



OcuFlora®

MARIGOLD EXTRACT - OCUFLORA

Botanical Name : *Tagetes erecta* L. Family : Asteraceae

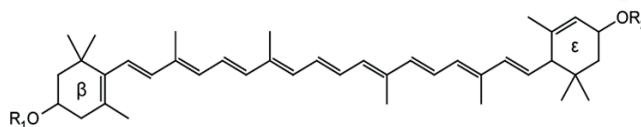
Common Name : Marigold, Part Used : Flowers.

Phytochemistry

Lutein is a natural carotenoid pigment synthesized by plants and microorganisms. Carotenoids are classified as either provitamin A (alpha-carotene, beta-carotene, and beta-cryptoxanthin, which can be converted into retinol) or nonprovitamin A (lutein, lycopene, and zeaxanthin).

Lutein esters from *Tagetes erecta* L. is a purified extract derived from the dried petals of yellow marigold flowers with organic solvents. It contains, as a major component, lutein esters of which helenien (lutein dipalmitate) accounts for the major part. A smaller proportion of zeaxanthin esters is also present. Helenien (β,β-carotene-3,3'-diol dipalmitate) is member of a group of pigments known as xanthophylls and have no provitamin A activity.

The human macula uniquely concentrates three carotenoids: lutein, zeaxanthin, and meso-zeaxanthin. Lutein and zeaxanthin must be obtained from dietary sources such as green leafy vegetables and orange and yellow fruits and vegetables, while meso-zeaxanthin is rarely found in diet and is believed to be formed at the macula by metabolic transformations of ingested carotenoids.



	R ₁	R ₂
all-trans-lutein	H	H
3'-O-monoester	H	fatty acid
3-O-monoester	fatty acid	H
diester	fatty acid	fatty acid

Chemical structure of free and esterified lutein



Pharmacological action

Lutein has antioxidant (1) (2) and anti-inflammatory (3) activities, and supplements are marketed as protection against ocular diseases such as age-related macular degeneration (AMD) and for general eye health. Lutein is one of the predominant carotenoids that accumulates in both the lens and retinal macula (5). It scavenges reactive oxygen species, preventing damage to DNA and protein molecules (4) (6). As an oxycarotenoid, its structure is less hydrophobic than beta-carotene and lycopene. This enables lutein to react with free radicals in a membrane's aqueous phase, resulting in increased membrane integrity, which may in turn affect tissue permeability to oxygen and other molecules (4). It may also protect against ocular damage by reducing the amount of blue light that reaches photoreceptors (6).

Available grades

- Free Lutein - 5 to 80% (Powder)
- Free Lutein - 5 to 30% Water Dispersible (Powder)
- Free Lutein - 5 to 40% (Oil suspension)
- Lutein Ester - 5 to 80% (Powder)
- Lutein Ester - 5 to 20% (Oil suspension)
- Zeaxanthin - 5 to 60% (Powder)
- Zeaxanthin - 5 to 20% (Oil suspension)



References

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2. Sindhu ER, Firdous AP, Ramnath V, et al. Effect of carotenoid lutein on N-nitrosodiethylamine-induced hepatocellular carcinoma and its mechanism of action. *Eur J Cancer Prev.* Jul 2013;22(4):320-327.
3. Oh J, Kim JH, Park JG, et al. Radical scavenging activity-based and AP-1-targeted anti-inflammatory effects of lutein in macrophage-like and skin keratinocytic cells. *Mediators Inflamm.* 2013;2013:787042.
4. Hu J, La Vecchia C, Negri E, et al. Dietary vitamin C, E, and carotenoid intake and risk of renal cell carcinoma. *Cancer Causes Control.* Oct 2009;20(8):1451-1458.
5. Eliassen AH, Hendrickson SJ, Brinton LA, et al. Circulating carotenoids and risk of breast cancer: pooled analysis of eight prospective studies. *J Natl Cancer Inst.* Dec 19 2012;104(24):1905-1916.
6. Slattery ML, Benson J, Curtin K, et al. Carotenoids and colon cancer. *Am J Clin Nutr.* Feb 2000;71(2):575-582.



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