



NATIONAL CONFERENCE ON
“Recent Trends in Industrial Pharmacognosy”
“RTIP-2012”

THEME: Modern sophisticated instruments: The Hallmark of Industrial Pharmacognosy

On Friday the 16th March 2012

Organized by

The Department of Pharmacognosy, College of Pharmacy, Mother Theresa Post Graduate and Research Institute of Health Sciences(MTPG&RIHS), A Government of Puducherry Institution, Indira nagar, Gorimedu, Puducherry – 605 006.

The Institution:

Mother Theresa Post Graduate and Research Institute of Health Sciences is a Government of Puducherry Institution, established in the year 1991, affiliated to Pondicherry University a central university and approved by Pharmacy Council of India and All India Council of Technical Education. The Institution is offering B.Pharm, Lateral entry B.Pharm and M.Pharm in four specializations viz. Pharmaceutics, Pharmaceutical Chemistry, Pharmacology and Pharmacognosy.

The Conference:

A national conference on “Recent trends in Industrial Pharmacognosy – RTIP-2012” is scheduled to be held in MTPG & RIHS on 16th March 2012. This conference will provide an effective forum for in depth analysis of the challenges involved in the standardization of herbal drugs and their formulations. It will bring together industrial phytochemist, analyst, pharmacognosist, and other allied professionals to discuss the latest development and trends in the field of herbal drug research.

This is an incredible opportunity for the student and scholar community and faculty members from all over India to showcase their novel ideas, research findings and reviews in the form of oral or poster presentation.

Invited Speakers:



Prof.DR.V.Gopal, M.Pharm.,M.B.A(Edu.Mgmt),Ph.D.

Principal, College of Pharmacy, Academic Registrar, Mother Theresa PG&R Institute of Health Sciences, (A Government of Puducherry Institution) Puducherry – 605 006.

Topic : Yesterday, Today and Tomorrow of Industrial Pharmacognosy.

DR. Hannah Rechal Vasanthi, Reader, Department of Biotechnology, School of Life Sciences, Pondicherry University, Puducherry.

Topic: Molecular techniques in Industrial Pharmacognosy.

Prof. DR.N.S Jaganathan, M.Pharm., Ph.D., Head of the Department of Pharmacognosy, Annamalai University, Annamalai nagar.

Topic: Applications of HPTLC in industrial pharmacognosy.

Prof. DR.D. Chamundeeswari, M.Pharm.,Ph.D., Principal, Faculty of Pharmacy, Sri Ramachandra University, Porur, Chennai.

Topic: Application of Atomic Absorption Spectroscopy in the standardization of Herbal drugs and their formulations.

DR.A.Saraswathi, Director, Captain Srinivasamurthy Research Insitute of Ayurveda and Siddha Drug Development, Aringar Anna Hospital campus, Arumbakkam, Chennai – 106.

Topic: Role of modern sophisticated instruments in the standardization of ISM formulations.

VENUE: Auditorium, MTPG & RIHS, Puducherry.

ORGANIZING COMMITTEE:

Chief Patron: Dr.V.Vasudevaiah, Dean, MTPG&RIHS.

Organising Secretary: Prof.DR.V.Gopal, Academic Registrar, MTPG&RIHS.

Co-ordinators: Mrs.E.Selvakumari, Asst.Prof., MTPG&RIHS and
Mr.G.Prakash Yoganandam, Asst.Prof., MTPG&RIHS.

Treasurer: Mr.V.Sandirassegarane, Demonstrator, MTPG&RIHS.



YESTERDAY, TODAY AND TOMORROW OF INDUSTRIAL PHARMACOGNOSY.

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Introduction

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter. A number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems. In Indian Systems of Medicine (ISM) most practitioners formulate and dispense their own recipes. The WHO has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as “**Botanical Garden**” of the world. The current research focuses on herbal drug preparations and plants used in the treatment of diabetes mellitus, a major crippling disease in the world leading to huge economic losses.

Mankind was, is and will be depending on drugs of natural origin (biodrugs) for all their health needs. There is increasing use of biodrugs, worldwide. When entering a pharmacy today, considerable shelf space is devoted to Biodrugs to a degree which would have been quite unimaginable even 20 years ago. The market value and economic value of biodrugs is ever growing. Biodrugs are playing a major role in our national health care system and its contribution for our economy is ever increasing.

Though the long term benefits of biodrugs outweighs the other forms of medicines, but today it appears that the modern system of medicine is more reliable scientifically and clinically. The biodrugs craze is now slowly wanning and its future is shadowed by the **lack of same rigorous scientific testing as that in modern medicine.** Standard evaluation procedures and Pharmacopoeial standards are yet to be developed and implemented for a majority of bio drugs and their formulations. As a huge population in India depends on biodrugs, there is an increased need for stringent quality norms and standardization methods for ensuring that the patients obtain safe and efficacious products. Currently there is poor understanding and ineffective evaluation of biodrugs and their formulations. There is lack of proactive evaluation of biodrugs formulations to combat counterfeit and substandard quality products.

The evaluation of biodrugs formulations have changed considerably since its initiation, having metamorphosed from a largely descriptive botanical and microscopical field in the late 19th and early 20th centuries, to having more of a chemical and biological focus within the last 40 years or so. The evaluation of biodrugs formulations is becoming comprehensive and is integrating effectively the traditional elements of pharmacognosy. Today, this evaluation process is contributed from the collective technical expertise in several diverse areas, including ethnobotany and ethnopharmacology, classical botanical pharmacognosy, natural products chemistry, phytochemistry, analytical pharmacognosy, phytotherapy and clinical pharmacy. The approaches to this modern science of Industrial Pharmacognosy have still room for improvement.



The problems faced in the field of Industrial Pharmacognosy and their solutions will be discussed in detail with relevant case studies. The major problems faced in the field of Industrial Pharmacognosy are:

1. Lack of scale up studies.

Most of the drugs of natural origin used in the Indian system of medicine were tailormade. Hence the studies for scale up have not been carried out since time immemorial. Currently almost all of these biodrugs are manufactured in bulk. As the scale up studies have not been carried out many problems such as batch to batch variation is predominant in case of biodrugs. Hence a systematic and scientific scale up studies is the need of the hour in the field of Industrial Pharmacognosy.

2. Lack of quality control studies.

Drugs of natural origin were dispensed free in the Indian System of Medicine. Hence the chances of adulteration and substitution were rare. Therefore the quality control parameters in case of biodrugs were underdeveloped. This area of Industrial Pharmacognosy needs special attention and immediate ellaborate studies for effective use of biodrugs.

3. Lack of stability studies, packaging and Labelling.

Biodrugs used in the various traditional systems of medicine were prepared and dispensed as and when required. These formulations when adopted by Industrial Pharmacognosy suffer from lack of stability studies, Packing studies and Labelling studies. Studies in these sections are highly essential and would really strengthen Indian Industrial Pharmacognosy.

Achieving complete and wholesome standardization biodrugs and their formulations is the need of the hour and its implementation will be a historic leap towards India's health security. It will transform the health landscape of India and play a major role in achieving "Health for all".

MOLECULAR TECHNIQUES IN INDUSTRIAL PHARMACOGNOSY

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With resurgence of herbal medicine globally, herbal drug technology has evolved drastically in a positive direction. Herbal drug technology involves converting botanical materials into medicines, where standardization and quality control with proper integration of modern scientific techniques and traditional knowledge is ensured. Use of molecular biomarkers which include DNA and protein markers at cellular and nuclear level have wide application in the fields of taxonomy, physiology, biochemistry, genetics, pharmacology and pharmaceutics. To highlight, the main applications of molecular biomarkers in herbal drug technology includes its direct role in pharmacognosy, pharmacodynamics and pharmacogenomics. In pharmacognosy for correct botanical identification and authentication of crude plant materials and identification of adulteration and substitution, molecular markers are used as part of standardization and quality control. Likewise, in pharmacodynamics biomarkers are used in discovery of new diagnostic and prognostic indicators of therapeutic response; elucidation of molecular mechanism of action of a herb, its formulations or its phytochemical components and identification and validation of new molecular targets



for herbal drug development. Further, in pharmacogenomics biomarkers are used for prediction of potential side-effects of the herbal drugs during preclinical activity and safety studies; identification of genes involved in conferring drug sensitivity or resistance and prediction of patients benefit of using the herbal drug. Current focus on chemotype-driven fingerprinting and related techniques requires integration with genotype-driven molecular techniques so that an optimal characterization of botanical materials is possible. Some of the molecular techniques used in working with molecular biomarkers include hybridization based methods such as RFLP; polymerase chain reaction (PCR) based methods such as random amplified polymorphic DNA (RAPD), DNA amplification fingerprinting (DAF), and amplified fragment length polymorphism (AFLP); and sequencing based methods which includes DNA fingerprinting. Hence, knowledge on the recent developments in molecular techniques would help to bring in newer prospects in pharmacognosy and use of herbal drugs to alleviate various diseases thereby promoting industrial applications. A scientific study on molecular techniques used in authenticating a potential cardioprotective plant species followed by studying the molecular targets (markers) for cardioprotection would be highlighted to emphasize the role of molecular techniques in drug discovery and development from medicinal plants.

ROLE OF HPTLC IN THE STANDARDIZATION AND QUALITY CONTROL OF HERBAL DRUGS AND FORMULATIONS

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The word, “Standardization” is used to describe all measures, which are taken during the manufacturing process and quality control leading to a reproducible quality. “Standardization” expression also encompasses the entire field of study from birth of a plant to its clinical application. It also means adjusting the herbal drug preparation to a defined content of a constituent or a group of substances with known therapeutic activity by adding excipients or by mixing herbal drugs or herbal drug preparations. (E.g. Standardized extracts).

Standardization of an herbal drug has to be detailed under the following headings:

- I. Botanical:** Comprising of
- Macroscopy
 - Microscopy including quantitative microscopy.
 - Powder microscopy
- II. Chemical:** Comprising of
- Powder identify
 - Total ash
 - Acid - Insoluble ash
 - Water soluble ash
 - Various solvents extractive values.
- III. Instrumental:** Comprising of



- HPLC
- HPTLC
- LC-MS
- AAS

Quality control and quality assurance of herbal drugs

The WHO Guidelines for quality assessment of plant materials are not followed by most of the 8,500 licensed manufacturers of herbal formulations, since most of these are small-scale manufacturers with limited resources and knowledge. However, few medium and large-scale manufacturers undertake some quality control testing of herbal materials. In most cases the traditional doctor attached to the manufacturing company approves the materials based on the organoleptic characters and their knowledge of plants. This is highly inadequate and steps must be taken by the manufacturers to undertake effective quality control checks on the plant materials in order to manufacture herbal products with consistent clinical efficacy. A great majority of drugs in modern medicine have been analyzed and their authenticity confirmed by chemical and instrumental analysis. Often the quality control and quality assurance of the drugs are confirmed by these tests and no biological screening is done. However, in the case of herbal drugs it is different since no standard pharmacopoeial methods are available for their identity, when they are in multi-herbal formulations and more so when the extracts of herbs have been used in the formulations. However, regular botanical identification and phytochemical testing shall be of immense help if carried out for both raw materials as well as for the formulations.

Biomarkers

In order to rationalize the use of natural product extracts in therapy, a need-based and novel concept of biomarkers is being coined and defined. The bio-makers in combination with other chemical entities via poorly understood mechanisms of synergy or antagonism are supposedly responsible for the efficacy of the standardized extracts for any particular therapeutic area or disease. The bioactive extract, being the composite mixture in terms of classes and groups of organic compounds in conjunction with many extraneous materials (both organic and inorganic), could be better understood in terms of biomarker concept. Defining of the biomarker has to be very specific and a lot of insight has to go into it before declaring any distinct molecule as a biomarker. Moreover, a good number of biomarker is desirably required to achieve the elusive goal for the rational use of any given standardized extract.

In addition the extract may also be biologically standardized through the in vivo and / or in vitro models.

Chemo profiling

All these aspects of standardization and quality assurance processes are to define the three attributes of authenticity, purity and assay. Fortunately, there are not much scientific problems associated with authenticity and deciding about the limits of the purity for the crude drugs and their derived extracts. Our country has been slow to document authenticity and purity of the available Ayurvedic or Siddha materials and formulations in a formatted manner of Ayurvedic/Siddha Pharmacopoeia but there is lot of information available. Now the Department of AYUSH, Government of India has published Ayurveda/Siddha/Unani Pharmacopoeia with limited number of herbal drugs. The problem area for herbal formulations is the assay part, which constitutes both chemical composition and bioefficacy. The chemical assays are essential as well as desirable in the first place to standardize the raw material at the time of formulating an herbal preparation and also for monitoring the quality



control of the finished product. Once these chemical assays are available with acceptable limits of sensitivity and procedure, they could be helpful in developing biological assays.

HPTLC

Chromatography is the science of separation used either for identification or quantification of chemical substances. In the field of Pharmaceutical Sciences, TLC enjoys a practical application status, as it combines the art of chromatography with quickness at a moderate cost. Introduction of High Performance Thin Layer Chromatography (HPTLC) is a major advancement in the analysis of herbal drugs with better resolution. The basic difference between TLC and HPTLC is not only the particle and pore size of sorbents but also automation of analytical procedure.

Recent changes in practice of thin layer chromatography (TLC) have created a renaissance of interest in this technique and led its wider acceptance as a powerful tool for quantitative and qualitative analysis of mixtures. The technique, which can almost assess the quality and quantity of drugs in mixtures, is the performances breakthrough in TLC, i.e., High Performance Thin Layer Chromatography (HPTLC). It is a culmination of improvement in practically all the operations comprising TLC, including improvement in the quality of sorbent layers, method of application, new development technique and scanning densitometers for in-situ densitometry with higher sensitivity.

Applications

For analysis of drug mixtures and also herbal products usually containing over 10 ingredients, HPTLC provides the rapid and positive analysis compared to other chromatographic methods presently available, leading to quantitation of chief constituents of formulation as well as crude extract.

1. It also provides easy method for monitoring the identity and purity of drug and detection of adulteration.
2. Most of the dosage forms such as tablets, capsules, liquid (oral), suspensions, eye, ear and nose preparations, semi-solid (ointments, creams, and gels) and aerosols can be analyzed by HPTLC.
3. This technique has been successfully used for determination of drugs and their metabolites in biological samples like blood and urine.
4. Its applications have been extended to study purity profile to drug substances, content uniformity test, assay values and dissolution rates.

Chromatographic Finger Prints

Fingerprint analysis by HPTLC or HPLC is one of the most powerful tools to link the botanical identity to the chemical constituent profile of the plant. In combination with microscopic investigations, the fingerprint provides the means for a convenient identity check. It can also be used to detect adulterations in raw materials. From the constituent profile, a number of marker compounds can be chosen which might be used to further describe the quality of the herb or the herbal preparation. High performance thin layer chromatography can also be employed for quantitative determination of such marker compounds.

Some of the plants are known to contain characterizing compounds that are specific to the species or family. These characterizing compounds are referred to as the chemical marker compounds which are biologically or therapeutically active principles. The plant material can be standardized with these markers and quantified-in-the-plant. In case of processed plant materials the quantification is done with the changes in the quantities of these marker compounds. Normally these chemical marker compounds are available amongst alkaloidal and some types of glycosidic crude drugs.



Majority of chemical composition of higher plants in general is common to all plants and we need to direct our efforts to develop assay procedures for such type of components.

Commercially, our country has lagged far behind in the international market for traditional drugs. The use of genuine and authentic plant material is essential for production of quality drugs in these systems of medicine. In fact credibility of these systems depends upon the availability and authenticity of crude drugs. One of the best methods of standardizing herbs and herbal formulations based on modern scientific tools is chromatography. It not only helps in establishing the correct botanical identity but also helps in regulating the sanctity of the herb.

Role of analytical techniques in herbal drug standardization

Newer analytical methods have to be developed for these drugs or drug combinations because of the following reasons:

- ❖ The drug or drug combination may not be official in any pharmacopoeia.
- ❖ A literature search may not reveal an analytical procedure for the drug or its combination.
- ❖ Analytical methods may not be available for the drug combination due to interferences caused by excipients.
- ❖ Analytical methods for the quantification of drug or drug combination from biological fluids may not be available.

The newer developed analytical method finds their importance in various fields like

- ❖ Research institutions,
- ❖ Quality control department in industries, approved testing laboratories,
- ❖ Biopharmaceutical and bio equivalence studies and clinical pharmacokinetic studies.

Current trends in herbal drug standardization

Though many analytical instruments such as HPLC, HPTLC, HPLC-MS, UV spectroscopy etc., were utilized for the evaluation of these herbal drugs or formulations, HPTLC found a prominent role in the analysis of herbal drugs, since, HPTLC provides the rapid and positive analysis compared to other chromatographic methods presently available, leading to quantitation of chief constituents of formulation as well as crude extract. Further, it is most frequently used where only finger printing of the herb is required without quantifying the compound.

Application of Atomic Absorption Spectroscopy in the standardization of herbal drugs and their formulations

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In recent years, there has been great demand for plant derived products in developed countries. These products are increasingly being sought out as medicinal products, nutraceuticals and cosmetics. There are around 6000 herbal manufacturers in India. Due to lack of infrastructure, skilled manpower, reliable methods and stringent regulatory laws most of these manufacturers produce their product on very tentative basis. It is a common misperception that medicines of natural substances cannot be toxic, but according to the advanced researches it has been documented that plants not only contain toxic secondary metabolites, but they are also contaminated with environmental pollutants specially heavy metals, which pose a great health risks to all living



organisms upon long term exposures . Application of synthetic fertilizers, lime, organic manure industrial residues (Annan et al., 2010; Kos et al., 1996) transportation and storage conditions also contributes to heavy metal toxicity in herbal drugs and formulations.

Quality assurance of the herbal formulations is the key concern of the current phyto medicinal research due to increased toxicity reports. Essential heavy metals such as copper, zinc, chromium, iron, and cobalt helps in functioning of enzyme systems, hemoglobin formation, vitamin synthesis, growth and development and photosynthesis in plants. The heavy metals such as lead, arsenic, mercury, cadmium produce deleterious effects upon exposure even at very low concentrations.

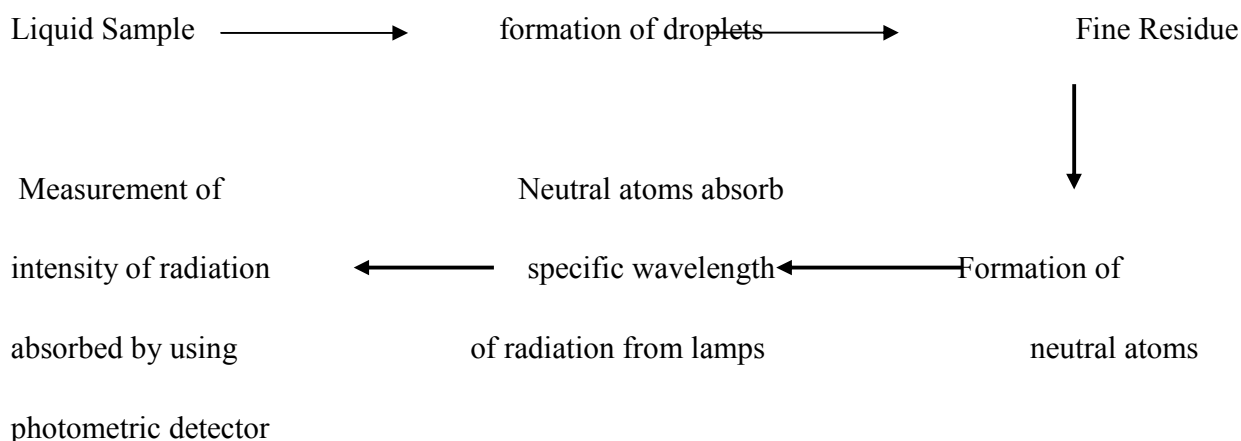
The Government of India, Department of Ayush, Ministry of Health and Family Welfare has issued new safety standards for the ayurvedic drugs. The permissible limits of the heavy metals in ayurvedic drugs with herbal ingredients as per WHO (World Health Organisation) and FDA (Federal Drug Administration) is given below.

HeavyMetal	Maximum Permissible Limit
Arsenic (As)	10 ³ ng/g
Cadmium (Cd)	0.3 µg/g
Lead (Pb)	10 µg/g
Mercury (Hg)	1 µg/g
Copper (Cu)	Not specified
Zinc (Zn)	Not specified

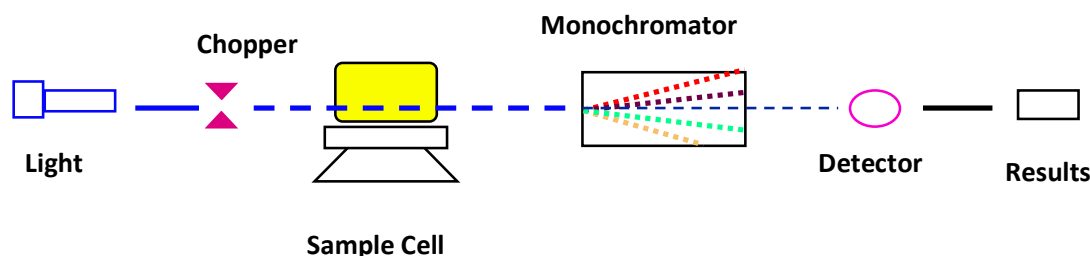
These heavy metals are essential for performing several biological functions in human body. If these metals are present in high concentrations in blood stream, then they can accumulate in vital organs and can cause various toxic effects.

In order to have a good coordination between the quality of raw materials, in process materials and the final products, it has become essential to develop reliable, specific and sensitive quality control methods using a combination of classical and modern instrumental method of analysis. Atomic Absorption Spectroscopy is a versatile equipment approved by AYUSH and other global standards for the detection and quantification of heavy metals in herbal drugs and formulations.

The schematic diagram of the principle of AAS is given as follows:



Basic components in an atomic absorption instrument



Light Sources:

The main sources used for atomic absorption are the *hollow cathode lamp* (HCL) and the *electrodeless discharge lamp* (EDL). The only function of the flame is to convert the sample aerosol (which is aspirated) into atomic vapor which can then absorb light from the primary light source (hollow cathode lamp or electrodeless discharge lamp). The light source (HCL or EDL) emits a spectrum specific to the element which is focused through the sample cell into the monochromator. Electrodeless discharge lamps are available for a wide variety of elements, including antimony, arsenic, bismuth, cadmium, cesium, germanium, lead, mercury, phosphorus, potassium, rubidium, selenium, tellurium, thallium, tin and zinc.

Chopper: The chopper rotates like fan and allows alternative radiation from flame or lamp. This produces a pulsating current (Signal), which is used to measure the intensity of light absorbed by elements without interference by radiation from flame.

Absorption cell: They are used to spray the sample solution into fine droplets, mix with fuel and oxidant so that a homogenous flame of stable intensity is obtained. The burner is the most commonly used absorption cell because of its merits like uniformity in the flame intensity. The sample solution fuel and the oxidant are mixed before they reach the burner tip. Only few droplets of uniform size reaches the flame and the remaining are drained through an outlet at the bottom.

Monochromator: Some elements have a single absorption line but several elements have more than one absorption line. Hence, it is necessary to select the spectral line for absorption measurements. Moreover, it is necessary to isolate the line spectrum of element from that of the emission by the gas in the lamp, or from the background signal of the flame.

Detector: The intensity of radiation absorbed by elements in the UV or visible region can be detected using photo multiplier tube. When a radiation is passed through a sample cell, part of it is being absorbed by the sample solution and the rest is being transmitted. This transmitted radiation falls on the detector and the intensity of absorbed radiation can be determined. In these detectors, the light energy is converted to electric signal which can be read or recorded.

Readout device: The readout device is capable of displaying the absorption spectrum as well as the absorbance at a specified wavelength.

Different Techniques in Atomic Absorption Spectrophotometer:



This Instrument has three technique, by which metals can be determined namely,

- Flame Technique
- Mercury /Hydride Generation Technique and
- Graphite Furnace Technique

Method of analysis

Powder of herbs about 1 gram digested through wet digestion method, 10 ml of concentrated HNO₃ is added and allowed to stand overnight. Solution is heated carefully in a water bath until the production of red nitrous oxide fumes has not been ceased. Beaker is now allowed to cool at room temperature. 4 ml of 70% HClO₄ is added and mixture is heated again to evaporate into a small volume and filtered through Whatman filter paper No.42, transferred to a 50 ml volumetric flask and made up the volume with distilled water. Fuel as air and acetylene gas mixture is used. The concentrations of analytes were directly obtained from calibration graphs and all measurements were run in triplicate for the samples and standard solutions.

Other instruments which can measure metals in ng/L or parts per trillion level are

- Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)
- Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

Applications of Atomic Absorption Spectrophotometer:

AAS is mainly used for quantitative analysis of various elements present in different samples. Calibration curve method is used in qualitative analysis where various standard solutions of the element to be determined are prepared and the absorbance of each solution is determined. A calibration curve of concentration of elements (Vs) absorbance is made, from which the concentration of the elements in the sample solution is determined. Beer's law is obeyed over a wide range of concentration. Low levels of detection such as 0.001ppm of elements are possible in qualitative analysis by AAS.

The following are some of the applications of AAS

1. Estimation of trace elements in biological fluids (eg. Blood, urine, saliva etc).
2. Estimation of elements like Copper, Nickel, Zinc, Magnesium, Iron etc., of nutritive importance in food and drugs.
3. Estimation of elements including heavy metals in ISM drugs.
4. Estimation of elements in soil samples, water supply, effluents, dye samples etc.

Samples like soils, feed, fertilizer, plant and animal tissue, bio-fluids, fingernail, hair, seawater, metallic air pollutants, meat, fish, edible oil, food and beverages, pistol bullets, paint scrapings, ceramics, rocks and soils, ores, cement, glass, leather, iron, steel, gold, cosmetics, gasoline, pharmaceutical preparations and textile can be analyzed for required metal contents which has application in various industries.



Role of Modern Sophisticated Instruments in the Standardization of ISM formulations.

A.Saraswathy

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The ASU system of medicine has its raw materials from plant, animal, metal and mineral origin. The formulations are also varied. The different formulations in Ayurveda system of medicine include Curnas, Avalehas etc. Phytochemicals are the secondary metabolites produced by plants. They play an important role in the therapeutic efficacy of the drug.

Identity and Assay of Marker compounds

The isolation of phytochemicals in the extract is performed through various chromatographic techniques. Thin Layer Chromatography (TLC) is performed to identify the plant along with its marker compound. This is comparatively economical and fast. High Performance Thin Layer Chromatography (HPTLC) is the upgraded version of TLC where the test can be performed both qualitatively and quantitatively.

The volatile oil is separated by distillation using Clevenger apparatus. The constituents in the oil are separated and characterized through Gas chromatography (GC)- Mass Spectroscopy. The components present in the analyte sample to be separated should be stable in its gaseous state. The mobile phase or carrier gas in GC is inert gas like Helium and the stationary phase is liquid or solid.

The compounds that are decomposed on vaporization are separated through High Performance Liquid Chromatography (HPLC). In HPLC the mobile phase can be water, Methanol or Acetonitrile. The stationary phase is normal phase or reverse phase depends on the polarity of the compound that is to be separated. Hyphenated techniques HPLC-MS/MS/MS can also be used.

Compounds that are polar are separated through Column Chromatography (CC). Compounds that are less polar are eluted first and more polar are eluted last.

The isolated compound is identified by its melting point or boiling point, R_f in a particular mobile phase, optical rotation, UV, IR spectroscopic analysis, Mass Spectroscopic analysis, ^{13}C and ^1H NMR.

UV spectroscopy is routinely used to measure the number of conjugated double bonds, also aromatic conjugation within the molecule. It is also used for differentiating between conjugated and non-conjugated system (extended conjugation shifts longer λ) and for differentiating between trans and cis system. (trans isomers absorb at longer λ than cis isomers for superimposability of UV).

IR spectroscopy deals with the infrared region of the electromagnetic spectrum that is light with a longer wavelength and lower frequency than visible light. Its main goal is to determine the chemical functional groups in the sample as different functional groups absorb characteristic frequencies of IR radiation.



Mass spectrometry is a technique for separating and identifying molecules based on mass. The separation techniques like GC, HPLC, LC are linked to MS for identification.

NMR is used for identification of functional groups. It provides information on the number and type of chemical entities in a molecule and gives information on total number of protons, environment of protons and type of protons based on chemical shift and coupling constant. ^{13}C gives information on carbon atoms.

Elemental analysis of the compound gives information on the percent content of C,H,N and O.

ORAL PRESENTATIONS

ORAL-01

THE WOUND HEALING EFFECT OF HERBAL CREAMS FORMULATED WITH DIFFERENT LEAF EXTRACTS OF *Passiflora foetida*

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Abstract: Phytomedicine for wound healing are not only cheap and affordable but are also purportedly to be safe as hypersensitive reactions are rarely encountered with the use of these agents. *Passiflora foetida* is reported to possess anti-inflammatory, anti-ulcer, anti-oxidant activities. It is reported that traditionally its leaves used in the wound healing treatment. Thus, the study was carried out to evaluate its wound healing potential scientifically. **Methodology:** In this study, *Passiflora foetida* leaves were extracted with different solvents which include petroleum ether, chloroform, ethanol and water. Antibacterial activity of the extracts was screened against various microorganisms using Amikacin 30 mcg as standard. Then, the plant extracts were formulated as herbal creams with aqueous base. The wound healing effect of herbal creams formulated with *Passiflora foetida* leaf extracts embedded in aqueous cream base has been evaluated *in vivo* using the excision wound healing model and linear incision wound healing model, on wistar rats. The herbal creams were used to treat wounds inflicted on experimental rats. **Results and discussion:** Antibacterial study revealed that the extracts were having good antibacterial activity against microorganisms tested. The wound healing effects of the formulations were compared to that of a standard (5 % w/w Povidone iodine ointment). In all cases, there was a progressive decrease in wound area with time, indicating an efficacy of the formulations in healing the induced wounds. By the 8th day, the cream containing ethanol extract of *Passiflora foetida* leaves in aqueous cream base showed 100 % healing. The wound areas in the animals treated with the



standard showed a 93% healing by the 8th day, indicating that the plant extract at that given concentration, had a better wound healing property than the standard used.

Keywords: Wound healing, herbal creams, *Passiflora foetida*, 5 % w/w Povidone iodine ointment.

ORAL-02

INSILICO MOLECULAR DOCKING STUDY OF RUBIA SPECIES DERIVED PHYTOCONSTITUENTS AGAINST TARGET PROTEINS FOR DIFFERENT TYPES OF CANCER CELL LINE

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Cancer is a leading cause of death worldwide, accounting for 7.6 million deaths (around 13% of all deaths) in 2008. According to WHO, deaths from cancer worldwide are projected to continue rising, with an estimated 13.1 million deaths in 2030. The plant derived compounds have played an important role in the development of several clinically useful anticancer agents. The phytoconstituents can be screened for their action virtually by the aid of docking software. The aim of present study was to predict the interaction of the compounds Christofin and Rubifolic acid, derived from *Rubia tinctorium* and *Rubia cordifolia* belonging to the family Rubiaceae, with cancer target protein of different types of cancer cell line. The protein ligand interaction plays a significant role in structural based drug designing. The target cancer proteins which were selected are lung cancer (EGFR kinase), gastric cancer (Topoisomerase II) and breast cancer (BRCT repeat region from breast cancer associated proteins). The susceptibility of these proteins to the selected plant derived constituents were evaluated. The analogues of these derived compounds were prepared using ACD Chem sketch and docked using Arguslab and Pymol. The selected compounds namely Rubifolic acid and Christofin were found to have good docking score such as -8.1765 kcal/mol and - 8.6383 kcal/mol with lung cancer proteins compared to the breast and gastric cancer cell lines. The properties of the molecules were evaluated using OSIRIS property explorer web tool which predicts the molecules to be non-mutagenic and non-tumourigenic. The cLogP values of the compounds namely Rubifolic acid and Christofin were found to be 4.17 and 3.18 respectively. The detailed analysis of the resulted molecules may candidate them for the treatment diverse cancers.

ORAL-03

EFFECT OF ETHANOLIC EXTRACT OF MERREMIA EMARGINATA LINK IN AMELIORATING JOINT DESTRUCTION IN RHEUMATOID ARTHRITIS IN RATS

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Rheumatoid arthritis (RA) is a kind of chronic inflammatory autoimmune disease. The degradation of extracellular matrix and cartilage pave way in understanding the molecular mechanisms in RA. In the present study, the efficacy of ethanolic extract of *Merremia emarginata* in ameliorating the disease process via markedly reducing the joint destruction was demonstrated in adjuvant induced arthritis rat model. Ethanolic extract of the plant *Merremia emarginata* were administered at two doses 100mg/kg & 200mg/kg b.wt for 14 days after 14 days of adjuvant injection in rats. The activity of lysosomal enzymes, collagen degradative products were analysed in control & experimental animals. The study revealed that ethanolic extract of 200mg/kg exhibited a profound reduction ($P < 0.05$) in the activities of lysosomal enzymes and there by decreasing ($P < 0.05$) the levels of GAGs & its fraction when compared to arthritis rats. The effect of ethanolic extract 200mg/kg b.wt was found to be improved than lower dose and this might be due to the phytoconstituents present in *Merremia emarginata*.

ORAL-04

**DEVELOPMENT, STANDARDISATION AND PHARMACOLOGICAL EVALUATION
OF A POLYHERBAL FORMULATION TO TREAT
BENIGN PROSTATIC HYPERPLASIA**

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Abstract:

Benign prostatic hyperplasia (BPH) involves the proliferation of epithelium and fibro muscular tissue of the prostate, commonly seen in aged men. Complications with surgical prostatectomy and side effects with conventional therapy exclude their use as routine treatments for BPH. So, phytotherapy has gained momentum as an alternative. **Aim:** The aim of the study was to develop a polyherbal



formulation to treat BPH, to set up its quality control standards by evaluating its phytochemical, formulation parameters and to evaluate the efficacy of the formulation by *in vitro* and *in vivo* pharmacological studies. Antibacterial activity against *E.coli* was also carried out for evaluating its potential against urinary tract infections associated with BPH. **Methods:** Raw material analysis of the herbal crude drugs and extracts was carried out and its identity and quality was checked. Polyherbal capsules were developed and standardised in order to promote patient compliance. Accelerated stability study was carried out. Antibacterial activity was performed against *E.coli*. Pharmacological investigation both *in vitro* (evaluation in NIH 3T3 cell lines by MTT assay) and *in vivo* (activity against experimental hyperplasia in male wistar rats) was performed to evaluate the efficacy of the formulation. **Results:** Results indicated that developed polyherbal capsule has passed through all the standardisation parameters. Capsules were stable in the accelerated stability conditions. From the *In vitro* study, IC_{50} value was found to be 211.8 μ g/ml. The antibacterial activity showed a good zone of inhibition against *E.coli* on concentration dependent manner. *In vivo* study is ongoing and results are awaited. **Summary & Conclusion:** Data suggested that formulated capsules were consistent with various identity and quality parameters. *In vitro* study showed the better inhibition of cellular proliferation of stromal cells. Based on the awaited *in vivo* study results, it may be evaluated in clinical trials on benign prostatic hyperplasia.

Key words: Benign Prostatic Hyperplasia (BPH), Polyherbal formulation, Capsules, Formulation development, Standardisation, Pharmacological evaluation.

ORAL-05

Cytokine regulation in fungal infected keratinocytes by influence of Microbial proteins

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Dermatophytes cause intractable superficial infections in humans. *Trichophyton tonsurans*, *Trichophyton mentagrophytes* and *Trichophyton rubrum* are the major pathogenic species causes Tinea which triggers the pro-inflammatory cytokines and immunosuppressor in the micro environment. Inflammatory cytokines play a major role in management of infections. Topical chemotherapies are cytotoxic to both the pathogens and host cell, so search of alternative to chemotherapy, the identification of host specific toxicity and immunomodulatory metabolites are in dry pipelines. Dermatophyte co-culture with keratinocytes cell lines (PHK16-0b) were used to investigate the regulation of cytokines in compatible peptide treated keratinocytes. The Minimum inhibitory concentration of peptide showed MIC_{50} at 76 μ g/ml and pharmacokinetic evaluation MFC (MIC_{90}) was 145 μ g/ml. *T.rubrum* infected keratinocytes resulted in the secretion of proinflammatory cytokines Interleukin -IL-2, IL-6 and TNF- α , whereas, *T. tonsurans* infected keratinocytes secreted pro-inflammatory cytokines. These cytokines involved in tissue remodelling, angiogenesis and inhibit the Delayed type hypersensitivity (wound healing). In peptide treated infected keratinocytes secrete anti-inflammatory markers IL-4 and the level of IL-4 mRNA was 3.2 fold increased in *T.tonsurans* and *T.metagrophytes* compared to *T.rubrum* infected keratinocytes. RT-PCR demonstrated for both treated



and untreated dermatophytes infected keratinocytes, level of expression ratio of IL-8 mRNA was 2 fold lowered compared to untreated Keratinocytes. The cytotoxicity of the protein was studied in keratinocytes and the results suggest that actinomycetes peptide was 18% toxic to Primary epithelial cells. These cytokine profiles may aid in proving the immunological features of anti dermatophytic peptides.

ORAL-06

Anti proliferative effect of alcoholic extract of *Acorus calamus* on Peripheral Blood Mononuclear Cells

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Mother Earth has bestowed us various plants with healing ability for curing the ailments of mankind. Plants are the richest resource of drugs of traditional systems of medicine, modern medicine, nutraceuticals etc. Traditional herbal medicine of India, known as **Ayurveda**, dates back to the second millennium BC. The **Rig Veda** also mentions herbal remedies called **soma**. Authentic compilation of teachings by the surgeon **Sushruta** is available in a treatise called **Sushruta Samhita** which describes 1120 illnesses and 700 medicinal plants.

Drug discovery from medicinal herbs requires continued access to plants and identification of potential secondary metabolites such as alkaloids, phenolics, flavonoids, terpenoids or isoprenoids from them. These metabolites have been extracted with solvents polar to nonpolar on an increasing degree of non-polarity and studied for their useful biological activities, such as antibacterial, antifungal, antidiabetic and anticancer activities. *Acorus calamus* Linn commonly known as sweet flag is an aromatic medicinal plant belonging to the familyAcoraceae.

Rhizomes of *Acorus calamus* has been used medicinally since ancient times and considered to possess antispasmodic, anthelmintic, nervine, sedative properties and used for the treatment of epilepsy, mental ailments, chronic diarrhoea, dysentery etc.,

Phytochemical analysis of *Acorus calamus* rhizomes in the present study revealed the presence of alkaloids, flavanoids, terpenoid, tannin, saponin, phenols, anthraquinones, steroid and glycosides. In this study the anti-inflammatory activity of *Acorous calamus* rhizome was tested using *in vitro* models. Ethanolic extract of *Acorus calamus* rhizomes showed prominent dose dependent anti proliferative effect on PHA induced Peripheral Blood Mononuclear Cells.



Conclusion: *Acorus calamus* rhizomes can be further investigated for their anti-inflammatory effects *in vivo* and can be used as a potent source of new anti-inflammatory drugs.

ORAL-07

**ESTABLISHMENT OF QUALITY CONTROL PROTOCOL FOR HERBAL FORMULATION
, SITOPALADI CHURNA**

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In the few decade's there has been exponentially growth in the field of herbal remedies. Newer guidelines for standardition, manufacture, quality control and scientifically rigorous research will be necessary for traditional treatments. this traditional knowledge can serve as a powerful search engine that will greatly facilitate drug discovery. standardization of herbal formulation is essential in order to ensure the quality ,purity, safety and efficacy. Sitopaladi churna is well known ayurvedic formulation is official in ayurvedic formulary of India ,traditionally used for asthma, cough, cold, tuberculosis ,chest pain, chronic rhinitis/sinusitis, coryza, and other respiratory disorders. It is observed that the consistency and content vary from one manufacture to another which effects therapeutic activity. hence it is needed to develop a protocol for the evaluation of sitopaladi churna in the present studies of market and laboratory herbal formulation of sitopaladi churna were procured and purchased from local market and they are evaluated as per Indian Pharmacopeia and WHO guidelines by following parameters viz, organoleptic characteristics, extractive value ,ash value, physical characters, moisture content, loss on drying, photochemical evaluation the result of present studies reveal that all six batches of sitopaladichurna were found in close proximity. this study of sitopaladi churna was precise ,reproducible and may be considered as protocol for it's for evaluation and establishment.

KEYWORDS; sitopaladichurna, polyhedral formulation, phytochemical analysis, physico-chemical, quality control, protocol

ORAL-08

**Sedative and anticonvulsant activities of the methanol leaf extract of
Ficus hispida Linn**

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ABSTRACT

The central nervous system (CNS) depressant and anticonvulsant activities of the methanol leaf extract of *Ficus hispida* Linn (FH) were investigated on various animal models including pentobarbitone sleeping time and hole-board exploratory behaviour for sedation tests, and strychnine, picrotoxin, and pentylenetetrazole-induced convulsions in mice. FH (200 and 400mg/kg, p.o.), like chlorpromazine HCl (1mg/kg, i.m.), produced a dose-dependent prolongation of pentobarbitone sleeping time and suppression of exploratory behaviour. FH (200 and 400mg/kg) produced dose-dependent and significant ($P < 0.05$) increases in onset to clonic and tonic convulsions, and at 400mg/kg, showed complete protection against seizures induced by strychnine and picrotoxin but not with pentylenetetrazole. Acute oral toxicity test, up to 14 days, did not produce any visible signs of toxicity. These results suggest that potentially antiepileptic compounds are present in leaf extract of FH that deserve the study of their identity and mechanism of action.

ORAL-09

Qualitative and Quantitative analysis of soil samples traditionally used for Mud therapy.

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Abstract

Mud therapy (InTamil “Mann vaidyam”) is traditionally used to cure various skin diseases, especially Herpes Zoster by the people of Pillaichavady village of Puducherry Union Territory. This practice has to be scientifically evaluated for its efficacy. Soil samples used for the mud therapy were collected and tested for microbial evaluation and the samples were subjected to atomic absorption spectroscopy and flame photometry. The sample shows a high concentration of Potassium oxide and medium concentration of Manganese, low concentration of Zinc, iron and copper and very low concentration of Phosphorus oxide. The bacterial species present in the soil were identified by culture methods. The isolated species belong to six dominant phyla, *Acidobacteria*, *Bacteroidetes*, *Firmicutes*, *Actinobacteria*, α -*Proteobacteria*, and the β -*Proteobacteria*. No known pathogenic bacteria species were isolated in culture from the soil samples. Further research is needed to scientifically evaluate the efficacy of Mud therapy. The present study shows the safety aspect of Mud therapy.



ORAL-10

MEDICINAL PLANTS IN KANNAPUR AIYANAR SACRED GROVE OF KARAIKAL, PONDICHERRY

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Abstract

Sacred groves are patches of forests dedicated to a local spirit or deity and protected by cultural traditions and religious precepts. The present survey is an attempt to enumerate the medicinal plants, which are distributed in and around the Kannapur, Aiyandar grove in Thirunallar commune of Karaikal region of Pondicherry, which is a coastal pocket on the shores of Bay of Bengal 130 km down south from Pondicherry. Medicinal uses of 26 plant species belonging to 24 genera and 18 families were enumerated. Most of the plants documented in the present study are of highly medicinal value. They are found to be the remedial for a number of diseases like joint pains, leucorrhoea, cardiac diseases, scorpion sting, stomach ulcer, snake bite, asthma, mouth ulcer, gingivitis, urinary track infection, cold, cough, wounds, stomach ache, jaundice etc. Comparative study of the present work with earlier work of similar nature reveals that the use of *Acalypha indica* for scorpion sting, *Cayratia trifolia* for bone setting and *Glinus oppositifolia* for sprains are new reports from this study.

Key words: Medicinal plants, sacred groves, diseases.

ORAL-11

COMMON PLANTS USED TRADITIONALLY AS INFUSIONS FOR INFANTS BY RURAL INHABITANTS, PUDUCHERRY- A CASE STUDY

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ABSTRACT:



As a part of post-natal care of infants, it is understood that plant infusions are commonly orally administered in Muthupillaipalayam, Puducherry. Nearly 250 families are living in this area. Among them 92% are still rely on traditional medicines to treat common ailments. Even breastfed infants are exposed to traditional preventive treatment. The treatment consists of administration of herbal preparations made from complex mixes of plants which include *Acalypha indica*, *Amaranthus viridis*, *Azadirachia indica*, *Cynodon dactylon*, *Leucas aspera*, *Moringa pterigosperma*, *Ocimum sanctum*, *Phyllanthus amarus*. The infusions are made from fresh tender leaves by boiling them in hot water with little amount of Garlic, Pepper, and Fennel. A total of 21 plant species are regularly used by the local inhabitants for the infants. Of the recorded plants, 3 are trees, 4 are shrubs and 14 herbs. The vast majority of the species recorded are well known and commonly. This indicates that the medicinal plant repertoire of non-specialist is limited to a very small number of species. Some of the earlier reports (Susana et al., 2010, Popat et al., 2001) reveals there are some toxigenic micro-organisms in some medicinal plants used for ritual protection of infants, hence this practice of administering plant infusion should be discouraged. As the government is also trying to create awareness on this aspect.

POSTER PRESENTATION

POSTER-01

In vitro antioxidant activity of leaves of *Raphanus sativus* Linn.

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Raphanus sativus Linn. (Syn: *Raphanus caudatus*) belongs to the family Brassicaceae, is an annual or biennial bristly herb, cultivated throughout India. Commonly, it is known as radish. The plant is used for the treatment of various ailments like influenza, dysentery, urinary troubles, heart disease, leprosy, cholera, dyspepsia, amenorrhoea, paralysis. It is known to possess anthelmintic, antitumor, anti-inflammatory, antibacterial and diuretic properties. The present investigation was planned to analyze the antioxidant properties of various extracts (ethanol, ethyl acetate and chloroform) of leaves of *Raphanus sativus*. The activity was determined by DPPH radical scavenging, nitric oxide scavenging and hydrogen peroxide scavenging method. All the extracts showed moderate to potent antioxidant activity when compared with standard ascorbic acid 90%. The order of scavenging activity was maximum, in ethanol extract followed by ethyl acetate and chloroform extract. The phytochemical analysis reveals the presence of alkaloids, glycosides, flavonoids, phytosterols in all the extracts of *Raphanus sativus*. In



conclusion, the present study indicates the potentiality of the *Raphanus sativus* leaves to utilize as a natural antioxidant.

POSTER-02

PHYTOCHEMICAL ANALYSIS AND INVITRO ANTIOXIDANT ACTIVITY OF BASSIA LATIFOLIA

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To evaluate the bark of *Bassia Latifolia* for its invitro antioxidant activities and preliminary phytochemical screening by different method. The bark of *Bassia Latifolia* was extracted with 70% ethanol, used for the evaluation of various invitro antioxidant by free radical scavenging using DPPH radical, hydrogen per oxide and p-NDA method using suitable chemical reagent to find out the active constituent. The various antioxidant activities were compare with suitable standard antioxidant such as ascorbic acid, BHT and curcumin. The generation of free radical viz O_2 , OH , H_2O_2 , NO and peroxy radicals were effectively scavenged by the ethanolic extract of *Bassia Latifolia*. The result obtained in the present study clearly indicated that *Bassia Latifolia* scavenges free radicals and reduces lipid peroxidation. Amerliorating the damage imposed by oxidative stress on different diseases condition and serve as potential sources of natural antioxidant.

POSTER-03

HERBAL DRUGS AS HEPATOPROTECTANTS

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ABSTRACT:

Liver is a large, meaty organ that sites on the right side of the belly. Weight is about three pounds, reddish brown in color and feels rubbery to touch. It plays a central role in transforming, clearing chemicals and susceptible to toxicity. Certain chemicals that cause liver injury are termed as Hepatotoxins. The drugs which produce hepatotoxicity are Bromfenac, Ibuprofen, Paracetamol, Acetaminophen, Glucocorticoids, Isoniazid and the natural product such as Aflatoxins and the industrial toxins like Arsenic, Carbon tetra chloride, Vinyl chloride, etc. The agents which are used in the treatment of hepatotoxicity are called Hepatoprotectants. Recently there is a greater global interest in non-synthetic natural drug derived from plant or herbal sources due to better tolerance and minimum adverse reaction. No effective measures are available for the treatment of liver diseases in modern medicine so far. Herbal drugs used in Indian system of medicines are however claimed to be effective and safe in such ailments. Herbal drugs which are used as hepatoprotectants are Silymarin (a flavonolignan mixture) extracted from the *Silybum marianum* (milk thistle) is a popular remedy for hepatic



diseases. Andrographolide (*Andrographis paniculata*), Glycyrrizin (*Glycyrrhiza glabra*), Picrorrhizin (*Picrorrhiza kurroa*), and Hypo-phyllanthin (*Phyllanthus niruri*) are potential candidates with hepatoprotective activity. Lupeol is derived from the plant *Cratoeva nurvala* which shows hepatoprotectivity against the natural product (Aflatoxin B₁) which produces toxicity. Ursolic acid is common triterpenic acid found in leaves of *Eucalytus tereticornis* have good protective activity. *Salvia triloba*, *Curcuma longa*, *Vinca minor*, *Ocimum basilium* also possess hepatoprotective activity.

POSTER-04

FREE RADICAL SCAVENGING ACTIVITY OF LEAF EXTRACT OF

'DREGEA VOLUBILIES BENTH'

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The purpose of the present study to evaluate the Anti oxidant activity of chloroform & hexane extract of leaves of *Dregea volubilies benth*. By using spectrophotometric 1,1-diphenyl-2-picrylhydrazyl(DPPH) free radical scavenging method. Traditionally this plant has been used as a folk remedies & food supplement. Anti oxidant are vital substances which posses the ability to protect the body from damages caused by free radical induced oxidative stress. A variety of free scavenging anti-oxidant is found in dietary sources like fruits, leaves, vegetables, tea, etc. By employing DPPH(1,1,-diphenyl-2-picrylhydrazyl) scavenging assay, it was found that chloroform extract of the sample endowed with Anti oxidant activity but hexane extract did not show the significant anti oxidant activity when compared to the standard drug (ascorbic acid).The result were analysed statically by regression method. The antioxidant activity of the extract were estimated by IC₅₀ value and the values are IC₅₀ chloroform extract =118.50µg/ml. and standard drug (ascorbic acid) IC₅₀ ascorbic acid = 99.25µg/ml. So the result indicate chloroform extract showed it's ability to scavage free radical in a concentration dependent manner. But hexane extract did not show significant anti oxidant activity. though, anti oxidant potential varied according to the different parts extracts and species.

POSTER-05

DEVELOPING A NOVEL METHOD OF VALIDATION OF AFORTE CAPSULE

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Standardization of herbal drugs is a major challenge as various factors influence the quality and quantity of various chemical constituents in same species of plant collected from different localities or during different season. Due to the above problem, active constituent analysis has been attempted by



many, however many herbs when in crude form have shown many therapeutic effects than when they were purified and tested. Standardization of polyherbal drugs are hence all the more challenging. In the present paper, we discuss about various methods, their reliability, accuracy and predictability in the standardization of a polyherbal Siddha drug formulation (Aforte capsule) and to suggest the possible test essential for standardizing the polyherbal drug and batch variability minimization. Aforte contains *Withania somnifera* and *Centella asiatica*. It is widely used as an anti stress agent. Three batches of Aforte capsule is taken and evaluated on the basis of pharmacognostic studies such as organoleptic, physico-chemical evaluation includes ash value, extractive value, moisture content, and powder microscopical studies. Parameters for finished capsule include uniformity of weight, pH and disintegration time as done. Analytical studies such as TLC & HPTLC have been carried out for three batches.

Conclusion: The correct identity of the crude herbal material is of prime importance in establishing the quality control of herbal drugs which is determined by Ash content, moisture content, extractive values etc... HPTLC fingerprint profiles were used to determine the identity, purity and strength of the polyherbal formulation and also for fixing standards for this Ayurvedic & Siddha formulation. HPTLC can be used as one of the methods to determine the batch variability.

POSTER-06

EVALUATION OF POLYHERBAL AYURVEDIC FORMULATION OF “ASTHA CHURNAM”

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India having a rich heritage of traditional medicine constituting with its components like Ayurveda, Siddha and Unani. The development of these traditional systems of medicines with the perspectives of safety, efficacy and quality will help not only to preserve the traditional heritage but also to rationalize the use of natural products in the health care. Standardization of herbal formulation is essential in order to assess the quality of drugs. Every herbal formulation must be standardized as per “WHO” guidelines. However the pharmaceutical industry generally relies upon the purifying and quantifying an active ingredient in order to standardize preparations of medications. The objective of “WHO” guidelines is to define the basic criteria for the evaluation of quality, safety and efficacy of drugs. “Asthachurna” a Ayurvedic polyherbal formulation is used for stomach ache, indigestion, gas trouble and lack of appetite, anemia etc. It consists of fine powders of Hingu (*Ferula asafetida*), Ajamoda (*Ptychotis ajowan*), Jeerakam (*Cuminum cyminum*), three acids such as Zingiber officinale (rhizome), Piper nigrum linn (fruits), Piper longum linn (fruits). The present study is to standardize the individual ingredient from Ayurvedic formulation qualitatively by known parameters like Organoleptic characters, Physical characteristics, Phytochemical screening and Physicochemical parameters. The set parameter was found to be sufficient to evaluate the churna, and can be used as reference standard for the Quality assurance/Quality control purposes as per “WHO” guidelines.



POSTER-07

Promising prospectives of ‘Java Olive’- *Sterculia foetida* L. Sterculiaceae.

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ABSTRACT

Medicinal trees have been used both in the prevention and cure of various diseases of human and their pets with the advent of human civilization. Many system of therapy have been developed primary based on plant. Plant polysaccharides comply with many requirements expected of pharmaceutical excipients such as non toxicity, stability, availability and renewability. They are extensively investigated for use in the development of solid dosage forms. Several medicinal trees and their products are still in home remedies and they represent a substantial proportion of the global drug market. These medicinal plant gain further importance in the region where modern medical health facilities are either not available or not easily accessible.

Sterculia foetida L Sterculiaceae is a tree with digitately lobed leaves, 5-7 leaflets, elliptic, margin entire, flowers in axillary panicles. The edible seeds eaten roasted or fried; seed used as adulterant for cacao; seed are also eaten as purge/dewormer; oil from seeds have uses in local culinary and traditional medicine; oil as an illuminate; fiber obtain from the bark used as cord; pulpwood; timber yields gum or glue used in bookbinding; fire wood and charcoal. The present survey has shown the hidden potentiality of *S. foetida*, Sterculiaceae for it medicinal and economical importance.

KEY WORDS: Medicinal trees, *Sterculia foetida* L, Sterculiaceae, Natural gum, Renewable resources, Excipients.

POSTER-08

Evaluation of the Anxiolytic Effect of Ethanol Leaf Extract of *Ficus gibosa* in Corticosterone induced anxiety in young adult mice

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The aim of the present work is to evaluate the anxiolytic effect of a ethanol extract of *Ficus gibosa*. Leaves in young adult mice. Anxiety in rodents was induced by administration of corticosterone (5 mg/kg/day), treated for 4 weeks developed an anxiety. Actophotometer, elevated plus maze, zero maze, hole board and rotarod paradigm were used to assess the anxiolytic activity of the ethanolic leaf extract *Ficus gibosa* (EEFG) at the dose of 200 and 400 mg/kg. p.o and diazepam 1mg/kg,i.p were administered 30 mins before the tests. The results showed that the EEFG significantly increased the number of head poking and line crossing in the hole board test. In the elevated plus maze the EEFG at the dose of 400 mg/kg significantly increased the duration of exploration in open arm in similar way to that of diazepam. Further, in the Zero maze the extract produced significant increase in time spent in open arm as compared to negative control. In the rotarod EEFG at the dose of 200 and 400 mg/kg significantly decreased the fall off time which shows the muscle relaxing property of the plant. The spontaneous locomotor activity count, measured using actophotometer, was significantly decreased in animal pretreated with EEFG. Indicating the remarkable sedative effect of the plant. The result of the present study suggests that leaves of *Ficus gibosa* may possess an anxiolytic effect.

POSTER-09

EVALUATION OF ANXIOLYTIC ACTIVITY OF *RUBUS RACEMOSUS* IN SWISS ALBINO MICE

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Anxiety is an exaggerated feeling of apprehension, uncertainty, and fear. It is an unpleasant state of tension and a particular form of behavioral inhibition that occurs in response to environmental events. Anxiety affects one-eighth of the total population worldwide and has become a very important area of research interest in psychopharmacology. The present study was designed to determine the effect of ethanolic extract of *Rubus racemosus* (EERR) in mice. Animals were treated with EERR extract and administered orally 60 minutes prior to the experiment. Ambulatory activity was measured for 10 minutes after oral administration dose was (200 and 400 mg/kg, p.o) and Diazepam (2 mg/kg 200 mg/kg, p.o) as standard drug. Assessment of anxiolytic activity in the mice was evaluated using Elevated Plus maze, hole board exploration test, zero maze and actophotometer tests. Anti-oxidant enzymes and neuro-transmitter levels were also estimated. EERR at doses of 200 mg/kg and 400mg/kg treated groups and Diazepam showed a significant ($p < 0.01$) alteration in anxiety behavior when compared with negative control. Analysis was done using Dunnett's t-test, Two-way ANOVA. EERR at the dose of 400mg/kg significantly improved serotonin, glutathione peroxides, glutathione reductase and super oxide dismutase activity, glutamate level was decreased. These findings suggest EERR exerts anxiolytic effect and be useful in primary medical care against anxiety.



POSTER-10

BIOINFORMATICS

“Involving computers to know the blue print of life...”

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ABSTRACT

Bioinformatics is the applications of computer technology to the management of biological information. Computers are used to gather, store, analyze and integrate biological and genetic information, which can then be applied to gene-based drug discovery, and development .The technology has advanced so much that we are in a position to detect and cure some genetical disorders.

The science of Bioinformatics, which is the melding of the molecular biology with computer science, is essential to the use of genetic information in understanding human diseases and in the identification of new molecular targets for drug discovery. Modeling (3D view) and simulation of the process obtained by interactions between the different building blocks of life can be seen on the computer.

In this paper, we have discussed the fundamentals of bioinformatics. We have discussed how large genomic data banks can be maintained and used. The latest trends such as the Micro-array technology have been discussed. We have developed algorithms comparing the DNA-protein encoding to computer program execution. We also depicted the cell as a state machine.

POSTER-11

Study of the hypolipidemic activity of *Ficus hispida* Linn. Leaf extracts in hyperlipidemic rats.

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ABSTRACT

The study aimed at evaluating the hypolipidemic effects of ethanol leaf extract of *Ficus hispida* Linn (EEFH) and investigating the potential mechanisms by which EEFH modulated lipid profiles in hyperlipidemic rats. Hypolipidemic effects of the single, daily oral dosing of 200 and 400 mg/kg of EEFH in Swiss albino rats for 30 days. On day 30, blood samples from the rats were collected for the estimation of total cholesterol, total lipid, free fatty acid, phospholipids, and triglycerides. The concentrations of plasma total cholesterol, total lipid, free fatty acid, phospholipid, and triglycerides in rats treated with EEFH at 200 and 400mg /kg were significantly decreased ($P < 0.05$), accompanied with significantly decreased concentrations of liver, kidney and heart total cholesterol and triglyceride ($P < 0.05$). These results indicated that EEFH largely improved the lipid profiles in the hyperlipidemic rats

POSTER-12

PRELIMINARY PHYTOCHEMICAL AND STANDARDIZATION OF THE PLANT *DREGEA VOLUBILIS.*, BENTH

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ABSTRACT

The plant extract of *Dregea volubilis* was screened for *invitro* and *exvivo* activities. Phytochemicals, chemical compounds that occur naturally in plants, are responsible for color and organoleptic properties, such as deep purple of blue berries and smell of garlic. The term is generally used to refer to those chemicals that may have biological significance but are not established as essential nutrients. Hence, medicinal plants have been receiving great attention worldwide researches because of the safe utility. The compounds that are responsible for therapeutic effect and are usually the secondary metabolites. Phytochemical screening of the plant revealed the presence of alkaloids, glycosides etc. In addition the values of percentage extractive and ash values, results of fluorescence analysis and phytochemical data will be helpful for the standardization and quality control of precious indigenous drug. The study scientifically validates the use of plant in traditional medicine.

POSTER-13

"Basal DNA Damage assessment in Normal and Healthy Individuals by COMET Assay"

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ABSTRACT

The present study has designed to assess the levels of DNA damage in healthy individual. To compare the levels of DNA damage among the individuals of similar age group with gender, food habits and lifestyle as well as the environmental factors. Life style and personal habits can produce a low level DNA damage and Comet formation in normal healthy individuals are due to this primary DNA lesions. These primary DNA damage may leads to biologically relevant chromosome or gene mutations. **This study was undertaken with the aim of assessing the status of DNA damage in a normal healthy population of Pondicherry by using COMET assay. The 60 male and 30 female volunteers in this study belonged to the smoking, non-smoking, vegetarian and non-vegetarian, non-alcoholic and alcoholic categories and** aged between 25 and 35 years. Data from the present study showed a marked difference in the Comet formation of the individuals when compare their area of residents i.e. in terms of exposure to environmental pollutants and eating habits. However factors like level of exercise, infection, occupational exposure i.e. exposure of the individuals to chemicals and other mutagens should be recorded and studied to make conclusion about the basal level of DNA damage in healthy individuals.

Keywords: Basal DNA damage, healthy individual, comet assay

POSTER-14

**NATURAL SUPERDISINTEGRANTS IN THE DEVELOPMENT OF ORALLY
DISINTEGRATING TABLETS: A REVIEW**

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ABSTRACT

The concept of oral Dispersible tablets (ODT) /Fast Dissolving Drug Delivery System emerged from the desire to provide patient with conventional mean of taking their medication. Difficulty in swallowing (Dysphagia) is a common problem of all age groups, especially geriatric, pediatrics and psychiatric patients because of physiological changes associated with these groups of patients. ODTs are solid unit dosage forms, which disintegrates or dissolves rapidly in the mouth without chewing and water, which results in significant benefits to the patients who prefer the convenience of easily swallowable dosage forms. Orally disintegrating tablets (ODT) are an emerging trend in novel drug delivery system and have received ever-increasing demand during the last few decades. This type of property in dosage form can be attained by addition of different excipients, from which disintegrant is the key adjuvant. In recent years, several newer agents have been developed known as superdisintegrants. Diverse categories of superdisintegrants such as synthetic, semi-synthetic, natural and co-processed blends etc. have been employed to develop effectual mouth dissolving tablets and to overcome the limitations of conventional tablet dosage forms. The uses of natural origin substances are comparatively cheaper with desired properties like abundantly available, non-irritating and non-toxic in nature. The objective of the present study is to highlight the various natural superdisintegrants along with their role in tablet disintegration and drug release, which are being used in the formulation to provide the safer, effective drug delivery with patient compliance. In this study various natural superdisintegrants like *Hibiscus rosa-sinensis* Linn. Mucilage, Isapghula Husk Mucilage (*Plantago*



ovata), *Cucurbita maxima* pulp powder, *Lepidium sativum* Seed Mucilage, Fenugreek Seed Mucilage, Chitosan, Guar Gums, Gellan Gums, Gum Karaya, Agar, etc. were studied for their importance. Natural superdisintegrants were compared with other superdisintegrants through various studies and concluded that Natural Superdisintegrants is more effective.

POSTER-15

A REVIEW ON PLANT METABOLITES AS A SOURCE OF ANTI-INFLAMMATORY AGENTS

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ABSTRACT

Inflammatory diseases including different types of rheumatic diseases are a major and world wide problem. Gastrointestinal side effect is the major problem associated with the presently available non-steroidal anti-inflammatory agent. Now a days world population moves towards herbal remedies for treatment of such ailments. The numbers of plants have been screened for their anti-inflammatory and anti-arthritis activity, but only few of them reached up to the clinical level. This problem is mainly due to purely academic oriented research. Researchers have to lay emphasis on the phytoconstituents obtained from that plant for the specific treatment of such disease and not only to increase the number of plants having anti-inflammatory activity but have to work towards tapping their therapeutic utility by finding out the mechanism of action at molecular level. In this review we have described some the plant constituents with respect to its anti-inflammatory mechanism of action.

POSTER-16

Standardization of Caturjata Churnam- An Ayurvedic Polyherbal Formulation

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ABSTRACT:

Standardization of herbal formulation is essential in order to assess the quality, purity ,safety, and efficacy of drugs based on amounts of their active principles. The present work was an attempt to prepare and standardize caturjata churna, an ayurvedic poly herbal formulation. It is a compound formulation containing *cinnamomum zeylanicum* (stem bark), *elettaria cardamomum* (seed),



cinnamomum tamala (leaf) , and *mesua ferrea* (stamen). It was used for cough and cold.the formulation was standardized on the basis of organoleptic characters, physical characteristics,phyto chemical screening and physio-chemical parameters. The set parameters were found to be sufficient to evaluate the churna and can be used as reference standard for the quality control \ quality assurance purposes.

Keywords: Caturjata churna, polyherbal formulation, standardization.

POSTER-17

CHARACTERISATION AND QUANTIFICATION OF PHYTOCONSTITUENTS FROM 3 MEDICAL PLANTS

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ABSTRACT:

This review article revealed that the phytoconstituents of 3 important medicinal herbs *Artemisia annua*, *Adhatodavasica*, and *Taxusbrievifolia* which are currently used as anticancer and Brochodilators drugs and their phytoconstituents like Artemisinin,Vasicin,Vasicinine and Taxol were isolated by extraction methods(soxhlet apparatus) and characterised by spectroscopic methods [NUCLEAR MASS RESONANCE(NMR) and MASS SPECTROSCOPY(MS)] and Quantified by HIGH PERFORMANCE THIN LAYER CHROMOTOGRAPHY(HPTLC). This article will be helpful for the future research studies for the development and structural approaches towards the natural herbs.

Key words: Artemisinin,Taxol, Vasicin, Vascinone.