

Probiotic Bacteria Present in Milk

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ABSTRACT

The most probiotic bacteria are *Lactobacillus* strains, it was isolated from the milk and milk products. It was isolated from the milk by biochemical test. Probiotic are live microorganisms. The initial stage in the selection of suitable probiotics to identify bacteria. The lactic acid bacteria is the probiotic bacteria, its species *Lactobacillus spp.* is isolated and identified by catalase test and Gram's staining. The *Bifidobacteria* is also probiotic bacteria. The aim of this study is to identify and isolated the probiotic bacteria from the milk. Many strains of probiotic bacteria was isolated from the milk and milk products. The probiotic bacteria are beneficial bacteria for the human health. Probiotic bacteria is a health promoting indigenous bacteria. The natural defense systems of the body are improved by the probiotic organisms. The probiotic bacteria are used to reduced the risk related to the immune mediated diseases, like atopic diseases. The probiotic bacteria also have harmful for our body. When consumed the high amount of probiotic, then the some people are suffering from gas, bloating, and other mild digestive.

KEYWORDS

Probiotic bacteria, *Lactobacillus spp.* , *Bifidobacterium spp.* , Milk, Milk products, Supplement.

INTRODUCTION

History of probiotic bacteria

In 1953, German chemist Werner Kollath coined the term *probiotic* (from the latin *pro* and the greek *bios*, which literally means "for life"). "Active substances that are necessary for life's healthy development", the Lilly and Stillwell coined the phrase in 1965 to represent the substances secreted by one organism which are promote the growth of another.(1)

Table:1 :- discovery of probiotic bacteria,

1965	Lilley et al.	Coined – Probiotic
1980	Johnson et al	Identified 6 phylogenetic groups of L.acidophilus
1991	Henry Tissier	First to isolate a. Bifidobacterium
1991	Holocobh et al.	Introduced it as probiotic

Probiotic bacteria, or health promoting indigenous bacteria, make up a large percentage of the human gut microbiota, whose composition is influenced by diet. Probiotic bacteria are commonly used as dietary supplements, but they can also be found as live microflora in the gut.(2) Although the term ‘probiotic’ was first used in relation to feed supplements in 1974, live microbial feed supplements have a long history. The fermented milks mentioned in the old testament were perhaps the first foods to include living bacteria. There is also evidence from wall painting dating back to 2500 B.C. that the Sumerians were in the habit of inoculating milk to induce fermentation. (3) *Probiotics* are live, non-pathogenic microorganisms that enter the human body through nutrition, live while passing through the gastrointestinal tract, and are good to one's health. In recent years, they have gained popularity as a means of boosting human health through diet.(4)

Probiotic bacteria

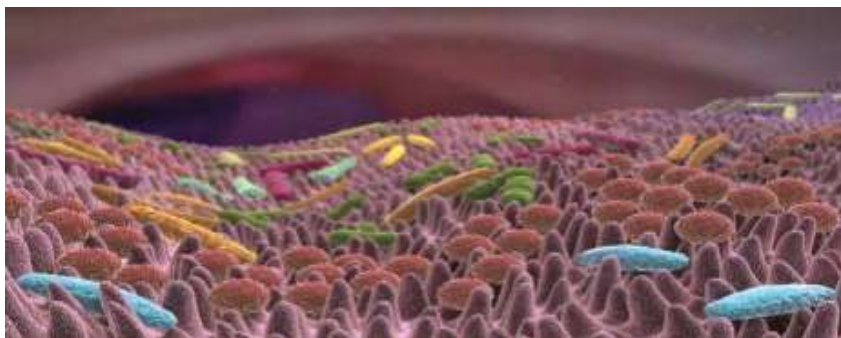


Figure:1:- Probiotic bacteria,

Probiotic bacteria are widely utilized as the active ingredient in functional foods like bio-yoghurts and dietary supplement, and the health advantages attributed to probiotic bacteria in the literature can be classified as either nutritional or therapeutic effects. Their involvement in raising the bioavailability of calcium, zinc, iron, manganese, copper, and phosphorus, as well as increasing the digestion of protein in yoghurt and vitamin synthesis in yoghurt, are all nutritional benefits.(5) Probiotic bacteria are described as live bacteria that have a favourable influence on the host's health, whether in a single mixed culture. The most commonly employed probiotic in the dairy sector are lactic acid bacteria, while certain Bifidobacteria and yeasts are also used. The genera *Lactobacillus*, *Leuconostoc*, *Pediococcus*, and *Lactobacillus* are now classified as lactic acid bacteria (LAB). Although various *Streptococcus* and *Enterococcus* strains have LAB-like qualities, *Streptococcus thermophilus* is currently the only strain employed in fermented dairy product.(6) Bacteria strains must meet criteria to be classified as probiotics, including the ability to thrive in the gastrointestinal tract. In the small and large intestines, Bifidobacterium species and LAB are naturally occurring commensal bacteria. By competitive exclusion and the synthesis of antibacterial compounds known as bacteriocins, these bacteria defend the host from possible infection. Another route by which probiotic

bacteria may provide a health advantage is through modifying immunological responses, which has only recently been discovered. Several animal experiment models have been used to examine the immune-stimulating effect of LAB. (7)

Mechanisms of probiotic bacteria

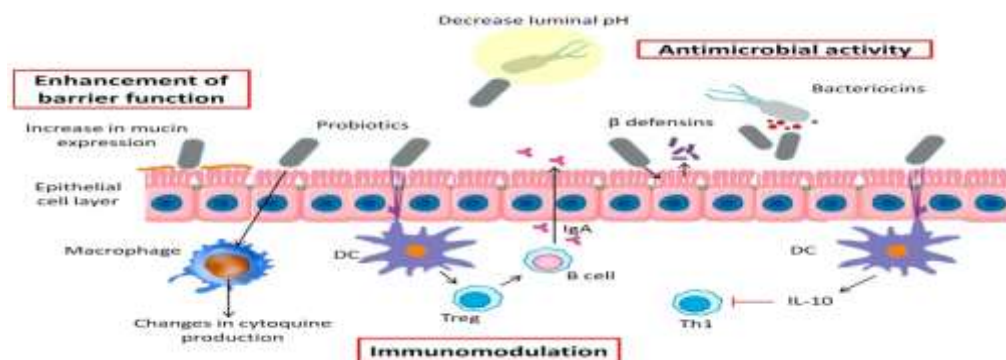


Figure:2:- Mechanisms of probiotic bacteria,

Probiotics are gaining popularity as an alternative to antibiotics and anti-inflammatory medications. However, their mode of action is poorly understood. Probiotics may affect the immune system of the host, directly affect other bacteria, or act on microbial products, host products, or food components. Integral components of the bacterial cell, such as DNA and peptidoglycan, may play a role in probiotic efficacy. (8) Enhancement of the epithelial barrier, increases adhesion to intestinal mucosa, and concurrent inhibition of pathogen adhesion, competitive exclusion of pathogenic microorganisms, production of antimicrobial substances and modulation of the immune system these all are major probiotics mechanisms. (9) Probiotic are living bacteria that can withstand stomach acid and bile, survive long period of storage, and are safe for human use. When consumed that in sufficient quantities, have a beneficial effect on the host's health or physiology. The mechanisms of probiotic bacteria are complicated and not fully understood. Several mechanisms have been reported on the prevention and treatment of IBD symptoms such as antimicrobial activity and suppression of bacterial growth, immunomodulation and initiation of an immune response, enhancement of barrier activity, and suppression of human T-cell proliferation. (10) Antimicrobial chemical produced by the probiotic bacteria, known as bacteriocins, are also thought to contribute to their positive effects. Several bacteriocins are generated by the several lactobacillus species. These bacteriocins inhibitory efficacy varies. Some bacteriocins promote other *Lactobacilli* or taxonomically related gram-positive bacteria, and few bacteriocins are against a wider range of gram positive and gram negative bacteria in addition *molds* and *yeasts*. For example The pathogen. The natural defence mechanisms of the body are improved by probiotic organisms. Probiotic have recently been discovered to be beneficial in a variety of human health issues,

including food allergy, lactose intolerance, atopic dermatitis, acute gastroenteritis colon cancer such as *Bacillus*, *Staphylococcus*, *Enterococcus*, *Listeria*, and *Salmonella* species are inhibited by the probiotic *L.salivarius subsp.salivarius* UCC118.(11)

Beneficial effects of probiotic bacteria

The natural defense systems of the body are improved by probiotic organisms. Probiotics have recently been discovered to be beneficial in a variety of human health issues, including food allergy, lactose intolerance, atopic dermatitis, acute gastroenteritis, colon cancer, arthritis, etc.(12) Probiotics are live microbial feed supplements that improve the host animal's internal microbial balance and hence benefit the animal. Probiotics are microbial cell preparations or microbial cell components that have a positive impact on the host's health and well being. (13) Probiotic are nonpathogenic bacteria that, when given in sufficient proportions, provide a health benefit to the host and can help prevent or improve certain diseases. Antipathogenic substances produced by many probiotics have been discovered, ranging from tiny molecules to functional antimicrobial peptides. Acid like lactic and acetic reduce PH, which has bactericidal and bacteriostatic effects. Antimicrobial peptides and bacteriocins are produced by probiotics, and their antimicrobial action involves increased permeability of the target cell's cytoplasmic, which results in the release of small cytoplasmic particles, depolarization of the membrane potential, and eventually cell death.(14) Probiotics have also been demonstrated to promote intestinal angiogenesis and regulate the accumulation. The beneficial use of intestinal microflora, also known as "colonization resistance" or the "barrier effect", is a key process by which indigenous gut bacteria maintain their presence and provide niche protection against newly ingested microbes, such as pathogen. (15) Probiotic claims of beneficial effects, such as improved gut health, improved immunological response, lower blood cholesterol, and cancer prevention, are becoming increasingly supported by evidence. Probiotics have strong evidence to support their use in the treatment of acute diarrhea, the evidence of antibiotic associated diarrhea, and the enhancement of lactose metabolism, but there is inadequate evidence to recommend them for other clinical diseases.(16) It's vital to remember that probiotics health advantages are strain-specific, not species or genus specific. As a result, no probiotic strains, even those of the same species, will deliver all of the stated benefits, and not all strains of the same species will be effective against recognized healthy circumstances.(17) Due to increased consumer awareness, probiotic foods are the most promising and dominant area in the functional food market. Probiotic organisms have been discovered to provide a wide range of health benefits to the host. Previously for probiotic organisms the fermented dairy was the most common delivery vehicle, but now a days the grains and other substrates are used as probiotic carrier. Probiotic are beneficial for our health.(18)

Harmful effects of the probiotics bacteria

Some doctors may advise you to include probiotics in your regular supplement regimen, but can you ever take too much? There are already trillions of bacteria in our stomach that are linked to good and bad health. Probiotics are believed to promote the growth of beneficial bacteria in the gut and hence enhance health, however research on the advantages is still inconclusive. (19) We are consumed high amount of probiotics, then some people are suffering from gas, bloating, and other mild digestive. Anyone thinking about *L. acidophilus* or another probiotic should talk to their doctor first, especially if they have a health problem. People who have a retious underlying health condition should be closely monitored while taking probiotics since they may raise the chance of more serious side effects, such as deadly infections. Its included critically ill people, very sick infants, people who have recently had surgery, those with weakened immune systems. (20) Probiotics are not recommended for those with serious medical conditions, such as those who are severely immunosuppressed, have pancreatitis, are in the ICU, have melaena, have a central venous catheter, infants with short bowel syndrome, or those who have open wounds after major surgery, unless under the supervision of a doctor. Furthermore, women who are pregnant or breastfeeding should get medical advice before taking some probiotics supplements. (21) Most people are likely to be safe while taking probiotics, but there are a few things to consider before starting or increasing your dosage. While probiotics are likely safe for those in good health, they may represent a risk to those with compromised immune systems or other health conditions, according to the national center for complementary and integrative health trusted source. (22) Most people are deemed safe since these helpful bacteria already reside in their bodies. However, there are a few things to think about. They have the potential to cause an allergic reaction. They may cause minor gastrointestinal issues, especially in the first few days after starting to take them. You may experience stomach discomfort, gas, diarrhea, or bloating. After your body has gotten adjusted to the symptoms, they normally fade away. (23)

Source of probiotic bacteria

Strain number*	Species	Source
TISTR 450	<i>Lactobacillus acidophilus</i>	NS
TISTR 1034	<i>Lactobacillus acidophilus</i>	Rat
TISTR 1338	<i>Lactobacillus acidophilus</i>	Gut of local Thai chicken
TISTR 389	<i>Lactobacillus casei</i>	NS
TISTR 390	<i>Lactobacillus casei</i>	Bagasse
TISTR 453	<i>Lactobacillus casei</i>	NS
TISTR 1340	<i>Lactobacillus casei</i>	Gut of local Thai chicken
TISTR 1341	<i>Lactobacillus casei</i>	Gut of local Thai chicken
TISTR 1463	<i>Lactobacillus casei</i>	Yogurt
TISTR 892	<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	Bulgarian yoghurt
TISTR 895	<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	NS

Table:2:- different species of probiotic bacteria,

Natural probiotics can be found in a variety of foods. Some types of trusted include; Yoghurt, Kefir, Buttermilk, Soft cheese, Soy-based products, such as miso, tempeh, and some soy beverages, Kimchi, Unpasteurized sauerkraut, Nutrition bars, Cereal juice. Although many goods claim to include probiotics, particular ones are more likely to help the body. Soft cheese is consumed may be useful strategy to ensure that helpful probiotic bacteria reach the gut.(24) Probiotics are live bacteria that provide health advantages to their hosts and can be isolated from a variety of sources, including plant foods. Sauerkraut is a cabbage product that is fermented by lactic acid bacteria in a microbiological succession and is a potential probiotic supplement. (25) Most of the dairy products may contains the probiotics. Fermented cabbage dish sauerkraut is popular in many European countries, it has more amounts of probiotics.(26)

Use of probiotic bacteria

The probiotic bacteria have the capacity to affect several components of the innate and adaptive immune system. Probiotic bacteria strains, *Lctobacillus* and *Bifidobacterium* may alter the mechanisms related to antigen processing. As a result, immune cells become more polarized, potentially promoting therapeutic

benefits in atopic illnesses.(28) The probiotic bacteria are use to gastrointestinal conditions, such as infectious diarrhea. *Lactobacilli*, *Bifidobacteria*, and *Streptococcus* species have all been studied for the prevention or treatment of diarrhea caused by antibiotic use, and they have been found to be safe.(29) The probiotics bacteria are use for treating the, irritable bowel syndrome, inflammatory bowel syndrome, infection diarrhea (caused by viruses, bacteria, or parasites),diarrhea caused by antibiotics. The probiotic bacteria also useful for problems in some parts of your body , for example skin condition, like eczema, Urinary and vaginal health , Preventing allergies and colds, Oral health,etc . (30) The LAB are produce the substances with antimicrobial activity against spoilage and pathogenic organisms. In Gastrointestinal tract related applications, the probiotic LAB are used. In Brazil, two governmental institutions shared the regulations towards the probiotics, Through the National health surveillance agency (ANVISA) the ministry of health assess the beneficial and probiotic potential of the strains that will used in the dairy production.(31)

CONCLUSION

The probiotic bacteria are found from the milk and milk products. The probiotic bacteria are isolated from the milk by Gram staining and catalase test. Mostly the probiotic bacteria are found from the yoghurt, kimchi, sauerkraut, like food products. probiotic bacteria are also found from the gut area of the human body. In this area of the body high amounts of probiotic bacteria are presents. This bacteria are beneficial for our health. This bacteria are use for treating some diseases of the human.Probiotic bacteria are reduced the immune mediated deseases. This bacteria also treating for the allergic illness. The vaginal part of the woman probiotic bacteria are present in high amount. From this part of the woman body we are found the probiotic bacteria. The probiotic bacteria are also found from the breast milk. Recent study are discovered the probiotic bacteria are highly present in breast milk. So according to that we are found the probiotic bacteria from this source. From the above discussion we are isolated the probiotic bacteria from the many sources.

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Conflicts of interest

The authors declare no conflicts of interest.

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