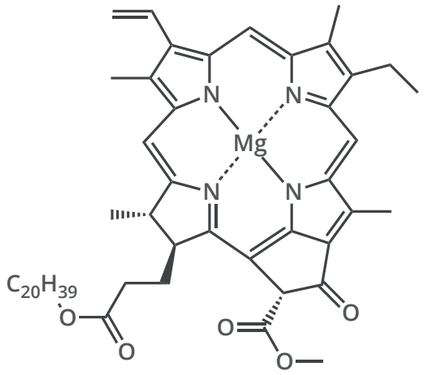
THE CHEMISTRY OF AUTUMN LEAF COLOURS

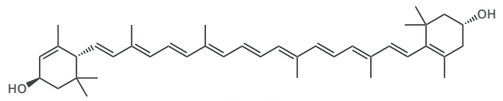
CHLOROPHYLL



CHLOROPHYLL A
A type of chlorin

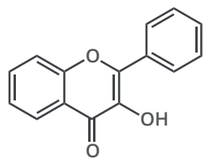
Chlorophyll gives plant leaves their green colour. Plants require warm temperatures and sunlight to produce chlorophyll. In autumn, the amount produced begins to decrease, and existing chlorophyll is slowly broken down, diminishing the green colour of the leaves.

CAROTENOIDS & FLAVONOIDS

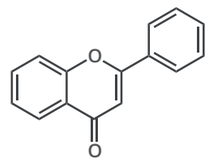


LUTEIN
A type of carotenoid

Carotenoids and flavonoid pigments are always present in leaves, but as chlorophyll is broken down in the autumn their colours come to the fore. Xanthophylls, a subclass of carotenoids, are responsible for the yellows of autumn leaves. One of the major xanthophylls, lutein, is also the compound that contributes towards the yellow colour of egg yolks.

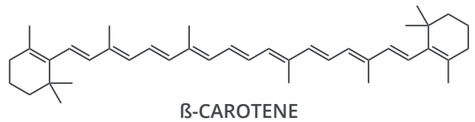


FLAVONOL
(general structure)



FLAVONE
(general structure)

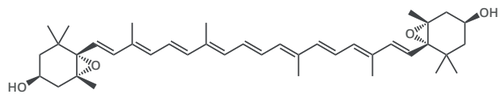
CAROTENOIDS



ß-CAROTENE
A type of carotenoid

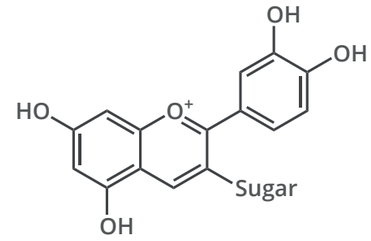
Carotenoids also contribute orange colours. Beta-carotene is one of the most common carotenoids in plants, and absorbs green and blue light strongly, reflecting red and yellow light and causing its orange appearance. It is also responsible for the orange colouration of carrots.

Carotenoids in leaves start degrading at the same time as chlorophyll, but they do so at a much slower rate; some fallen leaves can still contain measurable amounts.



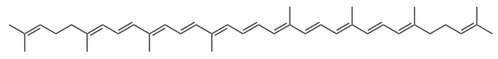
VIOLAXANTHIN
A type of carotenoid

ANTHOCYANINS & CAROTENOIDS



ANTHOCYANINS
(general structure)

Anthocyanin synthesis is kick-started by the onset of autumn. As sugar concentration in the leaves increases, sunlight initiates anthocyanin production. The purpose they serve isn't clear; it is suggested that they may play a light-protective role. It was previously thought they might delay leaf fall, but this has been discounted.



LYCOPENE
A type of carotenoid