Herbal Medicinal Wealth :

Utilization With Conservaton

Editors

Prof. Vd. Narayan S. Jadhav
Dr. Vinod D. Patange
Prof. Arvind S. Dhabe
Dr. Shital D. Ghorband (Jadhav)

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Rajarshi Prakashan,
Udgir

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Publisher : Mrs. Jayashri More

Published by :
Rajarshi Prakashan,
S.T. Colony, Nalegaon Road, Udgir
Dist - Latur (M.S.)
Mob. : 8830707388
E-Mail - rajarshiprakashan@gmai.com

ISBN : 978-81-955085-7-0

First Published : March - 2022
Cover page design : Sai Offset & Printers, Hadolti
Price-499/-

The Editors and SDSP Trust, Hippalgaon acknowledge and express indebtedness to National Medicinal Plants Board, Ministry of AYUSH, Government of India, New Delhi, for sanctioning financial assistance to organize Two days 'National Seminar on Recent Advances in Utilization of Medicinal Plants' at Dept. of Botany, Dr. BAMU, Aurangabad(MH) on 12th -13th March and to bring out seminar proceedings in the form of present book. The editors are equally thankful to the management of Shree Dhanwantari Sevabhavi Pratishthan, Hippalgoan for extending whole hearted cooperation.

MINISTER
PUBLIC HEALTH AI
FAMILY WELFARI
MAHARASHTRA STATE
Mantralaya, Mumbai 400
www.maharashtra.gov.i

Date : 7 March 2022

It gives me immense pleasure to learn that SDSP Trust Shree Dhanwantari Sevabhavi Pratisthan. with the support of National Medicinal Plant Board(NMPB),Ministry of AYUSH, Govt. of India,in association with Vigyan Bharati, NASYA ,WAF, at Dr.BAMU Aurangabad on 12th&13th March 2022. Organizing "Recent Advances in Utilization of Medicinal Plants".

The themes of National seminar is challenging to the academic institutions and research scholars. On the occasion, I send my warm greetings and wishes to the participants of the National seminar. I hope that the deliberations in the National seminar would be highly fruitful. I am sure that scientific and academic interactions among distinguished delegates particularly those from different corners of the nation, with young researchers, will promote herbal medicinal wealth of India in multi disciplinary approach. I am sure that participants will gain maximum from scientific deliberations of eminent persons during the seminar.

I heartly congratulate the organizers for their efforts in organizing this seminar.

I extend my best whishes on this special occasion and publishing book also wish this will be a memorable event for the years.

With Warm Regards,

Yours Faithfully,

(Rajesh Tope)

To,

Chief Coordinator,

Shree Dhanwantari Serobhori,

Pratishthan Trust

Prof. (Dr.) Tanuja Manoj Nesari
Director, AIIA &
Chief Executive officer,
National Medicinal Plants Board,
Ministry of AYUSH, GOI,
New Delhi.

Message

It gives me immense pleasure to know that the Shree Dhanwantari Sevabhavi Pratisthan. (SDSP Trust) Organizing ' National Seminar on Medicinal Plants with the support of National Medicinal Plant Board(NMPB),Ministry of AYUSH, Govt. of India, in association with Vigyan Bharati, National Ayurveda Students and Youth Association ,World Ayurveda Foundation & Dept. of Botany , at Dr.BAMU Aurangabad on 12th&13th March 2022.To commemorate " Azadi Ka Amrut Mahostav & Completion of Two Decades of Ayurveda Promotion and Healtrh care services in Rural areas of Marathwada in Maharashtra.

The Ministry of AYUSH, Govt. of India is committed for comprehensive development of the Science of Ayurveda and Medicinal Plants through the different Schemes, also dissemination of its merits across the stake holders and globe at large.

The program incorporates open discussion on policy issues on themes like cultivation ,Conservation and sustainable use of medicinal plants in past, present and future.

The intended release of proceedings on this occasion 'Herbal Medicinal Wealth: Utilization With Conservation, includes Expert's views on various medicinal plants related issues.

I congratulate the organizers for taking this initiative and hope that deliberations made in this event would certainly widen the horizons for Ayurveda and sensitize the stakeholders to work all together for the nurturing the global propagation of this ancient knowledge system.

I wish this event and Publication a great success.

(Sd/)
Prof. Tanuja Nesari

वैद्य जयन्त देवपुजारी
अध्यक्ष
VAIDYA JAYANT DEOPUJARI
Chairman

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आयुष मंत्रालय, भारत सरकार
National Commission for Indian System of Medicine
Ministry of Ayush, Govt. of India

D. O. No. - 20-4/2021-NCISM

Dated: 08.03.2022

MESSAGE

I am pleased to learn that the *Shree Dhanwantari Sevabhavi Pratisthan,Vibha, Nasya and World Ayurveda Foundation* are organizing a "*National Seminar on Medicinal Plants*", to promote the Indian System of Medicine and to commemorate *Azadi Ka Amritmahotsav* with the support of "*National Medicinal Plants Board*"(NMPB), in collaborate with the Department of Botany, *Dr. Babasaheb Ambedkar Marathwada University, Aurangabad*, on 12th & 13th March, 2022.

On this occasion, the organizers are planning to publish the proceedings in the form of a book which is really commendable.

My best wishes to this seminar and the publication.

Vaidya Jayant Deopujari

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महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

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(बालरोग नेफ्रोलॉजिस्ट) पीव्हीएसएम, एव्हीएसएम, व्हीएसएम
कुलगुरु

Lt Gen Madhuri Kanitkar (Retd)
(Pediatric Nephrologist) PVSM, AVSM, VSM
Vice-Chancellor

Date: 08th March 2022

Message

I am pleased to learn that Shree Dhanwantari Sevabhavi Pratisthan is going to publish a book on "Recent Advances in Medicinal Plants".

Various chapters of this book are very well arranged covering all the topics of Medicinal Plants, which will be helpful for all. I hope that the book shall provide guidelines to all students and society.

I sincerely acknowledge the efforts taken by all the authors, who have given their best in writing and preparation of this book. I am confident that this book will help in excellent academic development of all desirous scholars.

Looking forward to many more editions of the "Recent Advances in Medicinal Plants" in the years ahead.

I congratulate and extend my best wishes to the students, staff and management of Shree Dhanwantari Sevabhavi Pratisthan.

Mkanitkar

Lt Gen Madhuri Kanitkar (Retd)

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Maharashtra Legislative Council

सत्यमेव जयते

Satish Chavan (MLC)
B.E. (Mech.)
Aurangabad, Graduate Constituency

MESSAGE

It is my privilege to write you on the occasion of National Seminar organized jointly by N.M.P.B., Ministry of AYUSH, New Delhi, Shree Dhanwantari Sevabhavi Pratisthan (SDSP Trust), Hippalgaon, Ahmedpur-Latur, Dept. of Botany, Dr. BAMU Aurangabad, Vigyan Bharati, World Ayurveda Foundation and National Ayurveda Students and Youth Association during 12-13 March 2022 on an imperative topic of "National Seminar on Medicinal Plants" is very apt and rightly emphasized the challenges before the human beings recently developed due to the pandemic situation.

India is practicing Ayurveda since long time and our entire ancestors knew the treasure of use of medicinal plants. As we are well aware because of the COVID-19 and other related future challenges, Medicinal plant wealth and its uses for human benefits will be certainly a boom in combating the various ailments, even it will be helping in developing immunity in human beings with no side effects.

I am very much certain that high quality deliberation in this National Seminar will facilitate the platform for budding scientists, delegates, practitioners and the expertise in exchanging their thoughts, knowledge and findings for sustainable use of natural resources for societal benefits. This event would certainly widen the horizons for Medicinal plants & Ayurveda in sensitizing the stakeholders to work hand in hand promoting the global propagation of this ancient knowledge system. I look forward the participation of this platform will take India at global platform to lead in this field in future as well to resume the legacy.

At this outset I am pleased to learn that the organizer are going to publish the edited book on "Herbal Medicinal Wealth : Utilization With Conservation" related with updates of Medicinal Plants use, I am confident that the content of book will be useful to coming generation to update the development in the Ayurveda, the research carried by the scientist will be passed to the future generation for the benefits of mankind.

I convey my best regards to the contributors in this mission, for organizing such significant event and I wish them best luck for future endeavor for human welfare…

Satish Chavan
MLC

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प्राधिकृत अधिकारी
दि महाराष्ट्र स्टेट को-ऑप. मार्केटिंग फेडरेशन लि., मुंबई

विधान सभा
महाराष्ट्र

बाबासाहेब मोहनराव पाटील
आमदार, विधानसभा मतदारसंघ अहमदपूर
जि. लातूर

जा. क्र. 1370-21-22

दिनांक : 6/3/2022

I am delighted to note that National seminar on "Recent Advances in Utilization of Medicinal Plants" is being organized by **Shree Dhanwantari Sevabhavi Pratisthan, Hippalgaon,** Tal-Ahmedpur, Dist-Latur (SDSP Trust) with the support of National Medicinal Plant Board (NMPB), Ministry of AYUSH, Govt. of India, in association with Vigyan Bharati, NASYA and WAF, at Dept. of Botany, Dr. Babasaheb Ambedkar Marathawada University, Aurangabad on 12th&13th March 2022.

I understand that seminar will cover variety of topics in Medicinal Plants including cultivation, Conservation and sustainable use.

On this occasion, I send my warm greetings and wish the participants in the National Seminar all the very best and sincerely hope that the deliberations in the seminar would be fruitful.

The SDSP trust is successfully operating for the promotion, popularization and documentation of Ancient Medical science wisdom since two decades, similarly brings stakeholders together from different societal dimensions and providing them a common platform for interaction, provide inner route to link the Ancient Science, modern Science & technology with developmental programs.

I Congratulate Dr. Narayan S. Jadhav, Chief-Cordinator and the organizing team in selecting important theme for the National seminar and best wishes to this academic event.

I extend my best wishes for the success of the National Seminar and publication of book.

Yours Faithfully

Babasaheb Patil

निवास : मु.पो. शिरूर ताजबंद, ता. अहमदपूर, जि. लातूर. फोन : (०२३८१)२२००३१, मो.: ९१५८१७५१५१

केन्द्रीय आयुर्वेदीय विज्ञान अनुसंधान परिषद्
आयुष मंत्रालय, भारत सरकार
CENTRAL COUNCIL FOR RESEARCH IN AYURVEDIC SCIENCES
Ministry of Ayush, Govt. of India

प्रो.(वैद्य) रबिनारायण आचार्य
महानिदेशक
Prof.(Vaidya) Rabinarayan Acharya
Director General

Dated: 07.03.2022

MESSAGE

It is my immense pleasure to know that Shri Dhanwantari Sevabhavi Pratishthan is organising two days National Seminar on Medicinal Plants sponsored by National Medicinal Plants Board, Ministry Ayush from 12th to 13th March 2022 at Dr. Babasaheb Ambedkar Marathwada University, Aurangabad to commemorate "Azadi Ka Amrut Mahostav & Completion of Two decades of Ayurveda Promotion & Health Care Services."

The themes selected for the paper presentation cover a broad area commencing from the fundamentals of Dravyaguna Vigyan to the cultivation practices, agrotechnology and sustainability of medicinal plants. Further, topics related to Pharmaco-vigilance, Intellectual property rights (IPR) being the need of the hour, will surely facilitate in developing novel perspectives for advances in medicinal plant research among the academicians and research scholars.

I am confident that the deliberations will bring about new knowledge which will be helpful in further promotion of the ancient science of Ayurveda. I extend my heartily congratulations and best wishes to the organizers and take this opportunity to convey my regards for an effective, successful and brain-storming seminar.

7/3/22

(Prof. Vd. Rabinarayan Acharya)

जवाहर लाल नेहरू भारतीय चिकित्सा एवं होम्योपैथी अनुसंधान भवन, 61-65, संस्थानिक क्षेत्र, सम्मुख 'डी' ब्लाक, जनकपुरी, नई दिल्ली-110058
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Director AYUSH
Govt.of Maharashtra

Message

It gives me immense pleasure to know that the Shree Dhanwantari Sevabhavi Pratisthan. (SDSP Trust) Organizing ' National Seminar on Medicinal Plants with the support of National Medicinal Plant Board(NMPB),Ministry of AYUSH, Govt. of India, in association with Vigyan Bharati, National Ayurveda Students and Youth Association ,World Ayurveda Foundation & Dept. of Botany , at Dr.BAMU Aurangabad on 12th&13th March 2022. To commemorate " Azadi Ka Amrut Mahostav & Completion of Two Decades of Ayurveda Promotion and Healtrh care services in Rural areas of Marathwada in Maharashtra.

The program incorporates open discussion on policy issues on themes like cultivation , Conservation and sustainable use of medicinal plants in past, present and future.

The intended release of proceedings on this occasion 'Herbal Medicinal Wealth: Utilization With Conservation, includes Expert's views on various medicinal plants related issues.

I congratulate the organizers for taking this initiative and hope that deliberations made in this event would certainly widen the horizons for Ayurveda and sensitize the stakeholders to work all together for the nurturing the global propagation of this ancient knowledge system.

I wish this event and Publication a great success.

G. Y. Khati

Prof. G Y Khati
Director of AYUSH
Govt. of Maharashtra.

Dr. S.G. Deshmukh,
Dean,
Faculty of Ayurved and Unani,
Maharashtra University of Health Sciences,
Dindori Road, Mhasrul, Nashik-422004.

Date:-10/03/2022

Message

It gives me immense pleasure to know that Shree Dhanwantari Sevabhavi Pratisthan is going to organize National Seminar on Medicinal Plants and publish a book on **"Recent Advances in Medicinal Plants".**

I hope that the book shall provide guidelines to all students and society. I sincerely acknowledge the efforts taken by all the authors, who have given their best in writing and preparation of this book. I am confident that this book will help in excellent academic development of all desirous scholars. Looking forward to many more editions of the "Recent Advances in Medicinal Plants" in the years ahead.

I congratulate and extend my best wishes to the Shree Dhanwantari Shevabhavi Pratisthan.

(Dr.S.G.Deshmukh)
Dean,
Faculty of Ayurved & Unani,
MUHS, Nashik.

PREFACE

There are various and distinct issues which decide the status and strength of the nation. Medical education is a biggest asset in development of the nation. In recent decades global population is getting attract towards traditional health care system for healthy and safe healing. The details mentioned by the World Health Organization shows that 80% of world's Population still depends on natural products of medicines as they are efficient, safe, cost-effective, affordable, and easily accessible by the poor. India has Ayurveda, Siddha, Unani, and many ethnic healing practices, in these practices plants are used as medicine. The knowledge of use of plant as a medicine found in Rigveda, it is a storehouse of knowledge that described 67 medicinal plants, Yajurveda described 81 medicinal plants, In Atharvaveda 289 medicinal plants are mentioned. In Charak Samhita and Sushrut Samhita various chapters are described on therapeutic uses of nearly 500 medicinal plants. In recent time's people from all walks of life are switching over to the traditional medicines due to their no or less side effects, low cost etc. like this plants are the major source of drugs. Ayurveda explained four pillars of treatment in following verse

भिषग्द्रव्याण्युपस्थाता रोगी पादचतुष्टयम् ।
गुणवत्कारणं ज्ञेयं विकारव्युपशान्तये ।। (Ch. S. Su. 9/3)

Among these four pillars i.e Bhishak (physician), Dravya, Upasthata (attendant) and Rogi (Patient). Dravya (Medicinal Plants,Minerals etc.) is graded at the second rank, which is the main source of therapeutics. Though the Physician occupies the most important position, but he becomes lame without Drug. Hence the information relating to their occurrence, distribution, vernacular names and full knowledge regarding the position of the plant population is required for knowing the availability of the drug and physician should be always make an effort to gain knowledge as explained as

कृत्स्नो हि लोको बुध्दिमतामाचार्यः शत्रुश्चाबुध्दिमताम् विकारव्युपशान्तये ।
(Cha. S. Vi. 08/14)

It means that, one should acquire excellence even from the enemies, because for the wise, whole world is a teacher.

India has rich and diverse natural resources and it has biggest biodiversity as well rich vegetation of more than 45,000 plant species, out of which 15,000 to 20,000 plants have medicinal values. Out of these, only 7,000 to 7,500 plants are used for medicinal purpose by established communities.

Ayurveda science says the knowledge regarding the 'Medicinal herbs and plants should be recognized and identified with the help of cowherds, Goatherds, shepherd, hermits, huntsmen, forestdwellers, and those who cull the fruits and edible roots of the forest'

गोपालास्तापसा व्याधा ये चान्ये वनचारिणः ।
मूलाहाराश्च ये तेभ्यो भेषजव्यक्तिरिष्यते ।। (Su. S. Su. 36/10)

The need of Medicinal plants explorations at the national and international level has been increased in recent era. Available literature reveals that there is a huge gap in availability and demand of the medicinal plants. Increased demand leads into excess exploitation of medicinal plants so it is an urgent need to work on identification, sustainable utilization, conservation of the Medicinal plants. For this processes integrated approach is very much needed. This Seminar could be a small step towards this hug work.

The compilation of various papers presented on different issues related with medicinal plants in NMPB sponsored Two days National Seminar on " Herbal Medicinal Wealth: Cultivation With Conservation" held at Dept. of Botany, Dr. BAMU, Aurangabad. We received overwhelming response from all corners of the country and after final review , we shortlisted 35 papers to present under different parallel sessions and publish. We are thrilled and honoured in editing papers of scholar contributors of all over India and present this volume to the vast local and global readership. We sincerely hope that this effort will be appreciated.

The papers selected in present anthology, the contributors have seriously contemplated over present scenario, related with Medicinal plants Cultivation, Conservation ,Their Sustainable use and Others.

We will be failing in our duty if we do not express our gratitude to Hon'ble Vaidya Rajesh Kotecha, Secretary, Hon'ble Dr. Manoj Nesari, Adviser, Ministry of AYUSH, Government of India, Hon'ble Prof. Tanuja Nesari, Chief Executive Officer, and Hon'ble Dr. JLN Sastry,Ex. CEO, National Medicinal plant Board, New Delhi, for sanctioning financial assistance to organize Two days National Seminar on Medicinal Plants , To bring out seminar proceedings in the form of present book. We are equally thankful to the Hon'ble Health Minister(Govt .of Maharastra, Rajesh Tope, Hon'ble Vice Chancellor Lt. General Dr. Madhuri Kanitkar, M.U. H.S.Nashik, Hon'ble MLC, Shri. Satish Chavan, Hon'ble, MLA Shri Babasaheb Patil,Hon'ble Chairperson, National Commission for Indian System of Medicine, Vaidya Jayant Deopujari, Director General CCRAS,Prof. Ravinarayan Acharya, Hon'ble Director of AYUSH, Maharastra, Prof.Govind Khatti, and Dean, faculty of Ayurved Dr.Shrikant Deshmukh for their greetings and support .We are equally indebted to the Management of Shree DhanwantariSevabhaviPratisthan for extending whole hearted cooperation .Last but not least, we are thankful to scholar contributors ,and all organizing committee members of NSMP. Thank you

Editors

Prof. Vd. Narayan S. Jadhav
Dr. Vinod D. Patange
Prof. Arvind S. Dhabe
Dr. Shital D. Ghorband

Contents

1. HEALTH FROM NATURAL WEALTH

Dr.Shriramji G Jyotishi, Ph.D, (Pharma)
Mahatma Gandhi Ayurved College, Hospital and Research Centre,
D.M.I.M. S., Deemed to be University, Wardha

'VASUNDHRA', the godown of wealth - provides minerals as *Ras, Ratna, Manikya* (jewels and gems), metals, fuel, food, water, air, medicine etc. from its different sources as the land, the ocean, and the atmosphere. The energy provided by the sun is stored by it in the form of chemical energy. In other words it provides life and all the essentials for life;hence it is called *'THE MOTHER EARTH'*.The conversion of solar energy to chemical energy is through the natural solar panels 'the leaves' of the plants in the form of various complex molecules, which are useful as food, medicines, latex, cosmetics, dyes, even poisons which are processed and used as medicines. All these molecules are synthesised by the plants starting from the simple molecules as water, carbon dioxide, inorganic nitrates, sulphate, phosphates and other minerals, exhibiting each cell as the most advanced and sophisticated laboratory.

The nature possess everything, but obtaining it requires intelligent workout, that has been very intelligently pointed out by our ancient scholars (forefathers) in very unique way as churning of the ocean - "The *SmudraManthan*"; whatever it is, but mental churning - '*ManasManthan*', intellectual churning - '*BouddhicManthan*', physical churning (hard physical work) - '*DehManthan*' are required. The components used during *SamudraManthan* can be intellectually interpreted as, '*Samudra*' (The Ocean) - as the depth of nature (the marine wealth), '*TheMandrachalGiri*'(The mountain) - the height of nature (the land wealth), and the ocean and the mountain together stands for the width of the nature (the wealth at the junction of the two), '*Vasuki*' (the snake) - representing the deadliest poisonous and attacking object used as tool.The process represents nothing but the churning of the nature to get '*Amrit*', which is again nothing but knowledge of Ayurved '*Ayurvedoamritanam*', with which *Lord Dhanwantari* appeared, along with goddess for wealth and so many other things even the deadliest poison '*Halahal*" all these are the gifts of nature, which require intelligent handling. Here one should not forget that such an action is possible only with spiritual mind, represented by the '*Kachchhapavtar*' (the divine tortoise), providing the fundamental support and balance. Such an event needs social togetherness (Devine) for the welfare of the society facing the antisocial (Devils)and the hero as *Lord Shiva*, to hold and bear the deadliest outcome. So *SamudraManthan* is churning of nature for sustainable and universally applicable (*Sashvat*) knowledge.

As early as 5000 BC, i.e. about 7000 years ago 'The *Vedic* era', *Ayurved,* '*The Shashvat Shastra*' showed the real and the natural way of maintaining the health by using the natural material. It is presently called as the traditional method, but in real sense it is the natural method of maintaining the health or healing by understanding the nature in natural way as the human body is also the part of

the nature and parallel to it, '*yatBrahmande tat pinde*'; so also '*Yavantohi lokemoorti mantho bhavviseshat tavantahpurushe, yavantah purushe tavantah loke*'.The medicines (better to say positively bioactive material, still better to say *Ayurvedic* - no other alternative term) used here are well described with metaphysical (*trigunatmak and Panchmahabhoutic*) composition, pathophysio (*Aushdhi and Ahar- Raspanchak*) activity along with their processing and formulations (*Bhaishajyakalpana*).The *DravyaKarmukta* can be studied only by considering following ten variables as mentioned in *Ayurved as Dushya, Desha, Bala, kala, Agni, Prakruti, Vaya,Satmya, Sattva, Ahar*.

Herbs are one of such natural material which play major role here. The results in this regard have aroused interest in it day by day and it entered the modern medicines as herbal extracts with studies related to respective pharmacological activities. The ancient medical service has now changed to medical profession and commercialisation for monetary gain made it necessary to check their quality and standards including authentication and detecting adulteration resulted in the development of pharmacopoeial standards; though Ayurved has its own *Grahya - Agrahya* characteristics, but they are applicable in case of self-collection by the vaidya, i.e the season of collection, self-fallen fruits, the field identification and maturity of the specimen, the geographical location, and many more; the pharmacopoeial standards does not meet these basic requirements. The increasing global demand more than their natural availability resulted in extinction of many species and some endangered species forced their cultivation and even the development of hybrid varieties. But the studies have shown that they differ in one or the other respect, as for example the hybrid Amlahas attractive appearance, as bigger in size, translucency, smooth surface, attractive green colour and more vitamin C content as compared to the natural variety, but though the vitamin C content found in it to be lesser than hybrid variety its concentration is maintained for longer time than in hybrid variety, so also the tannins and fibre content of the natural variety is more than hybrid one and this makes the vitamin C not diminishing faster as in the later.Further according to the TLC patterns different material can be considered to be the substitute for one another, whereas according Ayurved fresh ginger and the dried one (*Ardrak and Sunthi*) are not substitute for each other. With the increasing demand of herbal drugs their cultivation, search of substitutes, working up for the unknown (to us) drugs with conservational approach has become necessary.Apart from the classical approach studies with modern methodology and related pharmacological and pharmacopoeial parameters are also essential to compete in trade at global level.

Finally having more or less number of drugs in any system of medicine is not important, but the potential lies with the management of health with lesser number of drugs, as far as the knowledge of the medicinal properties is concerned *AcharyaCharak* mentioned it as '*Na anaushadhibhutam hi kinchit dravyanamuplabhyate'* means 'there is no substance in the world which does not has medicinal property'.

2. FUTURE PROSPECTIVE OF CULTIVATION OF MEDICINAL HERBS

Dr.Meenal D.Lad[1], Dr.VikrantPatil[2]

1. Professor and H.O.D. Department of Dravyaguna PDEA'S College of Ayurved and research center,Pune,
2.. Managing Director,TATC, CEO, Ayurgenics Ayurveda PVT. Ltd.

In India, around 20,000 medicinal plant species have been recorded recently but more than 500 traditional communities use about 800 plant species for curing different diseases (Kamboj, 2000). Currently, 80% of the world population depends on plant-derived medicine for the first line of primary health care for human alleviation because it has no side effects. (0) Different diseases (Kamboj, 2000). Plants are important sources of medicines and presently about 25% of pharmaceutical prescriptions in the United States contain at least one plant-derived ingredient. (1) Different diseases (Kamboj, 2000). In the last century, roughly 121 pharmaceutical products were formulated based on the traditional knowledge obtained from various sources. (2) India has one of the richest plants medical traditions in the world. There are estimated to be around 25,000 effective plant-based formulations, used in folk medicine and known to rural communities in India. There are over 1. (3) India has one of the richest plants medical traditions in the world. 5 million practitioners of traditional medicinal systems use medicinal plants in preventive, promotional, and curative applications. (4) India has one of the richest plants medical traditions in the world. It is estimated that there are over 7800 medicinal drug-manufacturing units in India, which consume about 2000 tones of herbs annually. (5) During 1950-1970 approximately 100 plants based new drugs were introduced in the USA drug market including deserpidine, reseinnamine, reserpine, vinblastine, and vincristine which are derived from higher plants. (6) From 1971 to 1990 new drugs such as etoposide, Eguggulsterone, teniposide, nabilone, plaunotol, Zguggulsterone, lectinan, artemisinin and ginkgolides appeared all over the world. 2% of drugs were introduced from 1991 to 1995 including paclitaxel, topotecan, gomishin, irinotecan etc. Plant based drugs provide outstanding contribution to modern therapeutics; for example : serpentine isolated from the root of Indian plant Rauwolfia serpentina in 1953, was a revolutionary event in the treatment of hypertension and lowering of blood pressure.Vinblastine isolated from the Catharanthus rosesus (Farnsworth and Blowster, 1967) is used for the treatment of Hodgkins, choriocarcinoma, non-hodgkins lymphomas, leukemia in children, testicular and (7) Vinblastine isolated from the Catharanthusrosesus (Farnsworth and Blowster, 1967) is used neck cancer. (8) Vinblastine isolated from the Catharanthus rosesus (Farnsworth and Blowster, 1967) is used Vincristine is recommended for acute lymphocytic leukemia in childhood advanced stages of Hodgkin's, lymphosarcoma, cervical and breast cancer.

(0) (Farnsworth and Bingel, 1977). Podophyllotoxin is a constituent of Phodophyllum emodi currently used against testicular, small cell lung cancer and lymphomas. (10)(Farnsworth and Bingel, 1977). Plant derived drugs are used to cure mental illness, skin diseases, tuberculosis, diabetes, jaundice, hypertension and cancer. (11) Medicinal plants

play an important role in the development of potent therapeutic agents. Plant derived drugs came into use in the modern medicine through the uses of plant material as indigenous cure in folklore or traditional systems of medicine. (12) More than 64 plants have been found to possess significant antibacterial properties; and more than 24 plants have been found to possess antidiabetic properties. Daboi arussellii and Naja kaouthia used as antidote activity. (13) More than 64 plants have been found to possess significant antibacterial properties; and more than 24 plants have been found to possess antidiabetic properties. Venom neutralization by lupeol acetate isolated from the root extract of Indian sarsaparilla Hemidesmus indicus (Chatterjee, et al.,2006). (0) The present investigation explores the isolation and purification of another active compound from the methanolic root extract of Hemidesmus indicus, which was responsible for snake venom neutralization. Antagonism of both viper and cobra venom and antiserum action potentiation, antioxidant property of the active compound was studied in experimental animals. Recently, Chatterjee et al.(2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom inducedlipid peroxidation in experimental animals. The mechanism of action of the plant derived micromolecules induced venom neutralization need further attention, for the development of plant-derived therapeutic antagonist against (15) (2004) reported that an active compound from the Strychnusnux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. snakebite. (16) (2004) reported that an active compound from the Strychnusnux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. However, the toxicity of plants has known for a long period of time, and the (0) (2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. history of these toxic plants side by side with medicinal ones are very old and popular (10) (2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom induced

lipid peroxidation in experimental animals. worldwide. (19) (2004) reported that an active compound from the Strychnusnux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. These plants are major natural source of folk medication and also induce toxication. (0) (2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. Taxol isolated from Taxus brevifolius is used for the treatment of metastatic ovarian cancer and lung cancer, (21) (2004) reported that an active compound from the Strychnusnux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. Indian indigenous tree of Nothapodytes nimmoniana (Mappiafoetida) are mostly used in Japan for the treatment of cervical (22) (2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals. cancer. (23) (2004) reported that an active compound from the Strychnus nux vomica seed extract, inhibited viper venom induced lipid peroxidation in experimental animals.

The market for ayurvedic medicines is estimated to be expanding at 20% annually. (24) Sales of medicinal plants have grown by nearly 25% in India in past ten years (1987-96) , the highest rate of growth in the world . (24) But the per capita expenditure in India on medicines per annum is

amongst the lowest in the world. (0) In other developing countries too, plants are the main source of medicine. (0) Two of the largest users of medicinal plants are China and India. Traditional Chinese Medicine uses over 5000 plant species; India uses about 7000. (13) According to Export Import Bank, the international market for medicinal plant related trade having a growth rate of 7% per annum. China's share in world herbal market is US$ 6 billion while India's share is only US$1 billion. The annual export of medicinal plants from India isvalued at Rs. 1200 million. (29) All the major herbal-based pharmaceutical companies are showing a constant growth of about 15 per cent. (30) Traditional medicine has served as a source of alternative medicine, new pharmaceuticals, and healthcare products. Medicinal plants are important for pharmacological research and drug development, not only when plant constituents are used directly (0) As therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active (32) compounds. Recently even developed countries, are using medicinal systems that involve the use of herbal drugs and remedies. Undoubtedly the demand for plant-derived products has increased worldwide. The demand is estimated to grow in the years to come fuelled by the growth of sales of herbal supplements and remedies. (32)

This means that scientists, doctors, and pharmaceutical companies will be looking at countries like China, India, etc. for their requirements, as they have the greatest number of medicinal plant species and are the top exporters of medicinal plants. Supplying the demand for botanicals and herbals is a booming business demand for plant-derived products has increased worldwide demand is estimated to grow in the years to come fuelled by the growth of sales of herbal supplements and remedies The market for medicinal plants in India stood at Rs. 4.2 billion (US$ 56. 6 million) in 2019 and is expected to increase at a CAGR 38.5% to Rs. (32) 14 billion (US$ 188.6 million) by 2026. The total world herbal trade is currently assessed at US$ 120 billion. India's share in the global export of herbs and herbal products is low due to unsophisticated agricultural and (32) The total world herbal trade is currently assessed at US$ 120 billion. quality control procedures, lack of processing, research & development, standardization in products and regulatory framework in trade of medicinal (32) The export of herbs and value-added extracts ofmedicinal herbs has been gradually increasing over years. (32) In 2017-2018, India exported US$ 330. 18 million worth of herbs at a growth rate of 14. 22% over the previous year. (32) Also, exports of value-added extracts of medicinal herbs and herbal products in 2017-2018 stood at US$ 456. 12 million, recording a growth rate of 12. 23% over the previous year. The demand for herbal/value-added extracts of medicinal herbs is gradually increasing in foreign countries, especially in European and other developed countries. India has 15 agro climatic zones that comprise ~18,000 types of plants, of which 6,000-7,000 have therapeutic properties. (32) These medicinal plants are used in numerous applications in the Indian society and used to make medicines (32) In traditional medical practices such as Ayurveda, Unani, Siddha, Sowa-Rigpa,and homeopathy; also used in plant-based pharmaceutical companies. (32) The demand for herbal/value-added extracts of medicinal herbs is gradually increasing in foreign countries, especially in European and other developed countries. ~960 types of medicinal plants are traded, of which 178 species have yearly consumption levels of >100 metric tonnes. (32) Cultivation of medicinal herbs such as shankhapushpi, atis, kuth, kutki, kapikachhu and

karanja are (32) Changing the Indian agrarian ayurvedic scenes and providing extraordinary opportunities for farmers to increase their incomes. (32) According to the traditional treatment health centre, there are 25 significant medicinal plants that are always in full demand. These plants include the Indian Barberry, Liquorice, Bael, Isabgol, Atis, Guggal,Kerth, Aonla, Chandan, Senna, Baiberang, (32) According to the traditional treatment health centre, there are 25 significant medicinal plants that are always in full demand. Long Pepper, Brahmi, Jatamansi, and Madhunashini, Kalmegh, Satavari, Ashwagandha,Chirata, Katki, Shankhpushpi, Ashoka, Giloe, Kokum and Safed (32) Musli.

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3. MEDICINAL PLANTS CONSERVATION AND CULTIVATION IN ANCIENT INDIA

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Medicinal plants have been part of human life since Vedic era. The number of plants has gone from 30 plus in Rgveda to 180 plus in Atharva Veda. During the Vedic period, the herbs were mainly used for rituals while their medicinal use gradually increased during the Samhita period (2000-500 BC). The number of medicinal plants mentioned in Charka Samhita (500 BC) is less than 500 and those mentioned in Raja Nighantu (the last among major Nighantus) is about 1000. On the other hand, there are 7000 to 8000 medicinal plants / herbs reported with one or the other medicinal claim (Vide: TKDL or FRLHT database). This shows that humans are continuously exploring the judicious use of natural resources while ensuring the safety and efficacy. Charaka and Sushruta have noted that folk-medicine is the base for the medicinal use of the herbs. The mentioning about Vanacharinah; Tapasa; Vyadha; Gopala; Ajapa etc indicate the proximity of local communities and tribes with folk-medicine / ethnomedicine.

Increased use and access to biological resources is the major cause for conservation threat. There is a link between humans poaching the flora and fauna which is resulting in threatened / endangered status. Whenever, there is reduction or decreased availability of a specific species, conservation and/or cultivation practices have emerged. It is important to note that wild species like Pippali, Musta, Maricha, Asvagandha, Pushkaramula, Kushtha etc have been slowly brought under cultivation. Domestication of cereals, pulses, spices, and vegetables has resulted in protection of the species but the focus on wild varieties of these species is considerably reduced.

The usage of medicinal herbs from the local areas is emphasized by *Chakaka* (Asmin dese jatam) in *Vimana Sthana*. Examples like Ramatha (Hing from Afghanistan); Bahlika (Saffron from Iran); Magadhi (Pippali from Bihar); Dharamapattana (Pepper) are few of them. It shows that specific varieties are high-lighted indicating towards best germplasm.

Ayurveda texts have divided the country into three geo-climatic zones viz., *Jangala, Anupa, and Sadharana*. Soil is classified into five on the basis of panchabhuta dominance viz., *Akasiya, Vayuviya, Agneya, Jaliya, and Parthiva*. Medicinal herbs are claimed to be best if collected from - *Prasasta desa sambhutam* (collect the raw material from best soil type) and *Prasasta Ahani cha uddhrutam* (collected on the right time); avoid krimijushtam (pest-infested raw material) etc. *Oshadhi grahana kala* (good collection practices) emphasizes the conservation practices of ancient times. These kinds of discretions would result in conservation of the medicinal species.

We have come across the indiscriminate use of *Guggulu, Kushtha, Pushkaramula, Kiratatikta, Ashtavarga* etc., which resulted in the endangered status of these species. On the other hand, Sushruta advised that plants available near to the human settlements and road sides are to be avoided for human consumption. Considering these factors it is important to focus on Conservation and Cultivation practices of ancient India.

References Conservation in Ancient India

According to Rigveda moon is the God of herbs while Rudra is the God of medicine. Uprooting of plants or destruction of plants is not allowed for performing rituals.For rituals plant raw material essentially to be collected from the forests once they have fallen from tree.In case any cutting of live tree / plant is necessary, then nature's permission is obtaining through different ceremonies to do so and is restricted to less than 20% of raw material collection from the tree or plant.

चन्द्रमावाअपामायतनम् । आयतनवान्भवति । यःचन्द्रमसआयतनंवेद । आयतनवान्भवति । आपोवैचन्द्रमसआयत नम् । आयतनवान्भवति । यएवंवेद । यो पामायतनंवेद । आयतनवान्भवति ।

Moon is the source of water, He who knows this, becomes established in himself, Water is the source of moon, He who knows this, becomes established in himself. He who knows the source of water, becomes established in himself,

नक्षत्रत्राणिवाअपामायतनम् । आयतनवान्भवति । योनक्षत्रत्राणामायतनंवेद । आयत ?नवान्भवति । आपोवैनक्ष त्राणामायतनम् । आयतनवान्भवति । य एवंवेद । यो पामायतनंवेद ।आयतनवान्भवति ।

Stars are the source of water, He who knows this, becomes established in himself, Water is the source of stars, He who knows this, becomes established in himself. He who knows the source of water, becomes established in himself,

पर्जन्योवाअपामायतनम् । आयतनवान्भवति । यःपर्जन्यस्यायतनंवेद । आयतनवान्भवति । आपोवैपर्जन्यस्यायतनम् । आयतनवान्भवति । यएवंवेद । यो पामायतनंवेद । आयतनवान्भवति ।

Clouds are the source of water, He who knows this, becomes established in himself, Water is the source of clouds, He who knows this, becomes established in himself. He who knows the source of water, becomes established in himself,

संवत्सरोवाअपामायतनम् । आयतनवान्भवति । यःसं वत्सरस्यायतनंवेद । आयतनवान्भवति ।आपो ?वैसं ?वत्स ? रस्यायतनंवेद ।आयतनवान्भवति । यएवंवेद । यो प्सुनावंप्रतिष्ठितां वेद । प्रत्ये ?वति ?ष्ठति ।

Clouds are the source of water, He who knows this, becomes established in himself, Water is the source of clouds, He who knows this, becomes established in himself. He who knows the source of water, becomes established in himself,

Sri-sukta mentions flora as well as fauna :

Several flora and fauna are covered under this. *Asva-daayi*; *Go-daayi; Dhanya daayi* etc., phrases indicate the conservation aspects.

श्रीसूक्त (ऋग्वेद) ।। ?ॐ?

हिरण्यवर्णांहरिणींसुवर्णरजतस्रजाम् ।

चन्द्रांहिरण्मयींलक्ष्मींजातवेदोमआवह ।।१

....आदित्यवर्णेतपसोऽधिजातोवनस्पतिस्तववृक्षोऽथबिल्वः ।

तस्यफलानितपसानुदन्तुमायान्तरायाश्चबाह्याअलक्ष्मीः ।।६...

फलश्रुति

....अश्वदायीगोदायीधनदायीमहाधने । धनंमेजुषतांदेविसर्वकामांश्चदेहिमे ?

पुत्रपौत्रधनंधान्यंहस्त्यश्वादिगवेरथम् । प्रजानांभवसिमाताआयुष्मन्तंकरोतुमाम् ?

धनमग्निर्धनंवायुर्धनंसूर्योधनंवसुः । धनमिन्द्रोबृहस्पतिर्वरुणंधनमश्नुते?

वैनतेयसोमंपिबसोमंपिबतुवृत्रहा । सोमंधनस्यसोमिनोमह्यंददातुसोमिनः?

नक्रोधोनचमात्सर्यंनलोभोनाशुभामतिः ।। भवन्तिकृतपुण्यानांभक्तानांश्रीसूक्तंजपेत्सदा ।। वर्षन्तुतेविभावरिदिवोअभ्रस्यविद्युतः । रोहन्तुसर्वबीजान्यवब्रह्मद्विषोजहि ।।....

The above hymns pray Godess Lakshmi to provide proper crop harvest, animals etc. Their controlled usage resulted in the conservation.

Herbs from Yajurvediya Rudra - Namaka quotes ....

नमोहिरण्यबाहवेसेनान्येदिशांचपतयेनमोनमोवृक्षेभ्योहरिकेशेभ्यःपशूनांपतयेनमोनमः ।।.....

भवस्यहेत्यैजगतांपतयेनमोनमोस्त्र्यायाततायिनेक्षेत्राणांपतयेनमोनमःसूतायाहन्त्याय वनानांपतयेनमोनमः ।।२-१।। रोहितायस्थपतयेवृक्षाणांपतयेनमोनमो ....

.....

येतीर्थानिप्रचरन्तिसृकावन्तोनिषङ्गिण ।।११-९।।

यएतावन्तश्चभूयासश्चदिशोरुद्रावितस्थिरेतेषासहस्त्र-योजने । अवधन्वानितन्मसि ।।११-१०।।

नमोरुद्रेभ्योयेपृथिव्यांये । अन्तरिक्षेयेदिवियेषामन्नंवातोवर्षमिषव-

स्तेभ्योदश प्राचीर्दशदक्षिणादशप्रतीचीर्दशोदीचीर्दशाध्वास्तेभ्योनमस्तेनोमृडयन्तुतेयंद्विष्मोयश्चनोद्वेष्टितंवोजम्भेदधामि ।।११-११।।

Yajurvediya Rudra prasna - Chamaka quotes herbs like *Tila, Mudga, Masha, Nivara* etc. There are hymns where soil, sand, stones etc., are also mentioned. These references suggest the focus on the nature and conse

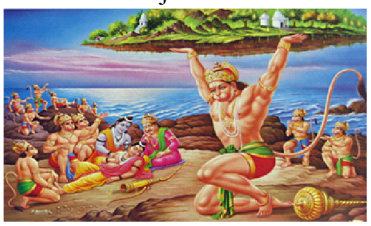
ऊर्क् मे सूनृता च मे पयश्च मे रसश्च मे घृतं च मे मधु च मे सग्धिश्च मे
सपीतिश्च मे कृषिश्च मे वृष्टिश्च मे जैत्रं च म औद्भिद्यं च मे रयिश्च मे रायश्च मे
पुष्टं च मे पुष्टिश्च मे विभु च मे प्रभु च मे बहु च मे भूयश्च मे पूर्णं च मे
पूर्णतरं च मेऽक्षितिश्च मे कूयवाश्च मेऽन्नं च मेऽक्षुच्च मे व्रीहियश्च मे यवाश्च मे
माषाश्च मे तिलाश्च मे मुद्गाश्च मे खल्वाश्च मे गोधूमाश्च मे मसुराश्च मे
प्रियंगवश्च मेऽणवश्च मे श्यामकाश्च मे नीवाराश्च मे॥ ॥ ४॥

Oh.... Lord Rudra ! Please protect & provide - grains, barley, black gram, sesame seeds, green gram, *khalva,* wheat, *masur dal*, *priyangu, anavah, syamaka and neevara* !

Famous success operations which were actual conservation threats in ancient India :

On a lighter note if we look at famous instance from Hindu mythology, some of the success stories are actually reflect upon conservation issues. They are :

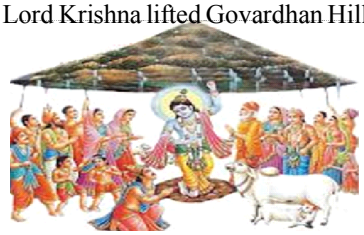
Hanuman lifted Gandhamadan Hill instead of Sanjeevani



Arjuna burnt Khandava vana for a snake

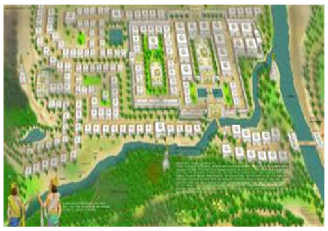
Lord Rama piecred 7 palm trees

Lord Krishna lifted Govardhan Hill



Saving Mayasura resulted in destruction of nature :

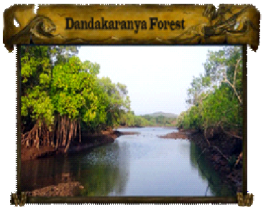
In their demolition of Khandava Krishna and Arjuna had saved one demon, Mayasura who was a great architect constructed the Maya assembly hall - a gigantic palace for the Pandavas in Indraprastha.



There were several forests and sacred grooves which stand as witness for the conservation practices of ancient India. For example, *Saindhava; Dandaranya, Naimisaranya, Kuru, Jangala* etc. Some of them are still traceable.

सैन्धवं दण्डकारण्यं नैमिषं कुरुजांगलम् ।
उपलावृत्तमारण्यं जम्बूमार्गोऽथ पुष्करम् ।।
हिमवानर्बुदारण्यमुत्तम परिकीर्तित।

Dandakaranya of Ramayan



Naimisaranya of Puranas

Further, there are examples for conservation of plants in the form of famous sites for conservation.

Some of them include: *Ashoka vana, Brindavana, Lumbini vana, Khandava vana* etc.

Ashoka-van of Ravana

Brindavan of Krishna

Lumbini vana- Lord Buddha's story indicates that there was a famous park.

In-situ conservation in Ayurveda

In-situ conservation, the conservation of species in their natural habitats, is considered the most appropriate way of conserving biodiversity.Conserving the areas where populations of species exist naturally is an underlying condition for the conservation of biodiversity. That's why protected areas form a central element of any national strategy to conserve biodiversity.

Sushruta's description about different climatic zones *(Desa pravibhaga)* and soil types *(Bhumi pravibhaga)* stands as an example for in-situ conservation. Plants have been mentioned as per these zones as well as soil types. *Desa* means a part of the country or geographical area and Bhumi means the area which allows different creatures to survive.

Different kinds of Desa (climatic or ecological zones)

Sushruta mentioned three climatic zones (Desa) considering the geographical conditions / natural flora of the respective places:

- o Jangala (dry areas) -predominant of vata
- o Anupa(wet areas) - predominant of kapha
- o Sadharana (mixed climate) - predominant of pitta

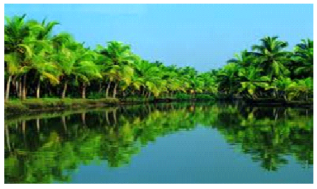
Jangaladesa [dry lands]

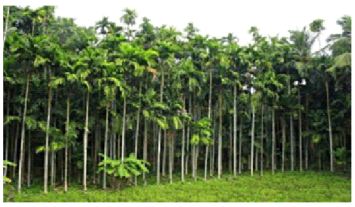
Areas with clear sky; possessing trees like *Kadara* (Acacia chundra), *Khadira* (Acacia catechu), *Asana* (Pterocarpus marsupium), *Asvakarna* (Dipterocarpus alatus), *Dhava* (Anogissus latifolia), *Tinisa, Sallaki* (Boswellia serrata), *Sala* (Shorea robusta), *Somavalka, Badari* (Zizyphus jujuba), *Tinduka* (Diospyros montana), *Asvattha* (Ficus religiosa), *Vata* (Ficus benghalensis), *Amalaka* (Emblica officinalis), *Sami* (Prosopis specichera), *Kakubha* (Terminalia arjuna), *Simsapa* (Dalbergia sissoo) etc; which is full of mirages or small ponds here and there with little water and more rocky area; which is full of stones; birds like *Lava, Tittiri, Cakora* are abundantly seen. People living in these areas are usually harsh, strong and rough in nature. Jangaladesa as the best among the areas.This climate does not allow diseases to spread and this zone is good for health.

Anupadesa [wet lands]

This area consists of trees like *Hintala* (Indian palm), *Tamala* (Garcinia morella), *Narikela* (Cocus nucifera), *Kadali* (Musa paradisiaca) etc; which is full of lakes and seas; which has cool breeze; which has beautiful sea coasts or river banks; which is full of trees; which possess many flowering plants; which is enriched with fauna like Swans (*Hamsa*), sea gulls (*Cakravaks*) etc birds. People living in this zone will be usually delicate, beautiful and gentle in nature.

Caraka considered Anupadesa as unhealthy and is not good for health.





Sadharanadesa

Both above described flora and fauna will be seen in this area. The people living in this area will show average qualities.

Soil diversity : Different kinds of Bhumi (Soil) Bhumi [soil] is 5 types as per predominance of Pancabhutas (five elements)

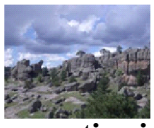
***Parthiva bhumi* -** full of heavy rocks, grayish or blackish coloured soil, and huge trees are present.

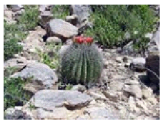
***Apya bhumi* -** smooth soil, full of water & grass, delicate trees and whitish soil are present.

***Agneya bhumi* -** different colours of soil, lighter, mixed with plenty of stones, smaller trees are present.

***Vayaviya bhumi* -** rough and ash-coloured stones, lean and small trees, xerophytes are more seen in this type of soil.

***Akasiya bhumi* -** sandy, taste-less water, dry trees, trees which grow near rocky- mountains are seen and soil is grayish black in colour.

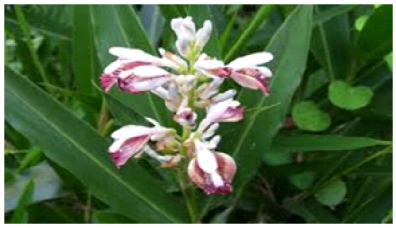



Ex-situ conservation in Ancient India

Ex-situ conservation means literally, "off-site conservation". It is the process of protecting an endangered species of plant or animal outside its natural habitat; for example, by removing part of the population from a threatened habitat and placing it in a new location, which may be a wild area or within the care of humans. While ex-situ conservation comprises some of the oldest and best-known conservation methods, it also involves newer, sometimes controversial laboratory methods. Bringing plants from other places is not a new practice for India. Parijata (Nyctanthes arbor-tristis) is a divine tree is introduced to earth by Lord Krishna from the heavens. This is ex-situ conservation.

Kalpavriksha is borne duringKshira sagara manthana; Dhanwantry brought Divya-oushadhis (precious herbs) from heavens to earth.Dvipantara vacha (Smilax china) &Kulanjan (Alpina galangal) are few other examples.

Penalty as part of Punishment in case of Destruction

Koutilya quotes that penalty or punishment is the only way to bring things under control. According to him this is an accepted point of view of saints and seers as well (1/3/2).

Koutilya imposed the following penalties if any one harms / destroys plants:

1. If a plant or plant part is collected from public gardens
2. If a plant or plant part is collected from road side
3. If flowers are stolen from public gardens

1) Selling of natural sources at the place of their origin is prohibited (2/38/22/3)
2) Purchase and sale of flowers & fruits at the place of their origin - 54 panas fine (2/38/22/5).
3) Purchase of veletables and tubers at the place of their origin - 51¾ panas (2/38/22/6).

Seetadhyaksha (Agriculture authority): similar to NMPB

Should possess complete knowledge on Krishi tantra (agricultural practices), Sulva sastra (geometry) and Vriksha ayurveda (botany). He and his knowledgeable team should only collect the natural plant materials like grains, flowers, fruits, vegetables, tubers, roots, creepers, sugar cane, cotton seeds etc seasonally (2/40/24/1).

Not to allow any unions for labour associated with agriculture (2/40/24/3).

If the agriculture workers are responsible for any destruction of harvest, they should be made responsible for loss recovery (2/40/24/4)

Water harvesting and Water management systems are well established (2/40/24 197 page).

Conservation of Animals in Artha Sastra

Spotted deer, calf, cow etc are the animals which are not to be killed. If any one does kill them, a fine of 50 panas shall be imposed (2/42/26/2 - 206 page).

Wild animals (Pasu [buffalo, wild ass, wild pigs etc], Mriga [deer, black buck, sambar etc], Vyala [tiger, lion, cheeta etc], Matsya [fishes] etc) are not to be hunted in Abhayaranyas (reserved forests). Hunting or Capturing these animals is considered only when they repeatedly attack the human settlements (2/42/26/4 - 206 page).

Some important references from Artha Sastra

Village / Hamlet borders to be made with trees like Banyan, Acacia, wells and tanks.

Villages should not have commercial activities (2/17/1/3 - 77-78 pages)

The Durga / Nagara (city) should have parks and trees in plenty (2/20/4).

Vana (jungle) = is the place where cattle like buffalos, wild ass etc; herbivors likee deer etc, forest products and elephants etc are available (2/22/6/2 - 100 pp).

PASU, MRIGA, DRAVYA, HASTI VANAPARIGRAHO VANAM

Vraja (dairy) = is the place where cow, buffalo, goat, sheep, ass, horse and wild ass are kept (2/22/6/3 - 100 page)

VYAYASTHANA = expenses made under conservation of cattle, wild animals, birds and tribes is not

to be considered under P&L account (2/22/6/6 - page 100 page)

Factors which prevented mass destruction of medicinal plants in ancient India

Several protocols for timely collection of herbs were in place which prevented indiscriminate collection of raw material.

The raw materials used in Ayurveda shall be collected according to part used, season, potency etc., in a specific manner.

Time of collection according to part used according to Charaka

Part used	Season
1. Tender leaves & branches	- Varsa&Vasantartu (Autumn & Spring
2. Root of trees which shed-off their leaves and regenerating plants which tender leaves	- Grisma (Summer) for usna virya plants; Sisira (late winter) for sitavirya plants.
3. Bark, Tubers & latex	- Saradrtu (later autumn)
4. Heart wood or sap wood	- Hemanta (early winter)
5. Flowers and fruits	- According to their season

Time of collection according to Susruta

Part used	Season
1. Roots	- Pravrtrutu (between summer & rainy season)
2. Leaves	- Varsartu (during rainy season)
3. Bark	- Saradrutu (late autumn)
4. Latex	- Hemantartu (early winter)
5. Heart wood	- Vasantartu (spring)
6. Fruit	- Grismaritu (summer)

Time of collection according to potency (Virya)

Susruta also proposed another method for collection of RM as per potency (Virya)

a) *Soumya-ousadha* (*Sita virya dravya*) - in *Soumyarutu* (cold season) i.e., in *varsa, hemanta & sisira*.

b) *Agneya-ousadha* (*Usnaviryadravya*) - in *Agneyaritu* (hot season)i.e., *in sarat, varsa& grismaritu*.

Cakrapani also opined that the roots of Usnaviryadravyas shall be collected in summer (*Grisma*) and those of *Sitavirya dravyas* in winter (*Sisira*).

Collection of drugs as per the soil (*Bhumi*)

Susruta described the significance of soil while collecting the drugs for different therapeutic procedures.

1. *Prthvi&Jala* predominant soil - *Virecanadravyas* (purgatives)
2. *Agni, Akasa&Vayu* predominant soil - *Vamanadravyas* (emetics)
3. Both the above soils together -*Ubhayabhagaharadravyas* (purgatives & emetics)
4. *Akasa* predominant soil - *Samanadravyas* (drugs used for palliative treatment)

Koutilya mentioned about *Sasya Adhikari* to possess exquisite knowledge on mathematics, farming / plants, soil etc.

Selection & Collection protocols of dravya (raw material) :

The herb grown in the best soil mentioned earlier shall be collected for the purpose of medicinal usage only. The herb to be collected should fulfill the following criteria viz., not effected by smoke, rain, air or water and Collected in the respective season.

The person who wants to collect the raw material should follow the ritual procedures, must be clean & neat, should wear white cloths should perform prayer etc., earlier to collection and he must be fasting overnight. Then the useful part shall be collected either from the East side or North side. Such raw material may be collected and preserved in the stores.

Sarangadhara advocates complete mental and physical well-beingness for a person who is about to collect the raw materials. The raw materials available near the *valimka* (ant-hills), polluted areas, water logged areas, burial ground, dry and sandy areas, the road sides, infected with pests, burnt or covered with snow etc, are to be avoided.

CONCLUSION

Vedic sciences have provided a cue for the concepts of conservation to the world. The references / findings quoted in this presentation suggest that the ancient Indian culture encouraged conservation of plants in general and medicinal plants in specific. The examples like *Hanuman* uprooting *Gandhamadana hill* in *Ramayana* and burning of *Khandava vana* by *Arjuna* in *Mahabharata* are some of the examples for mass destruction of eco-system. At the same time it is important to realize that there are ample number of references about the conservation in the ancient times e.g. *Lumbini vana* of *Lord Buddha, Ashoka vana* of *Ravana, Naimisaranya of Puranas* etc.*Charaka Samhita* and *Sushruta Samhita* [treatises of Ayurveda] did mention plants (herbs) as per climatic zones as well as according to soil types. *Koutilya's* system of penalty for strict compliance of conservation will be a path-finder for conservators of present era.

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4. CONCEPT OF PHARMACOVIGILLANCE IN AYURVEDA

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Traditional system of medicines is being used since centuries for healthcare by people in the countries of South East Asia region.Ayurveda, the traditional medicine system of Indian sub-continent has been in vogue since time immemorial for maintaining equilibrium at physical, physiological, spiritual & social health of an individual. Ayurveda uses a holistic approach to Health & Diseases. As the aim of Ayurveda rightfully points out,

The aim is to maintain the health of a healthy individual and treating the unwell. While doing so safety is always prioritized in Ayurveda. A medicine which develops adverse events while treating a disease is considered as Ashuddha (Improper) by Acharya Charak.

Then why there is need of Pharmacovigillance has arisen for Ayurveda system of medicine? Do Ayurveda have mentioned Pharmacovigillance in their ancient Texts? Was there any awareness regarding this matter? These are the questions we all are facing these days. In this essay we have tried to shed some light on this.

Globalization, consumerism, the explosion in free trade and communication across borders, and increasing use of the internet have resulted in a change in access to all medicinal products and information on them. These changes have given rise to new kinds of safety concerns such as: Illegal sale of medicines and drugs of abuse over the internet, increasing self-medication practices, Widespread manufacture and sale of substandard medicines, increasing use of traditional medicines and herbal medicines with other medicine with a potential for adverse interactions, Ayurvedic texts have many Refs of explaining drug-diet interactions. But latest such interactions found are not incorporated in Texts, no record system was available to understand Herb- Drug Interactions.

Let us first try to understand what Pharmacovigillane is.

" Pharmacon (Greek)= Drug
" Vigilare (Latin)= To keep awake or alert, to keep watch.

It's a science of collecting, monitoring, researching, assessing and evaluating information from health care providers and patients on the adverse effect of medicines, biological products, herbal and traditional medicines with a view to:

Identifying information about potential new hazards and preventing harm to patients.

In Ayurveda, the term Pharmacovigillance has not been explained separately but it has mentioned indirectly at many levels i.e from case taking to procurement of drugs, preparation of medicine, till prescribing the drug.

Acharya Charak has explained the importance of using correct medicine in correct manner and in correct avastha and disease. Ayurveda treats the patient on an individualistic manner. Generalized treatment is not the way how Ayurveda works.

योगादपि विषं तीक्ष्णमुत्तमं भेषजं भवेत् । भेषजं चापि दुर्युक्तं तीक्ष्णं सम्पद्यते विषम् ।।(च.सू.१/१२६)

A potent poison may become the best medicine if used judiciously. On the contrary even the best medicine becomes potent poison if used incorrectly.

There are basic 4 components with which Ayurveda Chikitsa begins. They are called the 4 pillars of Ayurveda Healthcare System. They are Bhishak (Physician), Dravya (Medicine), Upasthata (Nursing Staff) &Rogi (Patient). If there is any imbalance in any of them, then there may be incidences of ADR. So utmost care and efforts must be taken on all levels has been a moto so as to avoid any ADEs/ADRs.

श्रुते पर्यवदातत्वं बहुशो दृष्टकर्मता । दाक्ष्यं शौचमिति ज्ञेयं वैद्ये गुणचतुष्टयम् ।। (Cha.su.9)

Bhishak (Physician) is the 1st pillar. The qualities a Physician should possess are proficiency in theoretical knowledge, extensive practical experience, dexterity & purity of body & mind.

How a Physician should not be is also specifically mentioned by Acharya Charak.

वरमात्मा हुतोऽज्ञेन न चिकित्सा प्रवर्तिता । पाणि चाराद्यथाऽ चक्षुरज्ञानाद्भीत भीतवत् ।
नौर्मारूतवशेवाज्ञो भिषक् चरति कर्मसु ।। (Cha.su.9)

It is better to self-immolate than be treated by a quack, as a blind man moves groping with the help of the movement of his hand with fear, as a boat without sailors comes under the storm. The physician who has no knowledge of his area of medicine or science proceeds in the realm of therapeutic management with too much fear and lack of confidence. Therefore, never take treatment from an unknowledgeable physician. There are many contributing factors too which can result in ADEs.So, while treating patients which a physician should see. Illegible handwriting, Inaccurate medication history taking, Confusion with the drug name, Inappropriate use of decimal points, Use of abbreviations eg- su she, tri ki, missed drug in the Prescription, Missed route /Dose in the prescription by the *Vaidyas* eg. Local Application/*Niruh/ Anuvasan*, Missed *Anupan* etc. *Chikitsa* is carried out according to the stages of the disease. Usage of Drugs according to *avastha* may change. Such as use of *Shunthi in Saam atisaar*, use of *Kutaj* in *Nirama Atisaar* Similarly, *Navina & Jeerna avastha* of any disease also leads to different *Chikitsa prayog* such as in *Nava Jwara Langhana Chikitsa* is given whereas *Rasayan chikitsa* is given in *Jeerna Jwara In Shalya Tantra* various stages and its signs have been explained such as *Aam-Pachyaman-Pakva avastha of Vidradhi*, various stages of *Vrana* etc. So, it can be said that *Vaidya* has to consider various factors of a disease before giving any *Chikitsa* so as to prevent any kinds of ADEs.

बहुता तत्रयोग्यत्वमनेकविधकल्पना । सम्पच्चेति चतुष्कोऽयं द्रव्याणां गुण उच्यते ।।७।। (Cha.su.9)

प्रशस्तदेशसम्भूतं प्रशस्तेऽहनि चोद्धृतम् ।। युक्तमात्रं मनस्कान्तं गन्धवर्णरसान्वितम् ।
दोषघ्नमग्लानिकरमविकारि विपर्यये । समीक्ष्य दत्तं काले च भेषजं पाद उच्यते ।। (सु.सू.३४)
तानि तु द्रव्याणि देश-काल-गुण-भाजन-सम्पद्वीर्यबलाधानात् क्रियासमर्थतमानि भवन्ति । (च.क.१)

The 2nd pillar is *Dravya* (Medicine). Before prescribing any medicine, *Acharya* has specified certain criteria while procuring the Drugs. An ideal drug should be abundantly available, correct drug

should be procured, many kalpanas could be made with it and the drug should possess all the qualities. Acharya Sushrut has clearly mentioned about the Desh. The drug is affected by the soil, water, and air which are known as ecological effect. The efficacy of drug differs according to these ecological factors. So the drug should be grown in a Prashasta Bhoomi, it should be collected in correct time frame, it should be given in perfect amount, it should have ideal gandha, varna, rasa. It should be able to alleviate the Dushta Dosha in our body while not creating any harm.

Charak Samhita in the 8th chapter of Viman-Sthana has mentioned a protocol for Drug standardization,

तस्यापीयं परीक्षा-इदं एवं प्रकृतिमेवं गुणमेवं प्रभावास्मिन् देशे

जातमास्मिनृतावेवंगृहीतंमेवंनिहीतमेवमुपस्कृतमनया च मात्रया युक्तिमस्मिन् व्याधावेवंविधस्य पुरूषस्यैतावन्तं दोषमपकर्षयति उपशयति वा,यदन्यदपि चैवंविधं भेषजं भवेन्तच्चानेन विशेषेण युक्तिमिति । (च.वि.८/८७)

- इदमेव प्रकृति - nature of the drug
- एवम् गुणम् - specific properties
- एवम् प्रभावम् - specific effect of the drug
- अस्मिन् गुणे जातम् - found or cultivated in particular place
- अस्मिन् ऋत्वेव संगृहीतम् - collected in the specific season
- एवम् निहितम् - stored under certain conditions
- एवम् ऊपस्कृतम् - processed or prepared in a particular manner
- अनया च मात्रया युक्तम् - to be used in a specific dose
- अस्मिन् व्याधौ - used in the specific disease-therapeutic indication
- एवम् विधस्य - to be used in the prescribed manner- mode of use
- पुरूषस्य - to be used in specific type of patient
- एतावन्तम् दोषम् अपकर्षयति उपशमयति वा - duration of use of the drug- either till the vitiated *Doshas* are removed from the body or they are settled to normalcy
- एवम् विहितम् -the condition of the drug on use
- निषिद्धमेव - not to be used in certain conditions- therapeutic contraindication
- एवम संयुक्तम् - used along with certain drugs- adjuvant use

All these criteria are to be applied to each and every drug before procurement & prescription of the drug.

Similarly, there are many factors which can result in ADEs. Such as Adulteration, Wrong species of medicinal plants, Incorrect dosing, Errors in use, Use of contaminated products, inherently toxic nature of some plants such as Vatsanabh, Dhattura etc.

Many processes & precautions to be taken are explained in Ayurvedic texts for preparation & usage of Drugs such as Shodhana, Marana, Amrutikarana etc. if these procedures are not followed ex-

actly, they may lead to ADEs.

Matra Vichar i.e proper dosage of a drug is an important aspect of Chikitsa e.g- Matra should be finalized according to Avastha of rugna such as Balyavastha, Madhya avastha & Vruddha avastha, also according to potency of the drug, matra can change.

Potency of the drugs should be understood by the Vaidya before prescribing the medicine & its dosage eg- Tikshna dravya such as Lashuna, Maricha should be given in less doses.

Kashay Kalpana is specifically explained in Ayurveda where according to Agni bala they could be prescribed such as Phanta kalpana in Mandagni, Hima kalpana in Pitta prakriti etc.

उपचारज्ञता दाक्ष्यमनुरागश्च भर्तरि । शौचं चेति चतुष्कोऽयं गुणः परिचरे जने ।। (Cha.su.9)

3rd Pillar is the Upasthata (Nursing Staff/ Attendant). The attendant should possess qualities such as Knowledge of taking care of patient (nursing) as well as preparation, dispensing and administration of medicines and healthy recipes, affectionate towards patient and he should of purity of body and mind.

While handling the patient many such events can take place which can result as hazard to the patient. Discrepancy between the drug therapy received by the patient & the drug therapy intended by the prescriber, Drug administration is associated with one of the highest risk areas in nursing practice/ Paricharak. At every step all procedures associated with the patient are to be monitored and handled very carefully so as to avoid any ADEs. Many such examples can be explained such as wrong equipment and wrong method e.g., wrong direction of a lep, wrong Duration /Time for e.g- Instead of Nishikal, drug is administrated in Pratakal, wrong sequence of the Procedure for e.g- In Panchakarma, Sequence of Poorva, Pashchat, Pradhan Karma should be followed properly.

स्मृतिर्निर्देशकारित्वमभीरूत्वमथापि च । ज्ञापकत्वं च रोगाणामातुरस्य गुणाः स्मृताः ।। (Cha.su.9)

4th Pillar is the Rogi (Patient). An ideal patient should be the one who has good memory to remember treatment guidelines, obedient to follow given instructions by the Physician, fearless to face adversities of disease and he should be able to provide all information about the disease.

One of the speciality of Ayurveda is the concept of Viruddha Aahar. Ayurveda has elaborately described and has underlined the importance of 'Viruddha Aahar'.Intake of such Viruddha Aahar or Incompatible food can lead to various diseases. These food incompatibilities lead in formation of Ama (Undigested material), they cause Srotodushti (vitiation of channels) due to their innate qualities, which can lead to various diseases or even lead to ADEs.

In regards with Pharmacovigillance, Viruddha Ahar can be correlated on many levels such as during case taking of the patient regular dietary habits are taken into account, which can lead the Physician to diagnose & to decide about the treatment. Viruddha gunatmaka medicines can thus be avoided, similarly Anupana such as Madhu & Ghrita as they are said to be Vishavat if given in same amount, such basics should not be ignored by the Physicians and Patients should be made aware of that.

In conclusion, it can be said quite clearly that Ayurveda has elaborately described

Pharmacovigilance in all of its branches. Only key is to understand and apply all the indications given by Acharya in our Classics. So, in depth knowledge of the science and its wise application is the key to avoid any kinds of ADEs.

Considering the reality of increased demand and usage of ASU&H drugs, monitoring the safety of ASU&H drugs has become important and mandatory. In this direction Ministry of AYUSH has pioneered a Central Sector Scheme for promoting Pharmacovigilance for ASU&H Drugs. Since 2018 Ministry of AYUSH has panned across India with 1 National Centre, 5 Intermediate Centres & 74 Peripheral Centres. The main aim is to collect, collate and analyse data to establish evidence for clinical safety of ASU& H drugs. Ministry of AYUSH is striving hard to accomplish the vision through National AYUSH Mission (NAM). It aims to promote adoption of Quality standards of AYUSH Drugs and making available the sustained supply of raw materials. Good Agricultural/ Manufacturing/Collection/Storage Practices are being implemented on Industrial levels so as to maintain the highest quality of ASU&H Medicines.

Though on all levels efforts are being taken, there are some challenges which are yet to be overcome. Many times, traditional formulations are complex mixtures of many components. So, the exact profile of these constituents is likely to vary between different batches of manufacturing, also aspects like environment, time of harvesting, storage etc can affect their quality. Also, systemic clinical trial data for various herbal and ASU&H products are still not available. So, maintaining all records of any clinical trial should be followed thoroughly. Regarding reporting of ADRs the system is very well designed but awareness of reporting has to be imbibed into the students of ASU&H system of medicine.

The necessity of this programme has been highlighted during recent times when a media report based on study published in Journal of Clinical and Experimental Hepatology mentioned Use of herb Giloy resulting in Liver Failure in 6 patients in Mumbai. These findings were refuted by AYUSH highlighting efficacy of Giloy in managing various disorders which was already established. Also relating Giloy to liver damage was misleading and disastrous to the traditional medicine system of India. So, in order to avoid such misleading allegations, the steps taken by Ministry are absolutely necessary regarding reporting system of any ADEs & ADRs. Also, all practitioners, ASU&H students & Physicians, Nursing Staff; all should be made aware of this system which has been established.

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5. ANUKTA DRAVYA - CURRRENT RESEARCHES, IDENTIFICATION OF MEDICINAL PLANTS-CURRENT TRENDS AND CHALLENGES

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Introduction :

India and China are two of the largest countries in Asia, which have the richest arrays of registered and relatively well-known medicinal plants. The Indian subcontinent is well known for its diversity of forest products and the age-old healthcare traditions.

Information on the uses of plant species for therapeutic purpose has been passed from one generation to the next through oral tradition, this knowledge of therapeutic plants has started to decline and become outdated as a result of a shift in attitude and ongoing socio-economic changes.

The indigenous knowledge on the use of lesser-known medicinal plants is also rapidly declining. Through the realization of the continuous erosion in the traditional knowledge of many valuable plants for medicine in the past and the renewal interest currently, the need existed to review the valuable knowledge with the expectation of developing the medicinal plants sector.

Need of *Anukta Dravya*

Many important medicinal plants have been red listed and many are on the way. *Anukta dravyas* may solve the problem of scarcity of medicinal plants. We are in era of newly emerging diseases, *anukta dravyas* may help in finding their solution. It can pave a way to the discovery of novel compound.

Ethno-botanical studies carry a great importance in Ayurveda. Charak clearly directs to collect information about known and unknown dravyas from forest dwellers, shepherds, tribes etc. Their serious studies may expand our knowledge of herbs.

Above all, it is our duty to keep introducing new dravyas in DravyagunaVigyan so as to maintain the everlasting feature of Ayurveda.

Probable methods to study and include *anukta dravya* in *ayurvedic* pharmacopoeia

Document indigenous uses of medicinal plants, collecting primary information about the anuktadravya through folklore and extensive study of literature.

- Identification with the help of botanical and pharmacognostical studies.
- Nomenclature as per criteria laid down by different Nighantus esp. Raj nighantu.
- Evaluation of rasa (Taste), guna (Property), virya (Potency), vipaka (Metabolism) and prabhava (Specific action) in healthy volunteers.
- Toxicity studies in animals.
- Pharmacological studies.
- Clinical studies.

- Evaluation and validation of ethnobotanical claims.
- Inclusion in Ayurvedic pharmacopoeia of India.

Approaches for growing demand of medicinal plants -

There is a growing demand for natural product based medicines, health products, pharmaceuticals, food supplements, cosmetics etc. in the national and international markets. For the sustainable development of medicinal plants following strategy should be adopted.

1. Focus on Environment and Biodiversity -

Forests, waste lands, gardens, sacred groves etc. are the primary habitat for medicinal plants, so motivation for conservation, linkages for sustainable harvesting and rehabilitation of degraded areas should be done.

2. Research and development programmes-

Multi-disciplinary and active research and development programme are requiring getting potential of our medicinal plants for economic wealth. The R & D has to cover all aspects relating to the species from collection to utilization.

3. Cultivation of Medicinal plants-

Cultivated material is considerably more appropriate for various uses. Systematic cultivation of medicinal plants is urgent needs to fulfil the demand of markets, to develop and improve the agro-technology for valuable medicinal plants

- Adaptation of Good agricultural practices, Good storage practices, and Good field practice should be mandatory.
- Development of protocols for producing planting materials with desirable agronomic and therapeutic chemical derivatives.
- Genetic transformation techniques to be developed and standardized.
- Organic farming of medicinal plants as per world demand.
- conduct regular research and training on better harvesting and processing techniques,

The less abundant species in the wild should be promoted for the large-scale cultivation. Farming of any medicinal plant species should be brought into practice only after the reliable cultivation technology of the concerned species is available.

4. Bioengineering of Medicinal Plants -

Pharmaceutical importance/therapeutic value of medicinal plants are due to specific constituents/ combination of secondary metabolites present in them. For the improvement of therapeutic values of Medicinal plants, changes in the proportion of secondary metabolites are a lot required.

5. Quality control - certify raw material for quality control

The control of quality of the raw materials, in process and finished products is an absolute necessity for world market and human consumption. The quality requirements for medicinal plant preparations are strict in terms of active principles and toxic materials. Quality has to be built into the whole process beginning from the collection/cultivation of herbs to the final product reaching the consumer. Standard preparations need to be developed to improve quality, efficacy and effectiveness of the traditional drugs.

6. IPR & related issues -

The developed countries are exerting tremendous pressure on patenting medicinal plant products and processes. All attempts should be made to identify traditional formulations and knowledge relating to process and products and patents may obtain to the extent possible. The vital question of property right to developing countries for the use of know-how and genetic resources in the development of modern drugs has to be discussed and final solution to be derived.

7. Formalizing and organizing the market and trade

India has comparative advantages in the market and can generate a stronger presence globally.

8. Policy and institutional arrangement

Mechanism need to be evolved for conserving, enhancing and sustainable utilizing the medicinal plants resources.

India has set a vision regarding its medicinal plants sector and some major policy initiatives have been taken in this direction. Still, strategic actions based on research on various issues will be needed to realize the vision.

6. LONG PEPPR - THE CRUCIAL HERB

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Introduction :

Long Pepper is the perennial climber plant of Piperaceae family. Its spikes and roots are used on various health ailment of human as well as animals. Its spikes also used inspices and condiments. Long Pepper, or "Piper longum" is highly valued in Ayurvedic medicine. First mentioned in Sanskrit texts dated between 1,000 and 500 BC. LongPepper's Sanskrit name, "*Pippali,"* means "to drink and digest." In classical Ayurveda, Long Pepper is prized for its ability to promote *"agni,"* or digestive fire, without irritating those with sensitive *Vata* systems. It is considered *"tridoshic,"* meaning that it brings benefits to all three dosha types; *Vata, Pitta, and Kappha.*

Long pepper was a popular spice in ancient Greece and Rome, and later spread to greater Europe, where it was used in cooking and to make the mulled medicinal wine
hippocrasas until the AD1500s. Its use in culinary purpose in African countries,
where it is introduced by Arab traders. Longpepper is also known and popular in parts of Africa, mostly in the Islamic regions of North and East Africa, where to it has been introduced byArab traders.

Long Pepper has been used for a number of conditions, including as an antidote to scorpion and snake bite, but is valued for digestive support and anti-bacterial properties
- research shows that it is effective in treating giardia in animals. The spikes and roots contain Piperine, Piplartine, Piperolactum Aand B, Piperodioinealkaloids, and Tricontec, 22-23 Hydrostimagasterai steroids.

Long Pepper knows as Indian Long pepper in the world. However, in India it knows with different name in different
language such as *Magadhi, Pippali, Lendipippali, Pan pippali, Chottipippal, Pippal, Tippali, Navasaripippal, Badipippal, ajpippal* etc. Its origin is Indo-Malayan ecological area, mostly South east Asia region. In India, it found in wild such as in Himalayan region and Northeast States includingWest Bengal, while it is under cultivation in Maharashtra, Andhra Pradesh and Kerala. Largest cluster of Long pepper under cultivation found in north part mostly foot hills of Satpura, hills comprises ofAmravati, Akola and Buldana districts of Vidarbha region in Maharashtra. Mostly Bari Community is involved in the cultivation of Long pepper. It was grown as intercrop in Betelvine crop. However, LateUkardaji Datir during the decade of 1960s came to know its commercial importance and initiated Long pepper cultivation as main crop. To-

day, its cultivation spread on750 hectares area in these districts. Around 1400 households involved in the direct cultivation. The crop is skilled labor intensive and known as low volume high value crop.

Cultivation in Maharashtra State :

Soil: Farmers mostly prefer well drain silt loamy soil for planting Long pepper. However, they also cultivate on vertisols (Black soil) rich inorganic matter.The cultivation plot must have perennial access to irrigation water.

Farmers prepared the soil in the month of December for bed preparation by using the Rotavator. They prepared 1200 seed bed manually in a acre area after.

Climate: The plant grows under hot and moist climate. It grows here at around 300 meter altitude. It is grown under crops such as *Agast* (Agastya Sesban), *Shewaga* (Moringa oleifera), Indian coral tree (Erythrina variegata), *Pappaya* (Caricapapaya), Banana (Musaspp.) which gives support along with 20-25 percent shade intensity.

Where as, Birds Eye Chilies (Capsicum annuum), Turmeric (Curcuma longa) and *Sawari* (Sesbania sesban) grow sasa companion crops indicate three tireplanting system.

Varieties: Vishawamis the improved variety released by Kerala Agricultural University. However, the local growers used

the cuttings from local ingenious planting material available in this region.This Pippali known as a *Lendipippali, Panpippali, Chottipippal, Pippal, Navasaripippal.*

Planting : Cuttings of the best Long pepper vine used for planting having three to four nodes. They are planted 3 to 5such cuttings at one place. They have maintain 30 cms plant to plant distance whereas 75 - 90 cms between row to row. Around 50000 such cuttings covers the one acre area. Planting is directly done in seed bed rather than nursery of planting material.

Planting Time: Planting is done in second fort night of December to first fort night of February month.In these months the temperature of nights are cooled and the day temperature is congenial for sprouting.

Shed and Companion Crops : Farmers are planted various crops such as *Agasti* (AgastyaSesban), *Shewaga* (Moringaoleifera), Indian coral tree (Erythrina variegata), *Pappaya* (Carica papaya), Banana (Musa spp.) which gives support alongwith 20-25 percent shade intensity. Whereas, Birds Eye Chilies (Capsicum annum), Turmeric

(Curcuma longa) and *Sawari* (Sesbaniasesban) used as wind break and managing the temperature in the orchard. Farmers are also grown Corianderas a vegetable crop just after the complete planting of these plants, which harvested in two months.

Irrigation : Farmers are used sprinkler and drip irrigation apart from flood irrigation.Those having no access to micro irrigation, they used flood irrigation.Where as, those having access to micro sprinkler used the flood irrigation initially till the sprouting of the vines and after wards switch over on sprinkler fallowed by dripirrigation.The frequency of irrigation is depends on season such as 3 - 4 days and 7 - 9 days interval in winter and summer season respectively.

Plant Nutrition : Farmers add 6 - 8 ton FYM along with 8 qtl of Neem cake per acre before planting. They used NPK 40:20:20 per acre in three split dosages one after sprouting and then remaining two dosages in the month of July and August. Many farmers found skipping the first major dose, because of economic reason. Few farmers also used non-descriptiv eagro-tonics for the plants.

Integrated Plant Protection : Farmers avoided the same piece of land for frequent cultivation of Long pepper. They also avoided ill drained and acidic soils to grow this crop. During planting they used Copper Oxychloride for sapling treatment against Leaf Blight disease. Where as, they are also used root initiating hormone such as IAA at the sametime. Soil application of Trichoderma viride to manage the soil borne diseases. Whereas, few farmers planted marigold for nematode manage ment which one of the major causal organism for wilt in long pepper, which is dreaded disease inLong pepper. Farmers are also used Bavistin (Carbendazin 50% WP) and Nuvan to reduce wilt disease and the insects incidences.

Inter-culture operations : Weeding, earthing up and tying the vine uprightly with the support. Many farmers applied the Goal before planting as selective contact herbicide to check the weeds initially. After planting the manual weeding is done 3 to 4 times at 30 to 40 days interval. The earthing up operation is taken manually in the orchard in the month of April or May to conserve the moisture near the roots. Tying operation of the vine for its upright growth with the support is skilled work done manually 100 to 120 days after planting (i.e. March/April) and the operation is continued till October month further. Farmers are used now plastic threads for tying before that they used banana stem or Local tall grass known as Laheasa tying material.

Harvesting & Yield : Spikes of the Long pepper is main produce received from the creeper, while roots are secondary produce received from the plant after uprooting it in the last. Roots are harvested seldomly because many time they got rotting with in a soil. Harvesting of spikes is done three to five times manually during the months of October to December. The spikes are ready for harvest 2 months after their formation on the plants. Spikes are hand picked when they are blackish green. The harvested spikes are dried in the sun for 4 to 5 days until they are perfectly dry. The green to dry spikes ratio is around

10:1.5. Average per acre yield of dried Long pepper spikes is 445 kg., 641 kg. and264 kg. Respectively in 1st, 2nd and 3rd year. Where as,the average production cost comes to Rs.462 / kg .The local agricultural university approves Rs. 95287/acre as cost of production, where as Rs.20673/acre as a profit.The dried spikes are then stored in gunny bags. Beside the spike, the lower part of stems and roots which have a medicinal value also be harvested at the end of orchard. For the stems, they cut close to ground, while the roots are dug up, cleaned and heaped in shade for a day, after which they are cut into 2.5 to 5 cm long pices. The average yield of dried roots and stem is 100kg peracre.

Storage : It is high value low volume crop. Farmers sale it as per their needs and the market rate. The shelflife of Long papper dried spike is one to two years at normal condition, whereas, it is more in cold storage.The shelf life depends on input use, drying and storing condition. We evil is single-most storage pest affects the shelf life of dried spikes drastically.

Value Chain : The grower achieved thin or no profit because of volatile market condi tion sand sometime reduce to dusk because of incidence of wilt disease when the crop is ready for harvesting.The value chain of Long pepper exist in the cluster are as fallows : Grower---- Petty Trader---- Whole sale Mandy Traders --- (Retailer / Pharma Industry) ---Vaidya Some growers of Long pepper from the cluster came together and established Nagarjuna Aushadhi Vanaspati Farmers Producer Company (NAVFPC) during the year2013 to achieve the efficiency and improve the share of growers in the earning. The company also discourage the various forms of adultaration to get the quality Long pepper to the users. The company aggregate the Long pepper from the growers, graded it and supply to the Pharma Industry and Vaidya also.

Market and Demand : Long pepper as a crucial herb used in various health system such as Ayurvedic, Unani, Sidha, Tibeti, Folk medicine apart from spices. The major market of the Long pepper is Delhi,Nemuch, Mumbai, Chennai, Bangluru and Kolkatta.

It has a strong competition with other spp. of Longpepper grown in India and other nearby countries.The annual demand of Long pepper is approx. 2000-5000MT with growth rate of 16.3 percent. Long pepper is crucial herbs in health system of human and animal life. It also assisting to growers at their critical time as it is easily sale at high rate at the same time it doesn't required much place to store. Therefore, the farmers are still happy to grow the crop even though it has many weaknesses and threats. Doubling the farm income and Atmanirbharata is possible in Long pepper by following Good Agricultural Practicess and organic farming. NAVFPC is making awareness in the farmers to adopt these practicess alongwith the providing marketing support effectively and stregthen their likanges with other stake holder institutions.

7. GEO-BOTANICAL INDICATORS FOR PRESENCE OF GROUND WATER - AN INSIGHT FROM VRIKSHAYURVEDA

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ABSTRACT

Identification of ground water network by observing specific plant species in a particular area is elaborately cited in the *Vrikshayurveda*, written by *Surapala*. Along with plant species, other geographical features are also considered as indicators to detect the presence of ground water.Specific plant species occurring individually or in association with other species, association of some plant species with ant hills/termite mounds, conspicuous morphologic or physiologic features, unusual features like knots in the trunks of trees, presence of thorny trees, change in the colour of branches, plants with particular color of flowers, etc. were cited as indicators of ground water in *Vrikshayurveda*. The text not only says where to dig for water but also how deep and in which direction. The theory that plants can be a good indicator of underground water expressed by Surapala has been backed up by many scientific observations. The idea that plants of certain species more than others utilize water from the zone of saturation has been recognized, or at least suggested by several researchers. It is hoped that researchers from related fields will take interest to check validity of the documented classical practices.

Keywords : Ayurveda, Groundwater, Medicinal plants, *Vrikshayurveda*

INTRODUCTION

Ayurveda, one of the world's oldest holistic healing systems was theorized few thousand years back and is practiced up to this day. Although in theory, the science relates to all forms of life, in actual practice, its efficacy only in the case of human beings in widely known. There are ancient Sanskrit texts independently devoted to treatment of plants and lower forms of life like animals also. *Vrikshayurveda*, an ancient science of plant life written by Surapala ingeniously applied the basic principles of Ayurveda for the diagnosis and treatment of the various diseases of plants and trees.(1) Another most valuable contribution of this text is mentioning the plant species/geographical features as indicators of groundwater network. Specific plant species and other geographical features have been mentioned as indicators to detect the presence of ground water in this classical text.

Ground water also called zone of saturation, water table or capillary fringe is used by plants that habitually grow by perpetuating their roots to these zones to obtain water. Plant associations in arid and semiarid regions serve as indicators not only of presence of ground water, but of its depth, relative salinity and seasonal variations. Plants such as phreatophytes may serve as direct water indicators. (2) It is reported that, the people of Central Africa have been using Acacia grandulifer to identify areas with freshwater springs. (3) Acacia mesquite and Acacia greggii were also used by settlers in the south western part of the United States to find underground fresh water. (4) The

relation of the native vegetation to ground water is a subject of great scientific and practical importance. Though the explicit knowledge on study of plants as indicators of ground water is documented by ancient and medieval scholars in India, a systematic review of those concepts is still lacking. This might be the reason behind very little progress towards validation of these practices. Therefore, this paper is an attempt to compile the techniques of identifying the presence of ground water through geo-botanical indicators as mentioned in *Vrikshayurveda* written by *Surapala*. Attempts were also made to substantiate the traditional knowledge by gathering the related published scientific literature.

MATERIAL AND METHODS

In this review, botanical and geo-botanical indicators for the presence of ground water were compiled from the classical text *Vrikshayurveda* authored by *Surapala*. (1) Those plants having established botanical identity (5) were presented in tabular form along with associated geographical features, direction and depth of availability of water. Published literature from different sources was compiled and analyzed to find out the rationale behind the concept.

RESULTS AND DISCUSSION

The art of exploring underground water in India goes back to antiquity and *Surapala* in *Vrikshayurveda* expounds on this subject in detail. The text documented more than 40 plant species occurring individually or two different species together in a particular place which assist in identifying the underground water. The other clues for presence of ground water include association of some plant species with ant hills/termite mounds, conspicuous morphologic or physiologic features, unusual features like knots in the trunks of trees, presence of thorny trees in the midst of number of tress without thorns, change in the colour of branches, plants with particular color of flowers, etc. With the aid of these specific geo-botanical features, sources of groundwater were located at depths varying from 2 hasta to 225 hasta. Apart from this, distance and direction of ground water availability with respect to the indicator plants is mentioned (Table 1, 2). It is observed that, majority of the tree species mentioned in the text are perennial plants, especially trees and shrubs. The logic behind this may be that, annual plants, mainly legumes and grasses, are generally not good indicators since they depend mainly on rain and available only during some particular season of the year.

Table 1: Geo-botanical indicators for presence of ground water

SNo	Name of the Plant	Botanical Identity	Geographical characteristics	Availability of water	
				Direction	Depth beneath the ground(Hasta and Angula)*
1.	Jalavetasa	*Salix acmophylla*Boiss.	Waterless region	-	3 Hasta 18 Angula
2.	Jambū	*Syzygiumcaryophyllatum* (L.) Alston.	Anthills near or east of the tree		2 Hasta 2 Angula
3.	Nirgundī	*Vitexnegundo* L.	Plant grown on soil covered with anthill	3 Hasta to southern direction	10 Hasta 3 Angula
4.	Badari	(*Ziziphusmauritiana* Lam.)	Signs of existence of cobra/presence of anthill towards the west	Towards west	15 Hasta 15 Angula
5.	Kākodumbara	*Ficushispida*L.f.	Presence of anthill beneath the tree	-	14 Hasta 15 Angula

6.	Kuśa	*Desmostachyabipinnata* (L.) Stapf.	Anthill between two trees	25 Hasta towards west	24 Hasta 18 Angula
	Kovidāra	*Bauhinia purpurea* L.			
7.	Madhuka	*Madhucalongifolia* (J. Keonig ex L.) J. F. Macbr	Anthill towards north	5 Hasta towards north-west	38 Hasta 6 Angula
8.	Kadamba	*Neolamarckiacadama* (Roxb.) Bosser	Anthill towards south-west	3 Hasta towards east	2 Hasta
9.	Tāla	*Borassusflabellifer* L.	Surrounded by anthills	6 Hasta towards west	27 Hasta
10	Nārikela	*Cocosnucifera* L.	Surrounded by anthills	6 Hasta towards west	27 Hasta
11	Aśmantaka	*Ficusrumphii* Blume.	Existence of Badari tree or anthill on the left side.	6 Hasta towards west	15 Hasta 18 Angula
12	Vīrana and Dūrvā	*Cymbopogancitratus*(DC.) Stapf. and *Cynodondactylon*(L.) Pers.	Signs of watery region on waterless tract.	-	4.5 Hasta
13	Kharjūra tree with two heads/branches	*Phoenix dactylifera* L.	Waterless region	Towards west	13 Hasta
14	Dūrvā and darbha	*Cynodondactylon*(L.) Pers. and *Desmostachyabipinnata* (L.) Stapf.	Presence of both the plant over anthill	In between two plants	189 Hasta
15	Śamī tree with knots all over the tree	*Prosopis cineraria* (L.) Druce	Anthill towards north.	5 Hasta towards west	225 Hasta
16	Tilaka	*Wendlandiaheynei* (Schult.) Sant. &Merch	Presence of wet anthill beneath these trees	3 Hasta towards north	20 Hasta, 20 Angula
17	Āmrātaka	*Spondiaspinnata* (L.f.) Kurz			
18	Varuna	*Crateavanurvala*Buch-			

		Ham.			
19	Bhallātaka	*Semecarpusanacardium*L.f.			
20	Bilwa	*Aegle marmelos* (L.) Correa.			
21	Tinduka	*Diospyros discolor*Willd.			
22	Ankola	*Alangiumsalviifoilum*			
23	Śirīsa	*Albizialebbeck*(L.) Benth.			
24	Parūsaka	*Grewiaasiatica* L.			
25	Vanjula	*Salix caprea* L.			
26	Atibalā	*Abutilon indicum* (L.) Sweet			
27	Jambu	*Syzygiumcaryophyllatum* (L.) Alston.	Strong ground and presence of anthills adjacent to these trees	3 Hasta towards north	13.5 Hasta
28	Trivrit	*Operculinaturpethum* (L.) Silva Manso			
29	Sārivā	*Hemidesmumindicus* (L.) R.Br.exSchult.			
30	Dūrvā	*Cynodondactylon*(L.) Pers.			
31	Varāhi	*Dioscoreabulifera* L.			
32	Jyotiśmatī	*Celastruspaniculatus*Willd.			
33	Vyāghrapāda	*Gymnosporiamontana* (Roth.) Benth.			

* Ayurveda Formulary of India notes 1 hasta is equal to 18 inches (45.72 cm) and 1 angula is equal to ¾ inches (1.95 cm)[6]

Table 1: Botanicalindicators for presence of ground water

S No	Botanical characteristics	Availability of water	
		Direction	**Depth beneath the ground***
1.	Presence of thorny trees in the midst of number of tress without thorns	3 Hasta to the west	15 Hasta
2.	If the branches of tree are bent down or of yellow colour		13.5 Hasta
3.	Thorn less Ka□□akārī(*Solanumvirginianum*Linn.) plant with white flower		2 Hasta 6 Angula beneath the soil or 13 Hasta 13 Angula

			beneath thereof.
4.	Kar□ikāra(*Pterospermumcanescens*Roxb.) tree with white flowers or a palā□a (*Butea monosperma*(Lam.) Taub) tree	Northern direction	15 Hasta
5.	Presence of Badari(*Ziziphusmauritiana* Lam.) adjacent to a Rohītaka(Tecomellaundulata (Sm.) Seem) tree	3 Hasta to the west	94.5 Hasta
6.	Presence of karīra(*Capparis decidua* (Forssk.) Edgew.) plant beneath badari(*Ziziphusmauritiana* Lam.) tree	3 Hasta to the west	81 Hasta
7.	Presence of kakubha(*Terminalia myriocarpa*Van Heurck&Muell-Arg) and karīra(*Capparis decidua* (Forssk.) Edgew.) near one another	3 Hasta to the west	94.5 Hasta
8.	Presence of Kakubha(*Terminalia myriocarpa*Van Heurck&Muell-Arg) and bilwa (*Aegle marmelos* (L.) Blanco) near one another	3 Hasta to the west	94.5 Hasta

*Ayurveda Formulary of India notes 1 hasta is equal to 18 inches (45.72 cm) and 1 angula is equal to ¾ inches (1.95 cm)[6]

* Ayurveda Formulary of India notes 1 hasta is equal to 18 inches (45.72 cm) and 1 angula is equal to ¾ inches (1.95 cm)6 Modern scientific studies reveal interesting facts for authenticating the observations made by Vrikshayurveda. Studies have reported that, presence of certain species of vegetation can be a useful indication that ground water lies relatively close to the land surface. These plant indicators are most obvious in arid parts, where green vegetation stands out. Plants that have roots that extend to the water table and depend on groundwater for all, most or some of their water requirements are called phreatophytes. (4) These types of plants are able to act as indicator species because their morphology is affected to a larger extent by fluctuations in the groundwater table. (7) During dry months these species will stay green and maintain physiological activity while those that cannot obtain water from the water table will show obvious signs of water stress such as wilting. (8) Morphology, vegetation density and species composition changes considerably within a short distance between plant communities that are using an aquifer as a water source compared to those that are not. Plant species become dormant after ground water is beyond their reach. Other species growing near ground water within reach continue to grow actively throughout summer. Certain species in arid regions are observed to the depth of water table, showing that these species are confined almost completely to areas with specific depth limits. Though in humid climates these obvious visual signs are non-existent, the principle of using plant species as an index to locate ground is equally

useful in humid areas also.

The best relationships are found between certain groups of plants and the depth of ground water or the salinity of water. In North Africa, research has identified various plant associations (usually three to four main species per association) and their relationship to ground water depth and salt content of the water. (9) In a study conducted at central Pennsylvania, plots within 28 wetlands were sampled, and the plots were classified by water source. The study identified several groups of indicator species. Some species were strongly associated with the presence of groundwater. (10) A study carried out at the campus of College of Sericulture, Chintamani located in the Agro-climatic zone-5 of Karnataka to check the aquifer potential points using geophysical survey recorded a few families of tree species occurring as water indicators. It is concluded that the presence of such species suggests ground water discharge areas and indicate the availability of water. (11) The study also identified Leguminaceae, Caesalpinaceae and Meliaceae are the plant species occurring near these water regions. These regions also had lower electrical resistivity values.

The description of anthill/termite mounds as hydrologic indicator to locate sources of ground water is another unique contribution of this work. This concept has also been amply substantiated by observations made in several modern researches. Basically, the function of termite mounds is maintaining a constant humidity. Since high humidity is essential for the survival, the termites build their homes in places where ground water is available nearby. They transport the ground water through a vertical shaft below the mound reaching down to the water table. So, the presence of termite hill is a clue that it is present over or near a groundwater reservoir. Findings of a study indicate increased surface water infiltration, presence of riparian tree vegetation and other trees with tap-root system around termite mounds, linear assemblage of termite mounds along aquiferous dykes and seep-lines as well as the dependence of termites on water but avoidance of places with risk of inundation. (12) It is reported that, using termite mounds as hydrologic indicators, 24 bore wells were drilled in some parts of Coimbatore district. Of those, 21 wells discharged 130 to 500 litres per minute, which is a good success rate for a hard rock terrain. (13) As per T.S.Badrinarayanan, Geoscientist, B Square Geo Tech Services, Nagai district, Tamilnadu, mere presence of termite mounds cannot be blindly taken as a potential zone. From the termite mound studies, an interesting fact was observed that, the mounds having vents or conduits gave very good result. The closed type mounds may not be fruitful. The active ones i.e. where mound building activities are still going on, are more encouraging than the inactive ones. (14)

CONCLUSION

The subject of plants as indicators of ground water is by no means a new one. The quest for employing only sophisticated equipment with enormous cost has limited the power of observation. The explanation for lack of exploitation of such concepts probably lies in the fact that, the subject is in the border land between the traditional knowledge, hydrology and botany. Exploration of this concept needs the collaboration of both hydrologists and botanists along with the experts of traditional knowledge. With the help of traditional geo-botanical data, field works can be planned to prepare ground-water resources map by documenting the associations of documented observations

around known wells, ponds or ground-water areas. Use of the Geographic Information System along with these concepts can prove very effective in further shaping the understanding of the relationship. Whether these observations are applicable in all cases is also a subject of further research.

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8. CRITICAL REVIEW ON THE TERM VEDANASTHPAN W.S.R. TO VEDANASTHAPANA MAHAKASHAY

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Abstract -

Name of each chapter in *Charak samhita* has a certain meaning. These are indeed meaningful as well as indicating, For instance, *Apamargtanduliya Adhyaya*. *Apamarg tandul* is a drug of choice for errhine or stimulatory application which is reflected as *Shirovirechan. Charak* advocated four *Samshodhana* which are described in this topics along with the drugs and their application.

Similarly *Atreyabhadrakapeya Adhyay* , This chapter is devoted for the description of Seven *Padarthas of Dravyaguna*. *Ras* is the major one, there is symposium about the determination of number of ras which is inaugurated by *Bhadrakapya* and concluded with the speech of *Atreya.* On the same line each name of the *mahakashaya* is too meaningful and indicatory. Our try is to explain the meanings of the names of *mahakashaya*. It's a small perhaps the initial effort to explain the meaning of the term '*Vedanasthapn*' not only with etiomologically but also with experimental and clinical ways . it is tried that *Vedanasthapan Mahakashaya* is not the group of Pain killer drugs but these are drugs which are helpful in generation of Stimuli Or sensation.

Such type of drugs are helpful in the conditions such as Numbness, Sensory Loss which is observed in diabetic neuropathy, drug related neuropathy, Alcohol induced neuropathy, Post Paralytic neuropathy ,Frost bite etc.

Keywords - Vedanasthapan, Vedana , Sthapan, Numbness

Introduction :

Acharya Charak has introduced nearly 500 drugs in as fifty mahakashaya's. In this there are some groups which are related with Pain, stimuli etc., e.g *Angamarda Prashamanam, Shoolhar and Vedanasthapan Mahakashaya*.

One thing from above we are getting is that all the three mentioned *mahakashaya's* are used or must be used for a type of pain or stimuli.

For example if we are taking word *Angamarda Prashaman* which is literally means bodyache or in this we can say that it is group of 10 drugs which must be used as body relaxant or which relieves fatigue and pain in skeletal muscles. Another one is Shoolhar Mahakashay, in *Madhava nidana, madhva* has described shool as '??????????????????' which can Co relate with pricking or needle - pin like pain or shock like pain. Which may result due to pain arising from hollow organs. Which may be stated as spasmodic pain or colic in smooth muscles. The last *mahakashay* which is

what our concern is ' *Vedanasthapan mahakashay'*.

Here the word vedana has many meanings. According to various Samhitas or literature, generally the term vedana is reflected for pain however in some texts as *shabdkalpadrum, vachspatyama, amarkosha*. The term *vedana* is equalled with sensation, feeling or samvedana.and the word sthapana has mean as to establish. As we say in our Indian culture as '*Ganesh sthapna' or 'Ghatasthapna'* it means here we are establishing that particular thing or we create existence of that matter.

So, as Acharya Charak has said there must not be repetition for any particular things in Samhita. Then how can we say that if Acharya charaka has already given or described kashaya for different situations or for different types of pain then there must be something new in the concept of 'Vedanasthapan mahakashay'.

As we go through drugs which are described under '*Vedanasthapan mahakashay'* that most of drugs have *katu, Tikta, kashay ras* with *katu vipaka* and *shita virya*. Which ultimately precursor to vata dosha and as mentioned in our *Samhita* '??????????????' it means there is no pain without vata dosha. So, if these drugs causing increase in vata dosha then how can it will relive from pain.

Here we want to say that if drugs from *vedanasthapan mahakashay* increases *vata dosha* then it must have use for numbness or where abnormal sensation is present or where *suptata* is present.

So, we can use these drugs where mainly numbness or abnormal sensation is present in conditions like diabetic neuropathy, and various drug related neuropathy. Here our main focus is to enlighten the word '*Vedanasthapan*' as conventionally it takes mean as group of analgesic drugs. Rather than this the term Vedanasthapan must have to take as to establish stimuli/sensation /normal sensation and we have to work on this accordingly.

Aim-

To establish term Vedanasthapan related to Vedanasthapan mahakashaya.

Methods-

1. Literature review on term Vedanasthapan from Bruhattaryee.
2. literature review in terms of finding meaning of terms vedana and sthapna from various shbdakosha.
3. Analyse critically the mean of word Vedanasthapan or other related terms.
4. Establishing possible meaning of term Vedanasthapan in terms of Vedanasthapan mahakashay.

Result and Discussion - After critically analysing term Vedanasthapan, also separately term vedana and sthapan, we are supposed to get its meaning in terms of Vedanasthapan mahakashay. And according to that further study will be carried out.

9. USE OF ALGAE IN MEDICINE

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Abstract :

Algae are known to contain different bioactive compounds. These bioactive compounds have definite medicinal properties such as antioxidants, anticancer, antimicrobial, anti-inflammatory, anticardiovascular etc. Algae are used for a long time in traditional and folk medicine. Now a days bioactive compounds of algae are being widely used in medicine to cure many diseases of human being. Biocosmetics are skin care products where algae, especially microalgae have used extensively. Therapeutic properties of algae is used for promotion of health. Due to high Pharmaceutical values a new perspective of using algae in medicine has risen.

Key words : Algae, medicine, health.

Introduction :

Algae are a large and diverse group of plants which ranges from unicellular to multicellular thallus.They are primary producer and source of many bioactive compounds. Algae are rich source of dietary fibres, proteins, carbohydrates, lipids, vitamins, minerals, pigments, steroids, antioxidants, antibiotics etc. Antimicrobial compounds present in algae have definite inhibitory effect on pathogenic microorganisms. Medicinal qualities of algae were first appreciated as early as 1500 B.C. when species of Nostoc were used to treat gout, fistula and several forms of cancer. Seaweeds are utilized for a long time in traditional and folk medicine. Seaweeds such as Asparagopsistaxiformis and Sarconemasp. which are rich in iodine, widely used for controlling goiter disease caused by enlargement of thyroid gland. Algae are the immense source of several metabolites such as alkaloids, falvanoids, steroids, tannins and terpenes.Blue green are used as a source of dietary protein, B-vitamins and iron. They are used for weight loss, hay fever, diabetes, stress, fatigue, anxiety and depression. The high fibre content of red algae is useful in improving digestion. Algae is used as one of the most medicinal source due to its antioxidants, anticancer, antimicrobial and anti-inflammatory properties. Therapeutic properties of algae is used for promotion of health.

1. Antioxidant property of algae

The most powerful water soluble antioxidants found in algae are polyphenols, phycobiliproteins and vitamins. Many algae naturally contain high amount of carotenoids such as ?-carotene& ?-tocopherol (Miki, 1991). Astaxanthin constitute 6% dryweight of Haematococcus sp., a snow algae (Tsavalos et. al. 1992). Sulfated polysaccharides extracted from some brown algae like Sargassumthunbergii, Laminaria japonica have been shown the antioxidant activity (Zhang et. al. 1995 and Xue et. al .2000). Polyphenols in marine brown algae are called Phlorotannins and known to act as potential antioxidants. Filamentous green algae have great antioxidant properties. It is

observed that many algal species have helped in prevention of oxidative damage by the process of scavenging free radicals and active oxygen which help in cancer prevention. Blue green alga Spirulina platensis shows the highest antioxidants which leads to anticancer efficiency (Amouzgar and Salamatinia 2015). Antioxidants works against cancer, chronic inflammation, atherosclerosis and cardiovascular disorder. They also act against ageing process (Kohen and Nyska,m 2002).

2. Antimicrobial activity of algae

Algae are known to produce antibiotics and other medicinal drugs. Majority of algae produces antimicrobial compounds capable of inhibiting bacteria, viruses and fungi (Kim and Karadeniz, 2011). Antibiotic noscomic extracted fromNostoccommune showed antibacterial activity against Bacillus cereus, Staphylococcus epidermidis and Eschericia coli (Jaki et. al. 1999). Fatty acid isolated from Chlorella shows inhibitory effects on bacteria. Phenol compounds and pigments such as ?-carotene and chlorophyll II extracted from Chlorococcumhumicola shows antibacterial effects against Vibrio cholerae, Salmonella typhimarium, Staphylococcus aureus and Bacillus subtilis (Bhagavathy et. al. 2011). Ulva lactuca a green marine algae exihibit uniform antibiotic activity throughout the thallus(Hornsey and Hide, 1976). Sterols, heterocyclic and phenolic compounds obtained from seaweeds may be used as antiseptic and cleansing agents. Some sulfated polysaccharides isolated from seaweeds exhibit antiviral property (De Clerca 2000). Several uncharacterized polysaccharides isolated from Caulerpa sp., Corallina sp., Hypeacharoides, Padinaarborescens and Sargassum patens also exhibited high antiviral activity against HSV type 1 & 2 (Zhu et. al. 2003). Carrageen from red algae used against Influenza virus, Fucan from brown algae used against HIV. Nostaflan from blue green algae Nostocflagelliformae act against HSV-1, HSV-2 and Infuenza A virus.

3. Anti-inflammatory activity of algae

Inflammation frequently occurs in living tissues. Sulphatedpolysaccaharides particularly fucoidins from brown algae, alkaloids (cauleprin I, II, III) isolated from red and green seaweeds, carotenoids ((fucoxanthin and astaxanthin), phaeophytin A and vidalols A and B are anti-inflammatory comopounds isolated from microalgae (Jaswir and Monsur 2011). A compound carnosadine isolated from Grateloupiacarnosa shows anti-inflammatory activity (Wakamiya et. al. 1984).

4. Nutraceutical activity of algae

In coastal areas of all continents, seaweeds are used in human nutrition. Seaweeds and other algae are excellent source of dietary fibres as well as vitamins and minerals. Dietary fibres extremely useful in many health problems like constipation, weight gain etc. Spirulina and Chlorella are popular nutraceutical. Spirulina is used in human nutrition because of its high proteins content (68%) and its excellent nutritive value.

5. Algae in cosmetics

Algal extracts are being used in preparation of cosmetics. Phycobiliproteins of blue green algae as natural colorants are non-toxic and non-carcinogenic. A protein rich extract of Spirulinaplatensis repairs signs of early skin aging and prevent mark formation. It also improves skin moisture. Facial mask prepared from Spirulina and herbal extracts improves skin complexion and reduce wrinkles without any allergic effect (Jadhav 2019). Facial scrub made from Spirulina and other herbs remove dead skin cells.

Conclusion

Algae is used as one of the best medicinal source due to its antioxidant, antimicrobial and anti-inflammatory properties. Now a days biocosmatic market is occupied by the products of microalgae. Due to high pharmaceutical values a new perspective of using algae in medicine has risen. Hence it is concluded that algae plays a promising role in health of human being.

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10. PHARMACOVIGILANCE OF AYURVEDA AND ADVERSE DRUG REACTION

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Abstract :

Pharmacovigilance is the science which encompasses the activities concerning to the detection, assessment, understanding and prevention of Adverse Drug Reaction. A common misconception prevails among the masses and also a large population of practitioners is that Ayurveda drugs are safe and do not have any adverse reaction. The major goals of pharmacovigilance, namely to improve patient care and safety in relation to drug use, and thus promote rational drug use are recurrent themes of ayurvedic pharmacology Dravyagunavigyan Ayurvedic pharmacology) and Chikitsa (therapeutics) .(1) Pharmacovigilance is an important tool to analyse the drug effect particularly its side effects, if any. This paper outlines briefly the concept , Need of Pharmacovigilance for Ayurvedic medicines and implementation of National Pharmacovigilance Programme for Ayurveda, Sidhha, Unani Drugs, Challenges in introducing PV in Ayurveda, Recommendations, .

Keywords : Pharmacovigilance, Adverse Drug Reaction, Side effects, Challenges.

Introduction :

Ayurveda as a science has a vast history of research and development. The holistic approach of this ancient science envisions prevention of disease, (2) by virtue of its basic principles of healthy life style management, dietary intake and the uniqueness of keeping in view the individual's physiology and mental state during treatment. (3)A lot has been said and discussed about the effectiveness of one drug or the other in a wide spectrum of therapeutics but concerns regarding the safety and efficacy of these drugs have always been on the back seat. In the age of modern technology, scientific advancements, consumer awareness and the advent of evidence based medicine, there is very sparse evidence supporting the efficacy and safety of Ayurveda drugs, except that this system is in practice since hundreds of years and there is rarely any adverse effect reported. Some time back serious concerns were raised in relation to Ayurveda drugs that they contained heavy metals and were a threat to life. (4) It was only after that study, the authorities in India initiated some concrete steps to regulate the drug industry more effectively.

Etymology :- Pharmaco - Drug

Vigilance - To be Awake/ Alert, /To keep Watch / - To be Aware of / - To Observe

Definition- It is the Pharmacological related science related to the detection, Collection, assessment, understanding and prevention of adverse effects particularly long term, short term side effects of Medicine.

Some Technical Terms Used -ADR - Adverse Drug Reaction - A response to a drug which is noxious and unintended, and which occurs at doses normally used in man.

SE - Side Effect - Any unintended effect of a pharmacological product occuring at doses normally used in man.

SAE - Serious Adverse Event - Any adverse event which is fatal, life threatening, permanently disabling or which results in hospitalisation.

History-Thalidomide tragedy - 1961 : Thalidomide is used in pregnant women to prevent nausea. It is a Potent human teratogen Caused major birth defects like Phocomelia (Absence of proximal part of limbs) in estimated 20,000 children.

Aims :- **Objectives :-**

Ayurvedic concept of PV : Pharmacovigilance means monitoring the effect of medicine after it has been licensed for use and administered for a particular condition.Vigilance means to be more careful especially in order to notice possible danger or difficulties. As per Ayurveda, any drug/management/ procedure which, when administered, produces any untoward effect other than expected beneficial action is not considered a perfect treatment. Not only this, promotion of health and prevention of disease is the first approach in Ayurveda. Before starting any treatment, a multifaceted analysis of the status of the patient is mandatory so that the possibility of untoward symptoms due to error in diagnosis and planning of treatment is negligible.

A possibility to consider environmental factors along with psychological status further adds an evidence that Ayurveda incorporates such concepts of being vigilant in the treatment. Instructions and guidelines in the form of *DashavidhaParikshya Bhava* and *DashavidhaPariksha* (tenfold examination along with the consideration of ten factors to be examined before proceeding for treatment) indicate vigorous efforts to avoid errors in the diagnosis and management.

A list of adverse drug events may occur due to misuse of these preparations is elaborately discussed along with probable antidotes and precautions. Standard operating procedures along with the implementation of pre and post-patient care for *Panchakarma procedures* or para surgical interventions such as *Raktamokshana*, *Agnikarma* and vigilant approach for the management of possible complications can be also considered as a part of implementation of pharmacovigilance.

Not only this, for *Shadavidha Upakrama* such as *Langhana*-lightness / Deprivation, *Brimhana*-Nourishing, *Snehana*-Oleation, *Rookshana* -Drying, *Sthambana*-Drying, *Swedana*-Sweating , a strategy in the form of *SamyakLakshana* has been mentioned with a warning that, if these procedures are not stopped after achieving the *SamyakLakshana*, adverse effects may be attained by the patient. Hence, guidelines along with medicines to be used for future possibilities are framed for such conditions Few factors may increase the chances of Adverse Drug Reactions(ADR) related to Ayurvedic medicines and aggravate the need of reporting, such as the use of substitute drugs due to reduced availability of herbs, emergence of new diseases and treatment modalities, changed social structure and food habits, or chances of irrational combination of medicines.

Hence, a hairline difference between errors due to diagnosis or improper procedure or purification and manufacturing of drugs and complications arising due to over or under dosageof medicines or patients not restricting to the precautions to be followed during treatment shall be kept in mind.

Thus, in the present scenario, restoration of recording of such events in the form of Pharmacovigilance program in Ayurveda system of medicine becomes a necessity. Pharmaceutics and therapeutic variations, holistic approach, diverse and huge treasury of drugs and their formulations and numerous principles of diagnosis and management are potential sources of innovation for Ayurveda.

Term PV does not feature in Ayurvedic texts. Rational drug use are recurrent themes of Ayurvedic pharmacology and therapeutics. Along with descriptions related to actions & benefits of medicine. Ayurvedic pharmacology describes detailed adverse reactions& also how to deal with ways to minimize adverse effect in detail. On the other hand the classical texts of ayurveda promptly describe all the adverse reactions to irrationally procured, prepared and administered drugs or formulations.

Initiatives taken by the Government of India for starting the National Resource Center for Pharmacovigilance is a beginning step for it.Pharmacovigilance in India was initiated way back in 1986 with a formal Adverse drug reaction (ADR) monitoring system, under supervision of the drug controller of India. Later, the National Programme of Pharmacovigilance was launched in 2005, and was renamed as the Pharmacovigilance Programme of India (PvPI) in 2010.

PV CENTERS IN INDIA:-

- National - IPGT & RA Jamnagar
- Regional - 8 centre's - BHU, Trivandrum, Guhati, NIA, CCRAS, Chennai, Bangalore, Bhopal.
- Peripheral - 30 centre's.

Where to report?

Patient

⇓

Health Professional

⇓

Hospital/Manufacturer

⇓

Regional Centre

⇓

National Centre

What to report ?

- All suspected adverse reactions
- Lack of effects
- Resistance
- Drug interactions
- Reactions suspected of causing - Death, Hospitalization, Disability, Congenital anomaly.

Who can report?

Any health care professional may report suspected adverse drug events. The case reported by lay members of the public, or non -health care professionals are not accepted under the programme. But they can report the physician under whom they have undergone treatment .

Sources of reports :

■ Clinical trials ■ Spontaneous reports ■ Reports from consumers ■ Reports from manufacturer ■ National Poison center ■ Drug information center ■ Consumer organization

Need of PV for Ayurvedic Medicines

In ancient times, physicians prepared medicines for their patients themselves. Today production and sale of Ayurveda drugs is formalized into a thriving industry.

Ayurvedic medicines -

1. Classical Ayurvedic formulations 2. Patent and proprietry formulations.

This industrialization has brought many challenges about safe use of Ayurvedic medicines.

Challenges in introducing PV in Ayurveda: National Pharmacovigilance Program (NPP) encouraged reporting of all suspected ADRs, But number of reports related to Ayurvedic /herbal drugs are abnormally low. Concept & terminologies related to ADR monitoring are not covered in the Ayurvedic curriculum. Methods to study drug safety problems have not evolved adequately in Ayurveda. Information related to medicines are in the form of slokas in the texts, it is not easily available for general public. Signal detection is difficult because of inherent belief that Ayurvedic medicines are safe. Patients often use medicines from different systems of medicine concomitantly - difficulty in assigning causality. Lack of quality assurance and control in manufacture of Ayurvedic medicine. Most Ayurvedic formulations are multi-ingredient.

Recommendations : Introduce pharmacovigilance concepts into the curriculum of ayurveda at the under-graduate and post-graduate level. Encourage studies on drug safety. Make reporting of adverse reactions to regulators mandatory for ayurvedic formulations. Make unbiased and easily accessible drug information available. The Traditional Knowledge Digital Library launched by the Government of India is an example of how ancient knowledge available in the ancient scriptures can be made digitally accessible.Create awareness about the science of pharmacovigilance among ayurvedic physicians, patients and paramedical staff. Human resource development is a key feature for the success of this enterprise. It will be necessary to train ayurvedic experts in the science of Pharmacovigilance and include them not only in reporting but also assessment of the adverse reactions. More direct involvement of ayurvedic Academic Institutions in the NPVP after appropriate training would be an appropriate first step in this direction.

A strong cooperative effort from experts in Pharmacovigilance and ayurveda together can ensure that this system is up and functioning. The success of any pharmacovigilance system lies in its ability to prevent further adverse reactions on the basis of information received. This will be possible only when physicians are vitally alert to the onset or offset of any ADRs. They need to prioritize their contributions to make the pharmacovigilance program for Ayurvedic medicines a success.

DISCUSSION : A general misconception that prevails among the common people is that Ayurveda medicines are always safe. This mind set needs to be changed. Though these medicines are safer, but there intake being immune from any side effects is not the case. A common fact experienced by everybody, that taking even a little extra amount of food at dinner time can cause discomfort. Similarly, if a drug is not manufactured as per set protocols or if any incompatible (viruddha) intake is done and then side effects are bound to occur. The Department of AYUSH has gone a long way in creating infrastructure for pharmacovigilance reporting. Though this is still in its infancy, but we should

strengthen the basic idea which has led us to think and discuss upon this issue. The clinicians of Ayurveda should be given training regarding assessment of adverse reactions and must be taught the procedure for reporting of such reactions. The forms for assessing and reporting should be simplified to facilitate easy reporting. Close monitoring of all drug prescriptions should be done. Adequate inclusion of pharmacovigilance may be done in the undergraduate curriculum of Ayurveda. Prescription of Ayurveda drugs along with modern drugs should be avoided so that the effect of drugs on human body can be analysed. Bulk dispensing of drugs is a major issue and it steps should be taken to monitor it. Dispensing of churna (powders) in sachets can be done to provide fixed dose. Similarly Bhasma can be dispensed in capsule forms. Pharmaceutical houses need to share the burden and as well as responsibility for proper implementation of pharmacovigilance program. Data generated from various studies like clinical or pharmacological trials should be regularly updated in the text books. Experts of Ayurveda may also be reoriented and trained as experts in pharmaco-vigilance. The drug information should be easily available and should be completely digitalised so that the knowledge is available instantly. Though, the Traditional Knowledge Digital Library is a positive step in this direction.5More institutes should be involved in the process so as to create a deeper penetration of the concept. Students should be educated and the institutes may serve as satellite areas for data collection for any ADR and AE.

CONCLUSION : The need of the hour is to educate the physicians and encourage them to analyze and report any adverse effects that occur in a patient, no matter how petty or irrelevant they may seem. Quality drugs are one of the main pillars of effective therapy. The onus of providing quality drugs lies with the pharmaceutical houses. The industry should take some concrete steps to generate confidence and reliability for its products. The morality of manufacturing standard drugs can go a long way in minimizing the adverse effects and generating confidence in therapeutic efficacy. Further, this shall in long term lead to characterization of Ayurvedic drugs as OTC (over the counter), prescription or scheduled drugs for better safety and acceptance of Ayurvedic medicines. At some stage, there also needs to be regulation of self-preparation and administration of drugs by clinician. This shall only be a step towards global acceptance of Ayurvedic drugs.

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11. IN VIVO EFFICACY STUDY OF BHARANGI ON SO_2 OXIDE INDUCED RAT MODEL

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Abstract :

Bharangi is well known drug of Ayurvedic materia medica, widely used since ancient times on various respiratory disorders. Anti-asthmatic, anti-tussive and antispasmodic activities are its major therapeutic claims. Its root has been recommended by Acharyas. In precsent study, the drug Bharangi has tested for its anti-tussive effect for pre-clinical studies.

Method :

After ethical clearance, raw drug Bharangi was collected, authenticated and analysed for standardization.After this animal experimentation was done on so2 induced rat model.

Group A contains antitussive cough syrup as standard drug.

Group B contains Bharangiroot decoction.

Orally medication was given to both groups as per required doses before one hour of so2 exposure. Cough bouts were induced by sulphur dioxide. Number of cough bouts were counted for 5 minutes,after 30 minutes and after one hour of so2 exposure. Collected data treated with the Student's t test and inference was drawn accordingly.

Result : On observing tabulatedanalytical data, number of cough bouts of test drug Bharangi when compared with the standard drug, the p-value is greater than 0.05 ($p > 0.05$).

Discussion : Results suggested equal efficacy of both groups i.eBharangi root decoction provides equally effective anti-tussive activity as compared to standard drug.

Key words : AyurvedicMateriaMedica, Anti-tussive, Bharangi, Clerodendrumserratum (Linn.) Moon, so2 induced rat model.

Introduction :

Classical Ayurveda had recommended use of a functionally similar substitute. Abhavapratinidhidravya is one of the concept mentioned in Ayurvedic texts like Yogratnakar, Bhavaprakasha and BheshajyaRatnavali. Bhavaprakasha was the first who mentioned this concept in 16 th century A.D. and then repeated subsequently in forthcoming Ayurvedic literature. Abhavapratinidhidravya(drug substitution) concept is based upon the dravyagunavigyana principles. One such Ayurvedic substitution pair: Kantakari (SolanumsurattenseBurm. f., Solanaceae), a common drug for the seasonally available species, Bharangi(Clerodendrumserratum L., Verbenaceae).(1,2,3)In the present research paper, the drug Bharangi has tested for its anti-tussive effect by performing pre-clinical studies.

Bharangi botanically identified as ClerodendrumSerratum (Linn) Moon is a medicinal plant well

known for its numerous medicinal properties. *Bharangi* has been mentioned with a number of synonyms depicting its identifying morphological characters and pharmacological actions. Description of the drug can be traced in various *Nighantus*, under different chapters. A single hand, comprehensive information regarding *Bharangi*, its synonyms, pharmacological actions properties is available. The study(4) reveals that, about 80 synonyms were attributed to describe *Bharangi* botanically and pharmacologically. The leaves of the plant are called as *kharapatra*, and *angarvalli*, *kasaghni, brahmanyashti, vatari, gadarbhashaka* are the synonyms which are identifying characteristics features for Bharangi. It is attributed with 40 chikitsauupayogi(useful in treatment) properties like deepana, marutahara, shwasa, kasa, pinasa, gandamalaetc.

It is a perennial herbs or shrubs, 0.9-2.4 m high. Leaves sessile or nearly so, opposite or sometimes ternate, passing upwards into bracts, narrowly obovate- oblong or sub-elliptic, acute usually coarsely and sharply serrate. Flowers many, blue-purple or white, arranged in dichotomous cymes, the whole forming a lax, subpyramidalpanicle. Drupes 6 mm long, broadly obovoid, rather succulent, dark-purple when ripe. More or less distributed throughout India, in forests up to 1500 m altitude. Reported to be rare and endangered in Gujarat. Root and leaf are the parts used for medicinal purposes. The roots are bitter, acrid, thermogenic, anti-inflammatory, digestive, carminative, stomachic, anthelmintic, depurative, expectorant, sudorific, antispasmodic, stimulant and febrifuge and are useful in inflammations, dyspepsia, anorexia, colic, flatulence, helminthiasis, cough, asthma, bronchitis, hiccough, tumours, tubercular glands, dropsy, consumption, chronic nasal inflammation, skin diseases, leucoderma, leprosy and fever. Leaves are useful as an external application for cephalagiaand opthalmia. The root increases appetite, lessens expectoration. Seeds bruised and boiled in butter milk are used as aperient and in dropsy.(5)

It has been stated in various nighantus that Bharangiis Katu, Tikta, Kashaya in rasa along with *Laghu, Ruksha, Ushana gunas*. It is *Kaphavatashamak* in nature.

Properties :

Rasa *- Tikta,Katu, Kashaya,* ***Guna*** *- Laghu,Ruksha,* ***Veerya*** *- Ushna*
Vipaka *- Katu,* ***Doshaghnata*** *- Kaphavatashamaka*

Rogaghnata **:** *Gandamala,Vrana,Visarpa, Aruchi, Agnimandya, Gulma, Raktavikara, Shotha, Shwasa, Kasa, Rajayakshama, Pratishyaya, Nashtartava, Jwara.*

Karma : *Shothahara,Vranapachana, Deepana, Pachana, Anulomana, Raktashodhaka, Kaphaghna, Kasahara, Shwasahara, Jwaraghna, Swedajanana.*

Parts used : Root, stem, bark, leaves.

Dose : 3 to 6 g churna(powder) 10-20 ml of kwatha (decoction) (6)

Chemical Constituents :

Serratagenic acid, queretaroic acid, some phytosterols, saponins, two iridiod glycosides, ferulic acid, arabinose, scutellarein, baicalein are some important chemical constituents reported. (7)

Material and Methods :

Procurement of Raw Drug :

Field sample of BharangiClerodendrum serratum L. was collected and authenticated by an authorized field botanist and an Ayurvedic practitioner. Voucher specimens were deposited with the

Herbarium at B.S.I. Pune. The herbarium voucher specimen number of Clerodendrumserratum L. was DDC 01. (Ref. letter no. BSI/WRC/IDEN.CER./2020/H3 Dated 28/02/2020.

Experimental animals and ethics committee approval

12 Albino mice of either sex weighing between 25+5 gm was used for the present study. They were obtained from the animal house attached to the Pharmacology Laboratory of the institute. Exposure to 12 h light and dark cycles with ideal laboratory conditions in terms of ambient temperature (23+20C) and humidity (50-60%).They was housed individually in polypropylene cages in well-ventilated rooms. The mice was kept under observation for seven days with standard laboratory diet i.e. VRK Nutritional Solutions,Pune, Mice Pellet Feed and drinking water was given ad libitum. After this they was examined for their normal health and then subjected to experimental study. The study was carried out in accordance with the directions of Institutional Animal Ethics Committee after obtaining permission from Institutional Animal Ethics Committee with Approval number-BMK/IAEC/Res.No.-21/2021-10 and the guidelines of CPCSEA(Committee for the purpose of control and supervision of experiments on animals), Govt. of India, was strictly followed during the study. The experimental model suggested byMiyagoshi M (1986)was adopted.(8)

Experimental design

12 animals was randomly allocated into 2 groups having six animals in each group namely Group A (Standard group containing syrup with codeine phosphate content) having dose 5ml/kg and Group B (Bharangi root decoction) 12.5ml/kg dose. Converted into mice dose by referring to the standard table of Paget and Barnes(1969).(9)(10)After this animal experimentation was done on so2 induced rat model. The assembly comprises of 500ml three-necked flask containing aqueous saturated sodium hydrogen sulphite (NAHSO3 Solution. Concentrated sulphuric acid was introduced drop by drop in the bottle.SO2was filled already in the water manometer column by opening the three way cork so that SO2can enter the water manometer and can generate the pressure of75 mm of water. The three way cork can be rotated in such way that the volume of SO2collected in the water manometer escapes into the dessicator and covered with the lid. The amount of SO2was kept constant at the rate of 5 ml throughout the experiment.

Group A contains antitussive cough syrup as standard drug. Group B contains Bharangi root decoction. The standard drug and test drug was administered orally by oral catheter as per required doses before one hour of so2 exposure. The mice, after exposure to SO2for 1min in the dessicator, taken out of the dessicator and confined in an upturned filter funnel. The free end of the funnel was attached to a stethoscope, with the help of which the mice cough reflex was heard.Cough bouts were induced by sulphur dioxide. Number of cough episodes were enumerated for 5 minutes,after 30 minutes and

after one hour of so2 exposure. Collected data treated with the Student's t test.

Observation :

Table no 1 showing number of cough bouts count of standard drug at various interval

Sr. No.	Number of cough bouts for 5 minutes after so2 exposure	Number of cough bouts after 30 minutes	Number of cough bouts after one hour
A1	7	2	0
A2	8	1	0
A3	8	2	1
A4	7	1	2
A5	9	2	1
A6	7	2	0

Table no 2 showing number of cough bouts count of Bharangi test drug at various interval

Sr. No.	Number of cough bouts for 5 minutes after so2 exposure	Number of cough bouts after 30 minutes	Number of cough bouts after one hour
B1	7	2	0
B2	6	2	0
B3	8	2	0
B4	7	1	2
B5	8	3	1
B6	5	2	0

Result : Table 3 : Comparison of Standard drug with Bharangidecoction for number of cough bouts for 5 min. after exposure to SO_2

No. of cough bouts for 5 min. after exposure		
Sr.No.	**Standard drug**	**Bharangi**
1	A1-7	B1-7
2	A2-8	B2-6
3	A3-8	B3-8
4	A4-7	B4-7
5	A5-9	B5-8
6	A6-7	B6-5
Total	46	41
Mean	7.666666667	6.83333333
S.D.	0.816496581	1.169045194
p value	0.182790817	
Alpha	0.05	
Significance	Not significant	

Statistical Analysis

As the p-value is greater than 0.05 ($p > 0.05$), Null hypothesis (H0) is accepted suggesting that there is no difference between the means of two groups.

Table 4: Comparison of Standard drug with Bharangidecoction for no. of cough bouts after 30 min.

No. of cough bouts 30 min. after expose		
Sr. No.	**Standard drug**	**Bharangi**
1	A1-2	B1-2
2	A2-1	B2-2
3	A3-2	B3-2
4	A4-1	B4-1
5	A5-2	B5-3
6	A6-2	B6-2
Total	10	12
Mean	1.666666667	2
S.D.	0.516397779	0.632455532
p value	0.340893132	
Alpha	0.05	

Statistical Analysis

As the p-value is greater than 0.05 (p > 0.05), Null hypothesis (H0) is accepted suggesting that there is no difference between the means of two groups.

Table 5: Comparison of Standard drug with Bharangidecoction for no. of cough bouts after 1 hour

No. of cough bouts 30 min. after expose		
Sr. No.	**Standard drug**	**Bharangi**
1	A1-0	B1-0
2	A2-0	B2-0
3	A3-1	B3-0
4	A4-2	B4-2
5	A5-1	B5-1
6	A6-0	B6-0
Total	4	3
Mean	1.666666667	0.5
S.D.	0.816496581	0.836660027
p value	0.73416558	
Alpha	0.05	

Significance Not significant

Statistical Analysis

As the p-value is greater than 0.05 (p > 0.05), Null hypothesis (H0) is accepted suggesting that there is no difference between the means of two groups.

Discussion :

After comparing all the two groups, for various time interval, it can be stated that group B (Bharangi root decoction) is showing equal anti-tussive activity as compared to standard group A.

Conclusion :

Pre-clinical study data once again reconfirmed the efficacy of Bharangi drug as potent anti-tussive.

Acknowledgement:

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12. AN EXPERIMENTAL STUDY OF KASHAYA AND MADHUR SKANDHA DRAVYAS IN THE MANAGEMENT OF PARINAM SHULA (PEPTIC ULCER)

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Abstract :

Peptic ulcer is one of the burning problem to the community now a days. The term peptic ulcer applies to mucosal ulceration of the GI tract. Most ulcer occurs in the stomach or proximal duodenum. In Ayurveda Peptic ulcer comes in the category of *Shula*. This *shula* is divided into two ways 1. *Annadravakhyashool* 2. *Parinamshula* as mentioned by *Madhavakar.* Annadravakyashool means after taking food there will be pain ij abdomen because of food-vrana contact. And In parinamshoolthe pain in abdomen will be after digestion at the sight of small intestine. As Ayurvedic point of view regarding the treatment we have to treat ulcer by giving dravyas which are having *Shodhan, Ropan, Pittashaman, Manasikshanty, lekhan, Shoshan,Dahaprashaman* and *Anilapaha*. All these properties we find in *Kashaya* And *Madhur Rasatmaka Dravyas*. The effort has been made to see the properties and the action of these dravyas with suitable example.

Keywrds : *Kashaya, Madhur, Skandha, Shula*, Peptic Ulcer

Introduction :

There are following most important etiological factors which causes peptic ulcer these are

1. Hyper secretion of gastric juice - peptic ulcer develops in those are as of GI tract which come into contact with acid. No more acid no ulcer.
2. Mucosal infection by helicobacter pylori
3. Endocrine factor disturbances
4. Incidence of duodenal ulcer higher in anxiety prone personalities As per as treatment aspects of peptic ulcer is concerned the following treatment should have to be given

1. To neutralize, control and suppress acid secretion
2. Drugs which enhance mucosal defense factor
3. Eradication of H.Pylori from gastric juice
4. To heal ulcer
5. Relief from anxiety and mental stress

As per Ayurvedic point of view the drugs which are Kashayara satmak or Madhur Rasatmak can be used for the treatment of

Peptic ulcer.

Before giving such drugs we should know the properties. These are as follows according to Ayurvedic concepts

1. *Kashaya rasatmak dravyas* properties : *Ropan, Shodhan, Lekhan, Shoshan &Pittaprashaman*. These are Sanskrit terms the meaning of these are

Ropan - Healing, *Shodhan* - purification, *Lekhan* - curette, *Shoshan* - suction,

Pittaprashaman - to destroy extra secretions of the body In the following ways we can attribute these properties in peptic ulcer.

Microscopically the base of the ulcer consists of mucus and necrotic debris surround bed of granulation tissue and scar containing variable amount of inflammatory reaction.

Astringent property of drugs will act in the following way. By curette property they curette the necrotic debris and increase the blood supply to that region and help in healing.

By property of purification they purify the region which is infected by H.Pylori by destroying these organisms.

Pitta has to be taken as gastric juices and hormones. *Pittaprashaman* means these drugs controls the gastric acid secretion and hormones.

Shoshan means these drugs sucks the excessive *pitt*a (gastric juices)

1. *Kashaya rasatmak dravys* examples - *Udumbar, Plaksha, Parisha*

2. *Madhurrasatmak* properties of drugs and there action, *Rudhirmamsavardhnam* -to increase the blood and muscle, *Shadindriyaprasadan*-stress release, *Pittaprashaman*- to inhibit the excessive secretion of pitta, *Kshinkhsatsandhankar*- to help in healing of ulcer, *Dahaprashamanam*- elevates burning, *Anilapaha* - to brings the peristalsis to the normal position

Madhuradravya examples - Ipomea digitata, Phaseolusmungo, Traparapans, Agaricuscampestris, Cordiodichotoma, There may be three groups for the study

In first group give *madhurdravya*,in second group give *kashaydravyas*,in third group mix *madhur* and *kashayadravyas* and see the results.

The pharmacology of astringent drugs: the astringent because of their ability to participate superficial protein form a protective layer on mucus membrane. Bismuth salts are being commonly used for this purpose.

These are the agents which counteract muscular fibers. They also control abnormal secretion of mucus membranes such as those of stomach and of intestines.their action may be local,constitutional or remote.

Tannins: tannins are non nitrogenous plant constituents characterizes by their astringent action upon mucus membrane, they precipitate proteins from the cells of mucus membrane and thus exert a protective action.These substances are mostly useful in the treatment of diarrheas.

Astringent effect : (Precipitation of Proteins)

If the irritant,however,dissolves the precipitated proteins,the tissue damage is more extensive due to deeper penetration of the irritant .this effect is called as corrosive effect.Many concentrated acid and alkalis exert a corrosive effect.

13. VIRKSHAYURVEDA - AN INTRODUCTION TO ANCIENT PLANT SCIENCE

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ABSTRACT -
Ayurveda is way to live life. It deals with the life of man.Vrikshayurveda is branch of Ayurveda dealing with life of plants. The subjects dealt within this ancient science consist of collection and selection of seeds, sowing, germination, planting, nursing, selection of soil,manuring, pest and disease management, etc. The science of Vrikshayurveda was well developed even prior to 6th century. Unfortunately not a single text of that antiquity has been preserved. It is preserved by tradition only. In the present work, a critical review of Vrikshayurveda is taken.
Key words - Vrikshayurveda, Puranas, Nighantus

Introduction :

'SwasthasyaSwasthayaRakshanam, AtursyaVikarParimoksham' is the main objective of Ayurveda. Ayurveda is not just pathy to cure diseases, but it is the healthy life style designed by our great Rushi-Munis to make life suitable according to eco-climatic condition of our country.

Ayurveda has described the use of various herbs and their properties in treating human diseases. Herbal medicines are now widely used and possess a great global demand. This demand is mostly fulfilled by collecting medicines from forest. But increasing population, industrialization, commercialization and tremendous deforestation, the amount of herbal medicines is decreasing rapidly. Some Species are vanished because of their unlimited use and some are endangered; so it is very essential that these species should be protected and it is possible only when the herbal medicines are cultivated. The Medicinal plants should be cultivated in such a manner that they can be easily available in pure form at any time.

In order to achieve high yield and greater cash value a lot of inorganic compounds in the form of fertilizers, pesticides and insecticides are widely used in modern agricultural practices. But, it has been noticed that these practices have significant ill effect on plant's health, yield and soil grade. The final output of the same is to harm plants, human health and environment.

Ancient Indian science had described the use of herbs in treating various diseases of plants and animals. The field of Indian medicine dealing with plant health is termed as *Vrikshayurveda*. As the principles of Ayurveda are effectively applicable in today's lifestyle in treating human disease, it is interesting to study the effects and practical applicability of herbs in cultivation practices, plant health, plant yield. The cultivation of medicinal plants by methods described in *Vrikshayurveda* will also be very useful for mankind as it is free from harmful inorganic products. This will save the human from ill effects of fertilizers, pesticides and insecticides and also improve soil grade and there by the environment. *Vedas* are called as *Adya* that is first literature of the world. From Vedic era we find

that plants form a distinct component of immediate environment of Vedic Indians. As civilization began, research in Agriculture, Horticulture, also begun. *Vayu, Vrishti* and *Vriksha* are basic components of environment. In ancient India, along with Ayurveda, other branches of *Ayurveda* like V*rikshayurveda, Hastyayurveda, Ashwayurveda* were also developed, as our ancestors knew that for the balance of environment all its components should remain healthy. Today we call it ecosystem.

In *Vedic* literature we find types of soil, types of water and their resources, manures. This became the base of Agriculture and plant science. We find theories about the evolution of plants, about the nature of plant and the position of plants in the whole scheme of nature. Many references are available in these ancient texts from vegetation, features or habitat of plants, their use in varied areas of life.

The glory of plants is proclaimed in many *Puranas*. *Puranas* linked plants with God or Goddess thereby underlining sanctity of plants. *Matsyapuran* says that, one who plants trees attains *Mukti* and is never reborn on this earth. *Agni puran* also shares the same view. *Varahpuran* mentions that the person who plants the Banayan tree or ten Jasmine plants or five mango trees never goes to hell. *Padma puran* mentions the effects of planting specific trees along the roadside.

Human association with forests deepened their concern for the wealth of forest. They also started thinking about ailment of trees, their causes and cures. References to *Vrikshachikitsa* can be seen in many samhitas.*Charaksamhita* defines a physician as one who is well acquainted with the names and external features of plants and able to use them properly according to their properties.

In Ayurveda, treatise of *Charak, Sushrut* and *Vagbhata*, 1900 plant synonyms representing about 750 plants are mentioned. Nighantus are texts concerned only with plants, their synonyms, their medicinal properties .The *DhanvantariNighantu* says, the Physician does well to master *BheshajaVidya* by acquainting himself with various names of plants in *Sanskrit* and *Prakrit*,. *Raj Nighantu* described *AnupadiVarga*, *Dharanyadivarga* dealing with various types of soils, *PaniyadiVarga* dealing with various sources of water and the quality of water.

In *Varahmihir's Brihatsmhita* as well as in *Agnipuran* there are separate chapters dealing with *Vrikshayurveda. Kautiliya Arthashashtra* is a book discussing matters relating to Royal policy and the Governance. In this book, it is stated that the officer in charge of Agriculture, must attain the knowledge of *Vrikshayurveda*. In all three books we can see an exclusive section dealing with *Vrikshayurveda*. The subjects dealt within the ancient science of plant life consisted of collection and selection of seeds, germination and grafting, cutting, sowing, planting, nursing, selection of soil,manuring,cultivation of plants under favorable metrological conditions, pest and disease management, nomenclature, taxonomy and botanical novelties.

Resource books on Vrikshayurveda.

Brihatsamhita

Vrikshayurveda the science of plant life *Brihatsamhita* is a treatise in Sanskit compiled by *Varahmihir* in the 6th century.*Varahmihir* was an astronomer, astrologer and encyclopaedist. He flourished in the period 505-587 A.D. His patron king was *HarshaVikramaditya* of Ujjain who lived in 6th century A.D.*Brihatsamhita* deals with widely ranging subjects such as astronomy,

physics, geology, horticulture, archeology etc.

Brihatsamhita contains a chapter entitled *Vrikshayurveda*. It deals with the selection of land, collection and the treatment of seeds, sowing, cultivation planting reaping grafting, and the treatment of plant diseases.

In *"Brihatsamhita"*, the 55th *Adhyay* is *Vrikyayurdadhya*. In this chapter, he quoted about how the soil is prepared for plantation (Bri.sam. 55/2), RopanKal (55/06), Law regarding Ropan (55/07),RopanVidhi (55/8), Watering time (55/09), Pathology in plants (55/14), treatment of plants (55/15), sterility Treatment in plants (55/16), Experiment for plant growth (55/17-18), Beej RopanVidhi (55/19-20), Proper Nakshatras for Plantation (55/31) .

Upavan Vinod :

Upavan vinoda is chapter *Sharangdharpaddhati* written by *Sharangdhar*, belonging to the 13th century, is yet another ancient text. The author of this treatise *Sarangdhara* was a courities of king Hamira of *SakambhariDesh* (Bundelkhand) lived in 13th century A.D,(1283-13201). *Sharangdhar paddhati* deals with variety of subjects like medicine, politics, botany, physiology, etc.It almost covers the whole of human life in its most general as well as deeper aspect.

The chapter *Upavanvinoda* deals with an allied subject viz. arbori-horticulture. The chapter contains topics such as 1] Glory of trees 2] Selection of soil for planting various trees 3] Types of soil 4] Nourishment of plants 5] Plant diseases and remedies 6]Ground water sources and 7] Botanical marvels, etc.

Upavan vinoda is edited and translated by G.P.Majumdar (1935) in English and Borkar in Marathi.

Vrikshayurveda by Surpal :

This book was not available in India. The president of Asian Agriculture History Foundation, Secunderabad, Dr. Yashvant Nene, tried a lot to bring this book in India. He procured a manuscript of Vrikshayurveda of Surpala from Bodleian Library, Oxford, U.K. Dr. NaliniSadhale, translated this book in English and the above said institute published this book as Agri-History Bulletin No.1. Surapala is described as a scholar in the court of Bhimpala, a valorous and prominent king. Surapala is stated to be *Vaidyavidyavarenya*, a prominent physician. He is said to have earned reputation on account of *Siddhayogas*.

It is the manuscript on horticulture and botany and contains an interesting account of Selection of soil for planting various trees, Types of soil, Nourishment of plants, Plant diseases and remedies, Ground water sources, Botanical marvels, preparation of different kinds of manures, the kind of manure which should be applied to various crops, trees.

Thus *Upavanvinod* and *Vrikshayurved* by Surpal share almost all the topics.

KrishiSukti :

KrishiSukti is a Sanskit work on Agriculture which is narrated by the sage *Kashyapa* most probably in 8-9th centuryA.D. It is arranged in four parts and it contains the description and methodology of paddy cultivation, growing of vegetables, description of the order of eatables and uneatable things and the description of the rules containing information about the various oblations. *Bhatotpal* in his commentary on *Brihatsamhita*, called *Kashyap* as an authority on agriculture.

Amarkosha :

Amarkosh is a *Sanskrit* lexicon (6th century A.D) compiled by PanditAmarsimha and is also called as *Namalingnusasan*.The book comprises of 3 parts or *khandas* and is also called as *Khandakosha*.In its chapter *Bhoomivarga*,Twelve types of lands are described.These are Urvara (fertile), *Usara* (barren), *maru* (desert), *Aprahat* (fallow), *sadwala* (grassy), *pankila* (muddy), *jalprayamanup* (watey), *kachha* (land contigeous to water), *sharakara* (land full of pebbles and pieces of lime stone), *sarkarvati* (sandy), *nadimatrik* (land watered from river), and *devamatrik* (rain fed) depending upon the fertility of soil, Irrigation and physical charecteristics. *Vaishya* varg gives a comprehensive glimpse of classification of soil their suitability for the cultivation of specific crops.

Krishiparashara :

Krishiparashara is a *Sanskrit* work attributed to *sage Parashara* devoted exclusively to the different agricultural operations. It is difficult to determine authoritatively the date of this work. The most remarkable feature of this work is that it considers agriculture as merely depending on rainfall *'Vrishtimulakrishisarva'*. It describes the signs of immediate rainfall such as rising of ants from their holes, sudden crocking of frogs as well as particular position of the sun moon and other planets. Regarding seed collection, preservation and sowing, detailed rules and methodology which are of great practical value are mentioned in this book.

The science of *Vrikshayurveda* was well developed even prior to 6th century. Unfortunately not a single text of that antiquity has been preserved. It is preserved by tradition only.

Vrikshayurveda by Surpala and *Upavanvinoda by Sarandhara*, share almost all the topics. Many verses are identical and several others, although worded differently have an identical content. *Surpala* concludes the chapter with a note; these are from different sciences about *Vrikshayurveda*. Thus like *Surpala*, *Sarangdhara* too, admits that his work is a compilation from various texts on *Vrikshayurveda*.

Vrikshayurveda was the name of the text and the author was Surpala. The overwhelming resemblance between *Upavanvinoda* and *Vrikshayurveda* by *Surpala*, we can say that the science of *Vrikshayurveda* , was well developed in ancient India.

The following observations proved beyond doubt that such a branch of learning existed in ancient India.

We find references of this science in ancient Indian literature such as *Atharvaveda, Brihatsamhita of Varahmihira, Sarangdhara paddhati* of Sarangdhara, etc. which bring out the botanical and agricultural aspects; *Samhitas of Charak* and *Sushrut* which bring out the medicinal aspect; and *KoutiliyaArthashashtra*, *KrishiParashara*, *Buddhist Jatakas*,*Puranas (Matsya,Varah,Padma,Agni*,etc.), classical poetry like *Ramayana,Mahabharat*, which emphasize the economic, political, and socio-religious aspects. A subject so widely spread into so many branches of knowledge and so continuously preserved by tradition through a period spread over thousands of years must have a deep rooted and firm foundation in the culture itself in the form of a systematic and independently developed branch of science.

So, we can say such knowledge, especially folk beliefs and other ethno- botanical uses of plants

would help us understand plant-man-enviornment relationship for preserving biodiversity and knowledge bases for the use of future generations of humankind.

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14. ROLE OF PHYTOBIOTICS IN IMPROVING HEALTH STATUS OF BIRDS IN POULTRY FARMING AND TO REDUCE USE OF ANTIBIOTICS AND DRUG - A COST EFFECTIVE ANALYSIS.

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ABSTRACT :

The utilization of medicinal plants as old as human civilization. Plants are chemical store house that has a million of benefits including to cure various diseases. Along with the progress in the field of Domestic field demanded that all production costs must be optimized in order to produce an output is expected. Due to high cost of conventional medicines and vaccines coupled with the lack of knowledge on their use, these drugs are usually out of reach of the small-scale farmers particularly for backyard poultry farmers. There is therefore need for cheap easy to use and sustainable local poultry disease control programs. Herbal medicines use in domestic animals, in poultry farm is cheaper prizes and the good efficacy for the prevention or treatment of diseases related to poultry.
Furthermore, research required to devolved different feed additive from unknown herbals plants to increase benefits and good safe protein food to consumers as well as poultry industry growth. In this article here we try to enlightened focus on herbal medicine in poultry farm.

KEYWORDS : Photobiotic, health status, reduce use of antibiotic, cost effective.

INTRODUCTION :

Due to high cost of conventional medicines and vaccines coupled with the lack of knowledge on their use, these drugs are usually out of reach of the small-scale farmers particularly for backyard poultry farmers. There is therefore need for cheap easy to use and sustainable local poultry disease control programs. Since ancient times, plants and plant parts have an indispensable source of medicine for indigenous poultry production systems. Although modern medical science has developed to a great extent, many farmers in India depend on plant parts and herbal remedies for indigenous poultry health management. Unfortunately, local medical traditions are being lost because they are communicated orally from generation to generation and are largely undocumented. Very little has been done to verify and validate information gathered. There is therefore need for cheap easy to use and sustainable local poultry disease control programs. Popular demand and scientific significance

for organic poultry production, particularly feeding with medicinal botanicals have increased considerably in recent years to the production of the synthetic chemical used in poultry industries. Herbs can be used as a good alternative therapeutic aid to costly allopathic medicines/chemotherapy and boosting immune functions in intoxicated conditions and can also effectively complement allopathic medicines in diseased state. Traditional medicines have the potential to improve the growth as well as health status of the birds. Ethno veterinary practices involve the traditional beliefs, knowledge, practices and skills pertaining to healthcare and management of livestock and poultry. The antimicrobial exercise of herbs and spices Ginger, Cumin, Clove, Garlic, Pepper, Coriander, Mustard, Cinnamon, Oregano, Rosemary, Sage, Thyme. Garlic has more solid antimicrobial activities in the digestive tract than different herbs and spices

In present days poultry industry faces so many problems like -

- Increasing cost of drug and feed.
- Maintaining health status of bird.
- Market Value.

There is a need to focus on maintaining health status so, there will be automatic reduction in final budget and maintenance. Health management is a chief important part of poultry industry because it affects on productivity and ultimate economic structure. For poultry health management to be effective following principles are to be followed-

- Proper vaccination
- Temperature maintenance, cleanliness and ventilation.
- Prevention of infection.
- Early recognition of disease.
- Early treatment of disease.

As in Ayurved the main motto is "SwasthasyaSwasthyarakshanam". So it has to be applied on animals also. So, there is a big need to focus on prevention of disease first by using natural parameters which are easily available around us. Usually using sub- therapeutics antibiotics, anti microbial agents and growth promoters on broiler. They show rapid growth , weight gain but there use have also shown many disadvantages like high cost, adverse side effect on health of bird , long residual properties and carcinogenic effect on humans. The World Health Organization declared its intention has to reduce the overuse and misuse of anti- microbial in food animals for the protection of human health. So, there is a need to find alternative for antibiotics. There is a need of Researches which concentrate on the use of our ancient medicinal system to find herbs and plant which can safely use to increase health status and productivity of animal science.

Phytobiotics are herbal products derived from the medicinal plants.

Medicinal plants are cheap and renewable source of pharmacologically active substances are known to produce certain chemical that are naturally toxic to bacteria. The beneficial effects of disease preventing phytobiotics arises from

- Activation of food intake and secretion of digestive enzyme.
- Immune system stimulation.
- Anti bacterial

- Anti-viral

AIM :

To assess the combine effect of phytobiotics (herbal plant extract) like Turmeric, neem, garlic+ginger+mint+black pepper in maintaining health status of birds in poultry farm.

OBJECTIVE :

- **Primary :** To assess the effect of above herbals in maintaining bird health in comparison with the existing antibiotics like penicillin, amphicillin, amoxicillin etc.
- **Secondary :** To find out the solution for reducing financial budget for farmer especially for poultry farmers.

HYPOTHESIS :

Use of herbal plant as preventing measure in poultry diseases and their effectiveness immune inducer, antibacterial , antiviral and growth promoter.

Study design :

Interventional economical animal study.

Material and methods :

Study was carried out on poultry bird in 2 different batches , each batch consist of 50 birds .Batch done according to supply of antibiotics and herbal plant extract and study was carried out at Mauli Poultry Farm , at post Ukkadgaon, Taluka-Barshi , District- Solapur.

Materials used are:

1. Turmeric powder mixed with feed
2. Neem juice in water
3. Ginger + garlic +black pepper + mint extract mixed with water
4. Alcohol with water
5. Jaggary with water

Preparation method of medicine

1. Use of fresh herbal extracts/ juice with water
2. Use of dried herbals in powder form with feed
3. Kwathkalpana

Dosage and duration of medicine :

1. Jiggery with water

Dose - 100 g/1 lit of water

Duration - From 1st day to 3rd day only

Assessment - act as electrolyte

2. Turmeric powder

Dose - 150 g /Quintal feed

Duration-. Daily

Assessment- Reduce e coli count,
Worm infection
Act as anti-biotic.

3. Neem Juice

Dose - 15gm fresh leaves used to make 100 ml juices.
Duration- Per week
Assessment - Act as anti pyretic
Increase food consumption ratio.
Anti viral.
Hepato protective.

4. Ginger + pepper +Garlic +Mint extract

Dose - All are taken separately as 5 gm to make 100 ml juices.
Duration - Per 10 days
Assessment -increase in food consumption ratio (FCR) Shows growth promoting efficiency.

5. Alcohol with water

Dose - 100ml in 100 lit of water
Duration - Per week
Assessment - helpful in loss of appetite.
Helpful to maintain body temperature.

Drugs used and its Properties-

Drugs	Activity
1. Nimb(Azadirachta indica)	Immuno-modulatory, Antiviral, Antibacterial, Hepato protective, Jwaraghna because of Tikta rasa.
2. Haridra (Curcuma longa)	Increases palatability of food, Works on digestive system by Deepenkarya, Acts as Antibiotic, prevent influenza infection.
3. Aadrak(Zingiberoffincinale)	Increases appetite, Acts good in E-coli and Rhinitis infection, Deepen-Pachan, Stimulate immune system.
4. Pudina (Menthapiperita)	High growth promoting efficiency, Increases food consumption ratio and also acts on Respiratory system.
5. Marich (Piper nigrum)	Helps in maintaining body temperature, Deepan-Pachan, Improves digestive system.
6. Rason (Aliumsativum)	Works on digestive system, Works against rhinitis, Increases car diovascular activity.
7. Madya (Alcohol)	Good appetizer, Maintain body tem perature.

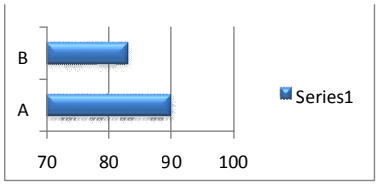
Inclusive criteria : Not applicable
Exclusive criteria : Not applicable

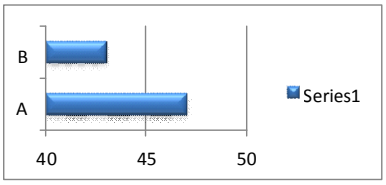
Parameters :

1. Number of birds affected with any illness an infection during trial period.
2. Mortality rate of birds.
3. Final weight gain at 48th day.
4. Food consumption ratio.
5. Average daily weight gain.
6. Average daily feed intake.
7. Average daily water intake.
8. Financial expenditure.

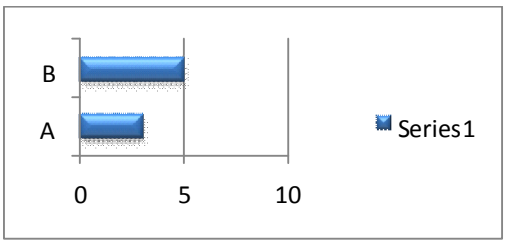
Observation -

1) Average daily feed intake (gm) 2) Average daily weight gain (gm)





3) Mortality rate



Parameters	Results after use of phytobiotics	Results after use of Modern Antibiotic Drugs
1.No. of birds affected with any illness or infection during trial period	No any such infections seen	E-coli, Rhinitis infections are commonly seen
2.Mortality rate	3%	5-6%
3Final weight gain	2.45-2.5 kg/per bird	2.35-2.4 kg/per bird
4.Average daily feed intake	88-89 gm	80 gm
5.Average daily water intake	200 ml	180 ml
6.Average daily weight gain	46-47 gm	43-44 gm
7.Feed consumption in 48 days	4kg	3.7 kg
8.Financial expenditure	57-58 Rs/per bird	65-66 Rs/per bird

RESULT & DISCUSSION:

RESULT & DISCUSSION :

Present study shows use of above combination improves performance, feed utilization. They are good immunity enhancer, growth promoter and decreases mortality rate. Therefore, this combination can serve as an effective replacement for chemical based growth promoters and drugs.

Utility of Herbal Drugs -

1. Helps in early prevention of diseases and infection.
2. Improves health status better than other APGs.
3. To try Organic poultry management.
4. Avoiding Intolerance to Antibiotics.

Benefit to society -

1. Providing food which is devoid of antibiotics.
2. Providing healthy food which doesn't have hazardous effect on health.
3. No risk of Drug Resistance.

Cost effectiveness -

1. As compared to costly drugs it is cost effective and more beneficial.
2. Reduces extra maintenance.
3. Budget Graph (Rs).

CONCLUSION :

Herbal medicine can be an alternative herbal drug instead of modern drugs because it can increase the liveability of the chicken as shown in Mortality percentage.

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15. ETHNO - MEDICINAL USES OF ECHINOPS ECHINATUS ROXB

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Abstract :
The medicinal plants survey was administered in Hingoli district of Maharashtra state for documentation the knowledge regarding medicinal plants species used against different diseases.The present studyprovides information about ethno medicinal uses of Echinopsechinatus Roxb. documented from district. It is commonly known as *Utkatari* which is belongs to the family Asteraceae
Key Word : Diseases, Hingoli, knowledge, Medicinal uses.

Introduction :

The man has close relation with nature and dependent on plants for fundamental needs from the time unknown. Plants are the fundamental source of food and energy, clothing and shelter, lifesaving drugs, flavouring and even the oxygen, that we breathe. The plants which possess the property of pharmacological effect on human body against ailments is called the medicinal plants. Medicinal plants are naturally known to produce the secondary metabolites such as alkaloids, sterols, terpenes, flavonoids, saponins, glycosides, tannins, resins, lactones, quinines, volatile oil etc. which shows pharmacological effect against various ailments and may cure different diseases. Plants are richest bioresources of drug for traditional system of medicine, modern medicine, food supplements, folk medicine, pharmaceutical intermediates, and chemical entities for synthetic drugs.

The synthetic drugs are considered to have more side effects to human being. Therefore, the medicines of herbal origin are used in many developed countries. The use of such drugs is increasing day by day. Various drugs are prepared from the medicinal plants in many countries of the worlds. Medicinal plants and traditional medicine has become mainstay of health care in many developing countries. Recently World Health Organization (WHO) estimated that 80% of population depends on medicines of herbal origin for their primary health care. Due to changed life styles, majority populations in developing countries are suffering with various new and medicine resistant diseases. Therefore, the demand of non-toxic or side effect less medicinal plants has been increased. All the collected data were compared with the pertinent literature (Bhuktar 2001, 2002, 2003; Jayshree 2011.Chavan et. al.2021). the identification of plant was done with the help of various floras (Naik 1979, 1998; Sharma 1998; Singh 2000, 2001.).

Botanical Description :

Family : Asteraceae

Echinopsechinatus Roxb. Fl. Ind. vol. 2. 3: 447. 1832; Hook.f. Fl. Brit. India 3: 358. 1881; Naik, Fl. Osmanabad 184. 1979 and Fl. Marathwada 1: 475. 1998; Shirodkar&Lakshmin. in Singh et al., Fl. Maharashtra St. Dicot. 2: 207. 2001; M. R. Almeida, Fl. Mah. III A: 99. 2001.

Local Name :

- Gujarati: Shuliyo, Utkanto, Utkato
- Hindi: Gokhru, Uthkanta, Utakatira
- Sanskrit: Kantalu, Kantaphala, Utati, Utkantaka,
- Urdu: Barhamdandi, Labh, Untkatara,
- Marathi: Utkatari
- Telugu: Brahmadandi
- Kannada: Brahmadande

Much-branched, rigid, annual herbs. Leaves alternate, sessile, oblong, lyrate or deeply pinnatifid; lobes triangular-oblong, sinuate, spinous pointed. Compound heads globose, on stout peduncles. Involucralbracts of individual simple heads scale-like; outer oblanceolate; intermediate bracts of ten turned into sharp spines. Florets bisexual with tubular, 5-lobed, white corolla; lobes of the corolla linear, acute. Achenes obconic, densely villous at base. Pappus short, brush-like.

Fls. &Frts.: November-March.

Uses Recorded from study area:The one teaspoon root powder is given orally at morning for fifteen days to cure piles and one teaspoon root powder is given at morning and evening for two to three days on fever in children.

Medicinal Uses :

It is used in malarial fever, skin diseases and wound healing. Root paste thought to facilitate childbirth (Singh, 2010). Root powder in water is given orally twice in a day in headache (Bagul, 2013). The root powder is given internally after parturition as a tonic and restoration of vagina and uterus. Entire plant decoction is given orally as abortifacient (Mali, 2011). Fresh root decoction is given two times in day to cure urinary problems (Punjani, 2010). antidiabetic, antihypertensive, analgesic, anti-inflammatory, antifungal activity, hepatoprotective, antifertility, antioxidant, diuretic and protective effects (Hamsalakshmi et al.2018).The root and seed are used for the treatment of sexual disability and aphrodisiac (Maurya, et al 2015).

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16. ROLE OF PHARMACOVIGILANCE FOR HERBAL MEDICINES : CONCEPT AND REGULATION

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Abstract :
Introduction : Worldwide the hazards of the drugs and medical therapies are monitored strictly to reduce the patient's mortality or the untoward adverse effects of the drugs. It is commonly considered that as compared to the modern drugs the Ayurvedic drugs show the less adverse effect on the human recipients. Due to the popularity of the Ayurvedic drugs and due to increase in demand of these from the community the chances of adulteration and malpractice in the manufacturing and distribution are increasing. However, incidence of adverse drug reaction owing to the consumption of traditional herbal drug led to the origin of Pharmacovigilance of herbal drug.
Material and methods :
The concept of Pharmacovigilance:Pharmacovigilance also known as Drug safety is the science relating to the detection, assessment, monitoring and prevention of adverse effects with Pharmaceutical products.
ADR : The adverse drug reaction in Ayurveda could be due to drug interaction,iatrogenic effect, drug overdose,administration of crude drug, contaminated state and therapeutic procedural complications.Also subjective variation,irrational use, adulteration,poor quality of drugs and inadequate clinical research necessitates the practice of Pharmacovigilance in Ayurveda.
Conclusion : Pharmacovigilance is needed for the prevention of drug induced harmful effect and to avoid financial risks associated with unexpected adverse effect. Herbal medicine on the market need continuous monitoring in every country.During the recent past considering the significance of pharmacovigilance in Ayurveda and indigenous systems of medicine,a national pharmacovigilance unit of ASU(Ayurveda, Siddha,Unani) system of medicine has been initiated at Gujrat Ayurveda University in the year 2008.
Keywords : Pharmacovigilance, Herbal drug, Adverse drug reaction, patient safety, ASU drug.

Introduction :

Pharmacovigilance is the science and activities relating to the collection, detection,assessment, understanding and prevention of adverse effects of drugs or any other possible drug related-problem. Recently its concerns have been widened to include herbals, traditional and complementary medicine.1

The history of the use of herbs as medication is as old as history. In our classics state that the use of herbs for medical treatment began over 4000 year ago. One form of traditional Indian medicine is called Ayurvedic. A combination of European, Chinese, Ayurvedic and other unconventional treatments influenced the use of herbs to the present day. Adverse events may also arise from the misuse

of the wrong species of medicinal plants, incorrect dosing, error in the use of herbal medicines by healthcare provider and consumers, interaction with other medicines and use of products contaminated with potentially hazardous substances such as toxic metals, pathogenic micro-organism and agrochemical residues.

The following examples demonstrate the range of problems encountered with the use of herbal medicines and products.

- Some herbal products were found to contain 0.1 to 0.3 mg of Betamethasone per capsule after some patients developed corti costeroid like side-effect.
- Owing to misidentification of the medicinal plant species, plant containing aristolochis acid were used for manufacturing herbal products which caused severe kidney failure in patients in several countries. List of the unapproved Ayurvedic medicinal products found on the Canadian market which have been analysed by health Canada and found to contain high level of lead mercury and arsenic are as follows.
- Karela tablets produced by Shriji Herbal Product, India.
- Karela capsule produced by Himalaya Drug, India.
- Mahasudarshanchurna powder produced by ZanduPharmaceutical, Mumbai
- Yograjguggul tablet by ZanduPharmaceutical, Mumbai

Need of Pharmacovigilance in herbal products :

In order to provide consistency in the naming of herbs in adverse reaction reports (AR), The WHO collaborating centre for International drug monitoring has recommended the use of proper scientific binomial names for used in medicine including the use of such name in the coding of AR reports.3 This would ensure comparability between reports from various international pharmacovigilance database.It is equally important for the authors of published AR case reports to identify the specific products involved, including label and manufacturer information ,specific ingredients and dose employed.

Why Pharmacovigilance?

The information collected during the pre-marketing phase of a medical drug is inevitably incomplete with regard to possible adverse reactions.

- Test in animals are insufficiently predictive of human safety.
- In clinical trial patients are selected and limited in number, the condition of use differs from those in clinical practice and the duration of trials is limited.
- Information about rare but serious adverse reaction, chronic toxicity, use in special group (such as children, the elderly or pregnant women) or drug interaction is often incomplete or not available

Pharmacovigilance is needed in every country because there is difference between countries and even region with in countries in the occurrence of adverse drug reaction and other drug related problem. Pharmacovigilance is needed for the prevention of drug induced harmful effect and to avoid financial risks associated with unexpected adverse effect. In conclusion medicine on the market need continuous monitoring in every country.

Material and Methods :

The difference between Drug related side effect and Adverse effects

Side effects of a drug: side effects are the unintended effects that occur when you take the standard dose of a medication.They are usually related to the way the medicine works and therefore can sometimes be expected to occur. e.g. Antibiotics can alter the good bacteria in the intestine and cause gastric side effects.

Adverse effects or events : They are the harmful effects that occur unexpectedly while taking the normal dose of a medication. They are not related to drug's action, so they may or may not have any relationship with the treatment.

Adverse drug reaction (ADR) **:** Any response which is noxious, unintended and which occurs at doses normally used in humans for prophylaxis, diagnosis or therapy of disease, or for modification of physiological function.

Methods in Pharmacovigilance : There are four methods

1. Passive surveillance
2. Active surveillance
3. Cohort event monitoring
4. Targeted Clinical Investigations

1. Passive Surveillance : It involve the usage of spontaneous adverse event reports voluntarily sent by healthcare professionals or patients to the marketing authorization holder or regulatory authority. Here, data related to the adverse reactions are collected in a central or regional database. The identity of the reporter remains anonymous, but patient related details like country, age, gender, and pre-existing co- morbidities can be recovered from the reporting forms.

Examples of spontaneous reporting systems include the-

1. FAERS (FDA Adverse Event Reporting System) database run by FDA
2. VigiBase, the WHO Global Individual Case Safety Report (ICSR) database
3. For Europe:EudraVigilance maintained by European Medicines Agency
4. Currently, there are no specific spontaneous reporting systems available for India. (Selected eligible medical colleges, hospitals and centres were approved as ADR Monitoring Centres. They collect the Individual Case Safety Reports (ICSRs), analyse them and report them to regulatory the authority. The technical associate from Medical Sciences, Banaras Hindu University is also an authorized person for collecting ICSRs along with its follow up and online database entry in Vigi-Flow software).

2. Active Surveillance :

This method aims to monitor certain specific drug -related adverse events and seeks to ascertain the number of adverse drug reactions entirely through a pre-planned process. It iscommonly known as toxicity monitoring or safety monitoring.

3. Cohort Event Monitoring :

In this method, the surveillance study is Planned prior to beginning the treatment with the medication. A group of people are exposed to a drug for a defined period and actively followed up during

treatment. Adverse events of the target drug or the events associated with one or more medicines taken with that drug are monitored.

4. Targeted Clinical Investigations:

These kinds of investigations are performed to identify and characterize the adverse reactions related to a drug among special populations like people with some genetic disorders, pregnant women and older people.

The steps involved in the adverse event case processing

The workflow of pharmacovigilance case processing involves three key steps.

- Data management,
- Assessment of the relationship between the Drug and ADR
- Timely Reporting to all Concerned Parties and Regulatory Authorities

Data management : The data management includes collecting ADR reports, verifying and organizing relevant details from the report and assignment of specific international codes to ADR and drug names.

Assessment of the relationship between the Drug and ADR : This steps involve deriving the link between the suspected ADR and the suspected Drug. Resources such as patient details, finding from the existing scientific literature and results from the laboratory tests are used in this process.

Timely Reporting to all Concerned Parties and Regulatory Authorities: This is the end goal of using pharmacovigilance systems. Experts use many kinds of statistical measures to check whether a drug had created a considerable number of ADR cases. Once it is found that a significant number of ADR cases are reported for a drug, timely reporting to all the concerned parties and regulatory authorities is made by the professionals.

Herbals concept of Adverse effect :

An AR is defined as a noxious and unintended response to a marketed health product, which occurs at doses normally used or tested for the diagnosis, treatment or prevention of a disease.4 It is undeniable that plants have an important role in the development of modern medicines. More than 60 to 70% of modern medicines in the world market are directly or indirectly derived from plant products. High profile issues such as ARs associated with Ephedra and Aristo lochia have shown that HMPs(herbal medicine products) can produce toxicity in human beings. The most common adverse effect reported are hepatic and renal problem. However, it is difficult to identify the causative agent associated with the ARs encountered because traditional herbal preparations often contain multiple ingredients,and from different Pharmacy without standardization are sold in the market. The WHO database has over sixteen thousand suspected herbal case reports. Due to the lack of clinical trials for most HMPs, post market pharmacovigilance is a critical source of safety information, however the assessment of ARs associated with HMPs offers unique challenges in the quantity and quality of available information.

Pharmacovigilance across the Globe :

Every country has its own pharmacovigilance system based on WHO guidelines. Let us see how some countries maintain their Pharmacovigilance systems.

1. Europe : In Europe, the European Medicines Agency coordinates and maintain the Pharmacovigilance database called EudraVigilance, which contains the records of all the suspected adverse drug reactions. It also includes a separate database for veterinary adverse drug reactions.

2. United States: The United States uses a multi-faceted approach to maintain pharmacovigilance systems that include FDA, the pharmaceutical manufacturers, academic/non-profit organization and public citizens. Case reports related to adverse drug reactions are collected and managed by the US FDA.

3. India : In 2004, the Central Drugs Standard Control Organization(CDSCO) along with the Ministry of Health and Family Welfare, Govt.ofIndia, launched the National Pharmacovigilance Programme NPP) based on the WHO recommendations. The pharmacovigilance system is maintained by dividing the whole country into zones and regions.

Discussion :

Herbal formulation being widely accepted therapeutic agents as antidiabetics, antiarthritics,hepatoprotective, memory enhancers and adaptogens. The commonest myth regarding herbal medicines is that these medicine are completely safe and can therefore be safely consumed by patient on own without a physician prescription, this often leading to side-effect, or unwanted effects. There is increasing awareness at several levels of the need to develop pharmacovigilance practices for herbal medicine.The current model of pharmacovigilance and its associated tools have been developed in relation to synthetic drugs and applying these methods to monitoring the safety of herbal medicines present unique challenges in addition to those described for conventional medicines. Several problems relate to the ways in which herbal medicines are named, perceived, sourced and utilized. This may be because of differences in the use of nonorthodox drugs (herbal remedies) which may pose special toxicological problems when used alone or in combination with other drugs. The purpose of pharmacovigilance is to detect, assess, and understand and to prevent the adverse effect related to herbal, traditional and complementary medicines

Conclusion :

There are several ways in which we can move forward in attempting to provoke pharmacovigilance in herbals.

1. Introduce pharmacovigilance concepts into the curriculum of herbal at the undergraduate and postgraduate level.
2. Make reporting of adverse reactions to regulatory mandatory for herbal formulations.
3. Human resource development is a key feature for the success of this enterprise. It will be necessary to train herbal experts in the science of pharmacovigilance and include them not only in reporting but also in assessment of the adverse reactions.
4. Healthcare professionals should remain vigilant for potential interactions between herbals and prescription medications, especially when it involves medications with narrow therapeutic indices.

Due to the wide use and easy availability of herbal medicines, herbal toxicity has become an issue of concern. The safety and quality of herbal medicine should be ensured through greater research, pharmacovigilance, greater regulatory control and better communication between patientsand health professionals.Pharmacovigilance in herbal medicine in India is perhaps an unthought-of concept as yet,we do not need 'Herbal thalidomide' to wake the pharmacovigilance community to the need of the hour.

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17. INTELLECTUAL PROPERTY RIGHTS : AN INTRODUCTION

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Abstract :

India is reach in natural resources, biodiversity, intelligence and culture since ancient times. Hman civilization is based on the facts of culture, integrity, technlogical developement, health sciences and respective financial aspects. Intellectual property rights (IPR) have been defined as ideas, inventions, and creative expressions based on which there is a public willingness to bestow the status of property. There are several types of intellectual property protection like patent, Trademarks, Designs, Layout design of semiconductor integrated circuit, Geographic indications of source, Copyright and related rights, Biological diversity, Plant varieties and farmers rights, andTrade secret etc. Each industry should evolve its own IPR policies, management style, strategies, and so on depending on its area of specialty.

Key words : Intellectual property rights, Ayurveda, Inventions,

INTRODUCTION :

Intellectual property rights (IPR) have been defined as ideas, inventions, and creative expressions based on which there is a public willingness to bestow the status of property. IPR provide certain exclusive rights to the inventors or creators of that property, in order to enable them to reap commercial benefits from their creative efforts or reputation. There are several types of intellectual property protection like patent, copyright, trademark, etc. Each industry should evolve its own IPR policies, management style, strategies, and so on depending on its area of specialty.

The process of Import & Export of Drugs in any country including India is a lengthy process involving the various reviewing and registration processes. The D & C rules (1945) prescribe various procedures for getting a drug approved to be imported/exported for human-veterinary use in the country. The rules are very clear prescribing the procedure to be adopted in this regard however; it is a tedious task to follow the procedures systematically and to meet the requirements. Latest amendments are given by the CDSCO according to the current Laws and Trading strategies for the approval for Import/Export in India. The procedure and requirements vary considerably depending on the status of the Drug Applied.

What is Intellectual property (IP)?

Property designates those things that are commonly recognized/as being the possessions of an individual or a group, A right of ownership is associated with property that establishes the good as being one's own thing" in relation to other individuals or groups, assuring the owner the right to dispense with the property in a manner he or she deems fit, whether to use or not use, exclude others from using, or to transfer ownership.

Properties are of two types - tangible property and intangible property i.e. one that is physically present and the other which is not in any physical form) Building, land, house, cash, jewellery are few examples of tangible properties which can be seen and felt physically. On the other hand there is a kind of valuable property that cannot be felt physically as it does not have a physical form. Intellectual property is one of the forms of intangible property which commands a material value which can also be higher than the value of a tangible asset or property. IPR denotes 'INTELLECTUAL PROPERTY RIGHT', which is a term used for various legal entitlements which attach to certain types of information, ideas, or other intangibles in their expressed form

Intellectual property (IP) refers to creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.

Intellectual property rights (IPR) can be defined as the rights given to people over the creation of their minds arising with their intellect.

The objective of intellectual property law is to grant incentive to the creator of work. Inventive activity is supposed to result in innovation, which further leads to technological advancement, industrial development and economic welfare. The holder of this legal entitlement is generally entitled to exercise various exclusive rights in relation to the subject matter of the Intellectual Property. The term intellectual property reflects the idea that this subject matter is the product of the mind or the intellect, and that Intellectual Property rights may be protected at law in the same way as any other form of property. Intellectual property laws vary from jurisdiction to jurisdiction, such that the acquisition, registration or enforcement of IP rights must be pursued or obtained separately in each territory of interest.

Intellectual property rights (IPR) can be defined as the rights given to people over the creation of their minds. They usually give the creator an exclusive right over the use of his/her creations for a certain period of time.

Importance and need for protecting Intellectual property :

- Lack of IPR awareness results in high risk of infringement, economic loss the death of inventions and decline of an intellectual era in the country. Thus, there is a great need for dissemination of IPR information so as to boost indigenous inventions and developments in the field of research and technology.
- In wake of globalization , it is utmost important to be ahead in innovations and creativeness to compete the stiff competitions in technology and trade.
- The development of any society directly depends on lPR and it policy frame work.
- IPR is essential to establish enterprise/ business and identity through branding strategy.
- IP protection prevents competitors from imitating products or services.
- Access useful technology through IP information and licensing arrangements and avoid wasteful investment in R&D.
- Enhancing value of company through effective IP asset valuation and management .
- Enhancing access to venture capital and other sources of finance.

Need for protecting intellectual property :

Any type of invention or creation is just not outcome of intellectual thinking but also require lot of

time energy and effort of a person. Time taken for an invention can vary from few minutes or days to many years. In addition, any creative work involves capital investment and of course the education or knowledge. All these things add up to a huge investment on the part of any creative professional. If the invention is outcome of an organizational Research and Development process then establishing infrastructure. procurement of instruments, manpower etc. amounts to huge financial investments. Thus, it becomes very important and essential to recognize, respect and allow the creator to reap all the benefits including financial benefits for his or her intellect, time and effort.

How to protect Intellectual property?

There is an extensive national and international system for defining, protecting, and enforcing intellectual property rights, comprising both multilateral treaty schemes and international organizations. The World Intellectual Property Organization (WIP0) was established, in 1967, as an agency of the United Nations. Since then the term really began to be used in the United States. India has its own patent act (1970) which is revised and made to protect the interest of our country. Other international organizations which exits for enforcement of IPR are Trade Related Aspects of Intellectual Property Rights (TRIPS), World Intellectual Property Organization (WIPO), World Customs Organization (WCO). United Nations Commission on International Trade Law (UNCITRAL), World Trade Organization (WTO) and European Union.

Categories of Intellectual Properties: On the basis of type of invention and creation of human mind and their applications the intellectual property rights are classified as follows .

1. Patents.
2. Trademarks,
3. Designs,
4. Layout design of semiconductor integrated circuit,
5. Geographic indications of source,
6. Copyright and related rights (literary and artistic works, musical work, artistic wonk photo graphic work, motion pictures, computer programmes and performing arts andbroadcasting work)
7. Biological diversity
8. Plant varieties and farmers rights
9. Trade secret (Undisclosed information)

Although one has to register IPR at legal authority in some presentable or tangible form to claim their benefits. Each type of IPR gives especial rights to its inventor and or creator to sustain and harvest economic benefits which further motivates skill and societal developments.

1. PATENT :

Patent is an exclusive right granted for an invention -a product or process that provides a new way of doing something , or that offers a new technical solution to a problem. Criteria for getting a patent are 1. Novelty, 2. Non- obviousness and 3 . Unity,

An invention must fulfill the following conditions to be protected by a patent. It must be of practical use (Utility); it must show an clement of "novelty" (Novel), meaning some new characteristic that is not part of the body of existing knowledge in its particular technical field. That body of existing

knowledge is called "prior art". The invention must show an "inventive step" that could not be deduced by a person with average knowledge of the technical field (non-obviousness). its subject matter must be accepted as "patentable" under law. In many countries, scientific theories, mathematical methods, plant or animal varieties, discoveries of natural substances, commercial methods or methods of medical treatment (as opposed to medical products) are not generally patentable.
Patents are granted by national patent offices or by regional offices that carry out examination work for a group of countries. Protection is territorial and is granted for a limited period, generally 20 years

2. TRADEMARKS :

A trademark is a distinctive sign that identifies certain goods or services produced or provided by an individual or a company. Its origin dates back to ancient times when craftsmen reproduced their signatures, or "marks", on their artistic works or products of a functional or practical nature. Over the years, these marks have evolved into today's system of trademark registration and protection.
The system helps consumers to identify and purchase a product or service based on whether its specific characteristics and quality - as indicated by its unique trademark - meet their needs.
Term of every trademark registration is (10 years from the date of making of the application which is deemed to be the date of registration.

3. DESIGNS :

A Design refers to the features of shape, configuration, pattern, ornamentation or composition of lines or colours applied to any article, whether in two or three dimensional (or both) forms. This may be applied by any industrial process or means (manual, mechanical or chemical) separately or by a combined process, which in the finished article appeals to and judged solely by the eye. The essential purpose of design law it to promote and protect the design element of industrial production. It is also intended to promote innovative activity in the field of industries. Designs are applied to a wide variety of products of different industries like handicrafts, medical instruments, watches, jewellery, house wares, electrical appliances, vehicles and architectural structures. An industrial design is primarily for aesthetic features.

4. LAYOUT DESIGN OF SEMICONDUCTOR INTEGRATED CIRCUIT :

Semiconductor Integrated Circuit means a product having transistors and other circuitry elements, which are inseparably formed on a semiconductor material or an insulating material or inside the semiconductor material and designed to perform an electronic circuitry function.
The layout-design of a semiconductor integrated circuit means a layout of transistors and other circuitry elements and includes lead wires connecting such elements and expressed in any manner in semiconductor integrated circuits.
The layout of transistors on the semiconductor integrated circuit or topography of transistors on the integrated circuit determines the size of the integrated circuit as well as its processing power. That is why the layout design of transistors constitutes such an important and unique form of intellectual property fundamentally different from other forms of intellectual property like copyrights, patents, trademarks and industrial designs.

The Semiconductor Integrated Circuits Layout-Design Act, 2000 was passed to fulfill India's obligations as a TRIPS signatory. It provides protection for semiconductor Integrated Circuit layout designs. The main purpose of the Act is to provide for routes and mechanism for protection of IPR in Chip Layout Designs created and matters related to it.

5. GEOGRAPHIC INDICATIONS OF SOURCE :

Geographical Indications of Goods are defined as that aspect of industrial property which refers to the geographical indication referring to a country or to a place situated therein as being the country or place of origin of that product.\ It is just an indication that the product originates from a definite geographical territory. It is used to identify agricultural, natural or manufactured goods produced or processed or prepared in that territory with a special quality or reputation or other characteristics.
Examples of Indian Geographical Indications - Solapur Chaddar,
Solapur Terry Towel, Basmati Rice, Darjeeling Tea, Kanchipuram Silk Saree, Alphanso Mango, Nagpur Orange, Mysore silk Saree etc
The primary purpose of this Act in India is to provide legal protection to Indian Geographical Indications which in turn boost exports. Registration of Geographical indication promotes economic prosperity of producers of goods produced in a geographical territory.
The authorized users can exercise the exclusive right to use the geographical indication.
The registration of a geographical indication is valid for a period of 10 years. It can be renewed from time to time for further period of 10 years each. If a registered geographical indication is not renewed it is liable to be removed from the register. Unlike other IPRs which are granted to a person or company, geographical indication is a "guarantee to consumers" that a product was produced in a certain place and has certain characteristics that are due to that place of production. It may be used by all producers who make products that share certain qualities in the place designated by a geographical indication

6. COPYRIGHT :

Copyright is the set of exclusive rights granted to the author or creator of an original work, including the right to copy, distribute and adapt the work. Works covered by copyright include, but are not limited to: novels, poems, plays, reference works, newspapers, advertisements, computer programs, databases, films, musical compositions, choreography, paintings, drawings, photographs, sculpture, architecture, maps and technical drawings./Copyright generally lasts for a period of sixty years.

7. BIOLOGICAL DIVERSITY :

Biological Diversity means the variability among living organisms from all sources and the ecological complexes of which they are part and includes diversity within species or between species and of eco- systems. Three main goals of protection of biological diversity are i) Conservation of biodiversity, ii) Sustainable use of its components and iii) Equitable sharing of the benefits arising out of the utilization of genetic resources. In this regard The Biodiversity Act 2002 primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people. This Act has specific provisions about ownership of intellectual property rights associated with exploitation of biodiversity. Industries have to obtain prior consent of the

National Biodiversity Authority before exploring the biodiversity in India. In the event of R&D based on exploitation of biodiversity and associated Local knowledge, there is a provision for sharing of benefits of such work with the local community. No direct flow of funds is expected to the community.

India has been a party to the Convention on Biological Diversity since 5th June 1992 and ratified the Convention on 18th February 1994.

8. PLANT AUTHORITY (PPV&FR AUTHORITY)

The Central Government has established the 'Protection of Plant Varieties and Farmers' Rights Authority in Ministry of Agriculture to administer the various provisions of the Act and take measures to promote the development of new varieties of plants and to protect the rights of the farmers and breeders. The Central Government has also established the Plant Varieties Registry' which shall be located in the head office of the Authority. The Authority is empowered to appoint a Registrar-General of plant varieties and other Registrars for the purpose of registration of plant varieties.

9. TRADE SECRET (UNDISCLOSED INFORMATION) :

Knowhow is another important form of intellectual property generated by R&D institutions that do not have the benefit of patent or copyright protection. Such know-how is kept undisclosed as trade secrets. A Trade Secret or undisclosed information is any information 'that has been intentionally treated as secret and is capable of commercial application with an economic interest. It protects information that confers a competitive advantage to those who possess such information, provided such information is not readily available with or discernible by the competitors. They include technical data, internal processes, methodologies, survey methods, a new invention for which a patent application has not yet been filed, list of customers, process of manufacture, techniques, formulae, drawings, training material, source code, etc. It therefore becomes imperative to strengthen the confidentiality around the trade secret by ensuring that contractual obligations are enforced on persons who are allowed to use the trade secret, especially, when it is licensed to a third party.

Since there is no documentary evidence such as a Letters Patent or a Copyright registration or a Trademark Registration to prove that the trade secret was originally created by the proprietor, it is essential to maintain proof of creation of trade secret either by mailing the information to oneself and retaining postmarked and sealed envelope or by depositing a copy of the information with a third party that would maintain a dated copy.

Trade secret remains confidential for indefinite period of time as per the will of the proprietor provided the security and its confidentiality is not breached. There is no specific legislation regulating the protection of trade secrets in India, India follows common law approach of protection and all matters relating to it are generally covered under the Contract Act, 1872. So, if the information constituting trade secret is leaked, legal action can be brought against the parties who have leaked it under the Law of Contracts. However, in such a case the protection of trade secret will be lost and it becomes available in public domain.

IMPORTANT WEBSITES FOR IPR AND PATENT RELATED INFORMATION

- www.ipindia.nic.in - Intellectual Property Office, India
- www.patentoffice.nic.in- Patent office, India

- http://copyright.gov.in/ - Copyright Office, India
- ipr.icegate.gov.in-Automated Recordation & Targeting for IPR Protection
- http://www.icegate.gov.in- E- Commerce portal of Central Board of Excise and Customs
- www.ipab.tn.nic.in - Intellectual Property Appellate Board, India
- www.mit.gov.in -Department of Information Technology, India
- http://www.mit.gov.in/content/office-semiconductor-integrated-circuits-layout-designregistry
- Semiconductor Integrated Circuits Layout-Design Registry (SICLDR)
- www.plantauthority.gov.in Plant Varieties and Farmers" Rights Authority, India
- http://nbaindia.org/- National Biodiversity Authority
- www.nipo.in - The Indian IPR Foundation
- www.wipo.int - World Intellectual Property Organization
- http://www.wto.org - World Trade organization

CONCLUSION :

Intellectual property right -IPR is the most important criteria to be a part of national as well as international competitive trade as without dissemination of IPR knowledge and implementation, creating the innovative environment is really impossible. In this knowledge based economy, intellectual property rights are very much essential for overall development of society. IPR 1S most essential for regulatory authorities and policy makers, hence it is high time to include IPR in basic educational system and promote IPR registration so as to encourage research and innovation in all the disciplines.

Different forms of IPR demand different treatment, handling, planning, and strategies and engagement c persons with different domain knowledge such as science, engineering, medicines, law, finance marketing and economics. Each industry should evolve its own IP policies, management style, strategies, etc. depending on its area of specialty. There is a great need for should be more clear and focused rules and regulations herbal as well as Ayurveda preparations.

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18. EXPLORATION OF INTELLECTUAL PROPERTY RIGHTS OF AYURVEDIC MEDICINAL PLANTS AND ITS BENEFITS

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Abstract :

Human civilization is evolved based on the facts of culture, integrity, technological development, health sciences and respective financial aspects. Since ancient ages, this development is based on the foundation of trade and related economics. The countries across the globe are also flourishing and called as developed nations with respect to their ability to acquire trade and making the economy powerful. The ownership of the rights on the products is vital criterion that enhances the financial gain. This ownership is awarded based on the registration of respective rights through Intellectual Property Right (IPR) provision made available across the globe. Knowledge of IPR and making the business out of it enabled industry professionals and respective nation more and more stable financially.This paper is articulated so as to explore the details of IPR pertaining to filing of patent up to making business in effective manner. The important steps in the whole process are explored. The stress is given on IPR methodology towards Ayurvedic medicinal plants and its derivatives. The techniques from filing of IPR to exhibition as medicine along with benefits are explained effectively.

Keywords : Ayurved, IPR, ownership, patent, plants.

Introduction

India is rich in natural resources, biodiversity, intelligence and culture since ancient times[1]. The well-known holy Aryuveda is being followed by the civilization since thousands of years. Dhanvantari, MaharshiSushruta, Charakacharya, Vagbhatacharyaand others are the pioneers of plentiful of therapies and medicines. Their guidance is throwing light on almost all non-curable diseases in present days. Due to mankind oriented holy culture of India, these inventions were made available to masses immediately by these stallwarts. Registering the ownership, using the invention for business was not the motive. However, in current scenario and because of globalization, the whole world has become a massive market[2]. Other nations understand the importance and unavoidable existence of Aryurvedic plants and respective medicines. They are taking the ownership through patenting processes and becoming masters of business trades in this field. It is serious alarming situation for Indian Ayurved, Biotechnology and business professionals. These professionals have now understood the gravity of the issue and started filing ownership patents for Intellectual Property Rights (IPR) to save our heritage. Still the number of business enabled patents filed by Indians is merely of 1% share at global level. In short, IPR is very important and current challenge in front of India. The IPR protects the rights and brings back the confidence in the owner. Many times it is observed that IPR does not cover all the aspects of traditional knowledge of respective regional community. This can be balanced by Trade Related Intellectual Property Rights (TRIPS), Convention on Biotechnological

Diversity(CBD), World Trade Organization (WTO) and Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) by an effective sui generis system. General Agreement on Tariffs and Trades (GATT) has given the nation wise freedom for appellation of origin and related information. This agreement covers competition in licenses which is not directly linked with IPRs[1-4]. In future when different types of IPRs arise on surface of market, we may face severe difficulty on trades at international level. This issue is serious in case of Ayurvedic plants and medicines. Therefore timely action is needed for IPR literacy in this field[5-9]. This paper is dedicated to these important issues, steps of IPR, benefits and related shortfalls.

The paper is organized in the following manner. Introduction is followed by Digitization of Ayurveda resources. The section on Process of IPR explores the cares and important aspects while filing patent. It is followed by IPR benefits. The section limitations and challenges of IPR explains various constraints and threats involved. Conclusion and acknowledgement is last part of paper followed by references.

Digitization of Ayurveda Resources

Indian culture and Ayurved is most precious gift to the world. Ancient India was following Ayurved for treatment of diseases as well as philosophy of regular life style on daily basis. It was accepted by the people on very holy way. An Ayurvedic literature was available on leaves, cloth, wooden sheets, etc. and later on in the form of papers. This literature is back bone of medicine theory and treatment. It has to be preserved not only because it is heritage but also for the sake of medical science. The preservation is being done in the paper form continuously by various government organizations and departments. However, this classical technique has its own limitations of less endurance life cycle. Now, the technology is well evolved and revolutionary digital techniques are at mature stage across the globe. Such advanced technology is well suitable for preserving the documentation in safe manner. This technique consists of scanning, imaging, typing, compressing, enhancing, exploring, reproducing, drafting, printing, broadcasting, displaying, amplifying, transmitting, etc. modes. The most important is the technique of storing the information in binary machine language on huge storage memory. New inventions in memories have developed large capacity memories in very tiny nonvolatile sizes. Therefore storage of huge information has become easy and fast. Additional advantage of this technology is the capability of rapid computing of large and complex functions and formulations. When the number of variables such as contents of drug, their parameters, quantities, environmental conditions, etc. is large, time required for calculations is also large. Advanced high speed computing has made it simple for medical researchers and professionals. This in turn helps in newer and newer drug formulations that lead to filing research patents quickly[10-20]. Patentees should be aware of these digital automation capabilities so as to explore it for benefit from rich resources of Ayurveda.

Process of IPR

Following are the prominent steps to be followed and care needs to be taken while filing and obtaining patent.

Submission of application - This can be carried out by the inventor himself or intermediate agency may be involved. Non-Disclosure Agreement (NDA) should be signed with such agency so as to keep content as professional secret. Patentability can also be checked at this stage.

- Draft of patent - The usability, intension, competition prevention should be taken care while drafting.
- Filing the application - All the necessary forms should be submitted officially along with appli cable fee.
- Examination - It is carried out by the patent office with inventor.
- Advertisement of acceptance
- Grant of patent
- Hearing parties
- Sealing of patent

Due care has to be taken by the inventor for not to disclose the content of patent in public domain in any case.

IPR Benefits

As discussed in the earlier sections, there are several benefits of filing the patent, registering and publishing it at National and International level. These are explained here briefly.

- Making of data base has become usual practice among the researchers across the world therefore making IPR leads to owner's awareness of this data base in detail.
- The prominent advantage of IPR is allotment of real ownership of the invention to patentee which creates confidence in patentee's research. Similarly, there is state of the art development of knowledge in the field of research and development.
- Filing the patents and creation of intellectual property surely leads to digitization and preservation of valuable ancient literature and knowledge of Ayurveda.
- The new techniques of Machine Learning (ML) made the segregation of large number of variables involved in classification processes of patents easy at international levels[3]. This has reduced the patentee's efforts involved in large number of data bases. Huge amount of Multinational Companies (MNC) are involved in research and development of ML tools and its applications.
- Patentee gains financial benefits and profits through business creation and resource sharing property of IPR. This results into sustainability of the owner of IPR.
- If the patentee shares the financial benefits to the folkpeople who are users of medicinal plants and formulae, then it will definitely boost their living standards.
- Similarly block chain technology is also being at national and international level for the patents' traceability and classification. If the patentee checks patent through these upcoming and advanced technologies, it will surely increase its business ability. Thus patents and IPR certainly have benefits in professional trade, position at national and international level and proud to nation due to contribution in Gross Domestic Product (GDP).

Limitations and Challenges in IPR

Though there are enormous advantages of patents and IPR, there are certain constraints and limita-

tions too. These are briefly discussed here.

- There is increase in patents on large scale at international level due to involvement of trade and economics. Patentee has to be well aware of these classified IPRs so as to register his/her own officially. Hence, getting real benefits of IPR has become tedious, laborious and complex process specifically at international level.
- There is unavoidable involvement of phytochemical analysis and too much finer detail analysis of the contents in case of Ayurvedic medicinal plants and related formulations. This has become bench mark and routine process in clinical tests and business. It has reduced the importance and role of human body in treatment. It is alarming and unethical situation.
- It is happening in various regions that the folks who cultivate and use plants medicines since thousands of years may remain un-benefitted due to allotment of benefits only to patent owner. Such situation becomes very pity as far as integrity of society and nation is concerned.
- Artificial Intelligence (AI) is playing important role in experimentation, simulations and prediction mechanism of analysis of drug and its formulation. These newer technologies are more and more computational machine dependent and hence lowering down person's individual logic, intelligence and wisdom. This new era is threatening the ethics of medical field.
- While filing patents at regional as well as international levels, misleading and incomprehensible language and grammatical mistakes done by various attorneys lead to slow down the IPR process. Hence as one of the major difficulty, IPR at International level has become long and expensive process.

Conclusion

Digitization of Ayurveda literature and related resources is need of the present time so as to preserve its great heritage. Ayurved, Botany, Biotechnology, Pharmacy andAgriculture departments should work hand in hand to proceed for IPR. Filing the patent on medicinal plants has its own different flavor in Intellectual Rights. Animal experimentation, Clinical trials and verifications are important criteria while proceeding for such patents. Ayurvedic medicinal formulae are proven unchallenging and have enduring importance in medical field therefore patent duration should be continuously extended to achieve business ability and trade.Though there are certain unavoidable limitations of IPR, the increase in number of patents with correct procedures and taking more benefits will result into financial sustainability of India in International trade.

Acknowledgement

Research work is being carried out in College of Ayurveda, BharatiVidyapeeth Deemed University. Authors are thankful to Library and laboratorial resources of Department of DravyagunVigyan. The helping hands from Agharkar Research Institute of India and (IRSHA) have accelerated the research process exponentially.

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19. MORPHOMETRIC STUDY OF CASSIA SPECIS FROM MAHARASHTRA, INDIA

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Abstract :

Four species of Cassia i.e., Cassia fistula L., Cassia javanica L. and Cassia renigera Wall. ex Benth. and Cassia roxburghii DC.were collected from different localities of Maharashtra. Vegetative morphological characters, floral reproductive characters and morphometric characters were studied in present investigation to check whether they support delimitation of the species. The othe rcharacters like number of leaflets, shape of leaflets, base and apex of leaflets, shape and length of petiole were showed significant distinction.Other characters includes petal colour, fruit length and width. The delimitation of the species are based mainly on quantitative characters. In present investigation the macromorphological characters clearly enhance the taxonomy of these species and they can be subsequently employed in their delimitation.

Key words : Cassia, Morphometric, Delimitation

Introduction :

Cassia L. is one of the largest genera wichare represented by about 32 different species from Maharashtra state, out of these, 16 species are wild and 16 are exotic ones (Singh and Karthikeyan, 2000). Members of genus Cassia L. consist of annual or perennial herbs, shrubs and trees which have been differentiated on the basis of number of leaflets, fertile and sterile stamens in single flower (Cooke, 1902). Cassia L. is widely distributed in tropical and subtropical regions and is used in traditional folk medicine, particularly for the treatment of periodic fever and malaria. The species are good source of mucilage, flavonoids, anthraquinones and polysaccharides (Sanghi et al., 2006). Several of them yield timber, tannin and dyes, fodder, vegetables, edible fruits. About 45 species are found in India of which few have been introduced for ornamental (Hemen Dave and Lalita Ledhwani, 2012). Irwin and Barneby (1981) subjected the genus to Some nomenclature and taxonomic changes that eventually led to the splitting of the genus into smaller genera i.e. Cassia, Senna and Chamaecrista. Irwin and Barneby (1981) relay their work on the argument that Cassia SensuLato is clearly an isolated group, the difference between three groups within it are as large as those which delimit some genera elsewhere in the Leguminosae family. Present investigation was undertaken on proper identification and classification of this genus and its species.

Materials and Methods :

Four different species of genus Cassia were collected from different localities of Maharashtra, i.e., Cassia fistula L., Cassia javanica L. and Cassia renigera Wall. ex Benth. and Cassia roxburghii DC. Prodr. The collected specimens were identified by using regional floras and literature study. The

habit and habitat of each species were recorded. Qualitative morphological characters were studied which include: leaflets -shape, base and apex, stipule shape, colour of petals and sepals. Quantitative morphological characters were measured with the help of metric ruler; it includes length and breadth of leaflets, fruits, petals, sepals, petioles. The collected specimens were processed and deposited as voucher specimens at Dr. BAMU Herbarium, Department of Botany, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.(field number 005205; field number: 005204; field number: 005218; field number: 005219)

Result and Discussion :

Present study deals with the four different species of Cassia, widely distributed in Maharashtra, these are Cassia fistula L., Cassia javanica L. and Cassia renigera Wall. ex Benth. and Cassia roxburghii DC. The vegetative morphological characters and floral reproductive characters shows similarities in all the four species of genus Cassia, hence difficult to identify on the basis of their repetitive morphological characters. Various quantitative and qualitative characters are tabulated in Table 1 and Table 2 respectively. The results obtained shows that number of leaflets, shape of leaflet, base and apex of leaflet, shape and length of petiole were showed significant distinction. Other characters includes petal colour, fruit length and width. The combination of these characters is species specific and can be utilize to delimit the individual species.

Table no 1. Summary of vegetative morphological characters :

Characters	Habit	Leaflet											Shape of	Pet
		Nu.	Shape		Apex				Base			Length	Petiole	leng
species	Trees	Leaflets	Elliptic	Oblong	Acute	Obtuse	Rounded	Mucronate	Cuneate	Rounded	Oblique			
C. fistula	+	4-8	+		+				+			5 -12.5×2.5-7.5cm	Linear	7-1 cm
C. javanica	+	12-16		+		+				+		1-4×1-3 cm	Acute	1.5- cm
C. renigera	+	30-40		+			+			+		3-5× 1.5-2.5 cm	Reniform	2.5- cm
C. roxburghii	+	12-30		+			+		+		+	2-3 × 1-1.5 cm	Acute	1-2

Table no 2. Summary of floral morphological characters :

Characters	Pedicel surface	Sepal surface	Petal colour			Petal shape	Inflorescence type		Fruit shape	Fruit size	
Species	Pubescent	Pubescent	Yellow	Pink	Red	obovate	Axillary	Deus racemo	Cylindric	Length	Width
C. fistula	+	+	+			+	+		+	30-60 cm	2-2.5 cm
C. javanica	+	+		+		+	+		+	20-35 cm	1.5-2 cm
C. renigera	+	+		+		+		+	+	20-30 cm	2.5-3 cm
C. roxburghii	+	+			+	+	+		+	20-40 cm	1-2 cm

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20. VEGETABLE GRAFTING : ECO-FRIENDLY APPROACH FOR SUSTAINABLE VEGETABLE PRODUCTION

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2. Subject Matter Specialists (Horticulture)

Abstract :

Vegetable Grafting is an alternative approach used in vegetable production to fight against soil-borne diseases such as Fusariumwilt, bacterial wilt and nematodes. Grafting as a technology for the commercial production was later on adopted by many countries in Europe, Middle East, Northern Africa, Central America and other parts of Asia. For the production of many fruit-bearing vegetables which include watermelon, cucumber, melon, tomato, eggplant and pepper, grafted seedlings were used. These seedlings besides providing resistance against biotic/abiotic stresses increase the yield of the cultivars.

Grafting improves quality of the plant and is used to induce resistance against low and high temperatures. Growth, yield and fruit quality of the scion is greatly influenced by the type of rootstock used. Due to high post graft mortality of seedlings, this technology is still in infancy in India. For its commercial application in India, sharpening of grafting skills and healing environment need to be standardized. This technique is considered eco-friendly for sustainable vegetable production.

Introduction

An experiment were carried out to study Tomato vegetable grafting. Tomato grafting may not be necessary for everyone , especially if fresh soil are available However due to the major investment in the greenhouse structure & the fact that tomato are an important economic crop .This research paper introduce tomato grafting techniques that are particularly suitable for small -scale production & field condition Resistance to soil borne pathogens Resistance to insect pests .Resistance to Abiotic stress. Increase the yield .Minimize the use of chemicals .Provide positive health and food safety benefits.

Material and method

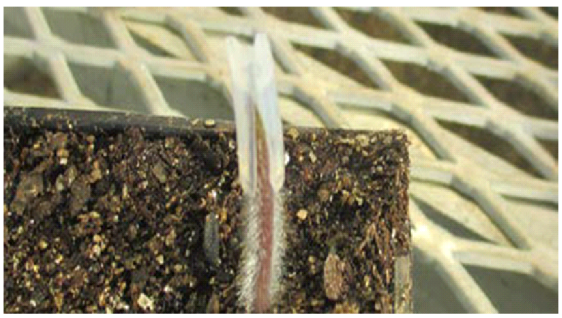
- The research work was carried out at research farm of Agriculture Development Trust ICAR Indian council of Agricultural Research, Malegaon BK , Baramati
- In the present study we used a wild variety of Tomato (Imported from Netherlands) as a root stock &cherry (Marnika) Tomato variety (Imported from Netherlands) as a scion.
- Scion & Root stock plant of 15 to 16 Days (2 to 3 weeks).
- At a minimum, the stem diameters of both rootstock and scion must be at least 1.5 to 2 mm. the smallest grafting clips are 1.5 millimeters.
- Grafting will require grafting clips, which come in diameters from 1.5 to 3.0 millimeters.

- Successful tomato grafting includes three steps:
- Raising healthy seedlings (pre-graft)
- Grafting
- Post-graft plant healing
- Each of these steps is important to ensure the final success of the graft.

- Step 1-Cut the rootstock at the stem at a deep angle

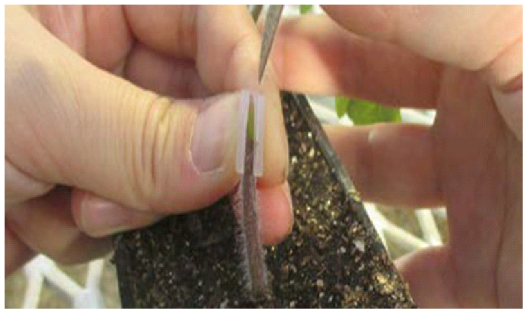
Step 2 A-Place a grafting clip halfway over the cut stem of the rootstock

Step 2 B-Make sure to orient the grafting clip along the side of the graft cut. The cut side of this rootstock faces right in this image. Note the direction of the grafting clip.



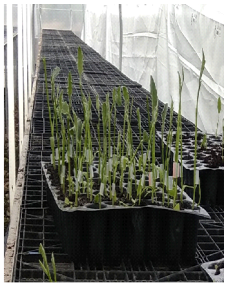
Step 3: Cut the Scion Stem

Step 4 A- Insert the scion into the grafting clip



Step 4 B-Make sure the cut surfaces of the rootstock and scion are in contact

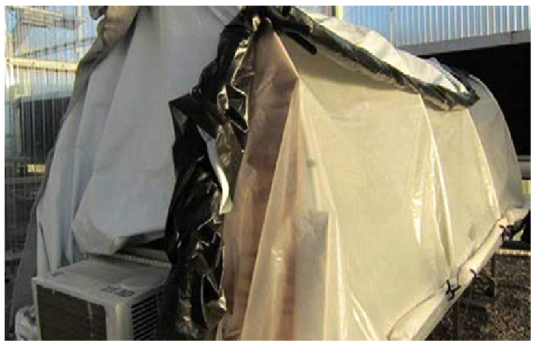
You need to be skilled enough to complete the tray and move it to the healing area quickly.



Post-graft Plant Healing

- The post-graft healing environment and acclimation process is essential to graft success. Neglecting post-grafting care will likely result in failed grafts.
- Promptly place newly grafted plants in an environment that has a relative humidity between 85 and 95 percent and temperature between 72°F and 85°F (220C - 290C) - keep them in this environment for the first 48 to 72 hours.

This healing chamber (Grafting chamber, Dark room) was attached to an air conditioner to reduce temperature This healing chamber (Grafting chamber, Dark room)was attached to an air conditioner to reduce temperature



Field trial - Vegetative Growth

Results and Conclusion

Results

In the present study done in open field we get success in field trial. Framer worried on damping of seedling , we get more success it should be overcame. Vegetable grafting in polyhouse is well known in other countries . Here we worked on Vegetable grafting in field condition.

Conclusion

Grafting technology has a potential to achieve a breakthrough in the cultivation of vegetables.Low-input sustainable horticulture.Grafted seedlings will be in great demand in field cultivation.

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21. IDENTIFICATION AND STANDARDIZATION OF MEDICINAL PLANTS

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ABSTRACT :

Most diseases have evolved into lifestyle diseases as a result of shifting lifestyle patterns. On a national and worldwide basis, the use of herbal products is increasing at an unprecedented rate. As a result, current and objective standards for evaluating the safety, quality, and efficacy of these drugs have been developed. The present criteria, metrics, and methods for testing the quality of herbal medicines were designed for allopathic pharmaceuticals and can only confirm the identity of plant components (and to some extent purity), not their safety and efficacy. Herbal remedies are natural products with phytoconstituents that vary based on the period and area, as well as processing and storage. The effectiveness profile of a herb may be influenced by differences in its harvest, processing, or storage. Tradition may be utilised as a guide to quality standards since past information about the harvest and use of most medicinal plants exists. The metrics used in traditional medicine to assess the quality of materials (dravya), such as rasa (taste), guna (properties), (potency), vipaka (post-digestion effects), and karma (activity), differ significantly from those used in western medicine. These conventional metrics represent both the quality and the efficacy of a product. Having stated that, there are no formal defined methods for either collecting or testing the activity in traditional medicines. Testing procedures that have been extinct in recent years must be revived.

KEYWORDS : Standardization, Traditional Medicine, Efficacy, Medicinal plants

INTRODUCTION

Medicinal plants have been utilised as a source of medicine in practically all societies from the dawn of humanity. The prevalence of natural goods with therapeutic characteristics has been related to the widespread usage of herbal treatments and healthcare preparations, such as those mentioned in ancient scriptures such as the Vedas and the Bible and obtained from frequently used traditional herbs and medicinal plants. Herbal medicine is still the major source of primary health care for around 75-80% of the world's population, primarily in underdeveloped nations. Herbal medicines have seen a resurgence of interest in recent years, as more and more people throughout the world have begun to employ medicinal plant items in their healthcare systems.Herbal medicine sales have plateaued to the point that these goods are now available to consumers as positive healthcare, similar to vitamins. As over-the-counter drug items, they may now be obtained in supermarkets, pharmacies, and a variety of other mainstream retail stores. This is due to the widespread perception that herbal medicines have no negative effects and are inexpensive and readily available. Herbal medicines are used two to three times more than conventional pharmaceuticals across the world, according to the World Health Organization (WHO) [1]. The inability of modern medicine to pro-

vide effective therapy for chronic diseases, as well as the advent of multi-drug resistance germs and viruses, has led to an increase in the use of herbal remedies in industrialised nations.These include cancer, HIV/AIDS, diabetes, hepatitis, allergies, and mental problems, among others. Chemical medication side effects, scepticism of allopathic medicine's methodologies and assumptions, rising prices, and improved public access to knowledge on the safety and usefulness of medicinal plants have all contributed to a surge in interest in medicinal plants [2]. When people try home remedies for acute, typically self-limiting diseases like a cold, sore throat, or bee sting, it's usually because professional help is unavailable right away, or because it's too inconvenient, expensive, or time consuming. Additional cultural variables, such as the environment and culture, as well as a "man-earth interaction," stimulate the usage of botanicals in rural locations.People think that if a region supports plants that can treat a sickness, it will also support plants that can cure it. Large swaths of India's rural population lack access to modern medicine. Hundreds of primary health care centres, which are supposed to serve rural communities, are short on staff, diagnostic equipment, and medicine supplies. As a result, traditional medical systems are primarily reliant on the rural people. With an increasing number of individuals returning to alternative medicine in order to escape the negative side effects of synthetic drugs, it is critical that they receive high-quality, authentic medications. The majority of herbal medications on the market today have not gone through the FDA approval procedure to prove their efficacy.Some of them are high in mercury, lead, arsenic, corticosteroids, and other dangerous organic chemicals. Ingestion of herbal medication has been linked to hepatic failure and even death. The vast majority of Ayurvedic formulations on the market are fake, adulterated, or mislabeled. The majority of commercially accessible products do not even adhere to old Ayurvedic texts. As a result, quality requirements for their usage as medications and as raw materials for the creation of other drug products must be established. There is no guarantee that the herb included in the container is the same as what is described on the exterior without a quality control.Some of them are high in mercury, lead, arsenic, corticosteroids, and other dangerous organic chemicals. Ingestion of herbal medication has been linked to hepatic failure and even death. The vast majority of Ayurvedic formulations on the market are fake, adulterated, or mislabeled. The majority of commercially accessible products do not even adhere to old Ayurvedic texts. As a result, quality requirements for their usage as medications and as raw materials for the creation of other drug products must be established. There is no guarantee that the herb included in the container is the same as what is described on the exterior without a quality control.

History of Herbals :

Medicinal herbs have long been man's most powerful weapon against pathogens, according to history. For more than 3000 years, plants have been employed in traditional medicinal systems such as Chinese traditional medicine, Ayurveda, and Unani medicine. Molds were used to cure ulcers in China as early as 2000 B.C., and Egyptians were known to apply mouldy bread to open wounds in 198415. In the Indian subcontinent, around 10,000 plant species are employed in Indian System of Remedies (ISM) / traditional medicines. Over 85 percent of Ayurvedic, Unani, and Siddha formulations contain 450-500 species, while about 40 species are employed in contemporary medications [7].

Revival of Herbal medicines :

Around the turn of the twentieth century, the pharmaceutical business began to evolve globally. With the advancement of chemical technology, crude medications were gradually supplanted by pure chemical pharmaceuticals, and medicinal plant therapy became less popular in affluent countries. However, in recent years, the pendulum has swung back, and there has been a renewed interest in the study and application of medicinal plants. Because the pharmaceutical industry is demonstrating a particular interest in exploiting or synthesising natural compounds taken from plants, therapeutic plants as a whole now maintain a secure position in modern medicine [8]. Furthermore, there has been an ever-increasing need for more and more medications derived from plants, particularly in industrialised countries. The revivalof interest in plant derived drugs is mainly due to currentwidespread belief that "GREEN MEDICINE" is safe andmore dependable than the costly synthetic drugs, manyof which have adverse side effects [9].

Advantages of Herbal Medicine :

- Herbal medication has a long history of usage and is more tolerated and accepted by patients.
- Medicinal plants are renewable, which is our only chance for ensuring a steady supply of low-cost medications for the world's rising population.
- The cultivation and processing of medicinal herbs and herbal products is environmentally friendly, especially in developing countries like India with rich agro-climatic, cultural, and ethnic biodiversity. Prolonged and seemingly uneventful use of herbal medicines may offer testimony to their safety and efficacy.
- Herbal medicine has contributed many of the most potent medications to modern medicine's large arsenal of pharmaceuticals, both in crude form and as a pure chemical upon which modern medicines are built [10].
- These medicinal plants, such as AlbizialebbekBenth. (siris), Chlorophytumborivilianum (safedmusali), Aloe barbadensis (Aloe vera), Terminalia arjuna (arjuna), and Withaniasomnifera (asvagandha), are responsible for changes in socio-economic status since impoverished farmers produce them [11].

Limitations of Herbal Medicines :

The prominent limitations of herbal medicine can besummarized as follows

1. Ineffective in acute medical care :

As may be observed, herbal medicines are not veryeffective to treat any acute illness, as most of themedicines are designed to work at molecular level ofphysiology, the drug takes its time to deliver the results.

2. Inadequate standardization and lack of qualityspecifications :

This is the element of herbal medications that is most frequently criticised. One crucial aspect to remember is that herbal treatments are natural. One crucial aspect to remember is that herbal preparations are used for their overall health benefits. The chemical elements of each herbal ingredient in the herbal preparation have complicated molecular formulas. Each herbal preparation is a polypharmacy source in and of itself. As a result, standardising herbal preparations or their constituents has become a very difficult task.

3. Lack of scientific evidence

Lack of herbal medicine literature There is a lack of scientific evidence to support the medical activity claimed, as well as their safety and efficacy. As a result, specific parameters of pharmacological evaluation of moderns on modern lines must be included.

4. Potentially serious drug interactions

Herbal medicine is being used by an increasing number of individuals as a health supplement or to treat specific conditions. Many patients have tried over-the-counter herbs before contacting a doctor. Herbal medicine has a higher risk of side effects and interactions than any other type of complementary medicines. Many popular herbs affect bleeding time (garlic, ginger, ginseng) and interact with traditional cardiac drugs (digoxin, diuretics, anti-arrythmics) in elderly patients with chronic cardiovascular disease [12].

Why peoples switching once again towards herbals ?

Four approaches to the use of plants as medicine include

1. The occult/shamanic Almost all non-modern civilizations are aware of its usage. The practitioner is supposed to have abilities or powers that enable him or her to employ herbs in ways that are not visible to the normal person, and the herbs are thought to impact the individual's spirit or soul.
2. The energetic method incorporates the major Ayurvedic and Unani systems. Herbs are said to have activities based on their energies and how they alter the body's energies. The practitioner should have significant training and, preferably, be sensitive to energy, but supernatural abilities are not required.
3. Early physiomedical practitioners adopted the functional dynamic method, and their philosophy is the foundation of current practise in the UK. Herbs have a functional activity that isn't always tied to a physical substance, but is frequently linked to a physiological function, but there's no explicit reference to energy notions.
4. The substance Phytotherapists, or modern herbalists, try to explain herb activities in terms of their chemical elements. Synergy [13] is a notion that states that the precise mix of secondary metabolites in the plant is responsible for the claimed or demonstrated action.

As a result, the rising usage of herbal remedies in industrialised nations might be attributed to modern medicine's inability to provide effective therapy for chronic disease, as well as the advent of multidrug resistant germs and parasites. New ailments such as cancer, diabetes, hepatitis, allergies, and mental problems are among them. Chemical medication side effects, scepticism of allopathic medicine's methodologies and assumptions, rising prices, and improved public access to knowledge on the safety and usefulness of medicinal plants have all contributed to a surge in interest in medicinal plants [13].

NEED OF STANDARDIZATION :

In the past, vaidyas used to treat patients on an individual basis and make drugs based on the patient's needs. The quality control part of practically every traditional system of medicine has been studied from its examination of itself Rishis, Vaidyas, and Hakims. Unlike in the past, when traditional practitioners created and assessed the characteristics of herbal remedies, today's issues are those of industrial scale manufacturing, shelf life, and long-distance distribution. As a result, current

and objective standards for evaluating the safety, quality, and efficacy of these drugs have been developed. People are also becoming more aware of the drug's potency as well as its adverse effects.To gain public trust and bring herbal products into the mainstream of today's health-care system, researchers, manufacturers (see list of herbal formulation manufacturers19), and regulatory agencies must use rigorous scientific methodologies to ensure the quality and consistency of traditional herbal products from batch to batch. It is the regulatory authorities' primary job to ensure that customers receive medication that meets the following criteria: purity, safety, potency, and efficacy. Customers all across the world are rekindling their interest in herbal products. However, the lack of a consistent quality control profile is one of the barriers to Ayurvedic formulation acceptability. The efficacy and safety of herbal medicine are influenced by the profile of ingredients in the final product.It is challenging to develop quality control parameters for plant-based pharmaceuticals due to their complex nature and intrinsic unpredictability, and contemporary analytical techniques are expected to assist in overcoming this challenge. 9. With extremely well specified criteria of analysis, quality controls of synthetic drugs pose no challenges. When it comes to quality, herbal goods, on the other hand, present a number of distinct issues. These are due to the complex combinations of diverse secondary metabolites found in the herbal components, which can change significantly depending on environmental and general conditions [15].

In addition, the elements responsible for the purported therapeutic benefits are typically unclear or just partially understood.The use of a mixture of herbal substances, as is done in traditional practise, further complicates these nuanced perspectives on quality elements of herbal medications. It's fairly unusual for a product to have up to five distinct botanical constituents. In the lack of a reference standard for identification, batch to batch variance begins with the raw material collection. During storage and subsequent processing, these variances become much more pronounced. Biological assessment for a specific disease area, chemical profile of the material, and specification for the completed product are all part of the process of establishing quality control standards for herbal crude and their formulation. Therefore, in case of herbal drugs and product, the word "Standardization" should encompass entire field of study from cultivation of medicinal plant to its clinical application [16].

The usage of inferior raw medicinal plant materials is to blame for the low quality of herbal medications. Extrinsic variables such as the environment and storage procedures can impact the safety and quality of raw medicinal plant components and final products. During processing, microbial or chemical contamination can potentially jeopardise safety and quality. Plant species identification errors, unintentional contamination, or purposeful adulteration by other species or plant components can all result in poor final product quality. (Adulteration refers to the admittance of impurities or the removal of all or a valuable component of a drug, as well as the addition of grade or tampering with the real). Many methods have been and are still usedfor the adulteration of crude drugs particularly in those stocks which are collected from wild sources in general adulteration occurs [17].

Standardizing safety and quality assurance methods is required to maintain a consistent, economical, and long-term supply of high-quality medicinal plant materials. The pharmaceutical industry is interested in developing standardized plant preparations that have been demonstrated to be safe and

effective. Unlike rural people who employ fresh/dried plant material or crude extracts, their concentration has been on identifying newer active components from plants. Furthermore, while it is widely assumed that standardisation of plant material is not required when used by rural communities for primary health care, a systemic approach is required for the validation of efficacy and safety of medicinal plants, regardless of whether the medicinal plant is to be used by local communities or by industry [17].

It is vital to focus on all elements of medicinal plant research, from ethno-pharmacology, use, isolation, and identification of active ingredients through effectiveness assessment, safety, formulation, and clinical evaluation, in order to assure the safety and quality of medicinal plants. The quality monitoring of medicinal plants begins at the source of plant material. The phytochemical composition of plant material and the consequent quality might vary owing to a variety of circumstances, including geographical location, soil quality, temperature, and rainfall, among others. Composition can be influenced by taxonomy, collecting time, collection technique, cultivation, harvesting, drying and storage conditions, as well as preparation and processing procedures. Contamination by microbes, chemicalagents such as pesticides and heavy metals as well as byinsects and animals during any of these stages can alsolead to poor quality of the finished products.Standardization of all these factors is necessary to meetthe current standards of quality, safety and efficacy [18].

WHO Guidelines for Quality Standardized HerbalFormulations :

- Quality control of crude drugs material, plant preparations and finished products.
- Stability assessment and shelf life.
- Safety assessment; documentation of safety based on experience or toxicological studies.
- Assessment of efficacy by ethnomedical information'sand biological activity evaluations.

The bioactive extract should be standardized on the basisof active principles or major compounds along with the chromatographic finger prints (TLC, HPTLC, HPLC and GC). The standardization of crude drug materials includes the following steps:

1. Authentication (Stage of collection, parts of the plant collected, regional status, botanical identity like phytomorphology, microscopical and histological analysis, taxonomical identity, etc.)
2. Foreign matter (herbs collected should be free fromsoil, insect parts or animal excreta, etc.)
3. Organoleptic evaluation (sensory characters - taste,appearance, odor, feel of the drug, etc.)
4. Tissues of diagnostic importance present in thedrug powder.
5. Ash values and extractive values.
6. Volatile matter
7. Moisture content determination
8. Chromatographic and spectroscopic evaluation.

TLC, HPTLC, HPLC methods will provide qualitative and semi quantitative information about the main active constituents present in the crude drug as chemical markers in the TLC finger print evaluation of herbals (FEH).

9. Determination of heavy metals - e.g. cadmium, lead,arsenic, etc.

10. Pesticide residue - The World Health Organization (WHO) and the Food and Agriculture Organization (FAO) define pesticide residue limitations, which are commonly found in herbs. During the growing process, these insecticides are blended in with the herbs. Pesticides such as DDT, BHC, toxaphene, and aldrin, for example, induce substantial negative effects in humans when crude pharmaceuticals are combined with them.
11. Microbial contamination - bacteria and moulds commonly found in medicinal plants come from soil and the environment. The limitations of E. coli and moulds shed insight on harvesting and production procedures. If taken with the crude medications, the compound known as afflatoxins will cause major negative effects. Afflatoxins should be totally eliminated or not present at all.
12. Radioactive contamination - Irradiation is generally used to prevent microbial development in herbals. The plant material may be sterilised as a result of this treatment, however the risk of radiation must be considered. The radioactivity of plant samples should be tested in accordance with the International Atomic Energy Agency's (IAE) and World Health Organization's (WHO) criteria. Physical, chemical, and microbiological characteristics that affect the durability of herbal mixtures.

STANDARDIZATION AND QUALITY CONTROLOF HERBAL CRUDE DRUGS :

According to the WHO, it is the process of physicochemically evaluating a crude drug, which includes aspects such as crude material selection and handling, finished product safety, efficacy, and stability assessment, documentation of safety and risk based on experience, consumer product information, and product promotion. To achieve a considerable degree of confidence in phytochemical diagnostics for the plant, many ways have been proposed. These include a variety of ways, such as Macro and Microscopic Examination: For Identification of right variety and search of adulterants. Foreign Organic Matter: Remove of matter other thansource plant to get drug in pure form.

Ash Values : It is criteria to judge the identity and purityof crude drug - Total ash, sulfated ash, water soluble ashand acid insoluble ash etc. Moisture Content: To check moisture content helpsprevent degradation of product

Extractive Values : These are indicating the approximate measure of chemical constituents of crudedrug.

Crude Fiber : To determine excessive woody material Criteria for judging purity. Qualitative Chemical Evaluation: It coversidentification and characterization of crude drug withrespect to phytochemicals Constituent. Chromatographic Examination: Includeidentification of crude drug based on use of major chemical constituent as marker.

Qualitative Chemical Evaluation :

Criteria to estimate amount the major class of constituents .

Toxicological Studies: Pesticide residue, potentiallytoxic elements, and Microbial count approach tominimize their effect in final product.

Physical evaluation :

Each monograph includes botanical, macroscopic, and microscopic descriptions of each plant's physical properties, which may be used to verify its authenticity and purity. Each description is complemented by comprehensive graphics and photographic photographs that serve as visual documentation of material that has been correctly recognised.

Microscopical analysis :

A combination of physical and chemical testing is required for complete and accurate characterisation of plant material. Plant microscopic studies are essential for ensuring the material's authenticity and as a first screening test for contaminants.

Analytical testing :

Isolation, identification, and purification are all covered by a chemical procedure for assessment. The drug is chemically analysed to determine the potency of vegetable and animal source material in terms of active principles.The chemical tests include color reaction test, these testshelp to determine the identity of the drug substance and possible adulteration.

Biological evaluation :

Certain medications' pharmacological activity has been used to assess and standardise them. The strength of a medication or its preparations can be determined using experiments on living animals and their intact or isolated organs. Biological assays, also known as Bioassays, are used to test all live organisms.

Analytical Techniques :

Appropriate analytical procedures for determining identification, quality, and relative potency are required for compliance with any monograph standard. There are several analytical methods to choose from. However, determining which is the most suited to employ might be tricky.

Characterization by Chromatography :

Chromatographic separations can be performed on a number of substrates, such as immobilised silica on glass plates (thin layer chromatography), and very sensitive High Performance Thin Layer Chromatography (HPTLC),volatile gases (gas chromatography), paper (paperchromatography), and liquids which may incorporate hydrophilic, insoluble molecules (liquid chromatography [19-20].

Purity Determination :

Each monograph covers purity criteria and other qualitative evaluations, such as foreign matter, ash, acid-insoluble ash, moisture content, moisture loss on drying, and extractives, as needed.

Quantitative Evaluation :

When applicable, the most appropriate quantitative analytical method should be specified, along with chromatograms. The method(s) main purpose is to provide verified techniques for quantification of the compound(s) most connected with pharmacological activity or qualitative indicators, as established by primary pharmacological literature, component declaration in product labelling, and an expert survey. A Methods Selection Committee will choose the method(s) from the primary analytical literature, with compendial methods taking precedence where available. In this context, validation consistsminimally of a two-lab validation using the sameprocedures, samples, and reference standards.

CONCLUSION

With the massive expansion in the global usage of medicinal plants, there have been various concerns raised about the safety and quality of herbal medicines. As a result, it has become vital to establish quality and safety assurance techniques in order to assure the supply of high-quality medicinal plants. Though the pharmaceutical industry has focused on standardising plant material for producing herbal

pharmaceuticals, it is often assumed that standardisation is not necessary when utilised by the rural population for primary health care. However, uniformity is necessary regardless of whether the plant is utilised by industry or the rural community.When it comes to employing separated active ingredients, which are required by the pharmaceutical industry for the manufacture of herbal medications, rural populations may choose for standardised extracts. The viability of the technique for that particular species determines whether to harvest plants from the wild or cultivate them. Following proper botanical identification, WHO guidelines for collecting plant materials should be followed in terms of proper season and climatic conditions, correct plant part practises that are non-destructive and do not result in contamination from soil, toxic weeds, or microbes should be followed. Following harvest, proper processing and storage conditions are necessary to minimise drying time, detoxification to reduce side effects, and enhancement of medicinal value and shelf life of the plant material.Phytochemical standardisation for plant material identification can be done using chromatographic techniques to obtain chemical fingerprints, bioassays, or DNA fingerprinting. In the extraction and appropriate identification of active components in plant extracts, chromatographic and spectroscopic methods have shown to be highly beneficial. As a result, standardisation entails the quality control of numerous elements impacting plant medicinal action, from plant species selection to formulation of herbal medications, in order to reduce batch to batch variance and fulfil quality, safety, and efficacy standards.

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22. IN - VITRO PROPAGATION OF CEROPEGIA BULBOSA ROXB VAR. BULBOSA

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Abstract :

In vitro propagation protocol has been standardized for threatened medicinal plant Ceropegia bulbosa Roxb. var. bulbosa. Reliable methodology for shoot multiplication and callus induction from leaf, nodal segment and seed explant of Ceropegia bulbosa has been developed. Leaf explant was found to be most suitable for callus induction. Maximum frequency of callus induction recorded on MS medium when it fortified with 2.5 mg/L and 3.0 mg/L of BAP in combination of 0.5 mg/L IBA. Maximum number of shoot multiplication has been recorded on MS medium when it supplemented with concentration of 3.0 mg/L BAP in combination with 0.5 mg/L IBA. Nodal segment was found to be the best explant for shoot multiplication.

Keywords : In vitro, Ceropegia bulbosa, Callus, BAP.

Introduction :

Ceropegia is the largest genus belonging to family Asclepiadaceae. This genus included 244 species which were distributed in Africa to Madagascar, in India and China, Northern part of Australia as far as Canary Islands. Highest diversity of the genus occurs in South Africa, Kenya, Madagascar and India(Good, 1952; Anonymous, 1992; Bruyns, 2003). In India, the genus is represented by 53- species, 2 - subspecies and 6- varieties out of which 37 are endemic to Peninsular India (Kambale and Yadav 2019).Ceropegia species have certain universally different names according to flower architecture such as lantern flower, Christensen, parasol flower, parachute flower, bushman's pipe, string of hearts, snake creeper, wine-glass vine, rosary vine, necklace vine flower, Chinese lantern, lantern plant, trap flowers, and pitfall trap flowers(Yadav, 1996; Quattrocchi, 2000).Propagation of Ceropegia species is difficult due to low seed viability,dormancy and poor seed germination (Yadav and Kamble, 2008; Srinivasarao et al., 2010).Beena et al., (2003) reported that vegetative propagation of Ceropegia through root tuber is very arduous. Hence axillary bud multiplication is effective alternative tool for clonal propagation.Plant tissue culture is one of the biotechnological tool for mass propagation and conservation of natural plant populations for sustainable utilization in the future (Bapat et al., 2008).Objective of the present study to develop competent protocol for in vitro propagation of C. bulbosa using nodal explant.

Materials and method :

Plant material collection and sterilization

Plant Ceropegia bulbosa var.bulbosa were procured from Gogababa hill in B. A. M. U. Campus of Aurangabad, Maharashtra, and cultivated in the botanical garden of Dr. Babasaheb Ambedkar marathwada University, Aurangabad. Authenticity was confirmed with the voucher specimen and deposited in B.A.M.U. herbarium Botany (Accession no. 0705) at Department of Dr. Babasaheb

Ambedkar marathwada university, Aurangabad. Leaf, nodal segment, and seed used as explant. This explant were thoroughly washed under running tap water (15 min) and then surface sterilized with 0.02 % and 0.03 % (W /V) HgCl2 solution for 3 min. And rinsed two times with sterile distilled water.

Culture medium and culture condition :

Sterilized leaf, nodal segment and seed explant were cultured on MS (Murashige and Skoog, 1962) medium supplemented with 1.0, 1.5, 2.0, 2.5 and 3 mg/L of cytokinin (BAP) in combinations of 0.5 mg/L Auxin (IBA). Before addition of clerigar (3 gm/l) pH of the media was adjusted to 5.8 and then media was autoclaved under 15 psi and 121°C. Afterward aseptically inoculated cultures were transferred into culture room for incubation under 16 h photoperiod supplied by white fluorescent tubes (2100-25000 lux) and maintained at 25 ± 2?C temperatures. At least 10 replicates were maintained for each concentration. Observations were recorded after 21 days. Mean (?) values with the standard error (S.E.) were calculated.

RESULTS AND DISCUSSION :

Standard protocol for surface sterilization of explant was analyzed by trial and error method. Surface sterilization of leaf, nodal segment and seed explant were tried with 0.01- 0.03% of HgCl2 for 3 and 5 minutes duration. The maximum microbe's free cultures and high regeneration percentage were recorded at 0.02% of HgCl2 for leaf and nodal segment and 0.03% of HgCl2 for seed explant during the present study. The hormones free MS medium was found ineffective to induce callus or regeneration of shoot using leaf, nodal segment and seed as a explant. Shoot regeneration was achieved from this explant, when MS medium fortified with 1.0, 1.5, 2.0, 2.5 and 3 mg/L BAP in combination of 0.5 mg/L of IBA. The maximum shoot induction percentage when leaf used as explant was recorded at 2.5 mg/L of BAP in combination of 0.5 mg/L of IBA. Nodal segment and seed also revealed shoot proliferation. When nodal segment and seed used as a explant maximum number of shoot multiplication was achieved on 3.0 mg/L of BAP in combination of 0.5 mg/L of IBA. When leaf used as explant, high frequency of callus induction recorded at concentration 2.5 mg/L and 3.0 mg/L BAP in combination with 0.5 mg/L IBA.

Table 1 : Effect of Cytokinin (BAP) and Auxin (IBA) for shoot multiplication using different explant of Ceropegia bulbosa.

Explant	Concentration of PGRs (mg/L)		Number of shoots /culture	Regeneration of shoots (%)
	IBA	BAP		
Leaf	0.5	1.0	2.62±0.20	20
		1.5	4.2±0.58	40
		2.0	9±0.44	50
		2.5	12.0±0.36	70
		3.0	9.78±0.68	50
Nodal segment	0.5	1.0	2.2± 0.37	20
		1.5	3.2±0.37	30
		2	9.6±0.67	50
		2.5	10.8±0.86	70
		3	12±0.66	80
Seed	0.5	1.0	3.2±0.58	20
		1.5	4.6±0.50	40
		2.0	8.4±0.67	60
		2.5	12.4±0.50	70
		3.0	13.8±0.58	70

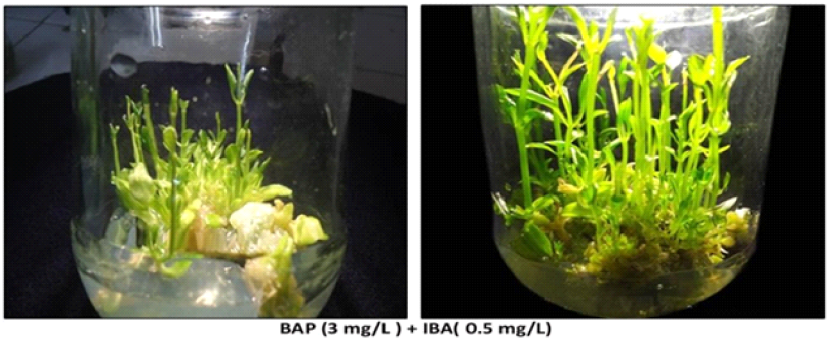
After 21 days mean ± SE of 10 replicates

Table 2: Effect of Cytokinin (BAP) and Auxin (IBA) for Callus induction using leaf explantof Ceropegia bulbosa

Source of explant	Concentration of PGRs (mg/L)		Frequency of callus Induction	Texture of callus	Response / colour of Callus	Induction of callus/ Somatic embryo
	IBA	BAP				
		1.0	+	--	Swelling of	--

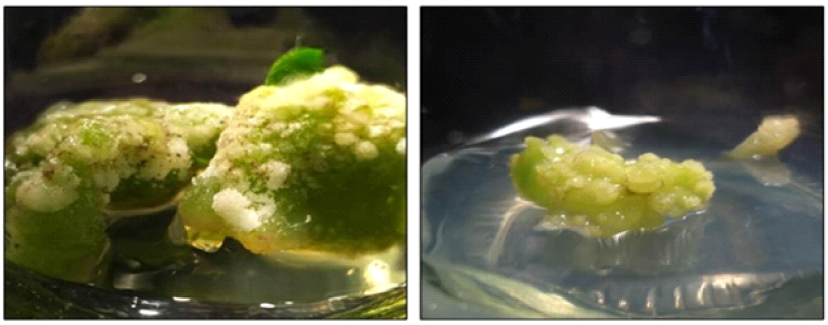
					explant	
Leaf	0.5	1.5	++	Friable	Greenish and white	Callus
		2.0	++	Friable	Light Green	Callus
		2.5	+++	Friable	Greenish	Callus
		3	+++	Friable	Greenish	Callus

Shoot multiplication



BAP (3 mg/L) + IBA(0.5 mg/L)

Callus induction



BAP (2.5 mg/L) + IBA(0.5 mg/L)

Conclusion :

In present investigation In-vitro propagation protocol has been standardized for threatened medicinal plant Ceropegia bulbosa Roxb. var. bulbosa. Reliable methodology for shoot multiplication and callus induction from leaf, nodal segment and seed explant of Ceropegia bulbosa has been developed.Leaf explant was found to be most suitable for callus induction. Maximum frequency of callus induction was recorded on MS medium when it was fortified with 2.5 mg/L and 3.0 mg/L of BAP in combination of 0.5 mg/L IBA. Maximum number of shoot multiplication has been recorded on MS medium when it was supplemented with concentration of 3.0 mg/L BAP in combination with 0.5 mg/L IBA. Nodal segment was found to be the best explant for shoot multiplication.

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23. COLLECTION METHODS OF GUGGULU

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Introduction :

In Ayurvedic classics Guggulu is using for a widespread of usage like *medoroga*, *vatavyadhirasayana* etc. purpose. Various compound preparations of Guggulu like *Yogarajaguggulu*, *mahayogarajaguggulu, simhanadaguggulu, trayodasangguggulu* etc. are having important value in pharmaceutical industry. The current topic deals with various aspects of Guggulu relates to it collection and various aspects of gugglu based on lexicons as well as pharmaceutical industry.

Collection process of Guggulu

Guggulu plant is tall upto 4-6 feet; branches are slightly ascending. Outer surface gets peeling off main branch with flakes. Bark is having ash colour. Generally the collection of the Guggulu takes place in cold season, the plant exudes yellowish resin called gum guggulu which is having balsamic odour. Near about after 8 years plant yields 1-1.5kg. Guggulu. As per lexicons of ayurveda Guggulu is mainly found in Marubhumi,it exudates in Grishmaritu due to heat. The collections of Guggulu with invasive methods are indicated in Hemanta ritu1.

Formation of Guggulu :

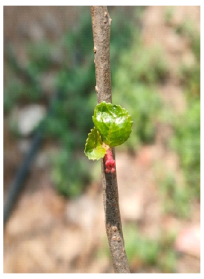
All members of the Burseraceae having the phloem oleoresin canals, which are formed schizogenously afterwards these unite with one another to form schizolysigenous cavities2.

Characters of Genuine guggulu[3]

1. *Astangasamgrahauttartantra* : Intense smell, Snigdha,pichcila, Free from impurities

2.*Kaideva Nighantu AusadhiVarga* : Melts in sunlight., Immediately burns in fire.

3.*Rasa ratnakararasakhanda* : Burns in fire, Melts in sunlight. Gives milky emulsion in lukewarm water.

Shodhana of Guggulu[4] :

Basavarajiya was the first author who describes guggulushodhana with different media as Nidigdhika, Amrita, Musta Vasa and Arishtka or with decoction of Triphala. (Ref-Shastri)
Guggulushodhan as per Basavrajiya

Usage of various Guggulu in various diseases[4]

Indications of Guggulu as per Chakrapani

Preparation	Vyadhi
Aadityapaka Guggulu	Vatavyadhi
Trayodasang Guggulu	
Kaishora Guggulu	Vatarakta
Amruta Guggulu	
Punarnava Guggulu	
Yograja Guggulu	Amavata
Simhanada Guggulu	
Bhritsimhanada Guggulu	
Navaka Guggulu	Sthaulya
Triphala Guggulu	Udavarta and Vrana
Vatika Guggulu	Vrana
VidangadivatikGuggulu	
Amritadivatika Guggulu	
SaptangaGuggulu	Nadivrana
Navaarishika Guggulu	Bhagandara
Saptavimsati Guggulu	
LakshaGuggulu	Bhagna
Abhaya Guggulu	
Ekvimsati Guggulu	Kustha
PanchatiktaGhrita Guggulu	
Vasa Guggulu	Amlapitta
Nava kashaya Guggulu	Visarpa and Visphota
Shadanga Guggulu	Netraroga

Guggulu sevana janya vikara :

Excessive or long term of Gugguluse vana may causes Timira (Blindness), Vadanashosha (dryness of mouth), Klibata (impotency), karshya (emaciation), moha (delusion), samalshitilabhava(looseness of stool), deharoukshya (dryness of skin)[5].
Administration of ashodhita (unpurified)guggulu causes skin rashes and irregular menstruation. gas-trointestinal distress,fatigue and skin rash[6].
Nava guggulu is Bruhmana and vrishya while that of purana guggulu is used as lekhana.

Contraindications while usage of Guggulu :

Amla (Sour), Tikshna (Pungent), Ajirna (Indigestion), Vyavya (Inercourse), Shrama(Hardwork), Atapa (Hot sunrays), Madya (Alcohol), Rosha (Anger)[7].

Substitute and adulterant :

Substitute :

1. C.berriyi Engl.- Burseraceae
2. C. roxburghii (Arn.)Engl.- Burseraceae
3. C.stockiana Engl.- Burseraceae
4. C.abyssinicaKunth.- Burseraceae
5. C.molmol Linn.- Burseraceae

Adulterant :

1. Hymenodictyonexcelsum (Roxb.)Wall. - Rubiaceae.
2. Bola- Commiphoramyrrha(Nees) Engl.-Burseraceae
3. Shallaki-Boswellia serrataRoxb.-Burseraceae

Extraction and isolation of Guggulu :

Method A :

Powdered drug

1. Extract the resin with alcohol
2. Filter
3. Concentrate - Concentrate extract an excess of water thus resins gets precipitate.

Method B :

Powdered drug containing oleoresin, percolate the powdered drug with non polar solvent. After steam distillation oleoresin and volatile oils (e.g.Rosin) gets separated.

Chemical Composition

Guggulu contains 60% of Gum, 30% of resin, 0.5% of volatile oil, 5% moisture and 3-4% foreign organic matter.

The resins contains Z and E guggulusterones and sterols as guggulusterol I, II and III.The volatile oil of the guggulu contains myrcene, dimyrcence, polymyrcene and caryophyllene.

Discussion and conclusions :

Certain studies of comparative phytochemical study of nava and purana Guggulu revealed that anthrocyanins and saponins were present in ethanol extract of Nava Guggulu and that of Purana guggulu it was absent. Steroids were absent in petroleum ether extract of navaguggluand that of purana guggulu it was present. Thus one can consider that due to Snigdha and PicchilagunaBruhmana karma takes place while that of laghu, tikshna and vishada properties of purnaguggulu helps in lekkhana karma[8].

Hemantaritu is the best season for collection of guggulu as per kaidevanighantu . It was assessed by various experiments in current era too as due to higher water level there is low water transport demands so winter season will be the best season for tapping of Guggulu[9].

Interestingly there wasn't any preparations start with Guggulu as pradhandravya mentioned by Charapani thus one can consider that Guggulu is best adjuent drug and should be used on baseline of

Ayurvedic preparations. Vegitative propagation through the stem is best method for guggulu. Propogation through seeds are possible but regeneration limitations are there. Thus cultivation as well as conservation is the need of the hour for this endangered species[10].

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24. STATUS OF MEDICINAL PLANTS AND THEIR CONSERVATION IN INDIA

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Introduction :

The use of medicinal plants as a source of medicine is as old as human civilization. Nearly every human culture or society, either in ancient time or in present time, use plants as a major source of medicine. About 80% of the World's population relies on traditional forms of medicines, largely plant based, to meet their health care needs. Some of the drugs used in Allopathic medicines are also extracted from the plants. The latest medicines evolved for the diseases like Cancer, Rheumatoid arthritis, Jaundice, AIDs are found out from plants only. Since long time, plants helps human in preservation and promotion of his health.

India is a birth place for variety of alternative traditional medical systems. Important among them are Ayurveda, Siddha and Unani. All these systems of medicine depend on plants as a major source of medicine. These traditional systems of medicines predominantly used plant based raw materials in most of their preparations and formulations. Over 90% of remedies of these systems are plant based. Use of plants for human and veterinary health, forms one of the oldest, richest and most diverse cultural traditions of India. There still exist large numbers of village based carriers of herbal medicine traditions in India. Millions of women and tribal people have traditional knowledge of herbal home remedies which are not scientifically documented in literature. Herbal drugs meet the health care of around 70% of Indian population.

India has a glorious tradition of health care system based on plants which dates back to Vedic era. In Rigveda which is the oldest known respository of human knowledge and wisdom (4500 - 2500 B.C.) mentions about 150 medicinal plants, while in Atharvaveda (2500 - 2000 B.C.) elaborate description of medicinal plants are given. In Samhita period the science of medicine systematically organized with clear concept and theories based on the treatises the Charaka Samhita 2000 B.C. (mentions about 526 medicinal plants) and Susruta Samhita 1000-800 B.C. (mentions about 573 medicinal plants). Apart from this there are other works on Ayurveda and medicinal plants by Nagarjuna, Chakradatta, Sharangdhar and Bangasen 1000-500 B.C., Vaghbhatta Jr. 800 A.D. complied most of the books on Ayurveda and wrote AshtangaHridhya Samhita and mentions about 902 medicinal plants.

Diversity and Distribution of Medicinal plants

India is bestowed with unique diversity in culture and natural vegetation exhibiting rich plant diversity. India ranks one among the seventeen top biodiversity rich countries. About 50000 plant species have been reported from India, representing about 7% of the World Flora. It has all known

types of agro-climatic, ecologic and edaphic, conditions. It also has unique biogeographical positions having all known types of ecosystems, ranging from temperate alpine and subtropical regions of North-West and Trans Himalayas, rain forests with high rain fall, wet evergreen humid tropics of Western Ghats and arid and semiarid regions of Peninsular India, dry desert conditions of Rajasthan and Gujarath to the tidal mangroves of Sunderban. India harbours 18800 flowering plants out of which 2000 plants are used in various classical systems of medicine like Ayurveda, Siddha and Unani. The tribals and rural communities use about 8000 species of wild plants as traditional medicine. The drugs used in Indian system of Medicines are 90% based on plant material and are considered to be safe, cost effective with minimum or no side effects when genuine ingredients are used. Global estimates indicate that over 3/4 of World population cannot afford the products of the Western pharmaceutical industries and have to rely upon the use of traditional medicines, which are mainly derived from plants. This fact is well compiled by World Health Organization (WHO) in an inventory of medicinal plants listing over 20000 species.

The forest areas have been the traditional source and storehouses of medicinal plants and herbs. Majority of the plant drugs have, so far been being gathered and marketed from wild sources. World Bank report states that, about 96% of the total plant material produced in India for manufacturing medicines is collected from wild. Macro analysis of the distribution of medicinal plants shows that they are distributed across diverse habitats and landscape elements. About 70% of India's medicinal plants are found in tropical areas mostly in the various forest types spread across the Western and Eastern Ghats, Vindhaya, Chotta Nagpur plateau, Aravalis and North-Eastern regions of Himalayas. Less than 30% of the medicinal plants are found in the temperate and alpine areas and higher altitudes. They include species of high medicinal value. Macrostudies shows that a larger percentage of the known medicinal plants occur in dry and moist deciduous and in semievergreen tropical forests as compared to the evergreen and temperate habitats. The forests of Himachal Pradesh are reported to supply very large part of medicinal plant requirements of India. The Western Ghats forms second major supply source while the Himalayas represents as 3rd heterogeneous source.

Analysis of habits of medicinal plants shows that 33% are trees, 20% shrubs, 32% herbs, 12% climbers and 3% are others. A very small proportion of medicinal plants are lower non-flowering plants like Lichens, Algae and Ferns. Majority of the medicinal plants are higher flowering plants. Of the 386 families and 2200 genera in which medicinal plants are recorded the families Asteraceae (419), Euphorbiaceae (214), Lamiaceae (214), Fabaceae (214), Rubiaceae (208), Poaceae (168), Acanthaceae (141), Roscaceae (129), and Apiaceae (118) share the larger proportion of medicinal plant species in India.

Importance of Herbal Medicines and Medicinal Plants

As a part of strategy to reduce financial burden on developing countries, which spend 40-50% of their total health budget on drugs. WHOcurrently encourages, recommends and promotes the inclusion of herbal drugs in national health care programmes because such drugs are easily available at a price within a reach of common man and as such are time tested and thus considered to be much safer than the modern synthetic drugs. Interest in herbal drugs is increasing in Western and Devel-

oped Countries also. In Asian Countries plant based drugs have become so popular that total annual turn over of herbal products is increasing every year. Between 30 to 50% of the population in some of the Developed Countries use herbals in some form as complementary medicine. Therefore, there is an increasing consumer demand for herbal medicines in developed countries. Annual sales growth rates of over 100 percent, for popular medicinal plants have been recorded in European and North American countries. In certain countries the herbals are more popular than the normally prescribed allopathic alternatives. This fact is also reflected in the International market of medicinal plants which is estimated at US $ 80 to 90 billion per year and is growing at the rate of seven percent.

In India there are over 5 lakhs licenced registered medical practitioners of Indian system of Medicine and Homeopathy. The number of ISM practitioners in India is rising to soaring levels. There are at present more than 8500 pharmacies in ISM in India catering the needs of thousands of herbal dispensaries. Besides there are many small manufacturing units using medicinal plants and thousands of Vaidyas preparing their own drugs from various medicinal plants. About 1400 licensed pharmacies are established in the state like Maharashtra alone. In India the ISM and Homeopathy are regaining their popularity over the allopathic since 1980 and herbal product market is doubling in size every 4 to 5 years.

India is of course already an active participant in global medicinal plant market having been the World's largest supplier of the raw material. In India due to high rate of deforestation and over exploitation of medicinal plants from wild, about 120 most important medicinal plants are reported to be threatened or rare, about 30 most valuable medicinal plants are critically endangered and some are even extinct from natural habitats.

Market Scenario of Medicinal Plants :

The EXIM Bank of India, in its report has reported the value of medicinal plants related trade in India of the order of 5.5 billion US$ and growing rapidly. According to WHO, the international market of herbal products is estimated to be US$ 62 billion which is poised to grow to US$ 5 trillion by the year 2050, India's share in the global export market of medicinal plants related trade is less than 0.5%. The Chinese export based on plants including raw drugs, therapeutics and other is estimated to be around Rs. 18000 to 22000 crores. While Indian export based on the medicinal plant is estimated to be around Rs. 3000 crores only. Government of India has targeted to increase this amount uptoRs. 15000 Crores by the year 2025 A.D. besides meeting domestic needs. Apart from requirement of medicinal plants for internal consumption, India exports crude drugs mainly to developed countries viz., USA, Germany, France, Switzerland, Spain, UK and Japan, who shares between them 75 to 80 percent of the total export of crude drugs from India.

The principal herbal drugs that have been finding a good market in foreign countries and India are Aconitum heterphyllum, A violoceum,A.ferox, Aloe vera, Atropa belladona, Acrous calamus, Cinchona officinallis, Dioscorea spp. Digitalis purpurea, Ephedra foliata, Plantago ovata, Cassia angustifolia, Chlorophytum borivillianum, Commiphora wightii, Coptis tetta, Dactylorhiza hatagirea, Embelia ribes, Mesua ferrea, Myristica malbarica,Nadostachys grandiflora, Nothapodytes nimmoniana,Onosma bracteatum, Picrohiza kurraoo, Pistacia integerrima, Rauvalfia serpentina, Rubia cordifolia, Santalum album, Smilax glabra, Swertia chirayita, Valeriana hardwichkii, Viola pilosa,

Berberis spp., Cathranthus roseus, Bacopa monnieri, Centalla asiatica, Glycyrrhiza glabra, Mucuna pruriens, Solanum indicum, Withania somnifera, Eclipta prostrata, Spilanthus spp., Asparagus racemosus, Piper longum, Andrographis paniculata, Phyllanthus amera, Emblica officinallis, Saraca asoca, Aegle marmelos, Garcinia indica, Tinospora cordifolia, Gymnema sylvestre, Terminalia arjuna, Gloriosa superba, Pterocarpus santalinus, Rheum emodi, Inularacemosa, Hedychium spicatum, Colchicum luteum,Justiciaadhatoda, Juglansregia, Punica granatum, Juniperus communis, Heracleum candicans, Saussurea lappa, Podaphyllum emodii etc.

Due to several problems medicinal plants market in India is unorganized. Medicinal plants are a living resource, exhaustible if overused and sustainable if used with care and wisdom. Current practices of harvesting are unsustainable and many studies have highlighted depletion of resource base. Many studies have conformed that pharmaceutical companies are also responsible for inefficient, imperfect, informal and opportunistic marketing of medicinal plants. There is a vast secretive and largely unregulated trade in medicinal plants, mainly from wild, which continues to grow dramatically in the absence of servious policy attention materials where the origin of a particular drug is assigned to more than one plant due to which adulteration is common in such cases. All these affect the market both directly and indirectly marketing is daunting problem, which bests the development of plant based industry in developing countries. Marketability of products will be a crucial factor in determining the failure or success of this sector. The market outlets can be for local use, some products could reach the consumer directly while others have to be either further processed or used as secondary components in other industrial products. A clear understanding of both the supply side issues and the factors driving the demand and size of the medicinal plants market is a vital step towards planning for both the conservation and sustainable use of the habitats of these plants as well as for ensuring continuous availability of the basic ingredients used to address the health needs of the majority of the World's population.

Conservation of Medicinal Plants :

In Situ Conservation :

At the national level a network of 103 National Parks, 544 Sanctuaries and 18 Biosphere reserves covering more than 5% of Country's geographical area spread over diverse forest ecosystems of the country has been created with the primary aim of conservation of biodiversity. These protected areas harbour large varieties of medicinal plants. These could serve as potential areas of genetic repository of medicinal plant diversity of the country. In situ conservation programmes for medicinal plants in protected areas could be taken up through Chief Wild Life Wardens. The programme needs to be in consonance with the objectives of protected areas. Over 7200 Sacred groves spread under a variety of forest ecosystem are also serve as natural repositories of medicinal plants. Non-protected forest areas also need to be considered for sustainable planning and management.

FRLHT in collaboration with State Forest Departments has established a coordinated network of 30 in-situ Medicinal Plant Conservation Areas (MPCAs) located within the protected areas of Kerala, Tamilnadu, Karnataka and Maharashtra, with the involvement of local communities in conservation, inventorization and nursery development of medicinal plants. In Maharashtra MPCAs

have been established at Melghat, Koyana, Amboli, Junnar etc. as a part of World Bank aided Maharshtra Forestry Project.

Ex-situ Conservation :

Establishing collections of germplasm of medicinal plants is one way of helping to maintain the resource base. At present India is co-ordinator of G-15 Gene Banks for Medicinal and aromatic plants. Under the nodal agency of DBT, three gene bank have been established at NBPGR New Delhi, CIMAP - Lucknow and TBGIR Thiruanantpuram. Under the aegis of ICAR, CSIR, ICFRE and ISM, about 30 medicinal plant gardens have been established with primary aim of developing cultivation technologies, seedling sources, and improvement of genetic stocks. Maximum size of such garden is 100 ha. ISM proposes to develop medicinal plant garden in each state ranging in size from 3000 to 5000 ha. under the World Bank aided programme.

Cultivation of medicinal plants for sustainable harvest in degraded forests, in wastelands of fringe forest areas, in the fields of farmers, and by industries themselves as captive plantations would relieve forests from undue pressure and promote conservation of depleting resources. One of the prereguisites for bringing the medicinal plants under cultivation is making the availability of good planting material and agro-technologies for the cultivation.

ISM promoted a scheme for development of agro technologies for 133 selected Medicinal species of demand by pharmacies. Agrotechnologies have now been developed for about 50 species of high demand through ICAR, CSIR, ICFR, TFRI and Agriculture Universities. Available data on economic returns and cost benefit analysis of cultivation of medicinal plants of high demand clearly reveal that medicinal plants can be valuable crops.

The National Medicinal Plant Board (NMPB) has formulated schemes and guidelines for financial assistance in different areas of medicinal plants sector covered under Promotional and Commercial Schemes applicable both for Government and Non-Government Organizations. Promotional scheme mainly includes survey, conservation, herbal gardens, extension activities, demand supply studies, Research and Development, value addition etc. and commercial scheme mainly includes production of quality planting material, large scale cultivation, post harvest technology studies, innovative marketing mechanism etc. The main aim of these schemes is to popularies the cultivation of medicinal plants, which is better way of ex-situ conservation.

Under the guidelines and by the support of National Medicinal Plant Board, Maharashtra State Medicinal Plant Board (MSMPB), Pune has announced and started many variable schemes for the large scale cultivation of various 46 medicinal plants viz. Acorus calamus, Aloe vera, Andrographis paniculata, Asparagus racemosus, Chlorophytum borivillianum, Azadirachta indica, Bacopa monieri, Boerhavia diffusa, Cassia angustifolia, Centella asiatica, Coleus barbatus, Dioscorea bulbifera, Embelia ribes, Garcinia indica, Gymnema sylvestre, Hemidesmus indicus, Mucuna pruriens, Phyllanthus amarus, Piper longum, Solanum nigrum, Stevia rebaudiana, Terminalia arjuna, Terminalia bellirica, Terminalia chebula, Tinosporacordifolia, Withania somnifera, Aegle marmelas, Albizzia lebbeck, Atropa belladona, Gloriosa superba, Glycyrrhiza glabra, Gmelina arborea, Inulara cemosa, Rauwolfia serpentina, Saraca asoca, Phyllanthus emblica, Ocimum sanctum, Cinnamomum verum, Aconitum heterophyllum, Barberi saristata, Commiphora wightii, Nardostachys jatamansi, Picorrhiza kurroa,

Podophyllum hexandrum, Saussurea costus and Swertia chirata.

Apart from this MSMPB also introduced promotional schemes like, production of quality seeds and seedlings of medicinal plants, establishment of Tissue Culture Labs and Research Labs for Research and Development, various schemes for post harvest technology and innovative marketing mechanism etc. For the better promotion of medicinal plants cultivation, State Government should have to ban auction method of Medicinal plants collections from the forest areas. Collections of natural herbal material from forest regions, should be done with the help of local peoples only, for the better conservation of medicinal plants.

25. A CURRENT SCENARIO OF TRADITIONAL MEDICINAL PLANTS OF WESTERN GHAT OF INDIA

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INTRODUCTION :

The use of medicinal plants as a source of medicine is as old as civilization. Nearly, every human culture or society, either in ancient time or in present's time, uses plants as a major source of medicine. About 80% of world's population relies on traditional forms of medicines largely plant based, to meet health care needs. Some of the drugs in modern medicines are also extracted from the plants. The latest medicines evolved for the disease like Cancer, Degenerative diseases, Hepatitis, AIDS and Asthma etc. are found out from plants only. All over the world till the research is going on. Since long time, plants helps human in preservation and promotion of his health.

India is a birth place for variety of alternative traditional medical system. Important among them are Ayurveda, Unani and Siddha. All these systems of medicine depend on plants. These traditional systems of medicines predominantly used plant based raw material in most of their preparations and formulations. Use of plants, for human as well as veterinary health is one of the oldest, richest and most diverse cultural traditions of India. There still exists large number of villages based carriers of herbal medicine traditions in India. Millions of women and tribal people have tradition knowledge of herbal home remedies which are not scientifically documented.

India has a glorious tradition of health care system based on plants which dates back to Vedic period. Rugveda the oldest known repository of human knowledge and wisdom mentioned about medicinal herbs in *Osadhi-Sukta* while more elaborate descriptions are available in Atherv-veda. In Vedas only description of herbs are but it having no any pharmacological base. The properties, therapeutic uses and pharmacology seem to have emerged in Samhita- kala mainly in Charak,Sushruta and Vaghbhatta. Further details are seenin medieval texts like Bhavprakash, Raj, Kaiyadev, Shaligram and many more Nighantus i. e. special texts which are dealing only with medicinal plants.

"Ayurveda" means knowledge about life. It is a great treatise developed by Indians. It speaks more about healthy life and less about medicines. Ayurveda believes in keeping health healthy physically, mentally, socially and spiritually. The first foremost aim of Ayurveda is maintain the health and treating the disease is secondary one.

Diversity and Distribution of Medicinal Plants :

India is bestowed with unique diversity in culture and natural vegetation exhibiting rich plant diversity. India ranks one among the twelve top biodiversity rich countries. About 46000 plant species have been reported from India, representing about 7% of the world flora. It also has unique bio-geographical positions having all known types of ecosystems ranging from temperate alpine and sub-

tropical regions of north-west and Trans Himalayas, rainforests with high rain fall, wet evergreen humid tropics of Western Ghats and arid and semiarid regions of peninsular India, dry desert conditions of Gujrath and Rajsthan to the tidal mangroves of Sunderban. Out of 17500 flowering plants 3000 plants are used in various classical systems of medicine like Ayurveda, Siddha and Unani. The tribal and rural communities use about 8000 species of wild plants as traditional medicine. The drugs used in Indian System of Medicines are 90% based on plant material and are considered to be safe, cost effective with minimal or no side effects when genuine ingredients are used. Global estimates indicate that Over ¾ th of world population cannot afford the products of western pharmaceutical industry and have to rely upon use of traditional medicines, which are mainly derived from plants. This fact is well complied by W.H.O. in an inventory of medicinal plants listing over 20000 species. The forest area has been the traditional source and storehouses of medicinal plants. Majority of plant drugs have, so far been being gathered from wild sources. World Bank report states that, about 96% of the total plant material used in India for manufacturing medicines is collected from wild. Macro analysis of the distribution of medicinal plants shows that they are distributed across diverse habitats and landscape elements. About 70% of Indian's medicinal plants are found in tropical areas mostly in the various forest types spread across the Western and Eastern Ghats, Vindhyas, Chotta Nagpur plateau, Arvalis and North-Eastern regions of Himalayas. Less than 30% of the medicinal plants are found in the temperate and alpine areas and higher altitudes. They include species of high medical value. Macro studies shows that a larger percentage of known medicinal plants occur in dry and moist deciduous and semi -evergreen tropical forests as compared to the evergreen and temperate habitats. The forests of Himachal Pradesh are reported to supply very large part of medicinal plants requirements of India. The Western Ghats forms second major supply source while the Himalayas represents as 3rd heterogeneous source.

WESTERN GHATS AND THEIR PLANT DIVERSITY :

India has rich treasure of medicinal plants and Ayurveda is gaining recognition and respect throughout the world. Plants have been the primary basis for drug discoveries and developing new drugs. Herbalists have made significant contributions to the medicinal plants of world. It is said that there is no plant species, which has no medical value. The worth of each species with established therapeutic value is invaluable.India, one of the mega centers of biodiversity has more than 2500 species reported to be of some medicinal value. In addition to known wealth of medicinal plants of the country, number of other plant species is awaitingphyto-chemical screening which would result into discovery of biologically active molecules of therapeutic value. However, in this edge of commercialization and globalization, the scenario of medicinal plants needs to be analyzed critically to find solutions to fulfill the global demands without affecting their natural populations.

Several species of established therapeutic value from Western Ghats are of rare occurrence and some of them need investigations on screening of their active molecules and therapeutic value. Western Ghats is store house of medicinal plants waiting screening for discovery of new drug. This lecture highlights the present scenario of medicinal plants, discusses issues related and need for analysis of situation.

Some of the rare medicinal plants of western Ghats include Conscinium fenestratum, Trichopusz

eylanicus, Embelia ribes, Antiaris toxicaria, Holigarna grahamii, Smilax zeylanica, Myristica malabarica, Nothapodytes nimmoniana, Ancistrocladus heyneanus, Delphinium malabaricum, Morinda citrifolia, Ophiorrhiza rugosa, Ravoulfia serpentine, Ravoulfia verticilliata, Pedalium murex, Piper longum, Baliospermum montanum, Capparis moonii, Chlorophytum borivilianum, Eulophianuda, Holostemma annulare, Oroxylum indicum, Peuraria tuberosa, Salacia brunoniana, Santalum album, Saraca asoca etc.

Probable plant species of potential medicinal value from Western Ghats which needs investigation are -Adenia hondala, Bryonia dioica, Corallocarpus epigaeus, Diplocyclos palmatus, Trichosanthus tricuspidata, Lobelia nicotialefolia, Diospyros species, Symplocos racemosa, Gardenia gummifera, Tabernemontana alternifolia, Swertia densiflora, Ipomoea species, Stereopermum chelenoides, Glnidia glauca, Macranga peltata, Phyllanthus amarus, Toddalia asiatica, Moullava spicata, Moringa cocanensis, Smilax macrophylla, Spermadictyon suaveolens, Zanthoxylum rhetsa, Baliospermum montanum, Anamitra cocculus, Nargamia alata, Entada rheedei, Diploclisia glaucescens, Ancistrocladus heyneanus, Jasminum malbaricum etc. It is but sure that some of these plant species will give some active bio-molecules to discover the new drugs.

TRADITIONAL MEDICINAL PLANTS

The word TRDITION is comes from the Latin 'traditio' means to transmit, to hand over or to give for safekeeping. Over centuries, tribal's developed their own locality-specific knowledge known as TRADITION. Many objects, beliefs and customs can be traditional so there are various origins and fields of tradition - Agriculture, Land use, Natural resource management, Livestock rearing, Food preparation, and Environmental conservation etc. This complex of knowledge - beliefs and practices is generally known as "Traditional knowledge" developed by a particular tribe, culture or ethnic group. Tradition is often used as an adjective, in contexts as - Traditional food, Traditional music, Traditional stories and poems, Traditional dance, design and sculpture and traditional medicine etc. In such constructions tradition refers to specific values and materials to the discussed context, passed through generation to generation.

Traditional medicine is also known as indigenous or folk medicine comprises knowledge system that developed over generation within various societies before era of modern medicine. The WHO defines traditional medicine as "The sum total of the knowledge, skills, and practices based on theories, beliefs and experiences indigenous to different culture, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness"

When adopted outside of its traditional culture, traditional medicine is often called complementary or alternative medicine.

The WHO notes however that "inappropriate use of traditional medicines or practices can have negative or dangerous effects" and that "Further research is needed to ascertain the efficacy and safety" of several of the practices and medicinal plants used by traditional medicine systems. Core disciplines which study traditional medicine include herbalism, ethnomedicine, ethnobotany and medical anthropology.

PLANT, AYURVEDA AND AYURVEDIC PHYSICIAN

In Ayurveda so many basic concepts are mentioned. Charaka a great Ayurveda Physician mentioned in his Charak Samhita about the great experts and best physician -

AaoYa QaInaama$paByaaM jaanato hyajapa vanao aAivapaScaOva gaaopaSca yao caanyao vanavaaisana: aa

na naama&anamaa~oNa $p&anaona vaa puna: aAaoYaQaInaaM pra p`aiPtM kiScad\ vaoidtumah-it aa

yaaogaivannaama$p&stasaaM t%vaivaducyato aikM punayaao- iva&anaIyaadaoYaQaI: sava-qaa iBaYak\ aa

yaaogamaasaaM tu yaao ivaQyaad\ doSakalaaoppaidtma\ apu$YaM pu$YaM vaIxya sa &oyaao iBaYagau%tma: aa

cark saMihta saU. A. 1

Collect information about drugs from goatherds, shepherds, cowherds, forest dwellers, ascetics, hunters, wild tribes and those who uses the tubers and other plant part as a food and drugs, do know or recognize the drugs by names and forms. None though recognizing the drugs by names and forms is able to know their great properties. One who is well acquainted with the names, forms and properties of drugs should be called a "GREAT EXPERT". Then what to speak of a physician possessed of thorough knowledge of these drugs. One who after experimentally with regional and seasonal properties of the drugs for all persons gets fully satisfied is worthy of being called the ----- BEST PHYSICIAN.

On the other hand, Sushruta also mentioned that…….

gaaopalaastapsaa vyaaQaa yao caanyao vanacaairNa: a

maulaaharSca yao toByaao BaoYajavyai@tirYyato aa

sauEaut saMihta.saU. 36

Collect the information about drugs from Cowherds,Ascetics,Hunters and Wild tribes.

Also, those who uses the tubers and otherplant part as a food and drugs.

CONSERVATION AND CULTIVATION OF MEDICINAL PLANTS

Denudation of forests accompanied by over exploitation of medicinal plants, discriminate collection of raw drugs and alteration in habitats for various purposes have threatened the existence and availability of several plant species, also causing imbalance in biodiversity. The belief that plant wealth is sustainable can no longer applicable as demand out-rates availability. Every increasing population coupled with diminishing forest resources, progressive increase demand of raw material both for indigenous, industries as well as for export, unrestricted exploitation of crude drugs from natural resources without proper measures of conservation have led to disappearing of medicinal plants at alarming rate from wild. Many medicinal plants easily available in the past are difficult to procure and are no longer commonly available in the wild.

Due to high rate of deforestation today we are losing at least one higher plant per day from tropical forest alone. If present trend continues, about 25% higher plants will be lost in next few decades. By the year 2050 up to 60,000 plant species will become extinct. World Watch Institutes (WWI) put

India in a 10th dubious position in maximum species loss counties. To scarcity of medicinal plants is obviously leading to adulteration and substitution which turn leads to production of substandard medicine.

It is essential to conserve the medicinal plants by ex-situ or in-situ methods. Conservation of medicinal plants is a challenging task. With increasing necessities of mankind it is rather impossible to have complete ban on destruction of forest and natural resources. Therefore multiplication and cultivation of medicinal plants are of utmost importance. In cultivation don't target only commercially important plants like Withania somenifera, Emblica officenalae, Aspragus recemosus etc.but think abouttraditional medicinal plants which are not commercially viable but important for maintaining health. If health is healthy then one can earn more.

TRADITIONAL MEDICINAL PLANTS: NEED TO STUDY

Ethno-medicinal and ethno-botanical study has great importance in India. In Ayurveda 7000 - 8000 plants are mentioned as medicine. So many controversial plants are also in Ayurveda which are not studied to this date. Besides that so many other plants are used by tribes which are not mentioned in Ayurveda. They have very good results to cure the diseases. So there is need of study of traditional medicinal plants. This is our responsibility to study these plants which having medicinal properties. We will get some new drug for new diseases.

Pharmacologists are also fighting for new challenging drug for new diseases. Today, plant sources are the only hopes for them. So they are in search of two persons - one, who collected the information from traditional healers and second, taxonomist for identification and authentication. This will be helpful for novel compounds, drug discovery etc. So the traditional medicinal plants must be respected, must be restudied and must be evoluate in the light of modern science.

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26. CLINICAL EFFICACY OF NYAGRODHADI TAIL IN POST-OP ERATIVE FISTULA-IN-ANO WOUND - CASE STUDY

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Abstract :

Fistula in Ano known in ayurveda as Bhagandara. It is one of the common but complicated anorectal disease. It takes time to cure, and recurrence is very high. It is mentioned in ayurveda in Ashtomahagada means eight dreadful diseases.In modern aspect various treatment has mentioned for fistula in ano. But as far as ayurveda management is concerned though it is time consuming but have least recurrence and complications both. Here a case study is conducted to show the efficacy of Nyagrodhadi tail in a patient 55 years old male underwent Partial fistulectomy. Post operative wound was cleaned and dressed for next 3months with Nyagrodhadi tail and healed completely. An effort is made to use the herbal drugs mentioned in samhitas for dressing and which shows good results.

Keywords : Bhagandara, Nyagrodhadi tail, Fistula in Ano, Fistulectomy

Introduction :

A fistula-in-ano, or anal fistula, is a chronic abnormal communication,usually lined to some degree by granulation tissue,which runs outwards from the anorectal lumen (the internal opening) to an external opening on the skin of the perineumor buttock (or rarely, in women, to the vagina)1.Fistula has different types according to complexity and anatomical positions of opening and tract. High anal fistula and Low anal fistula2, simple fistula and complex fistula3, Park's classification4 for fistula in ano. Ayurveda has mention about Bhagandara in various scriptures which have similarity in clinical features with Fistula-in-ano.Acharya Sushruta has mentioned about Bhagandara in detail and different treatment modalities for Bhagandara.Acharya Sushruta mentioned Bhagandara in eight dreadful diseases5.

Case Study :

A 55 years male patient, contractor by occupation of Amravati came to our hospital Shalyatantra Department complaining of right lateral perianal region pain associated with swelling at perianal region since last 10-15days with no h/o fever. He was examined clinically and diagnosed to have perianal Abscess with ?Fistula in Ano. He underwent probing and threading and later posted for surgery. He was evaluated and physician's fitness sought. He underwent Partial Fistulectomy. He was having large post op wound which was managed and treated with daily dressings with Nyagrodhadi Tail. He was operated in the month of November-2021 and follow up kept till wound healed completely. It took almost 3months to heal the wound completely.

General Examination :

K/c HTN on regular treatment
No h/o surgical intervention in past.
No known allergy.
O/E
Pulse: 88beats/min; BP- 140/90 mmHg; RR- 20/min; SpO2- 98% on RA
CVS - S1S2 audible, no murmur
RS - AEBE
CNS - Conscious, oriented
P/A - Soft, SoLo
No bladder complaints.
Having constipation.
Built: Tall stature, moderate built.
No Pallor, No icterus, No edema, No Lymphadenopathy
Investigation:
Hb. 13.4gm%, TLC- 13200, Platelet- 236000, RBS- 112mg%, Creatinine- 1.1
HIV- Non Reactive, HBsAg- Negative

Material and Method :

Material :

Nyagrodhadi tail6 is used for dressing. Nyagrodhadi tail is made up of Bada, Audumbara, Peepal, Palash, Mulethi etc. as mentioned in Sushruta Sutrasthana in Dravyasangrahniya7. Etract of these drugs mixed with Sesame oil and that oil is termed as Nyagrodhadi Tail.

Method :

Patient was call for dressing on daily basis. His post op wound was washed and cleaned by normal saline and gauze soaked in Nyagrodhadi Tail was kept on wound and packed.

Treatment Module :

Patient underwent partial fistulectomy and later from post op day2 he was call for dressing. When healthy granulation noted 2-3 weeks later. Dressing frequency was switched to alternate day from daily basis. Around 2 months later he was call for twice a week for dressing. Finally after 99days patients wound healed completely.

Discussion :

There are different types of treatment module for fistula in ano. Different types of dressing ointments and liquids are also used.Here Nyagrodhadi tail is used for dressing. Nyagrodhadi tailis made up of Bada, Audumbara, Peepal, Palash, Mulethi etc. with sesame oil. These drugs are mostly Kashaya Rasatmak, KatuVipaki and Sheet Virya. Sesame oil is having oil soluble lignansi.esesamin and sesamolin in high concentration. These lignans have antioxidants and antimicrobial properties8. Kashaya Rasa of drugs have vasoconstriction and dryness properties. Madhura Rasa pleases the body and sense organ and Sheet Virya reduces burning. Katu Rasa produces irritation and burning sensation9. By means of irritation and burning inflammatory procedure takes place which helps in wound healing. On other side the contradictory effect should not exceed landing up in a complication

the dryness by Kashaya rasa, SheetaVirya helps in burning reducing and Madhura rasa helps in pleasing sence organs. These conditions helps in wound healing fast without landing up into a complication.

Result :

By using Nyagrodhadi Tail in Post op Fistula in Ano wound a better healing pattern was observed without local buring or irritation. Size of wound decreased and shedding of slough is very fast as well. First day after surgery the condition of wound is as follow:

Size of wound - Approx. 10cm x 8cm x 5cm

Burning - (+++)

Irritation - (++)

Slough - (++)

Healthy Granulation - (+++)

Table No. 1

Sr. No.	Symptoms	After 1 week	After 3 weeks	After 1month	After 2 months	After 3 months
01	Size of wound	10x8x5	8x6x5	7x2x3	5x2x2	Healed scar
02	Burning	+++	++	++	+	0
03	Irritation	++	++	++	+	+
04	Shading of Slough	++	+	+	0	0
05	Healthy Granulation	+++	++++	++++	++++	Healed

Figure No. 1

Figure No.2

Figure No.3

Figure No.4

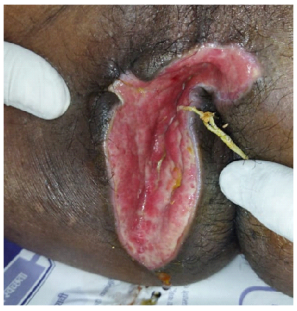

Figure No.5

Figure No.6

Figure No.7

Photos Annexure : :

Figure No.1 - Before Surgery
Figure No.2 - 1 week after surgery
Figure No.3 - 3 weeks after surgery
Figure No.4 - 1 month after surgery
Figure No.5 - 2 months after surgery
Figure No.6 - 3 months after surgery
Figure No.7 - Complete Healed

Conclusion :

There are different types of treatment module for fistula in ano. Different types of dressing materials and ointments are also used to dress Fistula wounds. But in fistula wound generally the area is perianal region. Which didn't get rest normally and there are the high chances of contamination due to faecal matter. Some ointments are costly, and some have local irritation. NyagrodhadiTail is purely herbal medicine which generally didn't revealed such complication and cost effective. Wound healing process revealed very fast and wound size reduced rapidly.

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27. ROLE OF ARJUN-JATAMANSYADI CHURNA IN ESSENTIAL HYPERTENSION : A REVIEW

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Abstract :

Hypertension is a common disease in present era.It is a chronic, psychosomatic, hemodynamic disease with a multi-factorial aetio-pathology of several dietary, environmental and genetic factors. It is one of the leading cause of the Global burden of disease and most frequent cause for cardiovascular, cerebrovascular and renovascular mortality and morbidity. The adverse effects of hypertension principally involve the blood vessels, central nervous system, retina, heart and kidneys. But Ayurvedic therapy can minimize these factors in a better way. There is an urgent need to develop a medicine, traditional Ayurvedic medicine which could show good control on essential hypertension. The combination of five drugs viz. *Arjun (Hridya), Jatamansi (Medhya), Haritki (Anulomaka), Manjista (Raktaprasadak), Gokshur (Mutral & Hridya),* and named as *Arjun-Jatamansyadi Churna consists of Mutral, Hridya, Medhya, Anulomaka, & Raktaprasadak* properties which would be useful in treatment of essential hypertension.

Keywords : Hypertension , Ayurveda, Arjun Jatamansyadi churna

Introduction :

Most adults are become victims of the disease in later half of their life. It is one of the most frequent cause for cardio-vascular, cerebro-vascular and reno-vascular mortality and morbidity. The adverse effects of hypertension principally involve the blood vessels, central nervous system, retina, heart and kidneys, and can often detected clinically. In Modern medicine antihypertensive drugs lower the high blood pressure but do not eradicate the risk of cardio-cerebro-reno-opthalmo-vascular involvement. Arjuna (Terminalia arjuna), Jatamamsi (Nardostachys jatamansi), Haritaki (Terminalia chebula), Manjishtha (Rubia cardifolia), Gokshur (Tribulus terisstis) , these five medicinal plants are very frequently used in Ayurveda in different diseases and proved satisfactory results in reducing symptoms in respective diseases. This is a review article to through lime light on traditional and contemporary pharmacology of these five drugs in view of their utility in management of essential hypertension.

Materials and Methods :

A thorough review of texts of Ayurveda like Brihattrayee and Laghutrayee were done for references of Guna-karma of Arjuna, Jatamamsi, Haritaki, Manjishtha , Gokshur. Obtained data was analysed with the researches done on above said herbal medicines.

1. Arjuna :

Arjuna (Terminalia arjuna) is a best medicinal plant used to treat cardiac diseases. In Rigveda

the term Arjuna is used to indicate white colour. Brihattrayee (Charaka,Sushruta & Vagbhata) are mentioned that, it is used to treat diseases like Raktpitta, Prameha, Kushtha, Mutraghata and Vrana. But these texts are not mentioned about it's " Hridya" property. It is Vrinda, Chakrpani and Shodala are mentioned it's use in Hridaroga. Arjuna is a tree which is commonly growing on bank of river so it has a synonym as Nadisarja. It is found almost in India. Commonly stem bark is used for the treatment. It has Kashay -Rasa, Sheet -Veerya, Katu -vipaka, Ruksha, Laghu-Guna, and Hridya - Prabhav ,Mutrala, Raktpittahara-Karma. Many modern researches proved it's diuretic, inotropic and chronotropic properties. In animal research model researchers found that aqueous extract of Arjuna increases the coronary flow. Dried, pulverized bark has been shown to augment endogenous antioxidant compounds of rat heart and prevent oxidative stress associated with ischemic–reperfusion injury of the heart. Arjunolic acid has been found to prevent the decrease in the levels of superoxide dismutase, catalase, GPO, ceruloplasmin, a-tocopherol, reduced glutathione, ascorbic acid, lipid peroxide, and myeloperoxidase. Further, the bark extract has also shown protective effects against doxorubicin-induced DNA damage and cardiotoxicity. Kumar et al. demonstrated that arjuna protects the heart against myocardial changes induced by chronic ß-adrenoceptor stimulation. Substantiating this, in a recent experiment, the bark extract significantly attenuated cardiac dysfunction and myocardial injury in rats with congestive heart failure (CHF). Cardioprotective action of arjuna was comparable to fluvastatin. Arjuna bark extract has a significant prophylactic and therapeutic beneficial effect in protecting heart against catecholamine-induced CHF, possibly through maintaining endogenous antioxidant enzyme activities and inhibiting LPO and cytokine levels. Recently, Mythili et al. confirmed the earlier findings that triterpenoids derived from arjuna extract containing arjunolic acid show cardio protective activity by boosting endogenous antioxidant defense system. Recently, arjuna has also been shown useful in improving cardiovascular endurance and in lowering SBP in normal healthy subjects.

2. Jatamamsi :

This is a medicinal plant which is frequently used as Medhya (Neuro-tonic). Spikenard is an English name of Jatamamsi, botanically it is identified as Nardostachys jatamansi Dc belongs to Valerianaceae family. it's Classical properties are Tikta-Kashaya- Rasa, Sheet-veerya, Katu-Vipaka, Laghu snigdha-Guna, Medhya-Prabhav. In classics it is mentioned that it is used in Daha, Visarpa, Kushtha, Manodosha. More than 20 active compounds are found in Jatamamsi in different researches. Different animal experiments are done by using it's extracts, one of them is cardio protective activity, in this model of study rats were pre-treated with N. jatamansi extract then Doxorubicin 15mg\kg was administered for myocardial damage. It was noticed that pre-treatment with N. jatamansi extract significantly prevented and restore the antioxidant enzyme activity and lipid peroxides near normal levels. The In-vitro antioxidant activity of N. jatamansi was studied by measuring the free radical scavenging activity. N. jatamansi showed potent anti oxidant activity and significantly reversed the stress induced elevation of LPO and NO levels and decrease in catalase activity in the brain. The N. jatamansi possesses significant anti-stress activity.

3.*Haritaki :*

This is a component of Triphala which is a widely used in Ayurveda modalities, identified botanical source is Terminalia chebula belongs to Combretaceae family. It has kashay pradhan Lavanvarjit panchrasa, Ushna-veerya, Madhur-Vipaka, Laghu-Rooksha-Sara- Guna. Haritaki fruit does body purification as well rejuvenation. It contains many phytochemicals chebulic acid, chebulagic acid, gallic acid anthraquinones are few of them. It is successfully used in Digestive diseases, urinary diseases, diabetes, skin diseases, heart diseases, irregular fevers, constipation, ulcers, vomiting, colic pain, haemorrhoids. Different animal researches supported it's antioxidant and free radical scavenging activity, cardio protective activity, Anti dabetic and reno protective activity as well hypo lipidemic and hypo cholesterolemic activity.

4. *Manjistha :*

It has a Raktaprasadak (Blood detoxification) property. Indian Maddar is an English name for it, it is used in many oral and tropical preparation. It's scientific name is Rubia cordifolia Linn. Family is Rubiaceae. Has Tikat-Kashay,Madura- Rasa, Katu-Vipaka, Ushna-Veerya, Guru-Ruksha-Guna. It balances Kapha and pitta. It is used in skin diseases. diseases of circulatory system and metabolism related disorders. It has many phytochemicals munjistin, purpurin, and pseudopurpurin. New anthraquinones namely 1-hydroxy-2,7-dimethyl anthraquinone, 2-hydroxy -6-methyl anthraquinone, 2,6-dihydroxy anthraquinone, 1- hydroxy 2-methyl anthraquinone, these are some of them. In one research Histopathological observation in CP (Cyclophosphamide)-induced rats showed varying degree of vacuolation, inflammatory infiltrate, and myofibrillar damage in the myocardium. However, treatment with Rubia cordifolia root extract effectively inhibited CP-induced cardiac damage by preventing the destructive pathological processes. Study revealed the presence of uridine-5-diphospho-N-acetylglucosamine, phosphonate compounds, and carbonyl derivatives, which are active ingredients in Rubia cordifolia root extract might be responsible for the abrogation of CP-elicited cardiotoxicity. Studies suggests that uridine-5-diphospho-N-acetyl glucosamine, phosphonate compounds, and carbonyl derivatives possess cardioprotective properties Hence, these phytoconstituents in Rubia cordifolia root extract might be responsible for the protective effect against CP-induced cardiotoxicity.

5. *Gokshura :*

It has two verities Laghu Gokshura & Brihat Gokshura . Laghu Gokshura is commonly used as diuretics, in all preparations this variety is used. Identified botanical source is Tribulus terrestris Linn, belongs to Zygophyllaceae family. Classically it's pharmacological qualities are Madhura-Rasa, Madhura-Vipaka, Sheeta-Veerya, Guru-Snigdha-Guna, Brumhana (nourishing), Vatanut (pacifies Vatadosha),Vrusya (aphrodisiac), Ashmarihara (removes urinary stone), Vastishodhana (cures bladder ailments) Karma. The preliminary phytochemical study of TT revealed the presence of saponins, flavonoids, glycosides, alkaloids, and tannins, many types of saponins of tigogenin and diosgenin is isolated from this plants viz furostanol and spirostanol, Louveaux et al. detected 18 flavonoids, along with many other phytochemicals ,Sterols such as ßsitosterols and stigmasterols were also found to be present. In different in-vivo researches proved it's diuretic effect comparable to that of the refer-

ence standard frusemide and also exhibited additional advantage of potassiumsparing effect thus the diuretic action of Gokshura makes it useful as an antihypertensive agent. It has hypolipidemic activity, anti-inflammatory activity, it showed significant effect in the treatment of various cardiac diseases including coronary disease, myocardial infarction, cerebral arteriosclerosis, and the sequelae of cerebral thrombosis. . Zhang et al. evaluated the protective effect of tribulosin against cardiac ischemia/ reperfusion injury to study the underlying mechanism in rats and study found usefulness of tribulosin in cardiac ischemia.

Conclusion :

Considering the available classical literature and research data on Arjuna(Terminalia arjuna), Jatamamsi (Nardostachys jatamansi), Haritaki (Terminalia chebula), Manjishtha (Rubia cardifolia), Gokshur (Tribulus terisstis) ,these medicinal plants could have a potential effect on essential hypertension due to their cardio protective, stress relieving, blood detoxification, immune-modulatory, hyperlipidemic, anti-atherogenic,antioxidant,diuretic(potassium sparing) activity.

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28. A COMPARATIVE PHYTOCHEMICAL STUDY OF ROOT AND STEM OF SARIVA (Hemidesmus indicus (Linn.) R. Br.

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Abstract :

Sariva a well known drug of Ayurvedic Materia Medica had been in wide use since ancient times. The official part of Sariva is root.Taking root for medicinal purpose renders the plant useless for its further use as it may become fatal to it. In such conditions, scarcity of genuine drug further hampers its usage. However owing to the shortage of Sariva and ever increasing demands in market, it becomes necessary to search an alternative with equal efficacy without compromising the therapeutic value. Ancient Ayurvedic literature opines that the properties and actions attributed to one part of the plant will be the same for the other parts too. It was analyzed and found that the stem of the same plant can be used instead of root. So stem of same plant can be substituted to root. No work has been reported regarding comparative Phytochemical study of root and stem of Sariva. Methods - an attempt has been made to check and compare phytochemical study of root and stem of Sariva. Result- Qualitative analysis reveals presence of certain chemicals like Carbohydrates, Alkaloids, Proteins, Tannins, Glycosides, Volatile oil in booth root and stem of Sariva, except saponins are present in root and absent in stem.Conclusion - Hence, stem can be used as substitute to root of drug Sariva. However, Pre-clinical and Clinical studies should be carried out to prove the same.

Key Words : *Sariva, Substitute, Phytochemical*

Introduction :

The properties of a good drug cited by Acharya Charaka as for better therapeutic state drug should have abundant availability, accomplished to cure many diseases, have many formulation and must be affluent with its properties [1].

In Ayurvedic literature two varieties of Sariva i. e. Shweta and Krishna Sariva had been mentioned [2, 3, 4]. Hemidesmus indicus is accepted by Ayurvedic Pharmacopeia and formulary as Sweta (white) variety. When only Sariva word is mentioned, then Sweta Sariva should be taken. Cryptolepis buchananii is accepted by Ayurvedic Pharmacopoeia of India as Krishna (black) variety [5].

Sariva a well known drug of Ayurvedic Materia Medica had been in wide use since ancient times.The official part of Sariva is root. The root has been widely used in Ayurvedic medicine since ancient times for treatment of various disease conditions[6]. Taking root for medicinal purpose renders the plant useless for its further use as it may become fatal to it. In such conditions, scarcity of genuine drug Sariva root further hampers its usage. However owing to the shortage of Sariva root and ever increasing demands in market, it becomes necessary to search an alternative with equal efficacy

without compromising the therapeutic value.

Ancient Ayurvedic literature opines that the properties and actions attributed to one part of the plant will be the same for the other parts too [7]. Now a day, it becomes a common practice of using stem in case of root, and also, it was analyzed and found that the stem of the same plant can be used instead of roots [8, 9, 10]. So other plant part of the Sariva, should be checked for substitute to Sariva root.The concept of drug substitution has been in vogue in Ayurveda and documented in texts dating to 15th and 16th centuries. Such a concept is called as 'AbhavaPratinidhi Dravya', wherein an 'Abhava Dravya' (unavailable drug) is replaced by a 'Pratinidhi Dravya'(substitute drug). The objective of this study was to analyze and compare Phytochemical profile of root and stem of Sariva for biochemical similarities and differences. No previous studies had been recorded to compare these two parts chemical profile. So stem of the Sariva should be checked.

Methodology : Chemical profiles (Phytochemical screening) comparison of root and stem of Sariva was done.

Plant Material : Field samples of Hemidesmus indicus (Linn.) R. Br was collected and authenticated by an authorized field botanist and an Ayurvedic practitioner. Voucher specimen was deposited with the herbarium at Boatany Department, Sant Gadge Baba Amravati University, Amravati. The herbarium voucher specimen number was MAE/2020/III. A slender, laticiferous, twining, sometimes prostrate or semi-erect shrub. Leaves opposite, shortly petioled, very variable, elliptic-oblong to linear-lanceolate, pale beneath and very frequently with a whole streak above. Flowers greenish outside, purplish inside, crowded in subsessile axillary cymes. Follicles slender, 10 cm long, cylindrical, sometimes curved, divaricate. Seeds numerous, flattened, black, with a silvery white coma[11].

Ayurvedic medicines are characterized based upon the principles of Dravyaguna Vijnana. In essence, each drug is identified / characterized using its Rasapanchak attributes of Guna, Rasa, Vipak, Veerya, Prabhav and Karma. Rasapanchakof Sariva are as follows

Table1 : Rasapanchak of Sariva

S.No.	Rasapanchak	Sariva
1.	Guna	Guru, Snigdha
2.	Rasa	Tikta, Madhur
3.	Vipak	Madhur
4.	Veerya	Sheeta
5.	Karma	Rochana, Deepana, Pachana, Anulomana, Raktashodhaka, Shothahara, Kaphaghna, Vrishya, Stanyashodhana, Garbhasthapana, Jwarahara, Mootrajanana, Mootravirajaniya, Kushthaghna, Jwaraghna, Dahaprashamana, Rasayana, Vishaghna.

Table 2 : Physico-chemical standards of Root and Stem of Sariva

S. No	Tests	Sariva Root	Sariva Stem
1.	Foreign organic matter	Negligible	Negligible
2.	Loss on drying	1.6%	2.5%
3.	Total Ash value	3.02%	7.25%
4.	Acid insoluble Ash value	0.487%	0.491%
5.	Water soluble Ash value	2.3%	1.75%
6.	Water Soluble extractive	23.5%	16.46%
7.	Alcohol soluble extractive	12%	13.6%

Table 3 : Qualitative chemical screening of Root and Stem of Sariva

S. No	Name of Test	Sariva Root	Sariva Stem
1.	Alkaloids	+	+
2.	Glycosides	+	+
3.	Saponon	+	-
4.	Phenols	+	+
5.	Tannin	+	+
6.	Carbohydrate	+	+
7.	Proteins	+	+

Discussion : The process of substituteidentification and reasons for using substitutes are not available in classical Ayurvedic texts [12]. Other plant part of the same drug can be substituted to official part only on the basis of pharmacognostical, phytochemical and pharmacological similarities. Table 2 shows the physico-chemical standard of the root and stem of Sariva. Negligible foreign organic matter in both parts suggests purity of sample. The loss on drying of any sample is directly related to its moisture content; loss on drying content of stem (2.5%) is higher than that of root (1.6%). So, it suggested that stem is having more water content than root. The ash value indicates the presence of inorganic and salt materials in the sample. Ash value was found to be 3.02% w/w and 7.25% w/w in

Root of Sariva

Stem of Sariva

Sariva Plant

root and stem respectively. It indicates that the inorganic materials and salt are more in stem of Sariva. All the physico-chemical parameters tested were as per Ayurvedic Pharmacopeia of India standard. On analyzing in detail, it was found that water soluble extractive value of root is higher than stem of Sariva. So, rootis more soluble in water. Qualitative analysis reveals presence of certain chemicals like Carbohydrates, Alkaloids, Proteins, Tannins, Glycosides, Volatile oil in booth root and stem of Sariva, except saponins are present in root and absent in stem.

Further comparative Pre- clinical and clinical studies have been needed to prove the same.

Conclusion - after analyzing and comparing it was found that stem could be substituted to root of Sariva.

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29. PHARMACOVIGILANCE IN AYURVEDA & ADVERSE DRUG REACTION : A Review

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Abstract :

Ayurveda the ancient health science has been practiced all over world. Pharmacovigilance Of Ayurvedic medicines has become essential due to increasing popularity of Ayurvedic medicines worldwide. People believe that ayurvedic medicines are purely herbal hence have no side effects which is not entirely true. Not only it should be included in syllabus but also the young practionars should also be trained to inform ADR of ayurvedic aspect.

Keywords : ADR (Adverse Drug Rection), Pharmacovigilance, Ayurveda, Herbo-mineral etc.

Introduction :

Ayurveda is an ancient science which deals with lifestyle & medicine. It has been practiced in Indian sub-continent since ages.The word Pharmacovigilance is derived from Pharmakon (Greek) means medicinal substances and vigilia (Latin) means to keep watch. The concept of Pharmacovigilanceis defined by WHO "The science & activities relating to the detection, assessment, understanding & prevention of adverse effects or any other drug related problems". Ayurveda has earned respect globally. Recently the Minister of Africa has claimed that his daughter got her vision back due to Ayurvedic medicines. This shows the awareness of Ayurveda & Ayurvedic medicine all over world. This has led to largescale demand of Ayurvedic medicines. Which makes it necessary to put a check on it. Due to which there is need to study adverse drug reaction in Ayurveda & study pharmacovigilance in detail. Which will eventually helpful in-patient safety & will help in ethical use of Ayurvedic medicine.

Necessity of pharmacovigilance :

After adverse drug reaction of thalidomide drug found globally. It became essential to keep a check on drugs. So, WHO made drug Monitoring compulsory from year 1968. The main purpose of pharmacovigilance was to reduce adverse drug reaction (ADR), patient safety & rational use of drug.

Necessity of pharmacovigilance in Ayurveda :

There is myth among people that Ayurvedic medicines are purely herbal based formulations that do not have any ADR, which is a very wrong concept. Though Ayurveda does not have mentioned terminology like pharmacovigilance & ADR but it has clearly stated ethical use of Ayurvedic medicinal. Now a days Ayurvedic medicines are available as OTC products& are used widely by people. Due to which it is necessary to implement ADR & pharmacovigilance as per modern norms.

Pharmacovigilance :

The concept of Pharmacovigilance is defined by WHO is, "The science & activities relating to the detection, assessment, understanding & prevention of adverse effects or any other drug related problems". It consists of detecting & reporting ADR. Drug dosage in individual is monitored & data is maintained. Data is collected in 2 types, 1) Spontaneous 2) Mandatory type. Basically, pharmacovigilance is about drug safety, which consist of data collection, monitoring, reporting, assessment & by assessment all the work to prevent or reduce ADR. In Ayurveda concept of pharmacovigilance is defined by Acharyas.The main aim of pharmacovigilance, mainly to improve patient care and safety in relation to drug use, and thus promote ethical use of drug. The use of Ayurvedic medicines is becoming popular day by day in India - and in recent times it has been widely accepted in many countries. Associated with this increasing use are growing concerns about the safety of ayurvedic medicines. This paper will help to discuss in brief the Ayurvedic concepts of adverse reactions to medicines, the need for pharmacovigilance of Ayurvedic medicines, challenges in introducing pharmacovigilance in Ayurveda.

Adverse drug reaction (ADR) :

ADR is an unintended reaction of drug. ADR is untoward medical occurrence at any dose resulting in unexpected effect of drug, life threating event, hospitalization, significant disability or even death. ADR consist of adverse event (AE), serious adverse event (SAE), Expected adverse reaction, unexpected adverse reaction & signal detection.In Ayurveda ADR can be seen when patient doesn't follow the do's & don'ts (Pathya-Apathya).

Pharmacovigilance & Adverse drug effect in Ayurveda :

The concept of pharmacovigilance resemblances with their action & benefit. Ayurvedic medicine, along with that in Ayurvedic Pharmacology (Dravyaguna) adverse effects of drug are mentioned with proper ways to minimize their side effects & ADR. Due to increase in use of Ayurvedic medicine its now necessity for studying pharmacovigilance. Which includes precautions right from raw drug collection, processing of drug till its use on patient & monitoring effects their after. Pharmacovigilance programme of India was started in 2003, for ASU drugs it was established in 2008,The purpose of the programme is to collect data, assess it & use of data reported with recommend& ADR monitoring system was implemented in 1986 by Govt. of India.The purpose of the programme is to collect data, assess it & use of data reported with recommendation regulatory body.Some quotes mentioned by Acharya Charak regarding pharmacovigilance are,

1. Effectiveness of drugs depends on proper dose administration, if failure of that will result in un wanted effects. (Charak Sustrasthan 15/4)
2. All drugs one should not use excess Pippali, Kshara or Lavan. (Charak Vimansthan 1/15) Goals of Pharmacovigilance in Ayurved:

1. Patient care and safety while using Ayurvedic medicines and related interventions.
2. Public records of Ayurvedic medicine
3. Assessment of benefit,effectiveness and harm or risk of Ayurvedic medicines.

Reporting system of Pharmacovigilance&ADR :

Pharmacovigilance Cell (PV Cell) was established for reporting any ADR or unexpected effect. The reporting form was made which was is to be filled and reported at peripheral center then further report to further national center. There are more than 8407 registered Ayush pharmaceuticals inIndia, drug manufactured by these are should come under pharmacovigilance process for patient safety & rational use. Reporting system works as follows,

Patient

⇓

Health professional

⇓

Hospital & manufacturer

⇓

Regional center

⇓

National center

Once data is reported the regulatory body at national level will analyze the report, will maintain log of each and every report which will be published.

To recall, Charaka says, "that even a strong poison can become an excellent medicine if administered properly. On the other hand, even the most useful drug can act like a poison if handled carelessly".[12]

Ayurveda prescribes medicines which consist of metals and minerals, given as bhasmas (incinerated mineral formulations) or in combination with plants as Herbo-mineral formulations (e.g., Chandraprabha vati). Manufacturing procedures for these medicines are stringent, and adverse reactions are described when precautions are not taken while manufacturing and administering these medicines. Hence it was necessary step in Ayurveda.

Challenges in Pharmacovigilance in Ayurveda :

Although the National Pharmacovigilance Program has encouraged reporting of all suspected drug-related adverse events including those caused by herbal/traditional/alternative medicines (Protocol of NPP, Version 1, 2004, p. 17), the number of reports related to Ayurvedic/herbal drugs has been abysmally low. Several challenges that preclude identification and reporting of adverse reactions to ayurvedic drugs can be identified related to detection, assessment and prevention of adverse reactions.

Assessment of adverse reactions to Ayurvedic medicines :

* Although several scales are available for causality assessment, applying them for Ayurvedic medicines and ascribing causality is perhaps the greatest challenge for several reasons, including:
* Information related to adverse effects is scattered in ayurvedic literature and not in electronic form.
* Also compounding factor that patient taking allopathic & ayurvedic medicines. It is difficult to find out pharmacokinetics and toxicokinetic.

* Dose related responses are rarely measured.
* There is lack of expertise in performing casualty analysis with Ayurvedic medicines.

Unbiased drug information about Ayurvedic drugs including both classical and proprietary formulations is not available easily.

* Patients are not adequately aware that ayurvedic medicines can cause adverse reactions and can take medicines for years on end with no monitoring as they believe that these medicines can do no harm. Hence, they do not even give history of taking these medicines.
* The topic ofPharmacovigilance is in not explained in detail in curriculum hence its awareness UG & PG level is very low.
* The Ayurvedic pharmaceutical industry is not motivated to focus on pharmacovigilance of ayurvedic medicines.

Prevention of Adverse Reactions to Ayurvedic Medicines

Any pharmacovigilance system is its ability to prevent ADR.Some of the points below will help to prevent ADR of Ayurvedic medicines.

* To improve the communication between the practioners and policy makers of orthodox western medicines and traditional Indian medicines.
* To collect unbiased information about adverse event of ayurvedic drugs.
* To include the topic of pharmacovigilance in syllabus of UG and PG students.To explain them the necessity to study the topic.
* The Ayurvedic Pharmaceutical industry should be motivated to focus on Pharmacovigilance of Ayurvedic Medicines. The ayurvedic pharmaceutical industry should introduce SOPs to check any adverse event and keep a note of it.

Conclusion :

Pharmacovigilance remains a dynamic clinical scientific discipline.It plays major role in meeting the challenges posed ever increasing range and potency of medicines. The important role of Pharmacovigilance is to improve communication between the health professional and the public. Also, to educate health professionals to understand the effectiveness/risk of medicines that the doctor practice.

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30. PHYTOCHEMICAL ANALYSIS OF METHANOLIC LEAF EXTRACT OF THESPESIA POPULNEA

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ABSTRACT :

Thespesia populnea, commonly known as the Portia treeis species of flowering plant in the mallow family, Malvaceae. Thespesia populnea is medicinally important plant species used to treat different diseases. The present work is aimed to screen the leaves of this medicinal plant for phyto-chemical studies. Leaf powder of these plant was dissolved in methanolic solvents and screened for secondary metabolites. Leaves of Thespesia populnea revealed that the presence of Steroid, Coumarin, Diterpenes, Alkaloid, Amino- Acids, Phyto-Sterol, Cardial Glycosides etc. Thespesia populnea plant leaves shows variation in synthesis of secondary metabolites. Thespesia accumulates more number of secondary metabolites. Aqueous and methanol extracts are suitable for extraction of secondary metabolites for Thespesia species. The findings of the present study will be helpful to the phyto-chemists and pharmacologists.

Keyword - Thespesia populnea , Screening, Extract, Methanol, Phyto-chemical properties etc.

INTRODUCTION:

Medicinal plants possess spectrum of active principles and are useful as curatives in various human and animal diseases. The continuing use of herbs in medicine reveals the functional value and its necessity in the future. In modern medicine, the importance of medicinal plants is increasing. Thespesia populnea commonly called as Hibiscus populnea belongs to the Family: Malvaceae. Thespesia populnea is an evergreen tree. The Leaves are alternate, simple, with petioles of length 5-10cm long and shiny, oval or triangular in shape (Archana et al., 2010) [2]. The flowers are hibiscus like single at upper leaf axils, corolla yellow with a red centre. The Fruits are Globose. It is a large tree found in the tropical regions and coastal forests in India and cultivated in the gardens (Parthasarathy et al., 2009) [17]. All the parts of the plant used in traditional system of medicine. The bark, leaves, flowers and fruits are useful in cutaneous infection such as scabies, psoriasis, eczema, ringworm, and guinea worm (Chang et al., 2002) [5]. The decoction of the bark is commonly used for the treatment of skin and liver diseases. A compound oil and capsules made from bark is useful in urethritits and gonorrhea. The bark, root and fruits were used in dysentery, cholera and haemorrhoids (Chabra et al., 1994) [4]. An ayurvedic preparation containing Thespesia populnea, namely "panchvalkala" posses' free radicals. The bark and flowers possess astringent, hepatoprotective, antioxidant and antiinflammatory activities (Shirwaikar et al., 1995, Illavarasan et al., 2003, Satyanarayana et al., 2004 and Manivasudevan et al., 2007) [20, 8, 19, 14]. The main chemical constituents are Kaempferol, Quercetin and its glycosides, herbacetin and its glucoside, populneol, populnin, populnetin, rutin, gossipetin, gossypol, lupeol, sesquiterpenoidal quinones viz; thespeson, thespone,

mansononeS C, D, E and F, amino acids and carbohydrates. Fruit juice is used on rheumatism sprains, scabies, swellings, insect bites and warts. Pulps of fresh fruits were applied for relief of migrane. Unripe fruit juice was used to cure piles. Decoction of bark was given to treat diarrhoea and arthritis. Root, fruit and leaf were used in psoriasis, scabies and other cutaneous diseases. Bark was used for the treatment of hemorrhoids and chronic dysentery. Leaf is used for an anti-inflammatory effect (Asima and Satyesh, 1994 and Jean, 1999) [3, 10]. The leaves are applied locally on swollen joints for their anti inflammatory effects and and also for skin diseases, hepatitis, jaundice, ulcers, wounds, psoriasis, scabies, urinary tract infections, diabetes, cholers, cough, asthma and gunva worm infections. Gossypol was found to be the major component of Thespesia populnea flowers (Akila and Rani, 1993). Hence, the present study was carried out to know the qualitative phytochemical properties of methanolic extract of Thespesia populnea.

Materials and Methods :

The leaves of Thespesia populnea were collected from in and around Latur district, Maharashtra. The leaves were washed thoroughly and dried in the shade.The dried leaf powder was used for experiments.

Preparation of methanolic leaf extract of Thespesia populnea :

T.populnea methanolic leaf extract was prepared by using cold maceration method. The leaves of T. populnea were shade dried and ground to a coarse powder. About 100 g of leaf powder was soaked in 500 ml of 95% methanol (v/v) for 72 h with intermittent mixing using a glass rod and then filtered through muslin cloth followed by Whatman No. 1 filter paper. The filtrate was evaporator by extraction method on open air and then air dried. Extract was weighed and the percentage yield was calculated with reference to the air-dried material.

Qualitative Phytochemical examination of the extract :

The extract obtained was subjected to preliminary phytochemical screening for the detection of various plant constituents by following standard procedures (Evans, 2002) [6].

Test for carbohydrates :

Molisch's test : About 300 mg of extract was mixed with 4ml distilled water and filtered. To 2 ml of this filtrate, 2-3 drops of alpha naphthalene solution in alcohol was added, shaken for 2 min and 1 ml of concentrated sulphuric acid was added slowly from the sides of the test tube. Then it was observed for the presence of purple ring at the junction.

Fehling's test : Fehling's A and Fehling's B solutions, each 1ml were mixed and added to 2 ml of extract, heated in boiling water bath for10 min, appearance of yellow and then brick red precipitate indicated the presence of reducing sugars.

Test for Phenolic compounds :

Ferric chloride test : Small quantity of the extract was mixed with water and treated with dilute ferric chloride (5%) and observed for the presence of blue colour.

Lead acetate test : Small quantity of extract was mixed with water and treated with 3 ml of lead acetate solution. The occurrence of white precipitate indicated the presence of phenols.

Test for flavonoids :

Shinoda test : To 2 to 3ml of dilted extract, a piece of magnesium ribbon and 1ml of concentrated HCl was added. A pink or red coloration of the solution depicted the presence of flavonoids.

Test for alkaloids :

To 10 g of dry extract, 20 ml of dilute hydrochloric acid was added, shaken well and filtered. The following tests were performed using the filtrate.

Hager's test : To 3 ml of filtrate, 1 ml of Hager's reagent (saturated picric acid solution) was added and observed for the presence of yellow precipitate.

Wagner's test : To 3 ml of filtrate, 1ml of Wagner's reagent reagent(iodine in potassium iodide) was added. The appearance of reddish brown precipitate indicates the presence of alkaloids.

Mayer's test : To 3 ml of the filtrates, 1ml of Mayer's reagent (potassium mercuric iodide) was added. The appearance of white precipitate indicates the presence of alkaloids.

Tests for Glycosides :

Legal's test : Dissolved the extract (0.1g) in pyridine (2ml), added equal volume of freshly prepared sodium nitroprusside solution (2ml) and made alkaline with Sodium hydroxide solution. Pink to red colour solution shows the presence of glycosides.

Test for Saponins :

Foam test : 1ml of extract was diluted with 20ml of distilled water and shaken in a graduated cylinder for a few minutes. A 1cm layer of foam formation indicates the presence of Saponins.

Test for steroid / terpenoid :

Liebermann-Burchard's test : To 1ml of extract, 1ml of chloroform, 2 to 3 ml of acetic anhydride and 1 to 2 drops of concentrated Sulphuric acid were added. Dark green coloration of the solution indicates the presence of steroids and dark pink or red coloration of the solution indicates the presence of terpenoids.

Test for Proteins :

Biuret test :

To 0.5 mg of extract equal volume of 40% NaoH solution and two drops of 1 % copper sulphate solution was added. The appearance of violet colour indicates the presence of protein.

Ninhydrin test :

About 0.5 mg of extract was taken and two drops of freshly prepared 0.2% Ninhydrin reagent was added and heated. The appearance of pink or purple colour indicates the presence of proteins, amino acids or peptides.

PHYTO-CHEMICAL SCREENING :

1) Steroid :

1ml of extract was dissolved in 10 ml of chloroform & equal volume of concentrated H2SO4 acid was added from the edge of test tube. The upper layer was not turns to red and H2SO4 layer showed yellow color with green fluorescence. This indicates the presence of steroid.

2) Tannin :

a) 2ml of extract was addedto 1%lead acetate solution. No yellowish precipitate indicates the

absence of tannin.

b) 4 ml of extract was treated with 4 ml of FeCl3. There is no formation of green color indicates that absence of condensed tannin.

3) Saponin :

5ml of extract was mixed with 20ml of distilled water.Then it is agitated in graduated cylinder for 15 minutes. No formation of foam indicates the absence of Saponin.

4) Anthocyanin :

2ml of aqueous extract is added to 2 ml of 2N HCl & NH3. The pink - red color doesn't change to blue violet color, indicates absences of Anthocyanin.

5) Coumarin :

3ml of 10% NaOH was added to 2 ml of aqueous extract. The formation of yellow color indicates presence of Coumarins.

6) Emodins :

2ml of NH4OH and 3ml of benzene was added to extract.There is no appearance of red color which indicates the abscence of Emodins.

7) Alkaloids :

A quantity (3ml) of concentrated extract was taken into a test tube and 1 ml HCl was added. T he mixture was heated gently for 20 minutes and then cooled.After filtrationthe filtrate was used for following test.

Wagner Test : Filtrate was treated with Wagner's reagent. The formation of brown reddish precipitate indicates the presence of Alkaloids.

8) Proteins :

Xanthoproteic test : Extract was treated with few drops of concentrated HNO3. There no formation of yellow color indicates the absence of Proteins.

9) Amino Acids :

Ninhydrin test : To the 2ml of extract, the ninhydrinwas added .Then boiled for few minutes. The formation of blue color indicates the presence of Amino Acids.

10) Carbohydrates :

Extract was dissolvedin 5ml of distilled water and filtered. The filtrate was used for the following test.

Molisch's test : Filtrate was treated with 2drops of alcoholic ?-naphthol solution in the test tube,. There is no formation of violet ring at the junction which indicates the absence of Carbohydrate.

11) Flavonoid :

a) Alkaline reagent test : Extract was treated with 10 % NaOH solution. There is no formation of intense yellow color indicates the absence of Flavonoid.

b) NH4OH test : 3ml of extract was added to 10% NH4OH solution. There is no development of yellow fluorescence which indicates that the test is negative.

c) Mg turning test : Extract was treated with Mgturning and added conc. HCl to this solution and then added 5 ml of 95 % ethanol. There is no crimson red color. It indicates the absence of Flavonoids.

12) Diterpenes :

Copper acetate test : Extract was dissolved in distilled water and treated with 10 drops of copper acetate solution. The formation of emerald green color indicatesthe presence of Diterpenes.

13) Phytosterol :

Salkowski's test : Extract was treated with chloroform and filtered. The filtrate was treated with few drops of concentrated H_2SO_4 and shakes well then allowed for standing, the appearances of golden red precipitation indicates the positive test.

14) Phenol :

Ferric Chloride test : The extract was treated with 4 drops of alcoholic FeCl3 solution.There is no formation of bluish black color, indicates the absence of Phenol.

15) Phlobatannins :

The aqueous extract of sample was boiled with 1% aqueous HCl. No deposition of red precipitation evidencesthe absenceof Phlobatannins.

16) Leuconthocyanin :

5ml of iso-amyl added to 5ml of aqueous extract. The upper red color became colorless, indicates the absences of Leuconthocyanin.

17) Cardial Glycosides :

Keller-Killani Test Extract was added with 2ml of glacial acetic acid alongwith a drop of FeCl3 . A brown color ring indicates the positive test.

Sr.No.	Secondary metabolites	Result
1	Steroid	+
2	Tannin	-
3	Saponin	-
4	Anthocyanin	-
5	Coumarin	+
6	Emodins	-
7	Alkaloids	++
8	Proteins	-
9	Amino acid	+++
10	Carbohydrates	-
11	Flavonoids	-
12	Diterpenes	+
13	Phytosterol	++
14	Phenol	-
15	Phlobatannins	-
16	Leuconthocyanin	-
17	Cardial Glycosides	+

Table- 1: Phyto-chemical Analysis methanolic extract of the leaves of the plant Thespesia populnea

Resut and Discussion :

Preliminary phyto-chemical investigation of the methanolic extract of the leaves of the plant Thespesia populnea shows the presence of Steroid, Coumarin, Alkaloids, Amino acid, Diterpenes, Phyto-sterol, and Cardial Glycosides .There is slight variation in contents. It might be due to plant source variation and change of method of extraction. On the basis of these data, researcher can easily isolate the particular leaves extract for qualitative analysis.

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31. ETHNOMEDICINAL USES OF ADANSONIA DIGITATA L.

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Abstract :

Several ancient literatures in Ayurveda mention the essence of Adansonia digitata L., whose health related benefits have already been proven and documented even by modern medicine. Adansonia digitata L. is enlisted as one of the endangered plant species. It is very essential to understand the plant provide the ethnomedicinal and conservatory importance of this tropical plant. The ethnic community called as Vaidus provide medical treatment using crude herbs in India. They have perpetuated traditional knowledge of uses of Adansonia digitata L. and was found by a survey. The ethnomedicinal importance, description and taxonomic classification of this plant has been presented in this review.

Keywords : Ethnomedicine, Adansonia digitata, Medicinal Plant.

Introduction :

Adansonia digitata is a gigantic tropical plant with many important phytochemicals and medicinal uses. This plant has been found to be endemic to Africa. Though, there are some plants found in India. Since tropical regions share the same geoclimatic conditions, these are best suited to grow Adansonia digitata L. This plant gives tangy large fruits with hard shell which can be used in crude form as food or medicine and thus making it commercially important. Sadly, this plant has a high flowering time and hence not looked as a horticultural crop. Due to this ignorance, this plant is now on the verge of being listed as an endangered species. It is the duty of medicos and botanists to collaboratively study the importance of the plant, review the advances in the research regarding this plant and advocate the utilization of plant and plant products. With this view, a review has been presented regarding the ethnomedicinal importance of this plant.

Taxonomy of Adansonia digitata L. :

A systematic identification of Adansonia digitata L.has been done by the taxonomists at the Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, from the sample available in Depratment of Botany, Dr. Babasaheb Ambedkar Marathwada University, and presented as a hierarchical taxonomic classification as below. The phenotypic data like the height of the tree (20-30m), girth 2-8 m, leaves, seeds flower structures, the bark texture (smooth and greyish colour)

matched with the taxonomic classification. The photograph of the selected plant is shown as in figure1.

Classification of the selected test plant

Kingdom Plantae
Phylum Tracheophyta
Class Magnoliopsida
Order Malvales
Family Malvaceae
Genus Adansonia
Species digitata L.

Documented records of Adansonia digitata L. in India

Savanur, a tiny hamlet in Karnataka's Haveri District, is known for its three towering Baobab trees, which are said to be the country's oldest. Each one is said to be over 5,000 years old (no one knows for sure due to the lack of tree rings), and one of them has a girth of 18 m (Mishra et al., 2019).Visitors to Mumbai's Zoo and botanical gardens are greeted with a fat Baobab at the entrance to Rani Bagh. Visitors to Mumbai's Zoo and botanical gardens are greeted with a fat Baobab at the entrance to Rani Bagh (Mishra et al., 2019). The Baobab in Mandu seems to have sprung a little, unleaved branch from its roots. The second Baobab, arguably the tallest of Mandu's several enormous Baobabs, towers above a little agricultural area on the plateau. This large ancient Baobab near an old palace has lately lost a large limb, making it the third Baobab in Mandu(Mishra et al., 2019).

One of the most remarkable of the Baobabs grown high on this rocky plateau is one of Sultan Bahadur's palaces, damaged by the Mughals (Mishra et al., 2019). The Dilwara Jain Temple on Mount Abu, Rajasthan's rocky resort town, has a Baobab famously known as Celestial Wishing Tree (Mishra et al., 2019). On the borders of Hyderabad's Golconda Fort, a spectacular, enormous Baobab tree gives the entire experience of any landmark tree: you may climb on its branches, crawl inside its hollow trunk, stand next to it, stare at it, and rest beneath it (Mishra et al., 2019).

A monstrously proportioned gigantic African Baobab towering in a meadow near Orccha, supposedly planted by Maharaja Bir Singh Deo over 500 years ago, is one of India's most stunning trees. Another easily recognised Baobab can be found only a few kilometres from the spectacular Mallanimli Baobab - which locals claim is the only tree of its sort in the world. In Madhya Pradesh's ruined city, Mandavgad, a few Baobabs flourish beside these relics. An antique tree grows among the fort's stern, 15th-century façade outside the Vasai fort in Maharashtra. In Gujarat's towns of Kutch, Bhavnagar, and Baroda, one or two Baobab trees may be found. In Chennai's Theosophist Society Gardens, a sanctuary devoted to biological preservation, a solitary Baobab tree thrives. Thiruvananthapuram, Kerala's zoological and botanical park, has one little Baobab tree (Mishra et al., 2019).

A personal, unrecorded survey in Aurangabad demonstrated that Baobab might be found in

a variety of locations. Baobab stands tall in Dr. Babasaheb Ambedkar Marathwada University auditorium and botanical garden, as well as on the University campus. The doctor's hostel and the girl's hostel at the Government Hospital and Training Institute (GHATI) both have large Baobab trees. Baobab may be found on Chikalthana road, Jatwada road, Railway station area, and Kanchanwadi, to name a few. The geographical location of the plants are not available and is required.

Botanical description of Adansonia digitata L.

The Baobab tree belongs to the Bombacoideae subfamily of the Malvaceae family, comprising around 200 genera and 2300 species (Ndoro, 2013). Seven more Adansonia species are related to Adansonia digitata L.(Sidibe et al., 2002). While Adansonia digitata L. is found in tropical Africa, there are six species in western Madagascar and one in Western Australia (Pettigrew FRS et al., 2012). The photograph of the tree with flower and fruit has been shown in Figure 1.

It is notable for its humongous size, reaching heights of 18-25 metres. Sidibe et al. (2002) describe the trunk as bloated and thick, up to 10 m in diameter, tapering or cylindrical, and suddenly bottle-shaped. Because of natural reasons or human intervention, many of the bigger Baobabs have hollow centres(Gerald E Wickens, 1982). Large main branches are widely dispersed throughout the trunk or restricted to the apex, and branches are spread sporadically. A layer of parenchyma cells sits between each layer of xylem cells, storing water (Spicer, 2014).

It has smooth, reddish-brown to grey bark that is soft and fibrous. However, the bark of ancient specimens may be transversely wrinkled, which is thought to be due to wood compression (Wickens, 2008). The thick fibrous bark seems to contribute considerably to structural support and may compensate for stem stiffness decreases that would otherwise occur with modest stem water usage (Chapotin et al., 2006). When the tree sheds its leaves, a green layer under the outer layer of the bark is thought to photosynthesize.

The tree has a large lateral root system with tubers at the end of the roots. During protracted drought times, the tuberous roots of juvenile specimens serve as water and/or sugar storage facilities (Hearn et al., 2013). Tree roots have been observed to grow up to 50 metres from the trunk and down to a depth of 10 metres(Diop, 2005).

Baobab leaves are palmately complex, with 5-7 leaves per palm. In actuality, they are 2-3 foliate at the start of the season, then 5-7-(9) foliate as the season progresses. A mature leaf may grow to be 20 cm in diameter, with a medial leaflet measuring 5-15 x 2-7 cm (Sidibe et al., 2002). Young leaves become glabrescent or glabrous, with whole margins and stellate-pubescent leaves underneath (SHARMA & JAIN, 2017). Deciduous leaves alternate at the ends of the branches or grow on short spurs on the stem.

The blooms of the Baobab are big and pure white, with five crinkled curled-back waxy petals and many stamens fused into a central column. The pedicel length ranges between 1 and 90 cm, while the flower corolla varies from 4 x 4 to 10 x 12 cm (Sidibe et al., 2002). Flowers on leaf axils that are pendulous, single, or paired are particularly noticeable.

Fruits are huge, oval with an olive-green velvety coating, and vary in size and shape. Their size ranges from 7.5 to 54 cm in length and 7.5 to 20 cm in width. A dry, mealy pulp is enclosed by the pericarp (which is roughly 1 cm thick). Reniform seeds, ranging in colour from dark brown to reddish black, are embedded in the pulp. Due to lateral flattening, seeds vary in size from 10-13 x 8-10 x 4-5 mm (Sidibe et al., 2002). The Baobab tree's leaf, blossom, and fruit are seen in figure 1.

Review of medicinal uses in India

The most important knowledge about Baobab is handed down by word of mouth. Not just for this species but also for all other valuable plants in India, such information must be documented. Khamis and Ruheza (2012) suggests expanding the school curriculum to include sectors that support indigenous knowledge values and biodiversity protection among younger generations. Because of modernity, respondents acknowledged a decrease in Baobab utilization, such as the use of fibre. According to Gomez-Beloz (2002), knowledge is at risk of being lost since it is not recorded, and interactions with the natural world are becoming more difficult for future generations to learn by observation. Two manuscripts, Charak Samhita and Sushruta Samhita, provide a great quantity of material on medical research, ranging from diagnostics to clinical practice to pharmacopoeia. (Samhita, 2001; Singh, 2017). Vagbhatta compiled the Astangahradya Samhita, the third key work, in the early seventh century(Gupta & Upadhyaya, 1987).

This issue of losing the knowledge of medicine is low in India due to the Ayurveda and ethnic community of Vaidu. Traditional medicine and treatment were done by the Vaidu community in India using locally accessible herbs, plants, and fruits. Their trade has thrived over remedies of potions and powders that promise treatment to ailments. Simultaneously, modern medicine has made advances along with Ayurveda, which generates modern registered medical practitioners who have academic knowledge about the phytochemicals and application of Adansonia digitata L. In Mumbai itself, over 12,000 Vaidu people live in 14 ghettos spread throughout the city. There was a lack of data regarding the census of Vaidu community in India. Hence, a survey is necessary to present a record. An unpublisheddata of interaction with Vaidus is presented here in Table 1. The flowing are the ethnomedicinal data recorded as common ancestral knowledges from the interview of Vaidu community as also evident from peer reviewed research (Trivedi, 2008).

1) Informant's details:

Name	-	Sahantabai and Sundarabai,
Gender	-	Female
Age	-	52 and 62 respectively
Occupation	-	Traditional healer
Education	-	Metriculation
Residence	-	Jatwada Tanda, Aurangabad

Data about medicinal plant and their use :

Plant (Local name) - Gorakh chinch
Habit (Tree/ Herb/ Shrub/Climber) - Tree
Plant part used - Leaves, seeds, fruits
Cultivated / Wild - Wild
Name of health problem/ disease treated - Inflamed throat, cold and cough
Method of crude drug preparation - dried in the shade and crushed, or fresh
Mode of administration - Dry powder with water
Other uses (if any) - as prophylactic
Remarks : Plant identified as - Adansonia digitata L.

2) Informant's details:

Name - Dr. Shabbar Amar Davasaaj, Ali Asgar,
Gender - Male
Age - 40 and 25 respectively
Occupation - Traditional healer
Education - BAMS and B. Com respectively
Residence - Aurangabad and Jalgaon, respectively

Data about medicinal plant and their use :

Plant (Local name) - GorakhImli
Habit (Tree/ Herb/ Shrub/Climber) - Tree
Plant part used - Leaves, seeds,
Cultivated/ Wild - Wild
Name of health problem/ disease treated - Inflamed throat, cold and cough
Method of crude drug preparation - dried and crushed,
Mode of administration - Dry powder with water
Other uses (if any) - for throat, cold and cough
Remarks : Plant identified as - Adansonia digitata L.

3) Informant's details:

Name - Vaidya Arvind ShankarraoDhabe, (shown in Figure 1)
Gender- Male
Age- 50
Occupation- Registered Vaidu and Professor at Department of Botany, Dr. Babasaheb Ambedkar, Marathwada University, Aurangabad
Education - M.Sc. PhD
Residence- Nandanvan colony, Aurangabad

Data about medicinal plant and their use :

Plant (Local name) - Gorakh Chinch
Habit (Tree/ Herb/ Shrub/Climber) - Tree
Plant part used - Leaves, seeds, fruit
Cultivated/ Wild - Wild
Name of health problem/ disease treated - Inflamed throat, cold and cough
Method of crude drug preparation - dried and crushed, processed, and packed or provided fresh in case
Mode of administration - Dry powder with water
Other uses (if any) - Diarrhoea, Urinary diseases, healing wounds, in skin diseases, improving digestion, cold, cough, prophylactic
Remarks : Plant identified as - Adansonia digitata L.

Traditionally inherited knowledge of Vaidya Arvind Dhabe

* Bark decoction and fruit pulp is given to accelerate digestion and fat metabolism.
* the fruit pulp is given to reduce excessive desire of eating.
* Fruit pulp is given in migraine and hemicrania.
* bark detection is given in all type of typhoid fever and malaria .

4) Informant's details:

Name - RatansinghChittodiya, Shuikar Jain
Gender - Male
Age - 30 and 40 respectively
Occupation - Traditional healer
Education - 12 th and not educated respectively
Residence - Jalgaon and Aurangabad, respectively

Data about medicinal plant and their use :

Plant (Local name) - GorakhImli
Habit (Tree/ Herb/ Shrub/Climber) - Tree
Plant part used - Leaves, seeds, fruit
Cultivated/ Wild - Wild
Name of health problem/ disease treated - Inflamed throat, cold and cough, stomach ailment, appetite issues
Method of crude drug preparation - desiccated and crushed, or fresh
Mode of administration - Dry powder with water
Other uses (if any) - digestion, immunity booster
Remarks : Plant identified as - Adansonia digitata L.

5) Informant's details :

Name - Thakur Vedraj, V. S. Salve,
Gender - Male
Age - 40 and 32 respectively
Occupation- Traditional healer
Education - uneducated and BAMS, respectively
Residence - Chalisghat and Aurangabad respectively

Data about medicinal plant and their use :

Plant (Local name) - GorakhImli/Gorakh Chinch
Habit (Tree/ Herb/ Shrub/Climber) - Tree
Plant part used - Leaves, seeds, bark, fruit
Cultivated/ Wild - Wild
Name of health problem / disease treated - Inflamed throat, cold and cough, asthma, normalizing menstrual cycle, diarrhoea
Method of crude drug preparation - dried and crushed, processed, and packed or provided fresh in case
Mode of administration - Dry powder with water or fresh
Other uses (if any) - as a prophylactic, immunity booster, improving digestion
Remarks : Plant identified as - *Adansonia digitata* L.

Figure 2 Interaction with registered Vaidu regarding importance and use of Adansonia digitataL. plant and plant parts.

Table 2 Ethnomedicinal survey from registered and unregistered medical practitioners.

Practitioner number	Registered practitioner	Experience (years)	Knows the plant by name	Plant part used	Processed/ unprocessed	Usage
1	yes	02	Adansonia digitata L., Gorakh chinch	Leaves, bark, seeds, fruits	Processed	In Cold and Cough
2	no	03	GorakhImli	Leaves, seeds, fruit	unprocessed	In inflamed throat, cold and cough
3	no	10	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough and pneumonia
4	no	05	GorakhImli	Leaves, seeds	unprocessed	In normalizing the menstrual cycle
5	no	04	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
6	no	01	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
7	no	05	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
8	no	06	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
9	no	10	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
10	no	15	GorakhImli	Leaves, seeds	unprocessed	In digestive problem, cold, cough, immunity booster
11	no	02	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
12	no	06	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
13	no	01	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
14	no	05	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
15	no	06	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
16	no	02	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
17	no	01	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
18	no	03	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
19	no	04	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
20	no	06	GorakhImli	Leaves, seeds	unprocessed	In Cold and Cough
21	yes	08	Adansonia digitata L., Gorakh chinch	Leaves, bark, seeds, fruits	Processed	In diarrhoea, analgesic, Asthma, Urinary diseases, healing wounds,
22	no	03	GorakhImli	Leaves, seeds	unprocessed	In diarrhoea, cold, throat infection

Practitioner number	Registered practitioner	Experience (years)	Knows the plant by name	Plant part used	Processed/ unprocessed	Usage
23	no	07	GorakhImli	Leaves, seeds	unprocessed	In diarrhoea, improved digestion
24	no	20	GorakhImli	Leaves, seeds	unprocessed	In diarrhoea, cold, throat infection
25	no	11	GorakhImli	Leaves, seeds	unprocessed	In inflamed throat, cold and cough
26	no	07	GorakhImli	Leaves, seeds	unprocessed	For healing wounds, improving digestion
27	no	09	GorakhImli	Leaves, seeds	unprocessed	normalizing menstrual cycles, cold, cough
28	no	20	GorakhImli	Leaves, seeds	unprocessed	Asthma, diarrhoea, pneumonia
29	no	06	GorakhImli	Leaves, seeds	unprocessed	Improved digestion, immunity booster, digestive problems
30	yes	04	Adansonia digitata L., Gorakh chinch	Leaves, bark, seeds, fruits	Processed	Diarrhoea, Urinary diseases, healing wounds, skin diseases, improving digestion

Uses of Adansonia digitata L.in food and nutrition : The Baobab tree has several edible sections. It is cooked like spinach; the leaves are also dried, powdered, and served as a sauce over porridges or boiling rice in Africa (Venter & Witkowski, 2011). Flowers may be eaten raw or added to beverages as a flavouring(Gebauer et al., 2002). The most vital food is undoubtedly fruit pulp. It may be eaten raw or dissolved in water or milk and used as a drink or a food sauce. The 'Baobab milk' is a nutrient-dense beverage (Obizoba & Anyika, 1994). This acidic drink is blended with peanuts in Cameroon (Arbonnier, 2009; Malgras, 1992). It may be used to enhance the fermentation of sugar cane for beer production in Tanzania (Fleuret, 1980). 'Baobab milk' and grain flour are blended in north Benin to form an acidic dish that may be eaten for a week (Codjia et al., 2001). Locals in Nigeria utilize Baobab pulp powder in 'tempe' fermentation (a protein-rich soy-based meat substitute) (Afolabi & Popoola, 2005).

Baobab seeds are often used to thicken soups, but they may also be fermented and used as a flavouring ingredient or roasted and consumed as a snack (Palmer & Pitman, 1961). Seeds are fried, pounded, and then crushed to a paste that is fermented, dried, and formed into balls in Kenya (Muchiri & Chikamai, 2003; Muok et al., 2000), while seeds are fried, pounded, and then crushed to a paste that is fermented, dried, and formed into balls in Ghana (Muchiri & Chikamai, 2003; Muok et al., 2000). Coffee or groundnuts may also be substituted with roasted seeds (Maundu, 1996). Baobab seeds may also be used to make cooking oil; however, this is not often practised. In West Africa, Baobab seed oil has been used to dilute groundnut oil and prepare a Senegalese meal. Baobab bark and taproot may be consumed in addition to the leaves, blossoms, fruit pulp, and seeds. In Nigeria, 'Kuka' (Baobab bark) is used to help youngsters acquire weight (Kaboré et al., 2011). In Mali and Kenya, children eat taproot, which is said to be a "delicious snack" (Dhillion & Gustad, 2004)

A. Medicinal uses : Most Baobab tree parts also have several medicinal properties and are used by ethnic people for human and animal medicine. A study carried out in West Africa reported 179 different medicinal uses of Baobab tree parts (Buchmann et al., 2010). Most cited medicinal properties and examples of some medicinal uses can be found in Table 1. Baobab pharmaceutical and toiletry products are also available in Europe (Wickens, 2008). The decoction of bark or the dried fruit is given in acidity. Fresh fruit juice along with sugar is given in constipation, diarrhoea, leucorrhoea, headache, chest pain and uneasiness. The fruit pulp is applied on skin to control skin disease. Bark decoction or extract is digestive and an appetizer. Decoction of the bark is proved to be diuretic. Leave or paste of leaf is given with sugar to release heat from the body. Leaf paste is applied over wounds to heal. Leaf paste is also applied on joints to reduce joint pain in rheumatism and arthritis. Seed powder has wound healing properties.

B. Other uses : The Baobab tree is notable for its cultural worth in addition to its nutritional and medical benefits. Several writers (Assogbadjo et al., 2006; Shoeb, 2008; Gerald E. Wickens, 1982; Wickens, 2008) have recorded superstitions and myths about the Baobab tree. Baobab trees, for example, are said to be a haven for witches in certain parts of Benin. Certain Baobabs in Nigeria are places of worship for fertility spirits, while the origins of several tribes in Zimbabwe's Matabeleland are linked to ancestor-Baobabs.

The Baobab tree serves as a signpost, an observation point, and a source of shade. Nomads, especially in Sudan's western region, rely on hollow trees to create freshwater reservoirs (Gebauer et al., 2002). The capacity of each tree to store water ranges from 1000 to 9000 litres(Craig, 1991). Hollow trees may be utilized as graves or temporary residences, as well as bathrooms, prison chapels, and churches (Mullin, 1997; Wickens, 2008). Sheep, cattle, horses, donkeys, and camels regularly graze the leaves of Baobab trees, while cows, horses, and donkeys consume the fruits during the dry season (particularly in agro-sylvipastoral systems in the Sahel) (Matig et al., 2006). Table 1summarises some additional often reported applications.

It is worth noting that the Baobab tree is also beneficial to the environment. Despite popular belief that Baobab shade is hazardous for crops (it is removed from agricultural land in certain locations), it really enhances site conditions. It supplies organic matter and nutrients to the soil via leaf fall, lowers soil temperature and water loss owing to evapotranspiration (Amundson et al., 1995), and attracts birds and big animals whose droppings add nutrients to the soil. The loss of several Baobab trees in Senegal as a consequence of 'Iceberg' lettuce cultivation in 1979 resulted in significant soil erosion.

Table 3 Medicinal properties of Adansonia digitata L.

Tree part	Most cited properties	Medicinal uses
Leaf	Antihistaminic, antipyretic, anti-coughing, diuretic, anti-diarrheic, toning, analgesic, expectorant, disinfectant and local anti-inflammatory	Fever, asthma, cough, anaemia, hypertension, haemorrhoids, aphrodisiac, baby teeth pain, transpiration activator, rheumatism, conjunctivitis, inflammation of the ear, urinary infection, insect bite, dracunculiasis, skin inflammation
Flower	-	Helps in birth, cough, anaemia
Fruit pulp	Toning, invigorating, anti-diarrheic, antipyretic, homeostatic, cicatrizing, Anti-enteralgia	Tiredness, poor appetite, aphrodisiac, diarrhoea, children intestinal tract pain, malaria, haemorrhoids,
Seeds	Anti-diarrheic, anti-enteralgia	Diarrhoea, children intestinal tract pain, hypertension, cough, malaria, gingivitis and other mouth infections, lactation stimulator, hiccups
Bark	Antipyretic	Fever, malaria, diarrhoea, inflammation of the digestion system, children invigorating, lumbago, menstruation problems, tooth ache, burns, sore skin treatment, skin softener
Roots	Toning, invigorating	Invigorating, malaria, epilepsy (with other plants)

Sourced from (Diop, 2005; Kerharo& Adam, 1974; Sidibe et al., 2002; Gerald E. Wickens, 1982; Wickens, 2008).

Conclusion :

A survey among the herbalist called 'Vaidu' in the ethnic community helped to find the significance of Adansonia digitata L. in India. This ethnic community is a wanderer in nature and settle in different districts at different times of the year. Most of them collect the medicinally important plants and store them in their mobile pharmacy. These plants' medical application and knowledge have been prevalent throughout the world. The utilization of this plant in India is major as medicine and as a food. The importance of Adansonia digitata L. as a medicine has been recorded long back in Vedic knowledge. There are written evidence of importance, mode of application and treatment using Adansonia digitata L. This makes Adansonia digitata L. not only a pharmacologically important plan but also raises its potential from a commercial perspective. As a fruit tree, sadly, this plant has been registered as an endangered plant. There are many commercial products popping out on internet which include plant parts of Baobab. Seed oil and desiccated fruit pulp are already found to be available on internet. This makes Baobab a commercial candidate tree of the future. There is a greater need to educate people about the importance of this plant and propagate it from commercial perspective.

32. स्वस्थ्य जीवन प्राप्ति में अन्नपान - आहारवर्ग - एवं आयुर्वेदीय पोषण सिद्धांत का महत्व : एक विश्लेषण

वैद्य रमण रंजन[१], वैद्य हितेन वाजा[२]

१. सहायक प्राध्यापक, राजकीय आयुर्वेद महाविद्यालय एवं अस्पताल, पटना

२. आत्रेय शासन आयुर्वेद चिकित्सा केंद्र, वेदोत्पत्ति आयुर्वेद विद्याशाला, अहमदाबाद

समाज में दीर्घ जीवन प्राप्त करना आयुर्वेद की प्रतिज्ञा है। दीर्घ दो अर्थ में प्रयुक्त होता हैं।

१- लम्बा [Quantitative] & शतायुजीवन

२- गुणवत्तायुक्त [Qualitative]-स्वस्थ्य अर्थात रोग मुक्तजीवन

आयुर्वेद आयु का विज्ञान है। कायाग्नि की सापेक्ष स्थितिमें अनुवर्तन के माध्यमसे समवायता को स्थिर रखने का विज्ञान आयुर्वेद है। धातु साम्य क्रिया शरीर इन्द्रिय सत्व आत्मा को प्राणी रुपी ऊर्जा से कायाग्नि के नियंत्रण में निरंतर जोड़े रखने की प्रक्रिया आयु है। आयु क्रिया प्रणाली ऊर्जा को लोक विश्व में निरंतर दो प्रकार के समानांतर कर्म से संपर्क स्थापित करके प्राप्त करती रहती है । १. बंधनमोक्ष २. जीवनयापन

१. बंधनमोक्ष & वृत्ति से लोक में काय, वाक् मानस कर्म आदि कर्म करना ही बंधन मोक्ष है।

२. जीवनयापन & बंधन मोक्ष हेतु शरीर की क्रिया प्रणाली निरंतर चलाने के लिए वायु, रस, मूत्र आदि की प्रीणन जीवन आदि कर्मों को अनुवर्तित @ उत्पन्न स्थिर लय करवाना ही जीवन यापन है ।

रसादिकी उत्पत्ति कोष्ठमें] स्थिति शाखा में और लय मर्मास्थि संधि में होता है। प्राणी @जीव के शरीरकी उत्पत्ति यदृच्छा @ अकस्मात्] हेतु नहीं हुई बल्कि बंधन मोक्ष के लिए हुई है। बंधनमोक्ष यदि निवृति एषणा प्रेरित रूपेण होता है तो आहार निद्रा आनंद संतुलित रहते है। और स्वास्थ्य प्राप्त होता है। बंधनमोक्ष यदि प्रवृति @इच्छा प्रेरित, रूपेण होता है तो आहार निद्रा आंनद अंसतुलित रहतेहैं] रोगहोताहै । आहारनिद्रा आनंद को त्रय उपस्तंभ कहा जाता है । आहार से शरीर का पोषण होता है। निद्रा से इन्द्रियों का पोषण होता है तथा आनंद @ ब्रह्मचर्य से सत्व का पोषण होता हैं।

शरीर में जो ऊर्जा को आपूर्ति्त करनेवाला भावप्राण होता है। आहार अग्नि सोम वायु का घन स्वरुप है। निद्रा पंचेन्द्रिय स्पी प्राण का वाहक होता है। आंनद सत्व रज तम रुपी प्राण का वाहक होता है । अतः प्राण का संवहन जिस मे होता है वह प्राणी कहलाता है। प्राण अनुवर्तन की ऊर्जा है।

पोषण प्रणाली @ अनुवर्तन ५ स्थानकोंसे वाहित होती रहती है &

स्थानक	अधिष्ठान मे ंकार्य	विक्षेप @ विकृति से रोग की उत्पत्ति
१- आहाररस	पोषक तत्त्व की उत्पत्ति	अजीर्ण, अपचन आदि
२- रस	पोषकतत्त्वकापरिवर्तन	हृदय, उदावर्त आदि
३- धातु उत्तक	पोषक तत्त्व की स्थिति	प्रमेह, स्थौल्य, पाण्डु आदि
४- उपांग	पोषक तत्त्व का उपयोग	वात व्याधि, संधिशूल आदि
५- अंग	पोषक तत्त्व का अनुबंध	अंधता, पंगुता, बधिर आदि

इन पांच स्थानकों में पोषक तत्त्व की उत्पत्ति, सम्यक प्रवर्तन, स्थिति, स्थिरीकरण, उपयोग, अनुबंध, इन्द्रियादि को गति प्रदान, क्रमशः होता है। आहार के इन पांच प्रकल्प में विक्षेप, विकृति से रोग की उत्पत्ति होती हैं। आहार के इन पांच प्रकल्पों को सापेक्ष बनाने के लिए पोषण प्रणाली सिद्धांत और आहार उचित उपयोग करना चाहिए ।

धातु साम्य रुपी प्रयोजन में तीन स्थितियां संभावित होती हैः

१- प्राकृत धातु को प्राकृत रखने का विज्ञान- स्वस्थ्य विज्ञान

२- प्राकृत धातु को विकृत कैसे होती हैं का विज्ञान- रोगनिदान

३- विकृत धातु को प्राकृत कैसे बनाये जा सकती है यह विज्ञान - चिकित्सा है।

आयुर्वेद का प्रयोजन 'स्वस्थस्य स्वस्थ्य रक्षणं आतुरस्य विकार प्रशमनच' में से प्रथम प्रयोजन की पूर्तिस्वस्थ्य विज्ञान से ही प्राप्त होती है। इसकी प्राप्ति में स्वस्थ्य एवं अन्नपान चतुष्क से क्रमशः वृत्तियों का सम्यक संचालन एवं आहार सम्बन्धी स्थितियां स्थिर रहती है ।

अन्न अनुवर्तन (पोषणप्रणाली) का ईंधन है । अन्नरुपी ईंधन से ही अनुवर्तन और समवयता जीवनयापन बन्धन मोक्ष प्रवृति होता है ।अन्न की गुणवत्ता पर शरीर की वय मर्यादा निर्भर है। अन्न की गुणवत्ता पर शरीर की वय मर्यादा निर्भर है ।अन्न के माध्यम से ही निद्रा को सम्यक किया जा है ।अन्न के गुणवत्ता के आधारपर शरीर की स्वस्थता निर्भर करती है । योग्य वर्ण, गंध, स्पर्श एव ंविधियुक्त अन्नपान हीशरीर को बाधित किये बिना शरीर को स्थिर एवं स्वस्थ्य रख सकते है ।

शरीर पोषण के लिए तीन न्याय निर्देशितहै ।

१. खले कपोत न्याय

२. केदारी कुल्या न्याय

३. क्षीर दधि न्याय

१. खलेकपोतन्याय : जिस द्रव्यों की जिस अधिष्ठान में आवश्यकता है, उसी अनुरूप सम्यक वितरण ही खले कपोत न्याय कहलाता है । जैसे अस्थि को घनपदार्थ की ज्यादा आवश्यकता होती हैं और रक्त को द्रव की इस

न्याय से उसी अनुरूप पोषण प्रदान होता है ।यह पोषण की सामानांतर पोषण प्रणाली है तथा अपने अपने स्थानकों को पोषण प्रदान करते है। इसमें पोषण की उपत्ति होती है। यहा पर रसस्पी स्वस्प परिवर्तन होता है। पोषण सम्बंधित विकार का ९०% भाग खले कपोत न्यायप्रणाली की विकृति से उत्पन्न होता है । कुपोषण सम्बन्धी विकार को इसके विकृति को दूर कर किया जा सकता है। जठराग्नि के नियंत्रण में यह न्याय प्रणाली होता है। कुल रोगो का ७०% भाग इस प्रणाली की विकृति से उत्पन्न होता हैं।

२- **केदारी कुल्या न्याय** : इसमें क्रमशः धातुओं का पोषण होता हैं। इसमें पोषण स्थिर होता है। पोषण प्रणाली में धात्वग्नि के नियंत्रण में यह न्याय प्रणाली होता है। यहापर वीर्यस्पी स्वस्प परिवर्तन होता है। कुल रोगोका २०% भाग इस प्रणाली की विकृति से उत्पन्न होता हैं।

३- **क्षीर दधि न्याय** : इस न्याय से स्वरूप परिवर्तन होता है। पोषण प्रणाली में महाभूताग्नि के नियंत्रण में यह न्याय प्रणाली होता है। यहापर विपाकरूपी स्वरूप परिवर्तन होता है। कुलरोगो का १०% भाग इस प्रणाली की विकृति से उत्पन्न होता हैं।

रस वीर्य विपाक मूलतः द्वादश प्राण के धारक अन्न के शरीर अधिष्ठान अनुसार स्वस्प भेद है ।

अन्न : प्राण को शरीर में धारण करने के क्षमतावान द्रव्य / भाव होता हैं। अन्न अनुवर्तन का माध्यम बनता है।

पान : अन्न का शरीर की विभिन्न धातुओं तक वहन करने की क्षमतावान द्रव्य / भाव पान होता है।

प्राणधारक अन्न योग्य कालदिशा प्राप्त कर अनुवर्तन का भाग बनेवाला और समवयता स्थिर रखनेवाला माध्यम पान है ।

अन्नपानः गमन भाषण आदि क्रियाओं में आवश्यक प्राण को शरीर धारण एवं उपयोग काल में यथायोग्य वहन करने की क्षमता वाले द्रव्य समूह को अन्नःपान कहते हैं।

आचार्य चरकने द्वादश आहार वर्ग का वर्णन किया है ।

शूकधान्य शमीधान्यमांसशाकफलाश्रयान्।
वर्गान् हरितमद्याम्बुगोरसेक्षुविकारिकान्।।
दश द्वौ चापरौ वर्गौ कृतान्नाहारयोगिनाम्। (चरक संहिता सूत्रस्थान २७/६-७)

१- शुकधान्य - अशित, खादित, पीत, लिढ से आहार रस में अन्न के प्रसाद / उपयोगी भाग को प्रवेश प्रदान करानेवाला अग्रज आहार वर्ग हैं। - चावल, षष्टिकशाली, गेंहूँ, यव आदि

२- शमी धान्य - आहार रस में से आहार प्रसाद भाग को रस मे प्रवेश करानेवाला आहार वर्ग है ।मूंग, उड़द, राजमा, अरहर, चना आदि

३- मांसवर्ग - रसमेंसे आहार प्रसाद भाग को धातु उत्तक मे प्रवेश करानेवाला आहार वर्ग है । अजा, आदि

४-शाकवर्ग - उपांग में प्राण का संवहन सुचारूरूप से करवानेवाला प्रधान आहार वर्ग है । परवल, चौलाई, ककड़ी, लौकी, बैगन, आदि । कच्चा शाक दुर्जर होता हैं तथा विकृत मल को बढ़नेवाला होता है । अतःशाक को हमेशा

स्नेह में भृष्ट कर ही खाना चाहिए।

५- फलवर्ग - अंग में वृत्ति चलना, लिखना, गमन आदि अनुसार प्राण को धारण कर रखते हैं और धातु ओंको प्रेरित करते हैं। एकही आहार वर्ग ऐसा हैं जो कच्चे स्वरूप में खाया जा सकता है । द्राक्षा, अनार, आम, सेवट केला आदि।

उपरोक्त पांच वर्ग अन्न के अंतर्गत आते है ।

६- हरितवर्ग- अन्न का वहां करनेवाला आहार वर्ग कोष्ठसे पोषकतत्त्व को आहार रसमें वाहित करता है । अदरक, जम्बीर, मूली, गाजर, प्याज आदि

७- मद्यवर्ग - आहार रस से पोषकतत्त्व को रस में वाहित करता हैं। शुक्त, कांजी आदि। मद्यवर्ग के आहार मात्रावत लेनेसे अमृत सामान होता है ।

८- अम्बुवर्ग - रस में से पोषक धातुओंको धातु उत्तान अंतर्गत भेजनेवाला आहार वर्ग है । अंतरिक्ष जल, तालाब का जल आदि

९-गोरस वर्ग : धातुउत्तक से उपांग में पोषकतत्त्व को भेजनेवाला आहार द्रव्य है। गोदुग्ध, अजाक्षीर, आदि

१० - इक्षु विकार वर्ग - इक्षु (गन्ना) के विकार अंग में वृत्ति (बोलना, लिखना आदि) अनुसार प्राण और धातु ओंको परस्पर योजन करते हैं। जैसे - मत्स्यांडी, गुड़, गुड़, शर्करा, शर्करा, मधु, आदि। मधुमन को विशद बनाता हैं। मधु इन्द्रियोंकी वृतियों का धातु साथ योग्य रीतीसे अनुग्रह को प्राप्त करवाता हैं।

११-कृत्तान वर्ग - अन्न को पान साथ संयोजित करनेवाला आहारवर्ग है । जैसे पेया, विलेपि, खिचड़ी, आदि। इसमें अग्नि का मुख्यरूप से संयोजक होता है ।

१२-आहार योगीवर्ग - जो आहार को सुपाच्य बनाकर शरीर को पोषण देनेवाला आहाररस आदि को सहज तासे भाग बनाते है ।जैसेः तेल, शुंठी, पिप्पली, कालीमिर्च, हिंगु, सेंधा नमक, अजवाइन आदि। इसमें सहायक द्रव्यों से संयोजक होता है ।

क्र. स.	आहारवर्ग	कार्य	उदाहरण
१	शुकधान्य	अशित, खादित, पीत, लिढ से आहार रस में अन्न के प्रसाद /उपयोगी भाग को प्रवेश प्रदान करानेवाला अग्रज आहार वर्ग है ।	चावल, षष्टिक शाली, गेंहूँ, यव, आदि
२	शमीधान्य	आहार रस में से आहार प्रसाद भाग को रस मे प्रवेश करानेवाला आहार वर्ग है ।	मूंग, उड़द, राजमा, अरहर, चना आदि
३	मांसवर्ग	रस में से आहार प्रसाद भाग को धातु उत्तक मे प्रवेश करानेवाला आहार वर्ग है ।	अजा, आदि
४	शाकवर्ग	उपांग में प्राण का संवहन सुचारु रुप से करवाने वाला प्रधान आहार वर्ग है ।	परवल, चौलाई, ककड़ी, लौकी, बैगन, आदि।
५	फलवर्ग	अंग में वृत्ति चलना, लिखना, गमन आदि अनुसार प्राण को धारण कर रखते हैं और धातुओं को प्रेरित करते है ।	द्राक्षा, अनार, आम, सेव, केला आदि।
६	हरितवर्ग	अन्न का वहन करनेवाला आहार वर्ग कोष्ठसे पोषक तत्त्व को आहार रस में वाहित करता है ।	अदरक, जम्बीर, मूली, गाजर, प्याज आदि
७	मद्यवर्ग	आहार रस से पोषक तत्त्व को रस में वाहित करता है ।	शुक्त, कांजी आदि।
८	अम्बुवर्ग	रस में से पोषक धातुओं को धातु उत्तान अंतर्गत भेजनेवाला आहार वर्ग है ।	अंतरिक्ष जल, तालाबका जल आदि
९	गोरस वर्ग	धातु उत्तक से उपांग में पोषकतत्त्व को भेजनेवाला आहार द्रव्य है ।	गोदुग्ध, अजाक्षीर आदि
१०	इक्षु विकार वर्ग	इक्षु (गन्ना) के विकार अंग में वृत्ति (बोलना, लिखना आदि) अनुसार प्राण और धातुओं को परस्पर योजन करते हैं। मधुमन को विशद बनाता है । मधु इन्द्रियों की वृतियों का धातु साथ योग्य रीती से अनुग्रह को	मत्स्यांडी, गुड़, गुड़शर्करा, शर्करा, मधु आदि
११	कृत्तान वर्ग	प्राप्त करवाता है ।	
१२	आहार योगी वर्ग	अन्न को पान साथ संयोजित करनेवाला आहार वर्ग हैं । इसमें अग्नि का मुख्य रुप से सयांजिक होता है। जो आहार को सुवाच्य बनाकर शरीर को पोषण देनेवाला आहार रस आदि को सहजता से भाग बनाते है । इसमें सहाय्यक द्रव्यों से संयोजक होता है ।	पेया, विलेपि, खिचडी, आदि । तेल, शुंठी, पिप्पली, काली मिर्च, हिंगु, सेंधा नमक, अजवाइन आदि ।

आहार का सेवन आहार विधि का प्रयोग कर रोग मुक्त स्वस्थ्य जीवन की प्राप्ति की जा सकती है । आहार ग्रहण विधि के कुछ प्रमुख सिद्धांत :

१- चतुर्विध कुक्षि सिद्धांत : भोजन का ग्रहण में २ भाग अन्न,एक भाग पान तथा एक भाग वायु करने का विधान है। इसी मात्रा से भोजन ग्रहण करनी चाहिए।

२- आहार का ग्रहण अग्नि बल के अनुसार करना चाहिए।

३- भोजन में मधुररस आदिका क्रम अनुसार ग्रहण करना चाहिए। भोजन के आदि में मधुर द्रव्य का ग्रहण, मध्यमें अम्ल, लवण और अंत में तीखा लघु, रूक्ष, तीक्ष्ण आहार का ग्रहण करना चाहिए तिक्त, कषाय द्रव्य का प्रयोग प्रक्षेप द्रव्य के रूपमें करना चाहिए।

४- भोजन में जल सेवन क्रम का भी पालन करना चाहिए। जल भोजन के मध्य में पीना अमृत सामान, भोजन के अंत में सेवित जल विषसमान, भोजन मध्य में विवेकपूर्ण जलसेवन तथा अंत में मुख शुद्धि हेतु जलपान करना चाहिए। अति जलसेवन अजीर्ण का प्रधान कारण है ।

५- एक काल भोजन सुख परिणाम कर होता है ।

आहार विधि विशेषयातन एवं अग्नि के बलाबल अनुसार ही अन्नपान का ग्रहण करना चाहिए क्योंकि आहार का उचित विधि सेवन समशन, विषमाशन, अध्यशन, से अजीर्ण की उत्पत्ति होती है, जो अपक्वमल की उत्पत्तिकर अनेक रोगों को उत्पन्न करता है ।

अतः रोगों से बचाव एवं स्वस्थ्य जीवन हेतु आहार का सम्यक प्रयोग करना चाहिए।

कहा भी गया है : **पथ्ये सति गदार्तस्य किमौषधनिषेवणैः।**

पथ्ये असति सतिगदार्तस्य किमौषधनिषेवणैः।। - लोलिम्बराज

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वैद्य हितेनवाजा, एमडीआयु, आत्रेय शासन आयुर्वेद चिकित्सा केंद्र, वेदोत्पत्ति आयुर्वेद विद्याशाला, अहमदाबाद

33. STUDIES ON PLANT BASED TRADITIONAL REMEDIES ON CHILD HEALTH CARE IN BEED DISTRICT, MAHARASHTRA

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Abstract :

The present study aims to explore the plant based traditional remedies by traditional practitioners on Child health care in Beed district, Maharashtra. Successive field surveys were carried out in AmbejogaiTaluka through traditional healers or practitioners who ceaselessly use their worthy knowledge to treat plant based traditional remedies on child health care. The information was collected by means of open-ended conversations, semi-structural questionnaire, group discussion, etc. The information obtained from the traditional practices was also cross verified to check the authenticity. The study revealed that the plant based traditional information collected for Fever, Mumps, and Diarrhea, Increase appetite in child and Cough from local practitioners by using various parts of plant such as flowers, stem, leaf and roots. The practitioners uses some medicinal plants likeUtaran, Black papper, PomegraneteKarivan/ Ekpani etc. Among the plants used by practitioners herbs are most common followed by Shrubs, trees and climbers. From this study it was concluded that the documentation is very important because all the local practitioners could not pass his knowledge to next generation so, this is one of the way to explore this valuable information and will open new door for researcher in the field of child health care.

Keywords -Traditional practitioners, Marathwada, Ambejogai, Fever, Cough and Mumps

Introduction :

The knowledge of medicinal plants in India has been accumulated in course of many centuries based on several ancient medicinal systems, including ayurveda, unani and siddha. According to the survey report of World Health Organization, 80% people of the developing world use plant remedies for several therapeutic purposes. India, one of the richest floristic regions of the world has diverse socio-economic, ethnic, linguistic and cultural areas. Therefore, the indigenous knowledge of medicinal plants and their use in treating several ailments might reasonably be expected in this country. Chandel et al. have reported that nearly about 70% of tribal and rural inhabitants of India are to a large extent depended on medicinal plants for their primary healthcare management due to either insufficient or inaccessible or less availability of modern healthcare system. The information regarding the medicinal properties of plants came down traditionally generation after generation through traditional healers. Apart from the tribal groups, many other forest dwellers and rural people also possess unique knowledge regarding plant utilization.

Beed one of the seven districts of Marathwada region of Maharashtra state. Lies between 18.27° to 19.27° Latitude and 74.29° to 76.44° E Longitude an average height of about 600m above mean sea level. Cover an area of 10227 sq.km. On the Deccan plateau and is centrally placed in the

region. It demarcates boundaries between Parbhani, Jalna, Aurangabad, Ahmednagar and Latur districts. Prior to independence, Beed was a part of the erstwhile Hyderabad state. It was included in the State of Maharashtra in 1960.

Topographically, the district may be divided into 1. Northern part a consisting of plains of Godavari valley. 2. Southern and southwestern part consisting of hilly area Balaghat range. Out of the total area of 10727 sq. km. of the entire district over 1440 sq.km. Most of the area and northern plains and Godavari valley is converted into an agricultural land.

Now a days the traditional knowledge is in the way of erosion due to environmental degradation, deforestation, agricultural expansion and population pressure. Traditional knowledge of medicinal plants and their use by indigenous cultures are not only useful for conservation of cultural traditions and biodiversity but also for community healthcare and drug development at present and in the future. Therefore, recording of indigenous knowledge of medicinal plants is an urgent task. The objective of this study was to interact with local traditional healers and to document their knowledge on utilization of medicinal plants, their usage and the types of diseases treated, etc.

Methods and Materials :

The practice of medicinal plants is widespread among the tribal people of Beed district, and it is deeply rooted in their socioeconomic culture. However, the documentation of local medicinal practices is distinctly absent for the region. Considering the great cultural and ethnolinguistic diversity of the tribal people of the province, several field interviews were designed to cover as in Ambejogaitalukaas possible, in order to maximize the diversity of knowledge and the plant species employed in traditional remedy. The present survey was conducted inAmbejogai city. Different interviewing procedures, including direct interview, group discussion, open-ended conversations, semi-structured questionnaire etc. were followed to get the information from the local traditional healers, known as aged knowledgeable persons regarding the use of different medicinal plants curing several ailments on child health care. The purpose of this survey was explained to them in details, and prior informed consent was taken as per ethical guidelines of the International Society of Ethnobiology. Plants were pointed out by the informants and their local names, used plant parts, formulation and dosages were given in table 1.

Sr. No.	Remarks	Disease treated	Name of healers
1	Fresh leaves of Pergulariadaemia (Forssk.) Chiov. Are crush and use 2-3 drops with breast milk.	Fever and Cough	Mr. Kondiba Manikrao Hatagle
2	Fresh leaves of Pergulariadaemia (Forssk.) Chiov. Are crush and apply paste on chick.	Mumps	Mr. Kondiba Manikrao Hatagle
3	Powder of Black pepper, Saindhav salt, Ginger, all ingredients crush and make powder. Use this one spoon powder twice a day with half glass water.	Cough	Mr. Vishnu Asruba Toradmal.
4	Give the Fruits of Karivana Centellaasiatiaca (L). Urb. Or Leaf juice is use two spoons twice a day.	Increase Appetite in child	Mr. Hanumant Kashinath Nagargoje.
5	Leaf of Ocimum sanctum (tulsi) crushed and 2-2 dropped in nose	Fever	Mr. Hanumant Kashinath Nagargoje.
6	1 tea spoon powder of Piper nigrum(kali miri) sprinkle on boiled egg and given at night. Half tea spoon of powder mixed with honey and given. 2-3 spoon of decoction is given	Cough, Flu complication Diarrhea Toothache	Mr. Dattaran Narayan Lavhale
7	4-5 Fruits of Ficuscarica(anjir) given twice a day	Cough Constipation	Mr. Dattaran Narayan Lavhale
8	1 cup of Meliaazadirachta (bakannimb) decoction given before breakfast	Diabetes	Mr. Dattaran Narayan Lavhale
9	Leaf juice of Tridaxprocumbens (L.) L. Two tea spoon at early morning.	Stomach discomfort	Mr. Lahu Ramrao Munde

Result and Discussion :

The majority of remedies were prepared from fresh plant material in the form of fresh leaves, powder and paste. The most frequently used mode of remedy administration is oral ingestion, followed by external use. Most of the diseases and pains were usually treated either with a single plant or a mixture of plant parts. In some cases, ointments like saindhav salt, mother breast milk etc. and other ingredients such as black peeper, ginger, ocimum,ficusetc. were also used to make ethnic formulations along with the parts of plant species.In children diseases the highest use report in the present study were documented forPergulariadaemia (Forssk.) Chiov,Centellaasiatiaca(L). Urb. Ficus carica, Piper negrum, Ocimum sanctum, Ficusreligiosa, Acaccianilotica.

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34. "BRAHMI" (BACOPA MONNIERI) : THE COGNITIVE ENHANCER IN AYURVEDIA : A REVIEW

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Abstract :
Bacopa monnieriis an Indian aquatic herb, has been used in traditional Ayurvedic medicine for centuries fo rmemory decline, pain, fevers, inflammation, and epilepsy. The major ingredients in B. monnieri extracts are steroidalsaponincalledbacosides. Bacopamonnieridecreases the rate of forgetting newly acquired information in healthyadults, andmayimprove cognitiveprocesses in healthyhumans.Asmoreand morepeopleturn to herbal medicine, Bacopamonnieriis experiencing increasing popularityasan onnieriappeared to suppress the release ofproinflammatory cytokines, whicharemoleculesthatstimulateaninflammatory immune responsein testtubeand animal studies. It inhibited enzymes, such as cyclo oxygenases, caspases and lipoxygenases playkeyroles in inflammation and pain.Bacopamonnierireduced bothsystolicanddiastolicbloodpressurelevels. Itdidthisbyreleasing nitricoxide, whichhelpsdilatebloodvessels,resulting in improved bloodflowandlower blood pressure.
Keywords : Bacopamonnieri,phytochemical,Ayurvedicmedicine

Introduction :

Bacopa botanically described Bacopa monnieri, is a perennial herb recently classified into the Plantaginaceae family from the Scrophulariaceae. Bacopa is a small, creeping succulent and water loving herb, grows in ponds, tidallands, and wetlands in tropical and semi tropical areas. The term 'Brahmi' originates from the Hindugod Brahma,which refers to the feminine aspect of Brahman. Brahman is also referred to as the 'cosmic consciousness', leading Bacopa to be associated with knowledge, learning, memory and concentration.Bacopa is a cooling bitter that is thought to pacify all *doshas*; *vata, pitta, &kapha,* or constitutions in the Ayurvedic tradition. Some use Bacopa to increase concentration and devotion to support a spiritual practice, and it is believed that ancient scholars utilized memorize extensive hymns and scriptures. The plants have flowers with 5 petals, are white or whitish blue and grow on short pedicels at the axils of the leaves. The whole plant or aerial parts can be dried and used medicinally in India, SriLanka, southern coasts of the U.S, & Australia. It having ability to thrive and absorb the moistureof its environment as well as absorbing the pollutants of its environment, such as pesticides, microbes, and heavy metals.

Botanical Description :

absorbing the pollutants of its environment, such as pesticides, microbes, and heavy metals. Botanical Description Bacopa monnieri is a perennial non-aromatic herb. It is little smooth crawling beefy plant with numerous branches. It develops up to a height of 60-90cm and its branches are 5-35cm long. Roots are thin, wiry, little, expanded creamish-yellow. Seeds are infinite, irregular, or oblong. The stem is delicate, green or purplish-green, around 1mm thick, consists of nodes and

internodes and the taste is slightly bitter. Leaves are bent, straight forward, inverse, crisscross, green, sessile, 8-15mm long, 4mm wide, elongated, dots are present on the lower surface with minute specks. Flowers are small, axillary, five-petaled, white, purple, pink, or pale violet in appearance. The pedicels are 6-30mm long; bracteoles present are narrow than pedicels. Fruits are like containers up to 5mm long, ovoid, glabrous, sharp at the apex and are purple in fresh condition. (. Oudhia et al., 2004,Wallis et al., 1946, Basak et al., 2016.,Tripathi et al., 1996)

Geographical Distribution :

This plant generally grows in wet soil, shallow water, and swamps. It is mainly found in countries like Nepal, India, Srilanka, China, Taiwan, Pakistan, Vietnam, Florida and the Southern region of the USA. In India, it is mainly found in tropical regions. It is dispersed in warmer regions of the world except India.[27-30](Pushkar et al., 2015, Kapoor et al.,2000, Barrett et al., 1978, Qureshi et al., 2008)

Ayurvedic Literature on Brahmi :

Brahmi (Bacopa monnieri Linn) is a very important herb in Ayurveda. It was initially described by Charaka Samhita, Atharva-Ved and Susurtu Samhita in their books.[51] It has been utilized as a therapeutic spice in Ayurveda since ancient times. It is used for the treatment of epilepsy, asthma, ulcers, and tumors.[52] It is described as a "Medhya Rasayan" drug (as indicated by "Ayurveda", the Indian traditional system of medicines, "Medhyarasayanas" possess natural therapeutic properties that support memory, re-establish intellectual deficiencies and enhance mental capacity) which is utilized to enhance memory. Intellect (Medhya), has been utilized by Ayurveda clinical experts in India for around 3000 years.[53,54] It plays a vital role in Ayurveda for the treatment of psychological problems of aging.[55,56] Bacopa plant is a significant element of the Ayurveda system, for example, Brahmighritam, Brahmirasayanam, and others. Brahmirasayan and Brahmigritham have been in use for quite a long time to control seizures in Ayurveda.[57] Brahmi is perhaps the most generally used herbs, the neurocognitive effects of which are well established. The herb is commonly used by Ayurveda to prepare polyherbal medicines like Saraswatarishta (SW) and Brahmi Ghrita (BG), Saraswat Choorna and others.[58,59] Ras panchak i.e., properties of Brahmi as per Ayurvedic literature is shown in table 1

Table 3: Rasa Panchak (properties) of Brahmi as per Ayurveda [60]

Sanskrit / English	Sanskrit /English
Virya/Potency	Sheeta/Cold
Vipak/Metabolic property	Madhura/Sweet
Guna/Physical property	Laghu/Light
Rasa/Taste	Tikta/Bitter

Ayurvedic Action of Brahmi (Baccopa monnieri) [61,62]

Vatahara - Calms Vata (maintain the circulatory system)

Anuloma - Redirects the flow of Vata (blood flow) do wnwards

Unmadahara - Reduces mental illness Pradnya shakti - Increases intellectual power
Hridya - Heart tonic
Majjadhatu Rasayana - Rejuvenative, particularly used to treat nervous system disorders.
Ayushya vardhana- Increases longevity
Balyam -Gives strength (especially to the mind)
Jeevaniya -Promotes energy
Medhya -Nervine
Nidrajnana- Promotes sleep
Kushtaghna -Alleviate skin conditions

Positive Effect :

B. Monnieri in unimpaired humans found an improvement in the speed of visual information processing and a reduction in subjective anxiety levels (Stough et al., 2001; Morgan and Stevens, 2010). B. monnieri improved spatial working memory accuracy (Stough et al., 2008).

Potential Mechanisms :

The heterogeneity of cognitive enhancement by B. monnieri extracts suggests diverse cellular mechanisms, in vitro and animal studies of potential cognitive enhancing mechanisms. B. monnieri is generally neuroprotective, preventing oxidative stress, lipid peroxidation and cell death (Hosamani and Muralidhara, 2009; Thippeswamy et al., 2013; Velaga et al., 2014).

Some of the neuroprotective and memory restoring effects of B. Monnieri may be due to the ability of bacosides to alter Ca2+ dynamics in smooth muscle cells and induce vasodilatation (Kamkaew et al., 2011). Vasodilatation of cerebral vasculature may facilitate cerebral blood flow, providing the brain with more oxygen and glucose to support higher levels of neuronal activity or maintain function in times of stress or injury, such as ischemia; focal blockage of cerebral blood flow.

B.monnieri appears to facilitate neuronal activity and synaptic signaling. It increases neuronal activity rather than impairing neurotransmitter reuptake or enzymatic degradation. Elevated levels of serotonin receptors may promote information encoding by facilitating cholinergic synaptic transmission (Rajan et al., 2011)

Traditional uses :

Bacopa traditionally was utilized in various conditions afflicting the mind and nervous system. In traditional Ayurvedic medicine, Bacopa is a rasayana, or a rejuvenative tonic, which promotes the revitalization of the body and tissues. It was used tonically to promote intellect and longevity. Its extracts are able to improve various cognitive functions in healthy college students. Bacopa monnieri decreases the rate of forgetting newly acquired information in healthy adults, and may improve cognitive processes in healthy humans.

Powerful antioxidants :

Bacopa monnieri contains powerful compounds that may have antioxidant effects. Antioxidants are substances that help protect against cell damage caused by potentially harmful molecules called free radicals. The damage caused by free radicals is linked to many chronic conditions, such as heart

disease, diabetes, and certain cancers. The plant extract contain Bacosides neutralize free radicals and prevent fat molecules from reacting with free radicals due to process called lipid peroxidation. Lipid peroxidation is linked to several conditions, such as Alzheimer's, Parkinson's, and other neurodegenerative disorders.

Reduce inflammation :

Inflammation is human body's natural response to help heal and fight disease. However, chronic, low level inflammation has been linked to many chronic conditions, including cancer, diabetes, and heart and kidney disease. In test tube studies, Bacopa monnieri appeared to suppress the release of pro inflammatory cytokines, which are molecules that stimulate an inflammatory immune response. It inhibited enzymes, such as cyclo oxygenases, caspases, and lipoxygenases play key roles in inflammation and pain.

Boost brain function :

Bacopa monnieri may help enhance brain function. Bacopa monnieri improved their spatial learning and ability to retain information . It also increased dendrite length and branching. Dendrites are parts of nerve cells in the brain that are closely linked to learning and memory. Bacopa monnieri significantly improved the speed of processing visual information, learning rate, and memory, compared with the placebo treatment.

ADHD symptoms :

Bacopa monnieri may help reduce ADHD symptoms. ADHD means Attention Deficit Hyperactivity Disorder; is a neurodevelopment disorder that is characterized by symptoms like hyperactivity, impulsivity and inattentiveness. The use of Bacopa monnieri extract significantly reduced ADHD symptoms, such as restlessness, poor self control, inattention, and impulsivity in children. Bacopa monnieri improved attention, cognition, and impulse control, compared with the placebo group.

Anxiety and stress :

Bacopa monnieri may help prevent anxiety and stress. It's considered an adaptogenic herb, meaning that it increases your body's resistance to stress. Bacopa monnieri helps reduce stress and anxiety by elevating your mood and reducing levels of cortisol, a hormone that is closely linked to stress levels. Bacopa monnieri had anti anxiety effects comparable to those of lorazepam (benzodiazepine), a prescription medication used to treat anxiety.

Blood pressure levels :

Bacopa monnieri may help keep blood pressure within a healthy range. High blood pressure is a serious health concern, as it places strain on heart and blood vessels. This can weaken heart and increase risk of heart dies. Bacopa monnieri reduced both systolic and diastolic blood pressure levels, due to releasing nitric oxide, which helps dilate blood vessels, resulting in improved blood flow and lower blood pressure.

Epilepsy :

Bacopa has also been indicated as a remedy for epilepsy in Ayurvedic medicine. Recently it examines with the anticonvulsant properties of the extracts in mice and rats with the high dose given IP at least for 10 days.

Bronchitis and asthma :

Bacopa extracts have relaxant effect on chemically in reduced bronchi constriction. The methanol extract of Bacopa possessed potent mast cell stabilizing activity comparable to disodium chromoglycate, a commonly used allergy medication. The potential usefulness of Bacopa extracts in bronchi constrictive conditions as well as some allergic conditions (Jatwa et al, 2014).

Gastrointestinal disorders :

The extract of Bacopa monnieri effects on the gastrointestinal tract, spasmolytic activity on intestinal smooth muscle (Joshi, et al, 2013). The extract gives protective and curative effects over gastric ulcers. Bacopa extract demonstrated the antimicrobial activity against Helicobacter pylori, bacteria responsible for chronic gastric ulcers (Joshi, et al, 2014).

Cardiovascular effects :

Bacopa as a Cardiotonic is frequently mentioned in Ayurvedic medicine texts. In vitro research using rabbit aorta and pulmonary artery has demonstrated that extract has vasodialatory effect interfering with calcium channel flux in tissue cells.

Hypothyroidism :

Bacopa extract increased the thyroid hormone T4 and have stimulatory effect on thyroid function (Kamesh, V. and Sumathi, T. 2012). Alzheimer's disease: Goswami et al. (2011) evaluated the effect of B. monnieri (Bacognize) effects patients of Alzheimer's disease. The Psychiatry Outdoor Patient showed statistically significant improvements in various components of Mini Mental State Examination Scale including orientation of time, place and person, attention and in their language component in terms of reading, writing and comprehension. The patients involved in this trial also reported improvement in their quality of life, and decrease in the irritability.

In 2013, Kunte and Kuna studied the neuroprotective properties of B. monnieri and revealed that the extract showed positive effects on body weight, learning skills, memory and concentration, moreover, B. monnieri could revert all the constituents of ATPase system to normal levels in Alzheimer's disease induced mice.

Parkinson's disease :

Jadiya et al. (2011) studied the effect of B. monnieri, stated that B. monnieri reduced alpha synuclein aggregation, prevented dopaminergic neuro degeneration and restored the lipid content in nematodes, thereby proving its potential as a possible anti Parkinsonian agent. Swathi et al. (2012) examined the neuroprotective effect of B. monnieri in rotenone induced Parkinson's disease with particular reference to glutamate metabolism in different regions of rat brain and conclude that the ability of B. monnieri extract to modulate glutamate metabolism in different brain regions of induced rodent model of Parkinson's disease.

Conclusion :

B.monnieri has demonstrated the presence of a wide variety of bioactive compounds that represent a rich resource in phytochemical of great interest to treat several pathologies. Some of the benefic biological effects show that this plant may play an important role as antioxidant, antinociceptive, anti

inflammatory, antimicrobial, anti carcinogenic, antiviral, anti allergic and anti tumorigenic, indicating its utility in the prevention or treatment of several diseases. B.monnieri is a promising plant that may offer low cost alternative strategy for the use in Medicine industry.

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35. PHARMACOVIGILANCE IN AYURVEDA AND ADVERSE DRUG REACTION

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Abstract: :

Pharmacovigilance is very important term which is now a days getting more interest from researchers in the field of Ayurveda. It deals with various aspect of drugs interactions ,its adverse effects and data collection with reference to it.Though this term is newly introduced in modern sciences it has been studied and evaluated in details by our ancient Acharyas of Ayurveda.In Charaka Samhita we can get references of various drug reactions according to its Rasa,Veerya, Vipaka and other Dosh Dhatu Avastha. This work is compilation of morden and Ayurvedic views regarding Pharmacovigilance.

Keywords : pharmacovigilance, charak samhita, samyog-virodh of dravyas.

INTODUCTION :

PHARMACOVIGILANCE :

It is a branch of science which deals with collection,observation,record and prevention of Adverse Effect of drug or therapeutic product.

It is commonly considered that ayurvedic drugs do not have adverse effects or side effects as compare to modern medicines .But in classical texts Acharyyas have already mentioned that drug should be given with Yukti otherwise it will act like a poison, and poison given with Yukti will work like medicine.Due to popularity of ayurvedic drugs there are increased chances of drug adulteration,mal-manufacturing and mal-practicing resulting in adverse drug reactions.

Adverse drug reaction are following

Side effect -These effects are considerable effect or negligiblepharmacological effect of drug on body. It may be rash , urticaria.

Untoward effect - they are undesirable effector unexpected effects shown by the drug on body. If they are severe there may be necessity of intervention by treatment. eg.diarrhea and vomiting due to amino acids.

Toxic effect - they are because of very high dose of the drug or the very prolonged use of the drug. For example depression of respiration due to morphin. Deafness because of dehydrostreptomycin.

Idiosyncratic effects - its qualitative intolerance of the drug due to genetically determined absence of enzymes or the reduced activity of enzymes.

Allergic reaction - these may be vary from every individual. they can be like rashes or maximally like anaphylactic.

Ayurvedic drugs should be studied under these adverse drug effects.There is NATIONAL

PHARMACOVIGILANCE COMITEE which maintain records of all adverse drug reactions and the data is collected from all ayurved colleges hospitals institutes and private practitioners. Record keeping and reporting of ADR issues is important for safety efficacy and standardization of ayurvedic drugs and products.

Material and methods : Charak Samhita
Ayurvedic text books
Modern pharmacology text books

OBSERVATIONS :

In Charak Samhita drug interactions are described under SAMYOG and VIRODH of dravyas. Samyog are combination of drug or dravyas which are helpful for body i.e. Hitakar sanyog, and Ahitkar sanyog or combinations of drug or dravya which are hazarders to body.In Charak Samhita it is mentionedas follows;

1] MaanVirodh; combination of dravya in such proportion that gives harmful effects on body,and its popular example is consuming Honey and Ghee in same proportion shows poisonus effects.

2] GunaVirodh: harmful combination of drugs or dravya having properties opposite to each other, sub types of this virodh is

1) Rasa Virodh; dravyas with opposite rasa
2) Vipak Virodh; dravyas with opposite vipak
3) Veerya Virodh; dravyas with opposite veerya

It means drugs having opposite properties(as per rasa,vipak,veerya) combined with each other are harmful for body functions(doshas,dhatus,malas).

3]Karma Virodh : combination of drugs having opposite actions to each other. They are described as follows;

A) Desha Virodh; e.g.cosuming sheet dravyas in sheet desha i.e. in cold region.
B) Kaal Virodh; e.g. consuming ushna dravya in hot weather.
C) Agni Virodh; e.g.consuming heavey food or dravya in Manda agni.
D) Koshtha Virodh;e.g.ruksha dravya in krur koshtha.
E) Veerya Virodh; consuming ushna and sheet veerya dravya in combination.
F) Satmya Virodh;consuming dravya which are known to be harmful to individual.
G) Paatra Virodh; e.g.aamla rasa dravya in copper pot is poisonus combination.
H) Maatra Virodh;consuming drug in wrong proportion.
I) Sanskar Virodh;consuming drug which are wrongly prepared e.g. cooking rice in silver pot.
J) Awastha Virodh;drug opposite to prakriti.
K) Parihaar Virodh;consuming dravya in wrong mannar.
L) Upchar Virodh; consumption of dravya which are not to be followed by each other.
M) Sanyog Virodh;unhealthy combination of dravya.

N) Sampad Virodh;dravya which have lost there healthy properties.
O) Hrida Virodh; consuming dravya whch are not pleasant mind.
P) Vidhi Virodh;having drugs or dravyas not according to shastra.
Q) Krama Virodh; taking drug not according to dincharya.
R) Dosha Virodh;e.g. ushna upchar in pitta vridhhi.
Drugs having poisonus properties should be undergo SHODHANA which is very important process while drug preparation otherwise it will show adverse drug reactions.
According to ayurveda these are ahitakar drug interactions. consuming food, drugs in above manner give rise to various health hazards, to which we can say adverse drug or food reactions.
According to modern reaserch there are various drug interactions which are maintioned as
A) Drug - Drug interaction ;
some drug interact with other drug like Antagonist and some work as Agonist to other drug.
B) Drug-food interaction;
food interact with drug like agonist or antagonist.
C) Food-food interactions;
combination of food stuffs resulting in harmful reactions.

CONCLUSION :

According to Ayurveda there are many kind of drug interaction which may be helpful or harmful to body, pharmacovigilance is also expected in this aspect of drug interactions.Observation , record keeping and informing to pharmacovigilance comitee are one of the important measures that should be taken in the field of ayurveda for more safety, efficacy and standardization of ayurvedic drugs and products.

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ISBN : 978-81-955085-7-0