Supporting information for

Contrasting soil fungal communities at different habitats in a revegetated copper mine wasteland

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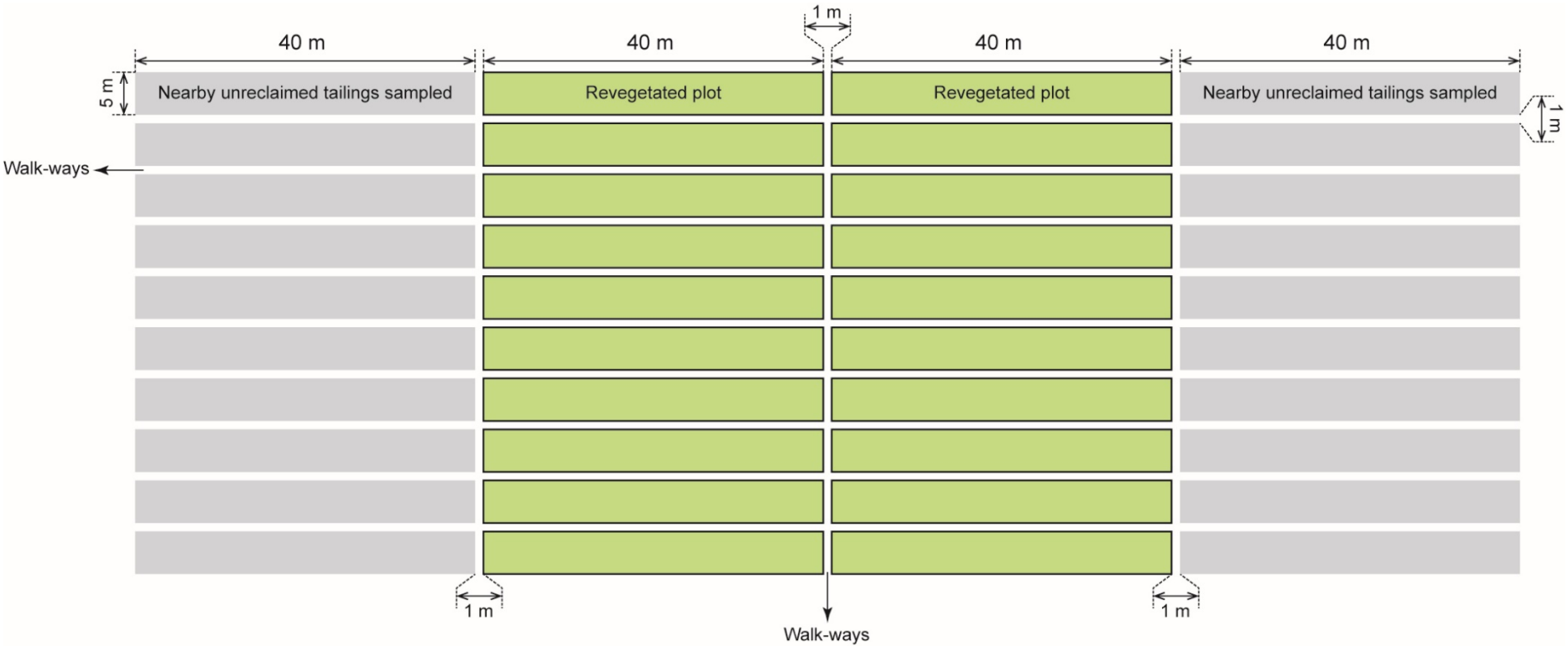

Figure S1. Schematic diagram showing the locations of our experimental plots and the nearby unreclaimed tailings sampled.

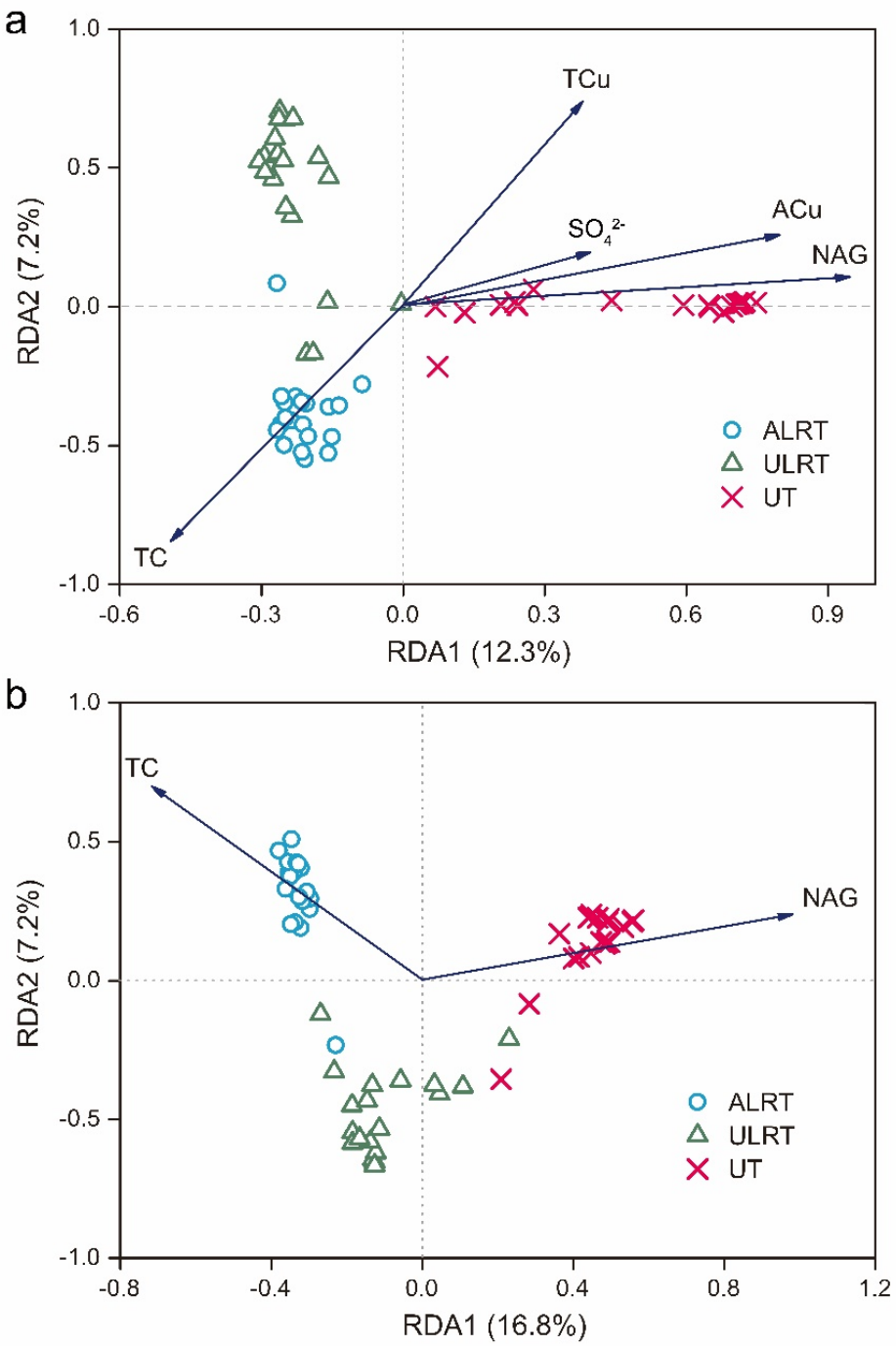

Figure S2. RDA ordination showing the overall fungal community composition at OTU level at UT, ULRT and ALRT at three (a) and four years (b) after the initiation of the revegetation scheme in relation to the statistically significant environmental factors ($P < 0.05$). The percentage variances explained by these environmental factors are given in Table S5 and the full environmental factor names are given in main text.

Table S1. Concentrations (mg kg^{-1}, n = 20, mean ± s.e.) of total and DTPA-extractable heavy metals in soil samples collected at the three types of habitats in the experimental site at three and four years after the initiation of the revegetation scheme.

	Three years			Four years		
	UT[#]	ULRT	ALRT	UT	ULRT	ALRT
Total Pb	51 ± 4.3 b*	36 ± 3.3 b	163 ± 7.6 a	58 ± 9.8 b	67 ± 6.8 b	159 ± 8.0 a
Total Zn	19 ± 1.5 b	22 ± 1.6 b	192 ± 26 a	18 ± 2.0 b	17 ± 1.6 b	111 ± 21 a
Total Cu	510 ± 33 a	459 ± 76 a	131 ± 27 b	399 ± 24 a	483 ± 43 a	178 ± 28 b
Total Cd	3.5 ± 0.30 a	0.52 ± 0.25 b	3.6 ± 0.26 a	2.6 ± 0.54[&]	2.2 ± 0.28	3.4 ± 0.57
DTPA-Pb	0.24 ± 0.11 b	0.28 ± 0.12 b	1.3 ± 0.26 a	0.17 ± 0.02 b	0.16 ± 0.03 b	1.5 ± 0.33 a
DTPA-Zn	7.9 ± 0.32 a	1.1 ± 0.30 c	3.3 ± 0.56 b	9.1 ± 0.99 a	0.82 ± 0.11 c	4.7 ± 0.68 b
DTPA-Cu	119 ± 13 a	39 ± 4.1 b	1.7 ± 0.33 c	140 ± 15 a	29 ± 4.7 b	2.3 ± 0.49 c
DTPA-Cd	0.003 b	0.01 ± 0.01 b	0.46 ± 0.07 a	0.003 b	0.01 ± 0.00 b	0.61 ± 0.11 a

[#]UT, the unreclaimed tailings; ULRT, unamended layer of the reclaimed tailings; ALRT, amended layer of the reclaimed tailings.

*Data for samples of different habitat types collected at a given sampling date with different letters are significantly different from each other ($P < 0.05$, Nemenyi test).

[&]The Kruskal–Wallis test is not significant.

Table S2. Pearson correlation coefficients for the alpha diversity metrics of soil fungi and the soil physicochemical factors selected by Bio-Env at three years and four years after the initiation of the revegetation scheme.

	DTPA-Cu	Total Cu	Total Zn	EC	DTPA-Zn	Fe^{2+}
Three years						
No. of OTUs	-0.71***	-0.67***	0.66***	-0.57***	-0.49***	0.29*
Chao1	-0.68***	-0.65***	0.59***	-0.61***	-0.50***	0.35**
ACE	-0.58***	-0.59***	0.48***	-0.58***	-0.43***	0.35***
Shannon index	-0.66***	-0.55***	0.61***	-0.64***	-0.58***	0.33*
Simpson index	-0.54***	0.35***	0.43***	-0.37***	-0.65***	0.39**
Four years						
No. of OTUs	-0.63***	-0.56***	0.57***	-0.57***	-0.16	-0.07
Chao1	-0.64***	-0.55***	0.55***	-0.60***	-0.18	-0.05
ACE	-0.58***	-0.49***	0.50***	-0.57***	-0.17	-0.01
Shannon index	-0.62***	-0.53***	0.52***	-0.60***	-0.16	-0.00
Simpson index	-0.53***	-0.43***	0.42***	-0.54***	-0.12	0.09

*, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

Table S3. Pearson correlation coefficients for the relative abundances of the dominant fungal phyla and the soil physicochemical factors selected by Bio-Env at three years and four years after the initiation of the revegetation scheme.

	DTPA-Cu	Total Cu	Total Zn	DTPA-Zn	Fe^{2+}	EC
Three years						
Ascomycota	0.42**	0.40**	-0.28*	0.21	-0.11	0.06
Basidiomycota	-0.31*	-0.33*	0.21	-0.09	0.03	0.08
Rozellomycota	-0.18	0.05	0.13	-0.31*	0.13	-0.27*
Mortierellomycota	-0.25	-0.27*	0.19	-0.20	0.10	-0.24
Chytridiomycota	-0.29	-0.25	0.25	-0.03	0.11	-0.15
Glomeromycota	-0.17	-0.30*	-0.04	-0.12	0.37***	-0.17
Blastocladiomycota	-0.19	-0.32*	0.15	-0.11	0.17	-0.02
Aphelidiomycota	-0.07	0.08	-0.09	-0.16	0.30*	-0.18
Four years						
Ascomycota	0.49***	0.49***	-0.17***	0.16	-0.01	0.46***
Basidiomycota	-0.33*	-0.46***	0.32*	-0.00	-0.07	-0.26*
Rozellomycota	-0.41***	-0.18	0.10	-0.29*	0.26*	-0.41***
Mortierellomycota	-0.26*	-0.31*	0.76***	-0.02	-0.14	-0.22
Chytridiomycota	-0.16	0.02	0.02	-0.19	-0.03	-0.11
Glomeromycota	-0.29*	-0.35***	0.06	-0.24	-0.01	-0.22

Blastocladiomycota	-0.17	-0.10	0.19	0.02	-0.07	-0.13
Aphelidiomycota	-0.18	-0.18	-0.00	-0.16	-0.03	-0.09

*, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

Table S4. Pearson correlation coefficients for the relative abundances of the dominant fungal genera and the soil physicochemical factors selected by Bio-Env at three years and four years after the initiation of the revegetation scheme.

	DTPA-Cu	Fe^{2+}	DTPA-Zn	Total Cu	Total Zn	EC
Three years						
Acidiella	0.42**	-0.27*	0.26	0.22	-0.17	0.13
Acidomyces	0.52***	-0.38***	0.45***	0.20	-0.26	0.18
*Ascomycota*_unclassified	-0.12	0.27*	-0.16	-0.22	-0.04	-0.09
Lycoperdon	-0.23	0.03	-0.19	-0.27*	0.27*	-0.18
*Microascales*_unclassified	-0.37**	-0.01	0.02	-0.48***	0.48***	-0.29*
Penicillium	-0.37**	0.21	-0.41***	-0.21	0.03	-0.27*
Scopulariopsis	0.14	-0.17	0.27*	0.03	0.06	0.22
*Sordariomycetes*_unclassified	-0.03	-0.11	0.15	-0.00	-0.06	0.09
Talaromyces	-0.13	0.45***	-0.52***	0.36***	-0.29*	-0.08
Trichoderma	-0.20	0.26	-0.41***	0.22	-0.16	-0.21
Four years						
Acidiella	0.48***	-0.15	0.46***	0.14	-0.15	0.43***
Acidomyces	0.54***	-0.27*	0.50***	0.16	-0.22	0.68***
*Ascomycota*_unclassified	-0.10	0.27*	-0.26*	0.05	-0.26*	-0.10
Lycoperdon	-0.25	-0.04	0.00	-0.34**	0.30*	-0.22

*Microascales*_unclassified	-0.34**	-0.10	-0.06	-0.48***	0.46***	-0.29*
Penicillium	-0.36**	0.36**	-0.40**	0.01	0.03	-0.52***
Scopulariopsis	-0.27*	-0.11	0.12	-0.32*	0.38**	-0.25
*Sordariomycetes*_unclassified	0.50***	-0.30*	0.23	0.10	-0.29*	0.49***
Talaromyces	-0.12	0.59***	-0.35**	0.49***	-0.23	-0.27*
Trichoderma	-0.14	0.10	-0.34**	0.16	-0.14	-0.18

*, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

Table S5. Summary of RDA, showing the percentage variance explained by the environmental factors selected by automatic stepwise model selection in RDA. The full environmental factor names are given in main text.

Environmental factors	% variance	*P*
Three years		
NAG	2.60	0.001
Total C	1.56	0.001
SO_4^{2-}	0.46	0.009
Available Cu	0.39	0.030
Total Cu	0.36	0.040
Total variance explained by RDA model	23.19	0.001
Four years		
NAG	4.15	0.001
Total C	2.29	0.001
Total variance explained by RDA model	25.38	0.001