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Evaluation of anticancer activity of Eugenia caryophyllus with novel heavy metal nanoparticles on different human cancer cell lines

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In unani system of medicine clove buds (*Syzygium aromaticum*) are derived from sun dried unopened flower buds of a plant named as *Syzygium aromaticum* which have been used as anodyne, carminative, for abdominal discomfort and to relieve tooth ache when applied to decayed tooth. The clove buds are commonly used as spices and food flavoring agents and are rich in health-promoting phytochemicals, which are currently getting much attention as a possible source of cancer chemo preventive and cancer treating compounds. During our study clove extract was prepared by Soxhlet extraction method by using solvent in increasing order of polarity. This dried extract was interacted with heavy metals like Silver (Ag), Copper (Cu), Zinc (Zn), Arsenic (Ar), Mercury (HG) and Lead (Pb). These heavy metals have been mentioned to possess anticancer property in unani system of medicine. The solution of clove extract and heavy metals was used to check anti-cancer activity on human cancer cell lines like liver (HEPG2), pancreas (PANC-1) and colorectal (HCT-116). In vitro anticancer activity on these above mentioned cancer cell lines were evaluated by (3-(4, 5-dimethyl thiazole-2-yl)-2, 5-diphenyl tetrazolium bromide) MTT assay. The different plant extract were used in different concentration separately and with different concentrations of heavy metals. The treatment of aqueous extract of *Syzygium aromaticum* with heavy metal resulted into the quick reduction of heavy metal ion into the nanosize. The synthesized heavy nanoparticles were characterized with UV-visible absorption spectrophotometer, XRD, SEM, and FTIR analysis. The cytotoxic activity of synthesized heavy nanometal particles was carried out against HEPG2, PANC1, HCT116 and anticancer activity results of clove extract alone and with heavy metals were calculated statistically.

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