Research article

Soil bacterial communities of Sahara and Gibson deserts: Physiological and taxonomical characteristics

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Supplementary

Table S1. Taxonomic affiliation of isolated strains.

| Sample, temperature of culturing | Strain | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|----------------------------------|--------|-----------------|--------------------------|-----------------------------------------------|----------------------|
| Gibson Desert, Australia, 25 °C  | KBP.AS.1 | GPY             | MH734536                 | Micrococcus aloeverae
|                                 |        |                 |                          | KY622923—99.7%
|                                 |        |                 |                          | Micrococcus yunnanensis
|                                 |        |                 |                          | MH298518—99.7%
|                                 |        |                 |                          | Micrococcus yunnanensis
|                                 |        |                 |                          | KY622921—99.5% | Micrococcus sp. |
|                                 |        |                 |                          | Janibacter indicus
|                                 |        |                 |                          | MF948904—100%
|                                 |        |                 |                          | Janibacter melonis
|                                 |        |                 |                          | NR_025805—100%
|                                 |        |                 |                          | Janibacter anophelis
|                                 |        |                 |                          | NR_043218—100% | Janibacter sp. |

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| Sample, temperature of culturing | Strain | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|---------------------------------|--------|----------------|-------------------------|---------------------------------------------|---------------------|
| Gibson Desert, Australia, 25 °C | KBP.AS.3 | GPY | MH734578 | *Micrococcus aloeverae* KY622923—99.7% *Micrococcus yunnanensis* MH298518—99.7% *Micrococcus yunnanensis* KY622921—99.5% | *Micrococcus sp.* |
| Gibson Desert, Australia, 25 °C | KBP.AS.4 | GPY | MH734587 | *Microbacterium oxydans* KX369591—99.8% *Microbacterium oxydans* KF975411—99.8% *Microbacterium oxydans* AJ717356—99.8% | *Microbacterium oxydans* |
| Gibson Desert, Australia, 25 °C | KBP.AS.5 | GPY | MH734597 | *Agrococcus sp.* KP238419—99.9% *Agrococcus jenensis* NR_026275—99.9% *Agrococcus citreus* NR_041542—99.6% | *Agrococcus sp.* |
| Gibson Desert, Australia, 25 °C | KBP.AS.6 | GPY | MH734599 | *Bacillus pumilus* JQ353824—99.5% *Bacillus safensis* MH160088—99.5% *Bacillus safensis* MH671851—99.5% | *Bacillus sp.* |
| Gibson Desert, Australia, 25 °C | KBP.AS.7 | GPY | MH734600 | *Rhodococcus sp.* KF441597—99.8% Uncultured *Rhodococcus sp.* KF504096—99.8% *Rhodococcus sp.* FR772123—99.8% | *Rhodococcus sp.* |
| Gibson Desert, Australia, 25 °C | KBP.AS.8 | GPY | MH734601 | *Bacillus safensis* MG645269—100% *Bacillus pumilus* LT906438—100% *Bacillus zhangzhouensis* NR_148786—100% | *Bacillus sp.* |

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| Sample, temperature of culturing | Strain   | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|----------------------------------|----------|-----------------|--------------------------|---------------------------------------------|-----------------------|
| Gibson Desert, Australia, 25 °C  | KBP.AS.9 | GPY             | MH734602                 | Microbacterium aurantiacum                   | Microbacterium aurantiacum |
|                                  |          |                 |                          | NR_116476—99.6%                             |                       |
|                                  |          |                 |                          | Microbacterium aurantiacum                   |                       |
|                                  |          |                 |                          | NR_116476—99.6%                             |                       |
|                                  |          |                 |                          | Microbacterium kitamiense                   |                       |
|                                  |          |                 |                          | NR_037048—99.3%                             |                       |
| Gibson Desert, Australia, 25 °C  | KBP.AS.10| GPY             | MH734538                 | Microbacterium aurantiacum                   | Microbacterium aurantiacum |
|                                  |          |                 |                          | NR_116476—99.6%                             |                       |
|                                  |          |                 |                          | Microbacterium aurantiacum                   |                       |
|                                  |          |                 |                          | NR_116476—99.6%                             |                       |
|                                  |          |                 |                          | Microbacterium kitamiense                   |                       |
|                                  |          |                 |                          | NR_037048—99.3%                             |                       |
| Gibson Desert, Australia, 25 °C  | KBP.AS.11| GPY             | MH734539                 | Aurantimonas altamirensis                   | Aureimonas altamirensis |
|                                  |          |                 |                          | EU442517—99.9%                              |                       |
|                                  |          |                 |                          | Aurantimonas altamirensis                   |                       |
|                                  |          |                 |                          | NR_043764—99.8%                             |                       |
|                                  |          |                 |                          | EU442517—99.9%                              |                       |
|                                  |          |                 |                          | Aurantimonas altamirensis                   |                       |
|                                  |          |                 |                          | NR_043764—99.8%                             |                       |
| Gibson Desert, Australia, 25 °C  | KBP.AS.12| GPY             | MH734541                 | Microbacterium lacus                        | Microbacterium sp.    |
|                                  |          |                 |                          | KX082876—99.7%                              |                       |
|                                  |          |                 |                          | Microbacterium aurum                        |                       |
|                                  |          |                 |                          | KJ127516—99.5%                              |                       |
|                                  |          |                 |                          | Microbacterium lacus                        |                       |
|                                  |          |                 |                          | HM209729—99.1%                              |                       |
| Gibson Desert, Australia, 25 °C  | KBP.AS.13| GPY             | MH734548                 | Brevundimonas vesicularis                   | Brevundimonas sp.     |
|                                  |          |                 |                          | MG966304—99.9%                              |                       |
|                                  |          |                 |                          | Brevundimonas vesicularis                   |                       |
|                                  |          |                 |                          | NR_113586—99.5%                             |                       |
|                                  |          |                 |                          | Brevundimonas nasdae                         |                       |
|                                  |          |                 |                          | MG650163—99.9%                              |                       |
| Gibson Desert, Australia, 25 °C  | KBP.AS.14| GPY             | MH734551                 | Paenibacillus glucanolyticus                | Paenibacillus glucanolyticus |
|                                  |          |                 |                          | KC789782—99.9%                              |                       |
|                                  |          |                 |                          | Paenibacillus glucanolyticus                |                       |
|                                  |          |                 |                          | CP015286—99.7%                              |                       |
|                                  |          |                 |                          | Paenibacillus glucanolyticus                |                       |
|                                  |          |                 |                          | NR_113748—99.6%                             |                       |
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|----------------------------------|--------|----------------|--------------------------|---------------------------------------------|----------------------|
| Gibson Desert, Australia, 25 °C  | KBP.AS.15 | GPY | MH734552 | *Bacillus drentensis* NR_118438—99.6%  *Bacillus infantis* NR_043267—99.4%  *Bacillus infantis* MH130045—99.6% | *Bacillus* sp. |
| Gibson Desert, Australia, 25 °C  | KBP.AS.16 | GPY | MH734553 | *Agrococcus sp.* KC160778.1—100%  *Agrococcus sp.* EU584505—100%  *Agrococcus citreus* NR_041542—100% | *Agrococcus citreus* |
| Gibson Desert, Australia, 25 °C  | KBP.AS.18 | GPY | MH734559 | *Bacillus subtilis* NR_116187—99.9%  *Bacillus subtilis* CP019663—99.6%  *Bacillus tequilensis* MH010390—99.8% | *Bacillus* sp. |
| Sahara Desert, Egypt, 25 °C    | KBP.AS.19 | GPY | MH734566 | *Bacillus litoralis* MF101139—100%  *Bacillus niabensis* KC788148—100%  *Bacillus halosaccharovorans* NR_109116—99.7% | *Bacillus* sp. |
| Sahara Desert, Egypt, 25 °C    | KBP.AS.20 | GPY | MH734569 | *Microvirga sp.* KX444133—99.1%  *Microvirga soli* KX247636—99.1%  *Microvirga aerilata* NR_114298—98.0% | *Microvirga soli* |
| Sahara Desert, Egypt, 25 °C    | KBP.AS.21 | GPY | MH734570 | *Arthrobacter sp.* JX949321—97.8%  *Arthrobacter agilis* JQ684255.1—97.6%  *Arthrobacter sp.* KC986992—97.4% | *Arthrobacter* sp. |

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|---------------------------------|--------|-----------------|--------------------------|-----------------------------------------------|----------------------|
| Sahara Desert, Egypt, 25 °C     | KBP.AS.22 | GPY             | MH734571                 | Microvirga sp. KX444133—99.4%                 | Microvirga soli      |
|                                 |         |                 |                          | Microvirga soli KX247636—99.4%               |                      |
|                                 |         |                 |                          | Microvirga soli KX247636—99.4%               |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.23 | GPY             | MH734572                 | Planomicrobium okeanokoites HQ848119—99.8%   | Planomicrobium okeanokoites |
|                                 |         |                 |                          | Planomicrobium okeanokoites HQ848112—99.8%   |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.24 | GPY             | MH734573                 | Pseudarthrobacter phenanthenivorans NR_074770—99.6% | Pseudarthrobacter sp. |
|                                 |         |                 |                          | Pseudarthrobacter phenanthenivorans CP002379—99.6% |                      |
|                                 |         |                 |                          | Arthrobacter phenanthenivorans NR_042469—98.5% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.25 | GPY             | MH734574                 | Arthrobacter sp. KJ191025—99.8%              | Arthrobacter sp.     |
|                                 |         |                 |                          | Arthrobacter parietis JF505951—99.7%         |                      |
|                                 |         |                 |                          | Arthrobacter parietis NR_042252—99.7%        |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.26 | GPY             | MH734575                 | Paenibacillus glucanolyticus CP028366—99.5%  | Paenibacillus glucanolyticus |
|                                 |         |                 |                          | Paenibacillus glucanolyticus MG051308—99.5%  |                      |
|                                 |         |                 |                          | Paenibacillus glucanolyticus MG051307—99.5%  |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.27 | GPY             | None                      | Was identified using morpho-phisiological method. | Bacillus sp.         |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.28 | GPY             | MH734576                 | Streptomyces sp. KM067288—97.6%              | Streptomyces sp.     |
|                                 |         |                 |                          | Uncultured actinobacterium clone H127         |                      |
|                                 |         |                 |                          | GQ504259—97.6%                               |                      |
|                                 |         |                 |                          | Streptomyces sp. EU847137—97.6%              |                      |

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|----------------------------------|--------|-----------------|--------------------------|---------------------------------------------|-----------------------|
| Sahara Desert, Egypt, 25 °C      | KBP.AS.29 | GPY             | MH734577                | *Arthrobacter agilis* KC788154—99.5%        | *Arthrobacter agilis* |
|                                  |         |                 |                          | *Arthrobacter agilis* KC788153—99.5%        |                       |
|                                  |         |                 |                          | *Arthrobacter agilis* KC788098—99.5%        |                       |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.30 | GPY             | MH734579                | *Bacillus psychrosaccharolyticus* MF101012—99.2% | *Bacillus psychrosaccharolyticus* |
|                                  |         |                 |                          | *Bacillus psychrosaccharolyticus* NR_113992—99.1% |                       |
|                                  |         |                 |                          | *Bacillus muralis* NR_042083—96.3%          |                       |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.31 | GPY             | MH734580                | *Kocuria polaris* HG515399—99.7%            | *Kocuria sp.*         |
|                                  |         |                 |                          | *Kocuria himachalensis* LC113906—99.0%      |                       |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.32 | GPY             | MH734581                | *Planomicrobium sp.* KU951464.1—99.4%       | *Planomicrobium sp.*  |
|                                  |         |                 |                          | *Planomicrobium sp.* MF041832.1—99.1%       |                       |
|                                  |         |                 |                          | *Planomicrobium chinense* KC842235—98.9%    |                       |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.33 | GPY             | MH734582                | *Planomicrobium stackebrandii* LC076757—99.5% | *Planomicrobium sp.*  |
|                                  |         |                 |                          | *Planomicrobium soli* NR_134133.1—99.7%     |                       |
|                                  |         |                 |                          | *Planomicrobium okeanokoites* NR_113593—99.2%|                       |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.34 | GPY             | MH734537                | *Arthrobacter sp.* KM507593—99.7%          | *Arthrobacter sp.*    |
|                                  |         |                 |                          | *Arthrobacter sp.* JX949321.2—99.7%        |                       |
|                                  |         |                 |                          | *Arthrobacter sp.* JX949321.2—99.6%        |                       |

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| Sample, temperature of culturing | Strain | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|----------------------------------|--------|-----------------|--------------------------|---------------------------------------------|----------------------|
| Sahara Desert, Egypt, 25 °C      | KBP.AS.35 | GPY             | MH734583                 | *Dietzia cinnamena*<br>NR_116686—100%<br>*Dietzia papillomatosis*<br>NR_116687—99.9%<br>*Dietzia lutea*<br>CP015449—98.9% | *Dietzia* sp. |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.36 | GPY             | MH734584                 | *Micrococcus aloeverae*<br>NR_134088—100%<br>*Micrococcus luteus*<br>LS483396—99.8%<br>*Micrococcus endophyticus*<br>KY933306—99.8% | *Micrococcus* sp. |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.37 | GPY             | MH734585                 | *Kocuria assamensis*<br>KT989850—99.9%<br>*Kocuria palustris*<br>NR_026451—99.9%<br>*Kocuria assamensis*<br>NR_132604—99.7% | *Kocuria* sp. |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.38 | GPY             | MH734586                 | *Micrococcus luteus*<br>JN545040—99.5%<br>*Micrococcus luteus*<br>MH211276—99.1%<br>*Micrococcus sp.*<br>MG214549—99.1% | *Micrococcus* sp. |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.41 | CM              | MH734588                 | *Micrococcus cohnii*<br>NR_117194—100%<br>*Micrococcus cohnii*<br>KP974711—100%<br>*Micrococcus sp.*<br>GQ169069—100% | *Micrococcus cohnii* |
| Sahara Desert, Egypt, 25 °C      | KBP.AS.42 | CM              | MH734589                 | *Arthrobacter crystallopoietes*<br>CP018864—99.8%<br>*Arthrobacter crystallopoietes*<br>JN393316—99.8%<br>*Arthrobacter crystallopoietes*<br>KU285616—99.8% | *Arthrobacter crystallopoietes* |

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| Sample, temperature of culturing | Strain | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|---------------------------------|--------|-----------------|--------------------------|---------------------------------------------|----------------------|
| Sahara Desert, Egypt, 25 °C     | KBP.AS.43 | CM | MH734590 | Arthrobacter crysallopoietes KC778371—99.9% | Arthrobacter crysallopoietes |
|                                 |        |                 |                          | Arthrobacter crysallopoietes CP018864—99.8% |                      |
|                                 |        |                 |                          | Arthrobacter globiformis NR_112192—97.6%  |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.44 | CM | MH734591 | Bacillus safensis MG645269—100% | Bacillus sp. |
|                                 |        |                 |                          | Bacillus pumilus LT906438—100% |                      |
|                                 |        |                 |                          | Bacillus zhanghouensis NR_148786—100% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.45 | CM | MH734592 | Microbacterium nematophilum KF499505—98.9% | Microbacterium sp. |
|                                 |        |                 |                          | Microbacterium sp. MG719566—98.8% |                      |
|                                 |        |                 |                          | Microbacterium kyungheense MF373498—98.9% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.46 | CM | MH734593 | Pseudomonas putida MG846038—99.8% | Pseudomonas putida |
|                                 |        |                 |                          | Pseudomonas putida MH636786—99.5% |                      |
|                                 |        |                 |                          | Pseudomonas putida MH620727—99.5% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.47 | CM | MH734595 | Sphingopyxis chilensis KY393080—99.7% | Sphingopyxis sp. |
|                                 |        |                 |                          | Sphingopyxis panaciterra NR_112561—98.6% |                      |
|                                 |        |                 |                          | Sphingopyxis chilensis NR_024631—99.1% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.48 | CM | MH734596 | Bacillus subtilis HQ111353—99.9% | Bacillus sp. |
|                                 |        |                 |                          | Bacillus velezensis KY694464—99.9% |                      |
| Sahara Desert, Egypt, 25 °C     | KBP.AS.50 | CM | MH734598 | Pseudomonas putida MG846038—99.8% | Pseudomonas putida |
|                                 |        |                 |                          | Pseudomonas putida MH580215—99.3% |                      |
|                                 |        |                 |                          | Pseudomonas putida MH580208—99.3% |                      |

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| Sample, temperature of culturing | Strain        | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|----------------------------------|---------------|-----------------|--------------------------|----------------------------------------------|----------------------|
| Gibson Desert, Australia, 10 °C  | KBP.AS.119 CM | MH734540        |                          | *Streptomyces sp.* KX573860—99.6%            | *Streptomyces sp.*    |
|                                  |               |                 |                          | *Streptomyces caniferus* NR_116636—99.5%     |                      |
|                                  |               |                 |                          | *Streptomyces glebosus* NR_117951—99.4%      |                      |
|                                  | KBP.AS.120 CM | MH734542        |                          | *Glutamicibacter nicotianae* MG813752—99.5% | *Glutamicibacter sp.* |
|                                  |               |                 |                          | *Glutamicibacter nicotianae* MG813750—99.5%  |                      |
|                                  |               |                 |                          | *Glutamicibacter arilaitensis* MG788347—99.5%|                      |
|                                  | KBP.AS.123 CM | MH734543        |                          | *Brevibacillus agri* KY818990—100%          | *Brevibacillus sp.*   |
|                                  |               |                 |                          | *Brevibacillus brevis* KJ782629—100%         |                      |
|                                  |               |                 |                          | *Brevibacillus reuszeri* NR_113802—99.3%     |                      |
|                                  | KBP.AS.125 CM | MH734544        |                          | *Bacillus subtilis* KX281183.1—99.4%        | *Bacillus*            |
|                                  |               |                 |                          | *Bacillus subtilis* KR999950.1—99.3%         |                      |
|                                  |               |                 |                          | *Bacillus subtilis* KR233009.1—99.1%         |                      |
|                                  | KBP.AS.127 CM | MH734545        |                          | *Rhodococcus fascians* MH605375—98.5%       | *Rhodococcus sp.*     |
|                                  |               |                 |                          | *Rhodococcus cerastii* MF777046—98.5%        |                      |
|                                  |               |                 |                          | *Rhodococcus fascians* MF974596—98.5%        |                      |
|                                  | KBP.AS.128 CM | MH734546        |                          | *Pseudochrobactrum asaccharolyticum* NR_042474.1—100% | *Pseudochrobactrum sp.* |
|                                  |               |                 |                          | *Pseudochrobactrum kiredjianiae* NR_042519—100% |                      |
|                                  | KBP.AS.129 CM | MH734547        |                          | *Sphingobacterium mizutaii* LT906468—99.0%  | *Sphingobacterium mizutaii* |
|                                  |               |                 |                          | *Sphingobacterium mizutaii* MF179537—99.0%   |                      |

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|----------------------------------|--------|-----------------|-------------------------|-----------------------------------------------|----------------------|
| Gibson Desert, Australia, 10 °C  | KBP.AS.131 | CM              | MH734549                | *Rhodococcus fascians* MH605375—99.0%         | *Rhodococcus* sp.    |
|                                  |         |                 |                         | *Rhodococcus cerastii* MF777046—99.0%         |                      |
|                                  |         |                 |                         | *Rhodococcus sp.* MF664191—99.0%              |                      |
|                                  | KBP.AS.132 | CM              | MH734550                | *Bacillus aryabhattai* MG430234—98.5%         | *Bacillus* sp.       |
|                                  |         |                 |                         | *Bacillus sp.* KC236676—98.5%                |                      |
|                                  |         |                 |                         | *Bacillus megaterium* JQ831622—98.5%         |                      |
|                                  | KBP.AS.174 | GPY             | MH734554                | *Brevibacterium epidermidis* KY992553—99.7%   | *Brevibacterium* sp. |
|                                  |         |                 |                         | *Brevibacterium sediminis* NR_153678—99.7%   |                      |
|                                  |         |                 |                         | *Brevibacterium siliguriense* LT629766—99.6% |                      |
|                                  | KBP.AS.175 | GPY             | MH734555                | *Brevibacterium sp.* HQ202806—100%           | *Brevibacterium* sp. |
|                                  |         |                 |                         | *Brevibacterium sp.* DQ448693—100%           |                      |
|                                  |         |                 |                         | *Brevibacterium sp.* MG819325—99.8%          |                      |
|                                  | KBP.AS.176 | GPY             | MH734556                | *Micrococcus sp.* JX239759—99.5%             | *Micrococcus* sp.    |
|                                  |         |                 |                         | *Micrococcus sp.* AM990848—99.3%             |                      |
|                                  |         |                 |                         | *Micrococcus luteus* MG859501—99.3%          |                      |
|                                  | KBP.AS.177 | GPY             | MH734557                | *Paracoccus sp.* MH173273—100%               | *Paracoccus* sp.     |
|                                  |         |                 |                         | *Paracoccus carotini faciens* MG988838—100%  |                      |
|                                  |         |                 |                         | *Paracoccus marcusii* NR_044922—100%          |                      |

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|----------------------------------|--------|-----------------|--------------------------|---------------------------------------------|----------------------|
| Gibson Desert, Australia, 10 °C  | KBP.AS.179 | GPY | MH734558 | Bacillus cereus GQ495663—100% Bacillus wiedmannii NR_152692—100% Bacillus thuringiensis MG645258—100% Bacillus anthracis LC379953—100% | Bacillus sp. |
| Sahara Desert, Egypt, 10 °C     | KBP.AS.183 | GPY | MH734560 | Massilia sp. KY635898—99.3% Massilia suwonensis NR_116872—99.0% Massilia niabensis NR_044571—98.8% | Massilia sp. |
| Sahara Desert, Egypt, 10 °C     | KBP.AS.184 | GPY | MH734561 | Micrococcus sp. KT583428—100% Micrococcus sp. FJ457288—99.8% Micrococcus sp. FJ015031—99.8% | Micrococcus sp. |
| Sahara Desert, Egypt, 10 °C     | KBP.AS.185 | GPY | MH734562 | Arthrobacter agilis KR085874. – 99.0% Arthrobacter agilis JQ825269.1—99.0% Arthrobacter agilis KC788152—99.0% | Artrobacter agilis |
| Sahara Desert, Egypt, 10 °C     | KBP.AS.186 | GPY | MH734603 | Micrococcus sp. JX239759—99.5% Micrococcus sp. AM990848—99.3% Micrococcus aloeverae MH553939—99.3% | Micrococcus sp. |
| Sahara Desert, Egypt, 10 °C     | KBP.AS.187 | GPY | MH734563 | Leucobacter sp. KY623368—99.6% Leucobacter aridicollis KR827428—99.6% Leucobacter aridicollis KC764981—99.6% | Leucobacter sp. |

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| Sample, temperature of culturing | Strain | Isolation media | GenBank accession number | The most closely related sequences in GenBank | Taxonomic affiliation |
|----------------------------------|--------|-----------------|--------------------------|---------------------------------------------|----------------------|
| Sahara Desert, Egypt, 10 °C      | KBP.AS.188 | GPY            | MH734564                 | *Stenotrophomonas* sp. MH703457—99.0%      | *Stenotrophomonas* malthophilia |
|                                  |         |                |                          | *Stenotrophomonas* malthophilia MF536870—99.0% |                     |
|                                  |         |                |                          | *Stenotrophomonas* malthophilia MF774134—99.0% |                     |
| Sahara Desert, Egypt, 10 °C      | KBP.AS.189 | GPY            | MH734565                 | *Pseudarthrobacter phenanthrenivorans* NR_074770—99.7% | *Pseudarthrobacter* sp. |
|                                  |         |                |                          | *Pseudarthrobacter phenanthrenivorans* CP002379—99.7% |                     |
|                                  |         |                |                          | *Pseudarthrobacter phenanthrenivorans* NR_042469—99.6% |                     |
| Sahara Desert, Egypt, 10 °C      | KBP.AS.190 | GPY            | MH734567                 | *Leucobacter* sp. KP152582—99.3%           | *Leucobacter* sp.    |
|                                  |         |                |                          | *Leucobacter aridicollis* KJ742507—99.3%    |                     |
|                                  |         |                |                          | *Leucobacter aridicollis* KR827428—99.2%    |                     |
| Sahara Desert, Egypt, 10 °C      | KBP.AS.465 | CM            | MH734594                 | *Bacillus licheniformis* MG607364—99.7%     | *Bacillus* sp.       |
|                                  |         |                |                          | *Bacillus subtilis* CP029052—99.6%         |                     |
|                                  |         |                |                          | *Bacillus licheniformis* MH482980—99.6%     |                     |

Table S2. The primers used for 16S rRNA gene amplification and sequencing.

| GenBank accession number | Strain | Taxonomic affiliation | Primers used for the amplification | Primers used for the sequencing |
|-------------------------|--------|-----------------------|------------------------------------|-------------------------------|
| MH734536                | KBP.AS.1 | *Micrococcus* sp.     | 27f + Un1492r                       | 1100r                         |
| MH734568                | KBP.AS.2 | *Janibacter* sp.      | 27f + Un1492r                       | 1100r                         |
| MH734578                | KBP.AS.3 | *Micrococcus* sp.     | 27f + Un1492r                       | 1100r                         |
| MH734587                | KBP.AS.4 | *Microbacterium oxydans* | 341f + 805r                       | 537r                          |
| MH734597                | KBP.AS.5 | *Agrococcus* sp.      | 27f + Un1492r                       | 1100r                         |
| MH734599                | KBP.AS.6 | *Bacillus* sp.        | 341f + 805r                       | 805r                          |
| MH734600                | KBP.AS.7 | *Rhodococcus* sp.     | 27f + 537r                        | 537r                          |
| MH734601                | KBP.AS.8 | *Bacillus* sp.        | 27f + Un1492r                       | 1100r                         |

Continued on next page
| GenBank accession number | Strain       | Taxonomic affiliation          | Primers used for the amplification | Primers used for the sequencing |
|--------------------------|-------------|--------------------------------|-----------------------------------|---------------------------------|
| MH734602                 | KBP.AS.9    | *Microbacterium aurantiacum*   | 27f + Un1492r                     | 1100r                           |
| MH734538                 | KBP.AS.10   | *Microbacterium aurantiacum*   | 27f + Un1492r                     | 1100r                           |
| MH734539                 | KBP.AS.11   | *Aureimonas altamirensis*      | 27f + Un1492r                     | 1100r                           |
| MH734541                 | KBP.AS.12   | *Microbacterium* sp.           | 27f + Un1492r                     | 1100r                           |
| MH734548                 | KBP.AS.13   | *Brevundimonas* sp.            | 27f + Un1492r                     | 1100r                           |
| MH734551                 | KBP.AS.14   | *Paenibacillus glucanolyticus* | 27f + Un1492r                     | 1100r                           |
| MH734552                 | KBP.AS.15   | *Bacillus* sp.                 | 27f + Un1492r                     | 1100r                           |
| MH734553                 | KBP.AS.16   | *Agrococcus citreus*           | 27f + 537r                        | 537r                            |
| MH734559                 | KBP.AS.18   | *Bacillus* sp.                 | 27f + Un1492r                     | 1100r                           |
| MH734566                 | KBP.AS.19   | *Bacillus* sp.                 | 27f + Un1492r                     | 1100r                           |
| MH734569                 | KBP.AS.20   | *Microvirga soli*              | 27f + Un1492r                     | 1100r                           |
| MH734570                 | KBP.AS.21   | *Arthrobacter* sp.             | 27f + 537r                        | 537r                            |
| MH734571                 | KBP.AS.22   | *Microvirga soli*              | 63f + 1387r                       | 1100r                           |
| MH734572                 | KBP.AS.23   | *Planomicrobium okeanokoites*  | 27f + Un1492r                     | 1100r                           |
| MH734573                 | KBP.AS.24   | *Pseudarthrobacter* sp.        | 27f + Un1492r                     | 1100r                           |
| MH734574                 | KBP.AS.25   | *Arthrobacter* sp.             | 63f + 1387r                       | 1100r                           |
| MH734575                 | KBP.AS.26   | *Paenibacillus glucanolyticus* | 341f + 805r                       | 805r                            |
| None                     | KBP.AS.27   | *Bacillus* sp.                 | Identified by morphology          |                                 |
| MH734576                 | KBP.AS.28   | *Streptomyces* sp.             | 341f + 805r                       | 805r                            |
| MH734577                 | KBP.AS.29   | *Arthrobacter agilis*          | 341f + 805r                       | 805r                            |
| MH734579                 | KBP.AS.30   | *Bacillus psychrosaccharolyticus* | 27f + Un1492r                 | 1100r                           |
| MH734580                 | KBP.AS.31   | *Kocuria* sp.                  | 63f + 1387r                       | 1100r                           |
| MH734581                 | KBP.AS.32   | *Planomicrobium* sp.           | 341f + 805r                       | 805r                            |
| MH734582                 | KBP.AS.33   | *Planomicrobium* sp.           | 27f + Un1492r                     | 1100r                           |
| MH734537                 | KBP.AS.34   | *Arthrobacter* sp.             | 63f + 1387r                       | 1100r                           |
| MH734583                 | KBP.AS.35   | *Dietzia* sp.                  | 63f + 1387r                       | 1100r                           |
| MH734584                 | KBP.AS.36   | *Micrococcus* sp.              | 63f + 1387r                       | 1100r                           |
| MH734585                 | KBP.AS.37   | *Kocuria* sp.                  | 27f + Un1492r                     | 1100r                           |
| MH734586                 | KBP.AS.38   | *Micrococcus* sp.              | 27f + Un1492r                     | 1100r                           |
| MH734588                 | KBP.AS.41   | *Micrococcus cohnii*           | 27f + 537r                        | 537r                            |
| MH734589                 | KBP.AS.42   | *Arthrobacter crystalliopoietes* | 63f + 1387r                     | 537r                            |
| MH734590                 | KBP.AS.43   | *Arthrobacter crystalliopoietes* | 27f + Un1492r                 | 1100r                           |
| MH734591                 | KBP.AS.44   | *Bacillus* sp.                 | 27f + Un1492r                     | 1100r                           |
| MH734592                 | KBP.AS.45   | *Microbacterium* sp.           | 27f + Un1492r                     | 1100r                           |
| MH734593                 | KBP.AS.46   | *Pseudomonas putida*           | 341f + 805r                       | 805r                            |
| MH734595                 | KBP.AS.47   | *Sphingopyxis* sp.             | 63f + 1387r                       | 1100r                           |
| MH734596                 | KBP.AS.48   | *Bacillus* sp.                 | 27f + Un1492r                     | 1100r                           |
| MH734598                 | KBP.AS.50   | *Pseudomonas putida*           | 341f + 805r                       | 805r                            |
| MH734540                 | KBP.AS.119  | *Streptomyces* sp.             | 63f + 1387r                       | 1100r                           |
| MH734542                 | KBP.AS.120  | *Glutamicibacter* sp.          | 341f + 805r                       | 805r                            |

Continued on next page
| GenBank accession number | Strain         | Taxonomic affiliation       | Primers used for the amplification | Primers used for the sequencing |
|--------------------------|----------------|----------------------------|------------------------------------|--------------------------------|
| MH734543                 | KBP.AS.123     | *Brevibacillus* sp.         | 27f + 537r                         | 537r                           |
| MH734544                 | KBP.AS.125     | *Bacillus* sp.              | 27f + 537r                         | 537r                           |
| MH734545                 | KBP.AS.127     | *Rhodococcus* sp.           | 63f + 1387r                        | 1100r                          |
| MH734546                 | KBP.AS.128     | *Pseudochrobactrum* sp.     | 27f + 537r                         | 537r                           |
| MH734547                 | KBP.AS.129     | *Sphingobacterium mizutaii* | 27f + 537r                         | 537r                           |
| MH734549                 | KBP.AS.131     | *Rhodococcus* sp.           | 63f + 1387r                        | 1100r                          |
| MH734550                 | KBP.AS.132     | *Bacillus* sp.              | 63f + 1387r                        | 1100r                          |
| MH734554                 | KBP.AS.174     | *Brevibacterium* sp.        | 27f + Un1492r                      | 1100r                          |
| MH734555                 | KBP.AS.175     | *Brevibacterium* sp.        | 27f + 537r                         | 537r                           |
| MH734556                 | KBP.AS.176     | *Micrococcus* sp.           | 341f + 805r                        | 805r                           |
| MH734557                 | KBP.AS.177     | *Paracoccus* sp.            | 27f + Un1492r                      | 805r                           |
| MH734558                 | KBP.AS.179     | *Bacillus* sp.              | 27f + Un1492r                      | 1100r                          |
| MH734560                 | KBP.AS.183     | *Massilia* sp.              | 27f + Un1492r                      | 1100r                          |
| MH734561                 | KBP.AS.184     | *Micrococcus* sp.           | 27f + 537r                         | 537r                           |
| MH734562                 | KBP.AS.185     | *Artrobacter agilis*        | 341f + 805r                        | 805r                           |
| MH734563                 | KBP.AS.186     | *Micrococcus* sp.           | 341f + 805r                        | 805r                           |
| MH734564                 | KBP.AS.187     | *Leucoacter sp*             | 27f + Un1492r                      | 1100r                          |
| MH734565                 | KBP.AS.188     | *Stenotrophomonas maltophilia* | 63f + 1387r                      | 1100r                          |
| MH734566                 | KBP.AS.189     | *Pseudarthrobacter* sp.     | 63f + 1387r                        | 1100r                          |
| MH734567                 | KBP.AS.190     | *Leucobacter* sp.           | 27f + Un1492r                      | 1100r                          |
| MH734594                 | KBP.AS.465     | *Bacillus* sp.              | 341f + 805r                        | 805r                           |

Amplification program for 341f + 805r primer pair: Amplification program for 63f + 1387r primer pair: Amplification program for 27f + Un1492r and 27f + 541r primer pairs

1. 95 °C 3:00
2. 95 °C 0:40
3. 55 °C 0:40
4. 72 °C 0:40
Go to step 2 4×
5. 95 °C 0:30
6. 55 °C 0:30
7. 72 °C 0:30
Go to step 6 23×
8. 1. 72 °C 5:00

### Table S3. Physiological characteristics of isolates.

| Strain   | Sample, temperature of culturing | Temperature, °C | pH | Maximum salt concentrations at which growth is possible, % |
|----------|----------------------------------|-----------------|----|----------------------------------------------------------|
|          |                                  |                 |    | NaCl, % | KCl, % | MgSO₄, % | NaHCO₃, % | Mg(ClO₄)₂, % |
| KBP.AS.1 | Gibson Desert, Australia, 25 °C  | 25–37           | 6–12| 15  | 10  | 20  | 10  | 15  | 5 |
| KBP.AS.2 | Gibson Desert, Australia, 25 °C  | 10–25           | 6–8 | <2  | 2   | <2  | <2  | 5   |
| KBP.AS.3 | Gibson Desert, Australia, 25 °C  | 25–37           | 6–12| 15  | 10  | 20  | 10  | 2   | 5 |
| KBP.AS.4 | Gibson Desert, Australia, 25 °C  | 10–25           | 3–8 | <2  | <2  | <2  | <2  | 5   |
| KBP.AS.5 | Gibson Desert, Australia, 25 °C  | 25–45           | 4–10| 15  | 10  | 20  | 2   | 2   |
| KBP.AS.6 | Gibson Desert, Australia, 25 °C  | 25–37           | 6–12| 15  | 10  | 20  | 2   | 5   |
| KBP.AS.7 | Gibson Desert, Australia, 25 °C  | 25–37           | 5–11| 15  | 10  | 20  | 2   | 5   |
| KBP.AS.8 | Gibson Desert, Australia, 25 °C  | 10–25           | 3–8 | <2  | <2  | 10  | 2   | 5   |
| KBP.AS.9 | Gibson Desert, Australia, 25 °C  | 25–37           | 6–12| 15  | 10  | 20  | 2   | 2   |
| KBP.AS.10| Gibson Desert, Australia, 25 °C | 25–37           | 5–12| 15  | 10  | 20  | 5   | 5   |
| KBP.AS.11| Gibson Desert, Australia, 25 °C | 25–37           | 6–11| 15  | 10  | 20  | 2   | 5   |
| KBP.AS.12| Gibson Desert, Australia, 25 °C | 25–37           | 5–12| 15  | 10  | 20  | 2   | 5   |
| KBP.AS.13| Gibson Desert, Australia, 25 °C | 10–50*          | 3–8 | 15  | 15  | 20  | <2  | 1   |
| KBP.AS.14| Gibson Desert, Australia, 25 °C | 25–45           | 3–8 | 15  | 15  | 20  | <2  | 1   |
| KBP.AS.15| Gibson Desert, Australia, 25 °C | 25–50           | 3–8 | 15  | 15  | 20  | <2  | 2   |
| KBP.AS.16| Gibson Desert, Australia, 25 °C | 25–37           | 6–12| 15  | 15  | 15  | 2   | 5   |
| KBP.AS.18| Gibson Desert, Australia, 25 °C | 10–50*          | 3–8 | 15  | 15  | 20  | <2  | 2   |
| KBP.AS.19| Sahara Desert, Egypt, 25 °C   | 25–37           | 4–8 | 15  | 15  | 20  | <2  | <0,5|
| KBP.AS.20| Sahara Desert, Egypt, 25 °C   | 25–25           | 3–8 | 15  | 15  | 20  | <2  | <0,5|
| KBP.AS.21| Sahara Desert, Egypt, 25 °C   | 25–50           | 3–8 | 15  | 15  | 20  | <2  | 2   |
| Strain  | Sample, temperature of culturing | Temperature, °C | pH | Maximum salt concentrations at which growth is possible, % |
|---------|----------------------------------|-----------------|----|-------------------------------------------------------|
|         |                                  |                 |    | NaCl, % | KCl, % | MgSO₄, % | NaHCO₃, % | Mg(ClO₄)₂, % |
| KBP.AS.22  | Sahara Desert, Egypt, 25 °C      | 10–37           | 3–8| 15      | 15     | 15       | <2        | 1           |
| KBP.AS.23  | Sahara Desert, Egypt, 25 °C      | 25–37           | 5–12| 10      | 15     | 20       | 2         | 2           |
| KBP.AS.24  | Sahara Desert, Egypt, 25 °C      | 25–37           | 5–12| 10      | 15     | 20       | 2         | 5           |
| KBP.AS.25  | Sahara Desert, Egypt, 25 °C      | 25–37           | 6–12| 10      | 15     | 15       | 5         | 5           |
| KBP.AS.26  | Sahara Desert, Egypt, 25 °C      | 25–37           | 6–12| 10      | 15     | 20       | 2         | 5           |
| KBP.AS.27  | Sahara Desert, Egypt, 25 °C      | 25–37           | 6–12| 10      | 10     | 15       | 10        | 2           |
| KBP.AS.28  | Sahara Desert, Egypt, 25 °C      | 25–37           | 6–12| 10      | 15     | 15       | 5         | 5           |
| KBP.AS.29  | Sahara Desert, Egypt, 25 °C      | 10–25           | 6–8 | <2      | 2      | <2       | <2        | 0.5         |
| KBP.AS.30  | Sahara Desert, Egypt, 25 °C      | 25–37           | 6–12| 10      | 15     | 20       | 2         | 5           |
| KBP.AS.31  | Sahara Desert, Egypt, 25 °C      | 10–25           | 3–8 | <2      | 2      | 15       | <2        | 5           |
| KBP.AS.32  | Sahara Desert, Egypt, 25 °C      | 25–25           | 6–8 | <2      | <2     | <2       | <2        | <0.5        |
| KBP.AS.33  | Sahara Desert, Egypt, 25 °C      | 10–25           | 5–8 | <2      | <2     | <2       | <2        | <0.5        |
| KBP.AS.34  | Sahara Desert, Egypt, 25 °C      | 25–25           | 6–8 | <2      | <2     | <2       | <2        | <0.5        |
| KBP.AS.35  | Sahara Desert, Egypt, 25 °C      | 25–25           | 6–8 | <2      | <2     | <2       | <2        | <0.5        |
| KBP.AS.36  | Sahara Desert, Egypt, 25 °C      | 25–25           | 6–8 | <2      | <2     | <2       | <2        | <0.5        |
| KBP.AS.37  | Sahara Desert, Egypt, 25 °C      | 25–50           | 3–8 | 2       | 5      | 20       | 2         | 5           |
| KBP.AS.38  | Sahara Desert, Egypt, 25 °C      | 10–25           | 6–8 | <2      | <2     | <2       | <2        | 5           |
| KBP.AS.41  | Sahara Desert, Egypt, 25 °C      | 10–37           | 4–10| 10      | 10     | 20       | 2         | 5           |
| KBP.AS.42  | Sahara Desert, Egypt, 25 °C      | 10–45           | 3–12*| 10     | 20     | 20       | 5         | 2           |

Continued on next page
| Strain     | Sample, temperature of culturing | Temperature °C | pH | Maximum salt concentrations at which growth is possible, % |
|------------|----------------------------------|----------------|----|--------------------------------------------------------|
|            |                                  |                |    | NaCl, %  | KCl, %  | MgSO₄, % | NaHCO₃, % | Mg(ClO₄)₂, % |
| KBP.AS.43  | Sahara Desert, Egypt, 25 °C      | 25–37          | 6–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.44  | Sahara Desert, Egypt, 25 °C      | 10–45          | 4–10| 10       | 10      | 20       | 2         | 5           |
| KBP.AS.45  | Sahara Desert, Egypt, 25 °C      | 10–37          | 5–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.46  | Sahara Desert, Egypt, 25 °C      | 10–37          | 4–9| 2        | 2       | 20       | <2        | 0.5         |
| KBP.AS.47  | Sahara Desert, Egypt, 25 °C      | 10–37          | 4–9| 5        | 5       | 20       | <2        | 2           |
| KBP.AS.48  | Sahara Desert, Egypt, 25 °C      | 25–37          | 6–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.50  | Sahara Desert, Egypt, 25 °C      | 10–37          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.119 | Gibson Desert, Australia, 10 °C  | 25–25          | 6–8| <2       | <2      | <2       | <2        | <0.5        |
| KBP.AS.120 | Gibson Desert, Australia, 10 °C  | 10–37          | 4–10| 5        | 5       | 10       | 2         | 2           |
| KBP.AS.123 | Gibson Desert, Australia, 10 °C  | 10–37          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.125 | Gibson Desert, Australia, 10 °C  | 10–45          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.127 | Gibson Desert, Australia, 10 °C  | 25–37          | 4–8| 5        | 5       | 20       | <2        | 2           |
| KBP.AS.128 | Gibson Desert, Australia, 10 °C  | 10–45          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.129 | Gibson Desert, Australia, 10 °C  | 10–37          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.131 | Gibson Desert, Australia, 10 °C  | 10–45          | 4–8| 5        | 10      | 20       | <2        | 2           |
| KBP.AS.132 | Gibson Desert, Australia, 10 °C  | 25              | 5–10| 10       | 10      | 20       | <2        | 2           |
| KBP.AS.174 | Gibson Desert, Australia, 10 °C  | 10–25          | 5–9| 2        | 2       | <2       | <2        | 0.5         |
| KBP.AS.175 | Gibson Desert, Australia, 10 °C  | 10–25          | 5–9| 2        | 2       | <2       | <2        | 0.5         |
| KBP.AS.176 | Gibson Desert, Australia, 10 °C  | 10–25          | 5–9| <2       | 2       | <2       | <2        | 0.5         |

Continued on next page
| Strain       | Sample, temperature of culturing | Temperature °C | pH     | Maximum salt concentrations at which growth is possible, % |
|-------------|----------------------------------|----------------|--------|----------------------------------------------------------|
|             |                                  |                |        | NaCl, % | KCl, % | MgSO₄, % | NaHCO₃, % | Mg(ClO₄)₂, % |
| KBP.AS.177  | Gibson Desert, Australia, 10 °C  | 10–25          | 6–8    | <2      | 2      | <2       | <2       | <0,5         |
| KBP.AS.179  | Gibson Desert, Australia, 10 °C  | 10–25          | 3–8    | <2      | 2      | <2       | 2        | 0,5          |
| KBP.AS.183  | Sahara Desert, Egypt, 10 °C      | 10–25          | 6–8    | <2      | <2     | <2       | <2       | <0,5         |
| KBP.AS.184  | Sahara Desert, Egypt, 10 °C      | 10–25          | 6–8    | <2      | <2     | <2       | <2       | <0,5         |
| KBP.AS.185  | Sahara Desert, Egypt, 10 °C      | 25–37          | 6–8    | <2      | <2     | 10       | <2       | 5            |
| KBP.AS.186  | Sahara Desert, Egypt, 10 °C      | 10–25          | 4–8    | <2      | <2     | <2       | <2       | 0,5          |
| KBP.AS.187  | Sahara Desert, Egypt, 10 °C      | 10–45          | 5–10   | 5       | 10     | 20       | 2        | 5            |
| KBP.AS.188  | Sahara Desert, Egypt, 10 °C      | 25–37          | 3–8    | <2      | 5      | 20       | <2       | 5            |
| KBP.AS.189  | Sahara Desert, Egypt, 10 °C      | 25–25          | 6–8    | <2      | <2     | <2       | <2       | <0,5         |
| KBP.AS.190  | Sahara Desert, Egypt, 10 °C      | 10–45          | 4–12* | 5       | 10     | 20       | 5        | 2            |
| KBP.AS.465  | Sahara Desert, Egypt, 10 °C      | 25–25          | 6–8    | <2      | <2     | <2       | <2       | <0,5         |

*: Strains characterised with widest temperature or pH ranges of growth.

Table S4. Antibiotic resistance spectra of isolates

| Strain       | Sample, temperature of culturing | Amp | Chl | Rif | Tet | Kan | Dox | Ceph |
|-------------|----------------------------------|-----|-----|-----|-----|-----|-----|------|
| KBP.AS.1    | Gibson Desert, Australia, 25 °C  | S   | R   | S   | S   | S   | S   | R    |
| KBP.AS.2    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.3    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.4    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.5    | Gibson Desert, Australia, 25 °C  | R   | S   | S   | S   | S   | S   | S    |
| KBP.AS.6    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.7    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | R   | S   | S   | R    |
| KBP.AS.8    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.9    | Gibson Desert, Australia, 25 °C  | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.10   | Gibson Desert, Australia, 25 °C  | S   | R   | S   | R   | S   | R   | S    |
| KBP.AS.11   | Gibson Desert, Australia, 25 °C  | S   | S   | S   | R   | S   | S   | R    |

Continued on next page
| Strain     | Sample, temperature of culturing | Amp | Chl | Rif | Tet | Kan | Dox | Ceph |
|-----------|----------------------------------|-----|-----|-----|-----|-----|-----|------|
| KBP.AS.12 | Gibson Desert, Australia, 25 °C  | S   | S   | S   | R   | R   | S   | R    |
| KBP.AS.13 | Gibson Desert, Australia, 25 °C  | R   | S   | S   | S   | S   | S   | R    |
| KBP.AS.14 | Gibson Desert, Australia, 25 °C  | R   | S   | S   | S   | S   | S   | R    |
| KBP.AS.15 | Gibson Desert, Australia, 25 °C  | R   | S   | S   | R   | S   | R   | R    |
| KBP.AS.16 | Gibson Desert, Australia, 25 °C  | S   | R   | S   | R   | S   | S   | R    |
| KBP.AS.18 | Gibson Desert, Australia, 25 °C  | R   | S   | S   | S   | S   | S   | S    |
| KBP.AS.19 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.20 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | R   | S   | S   | S    |
| KBP.AS.21 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | R   | S   | R   | S    |
| KBP.AS.22 | Sahara Desert, Egypt, 25 °C      | R   | S   | S   | S   | S   | S   | R    |
| KBP.AS.23 | Sahara Desert, Egypt, 25 °C      | S   | R   | S   | S   | S   | S   | R    |
| KBP.AS.24 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | R   | S   | S   | R    |
| KBP.AS.25 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.26 | Sahara Desert, Egypt, 25 °C      | S   | R   | S   | R   | S   | S   | S    |
| KBP.AS.27 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | R   | S   | S   | R    |
| KBP.AS.28 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.29 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.30 | Sahara Desert, Egypt, 25 °C      | S   | R   | S   | R   | S   | S   | R    |
| KBP.AS.31 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.32 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.33 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.34 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.35 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.36 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.37 | Sahara Desert, Egypt, 25 °C      | R   | S   | S   | S   | S   | S   | S    |
| KBP.AS.38 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.41 | Sahara Desert, Egypt, 25 °C      | R   | S   | S   | S   | S   | S   | S    |
| KBP.AS.42 | Sahara Desert, Egypt, 25 °C      | S   | R   | S   | S   | S   | S   | R    |
| KBP.AS.43 | Sahara Desert, Egypt, 25 °C      | R   | S   | S   | S   | S   | S   | R    |
| KBP.AS.44 | Sahara Desert, Egypt, 25 °C      | R   | R   | S   | S   | S   | S   | R    |
| KBP.AS.45 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.46 | Sahara Desert, Egypt, 25 °C      | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.47 | Sahara Desert, Egypt, 25 °C      | R   | R   | R   | R   | R   | R   | R    |
| KBP.AS.48 | Sahara Desert, Egypt, 25 °C      | R   | S   | S   | S   | S   | S   | R    |
| KBP.AS.50 | Sahara Desert, Egypt, 25 °C      | R   | R   | S   | S   | R   | S   | R    |
| KBP.AS.119| Gibson Desert, Australia, 10 °C  | R   | R   | S   | S   | S   | S   | S    |
| KBP.AS.120| Gibson Desert, Australia, 10 °C  | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.123| Gibson Desert, Australia, 10 °C  | S   | S   | S   | S   | S   | S   | S    |
| KBP.AS.125| Gibson Desert, Australia, 10 °C  | S   | S   | S   | S   | S   | S   | R    |
| KBP.AS.127| Gibson Desert, Australia, 10 °C  | R   | S   | S   | S   | S   | S   | S    |
| KBP.AS.128| Gibson Desert, Australia, 10 °C  | S   | S   | S   | S   | S   | S   | S    |

Continued on next page
| Strain       | Sample, temperature of culturing | Amp  | Chl  | Rif  | Tet  | Kan  | Dox  | Ceph |
|-------------|---------------------------------|------|------|------|------|------|------|------|
| KBP.AS.129  | Gibson Desert, Australia, 10 °C | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.131  | Gibson Desert, Australia, 10 °C | S    | S    | S    | S    | S    | S    | R    |
| KBP.AS.132  | Gibson Desert, Australia, 10 °C | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.174  | Gibson Desert, Australia, 10 °C | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.175  | Gibson Desert, Australia, 10 °C | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.176  | Gibson Desert, Australia, 10 °C | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.177  | Gibson Desert, Australia, 10 °C | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.179  | Gibson Desert, Australia, 10 °C | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.183  | Sahara Desert, Egypt, 10 °C    | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.184  | Sahara Desert, Egypt, 10 °C    | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.185  | Sahara Desert, Egypt, 10 °C    | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.186  | Sahara Desert, Egypt, 10 °C    | S    | S    | S    | S    | S    | S    | S    |
| KBP.AS.187  | Sahara Desert, Egypt, 10 °C    | R    | R    | S    | R    | R    | R    | S    |
| KBP.AS.188  | Sahara Desert, Egypt, 10 °C    | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.189  | Sahara Desert, Egypt, 10 °C    | R    | S    | S    | S    | S    | S    | S    |
| KBP.AS.190  | Sahara Desert, Egypt, 10 °C    | S    | R    | S    | S    | S    | S    | R    |
| KBP.AS.465  | Sahara Desert, Egypt, 10 °C    | R    | S    | S    | S    | S    | S    | S    |

R: Resistant strain; S: Sensitive strain; Amp: Ampicillin (100 mkg/ml); Chl: Chloramphenicol (100 mkg/ml); Rif: Rifampicin (100 mkg/ml); Tet: Tetracycline (100 mkg/ml); Kan: Kanamycin (100 mkg/ml); Dox: Doxycycline (100 mkg/ml); Ceph: Cephalixin (100 mkg/ml).

Figure S1. Taxonomic structure of the Gibson desert soil culturable bacterial communities: (I) community isolated at 25 °C, (II) community isolated at 10 °C. Each strain of the ones combined in the “others” group accounted for about 1% of the number of cultured bacteria in the community. This group includes Acinetobacter sp., Agrococcus citreus, Agrococcus jenensis, Bacillus sp., Brevibacillus sp., Brevundimonas sp., Glutamicibacter sp., Microbacterium oxidans, Microbacterium sp., Paenibacillus glucanolyticus, Pseudochrobactrum sp., Sphingobacterium mizutaii, Streptomyces sp.
Figure S2. Taxonomic structure of the Sahara desert soil culturable bacterial communities: (I) community isolated at 25 °C, (II) community isolated at 10 °C. Each strain of the ones combined in the “others” group accounted for about 1% of the number of cultured bacteria in the community. This group includes *Arthrobacter agilis*, *Arthrobacter crystallopoietes*, *Bacillus psychrosaccharolyticus*, *Dietzia cinnamena*, *Micrococcus cohnii*, *Micrococcus luteus*, *Micrococcus* sp., *Planomicrobium okeanokoites*, *Pseudomonas putida*, *Sphingomonas echinoides*, *Sphingomonas* sp., *Sphingopyxis* sp., *Streptomyces* sp.
Figure S3. Phylogenetic analysis of 16S rRNA genes of the strains isolated from desert soils which were sequenced using 1100r primer. The tree was constructed using the Neighbor-Joining method with the use of the most closely related sequences from GenBank. The number of taxa—82. The number of significant characters—640. The number of bootstrap replicates—500. Confidence values of branching are given for cases of 50% and higher. Circles indicate strains isolated from the Sahara desert, triangles—the Gibson desert; green and blue colours indicate strains isolated at 25 and 10 °C, respectively. The scale under the tree indicates the number of phylogenetically significant changes of nucleotides.
Figure S4. Phylogenetic analysis of 16S rRNA genes of the strains isolated from desert soils which were sequenced using 537r primer. The tree was constructed using the Neighbor-Joining method with the use of the most closely related sequences from GenBank. The number of taxa—45. The number of significant characters—342. The number of bootstrap replicates—500. Confidence values of branching are given for cases of 50% and higher. Circles indicate strains isolated from the Sahara desert, triangles—the Gibson desert; green and blue colours indicate strains isolated at 25 and 10 °C, respectively. The scale under the tree indicates the number of phylogenetically significant changes of nucleotides.
Figure S5. Phylogenetic analysis of 16S rRNA genes of the strains isolated from desert soils which were sequenced using 805r primer. The tree was constructed using the Neighbor-Joining method with the use of the most closely related sequences from GenBank. The number of taxa—40. The number of significant characters—382. The number of bootstrap replicates—500. Confidence values of branching are given for cases of 50% and higher. Circles indicate strains isolated from the Sahara desert, triangles—the Gibson desert; green and blue colours indicate strains isolated at 25 and 10 °C, respectively. The scale under the tree indicates the number of phylogenetical significant changes of nucleotides.