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**Publication date** 2022 **Document Version** 

Final published version Published in Bergey's Manual of Systematics of Archaea and Bacteria

# Citation (APA)

Sorokin, D. Y., & Merkel, A. Y. (2022). Dethiobacteraceae fam. nov. In W. B. Whitman (Ed.), *Bergey's Manual of Systematics of Archaea and Bacteria* (pp. 1-2). John Wiley & Sons.

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# Dethiobacteraceae fam. nov.

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De.thi'o.bac.ter.a.ce.a.e. N.L. masc. n. *Dethiobacter*, the type genus of the family; L. fem. pl. n. suff. *-aceae*, ending to denote a family; N.L. fem. pl. n. *Dethiobacteraceae*, the family of the genus *Dethiobacter*.

The family *Dethiobacteraceae* includes obligately anaerobic, moderately salt-tolerant, and obligately alkaliphilic bacteria able to grow chemolithoautotrophically by elemental sulfur disproportionation and fixing  $CO_2$  by the Wood-Ljungdahl pathway. The two strains currently known in pure culture are both isolated from saline soda lakes. H<sub>2</sub> can serve as an additional electron donor for sulfur and thiosulfate reduction. The family consists of a single genus *Dethiobacter* with the type species *Dethiobacter alkaliphilus*.

DNA G + C content (%): 48.3–48.5 (genomes of two isolates).

*Type genus*: **Dethiobacter** Sorokin et al. 2008, VL123.

The family *Dethiobacteraceae* includes strictly anaerobic bacteria with cells as short motile rods, occasionally forming round terminal endospores, and with the Gram-positive type of cell wall. The main metabolism is chemolithoautotrophy using elemental sulfur disproportionation for energy generation and the Wood–Ljungdahl pathway for autotrophic carbon dioxide fixation (Sorokin et al., 2008; Poser et al., 2013; Melton et al., 2017). In contrast to the neutrophilic sulfur-disproportionating bacteria, alkaliphilic *Dethiobacter* can grow by sulfur disproportionation without addition of Fe(III). The type species Dethiobacter alkaliphilus can use H<sub>9</sub> as the electron donor for anaerobic sulfur and thiosulfate respiration (Sorokin et al., 2008). A second, yet undescribed, strain Z-1002 was enriched and isolated with ferrihydrite as the electron acceptor and formate as the electron donor (Zavarzina et al., 2018). This isolate has 99.6% identity of its 16S rRNA gene sequence to the type species. Both strains are moderately salt-tolerant, obligate alkaliphiles. The family currently consists of a monospecific genus Dethiobacter with the type species D. alkaliphilus  $AHT1^{T}$  isolated from a Mongolian soda lake. The second isolate, strain Z-1002, was obtained from the hypersaline soda lake Magadi in Kenya. Dethiobacteraceae is currently the only family of the order Dethiobacterales in the class Dethiobacteria as established by the phylogenomic analysis based on 120 single-copy conserved proteins.

DNA G + C content (%): 48.3–48.5 (genomes of two isolates).

Type genus: Dethiobacter Sorokin et al. 2008, VL123.

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