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The neuroprotective effects of baobab and black seed on the rat hippocampus exposed to a 900-MHz electromagnetic field

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This study investigated the potential effects on the hippocampus of electromagnetic fields (EMFs) disseminated by mobile phones and the roles of baobab (*Adansonia digitata*) (AD) and black seed (*Nigella sativa*) (BS) in mitigating these. Fifty-six male, 12-week-old *Wistar albino* rats were divided into eight groups of seven animals each. No EMF exposure was applied to the control, AD or BS groups, while the rats in the Sham group were placed in an EMF system with no exposure. A 900-MHz EMF was applied to the EMF+AD, EMF+BS, EMF+AD+BS and EMF groups for 1 hour a day for 28 days. Pyramidal neurons in the hippocampus were subsequently counted using the optical fractionator technique, one of the unbiased stereological methods. Tissue sections were also evaluated histopathologically under light and electron microscopy. The activities of the enzymes catalase (CAT) and superoxide dismutase (SOD) were also determined in blood serum samples. Analysis of the stereological data revealed no statistically significant differences between the EMF and control or sham groups in terms of pyramidal neuron numbers ($p>0.05$). However, stereological examination revealed a crucial difference in the entire hippocampus between the control group and the AD ($p<0.01$) and BS ($p<0.05$) groups. Moreover, exposure to 900-MHz EMF produced adverse changes in the structures of neurons at histopathological analysis. Qualitative examinations suggest that a combination of herbal products such as AD and BS exerts a protective effect against such EMF side-effects.