Preface

Lutein (/ˈljuːtiɪn, -tiːn/;[2] from Latin *luteus* meaning "yellow") is a xanthophyll and one of 600 known naturally occurring carotenoids. Lutein is synthesized only by plants, and like other xanthophylls is found in high quantities in green leafy vegetables such as spinach, kale and yellow carrots. In green plants, xanthophylls act to modulate light energy and serve as non-photochemical quenching agents to deal with triplet chlorophyll, an excited form of chlorophyll which is overproduced at very high light levels during photosynthesis. See xanthophyll cycle for this topic.

Animals obtain lutein by ingesting plants.[3] In the human retina, lutein is absorbed from blood specifically into the macula lutea,[4] although its precise role in the body is unknown.[3] Lutein is also found in egg yolks and animal fats.

Lutein is isomeric with zeaxanthin, differing only in the placement of one double bond. Lutein and zeaxanthin can be interconverted in the body through an intermediate called *meso*-zeaxanthin.[5] The principal natural stereoisomer of lutein is (3*R*,3′*R*,6′*R*)-*beta*,*epsilon*-carotene-3,3′-diol. Lutein is a lipophilic molecule and is generally insoluble in water. The presence of the long chromophore of conjugated double bonds (polyene chain) provides the distinctive light-absorbing properties. The polyene chain is susceptible to oxidative degradation by light or heat and is chemically unstable in acids.

Lutein is present in plants as fatty-acid esters, with one or two fatty acids bound to the two hydroxyl-groups. For this reason, saponification (de-esterification) of lutein esters to yield free lutein may yield lutein in any ratio from 1:1 to 1:2 molar ratio with the saponifying fatty acid.[i]

In the present book, ten typical literatures about Lutein published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on Lutein. We hope this book can demonstrate advances in Lutein as well as give references to the researchers, students and other related people.

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[i] https://en.wikipedia.org/wiki/Lutein