

## Order *Atabeyarchaeales*

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### Etymology

[A.ta.be.y.ar.chae.a'les] **N.L. neut. n.** *Atabeyarchaeum*, referring to the type genus *Atabeyarchaeum*; *-ales*, ending to denote an order; **N.L. fem. pl. n.** *Atabeyarchaeales*, the *Atabeyarchaeum* order

### Nomenclatural type

Genus *Atabeyarchaeum*

### Description

Based on protein content and compositional features, we infer that *Atabeyarchaeia* is a non-methanogenic acetogenic chemoheterotroph, with potential to grow lithoautotrophically by using H<sub>2</sub> as an electron donor. Phylogenetic analyses using several sets of marker genes placed two complete genomes in a monophyletic group within the Asgard clade as a sister group to *Freyarchaeia*. We performed phylogenetic analyses using concatenated marker sets of 47 archaeal clusters of orthologous genes (arCOGs) and 15 ribosomal protein (RP15) gene cluster, as well as the 16S rRNA gene. The new genomes share only 40–45% AAI when compared to other Asgard genomes, consistent with their assignment to a new phylum. Although our analyses provide evidence for distinction at the phylum level, we chose to adhere to the Genome Taxonomy Database (GTDB) for standardized microbial genome nomenclature. We establish a robust classification and propose *Atabeyarchaeum* as the type genus for the family *Atabeyarchaeaceae*, the order *Atabeyarchaeales*, the class *Atabeyarchaeia* with the *Asgardarchaeota* phylum.

### Classification

*Archaea* » *Asgardarchaeota* » *Atabeyarchaeia* » *Atabeyarchaeales*

### References

Effective publication: Valentin-Alvarado et al., 2024 [1]

### Registry URL

<https://seqco.de/i:48234>

## References

1. Valentin-Alvarado et al. (2024). Asgard archaea modulate potential methanogenesis substrates in wetland soil. *Nature Communications*. DOI:[10.1038/s41467-024-49872-z](https://doi.org/10.1038/s41467-024-49872-z)