Introduction

Healing with medicinal plants is as old as mankind itself. The connection between man and his search for drugs in nature dates from the far past and there is ample evidences from various sources: written documents, preserved monuments, and even original plant medicines. Awareness of medicinal plants usage is a result of the many years of struggles against illnesses due to which man learned to pursue drugs from barks, seeds, fruits, and other parts of the plants (Petrovska, 2012). The World Health Organization (WHO) has listed over 21,000 species (including synonyms) that have been reported for medicinal uses around the world. (Chandel et al., 1996). Moreover, it is estimated that more than 80 percent of the world’s population relies on traditional health care. It was also reported that 25 percent of modern drugs were derived from plant sources and many others in modern pharmacopoeia were actually synthetic analogues of the drugs isolated from plant species (Rao et al., 2004). The WHO also appreciated the importance of medicinal plants for public health care in developing nations and evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicine and to study their potential usefulness including evaluation, safety and efficacy. Plants are used in the treatment of many health related disorders since time immortal. In addition to supplying essential nutrients for the mankind, plants also possess a variety of bioactive secondary metabolites like phenols, flavonoids, carotenes, etc and most of the biological activities are ascribed to these secondary metabolites. Epidemiological studies have also confirmed positive association between intake of fruits and vegetables and reduced mortality from common cancers, heart and other degenerative diseases. Different plant parts like roots, leaves,
stem, fruits, seeds, flowers and formulations made from them are prescribed for medicinal and therapeutic purposes in traditional systems of medicine. Plant based food supplements vary significantly in their active constituents. Also, active constituents are not known in many cases.

Globally traded plant based therapeutic preparations are either poorly characterized from the phytochemical aspect or are characterized with respect to just one or two marker compounds. Lack of marker compounds and their phyto resources further compound this problem. Systematic studies on variability of bioactive phytochemicals are also important for selection, genetic improvement, conservation and management of important accessions in gene bank as well as for development of novel chemotypes. Phytochemical investigations also generate important inputs for other research disciplines, such as plant biochemistry, plant physiology, plant biotechnology and chemosystematics. Significant advances in analytical techniques, in recent years, have opened new avenues for phytochemical research aimed at quantitative and qualitative identification of large number of compounds Therefore, proposed comprehensive phytochemical finger printing of the following plants:

1. *Asparagus racemosus*
2. *Vitex negundo*
3. *Vitex trifolia*
4. *Terminalia chebula*
5. *Terminalia bellerica*
6. *Embelica officinalis*
Using modern analytical techniques like uv-visible spectroscopy, IR spectroscopy, chromatographic techniques (GC, HPLC and LC-MS/MS) and NMR ($^1$H and $^{13}$C) would be very useful for tracking the marker compounds of nutraceutical and therapeutically importance as well for establishment of correlation between complex mixture and pharmacological activities such as antioxidant properties.

*A. racemous* Willd. is a highly valued plant for their abundance of bioactive compounds like saponins, flavonoids, hydroxycinnamic acids, sterols and carotenoids. Because of several health promoting properties of asparagus saponins, there is increasing interest in the identification and quantification of different types of saponins. Identification and quantification of different types of saponins, flavonoids and their seasonal variation in roots of *A. racemous* will be undertaken in the present research work.

*V. negundo* and *V. trifolia* is used in Ayurveda medicine as anti-inflammatory and anti-itching agents internally and externally. However, the claimed activities of the leaves have not been investigated using controlled experiments in detail. The major marker compounds such as phenolic acids, glycosides and flavonoids will be characterized in leaves and stem bark of *V. negundo* and *V. trifolia* species and their variation will be undertaken as the information is lacking significantly.

Fruits and bark of *Terminalia* species have been used since the vedic period (1500-500 BC) for the treatment of many of heart related ailments. Tannins, triterpenes, phenolic acids and glycosides are the major phytochemicals reported in different *Terminalia* species available in India. These phytochemicals will be characterized in different parts like stem bark, fruits and leaves of *T. chebula* and *T. bellerica* species.
E. officinalis has long been known in India and many other countries as important dietary source. Anti artherosclerotic, antidiabetic, anti-cancer and antioxidant properties of E. officinalis have been reported, however, little or no information is available for the phenolic (both bond and free form), the main constituents reported for the above bioactivities. Phenolics (free and bonded form) profiling will be investigated in the present studies.

In vitro anti-oxidant properties of the characterized individual phytochemicals as well as the extracts prepared using solvents of varying properties will carried out using DPPH, ABTS and reducing power assay. Further, correlation between the individual phytochemical and their contribution to total anti oxidant capacity will be established.