Isolation and Characterization of *Methanobacterium formicicum* MF

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The isolation and characteristics of *Methanobacterium formicicum* MF (DSM 863), accomplished in 1966 by M. P. Bryant, are described.

We report the isolation of strain MF, isolated in 1966 by one of us (M.P.B.). This strain has been widely distributed as a reference strain for *Methanobacterium formicicum* and was proposed by Balch et al. (1) as the neotype strain. It has also been proposed as such in a Request for Opinion (2).

Anaerobic techniques were those of Hungate (3). Medium (4) contained 5% (vol/vol) clarified rumen fluid, B vitamins, minerals, and bicarbonate-carbon dioxide buffer at pH 7.0; the gas phase was normally H₂-CO₂ (4:1). Roll-tube medium and slant medium contained 20 and 10 g, respectively, of Bacto-Agar (Difco Laboratories) per liter. A liquid sample (approximately 1 liter) was obtained from a domestic sewage sludge digester in Urbana, Ill., and immediately brought to the laboratory. A subsample was serially diluted in liquid medium and inoculated into roll-tube medium. After 7 days of incubation at 37°C, white to gray, filamentous colonies were observed. Surface colonies were flat, and subsurface colonies were filamentous spheroids. A typical colony was picked with a platinum-iridium needle and inoculated into slant medium by stabbing. After growth, the culture was used to inoculate roll-tube medium. A single colony type was observed; one colony was picked, reinoculated onto slant medium, and named strain MF.

Strain MF grew and produced CH₄ from H₂ and CO₂. When H₂ was replaced by N₂, no growth or methanogenesis occurred unless formate (50 mM) was added. Cells were crooked, gram-positive rods, 0.5 μm wide and 2 to 15 μm long, occurring as single cells with some chains and filaments. Cells grew well at 37 and 45°C but not at 55°C.

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LITERATURE CITED


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