Comparative Study of Antioxidant Properties and Effects of Aqueous Extracts of Cola Nitida and Vitex Doniana on Fe2+ - Induced Oxidative Stress in Rat Testes in Vitro

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Abstract

Male sexual dysfunction (MSD) could be caused by various factors which include psychological disorders, androgen deficiencies, chronic medical conditions, vascular insufficiency, penile disease, pelvic surgery, neurological disorders, drugs, life style, aging and systemic diseases. This study sought to assess the antioxidant properties of the aqueous extracts of the leaves of Black plum (Vitex doniana) and bark of Kola nut (Cola nitida), evaluate their effect on pro-oxidant induced lipid peroxidation in rat’s testes; and investigate the effect on arginase which is one of the key enzymes linked to Erectile dysfunction. The results of the total phenol, total flavonoid of aqueous extracts of Cola nitida and Vitex doniana revealed that Cola nitida (10.64 mgGAE/g) had significantly (P<0.05) higher total phenol content than Vitex doniana (4.68 mgGAE/g). The result also revealed that Vitex doniana (2.1 mgQE/g) had significantly (P<0.05) higher total flavonoid content than Cola nitida (1.3 mgQE/g). Also, Vitex doniana (20.24 mgAEE/g) had significantly (p<0.05) higher reducing property than Cola nitida (17.43 mgAEE/g). The results of the 2, 2’-azino-bis (3-ethylbenthiazoline-6-sulphonic acid (ABTS*) radical scavenging ability of the aqueous extracts of Vitex doniana and Cola nitida also showed that the extracts are able to scavenge ABTS* radicals, however, Vitex doniana (1.8 Mmol TEAC/100g) had significantly (P<0.05) higher ABTS* scavenging ability than Cola nitida (1.2 Mmol TEAC/100g). Furthermore, the DPPH* free radical scavenging ability of the aqueous extracts of Cola nitida and Vitex doniana revealed that extracts of Cola nitida and Vitex doniana scavenged DPPH* radicals in a concentration-dependent pattern. However, Vitex doniana (IC50 = 1.28mg/ml) had a significantly (P<0.05) higher DPPH* scavenging ability than Cola nitida (IC50 = 0.83 mg/ml). Both extracts were able to inhibit FeSO4 induced lipid peroxidation in a dose-dependent manner; however, Vitex doniana (IC50 = 1.07 mg/ml) had a higher inhibition of Fe2+ induced lipid peroxidation than Cola nitida (IC50 = 1.01 mg/ml). Vitex doniana (IC50 = 0.38mg/ml) has the higher arginase inhibitory activity than Cola nitida (IC50 = 0.34mg/ml). High phenolic content and strong antioxidant properties could be part of the mechanisms through which the water extractable phytochemicals of Cola nitida (bark) and Vitex doniana (leaves) exhibits its preventive measure of erectile function. However, Vitex doniana displayed a stronger effect on Male sexual function than Cola nitida.

Keywords: Sexual dysfunction, Vitex doniana, Cola nitida, antioxidant, arginase