### Supplementary table 1: Bacterial species cultivated from soil using SD and 2DCS cultivation methods.

| Species cultivated by SD | Species cultivated by 2DCS |
|--------------------------|---------------------------|
| **Agrobacterium cavarae** | Acinetobacter towneri      | Lysobacter zhanggongensis |
| **Agromyces italicus**   | Actinoplanes missouriensis | Massilia aerilata         |
| **Agromyces laixinhei**  | Actinoplanes palleronii    | Massilia agri             |
| **Bacillus cereus**      | Actinoplanes subglobosus   | Massilia albidiflava      |
| **Bacillus coreaensis**  | Agrobacterium cavarae      | Massilia flava            |
| **Bacillus pacificus**   | Agromyces humi             | Massilia lutea            |
| **Bacillus toyonensis**  | Agromyces italicus         | Massilia oculi            |
| **Bacillus wiedmannii**  | Agromyces laixinhei        | Massilia timonae          |
| **Brachybacterium paraconglomeratum** | Alcaligenes faecalis subsp. faecalis | Massilia umbonata |
| **Brachybacterium sacelli** | Alkalihalobacillus alkalinitrilicus | Mesobacillus boroniphilus |
| **Brucella cytisi**      | Ancylobacter oerskovii     | Metabacillus halosaccharovorans |
| **Cellulomonas denverensis** | Arthrobacter crystallopoietes | Metabacillus niabensis |
| **Cellulomonas pakistanensis** | Arthrobacter globiformis   | Methyllocella tundrae    |
| **Cellulomonas taurus**  | Bacillus cereus             | Microbacterium aerolatum |
| **Cellulosimicrobium funkei** | Bacillus coreensis         | Microbacterium aoyamense |
| **Chryseobacterium arthropphaerae** | Bacillus pacificus         | Microbacterium arboescens |
| **Chryseobacterium cucumeris** | Bacillus stercoris        | Microbacterium aurum     |
| **Chryseobacterium indologenes** | Bacillus thuringiensis gv. cytolyticus | Microbacterium bovistercoris |
| **Erwinia oleae**        | Bacillus toyonensis        | Microbacterium enclose |
| **Glutamicibacter mishrai** | Bacillus vallismortis       | Microbacterium            |
|                          |                           | Rhizobium wenxiniae       |
| Glutamicibacter protophormiae | Bacillus velezensis | Microbacterium foliorum | Rhizobium yantingense |
|-----------------------------|-------------------|-------------------------|-----------------------|
| Gordonia terrae             | Bacillus weihaiensis | Microbacterium ginsengiterra | Rhizobium zeae |
| Isoptericola nanjingensis   | Bacillus wiedmannii | Microbacterium gorillae | Rhodobacter xinxiangensis |
| Luteimonas soli             | Bosea massiliensis | Microbacterium hibisci | Rhodococcus canchipurensis |
| Lysinibacillus fusiformis   | Brachybacterium alimentarium | Microbacterium humi | Rhodococcus cerastii |
| Lysobacter soli             | Brachybacterium endophyticum | Microbacterium hydrocarbonoxydans | Rhodococcus pedocola |
| Lysobacter zhanggongensis   | Brachybacterium paraconglomeratum | Microbacterium insulae | Rhodococcus rhodochrous |
| Metabacillus halosaccharovorans | Brachybacterium rhamnosum | Microbacterium keratanolyticum | Shigella flexneri |
| Methyloccella tundrae       | Brachybacterium sacelli | Microbacterium ketosireducens | Shinella kummerowiae |
| Microbacterium bovistercoris| Brachybacterium squillarum | Microbacterium laevaniformans | Shinella zoogloeoides |
| Microbacterium esteraromaticum | Brachymonas chironomi | Microbacterium lushaniae | Sphingobacterium endophyticum |
| Microbacterium foliorum     | Brachymonas denitrificans | Microbacterium marinum | Sphingobacterium mucilaginosum |
| Microbacterium ginsengiterra | Brevundimonas olei | Microbacterium natoriense | Sphingobacterium multivorum |
| Microbacterium gorillae     | Brucella cytisi | Microbacterium oleivorans | Sphingobacterium nematocida |
| Microbacterium insulae      | Brucella pseudogrignonensis | Microbacterium paraoxydans | Sphingobium naphthae |
| Microbacterium keratanolyticum | Cellulomonas denverensis | Microbacterium phyllophlaeae | Sphingomonas canadensis |
| Microbacterium ketosireducens | Cellulomonas fimii | Microbacterium saccharophilum | Sphingomonas mucosissima |
| Microbacterium laevaniformans | Cellulomonas pakistanensis | Microbacterium sorbitolivorans | Sphingomonas yantingensis |
| Microbacterium marinum      | Cellulomonas taurus | Microbacterium telephonicum | Sphingopyxis chilensis |
| Microbacterium natoriense   | Cellulosimicrobium cellulans | Microbacterium testaceum | Sphingopyxis solisilvae |
| Microbacterium paraoxydans  | Cellulosimicrobium funkei | Microbacterium trichotheccenolyticum | Sporosarcina luteola |
| Neobacillus niacini | Chryseobacterium arthrophaeae | Microbacterium ureisolvens | Stenotrophomonas bentonitica |
|--------------------|------------------------------|---------------------------|----------------------------|
| Neorhizobium alkalisoli | Chryseobacterium cucumeris | Microbacterium wangchenii | Stenotrophomonas chelatiphaga |
| Novososphingobium gossypii | Chryseobacterium flavum | Micrococcus luteus | Stenotrophomonas indicatrix |
| Novososphingobium guangzhouense | Chryseobacterium indologenes | Morganella morganii subsp. sibonii | Stenotrophomonas lactitubi |
| Novososphingobium resinovense | Chryseobacterium timonianum | Neobacillus drentensis | Stenotrophomonas multophilia |
| Priestia aryabhattai | Citrobacter braakii | Neobacillus niacini | Stenotrophomonas nitritireducens |
| Priestia filamentosa | Curtobacterium citreum | Neorhizobium alkalisoli | Stenotrophomonas panacihumi |
| Priestia megaterium | Cytopbacter firmus | Neorhizobium huautlense | Stenotrophomonas pavanii |
| Pseuochrobactrum asaccharolyticum | Devosia riboflavina | Niallia taxi | Stenotrophomonas terrae |
| Pseudomonas graminis | Domibacillus indicus | Nitrincola tapanii | Streptomyces atriruber |
| Pseudomonas monteilii | Ensifer garamanticus | Nocardia carnea | Streptomyces atrovirens |
| Pseudomonas plecoglossicida | Ensifer meliloti | Nocardia rhamnosiphila | Streptomyces badius |
| Pseudoxanthomonas indica | Ensifer terangae | Nocardioideas lianchengensis | Streptomyces bambusae |
| Pseudoxanthomonas koreensis | Enterobacter hormaechei subsp. xiangfangensis | Novososphingobium barchaimii | Streptomyces bottropensis |
| Psychrobacillus lasticapitis | Enterobacter quasiroggenkampii | Novososphingobium gossypii | Streptomyces chrestomyceticus |
| Rhizobium panachii | Enterococcus casseliflavus | Novososphingobium guangzhouense | Streptomyces dioscori |
| Rhodococcus cerastii | Enterococcus durans | Novososphingobium resinovorum | Streptomyces endophyticus |
| Rhodococcus pedocola | Erwinia oleae | Ochrobactrum teleogrylli | Streptomyces globisporus |
| Rhodococcus rhodochrous | Glutamicibacter mishrai | Paenibacillus pinisoli | Streptomyces griseoflavus |
| Shigella flexneri | Glutamicibacter protophormiae | Pantoeea anthophila | Streptomyces griseovirdis |
| Sphingobacterium mucilaginosum | Glutamicibacter uratoxysans | Paracoccus lutimaris | Streptomyces heliomycini |
| Sphingobacterium multivorun | Gordonia terrae | Paucisalibacillus globulus | Streptomyces indicus |
| Species                                | Species                                | Species                                | Species                                |
|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Sphingomonas canadensis                | Isoptericola nanjingensis              | Pedobacter xinjiangensis              | Streptomyces lavendulae subsp. lavendulae |
| Sphingopyxis chilensis                 | Janibacter melonis                     | Piscicoccus intestinalis              | Streptomyces malachitospinus           |
| Stenotrophomonas indicatrix            | Kineosporia rhizophila                | Priestia aryabhattai                | Streptomyces manipurensis             |
| Stenotrophomonas lactitubi            | Klebsiella quasivariicola             | Priestia endophyta                   | Streptomyces osmaniensis              |
| Stenotrophomonas nitritireducens       | Klebsiella varicola subsp. tropica    | Priestia filamentosa                  | Streptomyces roseifaciens             |
| Streptomyces chrestomyceticus          | Knoellia locipacati                   | Priestia flexa                       | Streptomyces rubrogriseus             |
| Streptomyces griseoviridis             | Krasilnikoviella muralis              | Priestia megaterium                  | Streptomyces scabiei                  |
| Streptomyces malachitospinus           | Leclercia adecarboxylata               | Pseudarthrobacter enclensis           | Streptomyces shaanxiensis             |
| Streptomyces tendae                    | Leucobacter musarum subsp. musarum    | Pseudochrobactrum asaccharolyticum    | Streptomyces tendae                   |
| Terribacillus saccharophilus           | Leucobacter tardus                    | Pseudoduganella violaceinigra        | Terribacillus saccharophilus           |
|                                        | Luteimonas soli                       | Pseudomonas asiatica                 | Ureibacillus sinduriensis             |
|                                        | Lysinibacillus fusiformis             | Pseudomonas entomophila              | Xanthomonas maliensis                 |
|                                        | Lysobacter soli                       | Pseudomonas geniculata               |                                        |

**Total = 73**

**Total = 227**

**Supplementary table 2:** Bacterial species cultivated from anaerobic sludge using SD and 2DCS cultivation methods.
| Species cultivated by SD | Species cultivated by 2DCS |
|--------------------------|---------------------------|
| Acinetobacter calcoaceticus | Bacillus sp. H-04 |
| Alcaligenes faealis       | Bacillus sp. HH-01       |
| Bacillus cereus           | Bacillus sp. KHg1        |
| Bacillus cohnii           | Bacillus sp. KHg2        |
| Bacillus firmus           | Bacillus sp. NB-6         |
| Bacillus licheniformis    | Bacillus sp. Ob 11       |
| Bacillus pumilus          | Bacillus sp. PL-12       |
| Bacillus sp. Bt 27        | Bacillus sp. SG-1        |
| Bacillus sp. SH3          | Bacillus sp. TT102       |
| Bhargavaea cecembensis    | Bacillus amyloliquefaciens |
| Brachybacterium paraconglomeratum | Bacillus anthracis |
| Chryseobacterium gleum    | Bacillus aquimarissis    |
| Enterobacter cloacae      | Bacillus azotoformans    |
| Exiguobacterium acetylicum | Bacillus circulans           |
| Exiguobacterium aurantiacum | Bacillus coagulans        |
| Exiguobacterium sp. LY3   | Bacillus cytotoxicus      |
| Janibacter sp. BY48       | Bacillus flexus           |
| Micrococcus luteus        | Bacillus halmapalus       |
| Myroides odoratimimus     | Bacillus halodurans       |
| Myroides profundi        | Bacillus horikoshii      |
| Pantoea agglomerans       | Bacillus humi             |
| Pantoea endophytica       | Bacillus infernus         |
|                          | Micrococcus sp. TS17      |
|                          | Oceanobacillus iheyensis  |
|                          | Paenibacillus larvae      |
|                          | Paenibacillus lentimorbus |
|                          | Parabacteroides goldsteinii |
|                          | Parabacteroides gordonii  |
|                          | Paracoccus sp. R-24652    |
|                          | Planococcus sp. L4        |
|                          | Planococcus sp. 'SOS Orange' |
|                          | Planomicrobium okeanokoites |
|                          | Porphyromonas endodontalis |
|                          | Porphyromonas gingivalis  |
|                          | Pseudomonas pseudoalcaligenes |
|                          | Pseudomonas sp. S11       |
|                          | Pseudomonas xiamenensis   |
|                          | Serratia marcescens       |
|                          | Sphingobacterium multivorum |
|                          | Staphylococcus aureus     |
|                          | Staphylococcus caprae     |
|                          | Staphylococcus epidermidis |
|                          | Staphylococcus hominis    |
|                          | Staphylococcus massiliensis |
| **Pseudomonas aeruginosa** | **Bacillus litoralis** | **Cellulosimicrobium cellulans** | **Staphylococcus schleiferi** |
|----------------------------|-----------------------|----------------------------------|-------------------------------|
| **Pseudomonas alcaligenes** | **Bacillus macyae**   | **Citrobacter freundii**         | **Staphylococcus sp. FS-YC6717** |
| **Pseudomonas stutzeri**   | **Bacillus massiliensis** | **Cronobacter turicensis**       | **Staphylococcus warneri**     |
| **Staphylococcus arlettae**| **Bacillus megaterium** | **Enterobacter amnigenus**        | **Staphylococcus xylosus**     |
| **Staphylococcus cohnii**  | **Bacillus methanolicus** | **Enterococcus faecium**         | **Streptomyces carpticus**     |
| **Staphylococcus gallinarum** | **Bacillus mojavensis** | **Enterococcus malodoratus**     | **Streptomyces clavuligerus**  |
| **Staphylococcus haemolyticus** | **Bacillus mycoides** | **Escherichia coli**             | **Streptomyces yeochonensis**  |
| **Staphylococcus pasteuri**| **Bacillus niacini**  | **Escherichia hermannii**         | **Terribacillus halophilus**   |
| **Staphylococcus saprophyticus** | **Bacillus pseudomycoides** | **Kocuria rosea**              | **Tetrasphaera veronensis**    |
| **Staphylococcus sciuri**  | **Bacillus psychrosaccharolyticus** | **Kurthia gibsonii**           | **Thioclava pacifica**         |
| **Stenotrophomonas acidaminiphila** | **Bacillus safensis** | **Kurthia sibirica**             | **uncultured alpha proteobacterium** |
| **Stenotrophomonas maltophilia** | **Bacillus simplex** | **Kurthia zopfii**               | **uncultured gamma proteobacterium** |
| uncultured bacterium       | **Bacillus sonorensis** | **Kytococcus sedentarius**       | **uncultured proteobacterium** |
| uncultured Enterobacteriaceae | **Bacillus sp. 3EC2B1** | **Lysinibacillus fusiformis**      | **uncultured Pseudomonas sp.** |
| uncultured Klebsiella sp.  | **Bacillus sp. AC-1** | **Lysinibacillus sphaericus**     | **uncultured Pseudomonas sp.** |
|                           | **Bacillus sp. Bt 22** |                                 |                               |
|                           | **Bacillus sp. BT97**  | **Lysobacter sp. OC7**           | **uncultured Serratia sp.**    |
|                           | **Bacillus sp. GB02-14C** |                                 |                               |
|                           | **Bacillus sp. GB02-25** |                                 |                               |
|                           | **Bacillus sp. GB02-30** |                                 |                               |
| **Total = 37**            |                       |                                  | **Total = 162**                |

**Supplementary table 3:** Bacterial species cultivated from landfill leachate using SD and 2DCS cultivation methods.
| Species cultivated by SD                          | Species cultivated by 2DCS                           |
|--------------------------------------------------|------------------------------------------------------|
| Alcaligenes faecalis                            | Bacillus niacini                                     |
| Bacillus amyloliquefaciens                      | Chromobacterium piscinae                             |
| Bacillus cereus                                 | Micrococcus sp.                                      |
| Bacillus cohnii                                 | SMCC ZAT351                                          |
| Bacillus halmapalus                             | Staphylococcus cohnii                                |
| Bacillus licheniformis                          | Bacillus psychrodurans                              |
| Bacillus mycoides                               | Citrobacter freundii                                 |
| Bacillus sp. GB02-14C                           | Oceanobacillus iheyensis                             |
| Bacillus sp. HH-01                              | Staphylococcus gallinarum                            |
| Bacillus subtilis                               | Bacillus simplex                                     |
| Bacillus thuringiensis                          | Citrobacter werkmanii                                |
| Bacteroides acidifaciens                        | Ornithinibacillus californiens                       |
| Brevundimonas bullata                           | Paenibacillus massiliensis                           |
| Chromobacterium piscinae                        | Staphylococcus pasteuri                              |
| Citrobacter freundii                            | Bacillus sp. GB02-14C                                |
| Citrobacter gillenii                            | Bacillus sp. BB1                                     |
| Citrobacter gillenii                            | Clostridium drakei                                   |
| Citrobacter warneri                             | Paenibacillus durus                                  |
| Chromobacterium piscinae                        | Staphylococcus pseudoulugdunensis                    |
| Citrobacter freundii                            | Enterobacter aerogenes                               |
| Citrobacter gillenii                            | Paenibacillus xylanilyticus                          |
| Citrobacter gillenii                            | Staphylococcus warneri                               |
| Citrobacter gillenii                            | Enterobacter hormaechei                              |
| Citrobacter gillenii                            | Pantoaea agglomerans                                 |
| Citrobacter gillenii                            | Stenotrophomonas acidaminiphila                      |
| Species                          | Genus                        | Species                        | Genus                        | Species                        | Genus                        |
|---------------------------------|------------------------------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| **Citrobacter werkmanii**       | Bacillus azotoformans       | Bacillus sp. HM06-02            | Enterococcus faecium          | Pantoaea endophytica           | Stenotrophomonas maltophilia |
| **Clostridium subterminale**    | Bacillus badius              | Bacillus sp. JAMB-204           | Exiguobacterium acetylicum    | Parabacteroides gordonii       | Streptomyces clavuligerus    |
| **Laribacter hongkongensis**    | Bacillus beijingensis       | Bacillus sp. MB-11              | Exiguobacterium aurantiacum   | Parabacteroides gordonii       | Terrabacter tumescens        |
| **Lysobacter sp. OC7**          | Bacillus caldovelox         | Bacillus sp. MB-5               | Exiguobacterium sp. AT1b      | Paracoccus marcusii            | Thioclava pacifica           |
| **Parabacteroides goldsteinii** | Bacillus catenulatus        | Bacillus sp. PL-12              | Exiguobacterium sp. LY3       | Planococcus sp. PF109          | unclassified alpha proteobacterium |
| **Parabacteroides gordonii**    | Bacillus cereus              | Bacillus sp. S210               | Exiguobacterium undae         | Planococcus sp. PF8            | uncultured bacterium         |
| **Porphyromonas endodontalis**  | Bacillus circulans          | Bacillus sp. SH3                | Geobacillus caldoproteolyticus| Planococcus sp. S5             | unclassified Enterobacteriaceae bacterium |
| **Providencia rettgeri**        | Bacillus clausii            | Bacillus sp. TT402              | Halobacillus sp. S19-3        | Planococcus sp. 'SOS Orange'   | uncultured gamma proteobacterium |
| **Pseudomonas sp. 108Z1**       | Bacillus cohnnii            | Bacillus sp. w5                 | Janibacter sp. BY48           | Planomicrobium okeanokoites    | uncultured Klebsiella sp.    |
| **Pseudomonas xiamenensis**     | Bacillus cytotoxicus        | Bacillus sporothermodurans      | Klebsiella pneumoniae         | Porphyromonas endodontalis     | unclassified marine bacterium |
| **Serratia marcescens**         | Bacillus fastidiosus        | Bacillus subtilis               | Kocuria rhizophila            | Providencia rettgeri           | unclassified organism        |
| **Serratia proteamaculans**     | Bacillus firmus             | Bacillus thuringiensis          | Kurthia gibsonii              | Pseudomonas aeruginosa         | unclassified proteobacterium |
| **Sphingobacterium multivorum** | Bacillus flexus             | Bacillus vietnamensis           | Laribacter hongkongensis      | Pseudomonas plecoglossicida    | unclassified Pseudomonas sp.  |
| **Thioclava pacifica**          | Bacillus ginsengi           | Bacteroides acidifaciens        | Lysinibacillus fusiformis     | Pseudomonas putida             | unidentified proteobacterium |
| **uncultured alpha proteobacterium** | Bacillus halmapalus          | Brachybacterium paraconglomeratum| Lysinibacillus sphaericus     | Pseudomonas sp. 108Z1         | Virgibacillus halodenitrificans |
| **uncultured bacterium**        | Bacillus halodurans         | Brevibacillus agri              | Lysobacter sp. OC7            | Pseudomonas stutzeri           | Virgibacillus halophilus     |
| **uncultured organism**         | Bacillus humi               | Brevibacillus brevis            | Macroccoccus carouseticus     | Pseudomonas xiamenensis        | Virgibacillus koreensis      |
| Yersinia enterocolitica | Bacillus hwajinpoensis | Brevibacterium casei | Methylobacterium rhodinum | Renibacterium salmoninarum | Virgibacillus marismortui |
|------------------------|------------------------|----------------------|---------------------------|----------------------------|---------------------------|
| Yersinia massiliensis  | Bacillus lentus         | Brevibacterium linens | Microbacterium aurum      | Serratia marcescens        | Virgibacillus pantothenticus |
| Yersinia pseudotuberculosis | Bacillus licheniformis | Brevibacterium sp. II | Microbacterium dextranolyticum | Serratia proteamaculans | Virgibacillus proomii |
|                        | Bacillus litoralis      | Brevundimonas bullata | Microbacterium oxydans    | Sphingobacterium multivorum | Xylella fastidiosa |
|                        | Bacillus marisflavi     | Cellulomonas bogoriensis | Microbacterium phyllosphaerae | Sporosarcina ureae | Yersinia enterocolitica |
|                        | Bacillus megaterium     | Cellulomonas uda      | Microbacterium sp. D1-15  | Staphylococcus arlettae    | Yersinia massiliensis |
|                        | Bacillus mojavensis     | Cellulosimicrobium cellulos | Micrococcus luteus | Staphylococcus aureus | Yersinia pseudotuberculosis |
|                        | Bacillus mycoides       | Cellulosimicrobium sp. HY-13 | Micrococcus lylae | Staphylococcus chromogenes | Zimmermannella faecalis |

**Total = 36**

| Staphylococcus arlettae | Yersinia massiliensis |
|-------------------------|-----------------------|
| Staphylococcus aureus   | Yersinia pseudotuberculosis |
| Micrococcus lylae       | Zimmermannella faecalis |

**Total = 205**
### Supplementary table 4: Different type of bacterial genera isolated from agricultural soil sample with application of increasing centrifugal ‘g’ force

| Serial dilution / 0g | 3000g     | 6000g     | 9000g     | 12000g    | 15000g    | 18000g    | 21000g    |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Agrobacterium       | Acinetobacter | Actinoplanes | Actinoplanes | Actinoplanes | Actinoplanes | Alcaligenes | Agromyces |
| Agromyces           | Agromyces  | Agromyces  | Arthrobacter | Ancylobacter | Alcaligenes | Arthrobacter | Arthrobacter |
| Bacillus            | Arthrobacter | Alkalihalobacillus | Bacillus | Arthrobacter | Arthrobacter | Bosea | Cellulosimicrobium |
| Brachybacterium     | Bacillus   | Brachybacterium | Bacillus | Brachybacterium | Dom bacillus | Citrobacter |
| Brucella            | Brachybacterium | Cellulomonas | Cellulomonas | Brachybacterium | Cellulosimicrobium | Lysobacter | Neobacillus |
| Cellulomonas        | Brachymonas | Cellulosimicrobium | Devosia | Glutamicibacter | Cellulosimicrobium | Massilia | Neorhizobium |
| Cellulosimicrobium  | Brevundimonas | Chryseobacterium | Ensifer | Isoptericola | Enterobacter | Massilia | Neorhizobium |
| Chryseobacterium    | Brucella   | Cytobacillus | Enterococcus | Kineospora | Enterococcus | Mesbacillus | Novosphingobium |
| Erwinia             | Cellulosimicrobium | Ensifer | Janibacter | Klebsiella | Gordonia | Microbacterium | Piscococcus |
| Glutamicibacter     | Chryseobacterium | Enterobacter | Klebsiella | Lysobacter | Lysobacter | Neorhizobium | Rhodococcus |
| Gordonia            | Curtobacterium | Glutamicibacter | Krasilnikoviella | Metabacillus | Massilia | Novosphingobium | Streptomyces |
| Isoptericola        | Knoellia   | Isoptericola | Massilia | Microbacterium | Microbacterium | Pseudomonas |
| Luteimonas          | Leucobacter | Leclercia | Microbacterium | Neorhizobium | Neorhizobium | Neorhizobium | Pseudoxanthomonas |
| Lysinibacillus      | Lysinibacillus | Lysobacter | Micrococcus | Pseudoxanthomonas | Novosphingobium | Rhizobium |
| Lysobacter          | Lysobacter  | Massilia | Neorhizobium | Rhizobium | Pseudomonas | Shinella |
| Metabacillus        | Microbacterium | Microbacterium | Novosphingobium | Rhodobacter | Psychrobacillus | Sphingobacterium |
| Methylocella        | Morganella  | Micrococcus | Paracoccus | Sphingomonas | Rhizobium | Stenotrophomonas |
| Microbacterium       | Niallia    | Neobacillus | Paucisalibacillus | Stenotrophomonas | Rhodococcus | Ureibacillus |
| Neobacillus         | Nocardia   | Neorhizobium | Pedobacter | Streptomyces | Sphingobacterium |
| Neorhizobium        | Ochrobactrum | Nitrincola | Pseudodaganella | Xanthomonas | Streptomyces |
| Novosphingobium | Paenibacillus | Nocardioides | Pseudoxanthomonas | Xanthomonas |
|-----------------|---------------|-------------|------------------|-------------|
| Priestia        | Priestia      | Novosphingobium | Rhizobium       |
| Pseudochrobactrum | Pseudomonas    | Pantoea     | Sphingobacterium |
| Pseudomonas      | Pseudoxanthomonas | Priestia   | Streptomyces     |
| Pseudoxanthomonas | Psychrobacillus | Pseudarthrobacter |
| Psychrobacillus  | Rhizobium     | Pseudomonas |
| Rhizobium        | Sphingobacterium | Pseudoxanthomonas |
| Rhodococcus      | Sphingobium   | Psychrobacillus |
| Shigella         | Sphingopyxis  | Rhizobium   |
| Sphingobacterium | Stenotrophomonas | Rhodococcus |
| Sphingomonas     | Streptomyces  | Sphingobacterium |
| Sphingopyxis     | Sphingopyxis  |
| Stenotrophomonas | Sporosarcina  |
| Streptomyces     | Stenotrophomonas |
| Terribacillus    | Streptomyces  |
|                 | Terribacillus |
| **Total = 35**   | **Total = 31** | **Total = 36** | **Total = 24** | **Total = 20** | **Total = 21** | **Total = 18** | **Total = 11** |
Supplementary table 5: Different type of bacterial species isolated from agricultural soil sample with application of increasing centrifugal ‘g’ force

| Control/0g | 3000g        | 6000g          | 9000g           | 12000g         | 15000g         | 18000g         | 21000g         |
|------------|--------------|----------------|-----------------|----------------|----------------|----------------|----------------|
| Agrobacterium cavaiae | Acinetobacter towneri | Actinoplanes subglobosus | Actinoplanes missouriensis | Actinoplanes missouriensis | Actinoplanes palleronii | Alcaligenes faecalis subsp. faecalis | Agromyces huni |
| Agromyces italicus | Agromyces italicus | Agromyces italicus | Actinoplanes subglobosus | Ancylobacter oerskovii | Alcaligenes faecalis subsp. faecalis | Arthrobacter crystallopoietes | Arthrobacter crystallopoietes |
| Agromyces laixinhei | Arthrobacter globiformis | Alkalihalobacillus alkalinitriilicus | Arthrobacter globiformis | Arthrobacter crystallopoietes | Arthrobacter crystallopoietes | Bosea massiliensis | Cellulosimicrornium cellulans |
| Bacillus cereus | Bacillus stercoris | Bacillus cereus | Bacillus toyonensis | Bacillus toyonensis | Brachybacterium sacelli | Domibacillus indicus | Citrobacter braakii |
| Bacillus coreaensis | Bacillus thuringiensis gy. cytolyticus | Bacillus pacificus | Brachybacterium alimentarium | Brachybacterium rhamnosum | Cellulomonas fim | Glutamicibacter protophormiae | Microbacterium marinum |
| Bacillus pacificus | Bacillus toyonensis | Bacillus stercoris | Brachybacterium endophyticum | Brachybacterium sacelli | Cellulosimicrornium funkei | Glutamicibacter uratoxydans | Microbacterium paraoxydans |
| Bacillus toyonensis | Bacillus velezensis | Bacillus toyonensis | Brachybacterium rhamnosum | Glutamicibacter uratoxydans | Enterobacter quasiroggenkampii | Lysobacter soli | Microbacterium trichohecentrolyticum |
| Bacillus wiedmannii | Bacillus weihaensis | Bacillus vallismortis | Brachybacterium sacelli | Isopericola nanjingensis | Enterococcus durans | Massilia aerilata | Neobacillus niacini |
| Brachybacterium paraconglomeratum | Bacillus wiedmannii | Bacillus wiedmannii | Brachybacterium squillarum | Kineosporia rhizophila | Gordonia terrae | Mesobacillus boroniphilus | Neorhizobium alkalisoli |
| Brachybacterium sacelli | Brachybacterium endophyticum | Cellulomonas pakistanensis | Cellulomonas fim | Klebsiella varicola subsp. tropica | Lysobacter soli | Microbacterium aoyamense | Novosphingobium barchaimii |
| Brucella cytisi | Brachybacterium paraconglomeratum | Cellulosimicrornium cellulans | Devosia riboflavina | Lysobacter soli | Massilia umbonata | Microbacterium foliorum | Piscicoccus intestinalis |
| Cellulomonas denverensis | Brachybacterium sacelli | Cellulosimicrornium funkei | Ensifer garamanticus | Metabacillus niabensis | Microbacterium aerolatum | Microbacterium hibisci | Rhodococcus pedocola |
| Cellulomonas pakistanensis | Brachymonas chironomi | Chryseobacterium timonianum | Enterococcus casseliflavus | Microbacterium bovistercoris | Microbacterium aurum | Microbacterium lushaniae | Streptomyces atrovirens |
| Cellulomonas taurus | Brachymonas denitrificans | Cytobacillus firmus | Janibacter melonis | Microbacterium enclense | Microbacterium foliorum | Neorhizobium alkalisoli | Streptomyces osmaniensis |
| **Cellulosimicrobium funkei** | **Brevundimonas olei** | **Ensifer meliloti** | **Klebsiella quasivariicola** | **Microbacterium esteraromaticum** | **Microbacterium humi** | **Novosphingobium barclayi** | **Streptomyces tendae** |
|-------------------------------|------------------------|---------------------|-------------------------------|-------------------------------|------------------------|----------------------------|------------------------|
| **Chryseobacterium arthrophyraeae** | **Brucella pseudogrigonensis** | **Ensifer terangae** | **Krasilnikoviaea muralis** | **Microbacterium lusiana** | **Microbacterium oleivorans** | **Novosphingobium gossypii** | |
| **Chryseobacterium cucumeris** | **Cellulosimicrobium cellulans** | **Enterobacter hormaechei subsp. xiangfangensis** | **Massilia agri** | **Microbacterium natoriense** | **Microbacterium trichothecenolyticum** | **Pseudomonas entomophila** | |
| **Chryseobacterium indologenes** | **Chryseobacterium arthrophyraeae** | **Glutamicibacter protophormiae** | **Massilia oculi** | **Microbacterium oleivorans** | **Microbacterium wangchenii** | **Pseudomonas gengiulata** | |
| **Erwinia oleae** | **Chryseobacterium cucumeris** | **Glutamicibacter uratoxydans** | **Massilia timona** | **Microbacterium paraoxydans** | **Neorhizobium alkalisoli** | **Pseudoxanthomonas indica** | |
| **Glutamicibacter mithrai** | **Chryseobacterium flavum** | **Isotericola nanjingensis** | **Microbacterium aurum** | **Microbacterium saccharophilum** | **Neorhizobium huaultense** | **Rhizobium cellulosilyticum** | |
| **Glutamicibacter protophormiae** | **Curtobacterium citreum** | **Leclercia adecarboxylata** | **Microbacterium lobsentcoris** | **Microbacterium telechonicum** | **Novosphingobium resinovorum** | **Rhizobium pakistanense** | |
| **Gordonia terrae** | **Knoellia locipacati** | **Lysobacter soli** | **Microbacterium hydrocarbonoxydans** | **Microbacterium wangchenii** | **Pseudomonas entomophila** | **Rhizobium subbaroensis** | |
| **Isotericola nanjingensis** | **Leucobacter musarum subsp. musarum** | **Massilia albidiitava** | **Microbacterium marinum** | **Neorhizobium alkalisoli** | **Pseudomonas plecoglossicida** | **Rhizobium wenxianiae** | |
| **Luteimonas soli** | **Leucobacter tardus** | **Massilia flavia** | **Microbacterium natoriense** | **Pseudoxanthomonas mexicana** | **Pschrobacillus soli** | **Rhizobium yantingense** | |
| **Lysinibacillus fusiformis** | **Lysinibacillus fusiformis** | **Massilia latea** | **Microbacterium oleivorans** | **Rhizobium alamii** | **Rhizobium pakistanense** | **Shinella kajmmerowiae** | |
| **Lysobacter soli** | **Lysobacter soli** | **Microbacterium arborescens** | **Microbacterium testaceum** | **Rhizobium azibense** | **Rhizobium panachiumi** | **Shinella zoogloeoides** | |
| **Lysobacter zhanggongensis** | **Microbacterium foliorum** | **Microbacterium encluse** | **Micrococcus lateus** | **Rhizobium esperanzae** | **Rhizobium zeae** | **Sphingobacterium mucilaginosum** | |
| **Metabacillus halosaccharovorans** | **Microbacterium keratanolyticum** | **Microbacterium esteraromaticum** | **Neorhizobium alkalisoli** | **Rhizobium pakistanense** | **Rhodococcus canchipurensis** | **Stenotrophomonas pavanii** | |
| **Methylocella tundrae** | **Microbacterium ketosireducens** | **Microbacterium foliorum** | **Neorhizobium huaultense** | **Rhizobium panachiumi** | **Sphingobacterium mucilaginosum** | **Streptomyces globisporus** | |
| **Microbacterium bovistercoris** | **Microbacterium laevaniformans** | **Microbacterium hibisci** | **Novosphingobium gossypii** | **Rhizobium wenxiniiae** | **Streptomyces dioscori** | **Ureibacillus sindariensis** |
|-------------------------------|---------------------------------|--------------------------|-------------------------------|--------------------------|--------------------------|-----------------------------|
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **Paracoccus** | **Rhizobium** | **Streptomyces** | **Streptomyces** |
| **esteraromaticum** | **paraoxydans** | **hydrocarbonoxydans** | **lutimaris** | **vaniyengense** | **roseifaciens** | **Roseifaciens** |
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **Paucisalibacillus** | **Rhodobacter** | **Streptomyces** | **Streptomyces** |
| **foliorum** | **sorbitolivorans** | **keratanolyticum** | **globulus** | **xinxiangensis** | **tendae** | **tendae** |
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **Pedobacter** | **Sphingomonas** | **Xanthomonas** | **Sphingomonas** |
| **ginsengiterreus** | **testaceum** | **ketosireducens** | **xinjiangensis** | **mucosissima** | **maliensis** | **maliensis** |
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **Pseudeudaganella** | **Sphingomonas** | **Vlachaeinigra** | **Vlachaeinigra** |
| **gorillae** | **ureisolvans** | **paraoxydans** | **violaceinigra** | **antingensis** | **antingensis** | **antingensis** |
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **Pseudeudagonialla** | **Sphingomonas** | **koreensis** | **koreensis** |
| **insulatae** | **morganii subsp.** | **phyllophora** | **koreensis** | **bentonicita** | **bentonicita** | **bentonicita** |
| **Microbacterium** | **Microbacterium** | **Microbacterium** | **trichotheceonolyticum** | **pakistanensae** | **atroviolges** | **atroviolges** |
| **keratanolyticum** | **Nialla** | **paraoxydans** | **pakistanensae** | **atroviorens** | **atroviorens** | **atroviorens** |
| **Microbacterium** | **Nocardia carnea** | **Micrococcus luteus** | **panachimae** | **dioscori** | **dioscori** | **dioscori** |
| **ketosireducens** | **Micrococcus** | **Micrococcus** | **panachimae** | **dioscori** | **dioscori** | **dioscori** |
| **Microbacterium** | **Nocardia** | **Neobacillus** | **Rhzobium** | **griseoflavus** | **griseoviridis** | **griseoviridis** |
| **laevaniformans** | **rhamnosiphila** | **drensis** | **petrolearium** | **griseoflavus** | **griseoviridis** | **griseoviridis** |
| **Microbacterium** | **Neobacillus** | **Neorhizobium** | **Rhzobium** | **petrolearium** | **petrolearium** | **petrolearium** |
| **marinus** | **alkalisoli** | **alkalisoli** | **subbaroanis** | **petrolearium** | **petrolearium** | **petrolearium** |
| **Microbacterium** | **Paenibacillus** | **Nitrincola** | **Rhzobium** | **petrolearium** | **petrolearium** | **petrolearium** |
| **natoriense** | **pinisoli** | **tapanii** | **yantiingense** | **petrolearium** | **petrolearium** | **petrolearium** |
| **Microbacterium** | **Priestia aryabhattai** | **Nocardioles** | **Sphingobacterium** | **heliotrocin** | **heliotrocin** | **heliotrocin** |
| **paraoxydans** | **liaochengensis** | **liaochengensis** | **mucilaginosum** | **heliotrocin** | **heliotrocin** | **heliotrocin** |
| **Neobacillus** | **Priestia filamentosa** | **Novosphingobium** | **Stenotrophomona** | **manipurensis** | **manipurensis** | **manipurensis** |
| **niacini** | **barchaimii** | **barchaimii** | **panachimae** | **manipurensis** | **manipurensis** | **manipurensis** |
| **Neorhizobium** | **Priestia megaterium** | **Novosphingobium** | **Scabieae** | **manipurensis** | **manipurensis** | **manipurensis** |
| **alkalisoli** | **resinovorum** | **resinovorum** | **Scabieae** | **manipurensis** | **manipurensis** | **manipurensis** |
| **Novosphingobium** | **Pseudomonas** | **Pantoea anthophila** | **Streptomyces** | **Scabieae** | **Scabieae** | **Scabieae** |
| **gossypii** | **asiatica** | **anthophila** | **atroviorens** | **Scabieae** | **Scabieae** | **Scabieae** |
| **Novosphingobium** | **Pseudomonas** | **Pantoea anthophila** | **Scabieae** | **atroviorens** | **atroviorens** | **atroviorens** |
| **guangzhouense** | **entomophila** | **entomophila** | **Scabieae** | **atroviorens** | **atroviorens** | **atroviorens** |
| **Priestia aryabhattai** | **Streptomyces** | **Streptomyces** | **Scabieae** | **atroviorens** | **atroviorens** | **Scabieae** |
| **Streptomyces** | **bottropensis** | **bottropensis** | **Scabieae** | **atroviorens** | **atroviorens** | **Scabieae** |
| | | | | | | |
| Species                          | Genus                        | Species                           | Genus                        | Species                           |
|---------------------------------|------------------------------|-----------------------------------|------------------------------|-----------------------------------|
| Novosphingobium resinovorum     | Pseudomonas                  | monteilii                         | Priestia endophytica         | Streptomyces heliomycini          |
| Priestia aryabhattai           | Pseudomonas                  | mosselii                          | Priestia filamentosa         | Streptomyces tendae               |
| Priestia filamentosa           | Pseudomonas                  | nitrititolerans                   | Priestia flexa               |                                   |
| Priestia megaterium            | Pseudoxanthomonas indica     |                                   | Priestia megaterium          |                                   |
| Pseudochrobactrum asaccharolyticum | Psychrobacillus lasicapitis |                                   | Pseudarthrobacter encensis    |                                   |
| Pseudomonas graminis           | Rhizobium                    | cellulosilyticum                  | Pseudomonas asiatica         |                                   |
| Pseudomonas monteilii          | Rhizobium                    | panacihumi                        | Pseudomonas geniculata        |                                   |
| Pseudomonas plecoglossicida    | Rhizobium                    | subbaraoonis                      | Pseudomonas neuropathica      |                                   |
| Pseudoxanthomonas indica       | Sphingobacterium             | mucilaginosum                     | Pseudoxanthomonas indica      |                                   |
| Pseudoxanthomonas koreensis    | Sphingobacterium             | multivorum                        | Psychrobacillus lasicapitis   |                                   |
| Psychrobacillus lasicapitis    | Sphingobacterium             | nematocida                        | Rhizobium cellulosilyticum    |                                   |
| Rhizobium panacihumi           | Sphingobium                  | naphthae                          | Rhizobium pakistanense        |                                   |
| Rhodococcus cerastii           | Sphingopyxis                  | chilensis                         | Rhizobium panacihumi         |                                   |
| Rhodococcus pedocola           | Stenotrophomonas              | bentonitica                       | Rhizobium subbaraoonis        |                                   |
| Rhodococcus rhodochrous        | Stenotrophomonas              | chelatiphaga                      | Rhizobium wenxiniae           |                                   |
| Shigella flexneri              | Streptomyces                  | atrirubera                        | Rhizobium yantingense         |                                   |
| Sphingobacterium mucilaginosum | Streptomyces atrovirens | Rhizobium zeae |
| Sphingobacterium multivorum | Streptomyces badius | Rhodococcus cerastii |
| Sphingomonas canadensis | Streptomyces chrestomyceticus | Rhodococcus pedocola |
| Sphingopyxis chilensis | Streptomyces endophyticus | Sphingobacterium endophyticum |
| Stenotrophomonas indicatrix | Streptomyces griseoviridis | Sphingobacterium mucilaginosum |
| Stenotrophomonas lactitubi | Streptomyces lavendulae subsp. lavendulae | Sphingobacterium multivorum |
| Stenotrophomonas nitritireducens | Streptomyces malachitospinus | Sphingopyxis solisilvae |
| Streptomyces chrestomyceticus | Streptomyces rubrogriseus | Sporosarcina luteola |
| Streptomyces griseoviridis | Streptomyces tendae | Stenotrophomonas maltophilia |
| Streptomyces malachitospinus | Stenotrophomonas panacihumi |
| Streptomyces tendae | Stenotrophomonas terrae |
| Terribacillus saccharophilus | Streptomyces atrovirens |
| | Streptomyces chrestomyceticus |
| | Streptomyces heliomycini |
| | Streptomyces indicus |
| | Streptomyces shaanxiensis |
|                | *Terribacillus saccharophilus* |
|----------------|------------------------------|
| Total = 73     | Total = 70                   | Total = 78 | Total = 47 | Total = 43 | Total = 33 | Total = 30 | Total = 15 |