Scope of the work presented
It has been proposed that considerable DNA damage may be caused by endogenous metabolites produced during the body's normal metabolic processes. Such reactions are considered to lead to the formation of oxidised bases, alkylated bases and exocyclic bases. Evidence has indicated that exocyclic base adducts exist at significant levels in hepatic DNA of rats and humans and in *E. coli* these are efficient premutagenic lesions. It is considered that such endogenous DNA damages may contribute to the etiology of genetic diseases and may define the baseline of human cancer. As already mentioned, previous studies in this laboratory have shown that L-DOPA causes oxidative DNA damage and that the reaction is catalysed by the formation of hydroxyl radicals. Uric acid is considered to be a naturally occurring antioxidant and is present in the plasma at a relatively higher concentration. In order to further explore the antioxidant functions of uric acid, I have investigated its effect on L-DOPA- Cu (II) mediated DNA cleavage at concentrations similar to or lower than those found in plasma. These studies constitute the first chapter of the results.

The food that we eat has a significant bearing on our overall health. Previous studies in this laboratory have confirmed that several classes of plant derived polyphenolic antioxidant compounds such as flavonoids (Said Ahmad *et al.*, 1992; Fazal *et al.*, 1990) tannins (Bhat and Hadi, 1994; Khan and Hadi, 1994) and stilbenes are themselves capable of oxidative DNA damage in the presence of transitional metal ions. Capsaicin or trans-8-methyl-N-vanillyl-6-noneamide is the principal pungent phenolic substance present in hot red and chili peppers, which
are an important part of various diets around the world. As described above, there are numerous reports of its action as an antioxidant (De and Agarwal, 1989; De and Ghosh, 1992). On the other hand, there is also evidence that it may act as a genotoxic agent (Agarwal and Bhide, 1986; Jang and Kim, 1988). In view of such conflicting evidence, I have examined the prooxidant role of capsaicin and have shown that in agreement with the above polyphenolics, it is also capable of causing strand breakage in DNA in the presence of Cu (II) which is known to be a normal component of chromatin. Further, I have also compared both the antioxidant and the prooxidant action of capsaicin with dihydrocapsaicin which is also a constituent of red chili peppers. These studies constitute the second chapter of results.