SUMMARY

The work embodied in this dissertation is mainly concerned with the isolation characterization of chemical constituents from two medicinal plants and their possible biological activities. The isolated compounds from the present work were characterized by various modern spectroscopic techniques.

This dissertation is divided into two parts, **A and B.**

Part A

The *in vitro* antioxidant activities of the different fractions of *Caryopteris odorata* (Ham. ex Roxb.) were studied. The methanolic extract of this plant was dissolved in distilled water and partitioned with *n*-hexane, chloroform, ethyl acetate and *n*-butanol successively. These organic fractions and the remaining aqueous fraction were screened for their possible antioxidant activities by different methods: 1,1-diphenyl-2-picrylhydrazyl radical (DPPH) scavenging activity, total antioxidant activity, ferric reducing antioxidant power (FRAP) assay and ferric thiocyanate assay. The total phenolics were also determined. The results revealed that among these fractions ethyl acetate soluble fraction showed very good antioxidant potential, having an IC_{50} value of 8.01± 0.254 μg/mL. It also showed the highest total antioxidant activity (2.358 ± 0.035), FRAP value (2505.8 ± 0.58 μg/mL), inhibition of lipid peroxidation (77.53 ± 0.784) % value and total phenolic contents (87.08 ± 1.5μg/g) as compared to other fractions.The results of antibacterial activity of plant extraction showed that fractions have highest inhibition potential against gram negative bacteria as compared to gram positive bacteria. MIC value for each fraction was also calculated. Cytotoxic activity of plant extracts revealed that ethyl acetate soluble fraction has highest toxicity value, while *n*-hexane soluble fraction has lowest toxicity value. The phytochemical investigation of the chloroform soluble fraction of *Caryopteris odorata* (Ham. ex Roxb.) led to theisolation of one new constituent namely; *n*-pentadecyl[3-(4-hydroxyphenyl)] propanoate (**21**). Similarly, the known constituent like *trans*-cinnamic acid (**22**) *cis*-cinnamic acid (**23**), henicosanoic acid (**24**), methyl tricontanoate (**25**) and octacosanyl tricontanoate (**26**) were also obtained for the first time from this plant source. The ethyl acetate soluble fraction of this plant yielded four new iridoid glucosides (**27-30**); 8-*O*-*trans*-cinnamoyl caryoptoside (**27**), 8-*O*-*trans*-cinnamoyl shanzhiside methylester (**28**), 8-*O*-*trans*-cinnamoyl mussaenoside

8-*O*-cafeoyl massenoside (**30**). The structures of these compounds were determined by FAB-MS, IR, 1D and 2D-NMR spectroscopy and by comparison with the published data of the closely related compounds. All these isolates were screened for their antioxidant, anti-urease, anti-tyrosinase, acetyl cholinesterase, butyryl cholinesterase, and lipoxygenase activities and results revealed that *n*-Pentadecyl [3-(4-hydroxyphenyl)] propanoate (**21**) exhibits good antioxidant potential with low to zero enzyme inhibition activities. The antioxidant potential of isolated iridoids (**27-30**) was evaluated relative to conventionally used standards and these molecules exhibited good antioxidant potential. Inhibitory potential of iridoids (**27-30**) was also screened against enzymes. These iridoid glucosides were found to be inactive against anti-urease, anti-tyrosinase, acetyl and butyryl cholinesterases but active against lipoxygenase.

Part B

The phytochemical screening of the chloroform soluble fraction of *Opuntia dillenii* Haw. led to the isolation of single major compound 6-(hydroxymethyl)-4-methoxy-2*H*-pyran-2-one (opuntiol; **1**), $C_7H_8O_4$. Its stucture was established by single crystal XRD and by spectroscopic data. The ethylacetate soluble fraction of this plant led to the isolation of six known compounds (**1-6**). The structures of these compounds were determined by IR, 1D and 2D-NMR spectroscopy. Keeping, owing to larger quantity of (**1**) synthesis of a series of new *O*-substituted derivatives of opuntiol (**1**) was designed. These derivatives **3a-t**, were characterized by ^{1}H-NMR and then screened against acetyl cholinesterase, butyryl cholinesterase and lipoxygenase enzyme. 6-(Acetyloxy) methyl- 4-methoxy-2H-pyran-2-one (**3b**) and *N*-(2,5-dimethylphenyl)-2-[(4-methoxy-6-oxo-2H-pyran-2-yl)methoxy]acetamide (**3p**) were found to be the inhibitor of butyryl cholinesterase while (4-methoxy-6-oxo-2H-pyran-2-yl)methoxy]acetamide (**3b**), 6-(ethoxymethyl)-4-methoxy-2H-pyran-2-one (**3c**), 4-methoxy-6-[(phenylmethoxy)methyl]-2H-pyran-2-one(**3g**), 6-[(2-bromoethyloxy) methyl]-4-methoxy-2H-pyran-2-one (**3j**), *N*-(5-chloro-2-ethoxyphenyl)-2-[(4-methoxy-6-oxo-2H-pyran-2-yl)methoxy]acetamide (**3r**), *N*-(3,4-dimethylphenyl)-2-[(4-methoxy-6-oxo-2H-pyran-2-yl)methoxy]acetamide (**3s**) *N*-(3,4-dimethylphenyl)-2-[(4-methoxy-6-oxo-2H-pyran-2-yl)methoxy]acetamide (**3t**) were found to be active against α-chymotrypsin and among these **3s** was the good inhibitor of this enzyme having IC_{50} value of 142.71±0.22 µmoles/L.