**SUPPLEMENTARY MATERIALS – ДОПОЛНИТЕЛЬНЫЕ МАТЕРИАЛЫ**

**Article title Microbial diversity in buried steppe palaeosols in relation to former pattern of annual precipitation**

**Название статьи Микробное разнообразие погребенных степных почв в связи с ходом годовых осадков**

**Т.Э. Хомутова, А.В.Борисов**

**T.E.Khomutova, A.V.Borisov**

**Eurasian Soil Science.**

**Почвоведение.**

Таблица S1. Микроорганизмы, выявленные в почвах педохроноряда (ES – современная почва, PS – палеопочвы, но – не обнаружены), наиболее близкие к содержащимся в базе данных Мичиганского Университета (RDP)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RDP** | **Микроорганизмы** | | | | **PS-3** | **PS-2** | | | | **PS-1** | **ES** | |
| 204-124-462 | 2.7.1.1. Thermomicrobium roseum | | | | 207-125-459 | 207-124-462 | | | 203(205)-126-462 | | | 203-123-459 |
| 368-123-463 | 2.7.2.1. Thermus thermophilus subgroup str. HB-8; ATCC 27634(T) | | | | **но** | 367(369)-124-462 | | | | 369-124-462 | **но** | |
| 227-297-494 | 2.13.11. Nitrospina subdivision; Env. clone MB1228 group AF154095 | | | | **но** | **но** | | | | **но** | 227-298(295)-491 | |
| 92-140-469 | 2.15.6., CY. Aurantiaca group U8 5891 Str. IC025 | | | | **но** | 90-139-468 | | | | 90-139-468 | **но** | |
| 205-136-464 | 2.15.11. Rhodothermus group, Env. clone OPS2AF018187 | | | | **но** | 207-136-462 | | | | 205-135-462 | **но** | |
| 208-203-450 | 2.18. Env. clone WCHBI-31 group, Env. clone H1.43f | | | | 207-201-449(452) | 207-201(203)-449 | | | | 207-201-452 | 207-204-449 | |
| 228-150-424 | 2.21.1.2. Nostoc muscarum | | | | **но** | **но** | | | | **но** | 227-149-421 | |
| 370-151-486 | 2.25.1.2. Fibrobacter and relatives, Env. clone OCS 307 group | | | | **но** | **но** | | | | 369-151-487 | **но** | |
| 229-150-422 | 2.28.1.6.9. Methylocystis parvus, str. M U81595 | | | | **но** | **но** | | | 228-151(149)-420 | | 227-149-421 | |
| 513-130-422 | 2.28.1.8.1.2.8. Rhodobacter capsulatus subgroup, strains TCRI 3,5, 2 | 512-131-422(420) | | | | | 513-128-420(421) | | | 513-131-420 | 513-128-422 | |
| 93-131-422 | 2.28.1.10.7. Rhz. suberifaciens subgroup, clone SAR 324 U65908 | | | | **но** | 90-131-421 | | | | 90-131-420 | 91-132-422 | |
| 511-148-420 | 2.28.1.10.13. Erythrobacter longus subgroup, JCM 6170(T) | | | | 511-149-422 | 513-149-420 | | | | 513-149-420 | 513-149-421 | |
| 367-490-473 | 2.28.2.3. Methylophilis methylophilis | | | | **но** | 369-489-474 | | | | 369-492-473 | 369-489-475 | |
| 207-491-459 | 2.28.2.4.3. Nitrosospira multiformis, str. C-71 | | | | 207-490-459 | 207(209)-490-459 | | | | 207-492-459 | **но** | |
| 206-82-472 | 2.28.2.4.6. NMN Europea subgroup, Nitrosomonas sp. str. GH22 etc. | | | | **но** | 207-84-474 | | | | 207-83-473 | 207-79(81)-475 | |
| 209-84-475 | 2.28.2.5.9. Azoarcus indigens subgroup, str. VB32 LMG 9092(T) | | | | **но** | 209-84-477 | | | | 209-83-476 | 209-84-475 | |
| 205-149-471 | 2.28.2.9.5.1. Rubrivorax gelatinosus subgr. str. ATH2.2.1. ATCC 17011(T) | | | | **но** | 207-149-468 | | | | 205-149-473 | Not found | |
| 209-141-475 | 2.28.2.10.4. Burkholderia Caryophilli, str. MCII-8 | | | | **но** | 209-139-474 | | | | 209- (139)-476 | 209-140-475 | |
| 211-494-477 | 2.28.3.4.5. Thiobacillus subgroup AB015514 str. BD1-1 | | | | **но** | 209-495-477 | | | | 212-495-476 | 212-494-475 | |
| 215-498-481 | 2.28.3.8.7. Xan. campestris subgroup, str. ATCC33913(T) | | | | **но** | 215-496-479 | | | | 217-495-483 | **но** | |
| 209-492-72 | 2.28.3.13.14. Pseudomonas amygdalii subgroup | | | | **но** | **но** | | | | 209-491-75 | 209-495-75 | |
| 91-291-488 | 2.28.4.2. Bdelvibrio stolpii group | | | | **но** | **но** | | 90-290-487 | | | **но** | |
| 364-133-455 | 2.30.1.5.2. Eubacterium lentum | | | 364-133-456 | | 363-132-452 | | | | 364-131-454 | 363-135-455 | |
| 468-159-452 | 2.30.1.8.1. Streptomyces scabiei subgroup | | | | 469-158-452 | 469-158-452 | | | | 469-159-452 | 469-158-452 | |
| 370-146-456 | 2.30.1.9.1.1. Clavibacter cynodontis, str. GC | | 369-146-456 | | | 369-149-454 | | | | 369-146-455 | 369-149-454 | |
| 474-145-458 | 2.30.1.9.1.3.5. Microbacterium aurum | | | | **но** | **но** | | | | 474-146-459 | **но** | |
| 371-68-456  371-146-457 | 2.30.1.9.1.4. Clavibacter citreum subgroup, AB012590 IF015616  AB012591, IFO 15706 | | | | 369-70-454  369-149-454 | **но**  37-143-456 | | | | 372-70-459  372-143-459 | **nf**  371-146-455 | |
| 465-146-449 | 2.30.1.11.9. Micromonospora echinospora subgroup | | | | **но** | 465-143-449 | | | | 465-143-449 | **но** | |
| 354-137-76 | 2.30.1.12.2. Kibdelosporangium aridum sbgr. | | | | **но** | **но** | | | | 357-135-76 | 355-137-76 | |
| 369-140-461 | 2.30.2.2. Anaerobranca horikoshii str. JW/YL-138 DSM 9786(T) | | | | 369-140-459 | 369-139-462 | | | | 369-139-462 | 369-140-459 | |
| 578-290-487 | 2.30.3.1.3. Sporomusa paucivorans subgroup, AJ009486 clone SJA-112 | | | | **но** | **но** | | | | 578-290-487 | **но** | |
| 234-140-478 | 2.30.7.4.2. Paenibacillus Validis DSM 3037(T) | | | | **но** | 236-139-477 | | | | 236-139-476 | **но** | |
| 61-148-470 | 2.30.7.10.5. Sporosarcina urinae | | | | **но** | 60-149-468 | | | | **но** | **но** | |
| 219-133-452 | 2.30.8.2.5. Acholeplasma oculi ISM 1499 | | | | **но** | 220-132-452 | | | | 217-131-452 | 220-132-452 | |
| 230-279-475 | 2.30.8.2.8. Lactobacillus catenaformis, str. 1871 ATCC25546(T) | | | | **но** | **но** | | | | 228-277-476 | 233-278-475 | |

Таблица S2. Распределение выявленных групп микроорганизмов в горизонтах Ае и Bt (ES – cовременная почва, PS- палеопочвы)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Микроорганизмы** | **PS-3** | | **PS-2** | | **PS-1** | | **ES** | | |
| **Ae** | **Bt** | **Ae** | **Bt** | **Ae** | **Bt** | **Ae** | **Bt** |
| Nitrospina subdivision; Env. clone MB1228 group AF154095 |  |  |  |  |  |  | **+** |  |
| Nostoc muscarum |  |  |  |  |  |  |  | **+** |
| Thermomicrobium roseum | **+** | **+** | **+** | **+** | **+** |  |  | **+** |
| Env. clone WCHBI-31 group, Env. clone H1.43f | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |
| Rhodobacter capsulatus strains TCRI 3,5, 2 | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |
| Erythrobacter longus JCM 6170(T) | **+** |  | **+** | **+** | **+** | **+** |  | **+** |
| Atopobium minutum subgroup, Eubacterium lentum | **+** | **+** | **+** |  | **+** | **+** | **+** | **+** |
| Streptomyces scabiei subgroup | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |
| Clavibacter xyli subsp. cynodontis, str. GC | **+** | **+** | **+** | **+** | **+** | **+** |  | **+** |
| Clb. citreum subgroup, Env clone AB012591, IFO 15706 |  | **+** | **+** | **+** | **+** |  | **+** | **+** |
| Anaerobranca horikoshii str. JW/YL-138 DSM 9786(T) | **+** | **+** | **+** | **+** | **+** | **+** |  | **+** |
| Rhz. suberifaciens subgroup, clone SAR 324 U65908 |  |  | **+** |  | **+** | **+** | **+** | **+** |
| Methylophilis group, Mlp. methylophilis |  |  |  | **+** | **+** | **+** | **+** |  |
| Nitrosomonas sp. str. GH22 etc |  |  |  | **+** | **+** | **+** | **+** | **+** |
| Azoarcus indigens subgroup, str. VB32 LMG 9092(T) |  |  | **+** | **+** |  | **+** |  | **+** |
| Burkholderia glatei subgroup, Bur. Caryophilli, str. MCII-8 |  |  |  | **+** |  | **+** |  | **+** |
| Thiobacillus subgroup AB015514 str. BD1-1 |  |  | **+** | **+** |  | **+** | **+** | **+** |
| Acholeplasma laidlavii subgroup, Acp oculi ISM 1499 |  |  | **+** |  | **+** | **+** | **+** |  |
| Methylocystis parvus, str. M U81595 |  |  |  |  | **+** | **+** |  | **+** |
| Pseudomonas amygdalii subgroup |  |  |  |  | **+** | **+** |  | **+** |
| Kibdelosporangium aridum subgroup. |  |  |  |  | **+** | **+** |  | **+** |
| Lactobacillus catenaformis, str. 1871 ATCC25546(T) |  |  |  |  |  | **+** | **+** |  |
| RT. Salexigens group, Rt. Salexing |  |  | **+** |  |  |  |  | **+** |
| Fibrobacter and relatives, Env. clone OCS 307 group, |  |  |  |  | **+** | **+** |  |  |
| Bdelvibrio stolpii group |  |  |  |  | **+** | **+** |  |  |
| Microbacterium aurum |  |  |  |  |  | **+** |  |  |
| Sporomusa paucivorans subgroup, AJ009486 clone SJA-112 |  |  |  |  | **+** |  |  |  |
| Taylorella asinigenitalis USD1 |  |  |  |  |  | **+** |  |  |
| Leptotrix mobilis str. Feox-1 DSM 10617 (T) |  |  |  |  | **+** |  |  |  |
| Bacillus cereus subgroup (B. antraci, B. cereus, B. thuringi, etc) |  |  |  |  | **+** | **+** |  |  |
| Nitrosospira multiformis, str. C-71 |  |  |  |  | **+** |  |  |  |
| Thermus thermophilus str. HB-8; ATCC 27634(T) |  |  | **+** | **+** |  | **+** |  |  |
| CY. Aurantiaca group U8 5891 Str. IC025 |  |  | **+** |  | **+** | **+** |  |  |
| Rhodothermus group, Env. clone OPS2AF018187 |  |  | **+** | **+** | **+** |  |  |  |
| Rubrivorax gelatinosus str. ATH2.2.1. ATCC 17011(T) |  |  | **+** | **+** | **+** |  |  |  |
| Xanthomonas campestris subgroup, str. ATCC33913(T), |  |  | **+** |  | **+** |  |  |  |
| Paenibacillus validis subgroup Pae. Validis DSM 3037(T) |  |  | **+** | **+** |  | **+** |  |  |
| Micromonospora Echinospora subgroup |  |  | + | **+** | + | + |  |  |
| Sporosarcina urinae, Halobacillus litoralis |  |  | **+** |  |  |  |  |  |
| Clavibacter citreum subgroup, Env. clone AB012590 IF015616 |  | **+** |  |  | **+** |  |  |  |