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Family

Proteobacteria/Gammaproteobacteria/Thiohalomonadales/

Thiohalomonadaceae fam. nov.

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Thi.o.ha.lo.mo.nad.a.ce'ae N.L. fem. n. *Thiohalomonas*, the type genus of the family, *-aceae* ending to denote a family; N.L. fem. pl. n. *Thiohalomonadaceae* the *Thiohalomonas* family.

The family *Thiohalomonadaceae* accommodates facultatively anaerobic, chemolithoautotrophic sulfur-oxidizing bacteria. They utilize reduced sulfur compounds as the energy source and either oxygen or NO*x* as the electron acceptors. CO_2 is assimilated via the Calvin–Benson–Bassham cycle. The family is a member of the order *Thiohalomonadales* in the *Gammaproteobacteria* and consists of the genera *Thiohalomonas* and *Sulfurivermis*. The family-level status was established by phylogenomic analysis based on 120 single-copy conserved protein markers.

DNA G + C content (mol %): 58–65 (T_m of 3 species).

Type genus: **Thiohalomonas** Sorokin et al. 2007[VP].

The previously unaffiliated genus *Thiohalomonas* and the genus *Sulfurivermis*, originally classified as a member of the family *Thioprofundaceae*, are proposed to be (re)classified in a novel family *Thiohalomonadaceae* on the basis of phylogenomic analysis This family, together with a novel family *Thiohalophilaceae*, form a deeply branching phylogenetic lineage in the *Gammaproteobacteria* that is proposed to be classified in a new order *Thiohalomonadales*. The family *Thiohalomonadaceae* includes facultatively anaerobic, moderately halophilic (*Thiohalomonas*) and freshwater (*Sulfurivermis*), obligately autotrophic bacteria utilizing reduced sulfur compounds as the energy source and fixing CO_2 via the Calvin–Benson–Bassham cycle. They grow either aerobically or by sulfur-dependent denitrification. Cells are motile rods with the Gram-negative type of cell wall. Based on its genome sequence, ectoine serves as a compatible solute. The family includes two genera. The genus *Thiohalomonas* from hypersaline habitats consists of two species, the type species *Thiohalomonas denitrificans* with multiple isolates capable of complete denitrification of nitrate to N_2 and a single-strain species *Thiohalomonas nitratireducens* capable of partial anaerobic nitrate respiration to nitrite (Sorokin, 2008; Sorokin et al., 2006, 2007, 2020). The genus *Sulfurivermis* originated from a hot freshwater spring and currently includes a single species *Sulfurivermis fontis* (Kojima et al., 2017; Watanabe et al., 2019).

DNA G + C content (mol %): 58–65 (T_m of 3 species).

Type genus: **Thiohalomonas** Sorokin et al. 2007[VP].

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