

ORIGINAL ARTICLE

Evaluation of *In Vitro* Enzymatic and Non-Enzymatic Antioxidant Properties of Leaf Extract from *Alpinia Purpurata* (Vieill.) K. Schum.

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ABSTRACT **Objective:** To evaluate the enzymatic and non-enzymatic antioxidants of leaf extract from *Alpinia purpurata*. **Methods:** One gram of fresh leaf of *Alpinia purpurata* was grinded in 2 mL of 50% ethanol and centrifuged at $10,000 \times g$ at 4°C for 10 min. The supernatant obtained was used within 4 h for various enzymatic antioxidants assays like superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione S-transferase (GST), ascorbate oxidase, peroxidase, polyphenol oxidase (PPO) and non-enzymatic antioxidants such as vitamin C, total reduced glutathione (TRG) and lipid peroxidation (LPO). **Results:** The leaf extract of *Alpinia purpurata* possess antioxidants like vitamin C $472.92 \pm 6.80 \mu\text{g/mg protein}$, GST $372.11 \pm 5.70 \mu\text{mol of 1-chloro 2,4 dinitrobenzene (CDNB)-reduced glutathione (GSH) conjugate formed/min/mg protein}$, GPx $281.69 \pm 6.43 \mu\text{g of glutathione oxidized/min/mg protein}$, peroxidases $173.12 \pm 9.40 \mu\text{mol/g tissue}$, TRG $75.27 \pm 3.55 \mu\text{g/mg protein}$, SOD $58.03 \pm 2.11 \text{ U/mg protein}$, CAT $46.70 \pm 2.35 \mu\text{mol of H}_2\text{O}_2 \text{ consumed/min/mg protein}$ in high amount whereas ascorbate oxidase $17.41 \pm 2.46 \text{ U/g tissue}$, LPO $2.71 \pm 0.14 \text{ nmol/L of malondialdehyde formed/min/mg protein}$ and PPO $1.14 \pm 0.11 \mu\text{mol/g tissue}$ in moderate amount. **Conclusion:** *Alpinia purpurata* has the potential to scavenge the free radicals and protect against oxidative stress causing diseases. In future, *Alpinia purpurata* may serve as a good pharmacotherapeutic agent.

KEYWORDS *Alpinia purpurata*, enzymatic antioxidants, non-enzymatic antioxidants, oxidative stress, free radicals

Oxidative stress associated with the production of reactive oxygen species (ROS) is believed to be involved not only in the toxicity of xenobiotics but also pathophysiology in various tissue damages. The toxicity of organs such as liver, heart, kidney, brain etc., are associated with the metabolic activation of foreign compounds to form free radicals or with the production of ROS such as superoxide anion, hydroxyl radicals, hydrogen peroxide radicals, etc. These are responsible for tissue damaging effects such as lipid peroxidation and DNA damage.⁽¹⁾ Plant-based drugs produced very less side effects than allopathic drugs. Plant contains enzymatic antioxidants [superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), and glutathione S-transferase (GST)] and non-enzymatic antioxidants [vitamin C and total reduced glutathione (TRG)] to scavenge free radicals produced by ROS and protect organ from ROS-induced oxidative stress.⁽²⁾

Medicinal plants have been used to cure disease since antiquity. Plants still constitute one of the major sources of drugs in modern as well as traditional medicine throughout the world.⁽³⁾

Natural products such as herbs, fruits and vegetables become popular in recent years due to public awareness and increasing interest among consumers and scientific community.⁽⁴⁾

Alpinia is the largest genus in ginger family in which *Alpinia purpurata* (Vieill.) K. Schum. is a very popular garden plant in India.⁽⁵⁾ Rhizome has sharp odour, improves appetite, taste and voice. It is also used for headache, rheumatism, sore throat and renal disease.⁽⁶⁾ Phytochemical studies on *Alpinia purpurata* revealed that it possess flavonoids, rutin, kaempferol-3-rutinoside and kaempferol-3-olucronide.⁽⁷⁾ The phytochemical constituents of *Alpinia purpurata* promote

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