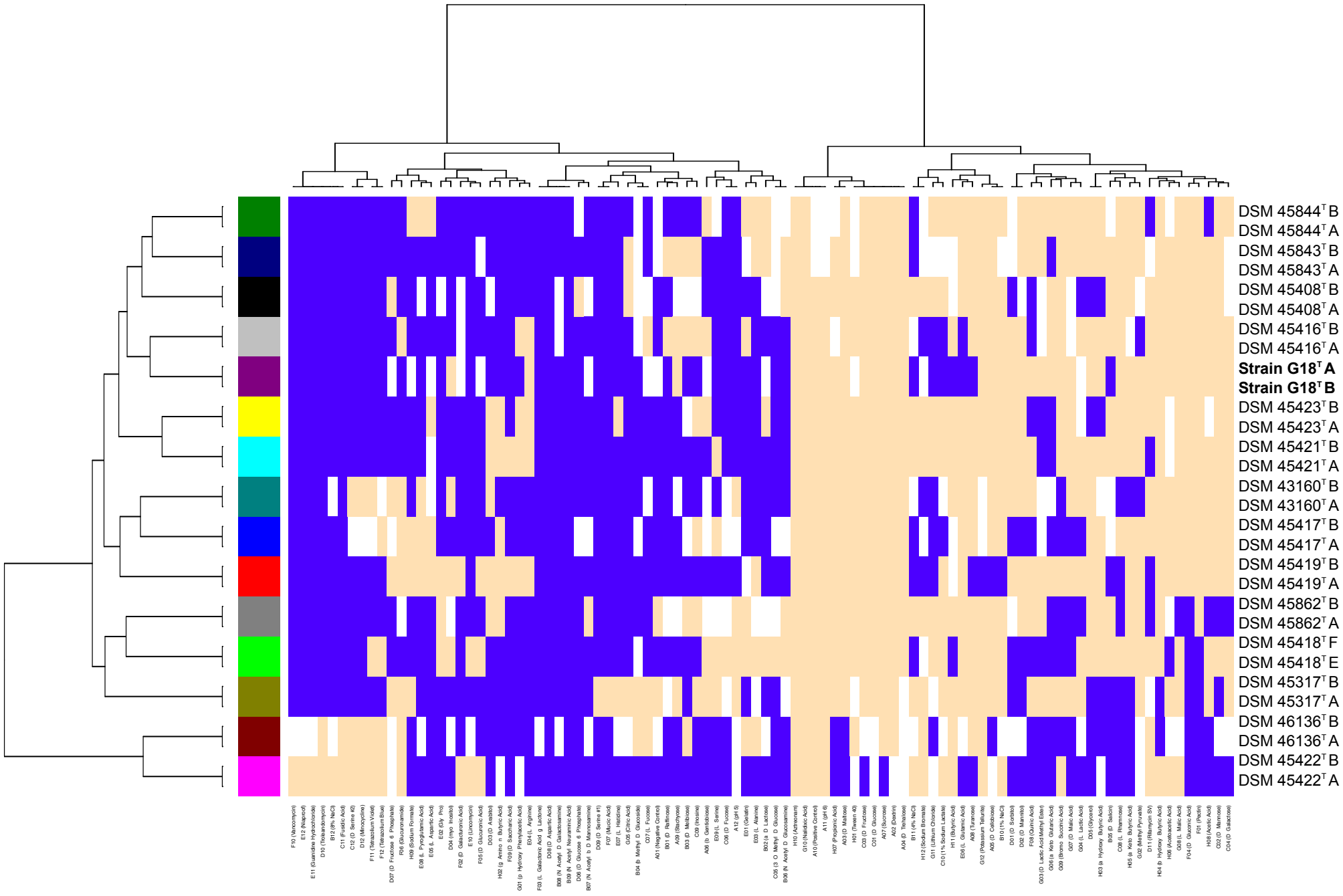
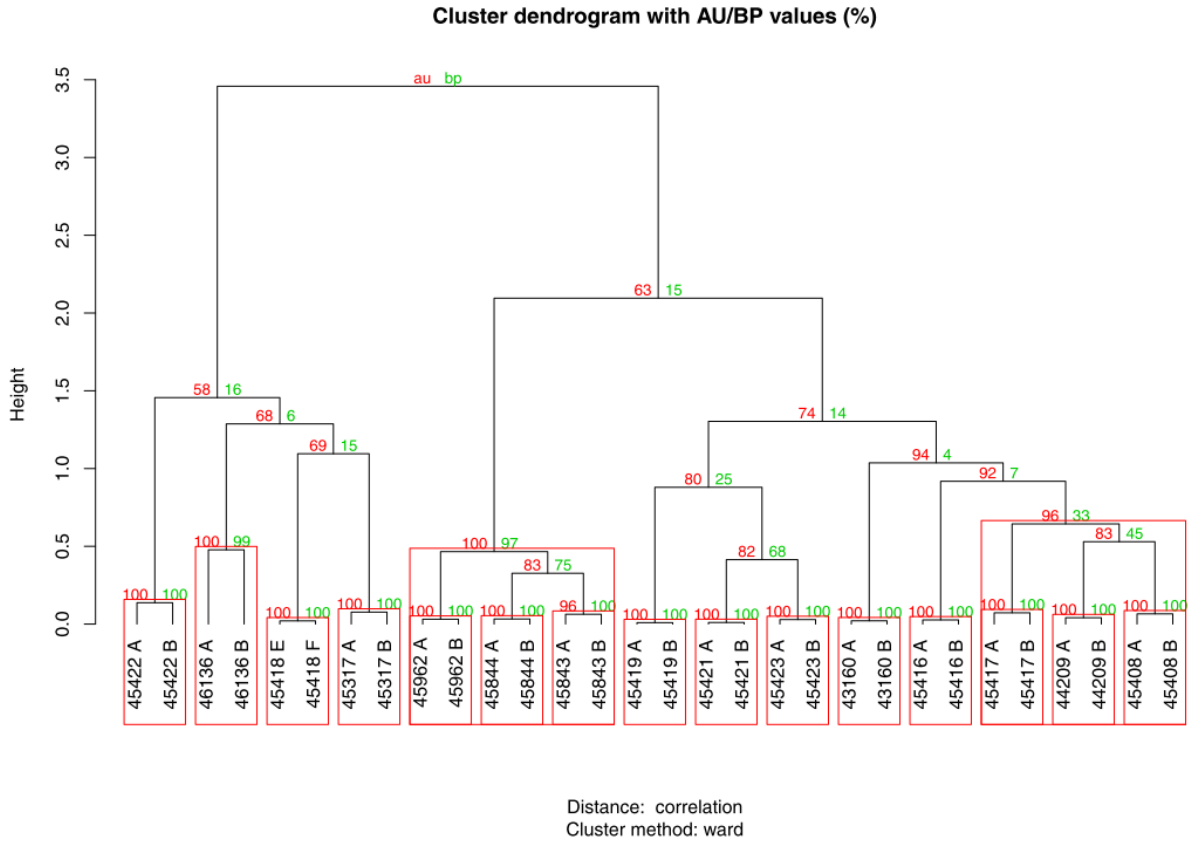
Supplementary Fig. S1. The parameter "Maximum Height" estimated from the respiration curves as measured with the OmniLog phenotyping device and discretized and visualized as heatmap using the `opm` package. Plates and substrates are rearranged according to their overall similarity (as depicted using the row and column dendrograms). Ochre colour indicates positive reaction; blue colour indicates negative reaction; white colour indicates ambiguous reaction. Letters (A/B) indicate each replicate of experiment.

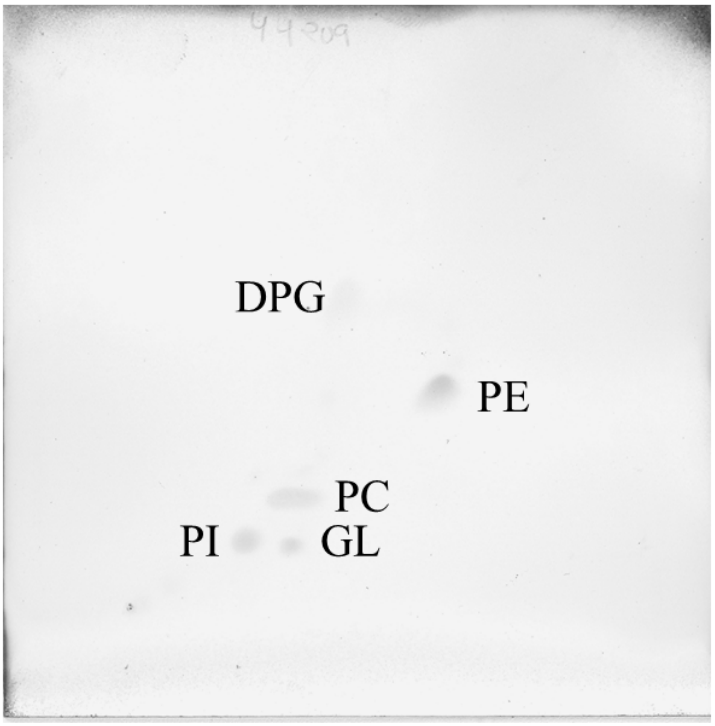

DSM 45844T B
DSM 45844T A
DSM 45843T B
DSM 45843T A
DSM 45408T B
DSM 45408T A
DSM 45416T B
DSM 45416T A
Strain G18T A
Strain G18T B
DSM 45423T B
DSM 45423T A
DSM 45421T B
DSM 45421T A
DSM 43160T B
DSM 43160T A
DSM 45417T B
DSM 45417T A
DSM 45419T B
DSM 45419T A
DSM 45862T B
DSM 45862T A
DSM 45418T F
DSM 45418T E
DSM 45317T B
DSM 45317T A
DSM 46136T B
DSM 46136T A
DSM 45422T B
DSM 45422T A
F10 (Vancomycin)
E12 (Niaproof)
E11 (Guanidine Hydrochloride)
D10 (Tetracycline)
B12 (4% NaCl)
C11 (Fusidic Acid)
C12 (D Serine #2)
D12 (Minocycline)
F11 (Tetrazolium Violet)
F12 (Tetrazolium Blue)
D07 (D Fructose 6 Phosphate)
F06 (Glucuronamide)
H09 (Sodium Formate)
E08 (L Pyroglutamic Acid)
E06 (L Aspartic Acid)
E02 (Gly Pro)
D04 (myo Inositol)
F02 (D Galacturonic Acid)
E10 (Uncomycin)
F05 (D Glucuronic Acid)
D03 (D Arabitol)
H02 (g Amino n Butyric Acid)
F09 (D Saccharic Acid)
G01 (a Hydroxy Phenylacetic Acid)
E04 (L Arginine)
F03 (L Galactonic Acid g Lactone)
D08 (D Aspartic Acid)
B08 (N Acetyl D Galactosamine)
B09 (N Acetyl Neuraminic Acid)
D06 (D Glucose 6 Phosphate)
B07 (N Acetyl b D Mannosamine)
D09 (D Serine #1)
F07 (Mucic Acid)
E07 (L Histidine)
G05 (Citric Acid)
B04 (b Methyl D Glucoside)
C07 (L Fucose)
A01 (Negative Control)
B01 (D Raffinose)
A09 (Sucrose)
B03 (D Melibiose)
C08 (Inosine)
A06 (b Gentiobiose)
E09 (L Serine)
C06 (D Fucose)
A12 (pH 5)
E01 (Gelatin)
E03 (L Alanine)
B02 (a D Lactose)
C05 (3 O Methyl D Glucose)
B06 (N Acetyl D Glucosamine)
H10 (Adrenanin)
G10 (Nalidixic Acid)
A10 (Positive Control)
A11 (pH 6)
H07 (Propionic Acid)
A03 (D Maltose)
H01 (Tween 40)
C03 (D Fructose)
C01 (D Glucose)
A07 (Sucrose)
A02 (Dextrin)
A04 (D Trehalose)
B11 (4% NaCl)
H12 (Sodium Bromate)
G11 (Lithium Chloride)
C10 (1% Sodium Lactate)
H11 (Butyric Acid)
E06 (L Glutamic Acid)
A08 (Turanose)
G12 (Potassium Tellurite)
A05 (D Cellobiose)
B10 (1% NaCl)
D01 (D Sorbitol)
D02 (D Mannitol)
F08 (Quinic Acid)
G03 (D Lactic Acid Methyl Ester)
G06 (a Keto Glutaric Acid)
G09 (Bromo Succinic Acid)
G07 (D Malic Acid)
G04 (L Lactic Acid)
D05 (Glycerol)
H03 (a Hydroxy Butyric Acid)
B05 (D Sebitol)
C09 (L Rhamnose)
H05 (a Keto Butyric Acid)
G02 (Methyl Pyruvate)
D11 (Rifamycin SV)
H04 (b Hydroxy Butyric Acid)
H06 (Acetoacetic Acid)
G08 (L Malic Acid)
F04 (D Gluconic Acid)
F01 (Pectin)
H08 (Acetic Acid)
C02 (D Mannose)
C04 (D Galactose)

Supplementary Fig. S2. Phenotypic dendrogram based on the parameter "Maximun Height" estimated from the respiration curves as measured with the OmniLog phenotyping device using Ward algorithm for agglomerative hierarchical clustering and correlation coefficient as a distance metric using the `pvclust` package. Support values approximately unbiased (AU, left) and bootstrapping (BP, right) are shown above the branches. Well supported clusters are defined by red squares.



Supplementary Fig. S3. Polar lipids profile of *Geodermatophilus poikilotrophi* sp. nov. G18^{T}, after separation by two-dimensional TLC. Plate was sprayed with molydatophosphoric acid for detection of total polar lipid. DPG, diphosphadidylglycerol; PE, phosphatidylethanolamine; PC, phosphatidylcholine; PI, phosphatidylinositol; GL, unknown glycolipid.

***Geodermatophilus poikilotrophi* sp. nov. G18^{T}**



Supplementary R-code File. S4. Exemplary code to fit the model and compute the confidence intervals using the R package `lethal`.

```
################################################################################

##Extraction of lethal doses

### Example code for the manuscript

##  Geodermatophilus poikilotrophi sp. nov., a multi-tolerant actinomycete

##  isolated from dolomitic marble
```

```
##   by Maria del Carmen Montero-Calasanz, Benjamin Hofner, Markus Göker,
##  Manfred Rohde, Cathrin Spröer, Karima Hezbri, Maher Gtari,
##  Peter Schumann,  Hans-Peter Klenk
## Author of the code: Benjamin Hofner
################################################################################
## Install and load package
install.packages("lethal", repos = "http://r-forge.r-project.org",
                 type = "source")
library("lethal")
## Run this only once as it takes some time; Thus if the results exist already,
## skip this
if (!file.exists("lethal_dose_uv.Rda")) {
    ## load UV radiation data, which is also part of the package leathal
    data("geoderm.uv")
    summary(geoderm.uv)
    ## make sure that strain and replicate are factors
    geoderm.uv$strain <- as.factor(geoderm.uv$strain)
```

```
698     geoderm.uv$replicate <- as.factor(geoderm.uv$replicate)
699     mod.uv <- LD(value ~ time, groups = "strain", experiment = "replicate",
700             dose_trafo = "sqrt", data = geoderm.uv,
701             family = negbin(theta = c(0.5, 10)))
702     ## Set seed to make results reproducable
703     ## (as we use bootstrap condidence intervals)
704     set.seed(0703)
705     ## On a linux machine one can easily use parallel programming by specifying
706     ## the numbers of cores to use with the additional argument "mc.cores", e.g.
707     ##   confint(mod.uv, B1 = 20, B2 = 100, mc.cores = 10)
708     ci.uv <- confint(mod.uv)
709     ## to reproduce results from the paper, one must use mc.cores = 3
710     save("mod.uv", "ci.uv", file = "lethal_dose_uv.Rda")
711 } else {
712     load("lethal_dose_uv.Rda")
713 }
714 ##############################################################################
715 ## Extract results
```

```
716 ## extract model and LDs
717 mod.uv
718 ## extract LDs only
719 LD(mod.uv)
720 ## extract confidence intervals (and LDs)
721 ci.uv
722 ##############################################################################
723 ## Produce plots
724 ## simple graphic without CIs:
725 plot(mod.uv, xlab = "Time (min)", ylab = expression(c.f.u.ml^-1))
726 ## graphic with survival fractions and confidence intervals:
727 plot(ci.uv, xlab = "Time (min)", upper_ylab = expression(c.f.u.ml^-1),
728      mar = c(4, 9.3, 2, 2.5))
729 ## add labels
730 mtext(rep(c("LD10", "LD50"), 3), side = 4, at = c(0.8, 1.2, 1.8, 2.2, 2.8, 3.2),
731       cex = 0.75, las = 2)
732
733
```