ROLE OF MEDICINAL PLANT AND THERE ACTIVE PRINCIPLE IN BIOTECHNOLOGICAL APPLICATION

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1. TOPIC

Role of Medicinal plant and there active principle in biotechnological application

2. INTRODUCTION:-

Important Medicinal plants, their Active Principles and Biotechnological applications

There may be as many as 4, 000 different phytochemicals having potential activity against several discuss such as cancer and metabolic or degenerative diseases. Before the sixteenth century most of the mainstream medical systems were based on the idea that one should work with nature and that the body's own healing capacity could be strengthened and complimented by the right herbs (Vaidya, 1, 995; Haslam and Nat, 1996). All the old medical system had, at their center, a belief in a primal energy that sustained life and health. The Chinese called it 'qi,' while the Indians referred to it as 'prang'.

Weston herbalists called it the 'vital force'. When modern medicine took over in the nineteenth century, these concepts were dismissed as remnants of the superstition and ignorance of earlier healing practices. The age of western medicine and dawned and had overshadowed traditional practices in china and India (Haslam and Nat, 1996). Plant chemistry includes the miracle of photosynthesis, plant respiration, structure, growth, development, and reproduction, much of the chemical basis of life is common to both plants and animals. Form a holistic perspective the whole of the plant must be respected as an integrated biologically evolved unit that is beyond the analytical comprehension of science (kirtikar and basu, 1995).

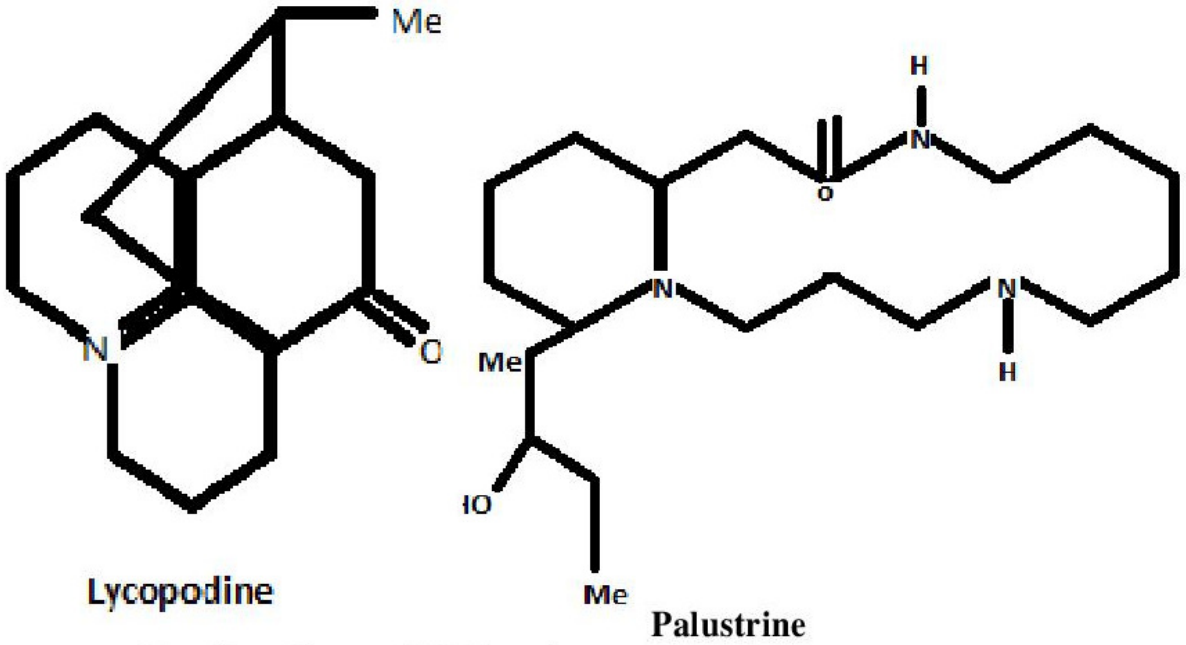
Physiologically active plant constituents are usually classified by their chemical structure rather than specific actions and include alkaloids, Anthocyanin's, Anthraquinones, Cardiac Glycosides Coumadin's, Cacogenic Glycosides, Flavonoids, Glucosilinates, Phenols, Saponins and Tannins.

Alkaloids:

Alkaloids are basic (alkali-like), nitrogen-containing organic constituents found in some plants. Alkaloids are organic bases. Many alkaloids are poisonous, others are addictive (e.g. cocaine), and some are used clinically (e.g. morphine). More than 10, 000 alkaloids are now known, the first discovered being nicotine, isolated form opium by Derosne in 1803. Alkaloids exist as salts in the cell sap. They may be extracted from the cell with acidified water or alcohol, or alternatively they are

soluble in organic solvents (e.g. Chloroform). When the plant is rendered alkaline (Anonymous, 1998).

Alkaloids are normally classified according to the heterocyclic ring system they possess, but more authors prefer a classification based on their biosynthetic organics from amino acids, e.g. phenylalanine, tyrosine or tryptophan (Anonymous, 1998).



Structure of Lycfopodine and Palustrine

Authocyanins:

Anthocyanins are the most abundant and widespread of the flavonoid pigments. They absorb light at the longest wavelengths, and are the basis for most orange, pink, red, magenta, purple, blue and blue-black floral colors. Key to providing such color diversity is the degree of oxygenation of the anthocyanidins (e.g. sugar moieties) added to these chromophores (Bhattari, 1994). At a primary level, the degree of oxygenation of the B-ring has the greatest impact on the colour.

3. Material Method

The medicinal plants were collected from November 2014 to October 2015 and identified and their diameter at breast height) measured with a diameter tape.The height of all plants was determined with clinometers. In each quadrate all trees were examined for the presence of limbers. Trees were also surveyed for epiphytes according to the method described by addo-Fordjour et al. Trees were classified into four groups based on their height' understory, low canopy, upper canopy and emergent species, The percentage canopy cover of each plot was determined by a spherical densitometer. At each plot four readings from the four cardinal directions were taken at four different points. The average of all readings from the four cardinal directions was taken at four different points. The average

of all readings for plots in each block was calculated and used as the percentage canopy cover of that forest type. The diameter of lianas was determined at 1.3 m from the rooting base. Each quadrate of 25 m x 25 m was subdivided into Medicinal plants are the most important source of life saving drugs for the majority of theorist population. Plant secondary metabolites are the economically important as drug, fragrances, pigments, food additives and pesticides. The biotechnological tools are important to select, multiply, improve and analyze medicinal plants. Plant cell culture systems represent a potential renewable source of valuable medicinal compounds, flavors, fragrances and colorants, which cannot be produced by microbial cells or chemical synthesis. In-vitro production of secondary metabolites in plant cell suspension culture has been reported from various medicinal plants and bioreactors are the key step towards commercial production of secondary metabolites by plant biotechnology. Genetic transformation is a powerful tool for enhancing the productivity of novel secondary metabolites; especially by Agrobacterium tumefactions. Combinatorial biosynthesis is another approach in the generation of novel natural products and for the production of rare and expensive natural products. DNA profiling techniques like DNA microarrays save as suitable high throughput tools for the simultaneous analysis of multiple genes and analysis of gene expression that becomes necessary for providing clues about regulatory mechanism, biochemical pathways and broader cellular functions.

Plants have been an important source of medicine for thousands of years. Even today, the World Health Organization estimates that up to 80 per cent of people still rely mainly on traditional remedies such as herbs for their medicines. Plants are also the source of many modern medicines. It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from or modeled on plant substances. The most popular analgesic, aspirin, was originally derived from species of Salix and Spiraea and some of the most valuable anti-cancer agents such as paclitaxel and vinblastine are derived solely from plant sources1-3. Biotechnological tools are important for multiplication and genetic enhancement of the medicinal plants by adopting techniques such as in-vitro regeneration and genetic transformations. It can also be harnessed for production of secondary metabolites using plants as bioreactors. This paper reviews the achievements and advances in the application of tissue culture and genetic engineering for the in-vitro regeneration of medicinal plants from various explants and enhanced production of secondary metabolites. In-vitro Regeneration In-vitro propagation of plants holds tremendous potential for the production of high-quality plant-based medicines4. This can be achieved through different methods including micro propagation. Micropropagation has many advantages over conventional methods of vegetative propagation, which suffer from several limitations5. With micro propagation, the multiplication rate is greatly increased. It also permits the production of pathogen-free material. Micro propagation of various plants

Species, including many medicinal plants, has been reported6-8. Propagation from existing meristems yields plants that are genetically identical with the donor plants9. Plant regeneration from shoot and stem meristems has yielded encouraging results in medicinal plants like Catharanthus roseus, Cinchona ledgeriana and Digitalis spp, Rehmannia glutinosa, Rauvolfia serpentina, Isoplexis canariensis.

However, the system will depend on the availability of liquid nitrogen methods. Production of secondary metabolites from medicinal plants. Plants are the traditional source of many chemicals used as pharmaceuticals. Most valuable phytochemicals are products of plant secondary metabolism. The production of secondary metabolites in-vitro can be possible through plant cell culture53, 54. Successful establishment of cell lines capable of producing high yields of secondary compounds in cell suspension cultures has been reported by Zenk55. The accumulation of secondary products in plant cell cultures depends on the composition of the culture medium, and on environmental conditions56. Strategies for improving secondary products in suspension cultures, using different media for different species, have been reported by Robins57.

Dragging all these aside nanoparticles have been an imminent issue in the field of biotechnology (Nanotechnology), their interference with the Quantum dots. To have a brief explanation about the quantum dots, a quantum dot is a portion of matter (e.g. semiconductor) whose exactions are confined in all three spatial dimensions. Consequently, such materials have electronic properties intermediate between those of bulk semiconductors and those of discrete molecules]. They were discovered at the beginning of the 1980s by Alexei Ekimov et al. in a glass matrix and by Louis E. Brus in colloidal solutions. The term “quantum dot” was coined by Mark Reed et al. [82]. Researchers have studied quantum dots in transistors, solar cells, LEDs, and diode lasers. They have also investigated quantum dots as agents for medical imaging and hope to use them as quits. Preparation of Biocompatible Quaternized Chitosan bio-nano-particles Encapsulating Cods Quantum Dots has been formulized. Today Nanomaterial's have been designed for a variety of biomedical and biotechnological applications, these Nanoparticles or nonporous sol- gel particles function- allied with organic groups can be used as biomarkers, tracer, and drug delivery systems with even all-in-one functionalities.

Genetic engineering is the process of transferring individual genes between organisms or modifying the genes in an organism to remove or add a desired trait or characteristic. Examples of genetic engineering are described later in this document. Through genetic engineering, genetically modified crops or organisms are formed. These GM crops or GMOs are used to produce biotech-derived foods.

It is this specific type of modern biotechnology, genetic engineering that seems to generate the most attention and concern by consumers and consumer groups. What is interesting is that modern biotechnology is far more precise than traditional forms of biotechnology and so is viewed by some as being far safer. The studies in the findings of the present study may be useful for designing degenerate primers or probes specific for APX and possibly presents the first line of defense amongst all the Acerbate Peroxidase isoforms involved in the cellular antioxidant defense pathway, during exposure to abiotic stresses. a discrete event based stochastic modeling approach for studying the molecular dynamics of cells has been proposed based on the simulation methodology and present the mathematical formalism underlying the in silicon system Many gene therapies have been reported during last decade, genetic variations and epigenetic patterns in autoimmunity and in Developmental Disorders like ADHD and End phenotypes have been noted.

4. FINDING AND ANLYSIS

The organisms used in each article were classified under two categories: (1) The "organism studied" refers to the species whose biology is being investigated, and (2) the "organism used" refers to the species actually used in the experiments. For example, for an article describing the production of human interferon in Escherichia coli, the organism studied is human and the organism used is. A summary of the data on experimental organisms is presented in. The most important organism used was E. coli, the routine host for DNA-cloning experiments. Also popular were the yeast Saccharomyces cerevisiae, used for protein expression work, and economically important strains of antibiotic-producing fungi. The organisms studied reflected the emphasis of China's biotechnology research. There was a relatively strong emphasis on agricultural research, whereas animal research was predominantly directed toward humans. An interesting sidelight was the substantial number of articles on species of special interest to China, namely, fish (mostly species used for aquaculture), the silkworm, the panda bear, and the Peking duck.

This is a specialty journal that publishes scientific articles and reviews on applied biotechnology and closely related basic research. Because of the relevance of this journal to this report, every research article published between Volume 1-1 (1985) and Volume 3-4 (1987) was surveyed.

This journal, which is published by CAS in English, is generally considered to be China's most prestigious scientific journal. Similar to the Proceedings of the National Academy of Sciences in the United States, it publishes articles considered to be of broad interest in several areas of the natural sciences, physical sciences, and mathematics. The survey included every article published between January 1987 and February 1988 relevant to either basic or applied biotechnology.

This publication contains English translations of abstracts of all articles published in 61 Chinese journals on the life sciences. All abstracts relating to biotechnology were surveyed for the period 1986 to 1987, and relevant articles were selected and obtained from the National Library of Medicine or the Library of Congress. Journals in China, as elsewhere, vary in prestige, quality, and the rigor of the peer review process. Except for the arbitrary inclusion of all articles from the Chinese Journal of Biotechnology, the survey was strongly biased toward the most interesting articles in what are considered to be the best journals in China. In addition, a serious endeavor was made to include articles on basic research, in particular in biochemistry (e.g., protein structure) and genetics (e.g., gene regulation). Besides the final 160 articles that were thoroughly reviewed and included in the survey, about 200 additional manuscripts were examined briefly.

While including these articles in the survey might have better met standards for statistical analysis, it seems unlikely that it would have affected the qualitative conclusions As expected, the predominant scientific disciplines represented in the articles were molecular biology and genetics, mostly because of the large number of articles on gene cloning. Next most popular was biochemistry, with a concentration of articles on protein structure. The fields of microbiology, virology, botany, and immunology were all reasonably well represented. (Note that the apparent paucity of articles on virology is because most of them were assigned to other disciplines; see.) The weakest areas noted were developmental and cell biology (seven articles for both fields combined) and protein-nucleic acid interactions (no articles).

The research goals of the articles surveyed are summarized in. Applied research was favored over basic research by a more than two-to-one margin. The most important applied goal was the production of foodstuffs and other natural products, with antibiotic fermentation and the improvement of agricultural crops close behind. The most important conclusion from this analysis is that a close correlation exists between research funding priorities and the research that is actually performed. In terms of originality, basic research articles far outstripped applied research articles.

For example, 22 percent of the basic research articles were considered to be "very original" as compared with only 3 percent of the applied research articles. More striking was the fact that 81 percent of the applied research articles "repeat previous research," either completely or with only minor changes in methodology or experimental material. Many of these articles described either the isolation of genes already cloned in the West or the production of previously described materials. For example, more than half of the applied genetics articles described the cloning of genes already sequenced and published in international journals.

5. CONCLUSON:-

Contrary to earlier reports of the use and need of very high concentrations of cytokine's for Brahmi growth, the present work has deciphered methods of improving in vitro propagation by developing a novel improved protocol highlighting efficient reproducible and reliable techniques for mass multiplication of a medicinally and economically important herb B. monnieri. The use of only cytokinins without any other growth hormones in low concentration in shoot induction and MS solid media used in rooting forms the highly significant observations of the study and found to be great importance in maintaining efficacy in multiplication, shortened time span, simplicity and benefit of genetic stability. This protocol is novel because of its minimal requirements and cost effectiveness for propagation. Also it is the first report of the plant being maintained in MS media with different hormones. This plant is a creeper so the possibilities of it being maintained it tanks in MS culture media forms a very attractive concept instead of growing them in pots. Medicinal plants are potential renewable natural resources and are generally considered to

play a beneficial role in human health care. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body. The most important of these bioactive compounds are alkaloids, flavonoids, tannins and phenolic compounds. In India, Tamil Nadu is under strategic geographical location and possesses an invaluable treasure of medicinal plants holding a major share in cultivation and export. B. monnieri (Brahmi) is one of the important medicinal plants belonging to the family Scrophulariaceae. Micro propagation techniques offer new avenues for the improvement of this important medicinal plant. The thesis entitled "Micropropagation of B. monnieri (L.) Pennell and application of some efficient microbes" deals with a morphometric characteristics, in vitro culture regeneration, organogenesis and qualitative phytochemical analysis in in vitro planets such as alkaloid, flavonoid, saponins, tannins, phytosterols, phenols and carbohydrates and HPLC analysis of callus and in vitro plantlets of B. monnieri and their antibacterial activity against four human pathogenic bacteria. Efforts were made to standardize an efficient protocol for micropropagation of this valuable medicinal plant with enhanced in vitro regeneration. Both direct and callus mediated regeneration were achieved from all the explants tested. Among the different explants 113 investigated for direct regeneration, maximum percentage of regeneration and number of shoots per explant were obtained from the nodal explant on MS medium supplemented with BAP (1.0 mg/l) and NAA (0.5 mg/l). It was followed by leaf explants.

Among the different explants cultured for callus mediated regeneration, nodal explant produced maximum amount of callus on MS medium containing BAP and 2, 4-D (each 1.0 mg/l). These calli on the MS medium containing BAP (1.0 mg/l) and NAA (0.5 mg/l) produced maximum number of shoots during the process of sub culturing. Maximum shoot elongation was recorded from the shoots of nodal explants (8.4 cm) on MS medium containing GA3 (1.5 mg/l), BAP (1.0 mg/l) and KN (1.0 mg/l). The regenerated shoots from all the explants were responded well for rooting on MS medium supplemented with IBA or IAA (1.0 mg/l). During the process of hardening, the rooted plantlets transferred to the sterilized mixture of garden soil, FYM and sand (ratio 2:1:1) showed 90%

survival. Combined application of Azotobacter chroococcum, Pseudomonas striate and Glomus aggregatum showed better growth and biomass production of the regenerated plantlets. GC-MS analysis revealed the presence of 06 compounds in the methanolic extract of in vitro plantlets sample, as per the report of earlier literature, these phytochemical compounds are known to have various medicinal properties.

Cognitive impairment, especially severe age-related memory decline, can be an early indicator of dementia. Thai Traditional Medicine characterizes elderly dementia differently than western medicine. This project aimed to elucidate this difference and interpret the memory loss associated with dementia, a western disease construct, using Thai traditional medical philosophies. Plants used in Thai traditional medicine were tested using *in vitro* colorimetric bioassays to analyze crude the extracts of plants and multi-plant formulas, as suggested by traditional healers. These tests used modern scientific inquiry to validate ancient traditional plant knowledge. This chapter is a summary of the findings from this project.

As our lifestyle is now getting techno-savvy, we are moving away from nature. While we cannot escape from nature because we are part of nature. As herbs are natural products they are free from side effects, they are comparatively safe, eco-friendly and locally available. Traditionally there are lot of herbs used for the ailments related to different seasons. There is a need to promote them to save the human lives.

These herbal products are today are the symbol of safety in contrast to the synthetic drugs, that are regarded as unsafe to human being and environment. Although herbs had been priced for their medicinal, flavouring and aromatic qualities for centuries, the synthetic products of the modern age surpassed their importance, for a while. However, the blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security. It's time to promote them globally.

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Medicinal plants grow naturally in any rangeland in so many countries around the world. Increasingly, medicinal species that reside in natural areas have received scientific and commercial attention. Over centuries, cultures around the world have learned how to use plants to fight illness and maintain health or as food purpose. But we still know little about the treasure trove inhabiting our wild places around our habitat. The present study based on scientific literature in order to identification medicinal plant in Karvan rangeland

was conducted. The result of our work showed there are many different medicinal plant in differ plant family. And many people, local people even had not sufficient knowledge about them. Identify an

Plants that are used as medicines have been referred to as "herbs" for over 4000 years by European and Mediterranean cultures, hence the word "herb", being a derivation of the Old French word "herbe" from the Latin word, "herba". Originally, the term "herb" only applied to non-woody plants. Today, "herb" refers to any part of any plant used for aroma, flavoring or medicine, including those that come from trees and shrubs.

An "herb" may be a fruit, a bark, a flower, a leaf, or a root, as well as a non-woody plant. Although the term "herb" can also be used with food spices, it is generally used in reference to any plant, or any part of a plant, having nutritional and/or medicinal value(s). A spice is a vegetative substance used in nutritionally insignificant quantities as a food additive for flavor, color, or as a preservative that kills harmful bacteria or prevents their growth. It may be used to flavor a dish or to hide other flavors.

In the kitchen, spices are distinguished from culinary herbs, which are leafy, green plant parts used for flavoring or as garnish. Many spices are used for other purposes, such as medicine, religious rituals, cosmetics, perfumery, or for eating as vegetables. For example, turmeric is also used as a preservative; licorice as a medicine; garlic as a vegetable. All plants produce chemical compounds as part of their normal metabolic activities.

These are divided into primary metabolites, such as sugars and fats, found in all plants, and secondary metabolites, compounds not essential for basic function found in a smaller range of plants, some useful ones found only in a particular genus or species. The functions of secondary metabolites are varied. For example, some secondary metabolites are toxins used to deter predation, and others are pheromones used to attract insects for pollination. Pigments harvest light, protect the organism from radiation and display colors to attract pollinators. Phytoalexins protect against bacterial and fungal attacks. Allelochemicals inhibit rival plants that are competing for soil and light.

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