.5%
Naïve	Epoxiconazole	98.2% \pm 25.3%	85.8% \pm 11.4%
	Control	92.8% \pm 5.3%	86.6% \pm 12.9%

Table D:

List of metabolites identified in freeze-dried tissues of the earthworm *Aporrectodea caliginosa*. Metabolites kept for interpretation were classified into four functional metabolic groups: amino-acids, sugars, organic acids and urea cycle metabolites from the energetic metabolism. The others metabolites found but not kept for

interpretation are classified as polyols, other metabolites, and non quantified metabolites (below the quantification limit of the GC-MS). For the quantified metabolites, minimum and maximum concentrations (nmoles/mg dry mass) are also shown.

Metabolites	Abbreviation	Minimum and maximum concentrations (nmoles/mg dry mass)
<u>Amino acids (12)</u>		
<i>Hydrophilic Amino-Acids (2)</i>		
Asparagine	Asn	0.34-8.86
Aspartate	Asp	0.16-2.65
<i>Lipophilic Amino-Acids (7)</i>		
Alanine	Ala	0.02-17.1
Isoleucine	Ile	0.34-0.41
Leucine	Leu	0.03-0.61
Methionine	Met	0.32-0.62
Phenylalanine	Phe	0.02-0.69
Proline	Pro	0.35-0.61
Valine	Val	0.13-1.54
<i>Neutral Amino-Acids (3)</i>		
Glycine	Gly	0.15-8.49
Serine	Ser	0.16-2.24
Threonine	Thr	0.18-0.67
<u>Sugars (3)</u>		
Glucose	Glu	0.15-0.96
Mannose	Man	0.02-0.14
Ribose	Rib	0.02-0.2
<u>Organic acids from the energetic metabolism (5)</u>		
Aminobutyrate	Ami	0.03-0.84
Citrate	Cit	0.02-0.58
Fumarate	Fum	0.16-3.68
Lactate	Lac	0.03-20.84
Succinate	Suc	0.16-5.33
<u>Urea cycle metabolites (2)</u>		
Ornithine	Orn	0.02-0.92
Putrescine	Put	0.21-3.78
<u>Metabolites not included in the interpretation</u>		
<u>Polyols (4)</u>		
Glycerol		0.62-13.81
Glycerol 3 phosphate		0.16-8.04
Inositol		0.41-4.05
Mannitol		0.02-2.46
<u>Other metabolites (2)</u>		
Cytosine		0.02-0.26
Ethanolamine		0.02-0.41
<u>Non quantified metabolites (9)</u>		
Glycerate		(< QL , S/N < 10)

Pipecolate
Erythritol
Citrulline
Fructose
Galactose
Sorbitol
Gluconate δ -lactone
Trehalose