

Above-Sea Fossilized Coral

The Miracle of Yonaguni Island Contains Over 70 Minerals:
100% Natural, Comprehensive Mineral Content

 Coral International Co., Ltd.



What is Fossilized Coral?

The waters that span the area from the main island of Okinawa to the Yaeyama Islands are known as one of the greatest treasure troves of coral reefs in the world. Individual coral faithfully repeat a growth process of replication by division and gradually form coral reef through this continual reproduction. Coral take in carbon dioxide and calcium from seawater and make an exoskeleton principally consisting of calcium carbonate in the process. Many of the Ryukyu Islands are made of coral lime strata, the accumulation of coral reefs formed and exposed above ground that followed a drop in sea level or crustal movement. The coral of Yonaguni Island is

especially aggregated, fossilized coral preserved in the state when it was living, which is unseen anywhere else in the world. In fact, "fossilized coral" today refers only to the coral from Yonaguni Island.

While fossilized coral has risen above sea level, coral weathered and accumulated underwater at the sea bottom is called coral sand (sand coral). Outside of Japan, the two are clearly distinguished: the former is called Above-Sea Fossilized Coral, and the latter is called Marine Coral. This website specifically describes Above-sea Fossilized Coral.

Marine pollution is becoming a problem all over the world now. A profound impact is seen on marine ecosystems from large vessels run aground, influx of polluted water, drift waste ashore, etc. Consequently, coral gathered from the sea bottom cannot be assured from the impact of future marine pollution. On the other hand, fossilized coral above sea level can be considered safe material without any worry over future marine pollution impact. Coral International, Inc., is the sole owner in Japan of this fossilized coral.



Coral and Coral Reef

Corals are animals belonging to phylum Cnidaria, the same as jellyfish and sea anemones. About 1,300 species of coral are believed to exist around the world, and about 400 are seen around the Ryukyu Islands. This tremendous variety explains well the reason why Okinawa is called a treasure trove of corals.

Among this variety, some species are "gemstone coral," which inhabit the deep sea and retain a hard, elaborate exoskeleton, while others are "hermatypic coral," which can rapidly produce calcic frames in large quantities to form a coral reef. "Hermatypic coral" lets algae called zooxanthella to live together and grows by getting oxygen and nourishment supplied by zooxanthella photosynthesis. Thus, a coral reef cannot grow unless there is a warm and clean sea, whose depth is shallow enough for sunlight to reach down plentifully.

Rarity of Fossilized Coral



Rarity Marked by Purity and Mineral Content

Yonaguni Island is located at the western end of the Yaeyama Island chain, which belongs to the Nansei Islands, and lies northeast of Taiwan. In short, the island represents Japan's westernmost soil and national border. The fossilized coral of Yonaguni Island originates from coral reefs that grew in pristine seas during the warm period approximately 100,000 years ago. Subsequent crustal movement elevated the reef above the sea. The "youth" of this fossilized coral is notable, considering that the genesis of coral dates back about 460 million years. Unlike coral limestone of older generations found with fish bones, sea urchin needles, and dead shellfish, it retains high purity. This youth and purity mark the rarity of fossilized coral. Furthermore, more than 70 kinds of minerals including calcium are contained in fossilized coral. Other than Yonaguni Island product, coral limestone containing such an abundance of minerals has not been discovered elsewhere around the world.

Non-Calcinated Calcium of Special Preparation

Various raw materials are used as a source of calcium for health foods. For instance, calcium phosphate is the principal content of fish-bone calcium. Calcium lactate is chemically synthesized. The raw materials for calcium carbonate, which could also be made from fossilized coral, are frequently shells of oyster or scallop. One characteristic of fossilized coral is that its calcium is non-calcinated. The application of heat to calcium carbonate alters its properties. The fact that fossilized coral is not calcinated means that it is not oxidized. This prevents denaturing and degrading of any mineral ingredients such as calcium and magnesium.

Superb Aqueous Dispersion



Calcium carbonate crystals can assume two forms: aragonite and calcite. Fossilized coral is classed in the porous aragonite form. Through a special preparation method, fossilized coral used in nutritionally functional food products of Coral International is finished as ultra-fine particles of average grain size 3 μm with outstanding aqueous dispersion. Since the porous aragonite crystalline structure is directly retained, consumption within the body promptly leads to dissolution as a product with outstanding abso

Nature's Blend of Mineral

Over 70 Kinds of Natural Minerals

The superb fossilized coral found on Yonaguni Island contains over 70 kinds of natural minerals, including all 16 essential minerals. As humans we must consume minerals daily from our diet, because our bodies cannot create them. Through our modern-day lifestyle and diet, we tend to absorb plenty of calories in the forms of fat, protein, and sugar, while we suffer a deficiency in vitamins and minerals. As a component of bones and teeth, and as a regulator of physiological function, calcium is an essential mineral. Calcium is the most plentiful mineral contained in fossilized coral at about 37%. Yonaguni Island's fossilized coral is truly nature's blend of minerals.

| Major Essential Minerals contained in Yonaguni Island's "fossilized corals" | |
|---|---------|
| Calcium (Ca) | 37.2g |
| Magnesium (Mg) | 0.639g |
| Iron (Fe) | 0.062g |
| Iodine (I) | 1.42mg |
| Copper (Cu) | 0.228mg |
| Zinc (Zn) | 0.086mg |
| Chromium (Cr) | 0.016mg |

From the Report by Western Analysis, Inc. dated July 1, 2006 Content per 100g

Ancestors' Wisdom

In Okinawa, coral has been used for nutritional supplementation by pregnant women and for mood stability as a kind of Chinese medicine for a long time. It is well known that taking sufficient calcium during pregnancy, after giving birth, and during lactation is essential. Women in the remote islands of Okinawa historically collected fragments of coral and partook of a soup boiled with these fragments and chives. This concoction was doubtless the wisdom of ancestors for replenishing minerals such as calcium.

Astonishing Adsorption Removes Harmful Substances



Incredible Anti-Bacterial Power

Another strong characteristic of fossilized coral is its power to adsorb bacteria. A test report issued by Kitasato Research Center for Environmental Science about adsorption effects confirmed that fossilized coral calcium adsorbs E. Coli and Staphylococcus Aureus. More interestingly, the adsorbed bacteria do not multiply in fossilized coral calcium. The enormous surface area that results from the porosity of fossilized coral enables this adsorption. According to the measurement of specific gravity and surface area of corallite prepared by Japan Energy Research and Development headquarters, the surface area of such porous fossilized coral is estimated to be around 2,200 times more than the surface areas of other substances in general. Fossilized coral can adsorb bacteria using this incredible surface area.

| Fossilized Coral Adsorption Test | | |
|--|--------------------------|-----------------------|
| | Fossilized Coral 0.5g | Fossilized Coral 1.0g |
| Concentration of staphylococcus aureus | 1,000,000/10ml | |
| Bacteria count at start of test (cfu) | 1,000,000 | 1,000,000 |
| Supernatant after 24 hours (cfu) | No detection | No detection |
| Sediment after 24 hours (cfu) | 230,000 | 220,000 |

From Test Report prepared by Kitasato Research Center for Environmental Science, September 15, 2006

Test method: Bacteria test solution that was adjusted to 1 million staphylococcus aureus per 10 ml was poured into test tubes respectively containing 0.5 g and 1.0 g fossilized coral that were prepared, and the counts of staphylococcus aureus in the supernatant and the sediment were measured 24 hours later.

Elimination of Heavy Metals and Residual Pesticides

The porous structure and enormous surface area of fossilized coral have been confirmed to evince their power for not only adsorption of bacteria, but also the elimination of heavy metals and residual pesticides. According to results of measurement tests conducted by Kounoshima Kasei's Environment Measurement Center, fossilized coral demonstrated very high removal rates (adsorption rates) exceeding 99% of heavy metal ions such as cadmium, copper, and lead. In addition, according to analytical results by Japan Food Research Laboratories, no pesticide was detected in crops sprayed with Urucal, a leaf spray. Furthermore, an authority on mold toxins, Prof. Masateru Koiwa of Rakuno Gakuen University in Hokkaido, has also confirmed that fossilized coral adsorbs mold toxins.

* "Urucal" is an agricultural spraying agent manufactured and distributed by Coral International and uses fossilized coral as a raw material.

| Removal of Heavy Metal Ion by Fossilized Coral | | | |
|--|-------------------------------------|---|------------------|
| Heavy Metal Ion | Content within 1L of Raw Water (mg) | Content after filtering fossilized coral (mg) | Removal Rate (%) |
| Cadmium | 5. 0 | 0. 002 | 99. 96 |
| Copper | 5. 0 | 0. 007 | 99. 86 |
| Lead | 5. 0 | 0. 024 | 99. 52 |
| Iron | 5. 0 | 0. 065 | 98. 70 |
| Nickel | 5. 0 | 0. 165 | 96. 70 |
| Zinc | 5. 0 | 0. 348 | 93. 04 |

Created based on the Measurement Certificate by Environmental Measurement Center, Kounoshima Kasei, Co., Ltd., 1988

Experimental method: 1L of water solution (concentration adjusted to 5mg/L) including various heavy metal ions was prepared and was poured in a cylinder container that has a faucet in a lower part, and fossilized coral w