——— Archaea-Crenarchaeota-Thermoprotei-Desulfurococcales-Pyrodictiaceae-Pyrodictium\_occultum\_WP\_058371210.1 ——— Archaea-Crenarchaeota-Thermoprotei-Sulfolobales-Sulfolobaceae-Acidianus\_hospitalis\_WP\_013775565.1 ———— Archaea-Crenarchaeota-Thermoprotei-Sulfolobales-Sulfolobaceae-Metallosphaera\_cuprina\_WP\_013736631.1 ——— Archaea-Crenarchaeota-Thermoprotei-Sulfolobales-Sulfolobaceae-Metallosphaera\_hakonensis\_WP\_110369214.1 —— Archaea-Crenarchaeota-Thermoprotei-Sulfolobales-Sulfolobaceae-Sulfodiicoccus\_acidiphilus\_WP\_126451239.1 Archaea-Crenarchaeota-Thermoprotei-Thermoproteales-Thermoproteaceae-Caldivirga\_sp.\_MU80\_WP\_066796409.1 ———— Archaea-Crenarchaeota-Thermoprotei-Thermoproteales-Thermoproteaceae-Vulcanisaeta thermophila WP 069808134.1 Archaea-Crenarchaeota-Thermoprotei-Thermoproteales-Thermoproteaceae-Vulcanisaeta distributa WP 013337225.1 Archaea ———— Archaea-Euryarchaeota-Halobacteria-Halobacteriales-Haloarculaceae-Halorientalis\_sp.\_F1325\_WP\_129069278.1 —— Archaea-Euryarchaeota-Halobacteria-Haloferacales-Haloferacaceae-Haloplanus vescus WP 092630956.1 Bacteria Archaea-Euryarchaeota-Halobacteria-Haloferacales-Haloferacaceae-Haloferax\_mediterranei\_WP\_004572582.1 Archaea-Euryarchaeota-Halobacteria-Haloferacales-Haloferacaceae-NA\_WP\_008573642.1 Archaea-Euryarchaeota-Halobacteria-Haloferacales-Haloferacaceae-Halogranum\_gelatinilyticum\_WP\_089694769.1 Archaea-NA-NA-NA-Archaeon\_AArcSI\_WP\_119818932.1 Archaea-Euryarchaeota-Halobacteria-Halobacteriales-Halobacteriaceae-Halorussus\_amylolyticus\_WP\_132057692.1 ——— 100\_\_\_\_\_ Archaea-Euryarchaeota-Halobacteria-Halobacteriales-Halobacteriaceae-Halorussus\_ruber\_WP\_135825534.1 Archaea-Euryarchaeota-Halobacteria-Halobacteriales-NA-halophilic\_archaeon\_LT46\_WP\_137283464.1 Archaea-Euryarchaeota-Halobacteria-Halobacteriales-Halobacteriaceae-Halarchaeum\_sp.\_CBA1220\_WP\_123074058.1 —— Bacteria-NA-NA-NA-NA-bacterium\_B66\_WP\_136249701.1 Paulinella\_ovalis\_nuclear\_SingleCell\_\_\_SAG1\_utg7180000011124.g5198.t1 Bacteria-Proteobacteria-Gammaproteobacteria-Enterobacterales-NA-NA\_WP\_004131470.1 100Bacteria-Proteobacteria-NA-NA-NA-NA\_WP\_000423742.1 100 Eukaryota-Arthropoda-Insecta-Phthiraptera-Pediculidae-Pediculus\_humanus\_XP\_002433304.1 Bacteria-Proteobacteria-Gammaproteobacteria-Enterobacterales-NA-NA\_WP\_010863772.1 Bacteria-Proteobacteria-Gammaproteobacteria-Vibrionales-NA-Vibrionales\_bacterium\_C3R12\_WP\_113795949.1 Bacteria-Proteobacteria-Gammaproteobacteria-Vibrionales-Vibrionaceae-Vibrio\_genomosp.\_F6\_WP\_017052226.1 Eukaryota-Stramenopiles-Mediophyceae-Triceratiales-Triceratiaceae-Triceratium\_dubium\_MMETSP1175\_c4689\_g1\_i1.p1 — Bacteria-Proteobacteria-Gammaproteobacteria-Vibrionales-Vibrionaceae-NA\_WP\_011217888.1 100 Bacteria-Proteobacteria-Gammaproteobacteria-Vibrionales-Vibrionaceae-Photobacterium\_lipolyticum\_WP\_107284554.1 Bacteria-Proteobacteria-Gammaproteobacteria-Vibrionales-Vibrionaceae-Salinivibrio\_proteolyticus\_WP\_077674207.1 Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Alexandrium\_tamarense\_MMETSP0384\_c67803\_g1\_i1.p1 + 100 Eukaryota-Chlorophyta-Mamiellophyceae-Mamiellales-Mamiellaceae-Micromonas\_pusilla\_MMETSP1402\_c1837\_g1\_i1.p1 - Eukaryota-Chlorophyta-Mamiellophyceae-Mamiellales-Mamiellaceae-Micromonas\_commoda\_XP\_002505798.1 — Eukaryota-Chlorophyta-Chlorophyceae-Chlamydomonadales-Chlamydomonadaceae-Chlamydomonas\_chlamydogama\_MMETSP1392\_c28415\_g1\_i1.p1 Eukaryota-Chlorophyta-NA-NA-NA-Tetraselmis chuii MMETSP0491 c4309 g1 i1.p1 —————— Eukaryota-Chlorophyta-NA-NA-NA-Picocystis\_salinarum\_MMETSP0807\_c3119\_g1\_i1.p1 Eukaryota-Streptophyta-Bryopsida-Funariales-Funariaceae-Physcomitrella\_patens\_XP\_024385403.1 Eukaryota-Streptophyta-NA-Brassicales-Brassicaceae-Arabidopsis\_thaliana\_NP\_193579.2 Eukaryota-Streptophyta-NA-Lamiales-Oleaceae-Olea\_europaea\_XP\_022889769.1 Eukaryota-Streptophyta-NA-Lamiales-Pedaliaceae-Sesamum\_indicum\_XP\_011072113.1

90 Eukaryota-Streptophyta-NA-Lamiales-Phrymaceae-Erythranthe\_guttata\_XP\_012858151.1 Eukaryota-Streptophyta-NA-Rosales-Rosaceae-Prunus\_avium\_XP\_021813242.1 — Bacteria-NA-NA-NA-NA-Natronospirillum\_operossus\_WP\_135482266.1 Eukaryota-Arthropoda-Malacostraca-Amphipoda-Hyalellidae-Hyalella\_azteca\_XP\_018028568.1 ——— Bacteria-Planctomycetes-NA-NA-NA-Planctomycetes\_bacterium\_Mal33\_WP\_145284582.1 —— Bacteria-Proteobacteria-Gammaproteobacteria-Cellvibrionales-Halieaceae-Halieaceae\_bacterium\_GH478\_WP\_133212230.1 Bacteria-Proteobacteria-Gammaproteobacteria-Alteromonadales-Alteromonadaceae-Marinobacter\_sp.\_NP6\_WP\_127401506.1 Bacteria-Proteobacteria-Gammaproteobacteria-Alteromonadales-Alteromonadaceae-NA\_WP\_041334256.1 Bacteria-Proteobacteria-Gammaproteobacteria-NA-NA-NA\_WP\_053112230.1 ———— Bacteria-Proteobacteria-Gammaproteobacteria-Oceanospirillales-Halomonadaceae-Halomonas\_sp.\_BC04\_WP\_043513535.1 Bacteria-Proteobacteria-NA-NA-NA-Proteobacteria\_bacterium\_228\_WP\_104154022.1 Eukaryota-Nematoda-Chromadorea-Rhabditida-Rhabditidae-Caenorhabditis remanei XP 003087149.1 Eukaryota-Chordata-Mammalia-Cetacea-Lipotidae-Lipotes vexillifer XP 007471579.1 —— Bacteria-Proteobacteria-Gammaproteobacteria-NA-NA-Thiolapillus\_brandeum\_WP\_041067184.1 <u>Eukaryota-Haptophyta-NA-Prymnesiales-NA-Chrysochromulina\_polylepis\_MMETSP0143\_c79215\_g1\_i1.p2</u> Eukaryota-Haptophyta-NA-Prymnesiales-NA-Prymnesium\_parvum\_MMETSP0008\_c8364\_g1\_i1.p1 71 Lukaryota-Haptophyta-NA-Unranked-NA-Scyphosphaera\_apsteinii\_MMETSP1333\_c64616\_g1\_i1.p1 Eukaryota-Haptophyta-NA-Prymnesiales-NA-Coccolithus\_pelagicussspbraarudi\_MMETSP0164\_c852\_g1\_i1.p1 Eukaryota-Rhodophyta-Porphyridiophyceae-NA-NA-Timspurckia\_oligopyrenoides\_MMETSP1172\_c1575\_g1\_i1.p1 Eukaryota-Rhodophyta-Bangiophyceae-Porphyridiales-Porphyridiaceae-Porphyridium\_purpureum\_2276.7 — Eukaryota-Amoebozoa-NA-NA-Paramoebidae-Vexillifera\_sp\_MMETSP0173\_c10538\_g1\_i1.p1 ----- MSTRG.6096.1.p1 Paulinella\_chromatophora\_CCAC0185\_nuclear\_\_\_scaffold14186-m90258 • 100 Paulinella\_chromatophora\_CCAC0185\_nuclear\_\_\_scaffold6215-m52838 Paulinella\_chromatophora\_CCAC0185\_nuclear\_\_\_scaffold27326-m131755 MSTRG.9958.1.p1 98 Paulinella\_chromatophora\_CCAC0185\_nuclear\_\_\_scaffold6315-m53423 Paulinella\_ovalis\_nuclear\_SingleCell\_\_\_SAG1\_utg7180000021045.g9632.t1 \_\_\_\_Fallinella\_ovalis\_nuclear\_SingleCell\_\_\_SAG3\_contig00517.g626.t1 Paulinella\_ovalis\_nuclear\_SingleCell\_\_\_SAG5\_contig00832.g1056.t1 Paulinella\_ovalis\_nuclear\_SingleCell\_\_\_SAG1\_utg7180000028822.g12868.t1 —— Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Bigelowiella\_natans\_MMETSP1052\_c11982\_g1\_i1.p1 Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Lotharella\_amoebiformis\_MMETSP0042\_c8957\_g1\_i1.p1 —— Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Lotharella\_globosa\_MMETSP0111\_c3142\_g1\_i1.p1 Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Chlorarachnion\_reptans\_MMETSP0109\_c7944 g1 i1.p1 —— Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Gymnochlora\_sp\_MMETSP0110\_c10487\_g1\_i1.p1 Eukaryota-Stramenopiles-Labyrinthista-NA-NA-Aplanochytrium\_sp\_MMETSP0954\_c2513\_g1\_i1.p1 +100 2100 Eukaryota-Stramenopiles-Labyrinthulomycetes-Unranked-Unranked-Aplanochytrium\_kerguelense\_jgi47516 LEukaryota-Stramenopiles-Labyrinthista-NA-NA-Aurantiochytrium\_limacinum\_MMETSP0958\_TR217-c0\_g1\_i1.p1 🚣 Бикатуоta-Stramenopiles-Labyrinthulomycetes-Unranked-Unranked-Aurantiochytrium\_limacinum\_jgi39355 Eukaryota-Stramenopiles-Labyrinthista-NA-NA-Aurantiochytrium\_limacinum\_MMETSP0960\_c1718\_g1\_i1.p1 ——— Eukaryota-Stramenopiles-NA-Bicosoecida-Cafeteriaceae-Cafeteria\_sp\_MMETSP1104\_c2923\_g1\_i1.p1 Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Amphidinium\_carterae\_MMETSP0258\_c13135\_g1\_i1.p1 Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Symbiodinium\_sp\_MMETSP1374\_c50386\_g1\_i1.p1 Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Karenia\_brevis\_MMETSP0027\_c35110\_g1\_i1.p1 ——— Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Oxyrrhis\_marina\_MMETSP0468\_c40464\_g1\_i1.p1 Eukaryota-Apicomplexa-Aconoidasida-Haemosporida-Plasmodiidae-Plasmodium\_chabaudi\_XP\_016653172.1 Eukaryota-Apicomplexa-Aconoidasida-Haemosporida-Plasmodiidae-Plasmodium\_yoelii\_XP\_726536.1 Eukaryota-Chromeraceae-NA-NA-NA-Chromera\_velia\_MMETSP0290\_c31471\_g1\_i1.p1 — Eukaryota-Apicomplexa-Conoidasida-Eucoccidiorida-Sarcocystidae-Besnoitia\_besnoiti\_XP\_029221763.1 Eukaryota-Apicomplexa-Conoidasida-Eucoccidiorida-Sarcocystidae-Toxoplasma\_gondii\_XP\_002365419.1 ryota-Ciliophora-NA-Unranked-NA-Euplotes\_focardii\_MMETSP0205\_c22970\_g1\_i1.p1 ——— Eukaryota-Ciliophora-NA-Unranked-NA-Platyophrya\_macrostoma\_MMETSP0127\_c10303\_g1\_i1.p1 Eukaryota-Ciliophora-Oligohymenophorea-Hymenostomatida-Tetrahymenidae-Tetrahymena\_thermophila\_XP\_001015405.2 Eukaryota-Ciliophora-Oligohymenophorea-Peniculida-Parameciidae-Paramecium tetraurelia XP 001424339.1 — Eukaryota-Choanoflagellata-Choanoflagellata-Choanoflagellata-NA-Acanthoeca\_sp\_MMETSP0105\_c27276\_g1\_i1.p1 ———— Eukaryota-Amoebozoa-NA-NA-Paramoebidae-Neoparamoeba aestuarina MMETSP0161 c23254 g1 i1.p1 Eukaryota-Amoebozoa-NA-NA-Paramoebidae-Stygamoeba\_regulata\_MMETSP0447\_c8647\_g1\_i1.p1 tomonadales-Hemiselmidaceae-Hemiselmis\_andersenii\_MMETSP0043\_c411\_g1\_i1.p1 phyta-NA-Cryptomonadales-Hemiselmidaceae-Hemiselmis\_andersenii\_MMETSP1041\_c29940\_g1\_i1.p1 Eukaryota-Cryptophyta-NA-Pyrenomonadales-Geminigeraceae-Guillardia\_theta\_CCMP2712\_jgi159766 Eukaryota-Cryptophyta-NA-Pyrenomonadales-NA-Geminigera\_cryophila\_MMETSP0799\_c4124\_g1\_i1.p1 ——— Eukaryota-Cnidaria-Anthozoa-Actiniaria-Edwardsiidae-Nematostella vectensis XP 001617604.1 — Eukaryota-Cnidaria-Anthozoa-Scleractinia-Pocilloporidae-Stylophora pistillata XP 022809225.1 Eukaryota-Euglenida-NA-Eutreptiales-NA-Eutreptiella gymnastica MMETSP0039 c12188 g1 i1.p1 — Eukaryota-Euglenida-NA-NA-Unranked-Neobodo\_designis\_MMETSP1114\_c7976\_g1\_i1.p1 — Eukaryota-Kinetoplastida-Kinetoplastida-Kinetoplastida-Trypanosomatidae-Trypanosoma\_theileri\_XP\_028879505.1 Eukaryota-Retaria-NA-NA-NA-Sorites\_sp\_MMETSP0191\_c86268\_g1\_i1.p1 ukaryota-Ascomycota-Dothideomycetes-Capnodiales-Mycosphaerellaceae-Pseudocercospora\_fijiensis\_XP\_007929648.1 + 100 Eukaryota-Ascomycota-Pezizomycotina-Undefined-Undefined-Mycosphaerella\_fijiensis\_jgi34751 Chaetothyriales-Herpotrichiellaceae-Cladophialophora yegresii XP 007754036.1 Archaea-CandidatusKorarchaeota-NA-NA-NA-Candidatus\_Methanodesulfokores\_washburnensis\_WP\_125671439.1 — Archaea-NA-NA-NA-NA-anaerobic\_archaeon\_MKD1\_WP\_147665217.1 Eukaryota-Ascomycota-Leotiomycetes-Helotiales-NA-Phialocephala scopiformis XP 018062477.1 Eukaryota-Placozoa-NA-NA-Trichoplacidae-Trichoplax\_adhaerens\_XP\_002110145.1 ukaryota-Chordata-NA-NA-Branchiostomidae-Branchiostoma belcheri XP 019642621.1 —— Eukaryota-Echinodermata-Asteroidea-Valvatida-Acanthasteridae-Acanthaster\_planci\_XP\_022092542.1 — Eukaryota-Platyhelminthes-Cestoda-Cyclophyllidea-Taeniidae-Echinococcus\_granulosus\_XP\_024347737.1 ——— Archaea-Thaumarchaeota-NA-NA-NA-Candidatus\_Nitrosotalea\_devanaterra\_WP\_148694459.1 ———— Archaea-Thaumarchaeota-NA-NA-NA-Candidatus\_Nitrosotenuis\_cloacae\_WP\_048187104.1 ——— Archaea-Thaumarchaeota-NA-NA-NA-Thaumarchaeota\_archaeon\_N4\_WP\_048196528.1 Archaea-Thaumarchaeota-NA-NA-NA-Marine\_Group\_I\_thaumarchaeote\_SCGC\_AAA799E16\_WP\_048088682.1 Archaea-Thaumarchaeota-NA-Nitrosopumilales-Nitrosopumilaceae-Nitrosopumilus\_adriaticus\_WP\_048118777.1 — Archaea-Thaumarchaeota-NA-Nitrosopumilales-Nitrosopumilaceae-Candidatus\_Nitrosarchaeum\_limnium\_WP\_007402939.1 Eukaryota-Arthropoda-Insecta-Hymenoptera-Apidae-Apis florea XP 012339220.1 Eukaryota-Arthropoda-Insecta-Hymenoptera-Formicidae-Vollenhovia\_emeryi\_XP\_011860385.1 — Archaea-CandidatusBathyarchaeota-NA-NA-NA-Candidatus\_Bathyarchaeota\_archaeon\_WP\_116577188.1 — Archaea-CandidatusBathyarchaeota-NA-NA-NA-Candidatus Bathyarchaeota archaeon WP 119816727.1