Abstract:

Storage of pears under low oxygen levels (0.5-1.0 kPa) leads to decreased ascorbic acid and ATP levels, a lower ATP-production, and to internal browning, a storage disorder in pears. Addition of 5 kPa carbon dioxide to the storage atmosphere increased the severity of this disorder. Experiments showed that anoxia can result in off-flavours, but not in internal browning. Internal browning is caused by brown pigments (melanins), which are formed due to oxidation of vacuolar polyphenols under the influence of tyrosinase (EC 1.14.18.1). We hypothesise that internal browning is initiated by a combination of oxygen radical action and a lack of maintenance energy for, amongst others, the regeneration of antioxidants. The two factors together lead to decompartmentation, bringing tyrosinase from the plastids and substrates from the vacuole together.