

## Plant photosynthesis and the palaeoenvironment

Almost all plant life on Earth can be divided into three categories based on the way plants assimilate or photosynthesize carbon dioxide into their systems. One of three different types of photosynthesis are used by most plants, these are the so-called C<sub>3</sub>, C<sub>4</sub>, and CAM (Crassulacean Acid Metabolism) pathways.

Plants which use the CAM pathway of photosynthesis are cactuses, agaves and also some orchids and bromeliads. C<sub>4</sub> and CAM photosynthesis has evolved as an adaptation to arid conditions because this results in more efficient water usage. C<sub>4</sub> plants include crop plants such as sugar cane and corn. C<sub>3</sub> plants include more than 95 % of the plant species on earth and include trees and grasses which grow in areas where the growing season is in summer.

C<sub>3</sub> and C<sub>4</sub> plants fractionate carbon isotopes in distinctly different ways and it is this feature which makes them suitable for palaeoenvironmental analysis. By studying the carbon isotopes in animal/human bones or teeth the diet of the living animal can be extrapolated from the carbon 13 to carbon 12 ratio.

Langebaanweg was found to be dominated by C<sub>3</sub> vegetation. You may read more about this in 'The environment...'.  
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