```
k_Bacteria;p_Actinobacteria;c_Acidimicrobiia;o_Acidimicrobiales;f_OCS155;g_
 k_Bacteria;p_Armatimonadetes;c_[Fimbriimonadia];o_[Fimbriimonadales];f_[Fimbriimonadaceae];g_Fimbriimonas
                   k_Bacteria;p_Bacteroidetes;c_Bacteroidia;o_Bacteroidales;f_;g_
                  k_Bacteria;p_Bacteroidetes;c_Cytophagia;o_Cytophagales;f__;g_
 k_Bacteria;p_Bacteroidetes;c_Cytophagia;o_Cytophagales;f_Flammeovirgaceae;g_
 k_Bacteria;p_Bacteroidetes;c_Cytophagia;o_Cytophagales;f_Flammeovirgaceae;g_Flammeovirga
  k_Bacteria;p_Bacteroidetes;c_Cytophagia;o_Cytophagales;f_[Amoebophilaceae];g_Candidatus Amoebophilus
 k_Bacteria;p_Bacteroidetes;c_Cytophagia;o_Cytophagales;f_[Amoebophilaceae];g_SC3-56
 k_Bacteria;p_Bacteroidetes;c_Flavobacteriia;o_Flavobacteriales;f_;g_
                 k\_Bacteria; p\_Bacteroidetes; c\_Flavobacteriia; o\_Flavobacteriales; f\_Cryomorphaceae; g\_Cryomorphaceae; g\_Cryomorphacea
 k_Bacteria;p_Bacteroidetes;c_Flavobacteriia;o_Flavobacteriales;f_Cryomorphaceae;g_Fluviicola
                  \label{lem:k_Bacteria} $$k\_Bacteria; p\_Bacteroidetes; c\_Flavobacteriia; o\_Flavobacteriales; f\_Flavobacteriaceae; Other algorithms and the substitution of the substi
  k_Bacteria;p_Bacteroidetes;c_Flavobacteriia;o_Flavobacteriales;f_Flavobacteriaceae;g_
 k_Bacteria;p_Bacteroidetes;c_Flavobacteriia;o_Flavobacteriales;f_Flavobacteriaceae;g_Tenacibaculum
                     {\tt k\_Bacteria;p\_Bacteroidetes;c\_Flavobacteriia;o\_Flavobacteriales;f\_NS9;g\_}
 k_Bacteria;p_Bacteroidetes;c_[Rhodothermi];o_[Rhodothermales];f_Rhodothermaceae;g_
k_Bacteria;p_Bacteroidetes;c_[Rhodothermi];o_[Rhodothermales];f_[Balneolaceae];g_Balneola
 k_Bacteria;p_Bacteroidetes;c_[Saprospirae];o_[Saprospirales];f_Chitinophagaceae;g_
 k_Bacteria;p_Bacteroidetes;c_[Saprospirae];o_[Saprospirales];f_Chitinophagaceae;g_Sediminibacterium
  k_Bacteria;p_Chloroflexi;c_Anaerolineae;o_S0208;f_;g_
 k_Bacteria;p_Chloroflexi;c_Ktedonobacteria;o_Thermogemmatisporales;f_Thermogemmatisporaceae;g_
 k_Bacteria;p_Cyanobacteria;c_4C0d-2;o_MLE1-12;f__;g__
 k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_;f_;g_
  k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_CAB-I;f_;g_
k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Cercozoa;f_;g_
 k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Chlorophyta;f_Mamiellaceae;g_
  k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Chlorophyta;f_Ulvophyceae;g_
 k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Haptophyceae;f__;g__
                 k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Stramenopiles;f__;g__
  k_Bacteria;p_Cyanobacteria;c_Chloroplast;o_Streptophyta;f_;g_
 k_Bacteria;p_Cyanobacteria;c_ML635J-21;o_;f_;g_
                   k\_Bacteria; p\_Firmicutes; c\_Clostridia; o\_Clostridiales; f\_Clostridiaceae; g\_Clostridium
                   \label{lem:k_Bacteria} $$k\_Bacteria; p\_Firmicutes; c\_Clostridia; o\_Clostridiales; f\_Lachnospiraceae; g\_Clostridiales; f\_Clostridiales; f\_Clo
 k_Bacteria;p_Firmicutes;c_Clostridia;o_Clostridiales;f_Peptostreptococcaceae;g_Tepidibacter
  k_Bacteria;p_Firmicutes;c_Clostridia;o_Clostridiales;f_[Acidaminobacteraceae];g_Fusibacter
 k_Bacteria;p_Firmicutes;c_Clostridia;o_Clostridiales;f_[Acidaminobacteraceae];g_WH1-8
 k_Bacteria;p_Fusobacteria;c_Fusobacteriia;o_Fusobacteriales;f_Fusobacteriaceae;g_Propionigenium
 k_Bacteria;p_Gemmatimonadetes;c_Gemm-2;o__;f__;g__
  k_Bacteria;p_Lentisphaerae;c_[Lentisphaeria];o_Lentisphaerales;f__;g__
k_Bacteria;p_Lentisphaerae;c_[Lentisphaeria];o_Lentisphaerales;f_Arctic95B-10;g_
                 \label{lem:k_Bacteria} $$k\_Bacteria; p\_Lentisphaerae; c\_[Lentisphaeria]; o\_Lentisphaerales; f\_Lentisphaeraceae; g\_lentisphaerae. $$k\_Bacteria; p\_Lentisphaerae. $$k\_Bacteria; p\_Lentisph
 k_Bacteria;p_Planctomycetes;c_BD7-11;o__;f__;g__
 k_Bacteria;p_Planctomycetes;c_Planctomycetia;o_Gemmatales;f_Gemmataceae;g_
                   k\_Bacteria; p\_Planctomycetes; c\_Planctomycetia; o\_Gemmatales; f\_Gemmataceae; g\_Gemmataceae; g\_
  k_Bacteria;p_Planctomycetes;c_Planctomycetia;o_Gemmatales;f_Isosphaeraceae;g_
k_Bacteria;p_Planctomycetes;c_Planctomycetia;o_Pirellulales;f_Pirellulaceae;g_
k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_;f_;g_
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Caulobacterales;f_Caulobacteraceae;Other
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Caulobacterales;f_Caulobacteraceae;g_
k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Ellin329;f__;g__
k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Kiloniellales;f_;g_
                    \label{lem:lem:k_Bacteria} \textbf{k} \underline{\hspace{0.3cm}} \textbf{Proteobacteria}; \underline{\hspace{0.3cm}} \textbf{c} \underline{\hspace{0.3cm}} \textbf{Alphaproteobacteria}; \underline{\hspace{0.3cm}} \textbf{c} \underline{\hspace{0.3cm}} \textbf{Kiloniellaceae}; \underline{\hspace{0.3cm}} \textbf{g} \underline{\hspace{0.3cm}} \textbf{Thalassospiration} \textbf{g} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \underline{\hspace{0.3cm}} \textbf{r} \underline{\hspace{0.3cm}} \underline{\hspace{
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;Other;Other
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Beijerinckiaceae;Other
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Bradyrhizobiaceae;g_
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Bradyrhizobiaceae;g_Afipia
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Bradyrhizobiaceae;g_Bradyrhizobium
                   k\_Bacteria; p\_Proteobacteria; c\_Alphaproteobacteria; o\_Rhizobiales; f\_Hyphomicrobiaceae; g\_Devosiales; f\_Hyphomicrobiaceae; f\_Hyphomicrobiaceae; g\_Devosiales; f\_Hyphomicrobiaceae; g\_Devosia
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Hyphomicrobiaceae;g_Hyphomicrobium
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhizobiales;f_Methylobacteriaceae;g_Methylobacterium
                   {\tt k\_Bacteria;p\_Proteobacteria;c\_Alphaproteobacteria;o\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Methylocystaceae;g\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiales;f\_Rhizobiale
                   k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodobacterales;f_Hyphomonadaceae;g_Hellea
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodobacterales;f_Rhodobacteraceae;Other
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodobacterales;f_Rhodobacteraceae;g_
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodobacterales;f_Rhodobacteraceae;g_Nautella
  k Bacteria;p Proteobacteria;c Alphaproteobacteria;o Rhodobacterales;f Rhodobacteraceae;g Phaeobacter
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodobacterales;f_Rhodobacteraceae;g_Thalassobius
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodospirillales;f_Acetobacteraceae;g_
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rhodospirillales;f_Rhodospirillaceae;g_
                  k\_Bacteria; p\_Proteobacteria; c\_Alphaproteobacteria; o\_Rhodospirillales; f\_Rhodospirillaceae; g\_Telmatospirillum and the substitution of the sub
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rickettsiales;f_;g_
 k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Rickettsiales;f_Pelagibacteraceae;g_
                    \label{lem:lem:k_Bacteria} \textbf{k} \underline{\texttt{Bacteria}}; \textbf{p}\underline{\texttt{Proteobacteria}}; \textbf{c}\underline{\texttt{Alphaproteobacteria}}; \textbf{o}\underline{\texttt{Sphingomonadales}}; \textbf{f}\underline{\texttt{Sphingomonadaceae}}; \textbf{g}\underline{\texttt{Sphingobium}}; \textbf{g}\underline{\texttt{Alphaproteobacteria}}; \textbf{c}\underline{\texttt{Alphaproteobacteria}}; \textbf{c}\underline{\texttt{Alphaproteobacteria}};
  k_Bacteria;p_Proteobacteria;c_Alphaproteobacteria;o_Sphingomonadales;f_Sphingomonadaceae;g_Sphingomonas
 k_Bacteria;p_Proteobacteria;c_Betaproteobacteria;o_Burkholderiales;f_Burkholderiaceae;g_Burkholderia
k_Bacteria;p_Proteobacteria;c_Betaproteobacteria;o_Burkholderiales;f_Comamonadaceae;g_
  k_Bacteria;p_Proteobacteria;c_Betaproteobacteria;o_Burkholderiales;f_Oxalobacteraceae;Other
  k_Bacteria;p_Proteobacteria;c_Betaproteobacteria;o_Burkholderiales;f_Oxalobacteraceae;g_
  k_Bacteria;p_Proteobacteria;c_Deltaproteobacteria;o_;f_;g_
 k_Bacteria;p_Proteobacteria;c_Deltaproteobacteria;o_Bdellovibrionales;f_Bacteriovoracaceae;g_
 k_Bacteria;p_Proteobacteria;c_Deltaproteobacteria;o_Myxococcales;f_;g_
  k_Bacteria;p_Proteobacteria;c_Deltaproteobacteria;o_Spirobacillales;f_;g_
 k_Bacteria;p_Proteobacteria;c_Deltaproteobacteria;o_Sva0853;f_;g_
k_Bacteria;p_Proteobacteria;c_Epsilonproteobacteria;o_Campylobacterales;f_;g_
  k_Bacteria;p_Proteobacteria;c_Epsilonproteobacteria;o_Campylobacterales;f_Campylobacteraceae;g_Arcobacter
k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_;f_;g_
                 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f__;g__
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Alteromonadaceae;g_
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Alteromonadaceae;g_Agarivorans
                   k\_Bacteria; p\_Proteobacteria; c\_Gamma proteobacteria; o\_Alteromonadales; f\_Alteromonadaceae; g\_Alteromonadaceae; g\_Alteromon
                   k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Colwelliaceae;g_
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Colwelliaceae;g_Thalassomonas
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Ferrimonadaceae;g_Ferrimonas
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Alteromonadales;f_Shewanellaceae;g_Shewanella
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Chromatiales;f_;g_
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Legionellales;f_Francisellaceae;g_Francisella
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_;g_
                   k\_Bacteria; p\_Proteobacteria; c\_Gamma proteobacteria; o\_Oceanos pirillales; f\_Endozoi cimonaceae; g\_Endozoi 
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_Halomonadaceae;g_Candidatus Portiera
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_Oceanospirillaceae;g_
                    \verb|k_Bacteria|; p_Proteobacteria|; c_Gamma proteobacteria|; o_Oceanos pirillales|; f_Oceanos pirillaceae|; g_Amphriteae|; description of the proteobacteria| o_Oceanos pirillales| o_Oceanos pirillaceae|; description of the proteobacteria| o_Oceanos pirillales| o_Oceanos pirillaceae|; description o_Oceanos pirillales| o_Oceanos pirillaceae| o_
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_Oceanospirillaceae;g_Neptunomonas
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_Oceanospirillaceae;g_Oceanospirillum
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Oceanospirillales;f_Oceanospirillaceae;g_Oleibacter
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Pseudomonadales;f_Moraxellaceae;g_Acinetobacter
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Pseudomonadales;f_Pseudomonadaceae;g_Pseudomonas
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Salinisphaerales;f_Salinisphaeraceae;g_Salinisphaera
k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Pseudoalteromonadaceae;Other
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Pseudoalteromonadaceae;g_Pseudoalteromonas
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Vibrionaceae;Other
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Vibrionaceae;g_
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Vibrionaceae;g_Photobacterium
  k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Vibrionales;f_Vibrionaceae;g_Vibrio
k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_Xanthomonadales;f_Sinobacteraceae;g_
                  k\_Bacteria; p\_Proteobacteria; c\_Gamma proteobacteria; o\_Xanthomonadales; f\_Sinobacteraceae; g\_Nevskianteria; p\_Proteobacteria; p\_Proteob
 k_Bacteria;p_Proteobacteria;c_Gammaproteobacteria;o_[Marinicellales];f_[Marinicellaceae];g_
 k_Bacteria;p_SAR406;c_AB16;o_Arctic96B-7;f_A714017;g_ZA3312c
                   k_Bacteria;p_TM6;c_SJA-4;o_;f_;g_
                {\tt k\_Bacteria;p\_Verrucomicrobia;c\_Opitutae;o\_Puniceicoccales;f\_Puniceicoccaceae;g\_Coraliomargarita}
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k\_Bacteria;p\_Verrucomicrobia;c\_Verruco-5;o\_R76-B128;f\_;g\_

Unassigned;Other;Other;Other;Other

k\_Bacteria;p\_Acidobacteria;c\_DA052;o\_Ellin6513;f\_;g\_

k\_Bacteria;p\_Acidobacteria;c\_Solibacteres;o\_Solibacterales;f\_;g\_