

Aerobic growth of *Anoxybacillus pushchinoensis* K1^T: emended descriptions of *A. pushchinoensis* and the genus *Anoxybacillus*

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In this work, corrections are made to the descriptions of the species *Anoxybacillus pushchinoensis* corrig. and the genus *Anoxybacillus*. Experiments to determine the relationship of *A. pushchinoensis* K1^T to oxygen showed that it was capable of aerobic growth, but preferred to grow anaerobically. During aerobic growth, the redox indicator resazurin was reduced as a result of hydrogen gas production. The facultatively anaerobic nature of K1^T was ascertained by cultivation in aerobic liquid medium, where growth began at the bottom of the tube. The anaerobic nature of K1^T was also indicated by a negative catalase reaction. This work is submitted to correct the description of the species *A. pushchinoensis* from obligate anaerobe to aerotolerant anaerobe and to emend the description of the genus *Anoxybacillus* from obligate anaerobes or facultative anaerobes to aerotolerant anaerobes or facultative anaerobes.

When *Anoxybacillus pushchinoensis* corrig. strain K1^T (= DSM 12423^T = ATCC 700785^T = VKM B-2193^T) was deposited at the American Type Culture Collection, it was determined during the authentication procedure that this strain could grow aerobically. Strain K1^T is a catalase-negative, obligately alkaliphilic and moderately thermophilic bacterium with a fermentative type of metabolism that is able to utilize a number of carbohydrates, including starch (Pikuta *et al.*, 2000). Growth of strain K1^T under aerobic conditions in *Anoxybacillus* broth (ANX; ATCC medium 2273 without sodium sulfite) was initiated from the bottom of the tube; during growth, resazurin was reduced as result of hydrogen gas formation. Unlike *Anoxybacillus flavithermus* d.y.^T (Heinen *et al.*, 1982), *A. pushchinoensis* K1^T did not form pigmented (orange) colonies when cultivated on agar either aerobically or anaerobically, suggesting a lack of carotenoids. Furthermore, when strain K1^T was grown in trypticase soy broth (TSB; ATCC medium 18) and used as the inoculum for TSB and ANX media either aerobically or anaerobically, no growth occurred in media of neutral or alkaline pH. However, when this culture was grown in ANX medium and used to inoculate TSB and ANX media, it grew both aerobically and anaerobically. Best growth was achieved in ANX medium at pH 9.0–9.7. Growth in TSB at neutral pH was scant and the organism died after one passage.

On the basis of the data reported here, we suggest the

following corrections to the descriptions of the species *A. pushchinoensis* and the genus *Anoxybacillus*. The description of the species *A. pushchinoensis* should be emended to aerotolerant anaerobe and that of the genus *Anoxybacillus* should be emended to aerotolerant anaerobes and facultative anaerobes.

Emended description of the genus *Anoxybacillus* Pikuta *et al.* 2000

Anoxybacillus (An.ox.y.ba.cil'us. Gr. pref. *an* without; N.L. n. *oxygenium* oxygen; L. masc. n. *bacillus* small rod; N.L. masc. n. *Anoxybacillus* small rod that lives without oxygen).

Cells are rod-shaped and straight with rounded ends, 0.4–0.85 × 2.5–5.0 μm, often arranged in pairs or chains and Gram-positive. Endospores are terminal, round and resistant to heating and freezing. There is only one spore per cell. Oxygen and catalase reactions are variable: aerotolerant anaerobes or facultative anaerobes. Alkaliphilic or alkalitolerant and thermophilic. Chemo-organotrophic, with a fermentative metabolism. DNA G+C content is 42–57 mol%. The genus currently includes *A. pushchinoensis*, *A. flavithermus* and *Anoxybacillus gonensis* (Belduz *et al.*, 2003). The type species is *A. pushchinoensis*.

Emended description of *Anoxybacillus pushchinoensis* corrig. Pikuta *et al.* 2000

Aerotolerant anaerobe.

References

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