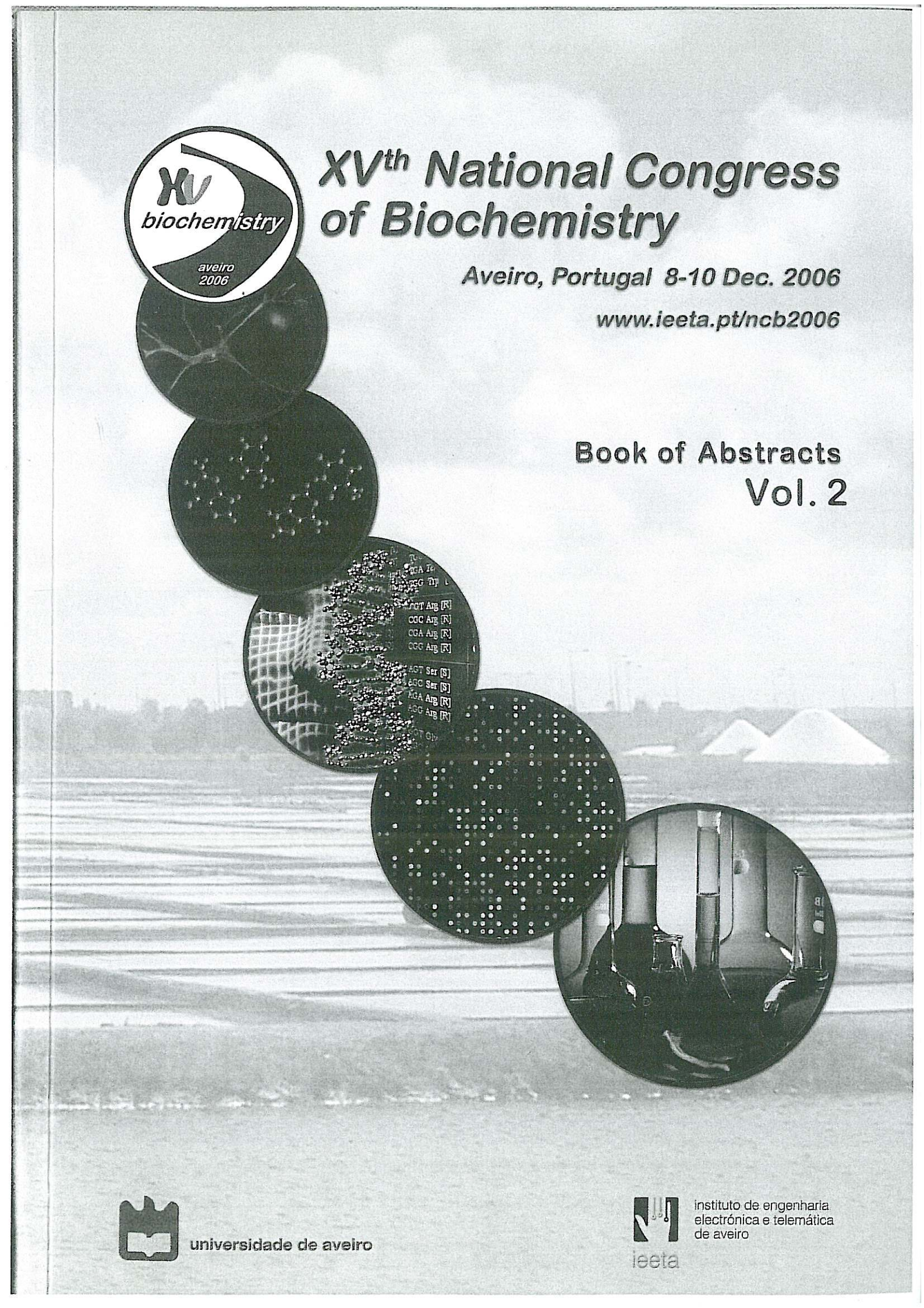

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ANTIOXIDANT ACTIVITY AND PHENOLIC CONTENTS OF OLEA EUROPAEA L. LEAVES SPRAYED WITH DIFFERENT COOPER FORMULATIONS

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The presence of cooper can catalyse oxidation of fatty acid chains, exerting a deleterious influence over shelf life. Transition metals, which possess two or more valence states with a suitable redox potential, act as pro-oxidants even at concentrations lower than 0.1 ppm, and could affect the speed of autoxidation and the direction of hydroperoxide breakdown to volatile compounds. Being copper a transition metal that even, in small concentration, is a very potent oxidation catalyst, can enter a redox reaction, giving rise to consequent lipid peroxidation phenomenon due to the free radicals producing. This group of reactive species (superoxide, hydroxyl and lipidic peroxides) may interact with biological systems in a clearly cytotoxic manner being responsible for several pathological processes, such as certain tumours (prostate and colon cancers) and coronary heart disease. In this respect, olive flavonoids, phenols and oleuropeosides have been shown to posses an important antioxidant activity towards these radicals, which is principally based on the redox properties of their phenolic hydroxyl groups and the structural relationships between different parts of their chemical structure.

In the present study we evaluated the residue levels of copper in Cv. Cobrançosa olive leaves as a result of tree pulverizations with copper formulations and we correlated these levels with antioxidant activity of the respective leave extracts. Copper contents were evaluated by electrothermic atomization atomic absorption spectrometry. Antioxidant properties were evaluated by their reducing power, scavenging effects on DPPH (1,1-diphenyl-2-picrylhydrazyl) radicals and protective effect of the leaves methanolic extracts on erythrocyte hemolysis by peroxyl radical scavenging activity. Extracts from leaves without copper treatment revealed better antioxidant properties than leaves treated with different copper formulations (lower EC_{50} values), which is in agreement with the higher content of phenols found in the first case. The EC_{50} values obtained for reducing power and scavenging effects on DPPH radicals were better than for hemolysis inhibition mediated by peroxyl free radicals. The use of $Cu(OCl)_2$ is not recommended due to its high persistence and the drastically decrease in reducing power values, scavenging effects on DPPH and hemolysis inhibition.