Artificial sweeteners are sugar substitutes that are used in a wide range of foods and beverages to provide sweetness with a negligible calorie contribution. They are sweeteners that are produced by chemical synthesis which typically exceed many times the sweetness of sugar. The artificial sweetener aspartame is a methyl ester of the dipeptide of the natural amino acids L-aspartic acid and L-phenylalanine. Controversies have swirled around the safety of aspartame at the very beginning of its introduction into the market. The metabolic conversion of chemical substances often lead to the production of reactive intermediate species, such as electrophilic compounds, which can potentially alter the structure and function of organs such as liver and brain, which are vulnerable to oxidative damage. Despite multitude of studies on aspartame, its effects on the antioxidant system have received little attention. Most of the adverse effects of aspartame in the brain are linked to the possible role of aspartame metabolites on monoamine neurotransmitter metabolism. Further, it is suggested that monoamine neurotransmitters play a significant role in learning, memory and behavior. The consumption of non-caloric sweeteners are preferred over caloric sweeteners with the increase in prevalence of obesity and diabetes. Epidemiological studies observed that the mean aspartame consumption may be more in special groups such as diabetics and children. In addition the usefulness of aspartame in maintenance of body weight is rather contentious. As aspartame may be used in a wide variety of foods there is the likelihood of long-term or lifelong human exposure. People
are unaware of how much aspartame they consume through different products. As liver and brain are susceptible to the effects of chemical substances and the consumption of foods containing synthetic sweeteners has been increasing heavily, it is necessary to explore the potential of aspartame for chronic toxicity.

The thesis contains seven chapters; Introduction is given in chapter I, Review of literature in chapter II and Materials and methods in chapter III. Effects of aspartame on biochemical profile and antioxidant status is given in chapter IV, Effects on brain neurochemistry is given in chapter V, Effects of aspartame on food intake, body weight and glucose homeostasis is given in chapter VI and Summary and conclusion in chapter VII.