Herbal remedies are one of the hottest trends in the field of biology today (Blumenthal, 1999) in which the activities of plants are used for treating diseases like asthma, cholera, diarrhoea, dysentery, dermatological infections, intestinal disorders, recurrent fever, ulcers and uremia. Nature has been a source of medicinal agent for thousands of years and an impressive number of modern drugs have been isolated from natural sources, many based on their use in traditional medicine. Various medicinal plants have been used for years in daily life to treat diseases all over the world (Owolabi et al., 2007).

The widespread use of herbal remedies and healthcare preparations such as those described in ancient texts like The Veda and The Bible has been traced to the occurrence of natural products with medicinal properties. In fact, plants produce a diverse range of bioactive molecules making them a rich source of different types of medicine. Higher plants as source of medicinal compounds have continued to play a dominant role in the maintenance of human health since ancient times. Over 50% of all modern drugs are of natural product origin and they play an important role in drug development programmes in the pharmaceutical industry.

Infectious diseases are usually characterized by clear symptoms, so it is likely that traditional healers have been able to recognize such diseases and have developed effective therapies. Moreover, antibiotics mostly have clear effects, the chance of finding antimicrobially active traditional medicine is considered high (Elmi et al., 1986). During the past several decades, traditional systems of medicine have become a topic of global relevance. Current estimate suggests that in many undeveloped
countries, a large proportion of the population rely heavily on traditional practitioners and local herbals to meet the primary healthcare needs.

Many infectious diseases are known to be treated with herbal remedies throughout the history of mankind. Even today, plant materials continue to play a major role in primary healthcare therapeutic remedies in many developing countries. Plants still continue to be almost the exclusive sources of drugs for the majority of the world populations.

Plant derived substances have recently become of great interest owing to their versatile applications. Medicinal plants are the richest bioresource of drugs of traditional system of medicine, modern medicine, pharmaceutical intermediates and chemical entities for synthetic drugs (Ncube et al., 2008). The search for new drugs from novel sources such as plants continues to be necessary (Farnsworth and Morris, 1976). Therefore, such plants should be investigated to better understand their properties, safety and efficacy (Prusti et al., 2008). There are hundreds of plants that have a long history of curative properties against various diseases and ailments. Since antiquity, man has used plants to treat common infectious diseases and some of the traditional medicines are still included as part of the habitual treatment of various maladies (Heinrich et al., 2004; Rios and Ricio, 2005).

For a long period of time, plants have been a valuable source of natural products for maintaining human health, especially in the last decade, with more intensive studies for natural therapies. About 80% of individuals from developed countries use traditional medicinal plants. India has tremendous potential of growing medicinal and aromatic plants (Patra, 1998). Man’s dependence on plants for his life began since human race (Hill, 1983). To date, plants continue to be major source of
commonly consumed drugs. The art of healing using plant extracts or their active principles as medicine began thousands of years ago. Even most synthetic drugs have their origin from natural plant products (Sofowora, 1982).

Scientific interest in medicinal plants has burgeoned in recent times due to increased efficiency of new plant derived drugs and rising concerns about the side effects of modern medicine. Most of modern researchers on herbal medicine have hinged around traditional folklore medicine. The modern medicine has brought with it an array of drugs which are quite safer for human consumption.

Biologically active compounds from natural sources have always been of great interest to scientists working on infectious diseases. In recent years, there has been a growing interest to evaluate plants possessing curative activities for various diseases (Clark and Hufford, 1993). Herbal medicines provide rational means for the treatment of many diseases that are incurable in other systems of medicine (Kameshwara Rao, 2000; Subramini and Goraya, 2003). Their biomolecules appear as alternatives for the control of even resistant species of bacteria and other human pathogens and their uses have been shown to have a scientific basis (Ganguly et al., 2001; Martino et al., 2002).

The quality control of medicinal plant materials which are used worldwide as folk medicine or raw materials for the pharmaceutical industry have always been one of the main concerns of the World Health Organization (WHO). Therefore, WHO organized the meetings of experts from various countries to establish internationally accepted guidelines for assessing the quality of medicinal plants so that they can be used by the regulatory agency in each country to set up the national quality specifications of medicinal plant materials that all parties involved in the production.
of herbal medicine need to understand in order to manufacture good quality, effective and safe products.

WHO currently encourages, recommends and promotes traditional remedies in national healthcare programmes as they are easily available at low cost, comparatively safe and are culturally acceptable. WHO in a number of resolutions has emphasized the need to ensure quality, using modern techniques and applying suitable standards. According to WHO, medicinal plants are the best source to obtain a variety of newer herbal drugs. Use of traditional medicine is one of the common practices in India due to their wide pharmacological activities (Nascimento et al., 2000).

India has an extraordinarily rich flora and wide knowledge of indigenous medicinal plants is well documented. Plants have long provided mankind with a source of medicinal agents with natural products once serving as the source of all drugs (Balandrin et al., 1993). Dependence on plants as the source of medicine is prevalent in developing countries where traditional medicine plays a role in health care (Srivastava et al., 1996). Medicinal plants which form the backbone of traditional medicine have in the last decades been the subject of very intense pharmacological studies. This has been brought about by the acknowledgement of the value of medicinal plants as potential sources of new compounds of therapeutic value and as sources of lead compounds in drug development.

Phytochemistry is a rapidly expanding area with new techniques for the analysis of organic compounds. It is one of the tools for quality assessment of plant drugs. Medicinal plants are still a major part of the traditional medical system in developing countries. Overcoming antibiotic resistance is the major issue of the WHO. Hence the last decade witnessed an increase in the investigation of plants as a
source of human disease management. Now a days, there are large number of pharmaceutical industries throughout the world dealing with modern science and synthetic products which cause side effects. Today despite of advances in pharmacology and synthetic organic chemistry, their reliance on natural products particularly on plants remain unchanged (Lantz, 2001).

Identification of a particular compound against a specific disease is a challenging long process. The objective of biological screening of plants is to find out sources of the biologically active chemical compounds which can be developed as drug or to discover the lead molecules which can be modified through chemical procedures into useful drugs. Importance of plants lies in their biologically active principles. Knowledge of the biological activity and chemical constituents of plants is desirable not only for the discovery of new therapeutic agents but also to give scientific basis for the folk medicine. Synthetic drugs are very expensive to develop and whose cost of development ranges from 0.5 to 5 million dollars. On the contrary, many medicines of plant origin had been used since long time without any adverse effects.

Standardization of herbal drugs based on their chemical and biological activity profile is an important prerequisite for acquiring the herbal market. The main problem encountered in standardization of Ayurvedic drugs is proper identification of the source plant. The use of herbal medicines for the treatment of diseases and infections is a safe and traditional therapy (Najafi and Deokule, 2010). Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. Plants produce these chemicals to protect themselves but recent research demonstrates that many phytochemicals can protect humans against diseases.
Pharmacology

Medicinal plants are still a major part of the traditional medical system in developing countries. Several herbal remedies are now being intensively used in therapy. The use of medicinal plants as antiinflammatory and antiarthritic drugs in medicine is a practice common in India, although in most cases, the active principles of the plants are unknown. However, evaluation of the pharmacological effects of the herbal crude extracts can still be used as a logical research strategy in the search for new drugs.

Anticancer activity

Cancer is a generic term for a group of more than 100 diseases that can affect any part of the body. Various plant parts are extracted for the treatment of cancers. Although there are many therapeutic strategies including chemotherapy to treat cancer, high systemic toxicity and drug resistance limit the successful outcomes in most cases. Accordingly, several new strategies are being developed to control and treat cancer. One such approach could be a combination of an effective phytochemical with chemotherapeutic agents, which when combined would enhance efficacy while reducing toxicity to normal tissues (Gali et al., 2011).

Antidiabetic activity

Diabetes-mellitus is a chronic disease characterized by elevated blood glucose level and disturbance in carbohydrate, fat and protein metabolism. These metabolic abnormalities result, in part, from a deficiency of the blood sugar-lowering hormone insulin. This deficiency in insulin results in type 1 diabetes or insulin dependent diabetes mellitus (IDDM). Type 2 diabetes or non-insulin dependent diabetes mellitus
(NIDDM) is a result of hyperglycemia caused by overproduction of glucose at the hepatic level or because of abnormal β-cell function or insulin resistance at target cells (Fajans et al., 1997). Currently available synthetic antidiabetic agents produce serious side effects like hypoglycemic coma and hepatorenal disturbances (Suba et al., 2004). Moreover, they are not safe for use during pregnancy (Rahman and Zaman, 1989).

**Hepatoprotective activity**

Hepatoprotection or antihepatotoxicity is the ability to prevent damage to the liver. Liver plays a major role in detoxification and excretion of many endogenous and exogenous compounds, any injury to it or impairment to its functions may lead to many implications on one's health. Management of liver disease is still a challenge to the modern medicine. Modern medicine has little to offer alleviation of hepatic ailments whereas, most important representatives are of phytoconstituents.

**Fertility studies**

Sexual dysfunction, impotence and other related problems is eluding scientific community and medical practitioners since time immemorial. Sexual dysfunction may have psychosocial implication affecting men in many ways. There has been a constant exploration for newer herbal and chemical agents to overcome these age-old problems of sexual dysfunction (Adimolelija, 1997). For many years, people have searched for ways to achieve sexual desire, sexual health and sexual techniques. This has led to the development and use of different substances known as aphrodisiacs to attain the desired excitement. An aphrodisiac can therefore be described as any substance that enhances sex drive and/or sexual pleasure. Aphrodisiac can also be viewed as any
food, drug, scent or device that can arouse or increase sexual drive or libido (Rosen and Ashton, 1993).

**Antiinflammatory activity**

Inflammation is considered as a primary physiologic defense mechanism that helps body to protect itself against infection, burn, toxic chemicals, allergens or other noxious stimuli, an uncontrolled and persistent inflammation may act as an etiologic factor for many of these chronic illnesses (Kumar *et al.*, 2004). Although it is a defense mechanism, the complex events and mediators involved in the inflammatory reaction can easily be induced (Sosa *et al.*, 2002). The side effects of the currently available antiinflammatory drugs pose a major problem during their clinical uses (Mattison *et al.*, 1998). Therefore, the development of newer and more potent antiinflammatory drugs with lesser side effects is necessary.

**Central Nervous System (CNS) activity**

Depression and anxiety disorders are the most common mental illness in humans (Wong and Licinio, 2001; Nestler *et al.*, 2002; Hyman, 2008). It is not only life threatening but also negatively impacts on functional recovery from other neuropsychiatric disorders (Dere *et al.*, 2010). Most of the drugs used now a days have adverse side effects. So the need for newer, better tolerated and more efficacious treatments remains high. Traditional herbal medicines are becoming increasingly popular worldwide (Watanabe *et al.*, 2001). The efficacy of medicinal plants in disease management is established and the World Health Organization has recognized their use in the primary health care delivery system.
For the present study, the two taxa (*Rauwolfia densiflora* (Wall.) Benth. ex Hk.f. and *Stephania wightii* (Arn.) Dunn.) were selected. The plant *Rauwolfia densiflora* belongs to the family Apocynaceae. Many species of this genus are well known medicinal plants. *Rauwolfia* species are used by the folk for the treatment of snake bites, insect stings, fever, nervous disorders, cerebral cramps, jaundice, gastrointestinal disorders, tetanus, epilepsy and as sedative (Sharma, 2004; Kutalek and Prinz, 2007; Arvind kumar *et al.*, 2011; Lalitharani *et al.*, 2011).

The plant *Stephania wightii* belongs to the family Menispermaceae. Many species of this genus are well known medicinal plants. *Stephania* species are traditionally used for the treatment of asthma, dysentery, wounds, hyperglycemia, cancer, fever, intestinal disorders and inflammation (Grace, 2008; Phachonpai *et al.*, 2010; Semwal *et al.*, 2010; Lalitharani *et al.*, 2010).

In view of this fact, in the present investigation, the ethanol extracts of the whole plant of *Rauwolfia densiflora* and tuber of *Stephania wightii* were used to study the phytochemical profile and pharmacological evaluation.

The present study attempts:

- To study the pharmacochemical characterization of whole plant of *Rauwolfia densiflora* (Wall.) Benth. ex Hk.f. and tuber of *Stephania wightii* (Arn.) Dunn.
  
  a. Ash and extractive values
  
  b. Fluorescence analysis
  
  c. Preliminary phytochemical screening
• The HPTLC profiles of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii* to confirm the presence of alkaloids, coumarins, glycosides, phenols and steroids.

• GC-MS analysis of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii* to identify the compounds.

• To assess the anticancer activity of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii*.

• To assess the antidiabetic activity of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii* in alloxan induced diabetic rats.

• To assess the hepatoprotective activity of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii* against hepatic toxicity induced by carbon tetrachloride (CCl₄).

• To assess the fertility activity of the above said plant extracts.

• To evaluate the antiinflammatory activity of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii* on carageenan induced oedema in rats.

• To assess the CNS (Central Nervous System) activity of ethanol extracts of whole plant of *R. densiflora* and tuber of *S. wightii*. 