3.1 Scope
Natural products have been playing a vital role in health care for decades. Of the different sources of natural products, plants have been a source of chemical substances, which serve as drugs in their own right or as key ingredients in formulations containing synthetic drugs. The process that leads from the plant to a pharmacologically active, pure constituent is very long and tedious and requires a multidisciplinary approach. The selection of the plant species is a crucial factor for the ultimate success of the investigation. Though random selection gives some hits, targeted collection based on chemotaxonomic relationships, ethnomedical information and information derived from traditional medicine are more likely to yield pharmacologically active compounds.

The World Health Organization has recently defined traditional medicine as comprising therapeutic practices that have been in existence for hundreds of years, before the development and spread of modern medicine and are still in use today. From the beginning of civilization, humans have used plants and animals to find remedies against illnesses and diseases. Traditional medicine is the synthesis of therapeutic experience of generations of practicing physicians of indigenous system of medicine, in which medicinal plant preparations were used for therapy. The earliest recorded evidence of their use in Indian, Chinese, Egyptian, Greek, Roman and Syrian texts dates back to about 5000 years. The classical Indian texts include Rigveda, Atharavanaveda, Charaka Samita and Sushruta Samhita. The herbal medicines and traditional medicaments have therefore been derived from rich traditions of ancient civilizations and scientific heritage (Kamboj, 2000).

The current interest in natural products as a source of therapeutic compounds is certainly expected, considering the role that medicinal plant extracts have played in the development of modern day medicine. Extracts of plants have yielded abundant diverse compounds, many with therapeutic utility. The development of pharmacology and modern day therapeutic began when early 19th century chemists attempted to isolate and characterize the active constituents in the plant extracts used in traditional medicine. It is important to emphasize that the majority of modern agents discovered from natural products were made available by the investigation of traditional herbal medicines. An impressive number of modern drugs have been isolated from plants based on their use in ancient medicine. In fact, over 120 pharmaceutical products currently in use are plant derived, and approximately 75% of these were discovered by examining the use of plants in traditional
Approximately 25% of the drugs prescribed worldwide come from plants, and 121 active compounds being in current use. Of the 252 drugs considered as essential by WHO, 11% are exclusively of plant origin and a significant number are synthetic drugs obtained from natural precursors. Six of the top twenty pharmaceutical drugs sold in 1996 were natural produces and more that 50% of this top 20 are linked directly to natural product research. In addition, it has been estimated that 30% of recently introduced drugs are directly of natural origin (Grabley and Thierick, 1999).

Discovery of digitalis, a medicine for congestive heart failure from Digitalis purpurea (Riaz and Forker, 1998), morphine, a narcotic analgesic alkaloid from Papaver somniferum (Foye, 1989), quinine, an anti malarial agent form cinchona bark (Drulihe et al., 1988) and other agents motivated scientists to isolate and characterize other biologically active natural products. The discovery of numerous active medicinal agents in the early 19th century encouraged the continued scientific investigation of ancient medicinal formulations into the 21st century. In addition, some natural products might be useful in disease unrelated to the traditional use of the product. For example, Cantharanthus roseua was initially used as hypoglycemic agent in folk medicine, but is now known to contain useful antineoplastic compound i.e. vinca alkaloids (Williamson et al., 1996). Therefore, screening should not be limited to application of traditional use, but should include other possible activities.

Because it has been noted that there is a greater probability of finding compounds with different biological activities form plants with reputed medicinal properties, rather than form plants collected at random. It gives an idea about the importance of natural products, especially plants in modern day drug discovery and that initiated the screening of some selected medicinal plants of genus SIDA.
3.2 Objective

- The objective of the proposed research work was to identify the medicinal plants for their potential as anti-infective agents.
- Based on literature survey and their use in traditional system of medicine followed by testing the plant extracts and fractions prepared by various extraction methods-aqueous/organic solvents-and test these for their anti viral properties in vitro and in vivo.
- The extracts were tested against both DNA (HSV type I & II and Adenovirus type VIII) and RNA (Poliovirus type-I and Influenza virus type A (H1N1) viruses by standard operating procedures confirming to WHO guidelines.
3.3 Plan of Work

To achieve this, work was planned as mentioned below which includes

I. **Collection and authentication of Plant material**
   a) Identification and Collection of plant material 
   b) Authentication of material and preparation of voucher specimen

II. **Preparation of plant extracts and Fractionation of active constituents**
   a) Drying of plant material and preparation of powder 
   b) Preparation of crude extracts by soxhlet extraction and drying 
   c) Fractionation by solvent partitioning and solvent crystallization method

III. **Cytotoxicity Studies**
   a) Determination of mitochondrial synthesis by Micro culture tetrazolium (MTT) assay. 
   b) Determination of total cell protein content by Sulphordamine B (SRB)

IV. **Antiviral Studies**

The screening of extracts for their inhibitory properties against Poliovirus type-I, Herpes Simplex Virus (HSV) type- I (HSV TK, HSV 7401 wild type virus) and II, Adenovirus type- VIII and Influenza virus A/PR-8/34 and Pandemic H1N1 strains.

a) **In vitro antiviral studies**
   i) Cytopathic Inhibition Assay 
   ii) Virucidal Assay 
   iii) Plaque reduction Assay 
   iv) MTT antiviral assay 
   v) Time of addition/Mode of action studies
      - Virus adsorption assay
      - Virus attachment assay
      - Virus penetration assay 
   vi) Immunofluorescence assay on Influenza virus A/PR-8/34 H1N1

b) **In vivo antiviral studies**
   i) Therapeutic efficacy in cutaneous mouse HSV infection model 
   ii) Determination of virus yield in skin and brain

V. **Antiviral activity of isolated fractions**