As very few data are available on both the antioxidant activity and dose-dependent re- sponse, the 1 aim of this work was to evaluate not only the protective action of six natural purified chlorophyll derivatives (chlorophyll a and b, pheophytin a and b, pheophorbide a and b) but also the synthetic Cuchloro- phyllin against lipid oxidation employing two methods: the bleaching of b-carotene in a water/linoleic acid emulsion and the scavenging of the stable radical 2,2-di- phenyl-1-picrylhydrazyl (DPPH).Ferruzzi, Bo hm, Courtney, and Schwartz (2002) provided information concerning in vitro antioxidant and antimutagenic activ- ities of water and lipid soluble chlorophyll derivatives as well as of metal chelated derivatives by free radical scav- enge and bacterial reverse mutagenesis assays, respec- tively. However, the same authors also reported that chlorophylls and pheophy- tins provide protection by preventing autoxidation of vegetable edible oils stored in the dark and suggested a hydrogen donating mechanism breaking the radical chain reactions. The antioxidant activities of the synthetic metallo-chlorophyll derivatives, especially Cu-chelated compounds were found to be much higher than those of natural chlorophylls and of Mg-free derivatives, which showed an almost insignificant antioxidant capac- ity. A research group in Japan (Endo, Usuki, & Kan- eda, 1985a, 1985b; Usuki, Endo, & Kaneda, 1984b; Usuki, Suzuki, Endo, & Kaneda, 1984) first suggested a pro-oxidant activity of chlorophylls under light, which could be understood as a transfer of the energy of singletexcited chlorophyll to oxygen that would form reactive oxygen species. Hoshina, Tomita, and Shioi (1998) found that chloro- phylls were better antioxidants than their metal free derivatives and confirmed the .importance of the porphy- rin ring on the inhibition of lipid autoxidation