Since DNA is the carrier of genetic information and spontaneous mutations occur only at a low frequency, cellular DNA has been regarded as an essentially stable entity. Developments in the last two decades have necessitated a revision of this view. The discovery of insertion elements (1) has made clear that certain segments of DNA can move between many different chromosomal sites. Further, cellular DNA is susceptible to several kind of damages caused by various physical and chemical agents such as heat, ionising and nonionising radiation and chemical mutagens. DNA repair systems operate in cells maintaining its high molecular weight and biological activity. .The subject of DNA repair therefore deals with the ability of a cell to survive in a generally hostile environment and is now known to involve a variety of repair mechanisms (2). Among these mechanisms are photoreactivation of ultraviolet (UV) induced pyrimidine dimers, repair through recombinational mechanisms as a post replicative event and specific removal of damage from modified DNA (3, 4, 5). Generally these mechanisms involve the sequential action of several enzymes. For example, in bacteria the removal of UV induced thymine dimers from DNA involves the action of an endonuclease, an exonuclease, DNA polymerase and a polynucleotide ligase. In addition a physiological role of nucleases has also been implicated in other cellular processes such as DNA replication and recombi-

nation (6). Study of nucleases has therefore been of considerable interest, particularly their purification, specificity and mode of action. Special attention has been given to nucleases having unique substrate specificities and unusual pH requirements, such as enzyme specific for single stranded DNA, restriction endonucleases, nucleases that can recognise various kinds of lesions in the secondary structure of DNA and alkaline nucleases. Such nucleases have proved to be of great use as biochemical tools for elucidating the structure of various nucleic acids (7, 8).

The pH of the midgut contents of the larvae of the insect class Lepidoptera has been determined to be between 9.2 and 9.7 (9). It is not surprising therefore that the protease present in the gut of the larvae of Spodoptera litura has a pH optimum of 11.0 (10). Thus it is possible that other hydrolytic enzymes present in the gut of this insect may also be optimally active in the high alkaline range. In view of this we considered it of interest to identify the nucleolytic activity in the gut of the larvae of Spodoptera litura. In this thesis, is reported the presence of a nuclease activity in this insect having a pH optimum of 10.5. The enzyme has been purified to homogeneity and characterised with respect to its physical and catalytic properties.