



Berries United's lingonberry mouthwash is effective against yeast, plaque, bacteria and oral tissue-destructive enzymes

The idea for the fermented lingonberry mouthwash was born as a result of dentist Pirjo Pärnänen's 15-year-long research. Professor Timo Sorsa partnered with her to establish their joint venture, Berries United.

From idea to innovation

Pirjo Pärnänen is a doctor of oral microbiology, a doctor of dentistry and a doctor of philosophy in biochemistry. 'While treating patients at my private clinic in East Helsinki, I started to wonder why some people get oral yeast infections and some don't. I immediately discovered a link with asthma medication and dry mouth.'

With a degree in both dentistry and biochemistry, Dr Pärnänen began to study the effects of different berries against thrush at the research laboratories of Helsinki University.

'As soon as I started basic laboratory tests, I noticed that the lingonberry turned out to be the most promising of all the berries.' The essential element of the patented mouthwash developed by Dr Pärnänen, is that the natural sugars of the common lingonberry are reduced to a fraction of its original through the process of fermentation. This enables the positive effects of the berry to come to the fore without any damage caused by sugars.

Through her own dental practice, she was able to carry out clinical trials with her patients. 'The trial subjects used my fermented lingonberry mouthwash for varying periods of six months at the most,' she says.

Initially, she noticed that the mouthwash reduced the inflammation caused by yeast *Candida*. After which she discovered that in addition to yeast, lingonberry mouthwash also inhibited the growth of various harmful bacteria, such as the growth of caries-related *Streptococcus mutans* bacteria, as well as dysbiotic periodontal-pathobionts.

Breakthrough in Timo Sorsa's chair-side test

One of the most significant contributors to Pirjo Pärnänen's research is periodontology professor Timo Sorsa. He is a senior dentist

in oral and maxillofacial diseases at Helsinki University Hospital. The duo's paths crossed when Pirjo was running experiments with the help of a rapid chair-side test based on the immunological detection of elevated levels of collagenase-2 (aMMP8), originally developed and patented by Timo Sorsa. It is a rapid oral rinse chair-side test that is validated on all continents, and is used to measure the level of inflammation and tissue destruction in the mouth. It was this test that demonstrated that all the classic indices of gum disease began to decrease with the help of lingonberry mouthwash without further application.

'The results showed that the lingonberry did not decrease the number of *lactobacilli*,' adds Prof Sorsa. 'The bleeding of gums, the plaque index and tissue destruction enzymes (aMMP-8) all decreased, but the probiotics that maintain oral health increased.'

Based on the results, it was also identified that high levels of *lactobacilli* in the mouth do not automatically mean an increase in caries as has traditionally been thought.

'Suddenly we had a safe substance available that is effective against yeast and bacteria; and prevents the activation of bad tissue-destructive proteolytic enzymes and soothes low-grade inflammation in the mouth. And this substance grows wild and free in the forests of Finland!' Prof Sorsa states.

'Eradicating lifelong yeast medications is a possibility'

A collaborator in the lingonberry project was Annamari Ranki, a professor of dermatology and venereal disease, researching APECED syndrome for more than 20 years of her career.

APECED patients suffer from yeast in their mouths, and since it's a genetic mutation, the patients are prone to yeast infections from childhood and have to take yeast medicines



all their lives.

'When a person continuously has yeast in their mouth, they live in constant danger, which includes the development of oral cancer,' says Timo Sorsa.

During her own study with lingonberry mouthwash in APECED patients, it transpired that one of Professor Ranki's patients was able to stop taking yeast medication after 15 years and to this day continues to live without it.

'When we are able to lower and balance the dysbiotic microbiome, together with reducing proteolytic burden in the mouth, then the next step is the possibility of eradicating lifelong yeast medications,' says Prof Sorsa.

Remaining untapped potential

The next stage in Dr Pärnänen and Prof Sorsa's lingonberry journey will be a more detailed study of molecular anti-inflammatory effects.

Timo adds 'If the patient has implants, ie artificial roots, in their mouth, they can easily get artificial root-surface-periodontitis, ie implantitis. In my opinion, these patients should start using lingonberry mouthwash straight away, because it prevents plaque from sticking to the artificial root-surface and simultaneously, it suppresses the harmful tissue-destroying enzymes.'