**Supplementary Table 3 The community differences between the unsterilization and sterilization soils at different phylogenetic levels**

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| **Phy** | **Unsterilization** | **Sterilization** |
| **Number** | **Taxonomy** | **10%** | **25%** | **40%** | **Taxonomy** | **10%** | **25%** | **40%** |  |
| 1 | Actinobacteria | 0.42208  | 0.39399  | 0.33845  | Proteobacteria | 0.48029  | 0.54972  | 0.47951  |  |
| 2 | Proteobacteria | 0.34662  | 0.31085  | 0.32684  | Actinobacteria | 0.24327  | 0.14364  | 0.15964  |  |
| 3 | Gemmatimonadetes | 0.11513  | 0.14385  | 0.16394  | Bacteroidetes | 0.09138  | 0.12485  | 0.14422  |  |
| 4 | Bacteroidetes | 0.05924  | 0.07017  | 0.08681  | Gemmatimonadetes | 0.10611  | 0.11490  | 0.11998  |  |
| 5 | Acidobacteria | 0.03144  | 0.04310  | 0.03973  | Firmicutes | 0.03919  | 0.03453  | 0.04315  |  |
| 6 | Firmicutes | 0.00713  | 0.00805  | 0.00918  | Acidobacteria | 0.01560  | 0.01643  | 0.02471  |  |
| 7 | Chloroflexi | 0.00687  | 0.00560  | 0.00506  | Fibrobacteres | 0.00644  | 0.00320  | 0.01090  |  |
| 8 | Fibrobacteres | 0.00039  | 0.00440  | 0.00841  | WCHB1\_60 | 0.00638  | 0.00292  | 0.00327  |  |
| 9 | WCHB1\_60 | 0.00206  | 0.00620  | 0.00431  | Cyanobacteria | 0.00525  | 0.00307  | 0.00228  |  |
| 10 | Nitrospirae | 0.00219  | 0.00451  | 0.00554  | Other | 0.00216  | 0.00232  | 0.00253  |  |
| 11 | Other | 0.00133  | 0.00231  | 0.00285  | Verrucomicrobia | 0.00093  | 0.00131  | 0.00211  |  |
| 12 | Elusimicrobia | 0.00044  | 0.00184  | 0.00378  | Chloroflexi | 0.00144  | 0.00093  | 0.00191  |  |
| 13 | Cyanobacteria | 0.00346  | 0.00108  | 0.00052  | Chlorobi | 0.00092  | 0.00106  | 0.00134  |  |
| 14 | Verrucomicrobia | 0.00039  | 0.00151  | 0.00128  | Elusimicrobia | 0.00011  | 0.00005  | 0.00177  |  |
| 15 | Saccharibacteria | 0.00043  | 0.00118  | 0.00079  | Gracilibacteria | 0.00000  | 0.00049  | 0.00050  |  |
| 16 | Chlorobi | 0.00050  | 0.00072  | 0.00091  | Armatimonadetes | 0.00023  | 0.00040  | 0.00032  |  |
| 17 | Parcubacteria | 0.00001  | 0.00029  | 0.00068  | Chlamydiae | 0.00006  | 0.00004  | 0.00067  |  |
| 18 | Gracilibacteria | 0.00000  | 0.00000  | 0.00035  | Saccharibacteria | 0.00009  | 0.00007  | 0.00037  |  |
| 19 | Armatimonadetes | 0.00013  | 0.00010  | 0.00011  | Parcubacteria | 0.00000  | 0.00000  | 0.00046  |  |
| 20 | TM6 | 0.00003  | 0.00009  | 0.00018  | Nitrospirae | 0.00013  | 0.00007  | 0.00026  |  |
| 21 | JL\_ETNP\_Z39 | 0.00007  | 0.00007  | 0.00012  | TM6 | 0.00000  | 0.00002  | 0.00003  |  |
| 22 | Planctomycetes | 0.00001  | 0.00003  | 0.00013  | JL\_ETNP\_Z39 | 0.00001  | 0.00000  | 0.00004  |  |
| 23 | Tenericutes | 0.00000  | 0.00002  | 0.00001  | Planctomycetes | 0.00000  | 0.00001  | 0.00003  |  |
| 24 | SM2F11 | 0.00000  | 0.00002  | 0.00001  | SM2F11 | 0.00000  | 0.00000  | 0.00001  |  |
| 25 | Deinococcus\_Thermus | 0.00002  | 0.00000  | 0.00000  | Fusobacteria | 0.00000  | 0.00001  | 0.00000  |  |
| 26 | Chlamydiae | 0.00000  | 0.00000  | 0.00001  | Tenericutes | 0.00000  | 0.00000  | 0.00000  |  |
| 27 | Fusobacteria | 0.00000  | 0.00001  | 0.00000  | Deinococcus\_Thermus | 0.00000  | 0.00000  | 0.00000  | 　 |
| **Class** | **Unsterilization** | **Sterilization** |
| **Number** | **Taxonomy** | **10%** | **25%** | **40%** | **Taxonomy** | **10%** | **25%** | **40%** |  |
| 1 | Actinobacteria | 0.26928  | 0.23525  | 0.20546  | Betaproteobacteria | 0.28194  | 0.31972  | 0.20067  |  |
| 2 | Alphaproteobacteria | 0.18679  | 0.14570  | 0.16544  | Actinobacteria | 0.22223  | 0.12808  | 0.14084  |  |
| 3 | Gemmatimonadetes | 0.11513  | 0.14385  | 0.16394  | Alphaproteobacteria | 0.13467  | 0.15630  | 0.14390  |  |
| 4 | Thermoleophilia | 0.11074  | 0.09730  | 0.08153  | Gemmatimonadetes | 0.10611  | 0.11490  | 0.11998  |  |
| 5 | Betaproteobacteria | 0.08795  | 0.10198  | 0.09354  | Sphingobacteriia | 0.07318  | 0.10393  | 0.09471  |  |
| 6 | Sphingobacteriia | 0.05062  | 0.05212  | 0.05319  | Gammaproteobacteria | 0.03828  | 0.04778  | 0.08231  |  |
| 7 | Deltaproteobacteria | 0.02362  | 0.04718  | 0.04652  | Bacilli | 0.03886  | 0.03436  | 0.04287  |  |
| 8 | Acidimicrobiia | 0.03112  | 0.04614  | 0.03813  | Deltaproteobacteria | 0.02516  | 0.02479  | 0.04725  |  |
| 9 | Acidobacteria | 0.02375  | 0.03666  | 0.03410  | Cytophagia | 0.01675  | 0.02012  | 0.04599  |  |
| 10 | Gammaproteobacteria | 0.04799  | 0.01540  | 0.02047  | Acidobacteria | 0.01442  | 0.01545  | 0.02211  |  |
| 11 | Cytophagia | 0.00779  | 0.01774  | 0.03316  | Thermoleophilia | 0.01121  | 0.00658  | 0.00813  |  |
| 12 | Bacilli | 0.00650  | 0.00725  | 0.00770  | Acidimicrobiia | 0.00771  | 0.00728  | 0.00929  |  |
| 13 | Holophagae | 0.00768  | 0.00644  | 0.00562  | Fibrobacteria | 0.00644  | 0.00320  | 0.01090  |  |
| 14 | Fibrobacteria | 0.00039  | 0.00440  | 0.00841  | ML635J\_21 | 0.00524  | 0.00305  | 0.00218  |  |
| 15 | Nitrospira | 0.00219  | 0.00451  | 0.00554  | Holophagae | 0.00118  | 0.00098  | 0.00259  |  |
| 16 | ML635J\_21 | 0.00000  | 0.00000  | 0.00000  | Nitrospira | 0.00000  | 0.00000  | 0.00000  | 　 |
| **Genus** | **Unsterilization** | **Sterilization** |
| **Number** | **Taxonomy** | **10%** | **25%** | **40%** | **Taxonomy** | **10%** | **25%** | **40%** |  |
| 1 | Gemmatimonas | 0.05062  | 0.05804  | 0.06798  | Massilia | 0.20921  | 0.25262  | 0.09957  |  |
| 2 | Arthrobacter | 0.05216  | 0.06466  | 0.04089  | Gemmatimonas | 0.06176  | 0.05969  | 0.06471  |  |
| 3 | Sphingomonas | 0.06422  | 0.03453  | 0.05663  | Sphingomonas | 0.03728  | 0.03359  | 0.04263  |  |
| 4 | Pseudonocardia | 0.03982  | 0.03970  | 0.04007  | Arthrobacter | 0.04863  | 0.03007  | 0.02891  |  |
| 5 | Patulibacter | 0.05076  | 0.01589  | 0.01594  | Flavisolibacter | 0.02154  | 0.03167  | 0.02067  |  |
| 6 | Nocardioides | 0.03282  | 0.01013  | 0.00935  | Bacillus | 0.02583  | 0.01719  | 0.02725  |  |
| 7 | Solirubrobacter | 0.01132  | 0.01525  | 0.01298  | Lysobacter | 0.02022  | 0.01146  | 0.03663  |  |
| 8 | Bryobacter | 0.01098  | 0.01240  | 0.01241  | Nocardioides | 0.02807  | 0.03045  | 0.00633  |  |
| 9 | Massilia | 0.01430  | 0.01020  | 0.00982  | Niastella | 0.01297  | 0.01666  | 0.02158  |  |
| 10 | Haliangium | 0.00437  | 0.01455  | 0.01461  | Phenylobacterium | 0.01146  | 0.02286  | 0.01187  |  |
| 11 | Flavisolibacter | 0.01231  | 0.01022  | 0.01061  | Micromonospora | 0.02040  | 0.00686  | 0.01351  |  |
| 12 | Segetibacter | 0.01166  | 0.01004  | 0.01068  | Ramlibacter | 0.01273  | 0.00788  | 0.01834  |  |
| 13 | Gaiella | 0.00877  | 0.01153  | 0.00971  | Streptomyces | 0.02746  | 0.00541  | 0.00510  |  |
| 14 | Noviherbaspirillum | 0.01095  | 0.00986  | 0.00892  | Bryobacter | 0.01088  | 0.01240  | 0.01372  |  |
| 15 | Candidatus\_Solibacter | 0.00669  | 0.01088  | 0.00936  | Segetibacter | 0.01233  | 0.01007  | 0.00754  |  |
| 16 | Bacillus | 0.00000  | 0.00000  | 0.00000  | Pseudonocardia | 0.00000  | 0.00000  | 0.00000  |  |
| 17 | Lysobacter | 0.00000  | 0.00000  | 0.00000  | Patulibacter | 0.00000  | 0.00000  | 0.00000  |  |
| 18 | Niastella | 0.00000  | 0.00000  | 0.00000  | Solirubrobacter | 0.00000  | 0.00000  | 0.00000  |  |
| 19 | Phenylobacterium | 0.00000  | 0.00000  | 0.00000  | Haliangium | 0.00000  | 0.00000  | 0.00000  |  |
| 20 | Micromonospora | 0.00000  | 0.00000  | 0.00000  | Gaiella | 0.00000  | 0.00000  | 0.00000  |  |
| 21 | Ramlibacter | 0.00000  | 0.00000  | 0.00000  | Noviherbaspirillum | 0.00000  | 0.00000  | 0.00000  |  |
| 22 | Streptomyces | 0.00000  | 0.00000  | 0.00000  | Candidatus\_Solibacter | 0.00000  | 0.00000  | 0.00000  |  |