



Vitamin P [bioflavonoids] and Skin Care

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In the 1930's scientists treated subcutaneous capillary bleeding successfully with natural vitamin C. Later, surprisingly, it was discovered that pure vitamin C had no effect on capillary bleeding as did natural vitamin C. There must be some other substance in natural vitamin C responsible for such a difference. This led Hungarian Scientist, Dr. Albert Szent-Gyorgyi to discover vitamin P in 1936.



Natural vitamin C not only contains ascorbic acid but also contains some other components called flavonoids or bioflavonoids also referred to as vitamin P. The letter P, for permeability factor was given to this group of nutrients because they improve the capillary lining's permeability and integrity.

Flavonoids are mainly aromatic plant pigments and most of them are yellow in colour. The term flavonoid stems from the Latin word "flavus", which means yellow. Flavonoids are water soluble substances with molecular weight in range from 300 to 700 (mainly having a basic skeleton of 15 carbon atoms). There are more than 4000 different bioflavonoids and the most popular ones are citrin, hesperidin, rutin, flavones, flavonols, catechins, flavonones, quercetin, anthocyanins and proanthocyanidins as well as isoflavonoids. Today, however, bioflavonoids are considered "vitamin-like" substances.

Bioflavonoids are found in many of the same foods as vitamin C, namely citrus fruit such as lemons, grapefruits, oranges, limes, apricots, cherries, grapes, black currants, plums, blackberries and papaya. Green pepper, broccoli and tomatoes are some good vegetable sources of bioflavonoids. It should be noticed that red grape seed is particularly rich in bioflavonoids (proanthocyanidins - red colour). Since bioflavonoids are produced via plant biosynthesis, all the commercial supply of mixed bioflavonoids are obtained through an extraction process of botanical materials. The composition and concentration varies with materials used and processing techniques.

Similar to vitamin C, bioflavonoids are essential nutrients for human health. A deficiency of bioflavonoids may increase the tendency to bruise or bleed and the protection of vitamin C may decrease as well. Bioflavonoids protect the human body against many diseases such as colds, flu, haemorrhage, asthma, allergies, bursitis, arthritis, eye problem and cancers etc. There are numerous studies about the health effect of bioflavonoids^{1,2}. The association of bioflavonoids with vitamin C is the reason that natural forms of vitamin C are more effective than pure ascorbic acid.

The estimated human consumption of mixed bioflavonoids is 0.5 to 1 gram per day. The intake of bioflavonoids is about 0.9

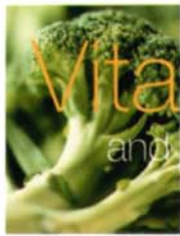
to 1.5 gram per day. After ingestion, bioflavonoids are stored in the body (mainly in liver and colon). Orally ingested vitamins are not always transported to the skin in sufficient quantity due to poor absorption, improper function of metabolic system or aging. The topical application of bioflavonoids that provides the skin with local concentrations substantially higher than those attained by oral ingestion, has a good advantage for skin care. As a matter of fact, most of the cosmetic-dynamic activities of a very large number of plants are due to bioflavonoids. Hence the recent inclusion of bioflavonoids in topical cosmetic applications.

Bioflavonoids have excellent anti-oxidation properties. Some flavonoids such as quercetin and galliccatechins are far more effective anti-oxidants than ascorbic acid³. As a consequence, bioflavonoids can protect ascorbic acid from oxidation. That is why a solution of natural vitamin C is more stable than that of pure ascorbic acid under the same condition. Bioflavonoids are also helpful in the absorption of ascorbic acid³. Therefore, bioflavonoids can enhance vitamin C's multiple functions via a synergistic effect. Bioflavonoids are highly recommended to be included in the topical application of ascorbic acid.

Blood capillaries link arteries to veins. Capillaries deliver oxygen and nutrients to organs, tissues and cells, then pick up carbon dioxide and waste through the veins back to the heart. Capillaries must be permeable enough to allow fluids to seep out of the capillaries, mix with the fluid that surrounds all cells and then re-enter the capillaries. If the capillaries are too permeable, too much fluid and proteins seep out, resulting in edema and even red blood cells may also seep out causing bruising and red spots. Bioflavonoids regulate capillaries' permeability and increase the strength of capillary walls to prevent breakage and rupture.

Due to aging, capillaries gradually become fragile, cracked or fractured. Aggressive skin treatments such as AHA peels, chemical peels and dermabrasion might cause the same problem as well. As a result, the skin shows unpleasant broken capillaries (called *couperose*), spider veins and the associated edema⁴. The topical application of high concentration of bioflavonoids can prevent and even reverse these undesirable appearances^{3,5}. >>

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continued

Studies indicate that the activity of bioflavonoids on capillary health needs the presence of ascorbic acid*. It indicates that vitamin C and bioflavonoids are good partners and help each other. A small quantity of ascorbic acid is suggested to be incorporated during the topical application of bioflavonoids for capillary health.

Bioflavonoids inhibit lipid peroxidation in membrane to protect biomolecules in the dermis, such as hyaluronic acid, collagen and elastin. Flavonoids probably also block degradation enzymes such as elastase and hyaluronidase etc. which cause destruction of these important skin components. Bioflavonoids play an active role in scavenging free radicals, improve cellular activity and help in the synthesis of collagen and elastin fibers. Bioflavonoids definitely have an excellent anti-aging benefit for the dermis and are sometimes called "the vitamin of the dermis".

Bioflavonoids have a good anti-inflammatory activity and act as an immune supporter and detoxifier against allergy, inflammation, germs, viruses, bacteria, infection and skin irritation.

Bioflavonoids provide such functions via several mechanisms. They help stabilise mast cells and basophils and inhibit their degranulation and subsequent release of histamine and other inflammatory

chemicals. They also inhibit some inflammatory enzymes such as lipid peroxidase and decreases leukotriene (another inflammatory molecule) formation*.

Topical application of bioflavonoids has multiple skin benefits such as enhancing vitamin C's effect, preventing broken capillaries, protecting the dermis against premature aging and reducing skin's sensitivity.

Just like topical application of vitamin C, bioflavonoids provide a new dimension for skin care technology.

Thus far, there are limited number of bioflavonoid products with high concentrations available on the market today. These types of products usually show a distinct yellow or red colour, which might not be cosmetically preferable. These products are usually beneficial for skin health. However, the actual performance depends upon the composition of bioflavonoids used and the formulation.

Since there are thousands of different species of bioflavonoids, the topical application of bioflavonoids will be an important new subject deserving extensive study and research in the cosmetic industry.

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