Abstract

Bioflavonoids are widely distributed in plants and present mainly in tea, cocoa, orange etc. are their major sources. They can exist as flavones, flavonols, flavononols, flavanones and isoflavones etc.

Falvonoids exhibit antioxidant activity by scavenging the reactive oxygen species. They easily tend to chelate with metal ions and form complexes. It has been reported that, the presence of metal ions can greatly influence their biological activities. In the present work, Algar - Flynn - Oyamada method for the synthesis of flavonol was undertaken where, the intermediate chalcone was prepared by Claisen – Schmidt condensation followed by their cyclisation using hydrogen peroxide in alkaline medium to yield flavonols. The purified test compounds characterised by UV, IR, NMR and mass spectroscopy. Their spectral data supported the structures for the final flavonols. The metal-ligand ratios for the complexes were determined by Job’s method and the amount of metal present in the complexes was estimated by titrimetry, whereas the metal ion concentration was determined by atomic absorption method. Further, the redox potential of the flavonols and their complexes were determined using cyclic voltammetry.

Further, the purified test compounds were evaluated for their antioxidant, antibacterial, anti-inflammatory and anticancer activity by in-vitro methods. Those test compounds exhibiting promising in-vitro activity were further tested for their acute oral toxicity according to OECD 425 guidelines. Further, the in-vivo anti-inflammatory activity was performed using Carrageenan-induced paw-edema, Carrageenan-induced air-pouch and CFA-induced arthritis models.