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 Oryza Oil & Fat Chemical Co. Ltd.

Joint Research by Oryza Oil & Fat Chemical and Miyazaki University Uncovers Dry Eye Improvement Effect of "Sakulora™ (Sakura Lactic Acid Bacteria) " and Leads to Joint Patent Application!

We are excited to announce that through a collaborative research effort between **Oryza Oil & Fat Chemical Co., Ltd. and the Faculty of Agriculture at Miyazaki University, we have discovered a new dry eye improvement effect in Sakulora™ (Sakura Lactic Acid Bacteria)**, a new product we launched last October. **A joint patent application has been filed for this discovery.**

■ Background of This Discovery

Currently, approximately 22 million people in Japan suffer from dry eye. Particularly, dry eye caused by Sjögren's syndrome^{*1}, an autoimmune disease, often involves irreversible progression of lacrimal gland tissue destruction and chronic inflammation, making fundamental improvement difficult with conventional treatments. However, recent research has revealed a connection between the onset and progression of dry eye and deterioration of the intestinal environment.

Therefore, to investigate whether " Sakulora™ (Sakura Lactic Acid Bacteria) ", derived from cherry blossoms and known for its bowel-regulating effects, could be effective against dry eye, we conducted joint research with the Faculty of Agriculture at Miyazaki University, which has faculty members specializing in the study of foods contributing to dry eye improvement.

■ Highlights of the Research Findings

In experiments using a Sjögren's syndrome-like NOD mouse model^{*2}, the following effects were confirmed through oral administration of Sakulora™.

- ✓ **Tear Secretion Promotion** : Increased tear fluid volume.
- ✓ **Lacrimal Gland Cell Protection** : Suppression of lymphocyte infiltration^{*3} in lacrimal gland cells.
- ✓ **Intestinal Environment Improvement** :
Promotion of short-chain fatty acid-producing bacteria^{*4} proliferation.
- ✓ **Inflammation Suppression** :
Suppression of inflammatory cytokine IL-6^{*5} production in the intestine.
- ✓ **Nervous System Regulation** :
Potential maintenance of tear secretion function through promotion of brain serotonin^{*6} production.

Based on these novel findings, our company and Miyazaki University have jointly filed a patent application.

■ Future Developments

The effects of Sakulora™ (Sakura Lactic Acid Bacteria) discovered this time are expected to be utilized in a wide range of fields, including health foods, functional foods, and supplements for maintaining eye health. We will continue to strengthen our industry-academia collaboration with Miyazaki University to build further evidence for Sakulora™ (Sakura Lactic Acid Bacteria).

■ Glossary of Terms

*1 Sjögren's syndrome :

One of the designated intractable autoimmune diseases. It causes chronic inflammation in exocrine glands throughout the body, including the lacrimal glands and salivary glands, leading to dry eye and dry mouth.

*2 NOD mouse model :

Mice with reduced tear and salivary gland function, used for research on dry eye symptoms similar to Sjögren's syndrome.

*3 Lymphocyte infiltration :

An indicator of inflammatory state observed in tissues and cells undergoing chronic inflammation.

*4 Short-chain fatty acid-producing bacteria :

Intestinal bacteria that produce "short-chain fatty acids," which are beneficial for a healthy gut environment.

*5 IL-6 (Interleukin-6) :

A type of cytokine, a protein that mediates intercellular communication, specifically known as an inflammatory cytokine. It shows high values in autoimmune diseases.

*6 Brain serotonin :

A neurotransmitter often called the "happiness hormone," involved in mental stability. It is thought to contribute to maintaining tear secretion volume by acting on the autonomic nervous system.

■ About Sakulora™ (Sakura Lactic Acid Bacteria)

As a result of many years of screening, we discovered a lactic acid bacterium (*Lactocaseibacillus paracasei* shidare strain) from weeping cherry blossoms and identified its excellent physiological activity. This is our second cherry blossom-themed ingredient, following our flagship product "Sakura Extract," which is touted for its anti-glycation effects. We have already obtained functional data for Sakulora™ (Sakura Lactic Acid Bacteria), including: (1) bowel regulation and constipation improvement (promotion of intestinal serotonin production, promotion of intestinal IgA production), (2) immune activation (promotion of IL-10, IL-12 production), (3) beauty effects (promotion of collagen and hyaluronic acid synthase gene expression), and (4) femcare effects (promotion of equol production, suppression of EMT).



Sakura Lactic Acid Bacteria

Sincerely,
Oryza Oil & Fat Chemical Co., Ltd.