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Rheum spiciforme Royle—the medicinal herb with positive modulatory effect on controlled *in vitro* oxidative stress

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Oxidative stress is the cause of many diseases, which are affecting the humans by deranging the balance between the oxidants and antioxidants. Pathologies such as Alzheimer's, Parkinson's, diabetes and cancer have been well associated with the production of free radicals during various metabolic processes. Many medicinal plants are used to treat such kind of diseases since ancient times. Here, we evaluated the medicinal herb *Rheum spiciformis* Royle (RS), used in folklore to treat many aliments for its potential against oxidative stress. Five different extracts (aqueous, chloroform, ethyl acetate, methanol and PET ether) of RS were evaluated against oxidative stress generated *in vitro*. Phytochemical constituents were assessed followed by total phenolics, DPPH, reducing power, hydroxyl radical scavenging activity and *in vitro* calf thymus DNA damage. The highest phenolic content (TPC) of 1191.65 mg GAE/g was observed in RS-MeOH extract. DPPH radical scavenging activity was found to be highest in RS-MeOH (96.60%) with IC_{50} 125.91 µg/mL. The reducing power of the extracts increased in a concentration dependent manner. Again Superoxide radical scavenging activity of RS extracts with IC_{50} values 34.10 µg/mL (RS-MeOH) for methanol was highest. Highest H_2O_2 scavenging activity 84.76 µg/mL was shown by RS-MeOH extract at 250 µg/mL of plant extracts. RS-MeOH showed great effect to scavenge free radicals as such prevents Calf thymus DNA damage induced by Fenton reaction. These results clearly indicate that RS-MeOH and RS-EtA among the five extracts possesses the highest positive modulatory effect on free radical scavenging on wide variety of free radicals as such can be employed as potential antioxidant and anti-inflammatory agent against various oxidative stress related pathological conditions.

Keywords: Antioxidants, Indian rhubarb, Phytochemicals, Rhubarb