

Supplementary Materials

Changes in the bacterial composition of cultivated soil after digging up operations for laying a pipeline

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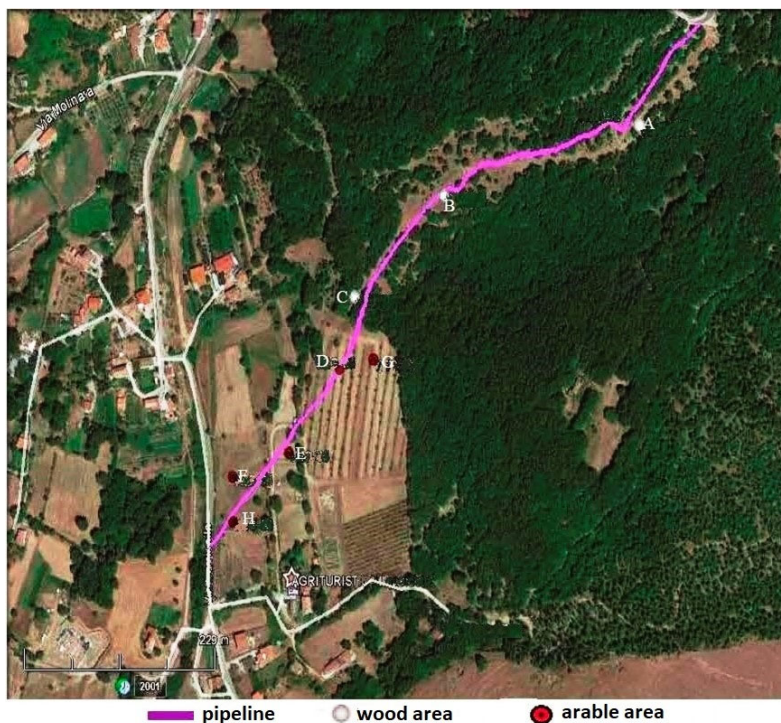


Figure S1. Google earth picture of the sampling site.

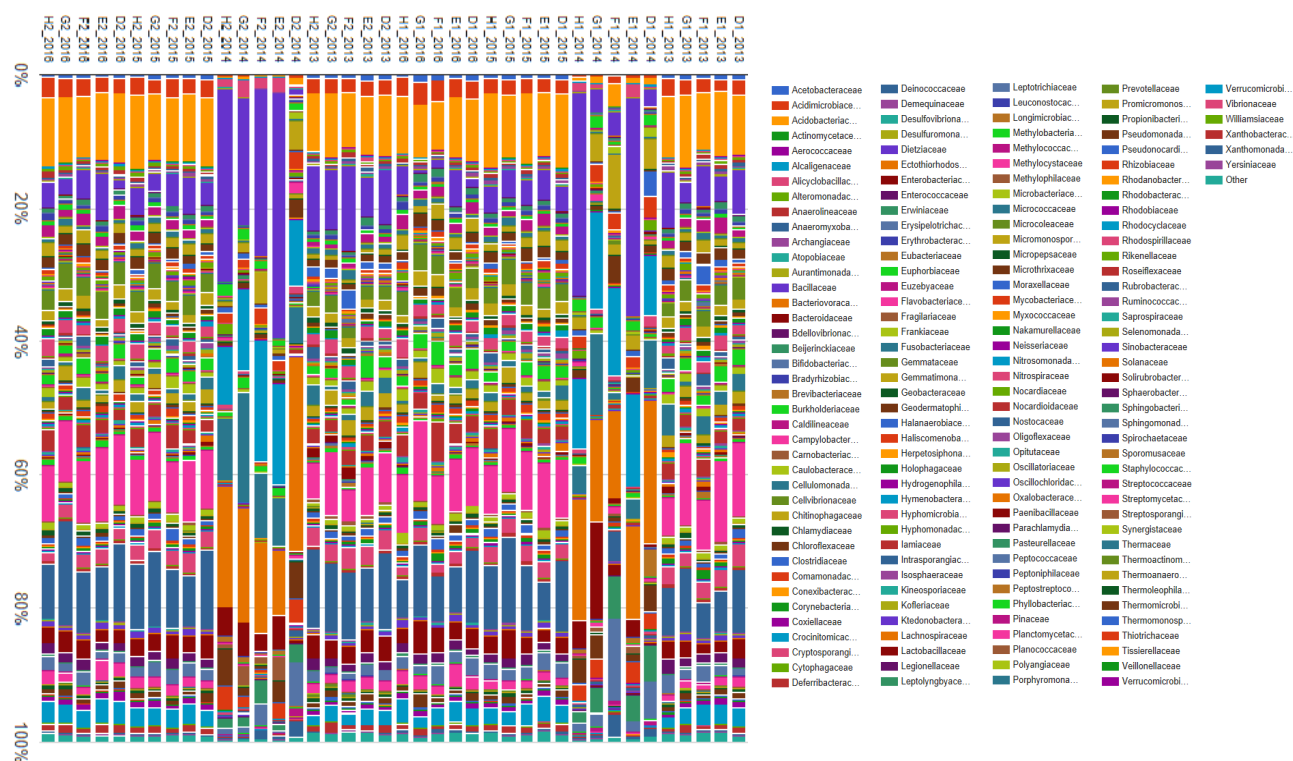
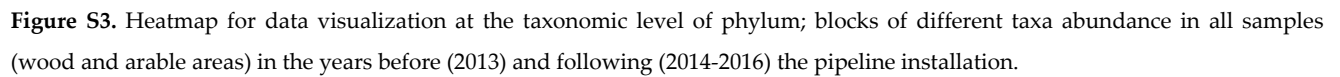


Figure S2. Distribution of taxa in soil samples (arable area) at the taxonomic level of the family. The samples are reported in order by sampling sites (DEF, GH), by year (following the chronological order of sampling), and by depth, remarking for each group the sampled sites at 0-20 cm (1) and subsequently those at 20-40 cm (2).



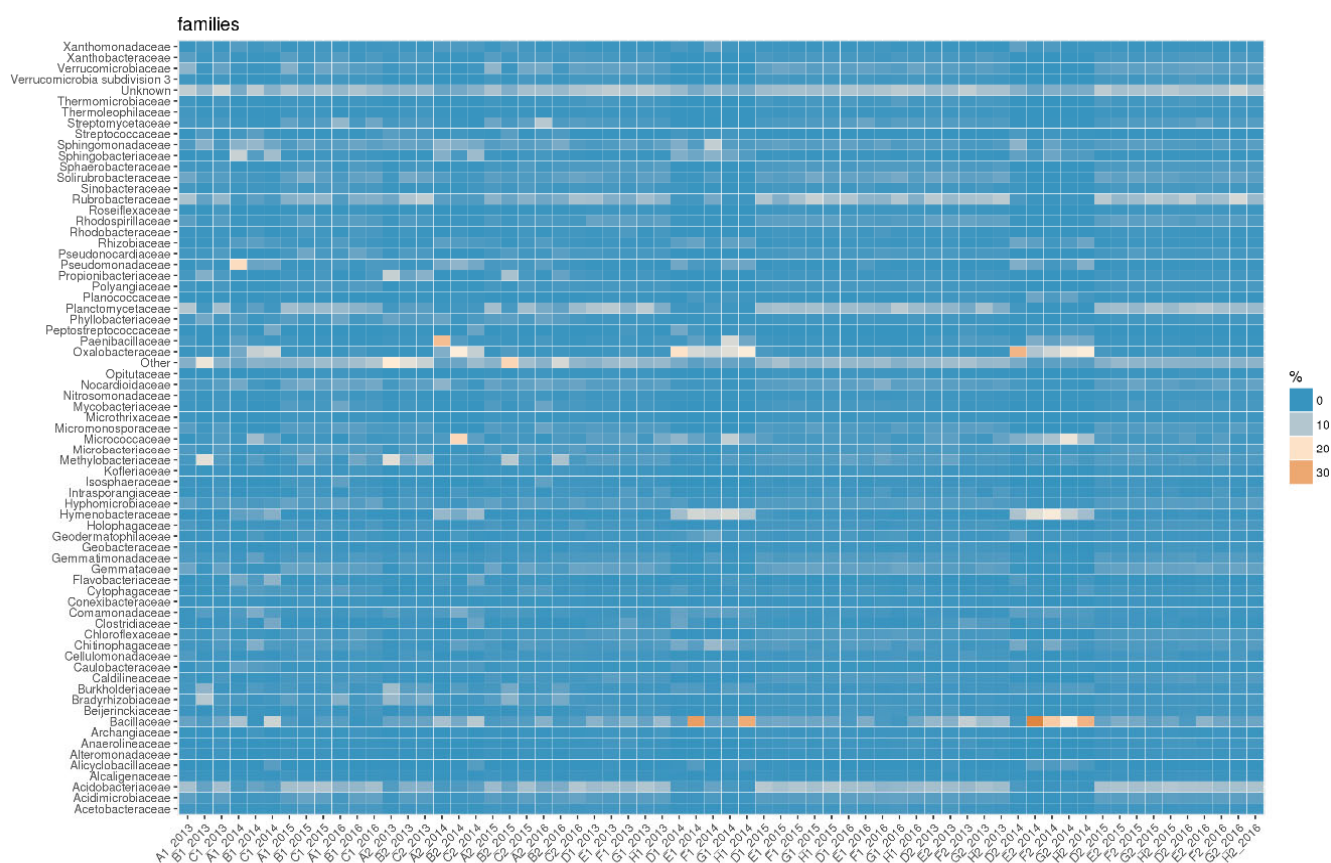


Figure S4. Heatmap for data visualization at the taxonomic level of the family; blocks of different taxa abundance in all samples (wood and arable areas) in the years before (2013) and following (2014–2016) the pipeline installation.

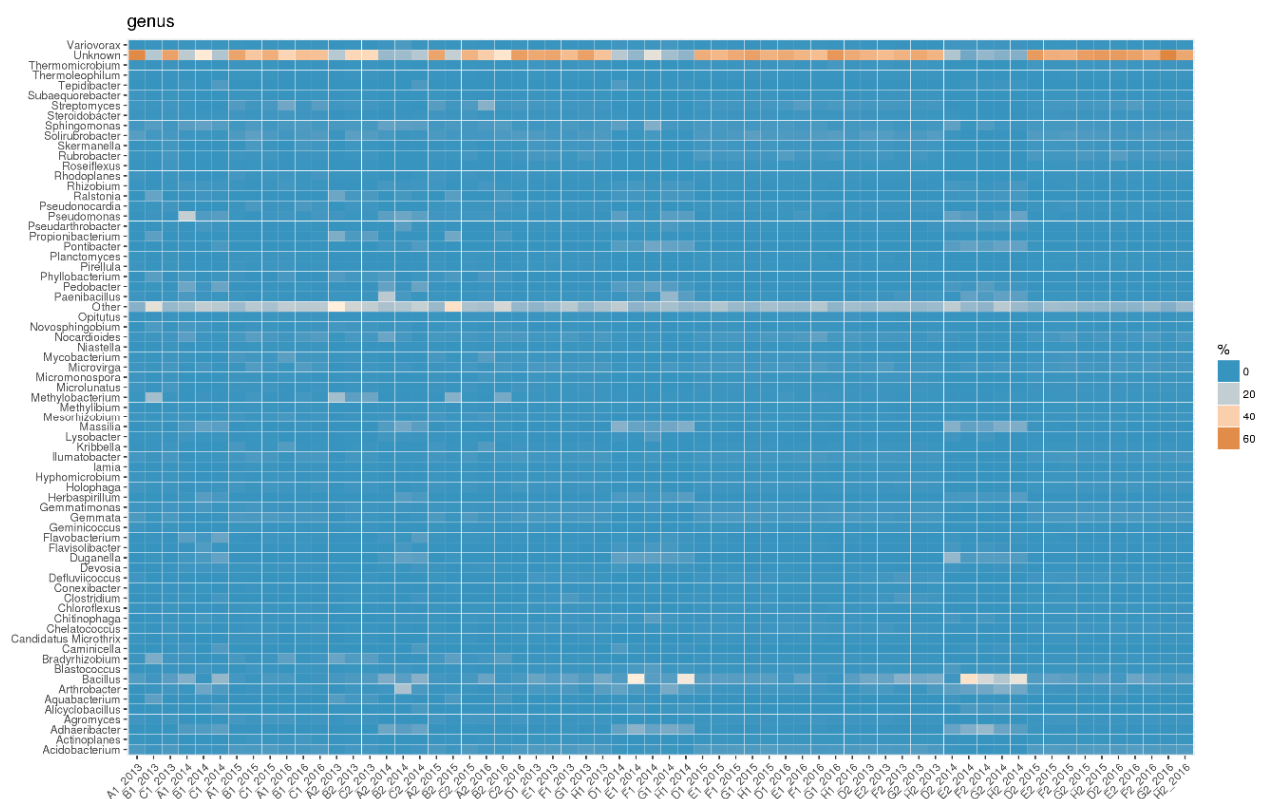


Figure S5. Heatmap for data visualization at the genus taxonomic level; blocks of different taxa abundance in all samples (wood and arable areas) in the years before (2013) and following (2014–2016) the pipeline installation.

Table S1. Taxa were identified at the phylum taxonomic level in all cultivated soil area samples collected during the three years following the pipeline installation (2014–2016). Taxa with more abundance are reported as over-represented, and those with less abundance are reported as under-represented in comparison to the 2013 (reference year); the abundance was defined as the log FC, the decimal logarithm of the fold-change that represents the times' number that the abundance is significantly modified compared to the reference.

PHYLA LEVEL											
2014				2015				2016			
OTUs under-represented	logFC	OTUs over-represented	logFC	OTUs under-represented	logFC	OTUs over-represented	logFC	OTUs under-represented	logFC	OTUs over-represented	logFC
Thaumarchaeota	-5.246301773	Arthropoda	7.906017092	Thaumarchaeota	-5.246301773	Chlorophyta	1.694219779	Thaumarchaeota	-5.246301773	Arthropoda	7.906017092
Candidatus Tectomicrobia	-4.802455283	Chrysiogenetes	5.211459679	Candidatus Tectomicrobia	-4.802455283	Bacillariophyta	1.658326947	Candidatus Tectomicrobia	-4.802455283	Chrysiogenetes	5.211459679
Chlorophyta	-4.080042594	Bacteroidetes	4.869019646	Chlorophyta	-4.080042594	Streptophyta	1.388272134	Chlorophyta	-4.080042594	Bacteroidetes	4.869019646
Euryarchaeota	-3.864011614	Firmicutes	3.159366156	Euryarchaeota	-3.864011614	Cyanobacteria	1.327755731	Euryarchaeota	-3.864011614	Firmicutes	3.159366156
Dictyoglomi	-3.629351485	Proteobacteria	2.409815187	Dictyoglomi	-3.629351485			Dictyoglomi	-3.629351485	Proteobacteria	2.409815187
Nitrospirae	-3.236839962	Deinococcus-Thermus	2.056877041	Nitrospirae	-3.236839962			Nitrospirae	-3.236839962	Deinococcus-Thermus	2.056877041
Planctomycetes	-2.882228445	Tenericutes	1.925772133	Planctomycetes	-2.882228445			Planctomycetes	-2.882228445	Tenericutes	1.925772133
Chloroflexi	-2.807370755	Fusobacteria	1.779600839	Chloroflexi	-2.807370755			Chloroflexi	-2.807370755	Fusobacteria	1.779600839
Verrucomicrobia	-2.737472389	Chlorobi	1.343358155	Verrucomicrobia	-2.737472389			Verrucomicrobia	-2.737472389	Chlorobi	1.343358155
Nitrospinae	-2.626796479	Spirochaetes	0.914661665	Nitrospinae	-2.626796479			Nitrospinae	-2.626796479	Spirochaetes	0.914661665
Armatimonadetes	-2.235253558	Cyanobacteria	0.88723275	Armatimonadetes	-2.235253558			Armatimonadetes	-2.235253558	Cyanobacteria	0.88723275
Chlamydiae	-2.192720089	Aquificae	0.535664819	Chlamydiae	-2.192720089			Chlamydiae	-2.192720089	Aquificae	0.535664819
Fibrobacteres	-2.14672731	Actinobacteria	0.45179431	Fibrobacteres	-2.14672731			Fibrobacteres	-2.14672731	Actinobacteria	0.45179431
Bacillariophyta	-1.893639121			Bacillariophyta	-1.893639121			Bacillariophyta	-1.893639121		
Acidobacteria	-1.848104355			Acidobacteria	-1.848104355			Acidobacteria	-1.848104355		
Synergistetes	-1.607824549			Synergistetes	-1.607824549			Synergistetes	-1.607824549		
Thermotogae	-1.521890478			Thermotogae	-1.521890478			Thermotogae	-1.521890478		
Thermodesulfobacteria	-1.111003779			Thermodesulfobacteria	-1.111003779			Thermodesulfobacteria	-1.111003779		
Elusimicrobia	-0.850999508			Elusimicrobia	-0.850999508			Elusimicrobia	-0.850999508		

Table S2. Taxa were identified at the family taxonomic level in all cultivated soil area samples collected in the three years following the pipeline installation (2014, 2015, 2016). Taxa with more abundance are reported as over-represented, and those with less abundance are reported as under-represented in comparison to the 2013 (reference year); the abundance was defined as the log FC, the decimal logarithm of the fold-change that represents the times' number that the abundance is significantly modified compared to the reference.

FAMILY LEVEL

2014				2015				2016			
OTUs under-represented	logFC	OTUs over-represented	logFC	OTUs under-represented	logFC	OTUs over-represented	logFC	OTUs under-represented	logFC	OTUs over-represented	logFC
Ktedonobacteraceae	-5.67745313	Flatidae	7.76578242	Ktedonobacteraceae	-5.67745313	Williamsiaceae	4.01955009	Methanosarcinaceae	-5.31935895	Stephanopyxidaceae	5.38043382
Methanosarcinaceae	-5.44262133	Hymenobacteraceae	7.38339489	Methanosarcinaceae	-5.44262133	Marinifilaceae	2.96457849	Erysipelotrichaceae	-4.57562628	Coccomyxaceae	4.90260604
Nitrososphaeraceae	-5.32871599	Oxalobacteraceae	7.18752404	Nitrososphaeraceae	-5.32871599	Tolypothrichaceae	2.96070390	Defluviitaleaceae	-4.39007583	Fragilariaceae	4.52946383
Nostocaceae	-4.56828357	Erwiniaceae	6.68868395	Nostocaceae	-4.56828357	Aeromonadaceae	2.95465374	Prolixibacteraceae	-4.19559556	Williamsiaceae	4.33771564
Isosphaeraceae	-4.46356073	Leuconostocaceae	6.19628286	Isosphaeraceae	-4.46356073	Procabacteriaceae	2.94911728	Peptostreptococcaceae	-3.68946772	Chattonellaceae	4.02160377
Roseiflexaceae	-4.32432687	Pseudomonadaceae	6.11934693	Roseiflexaceae	-4.32432687	Microcoleaceae	2.91569484	Methanomicrobiaceae	-3.35860031	Psilotaceae	3.97180420
Bryobacteraceae	-4.26980877	Sphingobacteriaceae	5.67694324	Bryobacteraceae	-4.26980877	Gomontiellaceae	2.86574304	Alicyclobacillaceae	-3.26837245	Tolypothrichaceae	3.83723923
Ferritrophicaceae	-4.23793450	Bacteriovoracaceae	5.12739743	Ferritrophicaceae	-4.23793450	Methanomassiliicoccaceae	2.70926163	Thermoactinomycetaceae	-3.26155126	Rhizosoleniaceae	3.62551973
Phycisphaeraceae	-4.22776437	Chrysigenaceae	5.11287505	Phycisphaeraceae	-4.22776437	Psilotaceae	2.61763482	Symbiobacteriaceae	-2.88048028	Methanomassiliicoccaceae	3.50568603
Caldicoprobacteraceae	-4.18822197	Haliscomenobacteraceae	5.00249325	Caldicoprobacteraceae	-4.18822197	Fragilariaceae	2.43314861	Limnochordaceae	-2.86272884	Osmundaceae	3.48348440
Sphagnaceae	-4.18586886	Gloeobacteraceae	4.84284670	Sphagnaceae	-4.18586886	Sphagnaceae	2.37594661	Christensenellaceae	-2.72530159	Erwiniaceae	3.30937089
Microcoleaceae	-4.09737664	Alicyclobacillaceae	4.81326179	Microcoleaceae	-4.09737664	Pedinomonadaceae	2.09603026	Clostridiaceae	-2.72374182	Budviaceae	3.29364593
Anaerolineaceae	-3.95803400	Marinifilaceae	4.76134959	Anaerolineaceae	-3.95803400	Cellvibrionaceae	2.07359064	Halanaerobiaceae	-2.69326827	Rhabdochlamydiaceae	3.09654584
Alteromonadaceae	-3.93290202	Rhizobiaceae	4.51577167	Alteromonadaceae	-3.93290202	Bacillariaceae	1.91300857	Lachnospiraceae	-2.67410514	Marinifilaceae	3.07077724
Thermosporotrichaceae	-3.77868030	Streptococcaceae	4.47617291	Thermosporotrichaceae	-3.77868030	Saccharospirillaceae	1.76994976	Catabacteriaceae	-2.55650515	Coleochaetaceae	3.06162711
Dictyoglomaceae	-3.74176509	Flavobacteriaceae	4.35733620	Dictyoglomaceae	-3.74176509	Coscinodiscaceae	1.48642667	Tissierellaceae	-2.55167934	Bacillariaceae	2.98967704
Symbiobacteriaceae	-3.63980065	Bernardetiaceae	4.27594649	Symbiobacteriaceae	-3.63980065	Coxiellaceae	1.33004998	Gracilibacteraceae	-2.47943139	Solanaceae	2.83497472
Halobacteriaceae	-3.58178672	Blattabacteriaceae	4.22426817	Halobacteriaceae	-3.58178672	Bdellovibrionaceae	0.98520390	Sporomusaceae	-2.44106395	Spirulinaceae	2.82408396
Fragilariaceae	-3.55799454	Enterobacteriaceae	4.15991448	Fragilariaceae	-3.55799454	Hymenobacteraceae	0.98445737	Paenibacillaceae	-2.42108568	Microcoleaceae	2.80554994
Sphaerobacteraceae	-3.50581327	Paenibacillaceae	4.01480835	Sphaerobacteraceae	-3.50581327	Bacteriovoracaceae	0.98243685	Ruminococcaceae	-2.39603961	Cryptomonadaceae	2.78311748
Anaeromyxobacteraceae	-3.48395979	Xanthomonadaceae	3.89235930	Anaeromyxobacteraceae	-3.48395979	Mycobacteriaceae	0.86143516	Clostridiales Family XIII. Incertae Sedis	-2.23523981	Eupodiscaceae	2.68623752
Thermomicrobiaceae	-3.45966028	Thermonemataceae	3.78414324	Thermomicrobiaceae	-3.45966028	Tsukamurellaceae	0.74932255	Syntrophomonadaceae	-2.11718618	Fabaceae	2.66817000
Nakamurellaceae	-3.41477526	Salinisphaeraceae	3.74300672	Nakamurellaceae	-3.41477526	Rhodanobacteraceae	0.71654194	Planococcaceae	-2.10168210	Saccharospirillaceae	2.44924840
Nitrospiraceae	-3.30250817	Gallionellaceae	3.68695066	Nitrospiraceae	-3.30250817	Xanthomonadaceae	0.65687181	Caldicoprobacteraceae	-2.08003555	Marsupiomnadaceae	2.40298751
Caldilineaceae	-3.24559076	Comamonadaceae	3.66293245	Caldilineaceae	-3.24559076	Rhodobiaceae	0.51152872	Peptococcaceae	-2.00121007	Hydrodictyaceae	2.39901611
Parachlamydiaceae	-3.20139726	Saccharospirillaceae	3.63085555	Parachlamydiaceae	-3.20139726	Kofleriaceae	0.50841064	Glycomycetaceae	-1.98310888	Ferrovaceae	2.36116396
Bacillariaceae	-3.20135641	Spirillaceae	3.62891151	Bacillariaceae	-3.20135641	Alcaligenaceae	0.50678895	Carnobacteriaceae	-1.90011464	Aeromonadaceae	2.33008415
Verrucomicrobia subdivision 3	-3.18555160	Hafniaceae	3.59614240	Verrucomicrobia subdivision 3	-3.18555160	Streptococcaceae	0.42319004	Sporolactobacillaceae	-1.86154581	Coscinodiscaceae	2.30614838

Syntrophomonadaceae	-3.18524639	Planococcaceae	3.58739671	Syntrophomonadaceae	-3.18524639	Polyangiaceae	0.24543152	Pasteuriaceae	-1.73815894	Oscillatoriaceae	2.28853040
Limnochordaceae	-3.11016522	Caulobacteraceae	3.56142798	Limnochordaceae	-3.11016522			Proteinivoraceae	-1.50700072	Yersiniaceae	2.27841071
Planctomycetaceae	-3.10754247	Micrococcaceae	3.53688746	Planctomycetaceae	-3.10754247			Selenomonadaceae	-1.50649496	Hafniaceae	2.14101806
Skeletonemataceae	-3.10696431	Lewinellaceae	3.53507011	Skeletonemataceae	-3.10696431			Veillonellaceae	-1.50253717	Chlorodendraceae	2.14018501
Methylacidiphilaceae	-3.10296088	Pelagibacteraceae	3.52359858	Methylacidiphilaceae	-3.10296088			Peptoniphilaceae	-1.49857967	Sphagnaceae	2.08850302
Catabacteriaceae	-3.08665594	Coxiellaceae	3.37395102	Catabacteriaceae	-3.08665594			Natranaerobiaceae	-1.40193707	Pedinomonadaceae	1.96875682
Micromonosporaceae	-3.06998039	Bacillaceae	3.34210402	Micromonosporaceae	-3.06998039			Desulfovibrionaceae	-1.34611803	Chroomonadaceae	1.95205548
Thermoactinomycetaceae	-3.03179398	Moraxellaceae	3.31163562	Thermoactinomycetaceae	-3.03179398			Deferribacteraceae	-1.33505309	Cryomorphaceae	1.90027074
Nannocystaceae	-2.97083909	Microscillaceae	3.28160234	Nannocystaceae	-2.97083909			Clostridiales Family XII. Incertae Sedis	-1.20595276	Coxiellaceae	1.89654267
Nitrospinaceae	-2.96199400	Spiroplasmataceae	3.25697567	Nitrospinaceae	-2.96199400			Eubacteriaceae	-1.18499417	Cellvibrionaceae	1.74615741
Dehalococcoidaceae	-2.95502042	Ferrovaceae	3.24167241	Dehalococcoidaceae	-2.95502042			Spirochaetaceae	-1.18307685	Haliscomenobacteraceae	1.64706914
Erysipelotrichaceae	-2.93524756	Carnobacteriaceae	3.18119280	Erysipelotrichaceae	-2.93524756			Bacillaceae	-1.16748553	Crocinitomicaceae	1.64275691
Pseudonocardiaceae	-2.90751778	Burkholderiaceae	3.15156525	Pseudonocardiaceae	-2.90751778			Staphylococcaceae	-1.14879961	Skeletonemataceae	1.62643143
Syntrophobacteraceae	-2.90696050	Cellvibrionaceae	3.12002312	Syntrophobacteraceae	-2.90696050			Anaeromyxobacteraceae	-1.14854420	Haliaceae	1.60674561
Aphanizomenonaceae	-2.88561826	Peptostreptococcaceae	3.10291319	Aphanizomenonaceae	-2.88561826			Desulfohalobaceae	-1.13977624	Oleiphilaceae	1.49671742
Actinospicaceae	-2.86252695	Chitinophagaceae	3.08378222	Actinospicaceae	-2.86252695			Syntrophobacteraceae	-1.03173183	Pseudomonadaceae	1.43046964
Leptolyngbyaceae	-2.85681994	Bdellovibrionaceae	3.06679976	Leptolyngbyaceae	-2.85681994			Vibrionaceae	-1.01500472	Aurantimonadaceae	1.39260060
Verrucomicrobiaceae	-2.85137777	Nautiliaceae	3.06153199	Verrucomicrobiaceae	-2.85137777			Amoebophilaceae	-0.96514819	Enterobacteriaceae	1.38222039
Symphyonemataceae	-2.84666397	Lactobacillaceae	3.03140517	Symphyonemataceae	-2.84666397			Fusobacteriaceae	-0.93690835	Nocardiaceae	1.23706386
Tissierellaceae	-2.71001416	Holospiraceae	3.02847238	Tissierellaceae	-2.71001416			Solibacteraceae	-0.93332625	Saprospiraceae	1.12781973
Defluviitaleaceae	-2.69112120	Francisellaceae	3.02816441	Defluviitaleaceae	-2.69112120			Nocardiopsaceae	-0.92656799	Flavobacteriaceae	1.11413256
Halanaerobiaceae	-2.68910720	Microcystaceae	2.98349296	Halanaerobiaceae	-2.68910720			Pasteurellaceae	-0.91948669	Bacteriovoracaceae	1.09471151
Prolixibacteraceae	-2.68324147	Deinococcaceae	2.89544721	Prolixibacteraceae	-2.68324147			Micrococcaceae	-0.90405821	Tsukamurellaceae	1.08685528
Euzebyaceae	-2.67674888	Aurantimonadaceae	2.88463964	Euzebyaceae	-2.67674888			Streptosporangiaceae	-0.89739544	Opitutaceae	1.07185497
Methanomicrobiaceae	-2.67492753	Dietziaceae	2.71737041	Methanomicrobiaceae	-2.67492753			Nitrospiraceae	-0.84356731	Mycobacteriaceae	1.05027631
Ectothiorhodospiraceae	-2.65079089	Geodermatophilaceae	2.62195731	Ectothiorhodospiraceae	-2.65079089			Coriobacteriaceae	-0.80400928	Alcanivoracaceae	1.03265593
Sporomusaceae	-2.62434262	Peptoniphilaceae	2.56700080	Sporomusaceae	-2.62434262			Thermoanaerobacteraceae	-0.78699607	Streptococcaceae	0.95833515
Pedinomonadaceae	-2.60620601	Succinivibrionaceae	2.53349360	Pedinomonadaceae	-2.60620601			Methylococcaceae	-0.74039180	Rhodanobacteraceae	0.92526458

Acidothermaceae	-2.60072278	Coleofasciculaceae	2.49792084	Acidothermaceae	-2.60072278			Rickettsiaceae	-0.68670236	Xanthomonadaceae	0.89655994
Streptosporangiaceae	-2.55798714	Sporolactobacillaceae	2.46114919	Streptosporangiaceae	-2.55798714			Bifidobacteriaceae	-0.66808222	Marinilabiliaceae	0.82817780
Nocardiopeceae	-2.52225945	Pectobacteriaceae	2.44207059	Nocardiopeceae	-2.52225945			Eggerthellaceae	-0.62681822	Syntrophaceae	0.82109719
Streptomycetaceae	-2.51011721	Sulfuricellaceae	2.43616681	Streptomycetaceae	-2.51011721			Anaplasmataceae	-0.60482501	Chitinophagaceae	0.79957352
Microthrixaceae	-2.50955550	Brucellaceae	2.38308897	Microthrixaceae	-2.50955550			Desulfuromonadaceae	-0.59847378	Sphingobacteriaceae	0.78035668
Geobacteraceae	-2.47673303	Sphingomonadaceae	2.37363918	Geobacteraceae	-2.47673303			Rhodospirillaceae	-0.58544202	Bdellovibrionaceae	0.75094070
Gemmataceae	-2.46396195	Clostridiales Family XII. Incertae Sedis	2.34438602	Gemmataceae	-2.46396195			Actinomycetaceae	-0.44754521	Cytophagaceae	0.71030918
Chthonomonadaceae	-2.42138407	Sutterellaceae	2.33330848	Chthonomonadaceae	-2.42138407					Streptomycetaceae	0.70346092
Fibrobacteraceae	-2.41641796	Colwelliaceae	2.33092945	Fibrobacteraceae	-2.41641796					Micropepsaceae	0.68761417
Gracilibacteraceae	-2.33667880	Brevinemataceae	2.32490873	Gracilibacteraceae	-2.33667880					Flammeovirgaceae	0.66433495
Solibacteraceae	-2.29750099	Cytophagaceae	2.31113175	Solibacteraceae	-2.29750099					Kofleriaceae	0.65143113
Chloroflexaceae	-2.28934544	Rikenellaceae	2.30219286	Chloroflexaceae	-2.28934544					Legionellaceae	0.64298519
Thermomonosporaceae	-2.26702361	Morganellaceae	2.27391185	Thermomonosporaceae	-2.26702361					Verrucomicrobia subdivision 3	0.59165552
Xanthobacteraceae	-2.25283561	Prevotellaceae	2.25732617	Xanthobacteraceae	-2.25283561					Rhodobiaceae	0.58624837
Opitutaceae	-2.20643799	Acholeplasmataceae	2.24636097	Opitutaceae	-2.20643799					Caldilineaceae	0.57158509
Frankiaceae	-2.18882628	Mycoplasmataceae	2.23900101	Frankiaceae	-2.18882628					Alcaligenaceae	0.53941169
Coriobacteriaceae	-2.16558129	Clostridiales Family XIII. Incertae Sedis	2.21725001	Coriobacteriaceae	-2.16558129					Gemmataceae	0.51721228
Haliaceae	-2.14721626	Legionellaceae	2.21086924	Haliaceae	-2.14721626					Phyllobacteriaceae	0.48772819
Thermoanaerobacterales Family III. Incertae Sedis	-2.11155189	Chromobacteriaceae	2.20837481	Thermoanaerobacterales Family III. Incertae Sedis	-2.11155189					Nocardioideaceae	0.45717254
Jiangellaceae	-2.09859541	Kordiimonadaceae	2.20535701	Jiangellaceae	-2.09859541					Acidimicrobiaceae	0.44951922
Oscillochloridaceae	-2.09387239	Bacillales Family X. Incertae Sedis	2.19217114	Oscillochloridaceae	-2.09387239					Bradyrhizobiaceae	0.44735454
Thermoleophilaceae	-2.09031284	Cyclobacteriaceae	2.12772692	Thermoleophilaceae	-2.09031284					Nitrosomonadaceae	0.39296275
Glycomycetaceae	-2.07081809	Aerococcaceae	2.12689459	Glycomycetaceae	-2.07081809					Burkholderiaceae	0.39082058
Proteinivoraceae	-2.06166055	Yersiniaceae	2.09222584	Proteinivoraceae	-2.06166055					Chloroflexaceae	0.37964056
Fervidobacteriaceae	-2.03464581	Corynebacteriaceae	2.08653461	Fervidobacteriaceae	-2.03464581					Polyangiaceae	0.27886772
Atopobiaceae	-2.01334894	Shewanellaceae	2.08514772	Atopobiaceae	-2.01334894						
Methylococcaceae	-2.01263402	Leptotrichiaceae	2.05132180	Methylococcaceae	-2.01263402						

Rubrobacteraceae	-1.96000736	Pseudoalteromonadaceae	2.01819354	Rubrobacteraceae	-1.96000736						
Chlamydiaceae	-1.93702817	Enterococcaceae	1.99125797	Chlamydiaceae	-1.93702817						
Acidobacteriaceae	-1.92675589	Listeriaceae	1.97858861	Acidobacteriaceae	-1.92675589						
Phaselicystidaceae	-1.90446945	Neisseriaceae	1.91842247	Phaselicystidaceae	-1.90446945						
Thermotogaceae	-1.88721594	Candidatus Midichloriaceae	1.83259270	Thermotogaceae	-1.88721594						
Catenulisporaceae	-1.86823604	Amoebophilaceae	1.82377018	Catenulisporaceae	-1.86823604						
Propionibacteriaceae	-1.84788449	Staphylococcaceae	1.82131441	Propionibacteriaceae	-1.84788449						
Rhodospirillaceae	-1.84742620	Oceanospirillaceae	1.81976511	Rhodospirillaceae	-1.84742620						
Herpetosiphonaceae	-1.84018338	Hydrogenophilaceae	1.79751167	Herpetosiphonaceae	-1.84018338						
Endomicrobiaceae	-1.81765751	Porphyromonadaceae	1.79465903	Endomicrobiaceae	-1.81765751						
Methylocystaceae	-1.80270868	Idiomarinaceae	1.72635277	Methylocystaceae	-1.80270868						
Eggerthellaceae	-1.80006110	Bartonellaceae	1.70407226	Eggerthellaceae	-1.80006110						
Natronaerobiaceae	-1.78446468	Fusobacteriaceae	1.65502896	Natronaerobiaceae	-1.78446468						
Polyangiaceae	-1.74982144	Selenomonadaceae	1.61251596	Polyangiaceae	-1.74982144						
Acetobacteraceae	-1.71243890	Oscillatoriaceae	1.59270684	Acetobacteraceae	-1.71243890						
Promicromonosporaceae	-1.68491534	Gordoniaceae	1.49481737	Promicromonosporaceae	-1.68491534						
Holophagaceae	-1.64577497	Oscillospiraceae	1.42166431	Holophagaceae	-1.64577497						
Solirubrobacteraceae	-1.58410270	Erythrobacteraceae	1.39462321	Solirubrobacteraceae	-1.58410270						
Demequinaceae	-1.51587393	Anaplasmataceae	1.33282779	Demequinaceae	-1.51587393						
Desulfuromonadaceae	-1.49409021	Piscirickettsiaceae	1.33266024	Desulfuromonadaceae	-1.49409021						
Iamiaceae	-1.49155615	Rickettsiaceae	1.31844354	Iamiaceae	-1.49155615						
Solanaceae	-1.48374210	Rhodanobacteraceae	1.30523165	Solanaceae	-1.48374210						
Kofleriaceae	-1.43915616	Rhodothermaceae	1.30064279	Kofleriaceae	-1.43915616						
Lachnospiraceae	-1.35192022	Methylophilaceae	1.26245936	Lachnospiraceae	-1.35192022						
Patulibacteraceae	-1.32257929	Crocinitomicaceae	1.17630721	Patulibacteraceae	-1.32257929						
Ruminococcaceae	-1.31007648	Oligoflexaceae	1.12332254	Ruminococcaceae	-1.31007648						
Thermoanaerobacteraceae	-1.29291655	Campylobacteraceae	1.10085072	Thermoanaerobacteraceae	-1.29291655						

Rhodobacteraceae	-1.28318200	Marinilabiliaceae	1.08196297	Rhodobacteraceae	-1.28318200						
Desulfovibrionaceae	-1.27364265	Bifidobacteriaceae	1.06173795	Desulfovibrionaceae	-1.27364265						
Thermodesulfobiaceae	-1.26599853	Sanguibacteraceae	1.03904751	Thermodesulfobiaceae	-1.26599853						
Syntrophaceae	-1.26351223	Halomonadaceae	1.03772451	Syntrophaceae	-1.26351223						
Nocardiaceae	-1.22659474	Rhodocyclaceae	1.03281903	Nocardiaceae	-1.22659474						
Micropepsaceae	-1.19447879	Clostridiaceae	1.02003134	Micropepsaceae	-1.19447879						
Christensenellaceae	-1.17500234	Vibrionaceae	0.92236468	Christensenellaceae	-1.17500234						
Synergistaceae	-1.14279030	Saprospiraceae	0.90766458	Synergistaceae	-1.14279030						
Mycobacteriaceae	-1.08362391	Methylobacteriaceae	0.84578386	Mycobacteriaceae	-1.08362391						
Cellulomonadaceae	-1.07919701	Kiloniellaceae	0.84565478	Cellulomonadaceae	-1.07919701						
Acidimicrobiaceae	-1.07021613	Helicobacteraceae	0.82873719	Acidimicrobiaceae	-1.07021613						
Syntrophorhabdaceae	-1.04053432	Flammeovirgaceae	0.80633445	Syntrophorhabdaceae	-1.04053432						
Heliobacteriaceae	-1.02647674	Hydrogenothermaceae	0.69581527	Heliobacteriaceae	-1.02647674						
Peptococcaceae	-0.97436149	Actinomycetaceae	0.60991335	Peptococcaceae	-0.97436149						
Brevibacteriaceae	-0.96188256			Brevibacteriaceae	-0.96188256						
Sporichthyaceae	-0.92905330			Sporichthyaceae	-0.92905330						
Tsukamurellaceae	-0.92222812			Tsukamurellaceae	-0.92222812						
Desulfobulbaceae	-0.91249498			Desulfobulbaceae	-0.91249498						
Sinobacteraceae	-0.91176299			Sinobacteraceae	-0.91176299						
Rhodobiaceae	-0.80795251			Rhodobiaceae	-0.80795251						
Nocardiodaceae	-0.77848134			Nocardiodaceae	-0.77848134						
Thermodesulfobacteriaceae	-0.75744565			Thermodesulfobacteriaceae	-0.75744565						
Intrasporangiaceae	-0.73255817			Intrasporangiaceae	-0.73255817						
Desulfobacteraceae	-0.69435711			Desulfobacteraceae	-0.69435711						
Veillonellaceae	-0.67923085			Veillonellaceae	-0.67923085						
Thiotrichaceae	-0.67213928			Thiotrichaceae	-0.67213928						
Beijerinckiaceae	-0.56144362			Beijerinckiaceae	-0.56144362						

Table S3. Ranges of chemical, physical-chemical and biological properties of collected samples.

	Year	Arable area				Wood area			
		2013	2014	2015	2016	2013	2014	2015	2016
Soil parameters	Unit	Surficial layer							
pH	---	7.8 - 7.9	8.2 - 8.8	8.0 - 8.3	7.8 - 8.1	7.8 - 8.9	7.6 - 8.7	7.7 - 8.1	7.3 - 8.2
Electrical conductivity	µS/cm	29 - 81	21 - 56	177 - 249	126 - 257	77 - 88	53 - 65	227 - 264	154 - 306
Organic carbon	g/kg	10.9 - 32.8	15.4 - 24.0	14.6 - 18.1	16.2 - 25.6	2.7 - 21.5	16.4 - 36.1	12.9 - 64.0	4.5 - 33.7
Total carbonate	g/kg	13.4 - 35.7	15.6 - 40.4	12.1 - 44.5	10.1 - 22.3	71.5 - 121	8.9 - 116	16.2 - 56.6	8.1 - 70.8
Exchangeable Ca	g/kg	6.3 - 23.8	17.5 - 18.9	18.8 - 35.0	21.3 - 36.3	36.3 - 67.5	15.9 - 18.5	13.7 - 28.7	6.3 - 38.8
Total-N	g/kg	1.4 - 2.4	1.0 - 1.5	0.04 - 0.56	0.05 - 0.16	0.50 - 3.2	1.29 - 2.30	0.56 - 0.70	0.28 - 0.63
Cation Exchange Capacity	cmol+/kg	25 - 39	31 - 51	33 - 49	33 - 39	17 - 36	22 - 41	21 - 41	22 - 28
Phosphorus content	mg/kg	3.3 - 40	22 - 41	37 - 79	33 - 77	3.0 - 53	31 - 131	21 - 220	27 - 209
Basal respiration	mg C-CO ₂ /kg dm	126 - 219	90 - 108	90 - 195	135 - 1020	78 - 144	102 - 142	141 - 318	153 - 522
Cumulative respiration	mg C-CO ₂ /kg dm	426 - 566	393 - 596	201 - 432	159 - 1822	232 - 405	551 - 707	672 - 1104	990 - 1359
Microbial biomass	mgC/kg dm	72 - 331	200 - 400	120 - 380	300 - 400	98 - 143	240 - 400	120 - 480	360 - 400
Soil parameters	Unit	Deep layer							
pH	---	7.8 - 8.0	8.4 - 8.9	8.1 - 8.2	7.9 - 8.4	7.9 - 8.7	7.9 - 8.7	7.9 - 8.4	8.0 - 8.5
Electrical conductivity	µS/cm	37 - 85	23.4 - 69.2	184 - 238	111 - 213	63 - 76	38 - 93	184 - 270	151 - 356
Organic carbon	g/kg	8.2 - 22.4	10.1 - 19.7	14.4 - 19.9	11.3 - 29.8	5.1 - 8.8	10.7 - 30.4	7.4 - 45.2	5.3 - 23.0
Total carbonate	g/kg	17.9 - 49.1	13.4 - 44.7	10.1 - 44.5	12.1 - 48.4	44.7 - 112	22.3 - 98.2	44.5 - 62.7	12.1 - 107
Exchangeable Ca	g/kg	2.5 - 27.5	17.4 - 18.7	12.5 - 32.5	31.3 - 43.8	41.3 - 71.3	15.6 - 18.3	25.0 - 27.5	10.0 - 43.8
Total-N	g/kg	1.0 - 2.5	0.70 - 1.30	0.06 - 0.08	0.05 - 0.08	0.50 - 2.0	1.0 - 1.3	0.56 - 0.69	0.35 - 1.06
Cation Exchangeable Capacity	cmol+/kg	29 - 35	31 - 40	30 - 38	34 - 35	17 - 23	25 - 37	24 - 37	20 - 25
Phosphorus content	mg/kg	3.0 - 31	17 - 36	34 - 82	36 - 86	1.3 - 13	32 - 68	53 - 138	58 - 128
Basal respiration	mg C-CO ₂ /kg dm	111 - 240	90 - 108	93 - 222	144 - 894	63 - 78	108 - 114	105 - 273	108 - 447
Cumulative respiration	mg C-CO ₂ /kg dm	348 - 484	447 - 641	240 - 528	305 - 962	173 - 235	414 - 572	270 - 975	531 - 1128
Microbial biomass	mg C/kg dm	79 - 329	200 - 360	140 - 280	120 - 340	90 - 167	200 - 400	120 - 340	100 - 340