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Firmicutes D/Dethiobacteria/

Dethiobacterales ord. nov.

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De.thi'o.bac.ter.a.les. N.L. masc. n. *Dethiobacter*, the type genus of the order; L. fem. pl. n. suff. *-ales*, ending to denote an order; N.L. fem. pl. n. *Dethiobacterales*, the order of the genus *Dethiobacter*.

The order *Dethiobacterales* is the only order of the class *Dethiobacteria*, which forms a deep-branching phylogenetic lineage within the phylum "*Firmicutes D.*" It consists of a single family *Dethiobacteraceae* and genus *Dethiobacter*, whose members are haloalkaliphilic anaerobes with a respiratory metabolism.

The order *Dethiobacterales* includes obligately anaerobic, spore-forming bacteria found exclusively in soda lakes. They are moderately salt-tolerant obligate alkaliphiles growing chemolithoautotrophically with elemental sulfur, thiosulfate, or Fe(III) as electron acceptors. Elemental sulfur can be disproportionated or used as an electron acceptor, with H₂ as the electron donor, while Fe-dependent respiration is possible with formate as the electron donor. *Dethiobacterales* is the only order of the class *Dethiobacteria*, and it includes a single family *Dethiobacteraceae* and genus *Dethiobacter*. The genus is currently represented by two pure culture isolates: the type strain AHT1^T (sulfur disproportionating) of the type species *Dethiobacter alkaliphilus* (Sorokin et al., 2008; Poser et al., 2013) from Mongolian soda lakes and an unde-

scribed (Fe-reducing) strain Z-1002 from soda Lake Magadi in Kenya (Zavarzina et al., 2018), which is closely related to the type strain. The order was established on the basis of phylogenomic analysis of the type species.

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

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