

Kryptonium thompsonii sp. nov. gen. nov.

Submitted by Palmer, Marike

Abstract

Analysis of the increasing wealth of metagenomic data collected from diverse environments can lead to the discovery of novel branches on the tree of life. Here we analyse 5.2 Tb of metagenomic data collected globally to discover a novel bacterial phylum (*Candidatus* Kryptonina) found exclusively in high-temperature pH-neutral geothermal springs. This lineage had remained hidden as a taxonomic ‘blind spot’ because of mismatches in the primers commonly used for ribosomal gene surveys. Genome reconstruction from metagenomic data combined with single-cell genomics results in several high-quality genomes representing four genera from the new phylum. Metabolic reconstruction indicates a heterotrophic lifestyle with conspicuous nutritional deficiencies, suggesting the need for metabolic complementarity with other microbes. Co-occurrence patterns identifies a number of putative partners, including an uncultured *Armatimonadetes* lineage. The discovery of *Kryptonina* within previously studied geothermal springs underscores the importance of globally sampled metagenomic data in detection of microbial novelty, and highlights the extraordinary diversity of microbial life still awaiting discovery

Genus *Kryptonium*

Etymology

[Kryp.to'ni.um] Gr. masc. adj. *krypton*, hidden; N.L. neut. n. *Kryptonium*, a hidden life form

Nomenclatural type

Species *Kryptonium thompsonii*^{Ts}

Classification

Incertae sedis (Bacteria) » *Kryptonina* » *Kryptoniales* » *Kryptoniaceae* » *Kryptonium*

References

Proposed: Eloë-Fadrosh et al., 2016

Registry URL

<https://seqco.de/i:22836>

Species *Kryptonium thompsonii*^{Ts}

Etymology

[thomp.son'i.i] N.L. masc. gen. n. *thompsonii*, after David Thompson, explorer of the region around Dewar Creek

Nomenclatural type

[NCBI Assembly: GCA_001442925.1](#)^{Ts}

Classification

Incertae sedis (Bacteria) » *Kryptonina* » *Kryptoniales* » *Kryptoniaceae* » *Kryptonium* » *Kryptonium thompsonii*^{Ts}

References

Proposed: Eloë-Fadrosh et al., 2016

Corrigendum: Oren et al., 2020 (from “*Kryptonium thompsonii*”)

Registry URL

<https://seqco.de/i:22835>

References

1. Eloe-Fadrosh et al. (2016). Global metagenomic survey reveals a new bacterial candidate phylum in geothermal springs. *Nature Communications*. [DOI:10.1038/ncomms10476](https://doi.org/10.1038/ncomms10476)
2. Oren et al. (2020). Lists of names of prokaryotic Candidatus taxa. *International Journal of Systematic and Evolutionary Microbiology*. [DOI:10.1099/ijsem.0.003789](https://doi.org/10.1099/ijsem.0.003789)

Register List Certificate of Validation

On behalf of the *Committee on the Systematics of Prokaryotes Described from Sequence Data* (SeqCode Committee), we hereby certify that the Register List seqco.de/r:jvapsuy2 submitted by **Palmer, Marike** and including 2 new names has been successfully validated.

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