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Nature has been the source of medicinal agents for thousands of years. An impressive number of modern drugs have been isolated from natural sources, mainly based on their use in traditional medicine. Ancient traditions of Indian medicine viz. Ayurveda, Unani and Sidha and now, even, allopathy derives many of their curative tools from plants. Ayurveda is the Indian, indigenous system of medicine, dating back to the Vedic age (2000-1000 A.C). It has been the integral part of Indian culture (Weiss, 1987). It was evolved after hundred of years of observation, research and experimentation, which resulted in to a complete science, based on certain principles. In Ayurveda, a healthy person is defined as one who has the three Doshas (Elements) in equilibrium the vata, pitta and kapha.

The Ramayana mentions about the life reviving herbs found in the Himalaya which was used by physician. Sushena to revive Laxaman after he was hit by an arrow from Meghanatha and fell unconscious, the herb was named “Sanjeevani” which was a resurrection plant and has been identified as a Pteridophyta: Selaginella.

The history of medicine in India can be traced to the remote past in Vedic period. The Rig-Veda perhaps the oldest repository of human knowledge, having been written about 4500-1600 B.C. claims about 99 medicinal plants, the Yajur Veda 82 plants and the Samveda 100. Athurveda deals with 288 plants almost all having medicinal ingredients and were used to cure deadly diseases. As per the Vedas the Brahmans deal with 129 plants while the Kalp Surtas Describe some about 519 plants (Kaushik and Dhiman, 2000).
Since his origin, human being had depended only on natural resources particularly on plants of his vicinity for getting rid of his ailments, besides for his other needs. Several such potent medicinal plants have seen the light of the day due to their continuous usage as effective drugs. Some of these plants have attracted the herbalists, who have put these plants in to use for centuries together and include the more potent ones in the materia medica of their region. Thus the material medica of traditional system of medicine in various regions of the world, such as Chinese materia medica, German materia medica, Ayurvedic materia medica, Unani materia medica etc. have been formed and the traditional system of medicine have come for existence. Today, traditional medicine is playing a commendable role of healing about 75-80% of world population (WHO, 1977). Nevertheless, some of the medicinal plants included in the materia medica of different system of medicine have attracted the scientific world. As a result, several active principles from these potent medicinal plants are being isolated, synthesized and marketed. *Rauwolfia serpentina* (Reserpine and serpentine), *Catheranthes roseus* (Vincristin), *Digitalis purpurea* (Digitallin and digitoxin) *Atropa belladonna* (Atropine), *Cinchona officinalis* (Quinine), *Panax gensing* (Gensing) etc. are some traditional plants being exploited for commercialization.

Ayurveda (about 2500 B.C.) contains a more detailed account of many drugs and their uses. Ayurveda in the fact is the foundation stone of the ancient medicinal science of life and art of healing. Charak Samhita (6000 B.C.) is another earlier treatise of Ayurveda which lists a total of 341 plants and plant products for use in health management. Susruta Samhita also deals with plants related to medicine.

Through history, plants have been the most important sources of medicines for human health. India has over 3,000 years old record of the use of medicinal heritage whose remain resource base is medicinal plants. We have perhaps one of
the richest ethno-botanical traditions in the world. Over 7,000 species of plant
ferns diverse habitat from orchid to ferns to trees, grasses, shrubs and climbers. are
used by local communities in different ecosystem from Ladakh to Kanyakumari
and stretching to the north-east hills of Mizorum and Nagaland which is one of the
twelve canters of mega diversity hotspots.

The importance of plant in human life can not to be numbered. From the
primitive ages we are directly or indirectly dependant on plants. Long before the
scientific era, man knew the enumerable importance of the plant life. Apart from
the primary necessities like food, shelter and cloth, slowly man got to know that
the plants can be used for preventive and curative activities. Indian scholars like
Charaka, Sushruta, Bhagvatta and several others gave remarkable description of
Indian medicinal plants. The plants contain steroids (Solanum nigrum), alkaloids,
(Catharanthus roseus), Cathartics (Cassia acutifolia), insecticides
(Chrysanthemum cinerariaefolium), food additives (Capsicum frutescens), colours
(Crocus sativus) and other related active metabolites of great value in
pharmaceutical and drug industry.

The Indian flora is very rich in medicinal plants. One of the earliest
treatises of Indian medicine: the Charak Samhita (100B.C.), mentions the use of
over 2000 herbs for medicinal purposes. Presently the Indian system of medicine
uses 1100 medicinal plants of which five dozens are said to be in larger demand.
Higher plants are still "the sleeping giants of drug development". (Farnsworth and
Morris, 1976), a virtually untapped reservoir of potentially useful drugs
(Farnsworth, 1984). They will continue to serve mankind in the twenty first
century as they have done since the dawn of history (Tyler, 1986).

Many species of Ayurvedic plants grow wild in the forest and hill areas in
different parts of the world. Man has identified some of these and by the concerted
efforts of botanists and chemist the utility of these medicinal plants has been established. In their natural occurrence the plants are scattered and it is difficult to collect and process them. Therefore the necessity to cultivate them on a large scale has become very urgent. Even though there are 7000 or more medicinal plant available, about 160 plants are being cultivated by forest department of different states and by private growers.

Most of the medicinal plants are collected from wild resources and only some species, used in larger quantities, are cultivated systematically. The most common and widely used methods of vegetative propagation are rooting of cuttings, budding, grafting and by using bulbils, suckers, and rhizomes etc. exploitation of the method for the propagation of medicinal plants however has not yet started on a large scale.

The knowledge of the properties of medicinal plants is little based on chemistry or pharmacology but mainly on indigenous category of knowledge called ‘dravya guna shastra’ which can not be converted in to modern day chemistry or pharmacology. Even today, there are over a million traditional village-residents, experts in herbal medicine including the traditional birth attendants, herbal healers and even monks who are well versed in ‘dravya guna shastra’. There is also a vast tradition that is very well infirmed in various home remedies.

India, with the vast biodiversity and potential for commercial cultivation of medicinal plants, could become a world leader in supply of raw material for medicinal plant sector. Majority of the demand of medicinal plant parts is met from the natural sources, forest being the primary sources. This has put a great pressure on these resources and there has been a gross depletion of the natural population of number of species. Such a situation has necessitated the
augmentation of raw material sources, by large scale cultivation of medicinal plants. Plant success in increasing the resources through cultivation of *Saussuroa costus*, *Rauwolfia serpentina*, *Withania somnifera* and *Gloriosa superba* has been reported by Sarin (2003).

Agro-technologies for cultivation of a number species have been developed but the large-scale cultivation of medicinal plants on farmlands is still to begin. Investment in medicinal plant cultivation is associated with risks and uncertainties on account of fluctuation in prices and other conditions influencing cultivation costs. The result of sensitivity analysis for the assessment of profitability of cultivation under adverse condition of price fall, increase in wage rate and rental value of land have shown that all the species were acute sensitive to the price fall so much so that a price fall of 50% resulted in to negative net benefits except for Kalmegh (*Andrographis paniculata*) by sowing method.

India accounts for nearly 8% of the biodiversity of the world despite having only 2-4% of the total land area. This makes our country as one among 12 mega diversity countries of the world. Out of 17,000 plants, the classical system of medicinals like Ayurveda, Sidha, and Unani make use of only about 2,000 plant species in various formulations (Anon, 2000). The global market for traditional remedies has shot up over $70 billion today from less than $20 billion just five year ago. (Bisht et al, 2005).

However, India has a rather small turnover of around Rs. 5,000 crores in medicinal and aromatic plants, which is around 1% of the global market. The future prospects of medicinal plant can be as such well imagined. The increase in demand for raw material has, however, put great pressure on the exiting forest and other natural vegetation, leading to near extermination of some species. There has been a gross depletion of the natural population of number of medicinal plants.
Quite a few of these have become vulnerable while at least ten are endangered and on the verge of extinction (Sarin, 2003). Considering the potential of these plants as effective sources of medicines, concerted efforts are required to conserve and augment them for sustainable utilization. Cultivation is clearly an alternative that can also be a potential provider of economic returns to the growers.

Medicinal plants have attracted considerable global interests in recent years. In the USA alone traditional drugs and preparation worth several hundred million dollars are imported from other countries especially from India and China. Climatically, the Indian sub-content is best suited for cultivation of various important medicinal plants.

The demand for medicinal plant is expected to increase by about 15 to 16 times between 2002 and 2005 (Anon, 2000). The Himalayan region of Uttarakhand state is the home for one of the largest reserves of medicinal plant diversity. The annual turnover of three of the major Indian systems of medicines (ISMS) i.e. Ayurveda, Unani and Siddha is estimated to be more than half a billion dollars. The current gap between demand and supply is estimated to be 40,000 tones by 2005 (Anon, 2000). Increasing demand by major herbal drug industries for medicinal plants as essential raw material for their drugs as also their collection, production, processing packaging and transportation requires high labour input which can create employment in Uttarakhand state. (Singh et al., 2005)

Proper utilization of medicinal plant resources of India requires comprehensive approach. There are many issues concerning this area of activity including inventory, quantitative and techno-economic evaluation, standardization in terms of therapeutic efficacy and augmentation of resources through conservation, domestication and large scale cultivation. The country has been engaged in research and development in this area since long and a good
amount of information on different aspects is available. There is need for retrieval and documentation of this information at national level, developing appropriate technologies and creating conditions for gainful utilization of available and developed resources.

The plant based traditional medicinal system continue to play an essential role in health care, there are rich sources of therapeutic agents. They are popularized due to their effectiveness, early availability, low cost and comparatively being devoid of serious toxic effects. Plant and nature products have contributed and will continue to contribute greatly to our health through development of pharmaceuticals and botanicals.

Herbal medicines are being used by about 75-80% of the world population, for primary health care because of better cultural acceptability, better compatibility with the human body and less side effects. However, in the last two years there have been major increases in their use in the world. Medicinal herbs as the major remedy in traditional and medicinal system have been used in medical practice for thousands of years have made a great contribution to maintaining human health. A majority of the world’s population in developing countries still relies on herbal medicines to meet its health needs.

According to WHO more than one billion people rely on herbal medicines to some or more extent. The WHO listed 2100 plants that have been reported to be of medicinal impotence around the world. Thus herbal medicines have been recognized as valuable and readily available resources for primary health care and WHO has enclosed their safe and effective use.

A weed is an undesirable plant. Weeds are considered as dreadful pests because losses due to them are estimated to be more than those occurring due to
all other pests combined together. But some of the weeds are used as medicine also. Chhui-mui (*Mimosa pudica*) is use for the treatment of sinus and Bhuin aonla (*Phyllanthus niruri*) is used as diuretic.

With the replacement of indigenous wisdom by modern practice, the utility of these plants became less understood and they came even to be looked upon as weeds. Recent revival of interest in natural products as eco-friendly, renewable resources has spurred attention once again on such plants. In this context, unless the productivity and sustained ability of these plants are ensured, there are chances of over-exploitation, which may lead to unlimited extinction.

Secondary metabolites of plants are valuable sources of a vast array to chemical compounds, viz flavors, fragrances, pigment, natural sweeteners, hydrocarbons, antimicrobials, pharmaceuticals etc. The secondary metabolites are substances, whose structure and metabolic interactions appear to be functionally distinct from those involved in primary metabolism. Those secondary metabolites are not the products of single gene but rather of multi-gene sequences coding complicated and highly integrated biochemical pathway. The alkaloids, steroids and terpenes are the major secondary metabolites used in the pharmaceutical, cosmetic and food industries. (Zenk, 1978, Bhom, 1980, Staba, 1980).

Only a few medicinal plants of high economic value like Belladonna, *Catharanthus roseus*, Cinchona, *Dioscorea sp.*, *Papaver somniferum*, and *Ruta graveolens* have been cultivated under field conditions. The majority of plants used for medicines are harvested from the wild. This results in several serious problems such as depletion of resources, extinction of rare species, material not being available in large quantities and throughout the year, incorrect identification and adulteration of the plant material.
If efforts are made for systematic cultivation of medicinal plants instead of collecting them from the wild, many of the problems mentioned above will be minimized. Properly identified and certified planting material can be supplied to the growers. Cultivation of plants can be planned to meet the needs of the industry in required quantities and at the required time. Unintentional adulteration can be avoided as well as it will be easier to check deliberate adulteration.

The present deteriorating condition of medicinal plants in natural forest is very precarious and needs immediate consideration not only for conservation but also for its propagation. Cultivation of medicinal plants is of great importance due to their huge demand in the pharmaceutical and other allied industries in India and abroad. Standardized methods of cultivation would initiate the hesitating farmers to develop their nurseries and adopt cultivation on large scale. It would eliminate unemployment and would prove as tool for their social and economic upliftment. It would reduce our imports and promote exports.

Fertilizer - soil is a thin layer of earth crust, which serves as a natural medium for the growth of plants. Different plant species have differences in their soil and nutritive requirements. Hilgard, the savant of americal soil investigation, defined soil as “the more or less loose and friable material in which, by means of their roots, plants may or do find a foothold and in nourishment as well as other conditions of growth” since the dawn of history, man has tried to fathom the phenomena of plant growth very little, however was know about the relation of plants to the soil and atmosphere until the beginning of 19th century (Evan, 2002).

Variation in particle size result in lettering soil types ranging from clayvia sand to gravel. Particle size is one factor influencing water holding capacity. All through different species have their own soil pH tolerance; no marked influence of pH value within the tolerance range has been demonstrated for essential oil and
alkaloids. All plants require calcium for their normal nutrition but plants known as caliphobous cannot be grown on chalky soils. In other cases different varieties of the same species may be grown on different soils. Generally nitrogen fertilizers increase the size of the plants and the amounts of alkaloids produced but the method of expressing the result of such experiments is important. The effect of nitrogen on glycosides and essential oil content appear variable. The effect of potassium on alkaloid production shows no consistent trend, but an interesting example is the increase in putrescence production in barley grown a potassium-deficient medium, where it is possible that the organic base has been formed to act as a substitute for potassium ions. It has long been maintained that trace amounts of manganese are necessary for the successful production of Digitalis purpurea and more recently it was show that a regimen on manganese and molybdenum feeding over the two years of development of D. grandiflora gives significant increase in glycoside yield (Evan, 2002).

Chhattisgarh state is fortunate that most part of its area is covered by the sal forest, because the sal forest have been found to be better places for medicinal plants as compared to the teak forests. Recognizing the medicinal plant variety of the state, the Chhattisgarh Govt., has declared the state as the herbal state. The theme of declaring the state to be herbal state is mainly to explore, conserve and promote cultivation of medicinal plants. However due to overexploitation of the plants, we are loosing very fast the plants like Chlorophytem spp. (Musly), Elaeocarpus (Rudraksh) etc. Overexploitation has been taken seriously now, but still the poaching and sending abroad of the medicinal plants from the state is going on at an alarming rate.

Conservation of medicinal plants has become a much talked problem. A common understanding is that we should conserve our biodiversity. However, conservation policy is decided upon the priority of the species to be conserved. In
this priority determination, the plants, currently in more demand are placed at the
top in the list of plants, to be conserved. In the current conservation policy, very
little if any significance is attached to the future, possible utility of the species.
Thus, every chance are there, that we may be negligent about the conservation of a
species, which carries lesser significance, presently, but may be discovered to be
of much significance with some later discoveries. By that time we may have got
reduced the gene pool of the species or we may have already lost the species. Thus
we must assign value to the species, taking under consideration both their present
as well as future, possible uses.

It is clear that the present source cannot be relied upon to meet the
increasing demand of the drug industry for which. Cultivation of medicinal herbs
on proper lines can be the only remedy. So it is necessary to explore the
indigenous medicinal plants and large scale trials on propagation methods for
multiplication of indigenous medicinal plants.

*Boerhaavia diffusa*, commonly known as ‘Punarnava’ is an important
medicinal plant, belonging to the family Nyctaginaceae. Although, all parts of the
plant are medicinally useful but roots are more important. Plant is pungent, bitter,
stringent, laxative, stomachic, diuretic, diaphoretic, expectorant, antipyretic and
cardio tonic. The whole plant, fresh or dried, is the sources of drug “Punarnava”.
Roots are laxative and used in asthma, anemia, jaundice and as an antidote to
snake venom and is also useful for restoration of virility in man. An alkaloid in the
root has been shown experimentally to produce a distinct and persistent rise in
blood pressure plus marked diuresis. Earlier investigations on aerial parts and root
have established the occurrence of oxalic acid, hypoxanthine-a-L-
arabinofuranoside, hentriacontane, B-sitosterol, ursolic acid, proteins and
carbohydrates. (Gupta & Ahmad, 1984). Leaves are useful in dyspepsia, tumors,
and opthalmia and joint pains and as appetizer. Seeds are tonic expectorant,
carmimative, lumbago, promising blood purifier and act against scabies. The plant has been reported anti-hepatotoxic effect (Ananda et al. 2002), hypoglycemic effect (Chude et al., 2001), and Antioxidant effect (Satheeth et al., 2005). The herb forms one of the ingredients of a herbal drug, LIVOL which is used as a liver tonic and feed additive for animals and also a constituent of new herbal composition, HERBORIFUMAL, which show better anti-inflammatory property.

Punarnava is an important non-weed forest produce having routine demand in national and international drug markets. There is a fair demand of different parts of this herb in homeopathic pharmacies.

*Solanum xanthocarpum* (Solanaceae) a perennial prickly prostrate herb, is found throughout India. All parts of the plant are medicinally useful. Root is an expectorant, forming an ingredient of the well known Ayurvedic medicine, Dasmula. It is used against cough, asthma and pain in chest. The plant has been reported to possess antiasthematic activity (Jagadeesum & Devi. 2002), Antinociceptive properties (Rahman et al 2003), Cytotoxic properties (Ikeda et al) and larvisidal properties against vectors of malaria and dange DHF. (Singh & Bansal).

Recent spread in developmental activities, urbanization, acquiring additional land for farming and grazing etc. are resulting in damage to natural habitats, of plants. Proper utilization of medicinal plant resources of India required a comprehensive approach. There are many issues concerning this area of activity. These include inventorisation, quantitative and techno-economic evaluation, standardization in terms of therapeutic efficacy and augmentation of resources through conservation, domestication and large-scale cultivation of which. Cultivation is the best technique for the increased production and improvement of
plants. Based on above things these two plants were selected for present investigation with following objectives:

- Selection of two medicinal herbs *Boerhaavia diffusa* and *Solanum xanthocarpum*.

- To determine the suitable soil for the growth of plants.

- To determine the effects of chemical fertilizer and biological manure on plant production.

- To determine the effect of hormones on the growth of plants as measurement of growth of plants as: Height/length, leaf size, number of leaves, number of nodes and internodes, number of branches, number of flowers and fruits were recorded.

- Estimation of primary metabolites (Carbohydrates and Proteins).

- Estimation of chlorophyll content.

- Estimation of alkaloid in the berries of *S. xanthocarpum*.

- Estimation of alkaloid in the roots of *B. diffusa*. 