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Āryavaidyan

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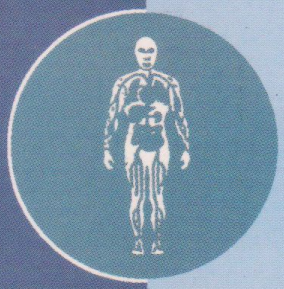
Of all the gifts,
the most precious is health



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November 2004 - January 2005

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āryavaidyan

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Aryavaidyan is intended to encourage scientific writing and intellectual interactions among scholars, academicians, practitioners and students of ayurveda and allied subjects like Siddha, Unani, modern medicine, etc.

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learning other disciplines and
serving the preceptor-these factors
endow one with intelligence and memory

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The Chief Editor (Publications)
Arya Vaidya Sala, Kottakkal
Malappuram District
Kerala State
Pin - 676 503, India.

Phone : 0483 -2742225, 2746665
Fax : 2742210, 2742572
E-mail : publications@aryavaidyasala.com

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AYURVEDIC ONCOLOGY

P.K. Warrier*

Abstract: The contemporary need is to enlighten the new generation of ayurvedic physicians with the great potential of ayurveda and steer them in the correct direction so that ayurveda can be revived in the right sense and spirit. The emergence of new diseases, less amenable to conventional treatments, necessitates the initiating of a process of redefining ayurvedic practices. This article is an attempt in this direction with illustrations of case studies in the treatment of cancer.

Introduction

Ayurveda is a system of medicine built on a philosophical foundation. Foundation does not go on changing over time but superstructure does. As any other biological discipline, ayurveda is dynamic at operational level. The *panchabhuta* and *tridosha* theories form the concrete foundation of ayurveda; *hetu linga aushadhanjanam* constitutes its super-structure. The superstructure can be updated and modified to cater to the contemporary healthcare needs at any point of time. The wide conceptual framework of ayurveda allows periodic systematization. It helps ayurveda to remain updated. Obviously as a result of the periodic systematization, the new age ayurveda is considerably different from its prototypes both in approach and techniques. The intellectually vibrant atmosphere of the present era should be properly utilized for updating ayurveda without deviating from its fundamental axioms. The stress is on fundamental axioms. It should be clear to everybody that any attempt to find parallels for ayurvedic biology, therapeutics and practices against western counterpart would be a meaningless exercise because western medicine cannot internalize the ayurvedic perspectives in the way it is originally envisaged. So the new generation of ayurvedic physicians may be cautioned against this unhealthy trend. This point can be illustrated by referring to a few examples.

Currently attempts to translate ayurvedic knowledge to modern parlance are done at various levels - academic, theoretical, research and clinical practice. No doubt that the frame of reference for diagnosis and therapies in the case of modern medicine is essentially anatomical and pathophysiological changes. Since no apparent anatomical reality is identified and established for certain technical terms used in ayurveda, e.g. *marmas*, *srotas*, one to one correlation would be rather impossible. It should be realized here that in ayurveda pathophysio-logical changes are often described in relation

* *Managing Trustee and Chief Physician, Arya Vaidya Sala, Kottakkal*

to the ayurvedic norms and terminologies primarily fixed; so is the case with the effect of therapies too. To cite an example the mode of action of *sirodhara* cannot be explained, rather understood, without knowing the anatomy of *marma*s located on the forehead. Typical western approach basically differs from ayurvedic perspective. Ayurvedic approach is basically field-oriented and functional. After an ayurvedic treatment, remarkable physical and mental improvements in patients are often observed. Even in such cases biochemical parameters used in modern medicine to assess the efficacy of treatment remain unchanged. In such instances comparative studies strictly based on the biochemical parameters do not help us to arrive at definite conclusions. Many a time those who adopt typical western approach to interpret ayurveda become sceptical and develop antagonism towards this science. Therefore the contemporary need is to enlighten the new generation of ayurvedic physicians with the great potential of ayurveda and steer them in the correct direction so that ayurveda can be revived in the right sense and spirit.

On looking back it is understood that all medical practices were traditional until the dawn of 19th Century. The influence of Cartesian philosophy introduced "scientific materialism" in medicine. It accepted only those principles and practices of medicine, which could be experimentally verified and statistically validated. But owing to various reasons during the last few decades, challenges have arisen against this biomedical model of healthcare. As a result, a bio-psycho-social approach has come into being in the medical field, which lays emphasis on holism. The intrinsic value of holistic approach is its integral vision of health, which is well represented in ayurveda.

Ayurveda, therefore, has shot into prominence globally more than ever before. Transcultural movements of the day enable, rather force, an interaction with other contemporary medical sciences. In this scenario, it is imperative to be on guard against an *identity crisis* that may arise in the storm of mediflation. Therefore, it is necessary, be prepared for a sea change as the time demands. Meanwhile, though we have all the liberty to modify the superstructure, abundant caution not to make a violent break with our tradition, is obligatory.

Cancer in ayurveda

One of the major reasons for redefining ayurvedic practices is the emergence of new diseases, which are less amenable to conventional standard treatments. It can be openly admited that cancer is not described in classic ayurvedic works such as *Brhattrayi*. In ancient times cancer had the status of an orphan illness. Orphan illness refers to a disease entity, which was not taken up for elaborate studies in terms of its etio-pathology, therapeutics and prognosis. It may be presumed that the neglect was for want of a large patient population. In the case of cancer the situation has thoroughly changed and it is now the major cause of fatality, second only to cardiac ailments. It is no more considered as an orphan illness as in the past. Naturally ayurveda too has to develop an oncology – both in the theoretical and applied fields.

No one can honestly claim to know the cure for cancer. Many of the questions related to etiopathology of cancer remain unanswered. The therapeutic choices offered to a cancer patient are rather grim. The treatment strategies of cancer are mainly three: - cut it out (surgery), burn it out (radiation) and destroy it (chemotherapy).

There is a strong anti-surgery feeling among patients. Cancer patients want to move away from radiation and chemotherapy fearing of physical disfigurations that may result from the therapies. To many, trauma of the treatment is worse than that of the disease. They are therefore, put in a climate of opinion ruled by fear and uncertainty. As a safer option they turn to other systems of medicine. Unfortunately, ayurveda has not yet succeeded in developing an effective methodology to deal with cancer cases and due to this the patients often face agonizing dilemma. In this situation, ayurvedic physicians are bound to take stock of the situation and improve themselves to come up to the expectations of the ailing fraternity without waiting for the evolvement of an unborn definite system in oncology.

Theoretical oncology hint

Here are a few hints to touch upon while developing an ayurvedic theoretical oncology. What should be the starting point? One must have a clear-cut understanding about the contemporary knowledge on cancer so as to perceive in an ayurvedic manner that would result in the formation of a sound ayurvedic oncology. There are significant points in classical ayurvedic works which are relevant for forming an ayurvedic oncology.

Systematic functioning of any biological entity requires three fundamental regulatory processes - input/output (transport), transformation and storage. In other words, we may say - चलनं (movement), पाकं (digestion) and उपचयं (transformation). The *tridosha* concept of ayurveda also has a sound basis for this systems theory. (Table 1)

To obtain a fair idea about the basic structural and functional concepts of human body, we may look into the derivations of a few words commonly used in ayurvedic classics such as - शीर्यते अनेन इति शरीरम् (body is called so because it perishes), दिह् वर्धने देहः (the root *'dih'* means to increase) and चीयते अन्नादिभिः कायः (body is nourished by diet).

As far as our knowledge goes, a cell is the basic structural unit of the human body. It may be rationally presumed that there was some knowledge of the cell boundary and molecular traffic between the extra cellular and intracellular fluids even before the advent of the electron microscope. A human body is composed of 50-100 trillion cells. Charaka says - शरीरावयवास्तु परमाणुभेदेनापरिसंख्येया भवन्ति अतिबहुत्वादतिसौक्ष्म्या–दतीन्द्रियत्वाच्च. It essentially means that the basic body components are structurally atomic, innumerable and unperceivable.

तेषां संयोगविभागे परमाणूनां कारणं कर्मस्वभावश्च । An individual cell is on one of the two largely exclusive paths: division or differentiation. Cells capable of dividing are undifferentiated (stem cells) whereas terminally differentiated cells are unable to divide. Stem cells produce daughter cells that can either become new stem cells or undergo terminal differentiation depending on tissue specific programming interacting with environmental signals. Both types of cells have different patterns of gene expression.

Each cell has unique characteristics (either inherited or acquired) to perform certain subset of functions. The integrity of human system is

TABLE 1

Physiological functions assigned to *tridosha*

Vata	*Pitta*	*Kapha*
Communication	Digestion	Connecting structures
Transport	Transformation	Cohesion
Movement	Metabolism	Lubrication

maintained by the synchronization of functions of sub-systems, which are organically interconnected and biologically regulated by the *tridosha*s, biophysico chemical energies of the body. Of the three forms of energies, *vayu* acts as the master force.

The cellular metabolism governed by the three *dosha*s can be briefly overviewed thus: *Vata* governing input/output is responsible for regulating transport across all membranes including the entry of food and other molecules into the cell and the elimination of waste materials. Governing motion (kinetics) would also be responsible for cell division and differentiation (*samyogavibhage karanam vayu*).

Pitta being responsible for metabolism (biochemical energy production and regulation) governs the krebs cycle wherein assimilated food is used to create high energy molecules required for cell growth and their sustenance. *Pitta* is also responsible for all the processes involving enzyme synthesis needed to bring about transformation.

Kapha, being responsible for storage can be identified with the cell membrane and cell wall, the basic reserves for the cell to call upon in hard times. On a molecular level *kahpa* can be identified with lipids and polysaccharides, the molecular basis for membrane and cell walls respectively. Mucus is polysaccharide while other lubrication may use lipids.

It may be of interest to note that the strategies, which maintain the process of control in single cells possess an underlying continuity throughout their biologic development, starting from the microscopic level of regulation of biochemical processes in single cells, and proceeding to the macroscopic level of control processes regulating the whole body and its subsystems. It can be seen that the processes of biologic development have maintained similar strategies of control to those used in the original cells, adding to and building on them as appropriate, but without fundamental alteration.

Cancer is a disorder of cellular behaviour, in which the structural/functional integrity is distorted.

What is cancer?

There are descriptions of disease entities in ancient ayurvedic texts that have remarkable similarities with modern interpretations of cancer. However, one can hardly find a single comprehensive word in ayurveda denoting a disease entity, which is worthy of comparison to the concept of cancer.

Etymologically the word *arbuda* represents an enormously growing mass encroaching and destroying the normal structural and functional status of an organ and on a larger scale the entire human body.

On conducting a literature survey, we get a fairly good amount of information with regard to the understanding and interpretations of our predecessors about cancer. In this context, an appropriate reference has to be made to a variety of diseases which have this particular feature in onset, growth, spread or manifestation. It includes *granthi*, *apachi*, *gulma*, *udara*, *vidradhi* and *dushtavrana*. Benign forms of these diseases are likely to become malignant over a period of time where the standard treatments prove ineffective. The *sannipatika* stage of *dosha* vitiation of diseases is comparable with malignant conditions.

One of the criteria adopted by the exponents of ayurveda in naming and grouping of diseases was their commonalities in ethiopathogenesis,

disease processes, clinical manifestations and terminal stages of the diseases. The following descriptions with its appropriate interpretations provide a sound basis for the development of ayurvedic oncology (Table 2).

Basic approach

Ayurvedic treatment for cancer should be basically holistic in approach and so modulated as to have the following results.

1. Eradication of morbid tissues
2. Protection of healthy cells from toxicity and other unfavourable conditions.
3. Promotion of regeneration of healthy tissues.

Anti cancer treatment has five major categories depending upon the level of medical care required – preventive, prophylactic, curative, palliative and supportive.

Based on the current understanding of the biology of carcinogens, preventive and prophylactic measures can be adopted. It includes an early identification of the disease, avoidance of carcinogens and a specific interference to lower cancer risk. Ayurveda definitely has some important role to play in preventive oncology because carcinogenesis is not an event but a process evolved over a considerable period of time. Manipulation of genetical, biological and environmental factors in the causal pathway should be attempted. It could be made easy by adopting and updating the principles and practices laid down in *svasthavrtta*. It may perhaps be possible to influence the mutations leading to carcinogenesis at the embryonic level by resorting to well designed prenatal care systems. The methods and materials recommended in ayurveda in this regard could be subjected to an in-depth study. Life style modification in terms of diet, relaxation, exercise, attitude and motivation can be effectively practised. Patient education and public awareness programmes enlightening the need of up keeping positive health could be contributory.

Chemoprevention is a relatively new concept. It involves the use of natural agents (chemical agents are also considered in western medicine) to reverse, suppress or prevent carcinogenesis before the development of invasive malignancy. The purificatory treatment regimen of ayurveda followed by the regular use of *rasayana*s may prove to be an effective mode of chemo-prevention.

The inbuilt health potentials of a human body could be appropriately channeled to inactivate the carcinogenic proliferation. It may perhaps be possible to influence the mutation leading to carcinogenesis at cellular level. This appears to be one of the basic axioms of the biologic therapy which is aimed at manipulating the

TABLE 2

The various stages of development of *arbuda*

Sopha (Oedema)	→	*Granti/Gulma* (Glandular swellings)	→	*Arbudam* (Tumour)	→	*Adhyarbudam* (Metastasis - primary site)	
Dvirarbudam (Distant metastasis)	→	*Vidhradhi* (abscess)	→	*Vrana* (Malignant ulcers)			

host-tumour interaction in favour of the host. The very existence of cancer in a person is a testimony to the failure of the immune system to deal effectively with cancer. Tumour cells have inherent capabilities to escape the attention of the defensive mechanism of the host. This could be compared with underground terrorism. In the initial phase the tumour cells do not exhibit a notable difference from the normal cells so that they are not identified as possible culprits. Tumour activity at this level is too low to be regulated by the cells so that normal antigen-antibody complex does not develop. Tumour cells can cloak themselves in protective shells of fibrin to minimize contact with surveillance mechanisms. In short, the tumour cells moving in a hidden path thus overpower the entire purpose of immune mechanism. It is unfortunate that most of the universally accepted anti-caner treatments also suppress the immune mechanism adding to the misery of the individual affected. This may perhaps be one of the demerits of the cancer therapy.

There are guidelines in ayurvedic classics to deal with neoplasia of various types. But therapeutic efficacy of such measures to counteract the process of carcinogenesis remains to be established. The centres of advanced studies in ayurveda and allied sciences are equipped with the infrastructure capable of isolating drugs having anti-mutagenic and antiproliferate activity. There is every reason to believe that in the near future ayurveda would have an *arbudaharaganam* to be incorporated into the chapter of *Sodhanadigana sangrahaneeyam* of *Ashtangahridaya.*

Ayurvedic practitioners have already started using classical formulations such as *Guggulutiktam kvatham*, *Kanchanara-guggulu*, *Rasasinduram*, *Gandira rasayanam*, etc. in the treatment of malignant disorders. Parenthetically, while mentioning about auto-urine therapy, it is observed that urine contains some anti-cancerous ingredients. Some scholars hold the view that medicaments recommended in *Arsochikitsa* have a specific role in the treatment of colon cancer. In a way we are finding clinically meaningful anti-tumour and anti-cancerous effect of ancient classical preparations. The observational and empirical data so obtained would be helpful to form a medical oncology of ayurveda.

Palliative care refers to the medical or comfort care that reduces the severity of a disease, slows its progress rather than providing a cure. In the case of cancer, palliative care becomes the focus of the treatment in certain conditions. This helps management of pain and other distressing symptoms.

Case studies

Keeping this in view, Arya Vaidya Sala has started an exclusive clinic for cancer patients, where primarily it acts as service providers. Meanwhile, the clinic is trying to document the case histories of cancer patients in a systematic manner so that the data generated thereof can be retrieved for further studies. This 6-year-old cancer clinic now has documented case histories of about 2000 cancer patients belonging to different categories. The primary analysis of the clinical patient population reveals that four groups of patients are seeking ayurvedic treatment.

There are patients who want to try ayurvedic treatment along with conventional anti-cancer treatments. They hope that combined therapy will be helpful to nullify the side effects of radiation and chemotherapy. They also hope that ayurvedic therapy would help prevent

recurrence in a safer way. Terminally, cancer patients take recourse to ayurvedic treatment for supportive and palliative care. A third group of patients are those who decide to try the ayurvedic treatment on a regular basis for total and permanent cure though they are temporarily released from the clutches of cancer with the help of surgery, radiation or chemotherapy. There is yet another group of patients on whom the clinic is concentrating just because they are fully dependent on ayurvedic treatment. Admittedly, this category of patients constitutes only a minor percentage of the patient population. Their decision to opt exclusively for ayurvedic treatment is essentially based on their understanding of the limitations and the risks of other treatment options. Our commitment towards this group of patients is relatively more because of the faith they have put in ayurveda.

As of now we do not have statistically significant number of cancer cases, to establish the efficacy of ayurvedic treatment. But there are medical case histories of cancer patients suggestive of the scope and relevance of ayurvedic treatment for management of malignant disorders. The guidelines for research methodologies designed by WHO include a specific clause which is very pertinent in this context. It says single case studies for evaluation of efficacy of herbal medicine should not be ignored because of its potential contribution to traditional medicine.

I vividly remember the case of a patient who had adenocarcinoma of stomach. His brother who was undergoing treatment in our hospital had a discussion with us about the possibilities of ayurvedic treatment for stomach cancer in which the western system had nothing much to offer in terms of a medical treatment. Based on the reports made available to us we suggested a course of treatment to be tried at his residence. In fact we did not get an occasion to see the patient personally even once before chalking out the treatment profile. The medicines included *Nimbamritadi panchahiktam kashayam* and *Sahadevyadi leham* and a few adjuvants. We were not very hopeful in the initial stages of the treatment. To our surprise we were getting reports from the patient indicating the progress of his recovery. He made his own arrangements to continue the treatment in the Gulf collecting medicines from Kottakkal. He continued the medication without any interruption for a period of more than five years. To him at least ayurveda has a cure for Cancer. Similarly, I would like to refer to another example. In this case the patient is a fifty year-old Keralite lady who was diagnosed as Ca. Lung. She approached us for medical advice forwarding her full medical case history. In addition to *Nimbamritadi panchatiktam kashayam*, *Sahadevyadi leham*, we prescribed *Parthadyarishtam* and *Agastyarsayanam* in view of the specific site of cancerous lesion. One cannot expect a tangible improvement in lung cancer cases. But this lady improved rapidly and she attained a near normal condition. The improvement was not merely symptomatic. Radiological examination revealed remarkable changes suggestive of the regression of the disease.

Another case is about a sixteen year-old patient, diagnosed as Acute Myloid Leukemia M-1. The diagnosis was done at Nizam's Institute of Medical Sciences, Hyderabad. The presenting symptoms were abdominal pain, low-grade fever, dry cough and generalized body ache. On examination, there was detectable splenomegaly. The patient was advised to try

Nimbamritadi panchatiktam kashayam, *Chandraprabha vatika*, *Ayoliptatippali*, *Rasasindooram* and a combination of *Nityakalyani* extract, *Tippali churnam*, *Rajatabhasmam* and *Talakabhasmam*. The patient continued the treatment on a regular basis and intimated the progress at regular intervals. She was registering improvement gradually. This case was personally reviewed after three months. The patient was totally free from all symptoms recorded initially and there was no splenomegaly. Her blood picture showed tremendous improvement in every aspect. She has been advised to continue the medication and give us the reports periodically.

These instances cannot be set-aside as odd events or miracles. Any way the time is not ripe to make tall claims about the curative effects of ayurvedic treatment in cancer cases. 'Miracles are also extensions of normal capabilities'; hence ayurvedic physicians, who come across similar incidences, must document such cases for future use.

Collaborative research activities also bring forth valuable data. A few of such activities undertaken by Arya Vaidya Sala, joining hands with Calicut Medical College, are referred to here. The attempt was directed to provide terminally ill cancer patients with supportive palliative care. Primarily it was decided to split the goals and aim at achievable bits. To cite an example, Opioid induced constipation is a big menace to the cancer patients who are receiving morphine therapy for pain relief. They cannot do away with opioid preparation because no therapeutically equivalent drug is available to replace it. The standard treatment adopted to relieve constipation has many inadequacies. That was the reason why doctors were willing to try some herbal preparation. A team of doctors studied the efficacy of well-known ayurvedic preparation *Misrakasneham* to relieve constipation. The study brought out highly encouraging results including better acceptance by patients. The Journal of Pain and Symptom Management, USA published an article about this study in 1997. Similarly, *Visvamritam* was tried for anorexia, *Sata-dhoutagritam* for oral mucositis. For various reasons the study could not yield statistically significant data but we were able to prove that it is well worth considering ayurvedic medicaments in the treatment profile of cancer.

Conclusion

Supportive care has an important role in the success of cancer therapy and supportive care is a major determinant of quality of life also. Ayurveda believes that a physician is not the final authority to decide the life span of the patient. But he has the responsibility to provide the best possible human care to the patient until he breathes his last - न वैद्यः प्रभुरायुषः (physician is not the lord of life), यावद् कण्ठगता प्राणा तावद् कार्यं भिषग्जितम् (treatment is to be done till the last breath)

The credo for oncology could be to 'cure sometimes, to extend life often and to comfort always'.

As has been rightly expressed by William Castle "the role of a clinical investigator is to ask questions at the bedside and then go as far from the bedside as his curiosity, legs, money and facilities take him. Some may take one step, some may take ten, but the important thing for the clinical investigator is the direction in which he walks and not the number of steps he takes."

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ANTIBACTERIAL ACTIVITY OF *EUGENIA JAMBOLANA*

K. Deepamol, Dhanya Vijayan, R. Manjula, S. Mohan and A.K. Valsa*

Abstract: *Eugenia jambolana* is used in traditional medicine to treat diarrhoea, pharyngitis and ring worm infection. The extracts of leaves and seeds were tested for the antibacterial activity against six clinically important bacteria *Escherichia coli*, *Klebsiella*, *Staphylococcus aureus*, *Bacillus*, *Salmonella typhi* and *S. paratyphi A*. By disc diffusion method, the acetone extract was found to be effective than water and chloroform extracts. The minimum inhibitory concentrations of seeds and leaves of the plant were found to be lower for *S. aureus* than *E. coli*. This study justifies the use of *E. jambolana* to treat infectious diseases.

Introduction

Resistance to antimicrobial agents such as antibiotics is emerging in a wide variety of organisms and multiple drug resistant organisms pose serious threat to the treatment of infectious diseases. Plants are known to possess antibacterial activity; several of them have been used in traditional medicine to treat wound infections (Chopra *et al*, 1956). Plants are the poorly exploited source of antimicrobial agents because the structures and modes of action are not known (Mitscher, 1975; Nychas, 1995). Hence studies for finding out more and more potent antimicrobial agents from plants require prime attention.

Eugenia jambolana is a medium sized tree widely distributed in Kerala. It belongs to the family Myrtaceae and bears simple and opposite leaves, variable in shape. The fruits are dark purple and one seeded. It is widely used in folk medicine to cure diarrhoea, pharyngitis and ring worm infection (Chopra *et al.*, 1956). Though there are several reports on the antimicrobial activity of medicinal plants (Erdelmeier *et al*., 1996; Vijaya and Ananthan, 1996; Elsohly *et al.*, 1997; Peres *et al*., 1997; Valencia *et al*., 2001), no reports are available on the antimicrobial activity of *E. jambolana*. The aim of the study was to demonstrate the antibacterial activity of the extracts of seeds and leaves of *E. jambolana* against clinically important organisms.

Materials and methods

The plant tested for antibacterial activity was available in the local areas. The leaves and seeds were used for the study.

Organisms used: Six clinically important bacteria used for the present study included both Gram

*. *Department of Microbiology, Sree Sankara College, Kalady.*

+ve and Gram -ve organisms. Gram +ve organisms were *Staphylococcus aureus* and *Bacillus*. Gram -ve organisms include *Escherichia coli, Klebsiella, Salmonella typhi* and *S. paratyphi A*. The organisms were collected from the Department of Microbiology, Little Flower Hospital, Angamaly.

Preparation of extracts: For the preparation of water extract, 500 mg of leaves and seeds were homogenised and mixed with 5.0 m1 of sterile distilled water. For the preparation of all other extracts, the seeds and leaves of the plant were cleaned, dried at 55°C and ground to fine powder. 500 mg of the powder was mixed with 2.5 m1 of each of acetone and chloroform. The solutions were allowed to sediment overnight at room temperature. The supernatant was dried and the powder weighed and dissolved in appropriate solvents and used for the study of antibacterial activity.

Methods of testing: The antibacterial activity was studied by the disc diffusion method (NCCLS, 1997a) and turbidimetric method (NCCLS, 1997b). For the disc diffusion method, lawn culture of the organisms was prepared in nutrient agar plates. Filter paper discs (∅ 5 mm) impregnated with solutions (each disc containing 500 mg of plant components) were placed on the air-dried surface of the media inoculated with respective microorganisms. Discs containing the pure solvents were used as control. After overnight inoculation at 37°C, the zones of inhibitions around the discs were measured.

Turbidimetric method was used for the determination of minimum inhibitory concentration (MIC). Test tubes containing 1.9 ml of sterile nutrient broth was inoculated with 0.1 ml of log phase cultures and varying concentrations of acetone extract were added to the tubes. A blank containing sterile nutrient broth was taken as the control. All the tubes were incubated at 37°C and optical density was read at 630 nm after 24 hrs.

Results and discussion

In a preliminary study, 25 plants were screened for antibacterial activity (data not shown). One of the plants, which showed antibacterial activity, was *E. jambolana*. In the disc diffusion method, the aqueous extract of the seeds and leaves were effective against all the organisms except *Bacillus sp*., but the inhibitory zone was lower compared to the acetone extract. Acetone extract of the leaves produced zones of inhibition against *S. aureus*, *E. coli* and *Klebsiella*. The acetone extract of seeds inhibited the growth of *S. aureus* and *E. coli* and showed only a little effect on *Klebsiella* (Table 1). The chloroform extract of the seeds showed activity against *S. aureus* and *Bacillus*. Since the acetone extract of the seeds and leaves were found to be effective against *E. coli* and *S. aureus*, MIC of the acetone extract against these organisms were found out (Table 1).

From these experiments, it is evident that the leaves of *E. jambolana* exerts antibacterial effect on *S. aureus, E. coli, Klebsiella, S. typhi* and *S. paratyphi A*; while extracts from its seeds are effective against *Bacillus sp*. in addition to the above mentioned strains. On calculating MIC, it is found that the acetone extract of leaves is more effective than the seed extract in inhibiting the corresponding bacterial activity. The MIC of leaf and seed extracts was found to be lower for *S. aureus* compared to *E. coli* and *Klebsiella.*

In the recent years emergence of resistance to

TABLE 1
Effect of *Eugenia jambolana* leaves and seeds on different bacteria

Organisms	INHIBITION ZONE DIAMETER (mm)*						Chloram-phenicol	MIC (mg/ml)	
	Water Extract		Acetone Extract		Chloroform Extract				
	L	S	L	S	L	S		L	S
Staphylococcus aureus	9.2	8.4	20.2	12.1	16.0	7.2	22.0	1.60	2.10
Escherichia coli	9.5	8.4	12.5	8.3	10.2	7.9	8.2	2.85	6.35
Bacillus	nil	nil	nil	nil	6.3	nil	nd	nd	nd
Klebsiella	13.1	9.9	10.3	6.5	7.1	6.7	nd	4.70	nd
Salmonella typhi	11.4	9.6	nil	nil	nil	nil	nd	nd	nd
Salmonella paratyphi A	12.3	8.2	nil	nil	nil	nil	nd	nd	nd

* Values, including diameter of the ftlter paper disc (5.0 rnm), are means of three replicates. Each disc contains 500 µg plant components and antibiotic disc contains 300µg chloramphenicol. Minimum inhibitory concentration (MIC) was calculated as mg/ml. **L** leaves; **S** seeds; **nil** no inhibition zone; **nd** not done.

most common antimicrobial agents such as β-lactams, macrolides, vancomycin or quinolones has become a major worldwide health problem (Tonin and Tomasz, 1986). The development of antibiotic resistance makes it imperative to develop new compounds with bactericidal activity. Several plants used in folk medicine are proved to have activity against infectious bacteria (Erdelmeier *et al.*, 1996; Vijaya and Ananthan, 1996; Elsohly *et al.*, 1997; Peres *et al.*, 1997; Valencia *et al.*, 2001).

The ethanolic, acetone and aqueous extracts of many plants are reported to have potent antibacterial activity (Larhsini *et al.*, 2001). The antimicrobial activity of resinous exudates, diterpenoids, flavonoids, phenolic compounds and essential oils of several plants have been reported earlier (Hasan and Ahmad, 1996; Roy and Pandey, 1996; Mendoza *et al.*, 1997; Caccioni, *et al.*, 1998; Abram and Donko, 1999; Ulubelen *et al.*, 1999; Cutter, 2000; Ulubelen *et al.*, 2000). Flavones isolated from several plants are reported to be active against methicillin resistant *S. aureus* (Tsuchiya *et al.*, 1996). Larhsini *et al.* (2001) have reported that the whole plant extract of *Eugenia caryophyllata* has marked antibacterial action against a number of organisms. *E. jambolana* also has activity against a few organisms that cause many infections.

The study justifies the use of *E. jambolana* in folk medicine to treat diarrhoea, pharyngitis, etc. Further studies are required to see whether the extracts are effective against drug resistant bacteria. The analysis of phytochemical compounds present in these extracts also requires further investigation.

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FUNGAL FLORA ASSOCIATED WITH MARKET SAMPLE OF *VACHA*

N. Padmakumar*, Rajeev Kumar Sharma** and R. M Johri*

Abstract: *Vacha* (*Acorus calamus* Linn.) is a very important raw drug that is using in various formulations of ayurveda, unani and siddha systems of medicine. The present study was conducted to determine the fungal contaminants associated with the commercial samples of *vacha*.

Introduction

Plants are used as medicine in different forms since ancient times. Crude drugs derived from higher plants constitute major raw materials used in Indian Pharmaceutical Industry. Besides consumption of a huge quantity of medicinal and aromatic plants, India also earns considerable amount of foreign exchange through the export of crude drugs, aromatic raw materials, plant based food supplements, essential oils, oleoresins, etc. *Vacha* is one among the major crude drug having a very high trade potential and botanically resourced from *Acorus calamus* Linn. *Vacha* is indigenous to India and spread along the trade routes. It has been valued for its rhizome and fragrant oils which finds usage in various medicinal preparations. Current research investigates *vacha* as having insecticidal, antibacterial and anti-fungal characteristics (Chopra, *et al*). The rhizomes are credited with a number of medicinal properties in different systems of medicines viz., ayurveda, unani, homeopathy, siddha and modem medicine. The plant is described in the classical text of ayurveda such as *Ashtangahridaya*, *Charakasamhita*, *Susrutasamhita*, *Bhavaprakasanighantu Rajanighantu*, etc. *Vacha* promotes digestive power and is useful in flatulence and abdominal colic as well. In the present study, samples of *vacha* were collected from different crude drug markets to determine the fungal contaminants associated with the commercial samples of drug. The study was undertaken due to the fact that the fungal constituents associated with the drug may reduce the medicinal properties to considerable extent. As a result of this it may affect the therapeutic activity of the drug formulation, or sometimes it may become poisonous also.

** Department of Botany, MMH (PG) College, Ghaziabad*
*** Pharmacopoeial Lab. for Indian Medicine, Dept. of ISM&H, Ministry of Health & Family Welfare, Govt. of India, Ghaziabad.*

Materials and method

Market samples of *vacha* were collected from Dehradun, Haridwar and Delhi markets. In the market, rhizomes are sold at the variable rates. The commercial samples of the drugs were kept in sterile containers and brought to the laboratory to avoid further contamination. The contamination studies were carried out immediately after the sampling, employing the following steps for fungal contamination.

Sample preparation

1 gram of the aseptically pulverized drug sample was transferred to a sterile 25 ml measuring cylinder. The volume was made up to 25 ml with sterile phosphate buffer (pH 7.2), thereafter the cylinder was covered with a sterilized glass stopper and manually shaken for about 20 minutes, so as to liberate active and inactive mycelia, spores and propagules present in the samples.

Preparation of culture media plates

The prepared sterile culture media of Saboraud's agar was aseptically pipetted (20 ml) into sterile petri dishes. The petri dishes were covered and media were allowed to solidify at room temperature. 1 ml of the prepared suspension of the drug was poured on the surface of the sterile, solidified media and allowed to disperse the suspension uniformly. Five culture media plates were prepared for each drug. Two culture media plates were kept blank without sample and rest of the three for the isolation of the fungi in the drug. All the plates were incubated at 25 to 28°C for 72 to 168 hours. The fungal colonies were identified to the species level wherever possible. The identification of the fungal genera and species was carried out through the help of various specialized references (Gilman 1957; Ellis 1971; Barnett & Hunter 1972). The various fungal contaminants identified in the commercial samples are delineated in the following table.

TABLE
Fungal flora in the commercial samples of *vacha*

Fungal contaminants	*Acorus calamus*			
	a	b	c	d
Aspergillus niger	+	+	+	+
Aspergillus fumiculosus	+	+	-	-
Aspergillus fumigatus	+	-	+	-
Aspergillus flavos	+	+	+	+
Aspergillus versicolor	-	-	+	+
Aspergillus clavatus	+	+	+	+
Aspergillus candidus	+	-	+	+
Aspergillus amstelodami	-	-	-	+
Fusarium oxysporum	-	+	+	-
Fusarium species	+	-	-	+
Mucor fragilis	+	-	+	+
Mucor species	+	-	+	+
Penicillium spinulosurn	-	+	+	+
Rhizopus oryzae	+	+	+	+
Rhizopus species	+	+	-	-
Sterile mycelium, black	+	+	+	+
Sterile mycelium, white	+	+	+	+

Samples drawn from: **a**: Dehradun; **b**: Haridwar; **c**&**d**: Delhi.

Results and discussion

All the commercial samples of *vacha* were found to be infected with fungi. *Aspergillus*, *Fusarium*, *Rhizopus* and *Mucor* species of fungi were found associated with the market samples of the drug. Out of these, the predominant species were *Aspergillus niger*, *Aspergillus clavatus*, *Aspergillus flavos*, *Fusarium oxysporum*, *Mucor fragilis* and *Rhizopus oryzae*. *Aspergillus* was the most dominant genus and seven species of *Aspergillus* were found to have infested with the market sample of the drug. This leads to the conclusion that drug-handling practices

from field to storage did not follow any prescribed measures to prevent biological contamination. Moreover, the lack of knowledge of the drug traders also resulted in the contamination. All these contributed to the possible deterioration of the quality of raw drug.

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OBESITY - METABOLIC DISORDER AND ITS AYURVEDIC APPROACH

Bharti[1], V.K.Shahi[1], Adarsh Kumar[2] and D.K.Mishra[3]

Abstract: It has been observed that obesity and lipid disorders are increasing in the modern effluent society where intake of calorie food is more than the calorie spent in exercises. Hyperlipidaemia leads to atherosclerosis, which causes a major risk for cardiovascular diseases. The great sages of ayurveda could visualize the conversion of *madhura dravya*s to *snehadravya*s during the metabolic changes. According to ayurveda, an obese person is liable to *kshudrasvasa*, *pipasa*, excess of appetite, excess of sleep, excess of sweat with body aches and lack of sexual power. Certain treatment modalities have been mentioned in ayurveda for this problem. *Silajatu*, *gomutra*, *guggulu*, *vacha*, *kushtha*, etc. are being used since ages for obesity. This paper highlights the limitations of modem drugs and the scope of ayurvedic medicines to treat obesity and lipid disorders.

Introduction

Medoroga and *medodosha* vis-a-vis obesity and lipid-disorders have been widely described in ayurveda especially in *Susrutasamhita* (Su. Chapter 15); *ahararasa* is described as the main cause of obesity.

Prameha, *pramehapidika*s, *jvara*, *bhagandara*, *vidradhi*, *vatoroga*s are the common problems of obese patients. Few medicines described in *Susrutasamhita* are - *Silajatu*, *Gomutra*, *Triphala*, *Lauhabhasma*, *Rasona*, Honey, Barley, *Moong*, *Guggulu*, etc.

The term 'obesity' implies an excess of adipose tissue, but here, it is difficult to define the word 'excess'. Normally the need of daily calorie for a person ranges between 31 to 35 K. cal. per kilogram of body weight. Overeating, under activity, genetic factors, metabolic factors and iatrogenic factors are the factors predisposing obesity.

Obesity can be assed by relative weight, which depends upon height and weight ratio, i.e. one parameter. A 20% increase in relative weight constitutes a health risk (National Institute of Health Consensus) Body Mass Index (BMI) is an alternative method of estimating obesity. B.M.I. (Body weight in kg and height in meters) above 85th percentile for young adults constitute a health risk (in male 27.8 and in female 27.3)

1. *Research Officers (Ay.), CRIA, New Delhi,* 2. *Research Officer, CCRAS, New Delhi,* 3.*Director CRIA, New Delhi*

Modern treatment to control obesity

1. Genfibrozi (Lopid): Decreases VLDL and triglycerides; dose 750 mg B.D. Side effects: Epigastric distress, Loose motions, Skin rashes, eosinophilia, body ache, blurred vision, impotence. If given with anticoagulants, bleeding tendency increases.
2. Lovastatin (Lipistat/Lovalip): Decreases total cholesterol and LDL cholesterol. Dose: 10-80 mg./day. Side effects: Flatulence, diarrhoea, constipation, nausea, abdominal pain, cramps, myalgia, headache and dizziness.
3. Amphetamines: Diethyl propion, Fenfluramine. Usually amphetamines are given to cause anorexia and work at the level of hypothalamus. These are effective for short periods. Diethylpropion causes habituation/addiction.

Limitations of modern drugs

It is very important to control obesity since it may predispose to: CHD, hypertension, hyperlipidemia, varicose veins, CVA, Hiatus hernia, gall-stones, osteoarthritis, diabetes mellitus, impotence, skin rashes.

Initial weight loss is not the therapeutic goal. Most obese patients eventually regain their weight. Central Council for Research in Ayurveda and Siddha (CCRAS) has conducted researches upon obesity and lipid disorders (hyperlipidemia) using the following drugs:

- *Ayush - 55* (Formulated by *parada*, *gandhaka*, *lauhabhasma*, *silajatu*, *abhraka*, *triphala*, *chitrakmoola* and *kutaki*).
- *Arogyavardhini* (Formulated by *parada-bhasma*, *gandhakabhasma*, *lauhabhasma*, *abhraka*, *triphala*, *tamrabhasma*, *silajatu*, *suddh guggulu*, *kutaki*, *chitrakamoola*)
- *Guggulu* (*Commiphora mukul*) (*Kaisora-guggulu*, *Yograjaguggulu*, *Navaka guggulu*, ethanolic extract of *guggulu*)
- *Kushtha* - (*Saussurea lappa* C.B. Clarke)
- *Vacha* (*Acorus calamus*)

Kutaki (*Picrorhiza kurroa*)

The rate of cholesterol conversion to the bile acids will influence the level of cholesterol excretion by the liver into the bile and hence the quantity of cholesterol absorbed from the intestines. Thus bile stimulants exert effect on cholesterol levels. Pandey &, Chaturvedi (1966) studied the effect of *Picrorhiza kurroa* on bile. Its alcoholic extract decreases density, specific gravity and viscosity of bile.

Hypolipidemic activity of *Acorus calamus* has been reported (Garteno, 1997). It has been reported (Chamorro, 1993) that cholesterol decreases by 57% and triglycerides by 42% in hyper cholesterolemic rats fed 18 mg/kg of alpha asarone for 7 days.

In the present study, 21 patients of *medoroga* were clinically treated with *Vacha-kutaki ghana satva* (1 gm. in divided doses thrice a day with luke warm water) for a period of three months.

Observations and result

A general symptomatic improvement was observed in the symptoms like polydipsia, polyphagia, weakness, exhaustion, excessive perspiration and dyspnoea on exertion, and extra quantity of carbohydrates and fats were restricted. A reduction in additional body weight was observed in patients of *medoroga* when treated with *Vacha-kutaki ghana satva* for 3 months

Number of patients was 18 and the mean

reduction in additional body weight was 17.46%. Mean serum cholesterol was also reduced in patients of *medoroga* when treated with *Vacha kutaki ghana satva* for 3 months (Table 1); also, a slight fall in mean LDL levels was noticed (Table 2). The summary of the result of treatment in *Vacha kutaki* treated cases is as follows:

- No. of patients 21
- Good response 1
- Fair response 4
- Poor response 8
- No response 5
- Drop outs 3

Here, good response denotes 20% reduction and fair response denotes 10 to 20% reduction in the body weight. Poor response denotes <10% reduction in the body weight and no response denotes no change in body weight. This anti-obesity and hyploipidemic action of *Vacha-kutaki ghana satva* may be attributed to its *lekhaniya* and *srotoshodhak* properties.

Discussions

Hyperlipidemia and obesity (*medodosha* and *medoroga*) are the major problems in the affluent societies and developed countries, where the general population does not pay attention to the balanced diet and physical activities. Apart from the dietary factors, metabolic defects and genetic disorders are also predisposing factors to lipid disorders.

In a normal human being, there is a set balance between food intake and its conversion into carbohydrate and proteins. Any defect in metabolism may lead to excessive production of fat or carbohydrate or protein, which may cause various diseases e.g. production of more glucose that may lead to diabetes, production of more lipids that cause hyperlipidemia. In the present study *Vacha-kutaki ghana satva* was used for obesity and lipid disorders. The results were quite interesting and promising. A reduction in the level of cholesterol and low-density lipoproteins were observed in *medoroga* patients. Also, a marked fall in additional body weight in patients has been noticed.

The liver plays a primary role in the degradation of cholesterol. The rate of cholesterol conversion to bile acids will influence the level of cholesterol excretion by the liver into the bile and hence the quantity of the cholesterol absorbed from the intestines. In other words, liver serves both as a chief source and agent for the disposal of Plasma cholesterol. In our studies *vacha* and *kutaki* have been used in combination, which showed a decrease in the level of serum cholesterol. It is well established in the classical texts that *kutaki* stimulates the flow of bile. The alcoholic extract of *kutaki* decreases density, specific gravity and viscosity of bile.

As we know bile stimulants exert effect on cholesterol levels, the rate of cholesterol conversion to bile acids would influence the level of cholesterol excretion by the liver into

TABLE 1

No. of patients	Serum cholesterol		Change in Serum cholesterol
	before treatment	after treatment	
18	234.61 + 20.29	227.5 + 21.17	6.73

Mean + S.D (n=18)

TABLE 2

No. of patients	Mean LDL		Change (fall) in LDL
	before treatment	after treatment	
18	145.83 + 17.75	141.67 + 17.85	41.17 + 2.87

Mean + S.D

the bile and hence the quantity of the cholesterol absorbed from the intestine. Hence the probable mechanism of *kutaki* to decrease the blood cholesterol level may be due to its stimulatory effect on bile, which, in turn, enhances the degradation of cholesterol. According to ayurveda, *vacha* is a *lekhaniya* drug. *Vacha* has been reported to have hypolipidemic activity (Garteno, 1997). Alpha asarone decreases cholesterol and triglyecride levels in rats (Chamaro, 1993). Probably there has been a synergistic effect of *vacha* and *kutaki* found in the present study.

The probable mechanism of both these drugs may be degradation of excess of adipose tissues from the peripherals of the body into its metabolites. Probably they are acting on the inter-metabolic pathways in conversion of lipids. It is well documented that *kutaki* has hypolipidaemic activity. Through its antioxidant property, it may be acting on other pathways of degradation of fats. *Vacha* may possess synergistic effect to it. However, the exact mechanisms by which these drugs have shown decrease the cholesterol levels and additional body weight requires further research.

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EVALUATION OF THE EFFICACY OF KŪŚMĀṆḌAGHṚTA IN THE MANAGEMENT OF DEPRESSIVE ILLNESS

Rajni Chandre*, K.H.H. V.S.S. Narasimha Murthy* and R.H.Singh**

Abstmct: *Kusmanda* (*Benincasa hispida*), an ayurvedic drug, is found to be very effective in the management of depressive illness due to its *medhya* property. The study was conducted in 25 clinically diagnosed cases with an objective of clinical evaluation of the formulation *Kusmandaghrita* in the management of depressive illness on the basis of various scientific parameters.

Introduction

Man is a social animal living under different kinds of stresses and pressures that cause to mood disturbances, which are further, converted into mood disorders. These mood disorders are two in number, depressive disorder, which is also known as major depressive disorder, and bipolar disorder. Depression is a symptom in some physical and psychological diseases and is itself a major psychological disease or disorder. Depressive illness is a common psychiatric disorder characterized by chronic depression of mood, suicidal tendency, overeating, excessive sleep and so on. Pathologically, there is deficiency of Noradrenergic or Serotonergic fiber activity, deficiency of NA (Noradrenalin) or 5HT (Serotonin) or receptor of NA or 5HT.

Various herbal and herbo-mineral preparations are being tried for evaluating the efficacy in the management of depression. After contemplative consideration of etiopathogenesis, it was decided to evaluate the efficacy of *Kusmandaghrita* in this regard (*Bhavaprakash, Madhyakhanda*, 22/33, 23/18,19).

Preparation

The fruit pulp of *kusmanda* (*Benincasa hispida*, Family - *Cucarbitaceae*) employed in several medicinal formulation recommended in various aliments is used for the preparation of the medicated *ghrita*. It has *laghu* and *snighdha gunas*; *madhura rasa*; *seeta virya*; and *madhura vipaka*. It has *vata - pitta samaka* properties. *Pakvaphala* is *sarvadosahara* and is mentioned as *Medhya rasayana* drug in ayurvedic literature. In general, *ghrita* consists of phospholipids, fatty acids, anti oxidents and a rich source of natural fat soluble vitamins. *Ghrita* is having *samskara anuvartana* property, which means it absorbs the qualities of the drugs with which it is processed. *Kushmandaghrita* is prepared by using the

*Department of Kayachiktsa, Faculty of Ayurveda, IMS, BHU, Varanasi
** Vice-chancellor, Rajasthan Ayurveda University, Prof. & Head (former), IMS, BHU, Varanasi

juice of *kusmanda*, cow's ghee and *yashtimadhu* (as *kalka dravya*). These drugs were selected in view of their classical indication as described in the ayurvedic texts and the preliminary studies conducted in the recent past.

Material and methods

30 cases recruited for the clinical study, were selected from the *Kayachikitsa* OPD and IPD of Sir Sunderlal Hospital, IMS, BHU, Varanasi. Of them, 25 patients turned up for full follow-ups whereas the remaining 5 dropped out. All the patients were advised to take 20 ml of *Kusmandaghrita* with hot water in two divided doses in the morning and evening for 3 weeks.

The following inclusion and exclusion diagnostic criteria were applied for the selection of cases of depressive illness. It was based on DSM - IV diagnostic criteria.

Exclusion criteria

Patients with following symptoms or having the history of following clinical conditions were excluded.

1. Mood incongruent delusions or hallucinations, incoherence or marked loosening of associations.
2. Patients superimposed with schizophrenia, schizophreniform disorders, mania or bipolar disorders.
3. Anxiously disorders, obsessive/ compulsive disorders
4. Chronic drug abuse, e.g. - barbiturates, etc.
5. Toxic drug like alcohol ingestion and withdrawal
6. Organic diseases like diseases of gastrointestinal system (irritable bowel syndromes, colitis), myocardial infarction, CNS disease and systemic disease like rheumatoid arthritis and other connective tissue disorders.

Inclusion criteria

The patients who fulfilled the DSM-IV diagnostic criteria for major and minor depressive disorders were included in this study.

DSM-IV diagnostic criteria:

I. At least two (but less than five) of the following symptoms for minor depressive disorders and five (or more) for major depressive disorders were observed during the same 2 week period and represented a change from the previous functioning; at least one of the symptom was either depressed mood or loss of interest or pleasure. (Symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations are not to be included).

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others. (In children and adolescents can be irritable mood).
2. Markedly diminished interest or pleasure in almost all activities most of the day, nearly every day
3. Significantly weight loss when not dieting or weight gain (e.g. a change of more than 5% of body weight in a month), or decreased or increased appetite nearly every day
4. Insomnia or hypersomnia nearly every day
5. Psychomotor agitation or retardation nearly every day
6. Fatigue or loss of energy nearly every day
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self reproach or guilt about being sick)
8. Diminishing ability to think or concentrate, or indecisiveness, nearly every day

9. Recurrent thought of death (not just fear of dying) and suicidal ideation without a specific plan for committing suicide.

II. The symptoms that do not meet criteria for a mixed episode.

III. The symptoms that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

IV. The symptoms are not due to the direct physiological effects of a substance (e.g. a drug abuse, a medication) or a general medical condition (e.g. hypothyroidism).

V. The symptoms are not better accounted for by bereavement, i.e. after the loss of loved one the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms or psychomotor retardation.

VI. There has never been a manic episode, a mixed episode, or a hypomanic episode and criteria are not met for cyclothymic disorder.

VII. The mood disturbance does not occur exclusively during schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder or psychotic disorder not otherwise specified.

VIII. For minor depressive disorder, there has never been a major depressive episode.

Psychometric evaluation: The following methods were used for psychometric evaluation:

- Hamilton Depression Rating Scale (HDRS)
- Hamilton Anxiety Rating Scale (HARS)
- Immediate Memory Span Direct and Indirect (IMSD and IMSID)

Observation and results

The effect of the trial treatment on the symptoms in 25 patients was encouraging (Table 1). The result shown in the table reveals that the effect of trial drug was statistically highly significant in the cases of Hamilton Depression Rating Scale. Statistically highly significant results were observed on Hamilton Anxiety Rating Scale. Also statistically highly significant results observed on Immediate Memory Span Direct; and on Immediate Memory Indirect test statistically highly significant results were observed.

TABLE 1

Effect of trial treatment on symptoms in 25 patients

Symptoms	Mean + SD					't' value
	BT	F_1	F_2	AT	D	
HDRS	14.68 + 2.63	12.20 + 2.35	10.08 + 2.38	8.40 + 2.36	6.28 + 2.26	t = 13.87 p <0.001 HS
HARS	12.44 + 3.18	10.20 + 3.43	8.56 + 2.90	7.64 + 2.96	4.8 + 1.71	t = 14.05 p <0.001 HS
IMSD	4.40 + 0.76	-	-	5.36 + 0.76	-0.96 + .455	t = 10.56 p <0.001 HS
IMSID	3.16 + 0.37	-	-	3.56 + 0.58	-0.40 + 0.50	t = 4.00 p <0.01 HS

From the above it can be concluded that *kusmanda* possesses anti depressant effect and that the trial drug *kusmandaghrita* is very effective for the treatment of mild to moderate depressive illness.

Discussion

Kusmanda is mentioned as a *medhya* drug in ayurvedic classics. *Medhya* drugs have been described in the texts for specially promoting the *medha* i.e. the memory, willpower and intelligence. Due to the *medhya* property, *kusmanda,* was taken up for trial for its possible anti depressant effect and the results have been presented with necessary statistical analysis.

Conclusion

The present clinical study indicates that *kusmanda* has mild to moderate antidepressant effect because of its *medhya prabhava*. And it throws a glooming light in the management of depressive disorder and that deserves further study.

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A THERAPEUTIC TRIAL OF JŌṢIṆA AND *ITRIPHAL USTKHUDDUS* IN THE TREATMENT OF CHRONIC MAXILLARY SINUSITIS

M. Aslam* and M. H. Siddiqui**

Abstract: This paper evaluates the medicinal properties of *joshina* and *Itriphal ustkhuddus* in the management of chronic maxillary sinusitis. Sixty patients selected and diagnosed on the basis of subjective symptoms, objective signs and routine investigation were treated by Indian system of Medicine. The result of therapy was analyzed on the basis of symptomatic relief and findings on radiological examination.

Materials and method

This study was carried out on patients who attended the outpatient department of Moalijat A.K. Tibbiya College, A.M.U. Aligarh from January to July 1997. Sixty adult patients (40 males and 20 females) diagnosed with chronic maxillary sinusitis in the age group ranging from 20 to 30 years were included in this study. The patients had complained of headache, frequent nasal obstruction and nasal discharge (Table 1 & 2). The cases of allergic rhinosinusitis, atrophic rhinitis, acute exanthems of chronic maxillary sinusitis, allergic rhinitis with bronchial asthma, diabetes, hypertension, peptic ulceration and pregnancy were excluded from the study. All the cases were subjected to routine blood examination, urine analysis, conventional X-ray paranasal sinuses (waters view), nasal swab culture and sensitivity test.

All these cases were treated by herbal drug preparations used in Indian system of medicine. The drugs used were - i. Joshina, (Hamdard), which is a recipe containing several ingredients used as coctive for phlegm (Table No. 4), ii. Maghz Fuloos Khiyar Shamber (Pulp of *Cassia fistula*) used as expectorant as it helps in the removal of secretion from respiratory tract and iii. sharbat ustkhuddus (Dwakhana Tibbiya College, Aligarh) used as nervine tonic (Table No. 5).

Radiological examination

The conventional radiological examination of the paranasal sinuses occipitomental view revealed mucosal thickening, total opacification and fluid levels in 58, 33 & 8 percent cases respectively (Table 3). The aerobic culture of the nose showed growth of pathogenic organism in 40% and non-pathogenic organism in remaining 60% cases. The pathogenic organism was pseudomon as *aerogonosa* 50%,

**Redaer, Department of E.N.T., J.N. Medical College, A.M.U., Aligarh.*
*** Reader, Department of Moalijat, A.K. Tibbiya College, A.M.U. Aligarh*

TABLE 1
Symptoms in chronic maxillary sinusitis

S. No.	Complaints	No. of patients	%
1	Headache	60	100
2	Nasal obstruction	50	84
3	Nasal Discharge	60	100
4	Anosmia	45	75

TABLE 2
Signs in chronic maxillary sinusitis

Sl. No.	Complaints	No. of patients	%
1	Congested mucosa	60	100
2	Mucoid discharge	10	17
3	Pus in inferior meatus	50	84
4	Pus in middle meatus	40	67
5	Hypertrophied inferior turbinate without deviated septum	20	33

TABLE 3
Radiological examination X ray PNS (Water view)

Sl. No.	Radiological findings	No. of patients	%
1	Mucosal thickening	35	58.3
2	Total capacity	20	33.3
3	Fluid	5	8.4

Staphylococcus anus, *Staphylococcus aureus* 13%, *Klebsella* 18%.

Dose and mode of administration

12g Joshina (ITSF) dissolved in 120ml warm water and administered orally for 3 - 4 days as coctive of phlegm. Then water extract of Maghaz Fuloos Khayar Shamber 6g was added in the above recipe for another 5 - 7 days. After 14 days, Joshina withdrawn and Sharbat ustkhuddus in the dose of 1 - 2 table spoon full was given in the morning and evening for another 15 - 30 days.

Result

All the cases of chronic maxillary sinusitis were analysed on the basis of symptoms and signs. It is found that headache, nasal discharges and nasal obstruction were predominant symptoms in all cases; whereas anterior and posterior rhinoscopy revealed congested mucosa and pus in the inferior and middle meatus.

In 45 cases subjective symptoms of headache, nasal obstruction and nasal discharge disappeared after 22nd day whereas in ten cases the treatment continued for about 28 days. However, the symptom did not subside in the remaining five cases even after one month of the therapy (Table 6).

TABLE 4
Composition of Joshina

Sl. No	Ingredient	Botanical name	Quantity
1.	Khatmi seed	*Althia officinalis* Linn	6g
2.	Aslasoos (rhizome) (root)	*Glycyrrhiza glabra* Linn.	6g
3.	Khubbazi (seed)	*Malva rotundifolia* Linn.	6g
4.	Gaozaban (flower/leave)	*Onosma bracteatum* Wall.	6g
5.	Banafshan (flower)	*Viola odorata* Linn.	3g
6.	Unnab (fruit)	*Ziziphus vulgaris* Lam.	5 No
7.	Sapistan (fruit)	*Cordia latifolia* Roxb.	9 No

Syrup prepared according to Hamdard Pharmacopoea

TABLE 5
Composition of *sharbat ustkhuddus*

Sl. No	Ingredient	Botanical name	Quantity
1	Asalasoos	*Glycyrrhiza glabra*	60 g
2	Parsiva - O - Shan	*Adiantum capillus*	60 g
3	Ustkhuddus	*Lavandula stoeches*	60 g
4	Uood Saleeb	*Poenia emodi*	60 g
5	Gaozaban	*Onosma bracteatum*	60 g
6	Badyan	*Foeniculum vulgare*	60 g
7	Karafs	*Apium graveolens*	60 g
8	Khatmi	*Althia officinalis*	60 g
9	Banafshan	*Viola odorata*	84 g
10	Gul- I - Surkh	*Rosa vinifera*	84 g
11	Maweez Munaqqa	*Vitis vinifera*	240 g
12	Sapistan	*Cordia latifolia*	50 nos
13	Qand Safaid	Sugar	2.5 kg
14	Honey		

Syrup prepared according to Biaz-e-Kabir (Unani pharmacopoea)

TABLE 6

Result of treatment

S.No.	No. of cases	No. of days drugs used	Status of symptoms	X - ray	%
1.	45	22	Disappeared	Reduction in and mucosa of sinusis	75
2.	10	28	Disappeared	17%	8
3.	5	30	Persist	No change	8

Etiopathology of chronic maxillary sinusitis

Phlegmatic exudate accumulates in the nasal sinuses and these phlegmatic exudate is the discharge, from the mucus membrane of nasal mucosa and sinuses, and caused by extreme cold, allergy and subject having cold and moist temperament. Some times indigestion also causes formation of phlegm.

Discussion

The patients included in this study were those who have failed conventional treatment of chronic maxillary sinusitis. The drugs included in this series were antibiotics/antihistaminics, local and systemic decongestants and analgesis. All the cases included in this study were radiologically proved cases of chronic maxillary sinusitis in which the mucosal thickness of maxillary sinus was more than 6 mm. Absolute eosinophil count was done in all cases to rule out allergy.

Byuggren *et al* and Good favours repeated the antral washout for the diagnosis as well as treatment of irreversible type of chronic maxillary sinusitis. Caldwell described surgical

TABLE 7
Chemico - Pharmacological properties of some ingredients

Khatmi	Mucilaginous
Sapistan	Antibacterial, Antiviral, Antitussive, Mucilaginous
Aslasoos	Antibacteral, Antiallerigic, Anti-pyretic, Antitussive, Anti inflammatory
Khubbazi	Antibacteral, Antifungal, Anti viral, Anti inflammatory, Mucillaginous, Rich vit. C.
Gaozaban	Anti inflammatory, Respiratory stimulant
Banafshan	Anti-tussive
Unnab	Antibacteral, Antifungal, Anti-tussive, Rich vit. C.

method of antral puncture in order to treat and cure chronic maxillary sinusitis. The present study evaluated the result of Joshina and Sharbat *ustkhuddus* for a period of one month. The result of the therapy was encouraging; it was a clinical evidence justifying the medicinal use Joshina and Sharbat ustkhuddus. The chemico-pharmacological properties of some ingredient of Joshina and Sharbat ustkhuddus (Table 7) embody the conventional allopathic approaches to the rational treatment of common cold, catarrh, cough and associated distress and fevers.

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THALASSEMIA SYNDROME - AN AYURVEDIC APPROACH

Onkar J. Kulkarni*

Abstract: In today's pediatric practice, the rate of genetic diseases are found to be high; among these diseases, Hemoglobinopathies are reported to be 240,000 per year and out of which Thalassemia syndrome constitutes almost 21%. Now a days, parents of such patients are approaching ayurvedic pediatricians; so, an alternative way of treatment has to be searched, based on the ayurvedic principles, with the help of which the disease can be very well understood and alleviated.

Introduction

The word genetic refers to that caused by single gene, multiple genes or chromosomes. Hereditary and genetic are often used very synonymously. Although terms like congenital, hereditary, genetic and familial may appear to be similar, there are subtle distinct and differences. Congenital refers to the disorder being present at birth, whether it is genetic or non-genetic. Familial means occurring in families only, but it is not necessarily to be genetic; hereditary is that which is inherited from one of the parents.

Incidences

Of all these, Thalassemia syndromes, one of the hereditary diseases are discussed here. In the whole world overall hemoglobinopathies are reported to be 240,000 per year out of which Thalassemia syndrome constitutes at most 21% which is characterized by autosomal recessive inheration with production of abnormal hemoglobin and mild to severe degree of anemia; not only this, there are reports that Thalassemia is occurring in a considerable proportion nearly all over the country.

Ayurvedic approach

Although the symptom found in this disease are not described under any particular diseases in ayurveda, there is a great need to look into this ailment with an ayurvedic view and some efforts should be made to find an alternative way of treatment in this creeping disease. For this we have to concentrate on few basic principles of ayurveda and other scattered references so that we can draw up a concept to fulfill our objective to understand the disease in ayurvedic perspective.

Modern view

Etiopathogenesis

In this case, the basic defect is hereditary inability to produce beta chains (normal adult

*Department of Kaumarabhritya, IPGT & RA, Govt. Ayu. University, Jamnagar.

hemoglobin, Hb-A), which results in erythrocytes that are thin and have very short life span; the result is hemolytic anemia with characteristic changes in blood and various organs. As a compensating mechanism, increased production of fatal hemoglobin (Hb-F) occurs. In the peripheral blood, a large number of normoblasts, target cells and microcytic hypochronic erythrocytes are present. Reticulocyte count is increased. Bone marrow hyperplasia causes bony changes.

Severe form (thalassemia major) is associated with homozygous state. Thalassemia minor is mild and is associated with heterozygous state while thalassemia trait is asymptomatic.

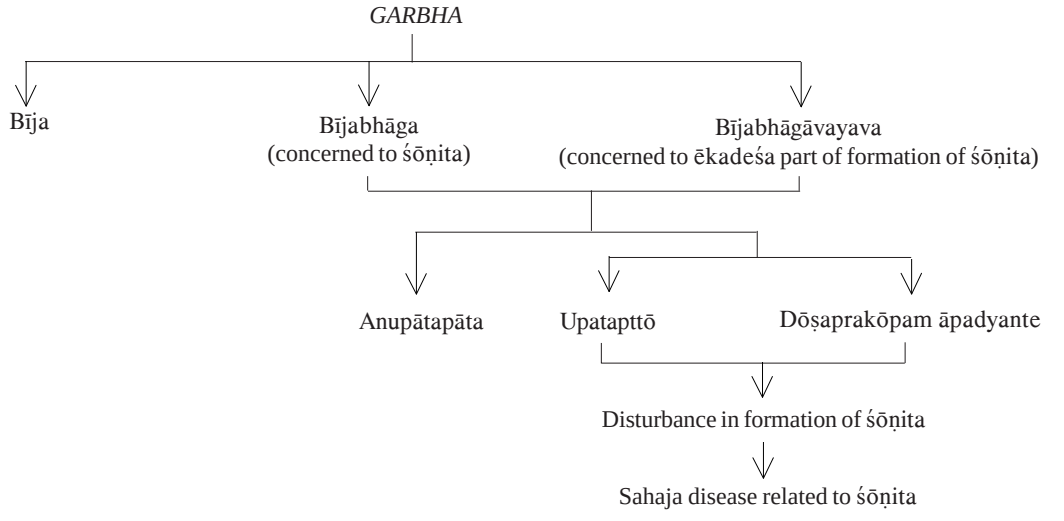
Ayurvedic view

In ayurveda, direct reference of this disease or any disease that is found in hereditary form, are not detailed but there are few general principles from which such disease could be very well understood. The disease under discussion is also not an exception to this fact.

बीजात्मकर्माशयकालदोषैर्मातुस्तथाऽऽहारविहारदोषैः ।
कुर्वन्ति दोषा विधिनानि दुष्टाः
संस्थानवर्णेन्द्रियवैकृतानि ।। – (च. शा. २/२९)

Garbha is formed by the union of *bija*s (*sukra* and *sonita*) and every *bhava* is produced by the *bijabhaga* of that particular *bhava* along with the *bijabhagavayava*, which is very specific and responsible for every character of that particular *bhava*. If the whole process is unaffected then it will lead to normal foetus and any abnormality will manifest as disease. In this particular disease it can be thought that *bija* (concerned to *sonita*) and *bijabhaga-vayava* (concerned to specific character of formation of *sonita*) are either *upataptta* (vitiated due to various factors like *karma*, *dushti* in *mata* or *pita*, etc.) or *doshapradushit* (vitiated due to *dosha*s). It will lead to abnormal production of *sonita* or vitiated (abnormal) *sonita* is produced which will cause the diseases of *sonita*. (Chart 1)

Chart 1



Manifestations

There are three forms of manifestations: Firstly, though the parents are affected by this particular disease, the *bija*, in the *garbha*, which is responsible for the production of *sonita*, is unaffected so the disease will not be manifested in the child. Acharya Chakrapani has explained this giving an example of *kustha*, but it can be understood for every disease (Chart 2). Secondly, due to excessive vitiation present in parents, *bija* of that particular *bhava* (*sonita* in this context) is also vitiated, which will lead to the production of *dushta adhar* (vitiated *bhava*) in the child and due to this vitiated *adhar* child may manifest with that disease or the disease may remain silent (Chart 3). Thirdly, if both the parents are having the disease (*vikritata*) and if the *vikriti* is added by *hetubala*, the *bija* is also vitiated by the same *vikriti* and the child produced will also manifest the disease (Chart 4).

Chart 2

Yadā pitā/mātā vikṛt bhavati - bījaṁ ca āduṣṭam
↓
Anupataptta ādhār (śōṇit)
↓
Anupatapttyāni ādhārādi, bīja sadruṣatah
↓
Asymptomatic/Silent/Normal child

(Chakrapani, Cha. Sa. 3)

Chart 3

Yadā āti vṛdha vikṛtitayah
↓
Pitā/mātā bījamapi duṣtā bhavati
↓
Tadā, ādhārasya duṣta bījat
↓
Vikriti duṣta ādhārah jāyate
↓
Duṣta ādhār
↓
Manifest as a disease | May remain silent

(Chakrapani, Cha. Sa. 3)

Pathogenesis

It has been already discussed that *vikriti* in the *bijabhaga* and *bijabhagavayaya* concerned to *sonita* leads to *vikriti* of *sonita*. Now, this abnormal *sonita* cannot perform the functions of *sonitadhatu* and the body in this abnormal form does not require it too. So, disintegration and elimination of such abnormal *sonita* takes place, which lead to generalized *dhatukshaya* that causes *anala mandyata* (both *jatharagni* as well as *dhatvagni*s); again this will lead to *dhatukshaya*. This condition will lead to excessive vitiation of *vata*, which will again aggravate the *dhatukshaya* and produce various complications (Chart 5).

Clinical features

The clinical features are delineated in Chart 6.

Prognosis

The factors regarding the diseases like *bijabhaga* and *bijabhagavayava* involvement, involvement of *raktadhatu* that is responsible for maintenance of life (*jivanam*). Other features

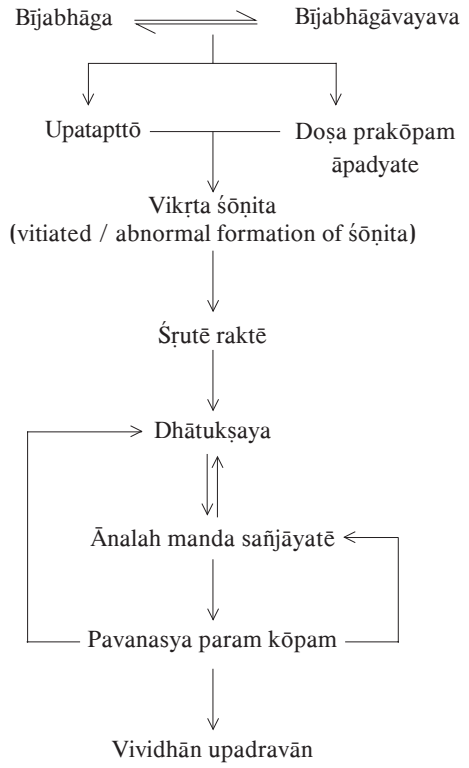
Chart 4

Vikṛt pitā — Vikṛt mātā
↑
Hētu balāt

Vikṛta bīja
↓
Vikṛta apatya bhavati
↓
Child manifest the disease

(Cha. Sa. 3)

Chart 5



(Cha. Sa. 3)

of *samprapti* like *dhatukshaya*, *jatharagni* and *dhatvagni mandya*, *vataprakopa* and various complications, adding to this the age group, which is affected, has few characteristics like *sukumaram, akleshasaham, asamparipurnata*, etc. So, considering all these facts, it can be concluded that this disease is either *kashta-sadhya* or even *yapya*.

Line of treatment

The following were the line of treatment suggested (Chart 7)

Preventive

1. Consanguineous marriage: Ayurveda upholds the disadvantages of such traditions and recommends *atulyagotriya vivaha*. Genetics too supports this view.
2. Marriage between affected male and female should be prohibited.
3. Curative T/t: For such disease, *sodhana* and various *panchakarma* along with different curative treatment should be followed before conception.

Curative

1. *Agni sandhukshanartham*:

Jatharagni and *dhatvagni*, specifically *raktadhatvagni mandya* is a characteristic feature of the pathogenesis. So, for that purpose 1st step of the treatment should be *Agnisandhukshana*. Various *deepana pachana* drugs can be used for *jatharagni* and specific drug should be used for *raktadhatvagni*. These drugs should have properties of *raktadhata-gamitva;* for this purpose, drugs recommended in *raktagata vishamajvara chikitsa* or *raktagata kushtha chikitsa* should be used.

2. *Sonita yapyayanartham*:

Production of abnormal *sonitadhatu* is the result of the *samprapti* of this disease; and *rakta* is the most important for life. So, normal (*prakrit*) *raktadhatu* has to be nourished. For this purpose classic texts suggest *adushta* and *asamskrit sonita* of different animals; this therapy can be considered by administering *vasti*s of *rakta*. The texts also describe the dietary regime in this regard, which has every importance in today's practical life (Chart 8).

Chart 8

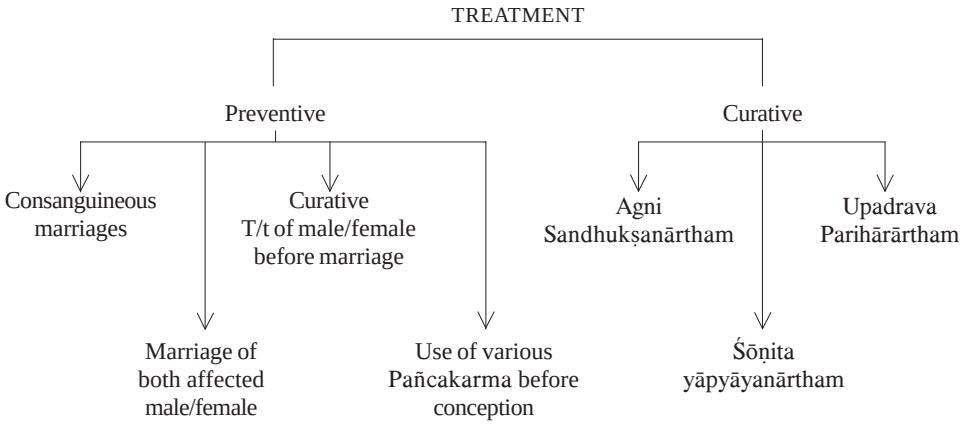
Generalised : तं नातिशीतैर्लघुभि: स्निग्धै: शोणितवर्धनै: ।
ईषदम्लैरनम्लैर्वा भोजनै: समुपाचरेत् ।।
सु. सू. १४/३८

Specific : Kṣīrabhōjanam - Pittaprakṛti
Yūṣabhōjanam - Kaphaprakṛti
Māmsarasa - Vātaprakṛti

Chart 6
Clinical features

Dhātu	Main function that disturb	Comparison with symptoms of Thalassemia syndrome
Rakta	Jīvanam = death	Aprasanna varṇa = Pallor; jaundice; characteristic facia; appearance
		Avyahat paktru = Anorexia
		Asukhanvitam = Lethargic, dull
		Atṛpti, Āpuṣti = Growth failure
		Tvak paruṣya = Dry skin, inceased skin, pigmentation

Chart 7
Line of treatment



3. *Upadrava parihararthams*:
*Upadrava*s could be a part of abnormal *rakta*. *Upadrava*s due to excessive vitiation of *vata* and *upadhatu*s as a result of generalized *dhatukshaya* should be managed accordingly; various *vasti*s and *sneha*s, different kinds of *rasayana*, *brimhana* and *vayasthapana* drugs and in combinations also should be used.

Conclusions

*Sahajavyadhi*s are neither described separately nor in detail by the classics. Such diseases can be understood with the help of few scattered references regarding *bija*, *bijabhava* and *bijabhagavayava*. *Vikritasonita*, *dhatukshaya*, *agnimandya*, *vayuprakopa* and *upadrava*s are the features of *samprapti* of this disease. Curative aspects of this disease includes, *agni sandhukshana*, *raktayapyayana* and *upadrava pariharam*. Last but not least, if we cannot add years to life, at least we can add life to years.

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IDENTIFICATION OF FUNGI ASSOCIATED WITH STORED CRUDE PLANT DRUGS AT GULBARGA MARKET

G M Vidyasagar, D.Surekha and Kavitha sagar*

Abstract: Sixteen fungi belonging to 7 genera were isolated from 31 stored crude plant drugs. Of which, 14 fungi were isolated from root samples, 9 from seed samples and 3 from a tuber. Among the fungi isolated, *Aspergillus niger* and *A. flavus* were found commonly on all the drug samples studied.

Introduction

From the time immemorial, the human beings have leaned on plants for curative treatment of diseases, due to which the plants have become integral part of traditional medicine across the continent.

Since there is no place in nature without microorganism, the crude plant drugs are commonly associated with microorganisms due to unconventional method of storage. The lack of proper authentication and unscientific storage widely invites contaminant microbes for their accidental multiplication, thereby leading to mycotoxin contamination.

Crude plant drugs being of immense value to mankind are today in turn being severely contaminated and toxicated by several fungi. The plant drugs which are being used as an effective curative for various human diseases are losing their quality to such an extent that their therapeutic potentiality, chemical constituents and pharmacological activities are considerably lost.

Along with the importance of crude plant drugs, man has also realized that immediate attention must be given to the process of identification of contaminant fungi which in turn help to predetermine the causal diseases in man. The present study reveals the pathogenic fungi associated with stored crude plant drugs marketed at Gulbarga.

Materials and methods

Thirty one stored crude plant drugs (18 roots, 12 seeds, 1 tuber) marketed from an ayurvedic shop at Gulbarga were collected separately in cleaned, sterilized polythene bags and isolated

* *Plant pathology and Fungal Biotechnology Laboratory, Dept of P G Studies and Research in Botany, Gulbarga University, Gulbarga, 585 106, INDIA*

the fungi associated with them using three different incubation methods.

1. Blotter method: The crude plant drugs collected from the market were placed on the moist blotter lined in the cleaned, sterilized petriplates. The petriplates were incubated at 30±2ºC for 3 days.

2. Agar plate method: The crude plant drugs collected from the market were placed on the PDA medium poured in sterilized petriplates. Petriplates were incubated at 30±2ºC for 3 days.

3. Spore suspension method: The crude plant drugs collected from the market were washed with double sterilized distilled water and the solution thus obtained was used as spore suspension. One ml of serially diluted spore suspension was spread uniformly over PDA medium in petriplates and incubated the petriplates at 30±2ºC for 3 days.

After 3 days of incubation, the fungi grown in the petriplates were isolated and identified using the literature.

Results and discussion

Sixteen fungi viz. *Aspergillus niger, A. flavus, A. fumigatus, A. clavatus, A. wentii, A. glaucus, Aspergillus sp.* I, *Aspergillus sp.* II, *Rhizopus nigricans, C. indicum, Fusarium sp., T. viride, Rhizopus sp., Penicillium sp.* I, *Penicillium sp.* II and *Rhizoctinia sp.* were isolated from 31 crude plant drugs (Table 1).

Fourteen fungi namely *A. niger, A. flavus, A. wentii, A. clavatus, A. fumigatus, A. glaucus, Aspergillus sp.* I, *Rhizopus sp., Fusarium sp., T.viride, Penicillium sp.* I, *C. indicum, Aspergillus sp.* II, and *Rhizopus nigricans* were isolated from root samples, while 9 fungi namely *A. niger, A. flavus, A. clavatus, A. fumigatus, Aspergillus sp.* II, *R.nigricans, Rhizoctinia sp. Penicillium sp.* II and *Fusarium sp.* were isolated from seed samples. From a tuber, *A. niger, A. flavus* and *A. fumigatus* were isolated. Similar studies were conducted by Roy and Kumari (1994) on seed samples of 19 medicinal plants obtained from various centres of Bhagalpur and recorded 41 fungi. Similarly, Agarwal and Singh (1974) and Kadian and Suryanarayana (1971), isolated fungi associated with sunflower and linseed respectively.

Maximum of seven fungi were isolated from *Berginia ligulata* among the plant drug samples. This was followed by six fungi from *Cedrus deodara, Glycyrrhiza glabra, Strychnos potatorum, Hygrophila auriculata, Pistasia vera* and *Plantago ovata*. Similarly four fungi from *Acorus calamus, Anacyclus pyrethrum, Berberis tinctoria, Colchicum luteum, Zingiber officinale, Costus speciosus, Rhyncosia minima, Cyperus rotandus, Ocimum sanctum, Strychnos nux-vomica, Piper nigrum* and *Maytenus senegalensis*, three fungi from *Clerodendrum serratum, Ipomoea mauritiana, Chlorophytum arundinaceum, Rubia cordifolia, Trachyspermum roxburghianum, Trigonella foenum-graceum, Semicarpus anacardium* and *Mucuna pruriens* and two fungi from *Withania somnifera* and *Picrorhiza kurooa*. This preferential association of fungi under similar storage conditions might be due to the differences in chemical make up of the material stored (Helberg and Kolk, 1972).

All in all, the result reveals that, species of *Aspergillus* in general and *A. niger* and *A.*

TABLE 1

Name of the fungi isolated from crude plant drugs using three incubation methods

Sl. No.	Name of the plant used	FUNGAL PATHOGENS ISOLATED			Total No. of fungi
		Moist blotter method	Aagar plate method	Spore suspension method	
1.	*Acorus calamus L*	Nil	*A. niger* *A. flavus* *R. nigricans* *A. clavatus*	*A. niger* *A. flavus* *R. nigricans* *A. clavatus*	4
2.	*Anacyclus pyrethrum DC*	*A.niger* *Fusarium sp.*	*A. niger* *R. nigricans*	*A. niger* *Aspergillus flavus* *R. nigricans*	4
3.	*Berberis tinctoria. Lesch*	Nil	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *Rhizopus sp.* *Aspergillus sp.II*	4
4.	*Berginia ligulata*	*A.niger*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. clavatus* *A. fumigatus* *Aspergillus sp.II* *A. wentii*	7
5.	*Boerhaavia diffusa.L.*	Nil	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *Aspergillus sp.II* *C. indicum*	5
6.	*Cedrus deodara*	Nil	*R. nigricans*	*A. niger* *A. flavus* *Fusarium sp.* *Aspergillus sp.II* *Aspergillus wentii*	6
7.	*Clerodendrum serratum*	*A.niger* *A.flavus*	*A. niger* *A. flavus* *R. nigricans*	*R. nigricans* *A. niger*	3
8.	*Colchicum luteum*	Nil	*A. niger* *A. flavous* *R. nigricans*	*A. niger* *A. flavus* *Aspergillus sps.II*	4
9.	*Cycus circinalis*	*A.niger*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *Aspergillus sps.II* *Trichoderma viride*	5

-/-

Table 1 continued....

Sl. No.	Name of the plant used	FUNGAL PATHOGENS ISOLATED			Total No. of fungi
		Moist blotter method	Aagar plate method	Spore suspension method	
10.	*Glycyrrhiza glabra*	*A. niger* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *Penicillium sp.I* *A. fumigatus* *A. wentii*	6
11.	*Ipomea mauritiana*	*A. niger* *A. flavus* *A. clavatus*	*A. niger* *A. flavus*	*A. niger* *A. flavus*	3
12.	*Zingiber officinale*	Nil	*A. niger* *A. flavus*	*A. niger* *Aspergillus sp.II* *T. viride*	4
13.	*Costus speciosus*	Nil	*A. niger* *A. flavus* *R. nigricans* *Fusarium sp.*	*A. niger* *A. flavus* *R. nigricans*	4
14.	*Withania somnifera*	*A. niger* *A. flavus*	*A. niger*	*A. niger* *A. flavus*	2
15.	*Rhyncosia minimia*	*A. niger*	*R. nigricans*	*A. niger* *Aspergillus sps.I* *A. glaucus*	4
16.	*Picrorhiza kurooa*	*A. niger*	*A. niger* *A. flavus*	*A. niger* *A. flavus*	2
17.	*Chlorophytum arundinaceum*	*A.flavus*	*R.nigricans*	*Aspergillus sp.II*	3
18.	*Rubia cordifolia*	Nil	*A. niger* *Rhizopus nigricans*	*Aspergillus sp.II*	3
19.	*Ocimum sanctum*	Nil	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans* *A. fumigatus*	4
20.	*Trachyspermum roxburghianum*	*A. niger* *A. flavus*	*A.niger* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans*	3
21.	*Trigonella foenum-graceum*	*A. niger* *A. fumigatus*	*A. niger* *A. flavus* *A. fumigatus* *R. nigricans*	*R. nigricans*	3

-/-

Table 1 continued....

Sl. No.	Name of the plant used	FUNGAL PATHOGENS ISOLATED			Total No. of fungi
		Moist blotter method	Aagar plate method	Spore suspension method	
22	*Cyperus rotundus*	Unidentified	*A. Niger* *A. flavus* *A. fumigatus*	*A. niger* *A. flavus*	4
23.	*Strychnos potatorum*	*A. niger* *A. flavus* *A. fumigatus* *R. nigricans* *Rhizoctonia*	*A. niger* *A. flavus* *A. fumigatus* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans* *Pencillium sp.II*	6
24.	*Strychnos nux-vomica*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *Penicillium sp.II*	4
25.	*Hygrophila auriculata*	Nil	*A. niger* *A. flavus* *Aspergillus sp.II* *A. fumigatus*	*A. niger* *A.clavatus* *Aspergillus sp.II* *Fusarium sp.*	6
26.	*Semicarpus anacardium*	*A. niger*	*A. niger* *A. flevus* *R. nigricans*	*A. niger* *A. flavus*	3
27.	*Pistasia vera*	*A. niger* *A. fumigatus*	*A. niger* *A. flavus* *Aspergillus sp.II*	*A. niger* *A. flavus* *R. nigricans* *Aspergillus sp.II* *A. fumigatus*	5
28.	*Plantago ovata*	*A. niger* *A. clavatus* *Aspergillus sp.II*	*A. niger* *A. flavus* *Aspergillus sp.II*	*A. niger* *A. flavus*	5
29.	*Piper nigrum*	Nil	*A. niger* *A. flavus* *A. fumigatus* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans*	4
30.	*Maytenus senegalensis*	*A. niger* *A. flavus* *Aspergillus sp.II* *R. nigricans*	*A. flavus*	*A. niger* *A. flavus*	4
31	*Mucuna pruriens*	*A. flavus* *A. niger*	*A. niger* *A. flavus* *R. nigricans*	*A. niger* *A. flavus* *R. nigricans*	3

flavus in particular were predominant, among all fungi isolated from plant crude drugs. Similar results were reported by Chaurasia (1995) and Kumari (1994).

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A STUDY OF MODIFIED JAḶŪKAVACARAṆA

V.A. Prabhakaran*

Abstract: *Jalukavacharana* is a well-known technique for letting out the vitiated blood from the affected portion in various diseased conditions described in ayurveda. Now, in modem science, this technique is found introducing in the field of micro-surgery. This study is an attempt to expose a modified method of *rakthamoksha* for letting out the vitiated blood from the body used by *jaluka*s (leeches).

Introduction

In ayurveda, generally, the treatment is divided into two category viz. *sodhana* and *samana*. *Sodhana* is further divided into five. They are *vamana*, *virechana*, *vasti*, *nasya* and *raktamoksha*. *Rakthamoksha* (blood letting) is an important treatment procedure for *raktajaroga*s. *Siravedha*, *sringa*, *alambu* and *jalukavacharana* are the commonly accepted bloodletting methods. Among these, *jalukavacharana* is considered as the safest. It is indicated in many diseases especially in *gulma*, *arsa*, *vidradhi*, *kushtha*, *vatarakta*, *galaroga*, *vrana*, *netraroga*, *visha*, *visarpa*, etc. Apart from these diseases, it is very effective for instant relief of pain, swelling and itching.

According to ayurvedic classic, *jaluka* sucks *dushta rakta* (vitiated blood) only. It is said that after exhausted the impure blood from the affected portion, *jaluka* fall down spontaneously. This concept seems wrong if we look into the life of leeches. The fact is that by using *jaluka* for *ratkamoksha*, we cannot drain the required quantity of blood from the affected portion. So it is recommended to try butterfly intervenous needle to be inserted in the lower part of *jaluka* for getting sufficient quantity of blood from the affected portion (Plate 1). This study was conducted at the Indian Institute of Panchakarma, Cheruthuruthy, Kerala on the patients admitted for the treatment of *amavata* in the year of 1998.

Materials and method

After cleaning the affected portion with Tap water, make a prick by the lancet needle in the diseased portion. Then put the purified *jaluka* in this part for sucking the blood from the site. *Jaluka* becomes big in size due to the sucking

*Research Officer (Ayu.), Clinical Research Unit (Ayu.), Kottakkal

of blood within 20 to 40 minutes. At this time, insert a butterfly I.V. needle very carefully under the lower portion of the *jaluka*. Suddenly bleeding starts from the body of *jaluka* through the I.V. needle; simultaneously it continues the sucking. After collecting sufficient quantity of blood from the site, needle has to be removed from the body of *jaluka*. Then remove the *jaluka* by the method as described in the *sastra*. After that, post *jalaukavacharana* is to be done on the bitten site and treat the *jaluka* as mentioned in the text and keep it for future use.

Selection criteria

Two patients admitted in the Indian Institute of Panchakarma, Cheruthuruthy, Kerala for the treatment of *amavata* were selected for this therapy. It was as per the direction of Central Council for Research in Ayurveda and Siddha, and the selection criteria for the clinical evaluation of the Herbo mineral preparation and *panchakarma* therapy. The cases selected for this study were those who did not respond to the treatment done within the prescribed trial period. Unfortunately, due to some technical reasons, sufficient number of such cases could not bring under this study.

Observation and result

Two patients of *amavata* were treated by this method. In both cases, pain and swelling found considerably reduced. It is also observed that after the application of the method the *jaluka* live for a long time.

Discussion and conclusion

As the study conducted was on fewer samples, it was not possible to arrive on a definite

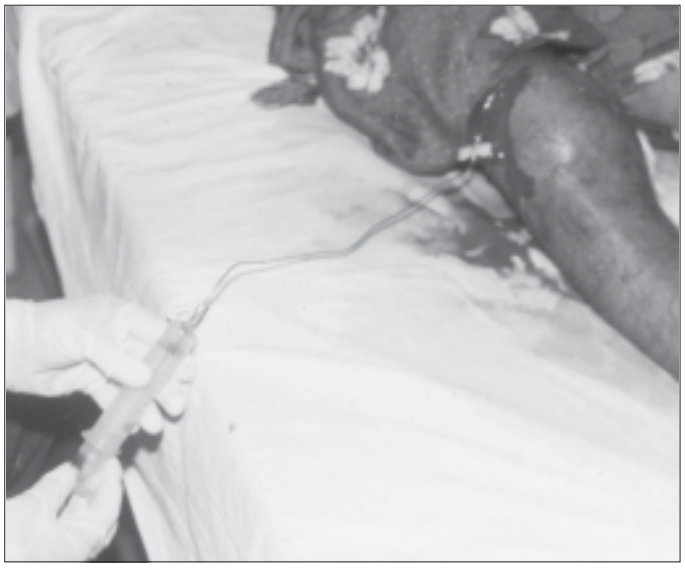

Plate 1

Removing blood through Butterfly IV needle from the *jaluka* and diseased site

conclusion regarding the result and effectiveness of this method. However, we have conducted numerous studies using *jaluka* in the ordinary method as per the textual procedure in the Out Patient level. The results of such studies were encouraging and on this topic a paper presented in the National Seminar at Manjery, Kerala in the year 1998 and won II prize. The aim of the study was to experiment the possibility of using modem gadgets to make the method more appealing and accepting.

The chief advantages of this method are that: 1) required quantity of blood can be removed from the affected part according to the health of the patient and nature of the disease in a single sitting, 2) collection of blood is very easy for laboratory investigation and 3) time and amount of blood can be standardized through this method.

Further, research studies are required in this field to:

- compare the effect and benefit of this method with that of ordinary method described in the texts.
- evaluate the Pathological and Biochemical changes of the blood collected through *jaluka* from the diseased portion and superficial as well as inter veins blood.
- compare and study the life span of *jaluka* used in the old and new method.

Acknowledgement

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ANTI MICROBIAL ACTIVITY OF TRIPHALĀCŪRṆAM

Ashok Kumar, D and M.V.V.Prasad*

Abstract: The Ethnaolic and aqueous extracts of the *Triphala churnam* consisting of *Terminalia chebula, Terminalia bellirica,* and *Emblica officinalis* were tested for antimicrobial activities against common pathogens viz. *Staphylococcus aureus, Klebsiella* sp, *Pseudomonas aeroginosa*, *Scherichia coli* and *Candida albicans*. Significant antimicrobial activity of the 90% ethanolic and aqueous extract was found in this study.

Introduction

Triphala churnam is well known for its various medicinal properties. The fruit of *Terminalia bellirica* is acrid, astringent, digestive, laxative and anthelmintic; it is stomachic, expectorant and anti-dysenteric; it is useful in bronchitis, sore throat, asthma, diseases of the heart, the eyes, the nose, the heart and the bladder; effectual in diarrhoea, bilious dyspepsia, tumours, dyspnoea, constipation, elephantiasis, etc. It cures diseases of the spleen and piles, enriches the blood, and is used in treating paralysis. The fruit of *Emblica officinalis* is diuretic, carminative, stomachic, and is used in diarrhoea, in convalescent stage of typhoid and other fevers and is a tonic to the brain[4&7].

Trihydroxy benzoic acid (Gallic acid) obtained from *Terminalia bellirica* confirms the presence of hepato-protective activity[1]. Fresh juice of *Emblica officinalis* has been found to have effective in hypolipidemic action and can be used as a pharmaceutical tool in hyperlipidemic subjects[5].

Alcoholic extract of the fruit rinds of *Terminalia chebula* showed antimicrobial action against methicillin resistant strains of *Staphylococcus aureus*. The present investigations were undertaken to test the antimicrobial activity of the both 90% ethanolic and aqueous extracts of *Triphala churnam* against some common pathogens.

Materials and methods

Plant Material:

The fruits were collected from the local areas in and around Kanchipuram District, Tamilnadu. The fruits were identified and authenticated by the Botanist, Captain Srinivasamurthy Drug Institute for Ayurveda, Arumbakkam, Chennai.

*Department of Pharmacognosy, Dr. H.L.T. College of Pharmacy, Kengal, Channapatna - 571 502. Karnataka.

The collected fruits were shade dried and reduced to a coarse powder in a mechanical grinder and passed through a 60 mesh sieve.

Preparation of extract:

Equal quantities of the powdered material were extracted with 90% alcohol and water in soxhelet apparatus. The individual extracts were collected and concentrated by evaporation. This extract was tested for antimicrobial activity on various micro-organisms like *Staphylococcus aureus*, *Klebsiella* sp, *Pseudomonas aeroginosa*, *Escherichia coli* and *Candida albicans.*

Determination of zone of inhibition:[2,3&6]

200 mg of the each extract was dissolved in 2 ml of double distilled water individually. Thus the concentration of 100 mg per ml was taken as the test solution. For reference, Standard discs containing a disc count of Ciprofloxacin 1 microgram for bacteria and Clotrimazole 15 microgram for Candida was taken.

Streak Plate method was performed to seed the agar plates. Using the loop, which had been flamed, cooled and dipped in the inoculum, continuous horizontal streaks were made on the solid agar plates. Each organism was streaked in two plates - one for investigating antimicrobial activity of aqueous extract other for alcoholic extract of Bacteria; and Candida were seeded on the plates containing Muller and Hinton Agar medium and Sabourand's Dextrose Agar medium respectively.

The sterile discs were treated with host solution and placed aseptically on the seeded agar plate along with the respective reference standard disc. Separate plates were selected to investigate aqueous and alcoholic extract for a particular microorganism. Then the plates were inverted and incubated at 37° C for 24 hours. The zone of inhibition of each extract for different organism was measured and was compared with a recommended standard drug (Table 1 & 2).

TABLE 1
Zone of inhibition of aqueous extract of *Triphala churnam*

Name of micro-organism	Zone of Inhibition (in mm)		Inference
	Aqueous extract	Standard extract	
Pseudomonas aeroginosa	19	20	Sensitive
Escherichia coli	10	12	Sensitive
Klebsiella sp	11	15	Sensitive
Staphylococcus aureus	9	14	Moderately sensitive
Candida albicans	19	20	Sensitive

TABLE 2
Zone of inhibition of alcoholic extract of *Triphala churnam*

Name of micro-organism	Zone of Inhibition (in mm)		Inference
	Alcoholic extract	Standard extract	
Pseudomonas aeroginosa	18	21	Sensitive
Escherichia coli	9	11	Moderately sensitive
Klebsiella sp	10	15	Moderately sensitive
Staphylococcus aureus	13	14	Sensitive
Candida albicans	18	21	Sensitive

Results and discussion

Results of antimicrobial screening of the 90% ethanolic and aqueous extract of *Triphala churnam* were measured in terms of Zone of inhibition. It is revealed that maximum antifungal activity was shown for *Candida albicans* by both aqueous and alcoholic extract in comparison with standard drug Clotrimazole. Maximum antibacterial activity was shown for *Pseudomonas aeroginosa* by both extracts in comparison with standard drug Ciprofloxacin. While *Staphylococcus aureus* was sensitive to alcoholic extract, *Escherichia coli* was sensitive to aqueous extract and *Klebsiella* was moderately sensitive to both extracts. The antimicrobial activity of aqueous extract was greater than alcoholic extract. This apparent antimicrobial activity of the aqueous extract may be due to the presence of tannin, as tannins are precipitator of proteins.

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MODERNIZATION OF AYURVEDA

Kaushalendra*

Abstract: Modernity and advancement are essential for human civilization. Unfortunately, in our country, the scientists and others have been following westernized modernity. In most ayurvedic research institutions our scientists are affected with the dazzling western systems of research methodology. Many renowned ayurvedic pharmacies are proud of their modern systems of manufacturing. The manpower has replaced by mechanical power. Man-made interferences have ruined the natural phenomena in the living cells and caused crises to the ecosystem also. This paper critically evaluates modernization in the traditional system of medicine.

The historic Second World War ended with the bombarding over Japan, followed by poverty, hunger and epidemics in the world. The terrible war had shaken the humanity allover the world. It was a period of day-to-day scientific invention and discoveries. After a short pause the world re-entered in the era of scientific glitter very speedily.

The contemporary modern medicine and surgery, which were creeping so far, had started toddling with confidence evoked by new inventions in microbiology. Gangrene patients, treated successfully were admired with modern surgery. Before the war, the gangrene was incurable disease. Indeed, it was resurrection of an ancient ayurvedic surgery attributed by the famous 'Indian method of surgery'; Anaesthesia made it easier and advance.

On the scenario of preventive medicine, vaccines have been appeared as boon to mankind so far. Many eradication programmes had been started after this invention. Once, it appeared as if man has conquered the fatal and incurable diseases. But it was a fallacy. Unfortunately, T. B. and small pox have manifested again, even in more panic form. In April 1999, five male and three female children were authentically reported died of small pox in Ambedkar nagar district in UP. Now two hundred vaccines are under development in U.S.A. Out of them, one hundred are under clinical trials. The scientists do appreciate that natural immunity is excellent than the acquired one. Nonetheless, they are paying their attention on new and new vaccines. Then what about the appreciation of excellence of natural immunity? Nowadays, multinational companies are involved in making more and more vaccines and exporting them to the poor and under developing countries.

* *Rashtriya Ayurveda Aushadhalay, Sambalpur, PO, Dist. Kanker (CG), U.P.,*

Reappearance of smallpox and more resistant from of T. B. and incidents of post-vaccinal complications (e.g. P.V.E.) have put a question mark on the pertinence of vaccination. Declining the death rate by vaccination in children is not a victory owing to some new medical hazards produced after using vaccines.

In case of sickling, tile sufferer is prone even to minor infections, which may cause crises. The infants are gifted with various resistance powers congenitally. Some may have excellent resistance requiring no vaccines at all. Some may have immune disorders and some may genetic disorders or so. Customary, all the infants are being given vaccines without medical screening. Vaccines are not nectar to suit all; therefore a meticulous observation is the demand of time before keeping continue the vaccination. Vaccination to all, in fact, is the medical superstition.

In the developed western countries there is a group of scientists making awareness against vaccination. They have the opinion that polio and small pox vaccines are responsible for AIDS. We know that AIDS was introduced firstly in middle Africa. There, it was manifested after vaccination against polio and small pox under eradication programme directed by WHO. Now India has become the second capital of AIDS. Dr. Alen Philips says that the vaccines are hundred times more dangerous that those of the diseases against which these are being used.

We failed to eradicate T. B. and some other vital diseases because we inoculate attenuated or dead microbes in a healthy body to produce artificial immunity. And this is not scientific process. It is very interesting that the drinking water we use is not free of coli-index. Tap-water is considered good if the coli-titre is under 500. In as much as, we are exposed to the bacterial aerosal, already present around us, thus we always remain in free contact with the microbes in different virulence. Such inoculation is natural and inevitable then what any more artificial inoculation for? Thanks to sage Kasyapa who depicted the *lehan samskar* which is the safest form of immunization having no complications at all.

Modernity and advancement are the essential parts of human civilization. Unfortunately, most of us, even well educated too have assumed westernization in course of being modern. One should think seriously about modernity which is not strictly referred to the westernization. Modernity, indeed, is a new concept of present time attributed by some more and advanced knowledge in accordance of the needs of the society in a particular place, climate and culture.

In our country, the scientists and others have been following westernized modernity in the fields of research as well as in living patterns. In most ayurvedic research institutions and in R&D wings of pharmacies our scientists are affected with the dazzle of western systems of research methodology. Therefore, they have been following the same methodology in ayurvedic research. In this course, two major factors have to be considered, viz. basic principles of ayurveda, which have been avoiding, and the second is indiscriminately interference in the Nature's systems.

Many renowned pharmacies are proud of their modern systems of manufacturing the ayurvedic medicines. The manpower has replaced by mechanical power. The time taken in different processes of *aushadhisamskarana* is minimized now by using modern equipment. In this way a *dravya* called *kal* - a very important factor in *paka kriya* is being avoided. The attributes originated by time cannot be produced artificially. All the bio-chemical

phenomena e.g. digestion of food, ripening of fruits and crops, development and growth of foetus, formation of petroleum, coal and fossils, etc. require a certain period of time to be happen. This is paramount factor; hence minimizing the time in bio-chemical phenomena will minimize the qualities of the products.

Thanks to God who has blessed the India with more than sixteen bio-climates responsible for bio-diversity. We have enough floriculture in natural form. Naturally grown herbs are excellent in medicinal properties hence there is no further need to add any more value by changing tile genetic pattern artificially. I am sure that any modification in genetic code is unscientific interference in the Nature's system. Such man-made interferences have ruined the natural phenomena in the living cells and caused crises to the ecosystem.

Recently, some scientists in U.S.A. have changed the genetic code in paddy. The altered gene code is added by human milk-proteins. These all are being done just to get patent brand of rice. Obviously, the intention is commercial benefits and not any positive benefits to the mankind. Genetically engineered and value added biomaterials would never be harmless to the user. The food grains, vegetables and fruits grown by genetically modified patterns of biomaterials are not wholesome to human beings. The prolonged use of such foods may cause to impotency or natural immunity may decline or so. We know that hundreds of species of paddy have been extirpated from C. G. State because of modern technology. A meticulous observation is needed on this to trace and explore the adverse effects of genetically engineered biomaterials. Likewise, allopathic medicines made of herbs have well-known side effects owing to the unscientific mode of preparation. Isolation of active principles from the herb-contents is the cause of side effects. Naturally grown or cultivated herbs from unmodified biomaterials contain some medicinally active principles and some the so-called inactive substances. The entire structure and all the bio components are necessary parts for the survival of plant cells. Therefore, containing substances other than the active principles is also a property of that medicinal plant and should remain entirely in the medicines. One should never be allowed to disturb this nature gifted internal structure of the herbs either by isolation of active principles or by genetic engineering of biomaterials. The substances found in a plant other than the active principles in combination form may act as catalyst or subsistence or may keep control the unwanted effects of active principles after entering in to the gut of living beings.

The aim and appropriateness of the research and research methodology, moral values and religiousness were the virtue of ancient scientists (the so called sages). Unfortunately, the modern scientists are devoid of such attributes. On the other hand globalization has forced the modern world to contribute blindly in trading competitions which have turned the science into a commercialized form. Not only the science but every thing, even emotions too have become commercialized. Now the time has come to set a worldwide discussion on these burning problems to save the life and ecosystem. We can do it by making hedges between reality and modernity and by giving respect to the science of Nature. These days, not only the ayurvedic scholars but everybody of us is facing the conceptual hazard, why that we feel the truth hanging between thoughts of ancient and modern times. But we have to over come this terrible plight.

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EFFECT OF PAṬŌLAKAṬURŌHIṆYĀDIGAṆA IN TOXINS - A CASE STUDY

S. Swaminathan*

Abstract: In the modern life style man invites toxins by unwholesome food habits. Pacificatory and purificatory therapies will bring quick result in the management of the diseases caused by toxicity; here is a case study.

During the starting period of my clinical practice a girl aged about thirteen years was brought with the complaints of – 1. severe skin cracks with a thick bad smelling discharge from waist to ankle joints, 2. itching and burning sensation in the affected parts on exposing to sunlight and 3. poor appetite and constipation.

Lot of skin specialists have attended on her complaints but no significant improvement could be achieved. The essential factors to understand in this case are the site of the disease, involvement of *dosha, dushya*, strength of the patient and disease, seasonal effects, appetite, constitution, age, mental status, diet, etc. The girl belonged to a middle class family and had been the habit of consuming incompatible foods like drinking milk soon after fish, *sambar* rice in night and was very fond of non-vegetarian items prepared in hotels.

The manifestation of disease was in *vatasthana* (below the waist) and the thick bad smelling discharge from the cracked skin indicates the involvement of *kapha* and *pitta dosha*s. The age of the patient was *kapha praya*.

Sutrasthana of *Ashtangahridaya* emphasizes that when *sthanidosha* is being dominated by *agantudosha* (here it is *kapha* and *pitta*) then treat the *agantudosha* first. Taking this in view, the following prescription was given.

15 ml *Patolakaturohinyadi kashayam* + 60 ml boiled warm water with 0.385g *Silajatu bhasma* and 0.154g *gandhaka bhasma* in the morning and evening at 6 O'clock in the empty stomach was advised. Also, the patient was instructed to lie down on left side for 45 minutes after intake of *kasayam*.

This group of drugs mitigates *kapha* and *pitta*, cures skin diseases including leprosy, fever, vomiting, anorexia and jaundice. *Ashtanga-sangraha* (*Sutrasthana* 10th Chapter) points out that admixture of two or more substances produces special effects not present in individual substances of the combination.

**Professor/HOD, Samskrita Samhita & Sidhanta, Sri Jayendra Saraswath Ayurveda College, Nazarathpet – 602 103*

The above medicine was prescribed as in the case of toxicity due to wrong combination of foods. The patient was strictly advised to take only buttermilk rice with a pinch of salt and for the side dish chutney prepared out of coriander leaves was permitted. She had to take this medicine for first twenty-one days.

After 21 days' medication, the thick foul discharge found watery but the exudation got increased. The only significant improvement was that the appetite had been improved and constipation got relieved. The same *kashayam* was repeated for another twenty days with diet restriction. The following improvements were observed on the follow up after forty-one days.

- The bad smelling watery discharge got completely stopped and the whole skin surface appeared dry and cracked. Due to this dryness the girl had an agonizing pulling pain.
- Appetite had considerably improved and constipation fully cured.

The father of the girl was very much annoyed by looking at the skin surface and the unbearable pain of the girl; he asked me in a choked voice "will my daughter survive or not?" As I am new to the clinical practice, I too had the same fear inside! But as a physician I had to console her father and again thought about the theory.

Ashtangahridaya in *Kushtachikitsa* mentions that external skin applications are to be done only after conquering the *dosha*s internally. One who does not look into this and apply strong pastes outside will only aggravate the disease.

The internal *dosha*s, which had been vitiated, were alleviated by intake of *Patolakatu-rohinyadi kashayam* continuously for forty-one days and hence the skin appeared dry and the following medicines were prescribed.

- *Khadirarishtam* - 25 ml in the morning and night ½ an hour before food. (Usually *arishtam* is given after food but here the site of the disease is *apanavayu sthana* and so, before food)
- *Dinesavalyadi kuzhambu* - for external application. (After three hours, washing the oil with green gram powder was advised).

The above medication continued for one week. The girl reported after one week and there was no symptom of the disease.

Conclusion

The above case gives an understanding that toxins accumulated over years together due to foods that are incompatible and by other ways in the *dhatu*s are to be detached and brought to *koshtha* and then eliminated from the system. Pacificatory therapies after purification will bring a quick result in curing the disease. It is impossible to cure a disease by keeping the toxins inside the body.

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A STUDY ON THE FORMULATION OF *PARPAM* AND APPLICATION FOR ITS STANDARDISATION

Jahir Hussain, R. Mallikeswari, M. Packialakshmi and P. Moorthy*

Abstract: Two different *parpam*s namely *Amaiotu parpam* and *Cilacattu parpam* were formulated for which traditional method of preparation was employed. They were subjected to physicochemical and spectroscopical analysis. This was an attempt to evaluate the *parpam* products.

Introduction

Parpam, a known *siddha* formulation is the oxide of minerals and metals. They are the products of calcination and are equivalent to *bhasma* in *Ayurvedeeya Rasasastra*.

Materials and methods

Formulation: - Siddha Research Institute, Madurai authenticated the raw materials for the study. Cleaned raw materials were purified through the specified process of *sodhana* i.e. purification, that are recommended for each component[1]. The purified drugs were crushed and converted into fine powder. These powders were put into the mortar; specified juices were added and ground and the mass was made into small discs and dried in sun. They were spread in a shallow earthen pan and covered with identical pan inverted over it and the edges were sealed with clay smeared cloth ribbon. This set up was burnt in kilns and subjected to calcinations. The calcinated product then ground in a mortar and was subjected to strict quality control tests to ascertain whether the resultant products are free from toxic heavy metals and undesirable characteristics, etc.

Results and discussion

In this study, two different *parpam*s were formulated following traditional method. The *parpam*s were fine powders and soluble in concentrated acids. Qualitative chemical analysis showed the presence of lead, calcium, iron, copper, magnesium, sodium and sulphates. Arsenic was found to be absent in both preparations. The amount of minerals and metals showed in the table are in ppm levels.

Table 1
Organoleptic characters

Character	*Amaiotu parpam*	*Cilacattu parpam*
Colour	Ash	White
Odour	Strong	Characteristic
Texture	Fine	Fine

**Department of Pharmacognosy, K.M. College of Pharmacy, Uthangudi, Madurai*

Table 2
Solubility profile

Solubilty	*Amaiotu parpam*	*Cilacattu parpam*
Water	Insoluble	Insoluble
Hot water	Insoluble	Insoluble
Con. Nitric acid	Soluble	Soluble
Con. Hydrochloric acid	Soluble	Soluble
Con. Sulphuric acid	Soluble	Soluble

Table 3
Qualitative chemical analysis

Chemical Analysis	*Amaiotu parpam*	*Cilacattu parpam*
Arsenic	Absent	Absent
Iron	Present	Present
Mercury	Absent	Absent
Lead	Present	Present
Copper	Present	Present
Calcium	Present	Present
Carbonate	Present	Present
Chloride	Present	Present
Magnesium	Present	Present
Phosphate	Absent	Absent
Sodium	Present	Present
Sulphate	Present	Present

Table 4
Minerals and metals spectral analysis
(UV-VIS method)

Minerals and Metals	*Amaiotu parpam*	*Cilacattu parpam*
Calcium	1.8	27
Magnesium	1.2	21.1
Lead	4.2	4.9
Iron	1725	1224
Arsenic	Nil	Nil
Copper	30.7	56

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EXCERPTS FROM CIKITSĀMAÑJARI – XLVII

Unnikrishnan, P.[1]

Abstract: Generally, worms are classified into two - external and internal; in this context, the term *krmi* denotes intestinal parasites, visible worms in contaminated wounds, lice, etc. In this issue, classification and treatment modalities of *krmi* are discussed in detail.

TREATMENT OF *KRMI*

Worms are divided into two based on their position in the body, internal and external (*bahya* and *abhyantara*). They are again classified into four, based on their origin. Contaminated excreta (*bahirmala*), mucoid material (*kapha*), blood (*asrik*) and fecal matters (*vit*) are the their sites of formation. Twenty types of worms are named in the texts. *Yooka* and *liksa* are external parasites. Internal parasites cause *kushta*, termed *kushtahetuka*. *Krmi* that originate from vitiated *kapha*, are seven viz. *antrada*, *udaravista*, *hridayada*, *maharuja*, *churava*, *darbhakusuma* and *sugandha*. Vitiated *rakta* cause six types *kesada*, *romavidhamsa*, *lomadvipa*, *udumbara*, *sourasa* and *mathara*. *Kakeruka*, *makeruka*, *asuraada*, *loona* and *leliha* are the parasites seen in faeces.

The presence of *krmi* can be confirmed by the symptoms of fever, pallor, colic, chest pain, lassitude, vertigo, aversion to food and diarrhea. Emesis and purgation are the basic remedial measures. Food should contain substances that are excessively bitter and spicy. Fats and oils should be reduced to the minimum.

Consume *mukkuti** prepared with *kuppamanjal* (*Bixa orellana*). A small quantity of *kayam* (*Ferula asafoetida*) covered with jaggery can be given for the relief from infestation of worms and intestinal parasites such as roundworms, pinworms, etc. Fine powder of *vayampu* (*Acorus calamus*) mixed with fresh cow's urine can be given. *Mukkuti* prepared from *kattuchena* (*Amorphophallus companulatus* wild var.) can be consumed. Buttermilk boiled with *kotuveli* (*Plumbago indica*) shall be consumed. A similar preparation where buttermilk replaced with ghee is also effective. Expressed juice from the leaves of *tumpa* (*Leucas aspera*) mixed with hot castor oil, rock salt and fine powder of *vizhalari* (*Embelia ribes*) also relieves intestinal helminthiasis and causes purgation. A *mukkuti* prepared from *vizhalkurunnu* (tender shoots of *Embelia ribes*) is also effective in relieving worm infestations of the gut.

1 *Vice Principal, Vaidyaratnam P.S. Varier Ayurveda College, Kottakkal, P.O. Edarikode 676 501*

*A liquid preparation in which drug/drugs are cooked in butter milk, churned well and boiled

A *kashaya* prepared from the following when consumed with the fine powder of *hingu* (*Ferula asafoetida*) and *ooshana* (*Piper nigrum*), for three consecutive days, relieve *krmi*.

Vidanga	*Embelia ribes*
Nirgundi	*Vitex negundo*
Abhaya	*Terminalia chebula*
Akhukarni	*Merremia emarginata*
Rasona	*Allium sativum*
Saubhanjana	*Moringa oleifera*
Nagara	*Zingiber officinale*
Abda	*Cyperus rotundus*

A *kashaya* prepared with the following shall be mixed with fine powder of *siddhartha* (*Brassica juncea*) and *hingu* to prepare a rice porridge. Consumption of this preparation relieves various types of worm manifestations and diseases caused by them.

Vizhalver	*Embelia ribes*	
Kanamula	*Piper longum*	
Sigru	*Moringa oleifera*	
Tulasi	*Ocimum sanctum*	
Brahmadruma	*Cedrus deodara*	
		1 part each
Cherukaitaver	*Pandanus odoratissimus*	
		5 parts

Fine powder of *katuku* (*Brassica juncea*) mixed with *kati* shall be used to prepare boiled rice. Consumption of this with fresh butter and rock salt in the early morning with empty stomach cure intestinal helminthiasis, ascites and anemia affecting children. To purge out worms, consume *kanji* mixed with *kati* or sour buttermilk immediately after intake of coconut milk mixed with the fine powder of *krimisatru* (*Vernonia anthelmintica*) and *vidanga* in the morning. *Kati* consumed with *krimighna* (*Embelia ribes*) and *krimisatruka* (*Vernonia anthelmintica*) relieves from worm infestation. Fine powder of *vidanga* consumed with honey also is effective.

A *kashaya* prepared from the root bark of *nimba* (*Azadirachta indica*) mixed with nocake powder and sugar cures vomiting and *krimi* in children.

Fine powder of the following (in equal quantity) consumed with cow's urine is capable of eliminating of worms in the adult.

Khadira	*Acacia catechu*
Kutaja	*Holarrhena pubescens*
Pichumanda	*Azadirachta indica*
Vacha	*Acorus calamus*
Trikatu	*Zingiber officinale*
	Piper nigrum
	Piper longum
Triphala	*Terminalia chebula*
	Emblica officinalis
	Terminalia bellirica
Trivrit	*Operculina turpethum*

Medicated ghee prepared from the following *kashaya* and cow's urine as liquid component eradicates *krmi*.

Triphala	*Terminalia chebula*
	Emblica officinalis
	Terminalia bellirica
Trivrit	*Operculina turpethum*
Danti	*Baliospermum montanum*
Vacha	*Acorus calamus*
Kampillaka	*Mallotus philippensis*

Intake of another medicated ghee prepared with a fine paste of *nisa* (*Curcuma longa*) as solid component and it's juice as liquid component eliminates *krmi*.

Mix fine powder of rice with a paste made out of *akhukarni kisalaya* (tender leaves of

Merremia emarginata); ground thoroughly, roll into bolus and cook in steam. Consumption of this bolus in suitable quantity, followed by intake of *dhanyamla* gives relief from worm infestations.

Medicate sour buttermilk with a *kashaya* prepared from the following and to which add fine powders of *vilanga* (*Embelia ribes*), *maricha* (*Piper nigrum*) and *manjal* (*Curcuma longa*). Intake of this preparation clears parasites of the gut.

Palasatol	*Butea monosperma* (bark)
Muringatol	*Moringa oleifera* (bark)
Kattu-tippaliver	*Piper longum* wild var. (root)
Cherukaita	*Pandanus odoratissimus* (root)

Roots of *tulasi* (*Ocimum sanctum*) ground well, mixed with warm water, on consumption relieve *krmiroga*. Alternatively the same paste can be taken with warmed *kati* also.

Preparations such as *kashaya*, *kalka* (paste), medicated ghee etc, using the drugs given in *Surasadigana*, given below, can also be made use of. (Ah. su. 15)

Surasayuga	*Ocimum sanctum* *Ocimum sanctum* (black var.)
Phanijjam	*Origanum majorana*
Kalamala	*Ocimum basilicum* var. *purpurascens*
Vilangam	*Embelia ribes*
Kharabusa	*Ocimum basilicum*
Vrishakarni	*Merremia emarginata*
Katphalam	*Myrica nagi*
Kasamarda	*Cassia occidentalis*
Kshavaka	*Centipeda orbicularis*
Sarasi	*Vitex trifolia*
Bharngi	*Clerodendrum serratum*
Kamuka	*Hiptage benghalensis*
Kakamachi	*Solanum nigrum*
Kulahala	*Sphaeranthus indicus*
Vishamusti	*Ageratum conyzoides*
Bhoostrina	*Cymbopogon citratus*
Bhootakesi	*Nardostachys jatamansi*

Massive infestation of intestinal parasites can be relieved by the consumption of the fine powder of the following with honey or expressed juice of *tekarasa* (*Eclipta prostrata*). This preparation is capable of eradicating *krmi*.

Tippali	*Piper longum*
Kayam	*Ferula asafoetida*
Vilanka	*Embelia ribes*
Tuti	*Elettaria cardamomum*

Ten *kana** of leaf of ripe *kariveppu* (*Murraya koenigii*) should be ground well with 20 *kana* of common salt and expressed juice of *parana* (?). A small quantity of this mixture should be consumed in the mornings for the relief of *krmi*.

Prepare a *kanji* with buttermilk medicated with the following. A small quantity of *sarjika-kshara* (sodium bicarbonate) should be added to it just before consumption.

Vilanga	*Embelia ribes*
Krishna	*Piper longum*
Maricha	*Piper nigrum*
Pippalimoola	*Piper longum* wild var. (root)
Sigru	*Moringa oleifera*

Drugs detailed in *Surasaadigana* can be given in the form of a *kashaya* or *kalka* for the relief from *krmi*. Fine powder of *vilanga* can also be added with edibles.

Consumption of *khala* (paste) prepared with *vanasoorana* (*Amorphophallus companulatus* wild var.) and *kuppamanjal* (*Bixa orellana*) or

*1 *kana* = 400 mg

powdered *vacha* mixed with cow's urine is prescribed for the relief from *krmi*.

Palasabeeja (seeds of *Butea monosperma*) and *asphotamoola* (root of *Calotropis gigantia*) or *tulaseesipha* (root of *Ocimum sanctum*) or *ajjhata* (*Phyllanthus amarus*) mixed with *dhanyamla* can be consumed for the relief from intestinal parasites.

Prepare a *kashaya* from the following and consume it with the addition of fine powders of *sigru, vilanga, hingu* (*Ferula asafoetida*) and *patu* (rock salt). This kills *krmi* like the powerful *mantra*s of *Atharvaveda* kill *asura*s (demons).

Nirgundi	*Vitex negundo*
Agni	*Plumbago indica*
Vilanga	*Embelia ribes*
Daru	*Cedrus deodara*
Rajani	*Curcuma longa*
Musta	*Cyperus rotundus*
Akhukarni	*Merremia emarginata*
Kshapa	*Anisomeles malabarica*
Bharngi	*Clerodendrum serratum*
Vyosha	*Zingiber officinale*
	Piper nigrum
	Piper longum
Phanijja	*Origanum majorana*
Sigru	*Moringa oleifera*
Chavika	*Piper brachystachyum*
Pathya	*Terminalia chebula*
Rasona	*Allium sativum*

Intake of a medicated ghee prepared from the expressed juice of coconut pulp and *snuheeksheera* (*Euphorbia ligularia*) as liquid component and fine powders of *krmisatru* (*Vernonia anthelmintica*) and *vacha* as solid component relieves intestinal parasites, flatulence, colic, splenomegaly and skin diseases. Fine paste of *asphootamoola* (root of *Calotropis gigantia*) should be applied over the abdomen and the patient should be directed to drink warm water. This preparation is a drastic purgative and should be used with caution.

Leaves of *patalamooli - karalekam* (*Aristolochia indica*) cooked in *kati*, soaked in cloth, should be applied over the abdomen and kept overnight; continuing this process for a period of seven days helps to fall off small and big intestinal parasites; it also relieves sub fertility.

Alternately, apply the above preparation on cloth and tie it over the abdomen in the evening, also consume purgatives such as *Avipattichoornam* or *Manibhadraleham*. Tie the cloth as detailed for three consecutive days and give purgatives for three alternate days and tie cloth on the other alternate days. This process can be done for three or five days depending on the gravity of the condition. By this, oedema of the abdomen is relieved and *krmi*s are expelled.

Application of a paste prepared from *sarapunkha* (*Tephrosia purpurea*) on the abdomen clears intestinal parasites in children. Application of *silindhrakandam* (*Musa paradisiaca*) or *hingu* applied around the navel is also effective.

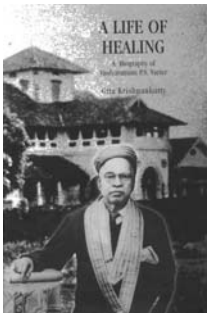
A paste prepared with *vishnukranthi* (*Evolvulus alsiniodes*) in warm water or *kati*, on application on abdomen relieves *krmiroga* in children. Milk, meat, ghee, jaggery, butter-milk, green leafy vegetables and edibles having sour and sweet taste are contraindicated in *krmi*. The worms in abscesses and ulcers are killed by direct application of the milky latex of *kalli* (*Euphorbia ligularia*).

Sesame oil, coconut oil or *neervetty* oil (*Hydnocarpus laurifolia*), medicated with the expressed juice of *kattutritva* (*Ocimum*

americanum), *tritva* (*Ocimum sanctum*) or *kattappa* (*Ageratum conyzoides*) as liquid component and paste of *kayam* (*Ferula asafoetida*), *ulli* (*Allium sativum*) and *ayamodakam* (*Trachyspermum roxburghianum*) as solid component on instillation can kill visible worms in the wounds.

Fine powder or paste of the following, mixed with sesame oil and honey, lukewarm, shall be retained in mouth for the relief from growths in the mouth, abscesses, wounds, *upajihvika*, muscular growths, itching and slimy secretions. This preparation is also capable of relieving inflamed gums, toothache and halitosis.

Siddharthaka	*Brassica juncea*
Ela	*Elettaria cardamomum*
Chavya	*Piper brachystachyum*
Sringiver	*Zingiber officinale*
Pippali	*Piper longum*
Kustumburuni	*Coriandrum sativum*
Maricha	*Piper nigrum*
Ajamoja	*Trachyspermum roxburghianum*
Haritaki	*Terminalia chebula*
Saindhava	Rock salt
Yavaksharam	*Hordeum vulgare*



A LIFE OF HEALING

Gita Krishnankutty
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A biography of Vaidyaratham P.S. Varier reconstructs the history of this extraordinary man and the institutions he established and nurtured. It shows how an ordinary student, spurred on by curiosity and determination to explore avenues of knowledge, succeeded in improving, modernizing and popularizing ayurveda at a time when allopathic medicines were making inroads into the Indian market.

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जल प्रदूषण एवं आयुर्वेदीय दृष्टिकोण

भूषण सरमंडल*

मनुष्य के शरीर का जल महाभूत एक प्रधान घटक है । स्वास्थ्य व रोग दोनों ही अवस्थाओं मे शरीर के विभिन्न कार्यों का वहन जलीयद्रव्यों के द्वारा होता है । वर्तमान युग में बढते हुए उद्योगीकरण – शहरीकरण ने वातावरण के प्राकृतरूप को बदला है, इसी कारण वायु प्रदूषण, जलप्रदूषण जैसी समस्याऐं उत्पन्न हो गयी हैं । प्रस्तुत लेख में जलप्रदूषण के आयुर्वेदीय मत का वर्णन किया गया है ।

पंचभूतात्मक विश्व का एक प्रमुख घटक जल हैं उसी प्रकार मनुष्य के शरीर का ७०% भाग भी जलीय द्रव्यों से निर्मित है । ये जलीय द्रव्य स्वास्थ्य व रोग दोनों ही अवस्थाओं में शरीर के कार्य का वहन करतें हैं । अत: जल का संपूर्ण रूप से त्याग असंभव ही है ।

पानीयं प्राणिनां प्राण विश्वमेव य तन्मयम् ।
(अ. सं. सू ६/२७)

जल की मात्रा के साथ इसकी गुणवत्ता भी महत्वपूर्ण है, क्योंकि भारत के समान विकासशील देश में दूषित जल जन्य रोग जैसे कि अतिसार, आन्त्र क्रिमि आदि तेजी से बढ रहे हैं । जिसका मुख्य कारण अस्वच्छता एवं शुद्ध पीने के जल का अभाव हैं ।

वर्तमान युग में मनुष्य के स्वास्थ्य को बनाये रखनें में वातावरण एक प्रमुख कारण हैं । बढते हुए उद्योगीकरण – शहरीकरण एवं नये नये तकनीकी विकास ने वातावरण के प्राकृत रूप को बदला है । इसी कारण वायु – जल – भूमी प्रदूषण जैसी समस्याएं उत्पन्न हो गयी हैं । प्रस्तुत लेख में जल प्रदूषण के विभिन्न पहलुओं को आयुर्वेदीय दृष्टिकोण से प्रस्तुत किया गया है ।

जल की गुणवता

हिताहितत्वे तद्भूयो देशकालावपेक्षते ।
(अ. हृ. सू. ५/२)

आयुर्वेदीय मत से अन्तरीक्ष जल 'अव्यक्त रस' होता है एवं देश व काल के संपर्क में आने पर उस में विभिन्न रसों की उत्पत्ति होती है अत: जल के सगुण/दुर्गुण का निर्धारण प्रधानत: देश व काल द्वारा होता है ।

शुद्धजल लक्षण

आयुर्वेदीय मत से शुद्ध जल निम्न लिखित गुणों से युक्त होना चाहिए:–

- निर्गन्ध
- अव्यक्तरसं
- तृष्णघ्नं
- शुचि
- शीतल
- लघु
- हृद्यं

* एम. डी. स्कोलर, वैद्यरत्नं पी. एस. वारियर आयुर्वेद कोलेज, कोट्टक्कल, केरल

- सुसूक्ष्मं
- विशदं
- अरूक्ष (स्निग्ध)
- अनभिष्यंदी

प्रदूषित जल लक्षण

प्राचीन काल में अन्तरिक्ष जल शुद्ध होता था जिसका प्रयोग पीने में किया जाता था । किन्तु वर्तमान में संपूर्ण वातावरण उद्योगों से उत्पन्न विषाक्त धूओं एवं धूल युक्त है, अत: शुद्ध जल प्राप्त होने की संभावनाऐं कम ही हैं । जल के प्रदूषित होने पर निम्नोक्त गुणों को आसानी से देखा जा सकता है ।

– विकृतगन्धवर्णरसस्पर्श

- क्लेदबहुल
- अपक्रान्तजलचर
- अप्रीतिकर
- विहङ्गमुपक्षीणं
- पिच्छिलं
- कृमिल
- विलग्नं
- वर्णशैवालयुक्त
- सांद्र
- दुर्गन्धी
- फेनान्वितं
- राजिभिरावृत
- मण्डूक मत्स्यप्रियते
- आनुपचर भ्रमित

जल प्रदूषण के कारण

जल में मुख्यत: दो प्रकार की अशुद्धियां (impurities) होती हैं – १) सामान्य अशुद्धि २) मनुष्यकृत अशुद्धि ।

सामान्य अशुद्धि की उत्पत्ति शुद्ध जल में प्रदुषित वातावरण, देश, भूमि आदि के कारण होती है । इसके अंतर्गत –गैस (dissolved gas), कृमि (microorganism) खनिज पदार्थ (minerals) का समावेश होता है । आयुर्वेदीय– मतानुसार जल के प्रदूषण के निम्नलिखित कारण होते हैं ।

१. ऋतुजन्य:– वर्षाकाल में जल स्वभावत: प्रदूषित हो जाता है एवं उसमें कई प्रकार की अशुद्धियां मिली होती हैं । (च. सू. २७/२१३)

२. देशजन्य:– जल की गुणवता का निर्धारण स्थान (जहां जल बहता या गिरता है) के अनुसार होता है । कुछ प्रांतों मे विशेष प्रकार की अशुद्धियां मिलती हैं जिसके कारण वहां की नदियों का जल कुछ विशेष रोगो को उत्पन्न करता है । (अ. ह. सू. ५/११–१२)

३. सेन्द्रिय प्रदूषक (organic pollutant):- जीवजंतुओं के मल, मूत्र, मृत शरीर एवं विषाक्त पौधों के जल स्रोतों में मिलने पर दुष्टि होती है।

प्रांतीय नदियाँ	रोग
प्राच्य (केन्द्रीय बंगाल व उडीसा के कुछ भाग)	
अवन्ति (उज्जैन)	अर्श
अपरांत (गोवा, करवार, उत्तर कर्नाटक का उत्तर पूर्व भाग) महेन्द्र पर्वत (उत्तर–पूर्व घाट)	उदरवृद्धि, श्लीपद
साह्य (दक्षिण भाग, पश्चिमी घाटों का)	त्वचा रोग, पाण्डू
विन्ध्य पर्वत (केन्द्रीय भारत)	शिरो रोग

४. विष:– विभिन्न प्रकार के स्थावर या जाङ्गम विष जल स्रोतों में मिलकर दुष्टि उत्पन्न करते हैं ।

५. कृमि:– इस हेतु के अंतर्गत विभिन्न प्रकार के रोगाणु (pathological organism) का समावेश किया जा सकता हैं ।

६. जो जल सूर्यप्रकाश, चन्द्रप्रकाश या हवा के संपर्क में नही आता वह भी अशुद्ध है ।

आयुर्वेद मतानुसार 'प्रज्ञापराध' को सभी जनपदोध्वंस का प्रधान कारण माना गया है ।

जलदोष (सु. सू. ४५/११)

आचार्य सुश्रुत के अनुसार अशुद्ध जल में निम्निलिखित छ: दोष पाये जाते हैं ।

१. स्पर्शदोष (defect of touch):– यदि जल में स्पर्शदोष है तो निम्निलिखित लक्षण उत्पन्न होते है :–
– खरता (hardness)

- पिच्छिल (slimness)
- औष्ण्य (hotness)
- दंतग्राहिता (दंतगत शीत अनुभव) (sensation of cold in the teeth)

२. वर्णदोष (defect of appearance):- जल में मृत्तिका, शैवाल आदि के कारण विभिन्न वर्णों की उत्पत्ति ।

३. रसदोष (defect of taste):- सामान्यत: शुद्ध जल अव्यक्त रस होता है; किन्तु अशुद्धियों की उपस्थित में अम्ल-लवणीय आदि रस युक्त होता है ।

४. गंधदोष (defect of smell):- जल में अनिष्टगन्ध या दुर्गन्ध होना गंधदोष होने का लक्षण है ।

५. वीर्यदोष (defect of potency):- वीर्यदोष युक्त जल के सेवन से निम्न लक्षणोत्पति होती है :-
- तृष्णा वृद्धि (thirst)
- शरीर गौरव (heaviness in body)
- उदर शूल (abdominal colic)
- कफवृद्धि (expectoration of *kapha*)

६. विपाकदोष (defect of digestion):- विपाक दोष युक्त जल के सेवन से निम्न लक्षणोत्पति होती है ।
- अजीर्ण (delayed digestion)
- उदरशब्द (gurgling)

प्रदूषित जल का शरीर पर प्रभाव (संप्राप्ति):-

यदि प्रदूषित जल का प्रयोग पीने, नहाने, खाना बनाने आदि में किया जाता है तो वह रोगकारी है। दूषित जल का शरीर पर निम्नोक्त प्रभाव होता है :-

१. यदि प्रदूषित जल नहाने के लिए प्रयोग किया जाता है तब कुष्ठरोग (त्वचा रोग) की उत्पत्ति होती है ।

२. यदि प्रदूषित जल पीने या खाना बनाने में प्रयुक्त किया जाये तब अपने दुर्गन्ध, पिच्छिल, अप्रीतिकर स्वभाव गुणों के कारण शरीर में अग्निमांद्य उत्पन्न करता है । यह अग्निमांद्य दो प्रकार का होता है - जठराग्निमांद्य, धात्वाग्निमांद्य ।

जठराग्निमांद्य होने पर उससे दुष्ट रस उत्पन्न होता है जो कि उदर विकारों का प्रधान कारण है । या फिर दुष्ट रस से शरीर में मलरूपी विकृत कफ की उत्पति होती है जिसका परिणाम शरीरबलह्रास (loss of immunity) है । धात्वाग्निमांद्य होने पर विभिन्न धातुगत रोग उत्पन्न हो सकते हैं। (Chart 1)

प्रदूषित जल द्वारा उत्पन्न रोग:- प्रदूषित जल के सेवन से मुख्यत: दो प्रकार से रोग उत्पन्न होते है:-

१. शीघ्रगामी (acute):- विषयुक्त जल के सेवन से छर्दि, दाह, शोथ, ज्वर, मूर्च्छा आदि लक्षण उत्पन्न होते हैं । (सु. सू. ३/८)

२. दीर्घकालिक (chronic):- यदि प्रदूषित जल का प्रयोग दीर्घकाल तक किया जाये तब - पाण्डू, त्वक्‌रोग, अजीर्ण, शोफ, उदरवृद्धि, अन्नवहस्रोतस संबन्धिरोग, श्वास, कास, प्रतिश्याय आदि लक्षण उत्पन्न होते हैं । (सु. सू. ४५/१५-१६)

जलप्रदूषण एवं दूषिविष

उद्योगों द्वारा उत्पन्न विभिन्न विषाक्त गैस एवं विषैले द्रव्यों का मनुष्य के स्वास्थ्य पर प्रत्यक्ष एवं अप्रत्यक्ष दोनों ही रूप में प्रभाव पडता है । प्रदूषित जल में उत्पन्न आहार द्रव्यों, मत्स्य आदि के दीर्घकाल तक सेवन से अल्पवीर्य विष शरीर में संचय होता रहता है । साथ ही शरीर में विभिन्न कारणों से अग्निमांद्य होकर विकृत मल रूपी कफ उत्पन्न होता है जो कि अल्पवीर्य विषों को आवरित कर दूषीविष की अवस्था को उत्पन्न करता है ।

वीर्याल्पभावादविभाव्यमेतत् कफावृतं वर्षगणानुबन्धी ।
(अ. ह्र. उ. ३३/३४)

जल शुद्धीकरण:-

स्वस्थ मनुष्य के स्वास्थ्य को बनाये रखने हेतु यह अत्यंत आवश्यक है कि शुद्ध जल की आपूर्ति निरंतर होती रहे ।

आयुर्वेदीय संहिताओं में वर्णित जल शुद्धि की विधियों का वर्णन निम्नोक्त है:-

लघुस्तरीयविधियां (simple methods)

१. उबालना:- इस का प्रयोग अधिक मात्रा में अशुद्धियां होने पर किया जाता है ।

२. तप्त लोहे के गोले या रेत को मिलना:- मध्य मात्रा में अशुद्धियों के होने पर उपयोगी है ।

३. सूर्यप्रकाश में गरम करना :- अल्प मात्रा में अशुद्धियों के होने पर उपयोगी है ।

४. वस्त्र से छानना

५. मोती - गोमेद आदि मणियों को प्रदूषित जल में मिलाना ।

६. जलशुद्धीकर गुणयुक्त औषधि मिलाकर जैसे -

- नागकेसर (*Mesua ferrea*)
- चंपक (*Michelia champaka*)
- उत्पल (*Nymphelia stellata*)
- पाटला पुष्प (*Stereospermum colais*)
- केतकी पुष्प (*Pandanus odoratissimus*)
- मल्लिका पुष्प (*Jasminum sambac*)
- पद्म मूल (*Nelumbo nucifera*)

बृहतस्तरीय विधि:- (comprehensive methods)

आचार्य सुश्रुत ने निम्नोक्त औषधियों की राख का प्रयोग विषाक्त जल युक्त स्रोतो में छिडकाव कर जलशुद्धि करने के लिए कहा है :- (सु. क. ३/८-९)

- धव (*Anogeissus latifolia*)
- अश्वकर्ण (*Dipterocarpus turbinatus*)
- असन (*Pterocarpus marsupium*)

Chart 1

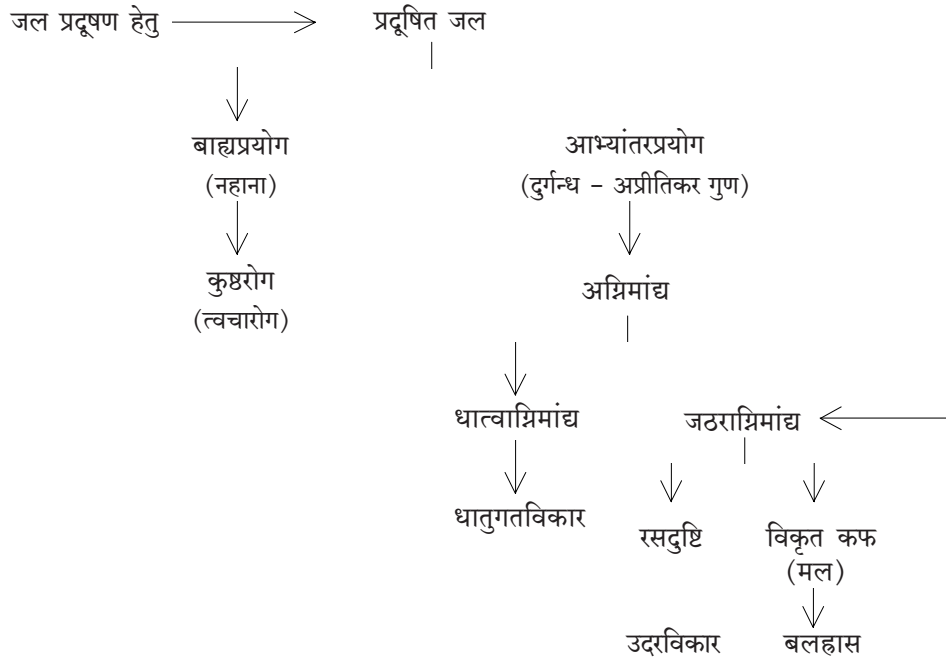
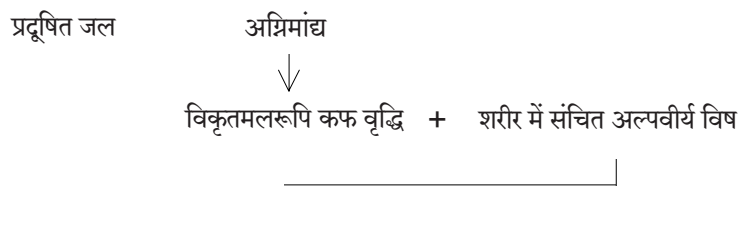


Chart 2



– पारिभद्र (*Erythrina variegata*)
– पाटला (*Sterospermum colais*)
– सोमवल्कल (*Acacia suma*)

जलप्रदूषण से बचाव के उपाय:–

वर्तमान युग में जबकि उद्योगीकरण, शहरीकरण अत्यंत आवश्यक अंग हैं तब 'व्यवस्थित योजनाओं' के द्वारा ही वातावरण को प्रदूषित होने से बचाया जा सकता हैं । आयुर्वेदीय सिद्धांतों का प्रयोग व्यक्तिगत स्तर पर करना महत्वपूर्ण साबित हो सकता है । जैसे कि:–

१) ऋतुचर्या का पालन करना ।

२) ऋतुकालिन शरीर शुद्धि (पंचकर्म विधियों द्वारा) ।

आयुर्वेदीय सिद्धांतो के पालन से शरीर की रोगप्रतिरोधक क्षमता को बनाये रखा जा सकता है । एवं शरीर में संचित अल्पवीर्य विषों को शरीर से निष्कासन किया जा सकता है । यदि अशुद्ध जल प्रयोग में आ जाये तब भी आसानी से रोगोत्पत्ति नहीं होगी ।

निष्कर्ष

१. संहिताओं में वर्णित विभिन्न जल शुद्धीकरण की विधियों का लघुस्तर पर सफल प्रयोग होता है एवं बृहतस्तर पर सफलताओं की संभावनाओं को पुन: परीक्षणों द्वारा सिद्धि करना चाहिए ।

२. ऋतुचर्या पालन– शरीर शोधन नियमित करने से व्यक्तिगत स्तर पर जलप्रदूषणजन्य रोगों से बचाव किया जा सकता है ।

३. वर्तमान में वातावरण को प्रदूषित होने से बचाने के लिए बहु आयामी कार्यक्रम के क्रियान्वयन की आवश्यकता है ।

४. उद्योगीकरण – शहरीकरण से यदि बचपाना असंभव है तब इस बात पर विचार की आवश्यकता है कि सामाजिक एवं आर्थिक विकास को बनाये रखने के लिए कितने स्तर तक प्रदूषण को स्वीकार किया जा सकता है ।

आभार:–
डॉ उण्णीकृष्णन पी. (प्रोफेसर), डॉ सी. एम. श्रीकृष्णन (रीडर), डॉ आशा के. वी. (लेक्चरर) अगदतंत्र विभाग, वी. पी. एस. वी. आयुर्वेद कालेज, कोट्टक्कल, केरल ।

संदर्भग्रन्थ:–

१. सुश्रुतसंहिता, आयुर्वेदतत्वसन्दीपिका, हिंदी व्याख्या, डॉ अम्बिकादत्त शास्त्री, चौखम्बा संस्कृत संस्थान, वाराणसी ।

२. अष्टाङ्गहृदय, सर्वाङ्गसुन्दर व्याख्या, श्री. लालचन्द्र वैद्य, मोतीलाल बनारसी दास पब्लिशर्स, प्रायवेट लि., दिल्ली ।

३. चरकसंहिता, आयुर्वेददीपिका संस्कृत व्याख्या, वैद्य यादवजी त्रिकुंजि आचार्य, चौखम्बा संस्कृत संस्थान, वाराणसी ।

४. द्रव्यगुण विज्ञान् (द्वितीय भाग), प्रो. प्रियव्रत शर्मा, चौखम्बा भारती अकादमी, वाराणसी ।

५. Park's Preventive and Social Medicine.