Electrochemical generation and reactivity of free radical redox intermediates from ortho-and meta-nitro substituted 1,4-dihydropyridines

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This paper reports a comprehensive study by cyclic voltammetry on the electrochemical characteristics and the reactivity of the one-electron reduction product from a series of nitro aryl 1,4-dihydropyridines in mixed and aprotic media. In addition, the effects of 1,4-DHP on the oxygen consumption of T. cruzi epimastigotes are reported. One-electron reduction products from 1,4-DHP derivatives significantly reacted with both thiol compounds and the nuclei acid bases, adenine and uracil. This reactivity was significantly higher than the natural decay of the radicals in mixed media. Based on these results the following tentative order of reactivity towards the xeno/endobiotics is as follows: cysteamine > glutathione > adenineuracil. Both the stability and the reactivity of the nitro radical anions electrochemically generated from 1,4-DHP showed a linear dependence with pH. The sensitivity to pi-I of the radicals derived from o-nitro substituted derivatives was significantly higher than m-n