

MicroFermenter: Sacca (*Saccharomyces*)

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Claim to fame: The fermentative and probiotic power of Saccharomyces

Fermented foods, have played a crucial role in human civilization, offering both rich flavors and health benefits. At the core of these probiotic-rich delicacies lies *Saccharomyces*, a vital microbe that makes fermentation possible!

Sacca: the fermentation champion.

Sacca (Saccharomyces) is one of the most widely utilized microbes in the food industry. *Saccharomyces* has been a cornerstone of human civilization for thousands of years, it has been essential in producing bread, beer, wine, and other fermented foods. Beyond its fermentative capabilities, certain species of *Saccharomyces*, particularly *Saccharomyces boulardii*, have gained recognition for their probiotic properties, promoting gut health benefits and overall well-being.

Discovery of *Saccharomyces*

The origins of *Saccharomyces* date back to ancient times, long before it was formally established in microbiology. Early humans likely encountered wild strains of *Saccharomyces* when fermentating fruits and grains, leading to the accidental discovery of alcoholic beverages and leavened bread.

The scientific study of *Saccharomyces* began in the 19th century, when Louis Pasteur identified yeast as the microorganism responsible for fermentation. In 1888, French scientist Émile Chrétien isolated a unique strain of yeast from lychee and mangosteen fruits in Southeast Asia, which he named *Saccharomyces boulardii* in honor of his colleague, Henri Boulard. This strain later became distinguished for its probiotic properties.

Overview of *Saccharomyces*

Saccharomyces is a unicellular eukaryote belonging to the kingdom Fungi. It reproduces asexually through budding and is known by its ability to metabolize sugars into alcohol and carbon dioxide under anaerobic conditions. The most well-known species, *Saccharomyces cerevisiae*, is commonly referred to as baker's yeast or brewer's yeast due to its widespread use in baking and brewing. *Saccharomyces boulardii*, is a non-pathogenic, thermotolerant yeast that survives the acidic environment of the human gastrointestinal tract, making it ideal for probiotic applications.

Probiotic Uses of *Saccharomyces*

Probiotics are live microorganisms that confer health benefits when consumed in adequate amounts. *Saccharomyces boulardii* is one of the most well-documented probiotic yeasts, known for: preventing and treating gastrointestinal disorders, such as diarrhea, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), and even certain metabolic disorders. It competitively excludes pathogenic bacteria from the human gut,

degrades bacterial toxins, and promotes the integrity of the intestinal lining, reducing translocation of harmful substances.

Its safety profile and efficacy make it a valuable component in probiotic supplements and medical treatments.

Fermentative Uses of *Saccharomyces*

Saccharomyces has been at the heart of fermentation processes for millennia. *Saccharomyces cerevisiae* is the primary yeast used in the production of bread, beer, wine, and other fermented beverages. During fermentation, *Saccharomyces* converts sugars into ethanol and carbon dioxide through glycolysis and the ethanol fermentation pathway. This process not only preserves food but also enhances its flavor, texture, and nutritional value. In baking, *Saccharomyces* ferments sugars in dough, producing carbon dioxide gas that causes the dough to rise. In brewing and winemaking, it converts the sugars in malted grains or grape juice into ethanol, creating a wide range of alcoholic beverages with unique flavors and aromas. Beyond traditional applications, *Saccharomyces* is also used in the production of biofuels, such as ethanol, and in the synthesis of pharmaceuticals and industrial enzymes.

Sacca is a healthy microbe!

The Importance of *Sacca* for us

Saccharomyces is a remarkable genus of fungi with far-reaching implications for human health and industry. From its ancient discovery to its modern applications, *Saccharomyces* has shaped human culture, scientific knowledge, and industrial innovation.

Its probiotic species, *Saccharomyces boulardii*, offers natural and effective gut health support, while its fermentative capabilities drive innovation in food, beverage, and biofuel production. As research into *Saccharomyces* advances, its potential to address global challenges in health, nutrition, and sustainability becomes even more promising, solidifying its status as one of the most valuable microorganisms on Earth.