Antioxidant Property of Beetroot Juice Stimulates Erythrocyte Antioxidant Enzymatic Activity under Oxidative Stress Stimulation

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Abstract
Many studies have shown that fruits and vegetables containing antioxidant compounds are beneficial to health. Many studies started to highlight the potential of beetroot; which is rich with betalain pigments, as the new alternative antioxidant supplementation due to its high capacity of free radical scavenging activity. Ultraviolet (UV) radiation emitted from sunlight can penetrate more than just skin tissues, thereby disturbing the balance of erythrocytes antioxidant enzymes level, particularly glutathione peroxidase (GPx) and superoxide dismutase (SOD) in erythrocytes. The aim of this study was to investigate the erythrocyte antioxidant enzymes in *Sprague Dawley* rats (*SD*) supplemented with beetroot juice at different concentrations upon UV-induced oxidative stress. The total betalain content that was measured spectrophotometrically showed that 500 mg/kg of beet root juice contained approximately ten fold-higher levels of betalain pigment, compared to 250 mg/kg and 100 mg/kg. DPPH test performed on different concentrations of beet root juices showed that the antioxidant activity of beetroot juice increases in concentration-dependent manner, only 500 mg/kg non-diluted beetroot juice exhibited 100% free radical scavenging activity. The erythrocytes suspension of *SD* rats treated with different concentrations of beetroot juices were assayed for GPx and SOD activity which showed an increase of the activity of these enzymes in concentration-dependent manner, especially in non-diluted preparation. We found that non-diluted (500 mg/kg concentration) beetroot juices exhibited highest antioxidant activity which offer significant protection against oxidative stress by elevating the activity of GPx and SOD enzymes in scavenging free radicals.

Keywords:
Beetroot, betalain, free radical, scavenging activity, SOD, GPx