LACTOBACILLUS ACIDOPHILUS (MORO) COMB. NOV.

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ABSTRACT. The name Lactobacillus acidophilus has never been validly published. Because it has been widely used for many years, the name is here proposed as a new combination (Lactobacillus acidophilus (Moro) comb. nov.). A description of the species is furnished. ATCC 4356 is designated as the neotype strain.

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Moro (1900) described an organism which he named Bacillus acidophilus. Unfortunately, the description is so incomplete that it does not permit the identification with certainty of the species with any of the bacterial species recognized today. However, it is possible that the organism Moro described was one which might be considered as being Lactobacillus acidophilus as the species is usually defined. It is evident that the organism described was not Microbacterium lacticum Orla-Jensen: it developed better under anaerobic conditions and grew scantily on the surface of agar in aerobic culture. Orla-Jensen et al. (1936) and Orla-Jensen (1943) report that the culture of Bacillus acidophilus received from the Král Collection was Microbacterium lacticum Orla-Jensen, and Rogosa et al. (1953), who also studied the Král strain, confirmed this. Moro's original strain probably has been lost, and another bacterium (perhaps a contaminant) has been kept under the old label. Moro also emphasized that B. acidophilus was different from the obligate anaerobe "Bacillus bifidus communis." Bacillus acidophilus could be isolated from babies fed on human or cow's milk and from older children. Nothing in his meager description contains anything which would disagree with the more complete one given below for Lactobacillus acidophilus.

Holland (1920) moved Moro's species from the genus Bacillus and placed it in Lactobacillus. No description or reference to a previous description accompanied the new name, and there was no indication that a new name or combination was ever proposed. Thus the name cannot be considered validly published. Bergey's Manual (1st edition, 1923) gave the name as Lactobacillus acidophilus (Moro) without citing the author of the combination. It cannot be considered as validly published by Bergey et al. This is furthermore substantiated by the fact that the 2nd (1925), 3rd (1930), 4th (1934), 5th (1939), 6th (1948) and 7th (1957) editions of Bergey's Manual all cited Holland as the author of L. acidophilus.

Because the name has gained wide usage but has never been validly published, we propose the name Lactobacillus acidophilus (Moro) comb. nov. (Basionym: Bacillus acidophilus Moro 1900) for the bacterium having the general characteristics of the genus Lactobacillus and the following description:

Gram-positive, nonsporulating rod. The colonies on trypticase-glucose-agar are rough, showing fuzzy outlines.

Forms DL lactic acid, is homofermentative, usually curdles milk, but at times very slowly, and usually forms between 1.0-1.9% lactic acid.

Nutritional requirements are complex; needed are amino acids and growth factors: pantothenic acid, riboflavin, and niacin. Thiamin not needed.

Catalase negative.

Does not develop below 16°C and frequently above 20°C only; upper limit varies with the strain, some have a limit about 45°C, others may grow at 48°C.

Ferments: Fructose, glucose, mannose, galactose, sucrose, trehalose, maltose, cellobiose, lactose.

Does not ferment: Rhamnose, sorbose, melezitose, starch, glycerol, sorbitol, mannitol, inositol.

Does not form gas from glucose.

Splits esculin; does not form ammonia from arginine.

Habitat: intestinal tract of mammals and fowls.

The description here furnished corresponds very closely to the ones offered by Orla-Jensen et al. (1936), Orla-Jensen (1943), Rogosa et al. (1953), Rogosa and Sharpe (1959) and Efthymiou and Hansen (1962). However, Orla-Jensen used the illegitimate synonym Thermobacterium intestinale for this organism; nevertheless there is no doubt that he considered the bacterium thus named to be identical with what is now regarded as L. acidophilus. Following the recommendation of the International Subcommittee on the Taxonomy of the Lactobacilli and Closely Related Organisms, ATCC 4356 is designated as the neotype strain for Lactobacillus acidophilus (Moro) comb. nov. For a description of the neotype strain, see Type Strains of Lactobacillus Species, American Type Culture Collection, Rockville, Md. (U.S.A.), 1968, p. 54.

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