

A study on Anti-oxidant Properties of Carvacrol

Shilpa, Research Scholar, Department of Physics, OPJS University, Churu

Abstract

Carvacrol, a naturally occurring monoterpenoid phenol, is a major bioactive constituent of essential oils obtained from plants such as oregano, thyme, and marjoram. It has attracted considerable scientific interest because of its diverse biological activities, particularly its antioxidant potential. The present study focuses on evaluating the antioxidant properties of carvacrol and understanding its possible mechanisms of action. Antioxidants play an important role in protecting biological systems against oxidative stress caused by an imbalance between reactive oxygen species and endogenous defence mechanisms. Carvacrol has been reported to exhibit free-radical-scavenging and reducing activities, which may contribute to its protective effects against oxidative damage. Its antioxidant capacity can be investigated using various in vitro assays, including DPPH and ABTS radical-scavenging assays, ferric-reducing antioxidant power (FRAP), and lipid peroxidation inhibition tests. The antioxidant activity of carvacrol is associated primarily with its phenolic hydroxyl group, which can donate hydrogen atoms or electrons to reactive species and thereby stabilize free radicals. The findings from studies of carvacrol suggest that it may have potential applications in pharmaceutical, food, and nutraceutical fields as a natural antioxidant. However, factors such as concentration, experimental conditions, bioavailability, and interactions with biological systems can influence its antioxidant effectiveness. Further in vivo and clinical investigations are required to establish its therapeutic significance and safety.

Keywords: Carvacrol, antioxidant activity, oxidative stress, free radicals, DPPH, ABTS, phenolic compounds, lipid peroxidation.

