Effect of *ocimum americanum* on cell damage in rat hippocampal slices


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**Abstract**

**Introduction:** Many species of the family *Lamiaceae* have been reported as source of innovative neuroprotective agents. Previous studies in our laboratory showed that ethanol extract of *Ocimum americanum* (EEOA) has a potent antioxidant and in vitro anticholinesterase activities. Aim: Evaluate the neuroprotective effect of the EEOA on the susceptibility to cell damage induced by hydrogen peroxide (H₂O₂) in hippocampal slices from young and aged rats.

**Experimental:** Wistar rats (4 and 16 months) were decapitated, brains were removed and the hippocampi dissected. Hippocampal slices were prepared and incubated with different concentrations of the EEOA (0, 0.1, and 1 μg/mL). After, the medium was replaced by fresh buffer in the absence or presence of H₂O₂. Mitochondrial activity, an index of cell viability, was assessed by reduction of 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT). The plasma membrane damage was measured by release of lactate dehydrogenase.

**Results:** The incubation with H₂O₂ impaired cellular viability in hippocampal slices from young and aged rats (ANOVA followed by Tukey’s, 65.8±5.8, p=0.009; 58.5±18.6, p=0.0001; respectively). The ethanol extract at 1 μg/mL reverted the damage induced by H₂O₂ in hippocampal slices from young rats (ANOVA followed by Tukey’s, 96.4±29.2 p=0.053). Incubation with H₂O₂ enhanced LDH released to the incubation media by hippocampal slices from young rats (ANOVA followed by Tukey’s, 125.6±7.4, p=0.001), while EEOA at 1 μg/mL reverted this parameter (ANOVA followed by Tukey’s, 102.9±2.5, p=0.009). The EEOA at 1 μg/mL reduced the LDH release (ANOVA followed by Tukey’s, 67.8±12.7, p=0.006).

**Conclusion:** Our results indicate that hippocampal slices from aged rats respond to H₂O₂ brain injury differently than those from young rats. The EEOA reverted membrane cell damage in hippocampal slices in both ages and was able to reduce impaired cellular viability in young rats. Our data suggests that *Ocimum americanum* contains useful neuroprotective compounds.

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