Title: Isolation And Identification Of Natural Bioactive Antioxidant And Anticancer Compounds In Spondias pinnata

Abstract

India has a rich tradition of plant-based knowledge on healthcare. A large number of plants/plant extracts/decoctions or pastes are equally used by tribals and folklore traditions in India especially in Ayurvedic system for treatment of different diseases. In recent years, development of complementary and alternative medicines using various medicinal plants has aroused keen interest in oxidative stress related diseases like cancer, diabetes, liver injury, atherosclerosis, neurodegenerative disorders etc. Use of naturally derived ‘Antioxidants’ have gained an immense importance as they effectively reduced the oxidative stress by scavenging the free radicals without causing any side effect.

In search of bioactive compounds from Spondias pinnata bark, its 70% methanol extract (SPME) was fractionated sequentially by different solvents based on their increasing polarity. Evaluation of bioactivity of the fractions suggests that chloroform, ethyl acetate and water fraction possessed significant bioactivity. Major compounds from these fractions were isolated by column chromatography and all total six compounds were isolated. Among them SPE2, SPE3, SPE4 and SPW1 were found to be biologically active and the structure were determined by studying their different spectral data. From there, SPE2 was found to be a novel quinoline compound, SPE3 is gallic acid (GA), SPE4 is methyl gallate (MG) and SPW1 is a glycoside rich fraction. All the four compounds got excellent antioxidant and free radical scavenging potential. Furthermore, GA, MG and SPW1 showed significant iron chelating property and dose-wise ameliorating effect on iron overload related pathological sequences. In support of the use of phytochemicals/antioxidants from SPME to combat against various human cancers; further the study was designed to investigate the anticancer property of these compounds on human lung (A549), cervical (HeLa) adenocarcinoma and glioblastoma (U87) cell lines. Although SPE2 is capable to kill cancer cells, it is more toxic towards normal fibroblast (WI-38) cells. In depth study with MG suggest that MG induced apoptosis in A549 and U87 cells through activation of both the apoptotic pathways but in case of HeLa cell it activated only extrinsic pathway. Overall, the present study projects a clear picture behind the bioactivity of the S. pinnata bark extract.

Siponkar Chaudhuri