Abstract

The Phenolic compounds (PCs) are the well-known plant secondary metabolites gaining popularity due to their diverse biological properties. The goal of the current work is to explore the interaction of two phenolic acids and their derivatives with biological macromolecule (DNA of calf thymus). The diverse biological properties of PCs were also explored in various solvent systems to understand its bioavailability and biological activity in different solvent system. We have also studied the effect of UVB exposure with and without phenolic acids (PAs) *in-vitro*. The sensing activity of PAs based Ni nanoparticle was also observed and it was found that the nanoparticle successfully sense the permanganate ions in the micromolar range. Finally, the interaction pattern of PAs with beta-casein was observed using various experimental and theoretical tools. The results demonstrated improved bio-efficacy of the PAs in terms of antioxidant activity and aqueous solubility.

In conclusion, the clinical efficacy of natural PAs may play an important role in protection against adverse effects related to oxidative damage.

Keywords: Sinapic acid, Gallic acid, Calf thymus DNA, Spectroscopy, Nanoparticle.