

Abstract

Isolated chloroplasts from *Pisum sativum* leaves catalyze [^3H]thymidine incorporation into acid-insoluble material using light as the sole energy source. Neither ribonucleotides, deoxyribonucleotides nor deoxyribonucleosides (other than [^3H]thymidine) are required. However, it is necessary that the plastids be intact and photosynthetically competent, as little synthesis occurs in lysed preparations or in the presence of photophosphorylation inhibitors. Thymidine incorporation is markedly reduced by the DNA synthesis inhibitors rifampicin, nalidixic acid, ethidium bromide and N-ethylmaleimide. Plant age is an important factor, since rates of synthesis are 3–10-times higher in plastids isolated from young plants (6–8 days old) than in chloroplasts from older ones (9–14 days old). The maximum rates using plastids from young leaves of 60–70 pmd/mg chlorophyll/h are 30–60-times greater than those previously reported [1].