

# Vision SAP

Science-based nutraceuticals for prevention of degenerative eye disease

Vision care is one of the smartest investments that an individual can make. By keeping one's eyes healthy, we increase our productivity and overall quality of life. As the baby-boom generation ages, a higher percentage of people will lose their vision quality. Vision maintenance initiated in the earlier stages of life ensures quality vision in the later years of our lives.

## ACTIVE INGREDIENTS

### Each vegetable capsule contains:

DL- $\alpha$ -Lipoic acid	200 mg
<i>Ginkgo biloba</i> leaf extract, 24% flavones glycosides, 6% terpene lactones	120 mg
Bilberry ( <i>Vaccinium myrtillus</i> ) fruit extract, 25% anthocyanosides	100 mg
Marigold ( <i>Tagetes erecta</i> ) extract, 15% lutein esters	67 mg
Marigold ( <i>Tagetes erecta</i> ) extract, 20% zeaxanthin esters	20 mg
<i>Haematococcus pluvialis</i> , 2% astaxanthin	20 mg
Mixed tocopherols (from non-GMO sunflower)	7.287 mg
Copper (from copper gluconate)	500 mcg
Selenium (from selenomethionine)	18 mcg
Vitamin B <sub>3</sub> (nicotinic acid)	5.1 mg
Zinc (from zinc citrate)	5 mg
Fruit blend (extract of <i>Vaccinium myrtillus</i> and <i>Vitis vinifera</i> seed and skin), 20% multianthocyanidins	100 mg

**Other ingredients:** Vegetable magnesium stearate and silicon dioxide in a vegetable capsule composed of vegetable carbohydrate gum and purified water.

**This product is non-GMO and vegan friendly.**

**Contains no:** Gluten, soy, wheat, eggs, dairy, yeast, citrus, artificial flavour or colour, or sugar.

**Vision SAP** contains 60 vegetable capsules per bottle.

## DIRECTIONS FOR USE

**Adults: Take 2 capsules daily with food containing oil/fat** or as directed by your healthcare practitioner. If you are taking other medications or natural health products, take this product a few hours before or after them. Consult a healthcare practitioner for use beyond 4 weeks.

## INDICATIONS

**Vision SAP** supplies a daily dose of antioxidants, nutraceuticals, carotenoids, and vitamins for the prevention of macular degeneration (a degenerative condition of the macula, the central retina) and cataracts (a clouding of the natural lens, the part of the eye responsible for focusing light and producing clear, sharp images). This formula's individual components have been scientifically demonstrated to aid in blood circulation, and for the support and transport of vital nutrients into the macular region for protection from oxidative stress. These components have been widely used for the treatment of eye disease, yet the scientific evidence of the combined formula has not yet been proven.

## STANDARDIZED EXTRACTS

**Vision SAP** delivers this formula with specified levels of one or more plant constituents. The idea of using standardized extracts is to establish a consistent potency and to control the full spectrum of bioactive chemical constituents naturally occurring in medicinal plants. Standardization ensures that consistent botanical materials are produced batch-to-batch using the appropriate preparation of quality starting materials.

## PURITY AND STABILITY

All ingredients listed for all **Vision SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.



Scientific Advisory Panel (SAP):  
adding nutraceutical research  
to achieve optimum health



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### WHAT ARE AMD AND CATARACTS?

Age-related macular degeneration (AMD) is the leading cause of blindness in North America, mainly affecting people over 64 years of age. AMD can be categorized as early or dry AMD, late or wet AMD, and is currently without an effective treatment. Oxidative damage is implicated in AMD. AMD affects the macula, the site of highest visual acuity because it contains the greatest concentration of photoreceptor cells, which are particularly susceptible to free-radical and blue-light damage.<sup>[1]</sup>

Cataracts are the leading cause of blindness worldwide, and cataract extraction is one of the most frequent surgeries performed on the elderly. Cataracts are characterized by the presence of an ocular opacity, which can be partial or complete in one or both eyes, on or within the lens. The opacity is caused by the accumulation of oxidatively damaged proteins in the lens of the eye, often leading to impaired vision or blindness.<sup>[1]</sup>

Risk factors for these age-related ocular diseases include advanced age, family history, excessive sun exposure, smoking, and light-coloured eyes. Good nutrition is essential for maintaining healthy vision, and scientific research suggests that antioxidants are vital in preventing degenerative eye diseases, such as AMD and cataracts.<sup>[1]</sup>

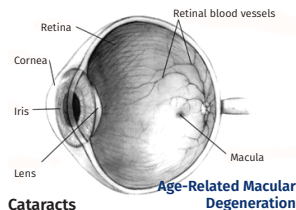
### REACTIVE OXYGEN SPECIES

Oxidative stress is often cited as a leading mechanism of aging and degenerative disease including age-related ocular disorders. In the retina, exposure to high-energy visible light produces damaging forms of oxygen called reactive oxygen species (ROS). ROS can cause lipid peroxidation, leading to oxidative cellular damage to DNA, protein, lipid membranes, and carbohydrate.

The body uses natural defense mechanisms against the oxidation of the eye tissue. The first involves antioxidant enzymes glutathione peroxidase, superoxide dismutase and catalase with micronutrients such as selenium, zinc, manganese, and copper, facilitating these antioxidant enzymes. The second involves antioxidant nutrients such as vitamin E (-tocopherol), vitamin C, and  $\beta$ -carotene. Studies have shown that the carotenoids extracted from marigold play an important role in maintenance of ocular health and reducing the risk of AMD and cataracts.<sup>[2]</sup>

### THE EYE

The eye has highly specific binding proteins for lutein and zeaxanthin. These two carotenoids are especially abundant at the center posterior portion of the retina, the macula, which possesses the highest concentration of photoreceptors, responsible for central vision and high-resolution visual acuity.



The high concentrations of these carotenoids are responsible for the yellowish colour of this region of the retina, designated as the *macula lutea* or "yellow spot," and thus both xanthophylls are usually referred to as macular pigments. The macular pigment in the human retina, unlike other tissues, contains only lutein and zeaxanthin, and its concentration of lutein/zeaxanthin is approximately 500 times higher than that of other tissues. Similarly, lutein and zeaxanthin are the only carotenoids present in the human lens; however, their concentrations are substantially lower in the lens relative to the macula.<sup>[1]</sup>

### MARIGOLD EXTRACTS AND ASTAXANTHIN

Marigold extracts are oxygenated carotenoids known as xanthophylls. Xanthophylls have superior antioxidant properties, and have a lower tendency for prooxidant behavior than  $\beta$ -carotene.<sup>[2]</sup>

Marigold extracts protect the retina by two mechanisms of action. First, in comprising the macular pigment, lutein appears to play a significant role as a photoprotective agent, effectively filtering out damaging blue light from the Sun.<sup>[1]</sup> Lutein's peak absorption occurs at 446 nm in the visual-light spectrum, and it therefore screens out blue light (440 nm) and effectively reduces light-induced retinal damage. Second, lutein protects against oxidative stress in the eye through quenching free radicals. Energy transfer to lutein and zeaxanthin quenches singlet oxygen, and these carotenoids are also believed to react with peroxyl radicals that are involved with lipid peroxidation.<sup>[2]</sup> Astaxanthin is structurally similar to lutein and zeaxanthin, but has a stronger antioxidant activity and unique UV-light photooxidation protection properties. Oxidative damage to the retinal tissues by UV light has been widely documented, and thus astaxanthin may assist in eye health maintenance.<sup>[3]</sup>

### BILBERRY, ANTHOCYANIDINS AND GINKGO BILOBA

Bilberry or *Vaccinium myrtillus* (25% anthocyanidins) has a long history of use for various eye conditions, and its active components, flavonoids anthocyanosides, are potent antioxidants with an affinity for the eye and vascular tissues.<sup>[4]</sup>

Multi-anthocyanidins (20%) are believed to reinforce retinal collagen, prevent capillary fragility and leakage, and improve microcirculation, decreasing ocular pressure. Multi-anthocyanidins supplementation assists in the treatment of glaucoma, cataracts, retinopathy, diabetes mellitus, and arthritis.<sup>[5]</sup>

*Ginkgo biloba* (24% flavonoid glycosides – 6% terpene lactones) functions in quenching ROS, increasing vasodilatation, decreasing blood viscosity, and thus increasing blood flow to the ophthalmic artery, revealing potential benefit for age-related macular disease and glaucoma.<sup>[2, 4]</sup>

### VITAMIN E

$\alpha$ -Tocopheryl acetate protects against lipid peroxidation and is the most effective antioxidant of the vitamin-E group. As a major antioxidant present in all cell membranes, vitamin E is highly concentrated within the rod photoreceptor outer segments and the retinal pigment epithelium. Vitamin E also protects vitamin A from oxidative degeneration in the retina.<sup>[2]</sup> Higher dietary intake of vitamin E is associated with an increase in retinal concentration, and a relationship has been observed between increased plasma vitamin E levels and reduced risk of AMD.<sup>[6]</sup>

### NIACIN

Niacin, or vitamin B<sub>3</sub>, has vasodilatory properties that may be beneficial in the treatment of ocular diseases, such as AMD, characterized by decreased choroidal circulation.

Several studies have observed a significant increase in choroidal blood flow and volume following treatment with niacin. It is speculated that an increase in choroidal blood circulation may facilitate the diffusion of gases and substances across the retinal pigment epithelium (RPE) – Bruch's membrane. This may improve removal of the waste products and metabolic debris from the outer retina, and thus reduce the accumulation of drusen material in AMD patients.<sup>[7]</sup>

### ZINC, COPPER, AND SELENIUM

Zinc is the second most abundant trace mineral in the body, is highly concentrated in ocular tissues, and along with copper, is involved in numerous enzyme systems within the eye, including alkaline phosphatase, carbonic anhydrase (important in aqueous production), antioxidant enzymes such as superoxide dismutase, and enzyme systems concerned with metabolism and nucleic acid. Zinc is a cofactor for retinal dehydrogenase; it is also involved in the metabolism of a vitamin-A transport protein, and the interconversion of retinol to retinal, essential for rhodopsin synthesis.<sup>[6]</sup>

Selenium stimulates the antioxidant enzyme glutathione peroxidase, protecting cell membranes from oxidative damage. Cataract patients are observed to have decreased levels of selenium in sera and aqueous humor; however, the significance of this relationship is unclear.<sup>[8]</sup>

### $\alpha$ -LIPOIC ACID

$\alpha$ -Lipoic acid is an essential cofactor in oxidative metabolism and has potent hypoglycemic and antioxidant effects: thus it has been considered as a potential therapeutic agent in diabetic cataracts. Recent studies found that in the lens tissue,  $\alpha$ -lipoic acid may prevent protein glycation and inhibit aldose reductase activity, prevent oxidative damage, and increase intracellular glutathione, ascorbate and vitamin E.<sup>[9]</sup>

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