CONCLUSION

The present thesis lays a considerable amount of scientific research and evidence for anti-diabetic and antioxidant activity of *Bambusa tulda*, one of the most useful bamboos that is native to the Indian subcontinent. *Bambusa tulda* was the choice of research due to its prominent usage in Bodo traditional medicinal system and lack of substantial scientific knowledge of the same on *in-vitro* hypoglycemic studies. Aqueous methanolic extract of *Bambusa tulda* leaves was used all through the study. The study was focused on studying the mechanism, composition and bioactive properties of leaves of *Bambusa tulda* found in Kokhrajhar district of Assam. Preliminary phytochemical screening was carried out to identify the biochemical constituents in the extract. It was found that *Bambusa tulda* contained secondary plant metabolites like saponins, steroids, alkaloids, tannins, flavonoids and anthroquinones. It also contained biomolecules like glycosides , reducing sugars and carbohydrates. The amount of phenols, flavonoids, and proanthocyanidins estimated in metanolic extract of leaves was found to be 17.494±0.01mg GAE/g, 176.35±0.03mg QE/g, 96.2±0.01 mg QE/g and 11±0.86µg CE/g respectively. The antioxidant potential of the extract was examined by DPPH assay, ferric reducing assay and hydrogen peroxide scavenging activity. It was noted that the aqueous methanolic extract of *Bambusa tulda* leaves at a concentration of 200mg/ml/ kg bodyweight showed highest antioxidant activity indicating its potential as a natural antioxidant. Fe^{3+} to Fe^{2+} transformation facilitated by the crude extract is evident through significant increase in absorbance with increase in concentration of extract compared to BHT . The Hydrogen peroxide scavenging activity of BT was similar to that of standard ascorbic acid. The GC-MS analysis of extract

exhibits the presence of several compounds namely 4-hydoxybenzoic acid, 2-hydoxybenzoic acid, (2E)-3-(2-hydroxyphenyl)prop-2-enoic acid,(2E)-3-(4-hydroxyphenyl)-2-propenoic acid, 2,4– dihydoxybenzoic acid, 4-Hydoxy-3-methobenzoic acid and (2E)-3-(4-hydoxy-3-methoxy-phenyl)prop-2-enoic acid. The presence of phytochemicals like phenols and flavonoids were positively correlated with DPPH, H_2O_2 and FRP activity indicating the antioxidant activity of BT. *In vivo* antihyperglycemic activity of crude extract was carried out in alloxan induced diabetic wistar rats and by measuring the antioxidant enzymes (SOD and GPx) in kidney and histopathology of pancreas. Further the methanolic extract showed potential lipid peroxidation inhibitory activity against lipid peroxidation. The protective effects of antioxidants in biological systems are attributed mainly to their ability to scavenge free radicals. LD_{50} studies have indicated that, the BT is not toxic at 100and 200mg/kg BW concentration. Further, the decrease in glucose level indicated its potential antihyperglycemic activity. The 200mg/kg BW dosage of aqueous methanol extract showed higher activity against alloxan induced diabetic rats, that can be due to the synergistic effect of the phenolic and flavonoid content of the above extract. Histopathological analysis of pancreas revealed regeneration of the β-cells in pancreatic region of experimental rats that makes BT a good natural antioxidant and anti-diabetic drug. Further studies at molecular level have to be carried out to prove its anti-diabetic efficiency and to bring out a drug molecule from the extract and to understand the molecular mechanism