

# CHEMICAL AND ANTIOXIDANT PROPERTIES OF INDIAN WINE

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## Introduction

Wines have been used for health reasons since ancient times. Of late, there has been a spate of reports emanating from the medical community citing wine's effects upon health based on the presence of those components other than alcohol.

Free radicals and oxidative stress are known to cause a wide range of ill effects and diseases and their prevention is known to ameliorate the effect. Free radicals are highly reactive species produced in the body during normal metabolic functions or introduced from the environment (xenobiotics compounds, diesel exhaust, tobacco smoke, radiation etc). Free radicals and oxidants can trigger lipid peroxidation, as well as the oxidation of proteins and DNA (Ames et al., 1993). All these events cause extensive damage to body cells and play an important role in many pathological states. In fact, they are believed to play a role in more than sixty different health conditions, including cancer, atherosclerosis, neurodegeneration, inflammation and aging process.

The antioxidants in wine and grape juice favorably modulate the blood clotting that climaxes heart attacks and strokes; they help further by relaxing blood vessels and inhibiting the oxidation of LDL (the "bad") cholesterol to its dangerous form. Second in importance to their cardiovascular benefits are wine's antioxidant actions against cancer.

## Objective

Present work focuses on the beneficiary aspects of Indian wine as an antioxidant. The project involves studies on chemical and antioxidant properties of Indian Wine.

## Methodology

Indian wine possesses potent free radical scavenging and antioxidant activities. The following parameters were studied in detail.

1. **DPPH scavenging activity:** The principle for the reduction of 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical is that, the antioxidant reacts with stable free radical, DPPH and converts it to 1, 1-diphenyl-2-picrylhydrazine.
2. **Ferrous sulphate induced lipid peroxidation inhibition activity:** MDA reacts with TBA to give a colored compound which has an absorbance maxima at 532 nm,

which serves as a convenient index for determining the extent of peroxidation reactions.

3. **Copper sulphate / Ferric chloride / Hydrogen peroxide induced lipidperoxidation inhibition activity:** Similar to that of ferrous sulphate induced lipid peroxidation, except that here copper sulphate or hydrogen peroxide is used to induce lipidperoxidation.

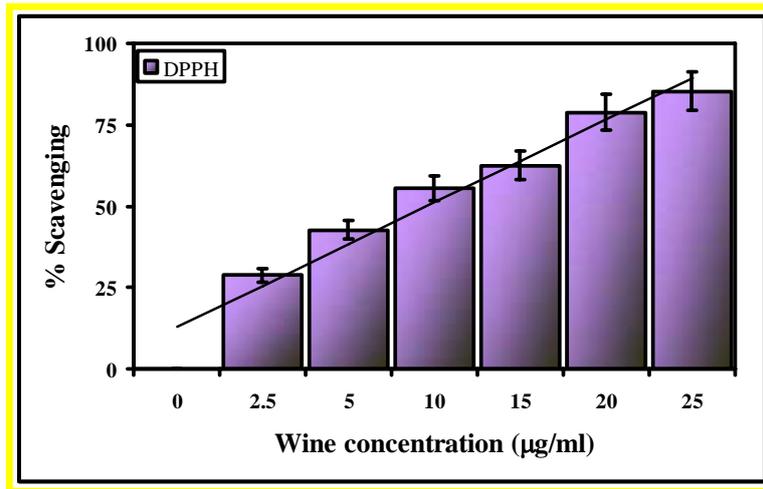


Figure 1: Effect of wine concentration on DPPH scavenging.

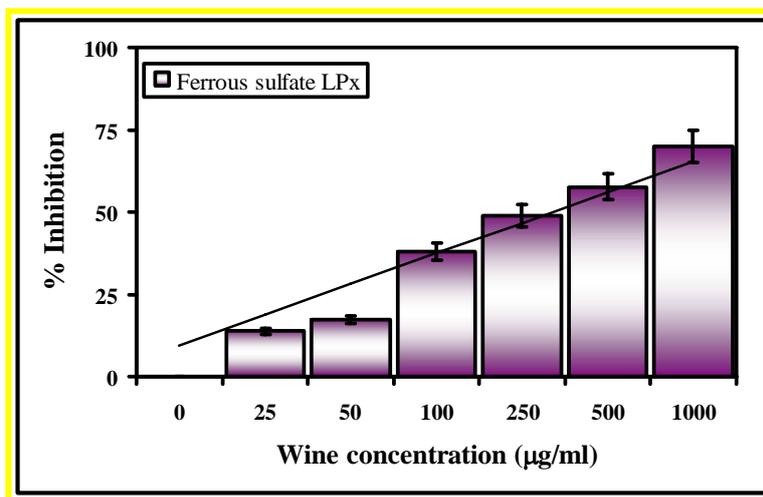


Figure 2: Effect of wine concentration on ferrous sulphate induced lipid peroxidation.

## Conclusions

- The results of in vitro antioxidant activity showed a significant free-radical scavenging effect, as wine extract was found to be both good hydrogen and electron

donor as evidenced in DPPH assays. The high antioxidant activity of wine extract may be due their redox properties, which play an important role in adsorbing and neutralizing free radicals, quenching oxygen, or decomposing peroxides.

- The wine extract was effective in inhibiting the copper sulphate induced lipid peroxidation and the IC<sub>50</sub> was observed to be 450 µg/ml.
- The wine extract was also effective in inhibiting the ferrous sulphate, ferric chloride and hydrogen peroxide induced lipid peroxidation and the IC<sub>50</sub> was observed to be 260 µg/ml, 225 µg/ml and 300 µg/ml respectively.

#### **Scope for future work**

- Analyzing the different chemical constituents of wine extract.
- Comparative study with International brand of wines.
- Assessment of pharmacological properties.