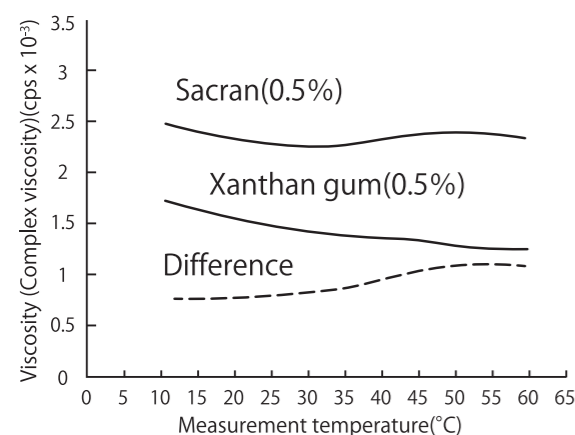


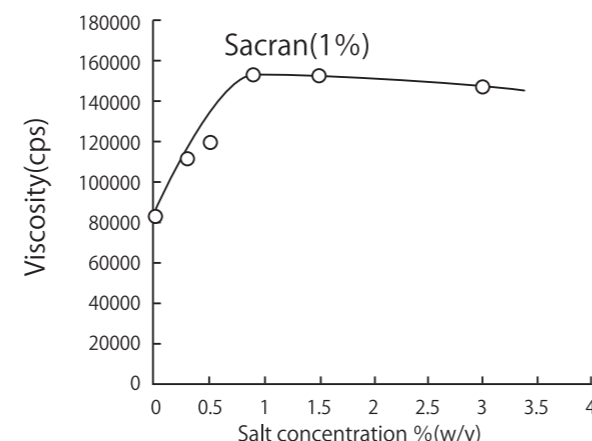
Temperature stability



Data obtained by Japan Advanced Institute of Science and Technology
Provided by Green Science Material Inc.

Xanthan gum decreases in viscosity when heated. On the other hand, sacran does not show any change in viscosity due to heating and remains stable. This difference in viscosity was confirmed to increase when heated.

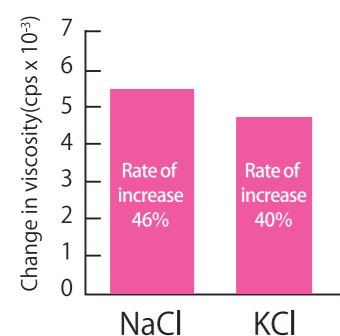
Increase in viscosity due to the addition of salt



Data obtained by Japan Advanced Institute of Science and Technology
Provided by Green Science Material Inc.

Addition of various concentrations of salt (NaCl) to 1% (w/v) sacran solution resulted in an increase in sacran viscosity. The maximum viscosity was reached when the concentration was equivalent (about 0.9%) to physiological salt solution.

Effect of ion type



After the addition of salt
Before the addition of salt
Data obtained by Japan Advanced Institute of Science and Technology
Provided by Green Science Material Inc.

As a result of measuring the rate of increase in viscosity when various univalent metal ions at 0.6% (w/v) are added to 1% (w/v) sacran solution (viscosity 12,000 cps), an increase in viscosity was found in all cases.

Safety evaluation

Human patch test : negative

Product name	INCI name/中文名称	Other ingredients	Package
Sacran B	APHANOTHECE SACRUM POLYSACCHARIDES	WATER, AND BUTYLENE GLYCOL	1 kg
Sacran	水前寺紫菜(APHANOTHECE SACRUM)多糖	—	10 g

Manufacturer: Green Science Material Inc.

Country of origin: Japan (Kumamoto/Fukuoka Prefectures)

The content in this document is prepared based on documents and experimental data available at the time; however, the content does not comprise a guarantee. Please note in advance that the content described in this document may be changed depending on the circumstances. All intellectual property rights including copyrights and design rights of data described here and related documents belong to Koken Co., Ltd., and any unauthorized reproduction, reprinting or citation is strictly prohibited. Please refer to the MSDS of the product in advance for the safe use of these ingredients. In addition, care should be taken to comply with regulations in each country on expressions concerning consumer products.

Raw material for cosmetics from fresh water algae

Sacran

APHANOTHECE SACRUM POLYSACCHARIDES



Sacran is a natural giant molecular polysaccharide extracted from the algae, *Aphanothece sacrum*, which lives in clear spring water from underflow water in the Aso region. *Aphanothece sacrum* is a highly valuable plant that can only live in special regions where the water is pristine and flows slowly. This product was named “Sacran” in acknowledgement of the scientific name, “*Aphanothece sacrum*”, where ‘sacrum’ means ‘sacred’. It is regarded as a luxury foodstuff and was gifted to the shogun as an offering during the Edo era.

Aphanothece sacrum secretes sacran to protect the cell from the harsh environment.

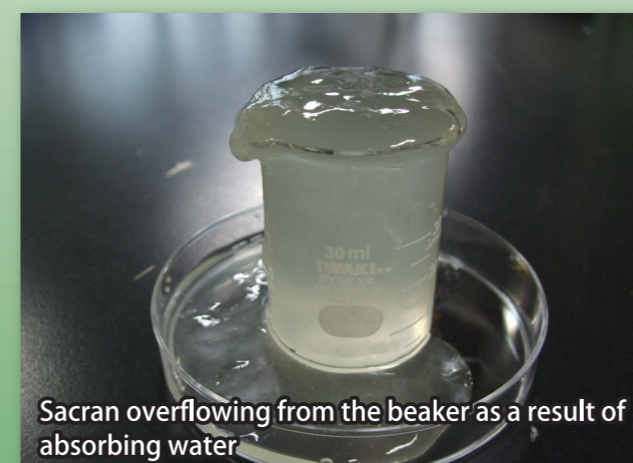
Sacran is said to prevent the invasion of bacteria and viruses from outside by retaining a lot of water and protecting *Aphanothece sacrum* from drying out.



Microscopy image



Aphanothece sacrum



Sacran overflowing from the beaker as a result of absorbing water

Applications: Lotions, milky lotions, creams, skin-care products, makeup products, etc.

Characteristics

Natural giant molecular

Natural polysaccharide extracted from *Aphanothece sacrum* found in Kumamoto and Fukuoka prefectures

Moisturizing effect

10-fold higher moisture retention capacity compared to hyaluronic acid

Protective membrane formation

Functions as a barrier to protect skin from external stimulus

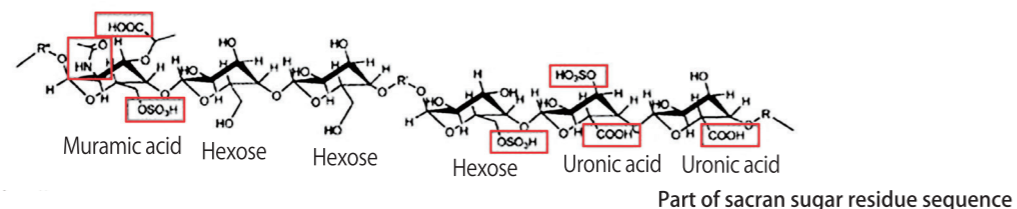
Anti-inflammatory effect

Anti-pollution

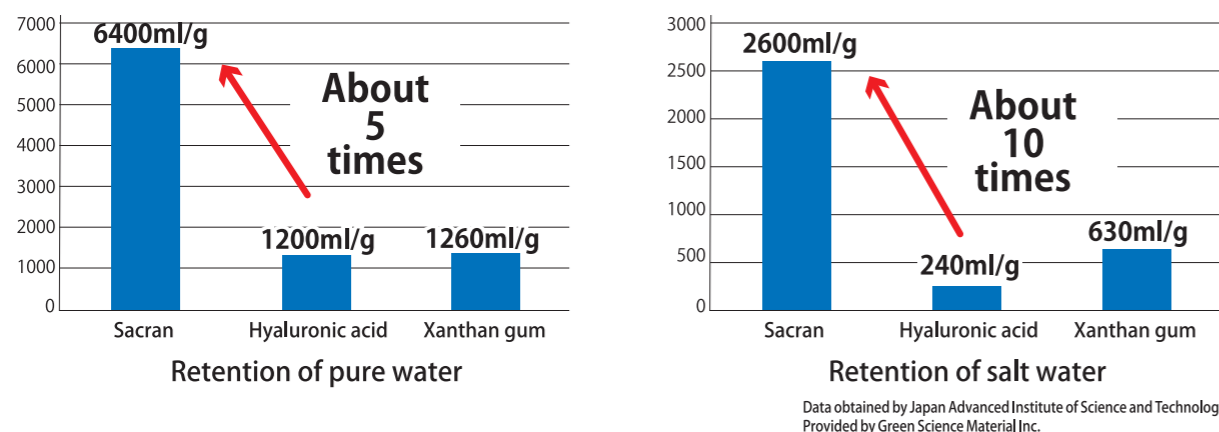
Sacran

Characteristics of Sacran

- Super-macromolecule with molecular weight of about 29 million
- Anionic polysaccharide with about 11% of sulfate groups and 12% of carboxyl groups per sugar chain
- Eleven types of monosaccharides including glucose, galactose, xylose and fucose have been identified as components and sacran also contains a novel monosaccharide, sulfated muramic acid.
- Aphanothece sacrum is a prokaryote but sacran is predicted to have a similar structure to mucopolysaccharides produced by eukaryotes and is anticipated to have a range of physiological activities.

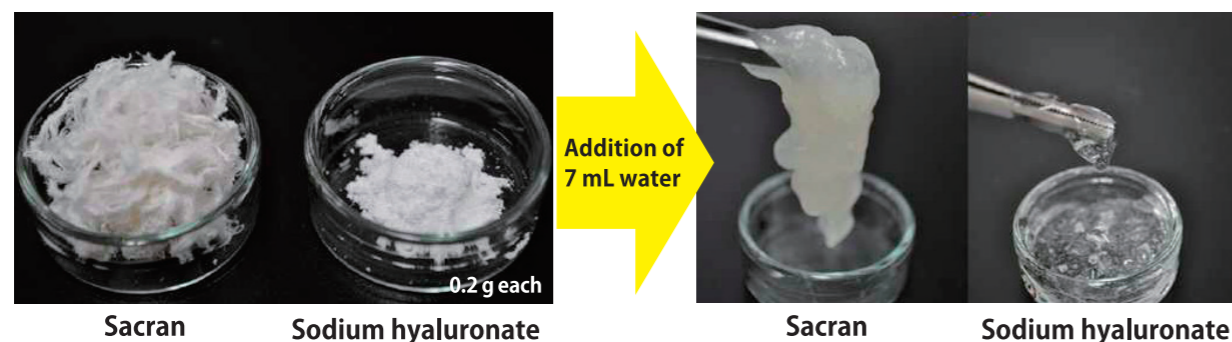


Water retention capacity

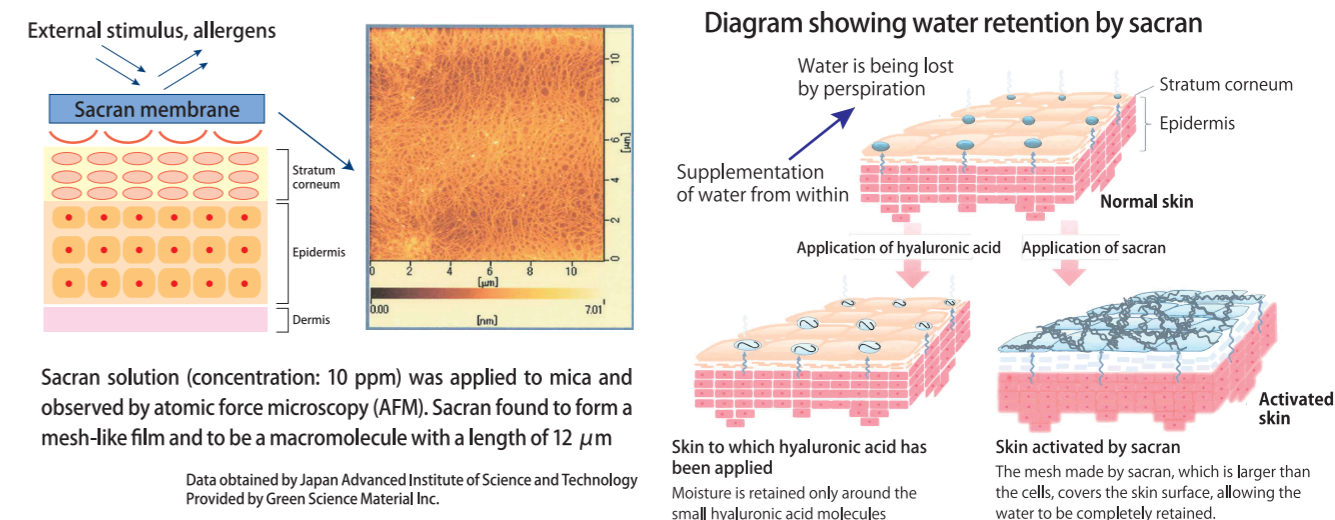


Using the improved tea bag method, a water retention assay was conducted for sacran, hyaluronic acid and xanthan gum. As a result of measuring the volume (mL) of water retained by 1 g (dry weight) of each sample, sacran was found to have a water retention capacity exceeding 6000-fold its own weight. Furthermore, compared to hyaluronic acid and xanthan gum, it was confirmed to have a water retention capacity 5 times and 10 times greater than hyaluronic acid when using pure water and salt water for the assay, respectively.

Difference in water retention capacity between sacran and Sodium hyaluronate

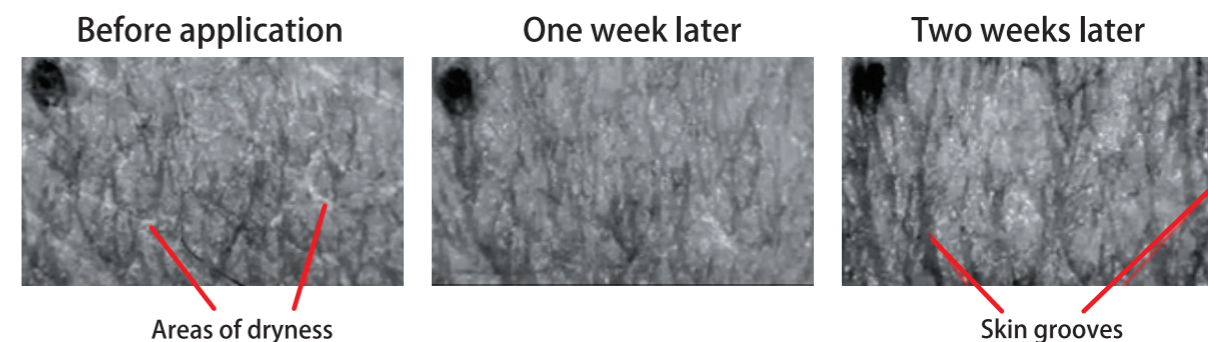


Barrier function



Effect on skin

Microscopy image of the observation site (inner side of the upper arm)



About 100 μL of sacran solution (0.1%) was continuously applied once every day to the inner side of the upper arm and skin texture was observed with a microscope 3 days, 1 week and 2 weeks after starting application. Skin was dry (white region) before application but after 2 weeks of sacran application, there were no dried areas and skin grooves were more noticeable.

It is anticipated that the application of sacran over time will improve the texture of the skin

From in-house data

Anti-inflammatory effect

