Introduction

Medicinal plants have occupied an important position in the socio-cultural, development of rural people of India. Most of the plants are major sources of natural products used as pharmaceuticals, agrochemicals, flavor and fragrance ingredients, food additives and pesticides. Crude drugs are usually dried parts of the medicinal plants that form an essential raw material for the production of traditional remedies of Ayurveda, Siddha, Unani, Homeopathy etc. Large number of primary metabolites acts as precursors of pharmacologically active metabolites in pharmaceutical compounds for the synthesis of drugs. Millions of the people in the third world still use the herbal drugs (Audichya et al., 1983). It has been estimated by WHO that 80% of the people living in the developing countries rely upon the traditional health practices for their primary health care needs (Austin and Bourne, 1992). Many higher plants are known to be the main source of the drug therapy in traditional system of medicines (Martinez, 1995). History reveals that many medicines that we use today were isolated from plants sources. Approximately 25-33% of currently available modern medicines in the United States have their origins in plants, animals or mineral systems. Biotechnologically derived and synthesized medicines have renewed interest to pay attention on herbalism (Dev, 1997).
Indian tribal sectors are considered as repositories of the rich knowledge of different uses of the plant genetic resources, which have remained unknown (Khoshoo, 1996). But due to the extension of developmental activities around the tribal areas we are losing such knowledge on the plant genetic resources (Shankar, 1995). Among the 16 hot spots known for rich flora in the world, two major hot spots are the Western Himalaya and Western Ghats located in India (Khoshoo, 1996). The hilly region of the Western Ghats recognized as region of high level of biodiversity is under the threat of rapid loss of genetic resources (Gadgil, 1996). Plant medicines were regarded as highly important in the lives of human. India is regarded as gold mine of well-recorded and traditionally well-practiced knowledge of the herbal medicines. India is perhaps the largest producer of the medicinal drugs and is rightly called the botanical garden of the world (Dubey et al., 2000).

Clinical research is an emerging field of research and development and considered as challenging opportunity to students of the life sciences. In India due to the progression of Pharmacy and Biotechnology, a clinical research field expands very significantly. The annual turnover with respect to drug designing and production of pharmaceutical business rose upto 700 billion American Dollars (28 lack crores of rupees) with 20% progressive increase in the field of
clinical research every year. On the basis of annual turnover of pharmaceutical industries, it is of prime necessity to pay their attention towards research to stand them in the competitions. It is assumed that India is the best country in the world to develop clinical research; hence, most of the leading foreign pharmaceutical companies are exploring this botanical garden of the world.

Plant material such as leaves, flowers, fruits, seeds, stem, wood, barks, root, rhizomes or other plant parts which may be complete, fragmented or powdered, constitutes herbs (WHO 2002). On the other hand, herbal products consist of one or more herbs for herbal preparations. These herbal drugs are usually in the dried form or stored fresh in unprocessed form. Certain exudates may also be considered as herbal drugs which are used to treat illness or to promote general health. Phytomedicines including capsules, tablets, tinctures and fluid extracts are those common preparations that have been prepared from plant sources. Among the many parts of plants that we use, bark products have always played exceptionally large roles. Traditionally, bark products have been particularly prominent as sources of medicines and raw materials. Bark differs from all other plant parts in its development, anatomy, and chemistry. The term bark refers to the all external tissue to vascular cambium (Esau, 1967). It is an aggregation of the phloem and the secondarily thickened tissue, the
secondary plant body along with epidermis, cortex and phloem derived from the primary plant body. This brief description indicates that bark is a highly complex, heterogeneous material composed mainly of a thin, physiologically active inner layer and a complex, relatively inert outer layer of bark. The complex tissue composition permits the bark simultaneously performs manifold functions such as photosynthesis, tissue aeration, and protection from the external environment and acts as a thermal insulation which helps to reduce the loss of water from the stem or root by forming the water repellent cork cells are well known (Niklas, 1999). Sometimes apical part of the bark is called as rind. Most of the woody plants have tannin cell and several bitter alkaloids. Secondary phloem of the inner bark contains coloured or colorless terpen hydrocarbons in the resin duct (Esau, 1967).

Chemical compounds found in low concentrations in other plant parts are highly concentrated in bark (Young, 1971). Mineral compounds are up to ten times more abundant in bark than in wood. Bark ash contains up to 60%, predominantly calcium, silica, and phosphorus (Jensen, 1963). The chemical composition of bark exhibits great diversity (Browning, 1967), containing phenolic acids, lignin and hemicellulose, suberin fragments, starch, gums, pectins, tannins, mucilages, simple polyphenols and their glycosides, tannins, terpenes and their derivatives, fats, waxes, free fatty and wax acids and
alcohols, sterols, resins, mono and disaccharides (sugars). Among bark extractives, polar materials tannins and polyphenols, glycosides comprise the main pool of the secondary metabolite (Burgon, 1964). Thus, it is obvious that bark of every plant species might be possessing quite important phytochemicals having great future medicinal potential. On this background it was thought worthwhile to undertake studies on nutritional and physicochemical constituents from barks of four important medicinal plants from Western Ghat. The bark samples of the four medicinal plants *Anogeisus latifolia*, *Crataeva religiosa*, *Pterocarpus marsupium* and *Terminalia arjuna* have been used by tribals in surrounding areas of the Kolhapur district for medicinal purpose. In the present study, an attempt has been made to investigate the biochemical, pharmacological and allelopathic potential of the apical rind, inner active bark and outer bark of above four medicinally important plants. Further these studies would prove beneficial in near future to standardize the drug and to perform the clinical trials for its safety and effectiveness.

The thesis is divided into four parts. Available literature on the ethnobotanical, pharmacological and phytochemical aspects of each selected plant species forms the substance of the first chapter. The second chapter “Material and Methods” describes the material and covers methodology followed in the present investigation. The findings
of the present study are discussed in the light of recent and pertinent literature in the third chapter ‘Results and Discussion’. The significant findings are briefly summarized in the fourth part under the heading ‘Summary and Conclusions’. The literature cited in the thesis is systematically presented in the last part of the thesis ‘Bibliography’