Genus Lactobacillus

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Lactobacilli are saprophytes in vegetable and animal material (e.g. milk). Some species are common animal and human commensals inhabiting the oral cavity and other parts of the body. They have the ability to tolerate acidic environments and hence are believed to be associated with the carious process.

The taxonomy of lactobacilli is complex. They are characterized into two main groups: **homofermenters**, which produce mainly lactic acid (65%) from glucose fermentation (e.g. *Lactobacillus casei*), and **heterofermenters**, which produce lactic acid as well as acetate, ethanol and carbon dioxide (e.g. *Lactobacillus fermentum*). *L. casei* and *Lactobacillus rhamnosus*, *Lactobacillus acidophilus* and the newly described species, *Lactobacillus oris*, are common in the oral cavity

Habitat and transmission

Lactobacilli are found in the oral cavity, gastrointestinal tract and female genital tract. In the oral cavity, they constitute less than 1% of the total flora.

Characteristics

Gram-positive coccobacillary forms (mostly bacillary), α- or non-haemolytic, facultative anaerobes non spore forming. These organisms ferment carbohydrates to form acids (i.e. they are **acidogenic**) and can survive well in acidic milieu (they are **aciduric**); they may be homofermentative or heterofermentative. The question as to whether they are present in carious lesions because they prefer the acidic environment, or whether they generate an acidic milieu and destroy the tooth enamel, has been debated for years.

Lactobacilli are also major constituents of the vaginal flora and help maintain its low pH equilibrium. Recently, the beneficial role of lactobacilli in maintaining the homoeostasis of the intestinal flora has been recognized, and lactobacillus-laced' food items have gained popularity among the health-conscious public.

Culture and identification

Lactobacilli grow under microaerophilic conditions in the presence of carbon dioxide and at acidic pH (6.0). Media enriched with glucose or blood promote growth. A special selective medium, tomato juice agar (pH 5.0), rogosa agar promote the growth of lactobacilli while suppressing other bacteria. Identification is by biochemical reactions.

Pathogenicity

Lactobacilli cause

- Dental caries
- Bacterial vaginosis

Lactobacilli and carious lesions

Lactobacilli are frequently isolated from deep carious lesions where the pH tends to be acidic. Indeed, early workers believed that lactobacilli were the main cariogenic agent (a theory that has been disproved), so much so that the number of lactobacilli in saliva (the **lactobacillus count**) was taken as an indication of an individual's caries activity (Caries test). Although this test is not very reliable, it is useful for monitoring the dietary profile of a patient because the level of lactobacilli correlates well with the intake of dietary carbohydrate.

TREATMENT

Lactobacilli are sensitive to penicillin clindamycin and erythromycin

POBIOTICS

Commercial preparations of lactobacilli are used as probiotics to restore normal flora after the imbalance created by antibiotic therapy.

- *Lactobacillus acidophilus* has been used in alternative medicine as a likely effective aid in treating diarrhea in children with rotavirus.
- ***Lactobacillus acidophilus*** has been used in alternative medicine as a possibly effective aid (in children or adults) in preventing diarrhea caused by antibiotics, travel, chemotherapy, or hospitalization. Lactobacillus acidophilus is also possibly effective in treating irritable bowel syndrome, bacterial vaginal infection, colic in babies, lung infections in children, skin problems in children who are allergic to milk, and other conditions.
- *Lactobacillus acidophilus* has also been used to treat lactose intolerance, Crohn's disease, overgrowth of bacteria in the intestines, or vaginal yeast infections caused by antibiotics.