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2.3.2 Reactions on green pigments 2.3.2.1 Chlorophyllase; 2.3.2.2 Mg dechelation; 2.3.3 Loss of green color; 2.3.3.1 Pheophorbide a oxygenase; 2.3.3.2 Red chlorophyll catabolite reductase; 2.3.4 Reactions on pFCC; 2.3.4.1 Hydroxylation; 2.3.4.2 Glucosylation; 2.3.4.3 Malonylation; 2.3.4.4 Demethylation; 2.3.4.5 Tautomerization; 2.4 Chlorophyll catabolic mutants; 2.5 Significance of chlorophyll breakdown; 2.5.1 Topology of chlorophyll breakdown; 2.5.2 Chl breakdown and cell death; 2.5.3 Chl breakdown and nitrogen economy; 2.6 The pigments of senescing leaves 2.7 The function of anthocyanins in leaf senescence 2.7.1 Physiological explanations; 2.7.2 Ecological explanations; 2.7.3 Reconciling these explanations; 2.8 Conclusions and perspectives; References; 3 Membrane dynamics and regulation of subcellular changes during senescence; 3.1 Introduction; 3.2 Loss of membrane structural integrity during senescence; 3.2.1 Senescence-associated changes in the molecular organization of membrane lipid bilayers; 3.2.2 Role of lipases; 3.2.2.1 Initial fate of de-esterified fatty acids in senescing membranes 3.2.2.2 Autocatalytic nature of membrane fatty acid de-esterification 3.2.3 Role of galactolipases; 3.3 Role of proteolysis in membrane senescence; 3.4 Dismantling of membranes in senescing tissue; 3.4.1 Plastoglobuli; 3.4.2 Cytosolic lipid-protein particles; 3.4.2.1 Sites of cytosolic lipid-protein particle ontogeny; 3.5 Role of autophagy; 3.6 Metabolism of membrane fatty acids in senescing tissues; 3.6.1 Galactolipid fatty acids; 3.6.2 Fate of thylakoid fatty acids during stress-induced senescence; 3.7 Translational regulation of senescence; References; 4 Oxidative stress and leaf senescence 4.1 Introduction

Sommario/riassunto

The scientific and economic significance of plant senescence means that much effort has been made to understand the processes involved and to devise means of manipulating them agriculturally. During the past few years there has been considerable progress in this regard, especially in the molecular, genetic and genomic aspects. Senescence has a tremendous impact on agriculture. For example, leaf senescence limits crop yield and biomass production, and contributes substantially to postharvest loss in vegetable and ornamental crops during transportation, storage and on shelves. In addition, prote