

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

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Table 1: Complete list of names proposed in the current register list.

Proposed Taxon	Etymology	Description	Parent Taxon	Type	Registry URL
Genus <i>Methanocrinis</i>	[Me.tha.no.cri'nis.] N.L. neut. n. <i>methanum</i> , methane; L. masc. n. <i>crinis</i> , hair; N.L. masc. n. <i>Methanocrinis</i> , methane (- producing) hair	Description of <i>Methanocrinis</i> gen. nov.  <i>Methanocrinis</i> (Me.tha.no.cri'nis. N.L. neut. n. <i>methanum</i> , methane; L. masc. n. <i>crinis</i> , hair; N.L. masc. n. <i>Methanocrinis</i> , methane (-producing) hair).  Straight, rod-shaped cells with flat ends, non-motile. Organotrophic, obligate acetoclastic methanogens converting acetate into methane and CO <sub>2</sub> . Represented by neutrophilic and alkaliphilic species. Separation of the genus is justified by its distinct genome-based phylogenetic position.  The type species is <i>Methanocrinis harundinaceus</i> .	<i>Methanotrichaceae</i>	<i>Methanocrinis harundinaceus</i> <sup>Ts</sup>	<a href="https://seqco.de/i:32310">seqco.de/i:32310</a>
Species <i>Methanocrinis harundinaceus</i> <sup>Ts</sup>	[ha.run.di.na'ce.us.] L. masc. adj. <i>harundinaceus</i> , like a reed, referring to the cell shape of a reed stem	Renaming <i>Methanosaeta harundinacea</i> (Ma et al., 2006) according to <a href="#">Khomyakova et al., 2023</a> .	<i>Methanocrinis</i>	NCBI Assembly: GCF_000235565.1 <sup>Ts</sup>	<a href="https://seqco.de/i:33292">seqco.de/i:33292</a>

Proposed Taxon	Etymology	Description	Parent Taxon	Type	Registry URL
Species <i>Methanocrinis natronophilus</i>	[na.tro.no.phi'lus.] <b>N.L. pref.</b> <i>natrono-</i> , pertaining to soda; <b>N.L. masc. philus</b> , friend, loving; <b>N.L. masc. adj.</b> <i>natronophilus</i> , soda-loving	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 <sup>+</sup> 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 <sup>+</sup> . Ammonium serves as the nitrogen source. Optimal growth temperature is 35°C. 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.	<i>Methanocrinis</i>	NCBI Assembly: GCA_029167045.1 Ts	<a href="https://seqco.de/i:32311">seqco.de/i:32311</a>
Species <i>Methanocrinis alkalitolerans</i>	[al.ka.li.to'le.rans.] <b>N.L. neut. n. alkali</b> , alkali; <b>L. pres. part. tolerans</b> , tolerating; <b>N.L. part. adj. alkalitolerans</b> , tolerating high alkalinity	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 CH <sub>4</sub> formation is observed on H <sub>2</sub> /CO <sub>2</sub> , 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.	<i>Methanocrinis</i>	NCBI Assembly: GCA_029167205.1 Ts	<a href="https://seqco.de/i:32309">seqco.de/i:32309</a>