Methanocrinis harundinaceus gen. nov. sp. nov., Methanocrinis alkalitolerans sp. nov., and Methanocrinis natronophilus sp. nov.

Submitted by Merkel, Alexander

Genus *Methanocrinis*

Etymology

[Me.tha.no.cri'nis.] **N.L. neut. n.** *methanum*, methane; **L. masc. n.** *crinis*, hair; **N.L. masc. n.** *Methanocrinis*, methane (-producing) hair

Nomenclatural type

Species *Methanocrinis harundinaceus*[Ts]

Description

Description of *Methanocrinis* gen. nov.

Methanocrinis (Me.tha.no.cri'nis. N.L. neut. n. *methanum*, methane; L. masc. n. *crinis*, hair; N.L. masc. n. *Methanocrinis*, methane (-producing) hair).

Straight, rod-shaped cells with flat ends, non-motile. Organotrophic, obligate aceticlastic methanogens converting acetate into methane and CO2. Represented by neutrophilic and alkaliphilic species. Separation of the genus is justified by its distinct genome-based phylogenetic position.

The type species is *Methanocrinis harundinaceus*.

Classification

Archaea » “Euryarchaeota” » *Methanomicrobia* » *Methanosarcinales* » *Methanotrichaceae* » *Methanocrinis*

References

Effective publication: Khomyakova et al., 2023 [1]

Registry URL

https://seqco.de/i:32310

Species *Methanocrinis harundinaceus*[Ts]

Etymology

[ha.run.di.na'ce.us.] **L. masc. adj.** *harundinaceus*, like a reed, referring to the cell shape of a reed stem

Nomenclatural type

NCBI Assembly: GCF_000235565.1 [Ts]

Reference Strain

6Ac

Description

Renaming *Methanosaeta harundinacea* (Ma et al., 2006) according to Khomyakova et al., 2023.

Classification

Archaea » “Euryarchaeota” » *Methanomicrobia* » *Methanosarcinales* » *Methanotrichaceae* » *Methanocrinis* » *Methanocrinis harundinaceus*[Ts]

References

Effective publication: Khomyakova et al., 2023 [1]
Assigned taxonomically: Khomyakova et al., 2023 [2]

Registry URL

https://seqco.de/i:33292

Species *Methanocrinis natronophilus*

Etymology

[na.tro.no.phi'lus.] **N.L. pref.** *natrono-*, pertaining to soda; **N.L. masc.** *philus*, friend, loving; **N.L. masc. adj.** *natronophilus*, soda-loving

Nomenclatural type

NCBI Assembly: GCA_029167045.1 [Ts]

Reference Strain

Mx

Description

Cells are non-motile, rod-shaped, 1.9–4.8 x 0.6–1.0 µm. Forms multicellular filaments in a common sheath. Forms methane exclusively from acetate by the aceticlastic pathway. Obligately alkaliphilic with the pH range for growth from 7.5–7.8 to 10.2 (optimum at 9.3–9.5). NaCl is not required for growth, but up to 1 M total Na+ in the form of sodium carbonates is tolerated. The nongrowing cells still actively produce methane at pH up to 10.5 and 1.5 M total Na+. Ammonium serves as the nitrogen source. Optimal growth temperature is 35oC. Yeast extract is not essential for growth but slightly stimulatory. The complete genome of strain MxTs, available under the GenBank assembly accession number (GCA_029167045) is the designated nomenclatural type for the species and was recovered from an enrichment culture, cultivated on acetate and established from a saline soda lake, in southwestern Siberia, Russia. The genome of the type strain is 2.41 Mb with the G+C content of 58.18 mol%. Completeness is estimated by CheckM at 97.04% with 0.00% contamination. The GenBank accession number for the 16S rRNA gene sequence of MxTs is KP205578.

Classification

Archaea » "Euryarchaeota" » *Methanomicrobia* » *Methanosarcinales* » *Methanotrichaceae* » *Methanocrinis* » *Methanocrinis natronophilus*

References

Effective publication: Khomyakova et al., 2023 [1]

Registry URL

https://seqco.de/i:32311

Species *Methanocrinis alkalitolerans*

Etymology

[al.ka.li.to'le.rans.] **N.L. neut. n.** *alkali*, alkali; **L. pres. part.** *tolerans*, tolerating; **N.L. part. adj.** *alkalitolerans*, tolerating high alkalinity

Nomenclatural type

NCBI Assembly: GCA_029167205.1 [Ts]

Reference Strain

M04Ac

Description

Cells are non-motile, rod-shaped, 1.7–6.5 µm in length and 0.9–1.5 µm in diameter. Can form polar pili/fimbriae-like structures of unknown nature on the surface of the cell. Filaments are formed after long incubation times. Growth occurs at 20–45°C (optimum, 37 °C) and at pH 7.5–10.0 (optimum 9.0); the presence of NaCl is not required. Yeast extract is not essential for growth, but highly stimulatory. Utilizes acetate for methane production. No growth or CH4 formation is observed on H2/CO2, formate, carbon monoxide and methanol. The complete genome of strain M04AcTs, available under the GenBank assembly accession number (GCA_029167205) is the designated nomenclatural type for the species and was recovered from an enrichment culture, cultivated on acetate and established from a terrestrial mud volcano at the Taman Peninsula, Russian Federation. The genome is characterized by a size of 2.44 Mb and a G+C content of 58.31 mol%. Completeness is estimated by CheckM at 99.84% with 0.00% contamination. The GenBank accession number for the 16S rRNA gene sequence of M04AcTs is OQ918309.

Classification

Archaea » "Euryarchaeota" » *Methanomicrobia* » *Methanosarcinales* » *Methanotrichaceae* » *Methanocrinis* » *Methanocrinis alkalitolerans*

References

Effective publication: Khomyakova et al., 2023 [1]

Registry URL

https://seqco.de/i:32309

References

1. Khomyakova et al. (2023). Phenotypic and genomic characterization of Bathyarchaeum tardum gen. nov., sp. nov., a cultivated representative of the archaeal class Bathyarchaeia. *Frontiers in Microbiology*. DOI:10.3389/fmicb.2023.1214631
2. Khomyakova et al. (2023). Phenotypic and genomic characterization of the first alkaliphilic aceticlastic methanogens and proposal of a novel genus Methanocrinis gen.nov. within the family Methanotrichaceae. *Frontiers in Microbiology*. DOI:10.3389/fmicb.2023.1233691

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:gyelqp06** submitted by **Merkel, Alexander** and including 4 new names has been successfully validated.

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