

***Culicoidibacter larvae* gen. nov., sp. nov., from the gastrointestinal tract of the biting midge (*Culicoides sonorensis*) larva, belongs to a novel lineage *Culicoidibacteraceae* fam. nov., *Culicoidibacterales* ord. nov. and *Culicoidibacteria* classis nov. of the phylum *Firmicutes*.**

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Abstract

Strain CS-1T, a novel facultative anaerobic bacterium, was isolated from the larval gastrointestinal tract of the biting midge, *Culicoides sonorensis*, a vector of the epizootic haemorrhagic disease virus and the bluetongue virus. Cells were Gram-stain-positive, non-motile, non-spore-forming, pleomorphic rods. Optimal growth occurred at pH 7.5 and 37 °C. The G+C content of the genomic DNA was 38.3 mol%, estimated by using HPLC. The dominant cellular fatty acids were C14 : 0 (45.9 %) and C16 : 0 (26.6 %). The polar lipid profile comprised glycolipids,

diphosphatidylglycerol, phospholipids and phosphoglycolipids. Respiratory quinones were not detected. Strain CS-1T had very low 16S rRNA gene similarity to members of the phylum Firmicutes: *Macrococcus canis* KM45013T (85 % similarity) and *Turicibacter sanguinis* MOL361T (88 % similarity). Phylogenetic analysis based on 16S rRNA, *rpoB*, *gyrB* genes, and conserved protein sequences of the whole genome revealed that strain CS-1T was related to members of the classes Bacilli and Erysipelotrichia within the phylum Firmicutes. Furthermore, average nucleotide identity and digital DNA-DNA hybridization analyses of the whole genome revealed very low sequence similarity to species of Bacilli and Erysipelotrichaceae (*Macrococcus canis* KM45013T and *Turicibacter* sp. H121). These results indicate that strain CS-1T belongs to the phylum Firmicutes and represents a new species of a novel genus, family, order and class. Based on the phenotypic, chemotaxonomic, phylogenetic and genomic characteristics, we propose the novel taxon *Culicoidibacter larvae* gen. nov., sp. nov. with the type strain CS-1T (=CCUG 71726T=DSM 106607T) within the hereby new proposed novel family Culicoidibacteraceae fam. nov., new order Culicoidibacaterales ord. nov. and new class Culicoidibacteria classis nov. in the phylum Firmicutes.

Beteiligte Forschungseinheiten

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