Abstract

In the recent era, antimicrobial resistance (AMR) is a major threat to health and human development. Treatment for the growing number of infections throughout the World have become less effective due to increasing ratio of infections becoming resistant to antimicrobials. Moreover, cost of AMR treatments is getting high to poor effectiveness of synthetic drugs against these diseases. Oxidative stress in biological systems leads to interruption in physiological processes that may cause structural and metabolic complications like diabetes. This problem can be resolved by investigation and production of new therapeutic agents which bacterial defense system cannot develop resistance. WHO declares that 80% of the people of developing countries are using plants for treatment of many diseases. Plants have been an important source of drugs and medicines since many years as they contain many antioxidant, antimicrobial and antidiabetic agents. Therefore, natural products are the best alternate of synthetic medicines. This work was performed to investigate the phytochemical profile of *Ficus benjamina* leaves extract using GCMS and HPLC analysis in order to measure the antioxidant, antibacterial and antidiabetic potential of its leaves extract with different organic solvents (ethanol and methanol) mixed with water in different proportions. In order to prepare leaves extract, quenching of freshly plucked leaves was done with liquid nitrogen. Then solvent compositions were prepared by mixing ethanol or methanol with water in proportions of 0%, 20%, 40%, 60%, 80% and 100%. Quenched leaves powder was extracted by using these solvent compositions through sonication, shaking and filteration followed by rotary evaporation and lyophilization in order to remove excess solvent. Then the extract yield of this freeze dried extract was calculated and further compositions of 5ml were prepared having 1mg of all the respective samples, followed by ultra-sonication for complete dissolution. These samples were employed for GCMS and HPLC analysis of secondary metabolites as well as for measuring antioxidant, antibacterial and antidiabetic potential using different assays. Findings of the current research indicate that: Extract yield obtained for *Ficus benjamina* leaves were 5.39, 6.13, 7.04, 6.83, 6.20 and 6.91% for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 6.11, 7.20, 9.20, 9.03, 8.84 and 7.21% for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively. Total phenolic content obtained for *Ficus benjamina* leaves were 884.25, 1111.75, 479.25, 496.75, 991.75, 1079.25 GAE mg/L for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 1249.25, 1411.75, 1514.25, 991.75, 1111.75 and 1989.25 GAE mg/L for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively. Total flavonoid content obtained for *Ficus benjamina* leaves were 243.45, 245.75, 215.27, 227.09, 206.18 and 249.81 CE mg/L for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 224.36, 220.72, 200.72, 199.81, 207.09 and 208.90 CE mg/L for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively. For the measurement of antioxidant potential, DPPH and ABTS assays and metal (iron) chelating activity were performed. In DPPH assay, percentage DPPH remaining obtained for *Ficus benjamina* leaves were 70.18, 64.08, 74.95, 62.01, 51.24 and 44.31% for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 71.84, 65.32, 52.07, 55.48, 56.21, 61.80% for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively

In ABTS assay, TEAC values obtained for *Ficus benjamina* leaves were 9.397, 9.185, 9.496, 9.115, 9.284 and 9.199 mM for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 9.370, 9.397, 9.483, 9.383, 9.397 and 9.383 mM for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively. In Metal (Iron) chelating activity, percentage bound iron obtained for *Ficus benjamina* leaves were 24.564, 25.767, 29.218, 23.520, 21.715 and 22.317% for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 25.356, 21.874, 19.816, 22.792, 23.773 and 23.773% for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively. For Antibacterial activity, Gram positive bacterial strain *Bacillus subtilis* and gram negative bacterial strain *Escherichia coli* were used against standard Penicilin. Zone of inhibition shown by Penicilin was 1.6cm. From the samples, only 60% ethanolic and 100% methanolic composition showed activity against *Bacillus subtilis*. Their diameters of inhibition zones were 0.8 and 0.9cm respectively. Whereas, no sample was active against *Escherichia coli*. In order to investigate anti-diabetic potential, α-Glucosidase inhibition assay was performed. Acarbose was used as standard and shown percentage inhibition of 95.92% for α-Glucosidase. Percentage inhibition of α-Glucosidase obtained for *Ficus benjamina* leaves were 74.85, 61.37, 81.82, 58.42, 51.28 and 53.69% for 100%, 80%, 60%, 40%, 20% and 0% ethanolic compositions respectively and 75.39, 60.48, 52, 54.50, 58.25 and 57.44% for 100%, 80%, 60%, 40%, 20% and 0% methanolic compositions respectively.