

Species *Geocrenenecus arthurdayi*

Etymology

[ar.thur.day'i] N.L. gen. n. *arthurdayi*, of Arthur Day, named for the American geophysicist and volcanologist Dr. Arthur L. Day (1869-1960), for his seminal work in Earth sciences, particularly relating to the hot springs in Yellowstone National Park, USA

Nomenclatural type

[NCBI Assembly: GCA_023539395.1](#) ^{Ts}

Description

MAGs identified as belonging to this species were recovered from metagenomes sampled from two thermal springs in Yellowstone National Park, USA. The six MAGs for this species range between 1,530,521 bp and 1,985,835 bp, in 82-223 contigs, with a G+C content of 38.4-39.4 %. Completeness estimates were between 96.1 and 97.8 %, with 0 % contamination, based on CheckM. Phylogenomic inference based on the ar122 conserved archaeal marker set placed the species within the genus *Geocrenenecus*, in the family *Wolframiiaptoraceae*. All genomes of this species were considered conspecific based on Average Nucleotide Identity (ANI), with pairwise values >99 %. Comparisons against the closely related members of the genus resulted in pairwise values between 75 and 78 %. No homologs to known or putative tungstate or molybdate transporters were identified from any of the genomes belonging to this species. Unlike other members of the genus, no GAPOR-like tungsten-dependent ferredoxin oxidoreductase was identified in this species. One genome encoded an unknown oxidoreductase. All genomes belonging to this species encode methylmalonyl-CoA mutase (McmA1/2), indicative of potential propionate metabolism. Unlike other species in the genus, the genomes of this species lack genes encoding cytochrome c oxidase subunits, but contain genes encoding cytochrome bd ubiquinol oxidase subunit I (*cydA*), and the aerobic carbon-monoxide dehydrogenase large subunit (*coxL*). The genomes within this species does also encode a homolog of *arxA*, suggesting potential respiratory arsenate reduction.

Classification

Incertae sedis (Archaea) » “Caldarchaeales” » *Wolframiiaptoraceae* » *Geocrenenecus* » *Geocrenenecus arthurdayi*

References

Proposed: Buessecker et al., 2022

Registry URL

<https://seqco.de/i:22824>

References

1. Buessecker et al. (2022). An essential role for tungsten in the ecology and evolution of a previously uncultivated lineage of anaerobic, thermophilic Archaea. *Nature Communications*. DOI:10.1038/s41467-022-31452-8