



## Contemporary Challenges in Ayurveda: An Ancient Medical Technology

SURESH KUMAR<sup>1</sup>, NEELAM TOPRANI<sup>2,5</sup>, SHANMUGAMURTHY LAKSHMANAN<sup>3,4,5\*</sup>

<sup>1</sup>CareKeralam limited, Koratty-680 309, Thrissur District, Kerala, India

<sup>2</sup>Sewanti Ayurvedic Series, Padmashri Naturals Inc., Vancouver, CA.

<sup>3</sup>Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA, USA.

<sup>4</sup>Department of Dermatology, Harvard Medical School, Boston, MA, USA.

<sup>5</sup>World Institute for Scientific Exploration, Baltimore, MD 21210, USA.

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### ABSTRACT

Ayurveda is an indigenous traditional medical technology of India that remained as a dormant medical system for the past few thousand years. Recently, mainstream medical system has probed into this Ancient Technique to demystify the mechanism of operation and examine its scientific validity. There are a number of issues that one comes across in such a venture which are addressed in this review. However, a paradigm model using a modern framework is suggested to be the best approach due to the nature of its axiomatic construct compared to its modern counterpart. This review addresses the shortcomings and advantages of the development of Ayurveda along with contemporary mainstream medical science.

**Keywords:** Ayurveda, Ancient Medicine, Paradigm, Indian Medicine, Traditional Medicine

### Introduction

In Ancient India, a broad range of scientific techniques and methodologies were established almost simultaneously by two indigenous groups of highly civilized cultures; one of which is Ayurveda-an Ancient Medical Science and Technology that has been practiced in India for more than 3000 years and still remains part of the mainstream medicine for over 60 per cent of the population in the country. Ayurveda is slowly expanding all over the world as an alternative approach to modern medicine. Today a number of research articles on Ayurveda are out there published in the main stream medical journals as well as explicit alternative medical journals devoted to Ayurveda. However, none of these published works so far uncovers the paradigm dimension of Ayurveda, rather they often viewed Ayurveda under the lens of mainstream medical system; characterization and analysis were carried out without valuing it for its own authenticity. It has to be understood that unlike traditional medicine as it is practiced today Ayurveda has always possessed a personalized medicine approach. From a

modern science perspective the fundamentals of Ayurveda cannot be explained on a cellular level using current nanotechnology because of the very nature of its axiomatic construct, though the indirect efficacy of some of the Ayurvedic components can be obtained in labs to a certain extent. There is enormous amount of literature out there on viewing Ayurveda from a modern science perspective and there is little need to review the subject here [1]. However, it is noteworthy to mention that Ayurvedic therapy is naturalistic, efficient, non-invasive biocompatible and does not initiate newer disorders in the patient due to the nature of its construct. Moreover, Ayurveda is based on scientific foundations that were time tested, though the modern scientists may find it rather difficult to comprehend the fundamentals axioms upon which Ayurveda is constructed [2].

Traditional Ayurvedic practices are carried out in India and many Asian countries at least for the past 3000yrs. As a result of royal patronage, i.e. the application and practice by the Royal Kings of India, the therapy was highly privileged in Ancient India. However, a series of foreign invasions and the subsequent socio-economic problems caused grievous injury to its fabric. The Arabs, Persians and Moghuls tried to amalgamate Ayurveda with Greco-Arabic medicine, resulting in the creation of the *Unani Tibb* [3]. Moreover, the Poisons Act

\*Corresponding Author

Shanmugamurthy Lakshmanan, PhD

Wellman Center for Photomedicine, Massachusetts General Hospital, Harvard Medical School, MA, USA.

Email: [slakshmanan1@mgh.harvard.edu](mailto:slakshmanan1@mgh.harvard.edu)



promulgated by the British East India Company prohibited Ayurvedic practitioners from preparing mercurial on the ground. They concluded mercury was poisonous [4], though the usage of mercury as an active medicine was there for more than 3000 yrs. This alternative view of medical science was one of the key reasons for the extreme degeneration and downfall of even the Tamil based medicine (siddha and other types of traditional based medicines from south India that extensively used mercury, arsenic etc.,) and the unnecessary confidentiality still maintained by its votaries in the dissemination of the knowledge.

Albeit its shortcomings Ayurveda is gradually undergoing a renaissance in modern times, and gaining popularity owing to the awareness on the harmful side-effects of synthetic drugs and the socio-economic effects of corporate-based commercialized pharma. Nevertheless, Ayurveda is facing serious downsides due to a number of reasons:

### Redaction of Historical Literature

Unlike modern medicine, Ayurvedic data was primarily presented in quatrains in Sanskrit language, primarily for the ease of memorizing the information. Emphasis on spirituality and the structuralism associated with Sanskrit language are also some of the obstacles in the list. As a result, a person who wants to understand Ayurveda system need to analyze the symptoms of a disease or disorder based on his/her own interpretations by synthesizing the quatrains and the interpretations were not centralized. It has to be noted that historically the ayurvedic texts used to be revised and upgraded from time to time. Many scholars accordingly redacted the *Charaka Samhita* and *Susruta Samhita* and this was one of the reasons why Ayurveda was dynamic in earlier days (at least 2000-3000 years ago). The *gurukula* system of education or the master-pupil relationship was also instrumental in keeping the system alive by documentation through oral traditions. Nevertheless, with the complete disappearance of the *gurukula* style of education today wherein the master (instructor) used to demystify the Ayurvedic literature, the modern student of Ayurveda is not in a position to understand the deeper meanings of the hidden science. For example, even though *vata*, *pitta* and *kapha* are further classified into groups of five each, the clinical significance of such a grouping is still obscure. Similarly, the sixty-three combinations of taste modalities that are mentioned in Ayurveda also seem to show no meaning to the modern student who has been fundamentally learning science from a new set of axioms that are nowhere close to the Ancient Science. In this context a strategically strong approach needs to be carried out in redaction of Historical literature to resurrect Ayurveda.

### Limitations in the Identification of Medicinal Plants and Herbs

Another limitation of Ayurveda is that there are only limited methodologies mentioned in the Ayurvedic texts for

identifying a medicinal plant. All these plants are given numerous Sanskrit and vernacular names which show a great degree of variation from one author to another. This is a major stumbling block in the standardization of Ayurvedic medicinal formulations. However, a reasonable way of getting over this problem is also possible. Taking cue from the pharmacolinguistic approach of Krishnamurthy [5], Pillai [6] ascertained the correct identity of the plant *Sankhupuspi*, in place of which *Canscora decussata* Schult., *Clitoria ternatea* Linn., *Convolvulus pluricaulis* Choisy and *Evolvulus alsinoides* Linn., were used in different parts of India. By scoring the Sanskrit synonyms of *Sankhupuspi* against the exomorphy of these contestants, it was discovered that the name *Sankhupuspi* is most appropriate for *Clitoria ternatea*. Out of 30 synonyms which obviously denote the morphological and pharmacological characteristics of *Sankhupuspi*, *Clitoria ternatea* scored 30, *Canscora decussata* 1, *Convolvulus pluricaulis* 2 and *Evolvulus alsinoides* 1. This study highlights the importance of studying in greater depth the Sanskrit names of plants presented in poetic style in several *nigantu* such as *Hrdyadipaka Nighantu* [7]. The pharmacolinguistic approach seems to be quite useful for ascertaining the identity of many controversial (in terms of modern medical assessment) medicinal plants.

### The Importance of Paradigm Shift in Ayurveda Education and Curriculum

In ancient times the teaching of Ayurveda was in the *gurukula* tradition and the *Charaka Samhita* unfolds clear guidelines for the selection of students and the method of education [8]. With the extinction of the classical style of training, Ayurveda education in India took a different turn in the early 20<sup>th</sup> century. Ayurveda colleges established on the pattern of western medical schools started offering courses in the discipline. After a series of experiments the Government of India introduced the Bachelor of Ayurvedic Medicine and Surgery (BAMS) course with a centralized syllabus to ensure uniformity in the pattern of education. Unfortunately, the present curriculum has several inherent glitches which weakens the practical applicability of Ayurveda. Students who have not studied Sanskrit/Tamil are chosen for Ayurveda and trained using English as a modality to understand Ayurveda. It has to be understood that English has its own limitations due to the lack of ancient cultural terms to describe the conditions. In addition to Ayurveda students are imposed by modern biomedical curriculum such as anatomy, physiology and pharmacology. As Ayurveda and Western medicine are built from different set of axioms when diagnosing and understanding the underlying mechanisms of diseases, the students show less interest for Ayurveda because of the lack of a modern framework to explain the mechanism. So the students are swept away by a highly commercialized medical technology which is much advanced in terms of terminologies and model and, the scientific basis of which can be easily demonstrated in the laboratory. By the time such a student reaches the final years of training, one tends to depend solely on Western

medicine for solving the problems of health and disease. The products of such educational institutions are responsible for the widespread notion that Ayurveda therapy is slow and ineffective. This is a strange situation when one reflects on the teachings of the great sage-scientists.

In order to demystify and give a fair deal for maintaining the authenticity of Ayurveda fundamentals, the authors feel that current curriculum need to be reformed considerably. Students who have fared well in a higher level Sanskrit/ Tamil course should be selected for training in the beginning until one change the education method using the novel method suggested by Lakshmanan [9]. Education ought to be on the basis of the redacted treatises, thus imbibing the true spirit enshrined in the learner. Efforts should also be made to teach Ayurveda as an experimental medical science with great emphasis on identifying the state of *dosakopam* (disturbance of the humors). Gradually modern syllabus should be trimmed down considerably in order to avoid overload and to allocate more time on understanding the fundamentals of Ayurveda. If Ayurveda is taught in such a “pure” style, the quality of the future practitioners will be vastly improved. Having faith in the ancient science, it is possible to diagnose a diseases basing on the perturbed state of the *tridosha*, choose the correct medicinal formulation(s), the taste, qualities, potency and post-digestive changes which will be matching the state of the disease or disorder and finally ensure that the treatment roots out the primary cause of the affliction.

It is not necessary that extremely orthodox or obscurantist to study Ayurveda, however it has to be understood that a need to understand language and the culture associated with it is important as well. *Charaka* opines that knowledge from any quarter, even from ones miscreants, should be accepted, tested and used profitably [8]. Thus modern curriculum may be introduced, but only in the post-graduate courses and certainly never in the primary basic medical course in the Indian system. The improper and simultaneous introduction of two divergent schools of thought to understand anatomy becomes a nightmare. This has the natural tendency to gradually raise skepticism regarding the scientific validity of Ayurveda based on modern science perspective.

## Research in Ayurveda

### A. Literature review

Sound knowledge of the basic tenets of Ayurveda is a *sine qua non* for efficient clinical practice. Though certain practical difficulties have crept into contemporary Ayurveda practices through centuries of negligence, its theories and principles have been time tested and long lasting such as modern quantum mechanical phenomena. However, sincere attempts are barring to explain in modern scientific language especially on the *Panchaboothas* and *Tridoshas* concepts, which form the basis of Ayurveda. The modest studies conducted by the authors have yielded interesting results favourable for a rational explanation of the *Tridoshas* concept, regarding the scientificity

of which there exist doubts in the minds of modern scientists [10].

Data on the applied aspects of Ayurveda are available in numerous Sanskrit texts, many of which are still unpublished for the modern world. A careful analysis on the literature has the potential to yield invaluable medical tips and resources that can be exploited to combat many diseases such as cancer, heart disease, AIDS etc., which are highly challenging problems faced by the international scientific community [11-13].

### B. Clinical research

It is highly essential to evaluate the efficacy of Ayurvedic drugs using the parameters of western medicine also. Such comparative clinical studies can pave way for global-level acceptance of the medicine. Figure 2. Illustrates an example where Ayurvedic Photosensitizers can be developed and tested as a comparative study to surya Ayurveda techniques that can be referred to *Rig Veda.IX.114.3*. However, the type of clinical research carried out today (mostly in India) is unfortunately detrimental to the core principles of Ayurveda. Not paying attention to the fact that Ayurveda and Western medicine differ fundamentally, investigators try to evaluate the efficacy of Ayurvedic medicines using insufficient experimental protocols. Invariably Western medical parameters are used for the diagnosis and Ayurvedic medicines for treatment. Most of the time researchers come across results that conclude that in clinical trials a particular formulation is found to have cured only 10% to 20% of the patients or sometimes that these drugs are proven to be totally ineffective. The Ayurvedic treatment has been time-tested and have been used since ancient times to diagnose and cure the particular disease, therefore an experienced traditional practitioners would always wonder how such incredible conclusions are arrived at. Often the Western medical system *in toto* or its experimental approach could be possibly blamed for the futile research.

Pondering over the subject the authors have arrived at the conclusion that these strange results are obtained by faulty design of experiments. While treating diseases Ayurvedic practitioners are expected to examine closely the following points for accurate diagnosis of the stage of a disease and subsequent selection of therapeutic protocol [14] as illustrated in Figure 2.

- 1) *Dusyam*: The “tissue elements” which form the human body
- 2) *Deasm*: The type of country where the patient resides
- 3) *Balam*: Stamina of the patient
- 4) *Kalam*: The season in which the diagnosis is made
- 5) *Anala*: State of the “abdominal fire”
- 6) *Prakrti*: Physiological constitution
- 7) *Vaya*: Age of the Patient
- 8) *Satvam*: Emotional constituent of the patient
- 9) *Satmyam*: Substances used and life style of the patient
- 10) *Aharam*: Diet nature and method of intake

These variables should be considered in any serious clinical Ayurvedic study and the results should be interpreted

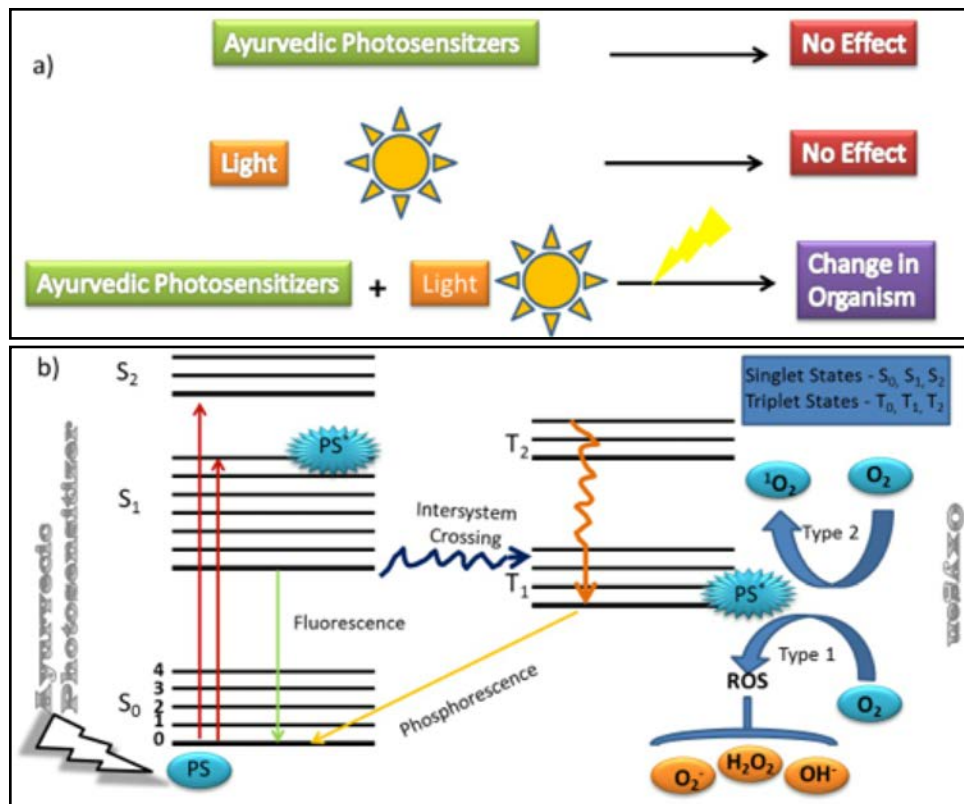


Figure 1: a) The effect of Ayurvedic root based ingredients with light used in surya Ayurveda b) Jablonski diagram illustrating the possible mechanism involved in Photomedicine.

accordingly. These conditions demands further research on large patient population statistics. The authors expect that by proper application of western framework the efficacy of Ayurvedic medicines can be well established.

**C. Comments on the quest for the active principle**

There is a tendency among ayurvedic researchers to look for the active principle of a drug. After a laborious process the active ingredient of a single drug can be isolated. But the chemical component may behave similar to any other pharmaceutical ingredient - it may possibly exhibit its side-effects due to the contamination and additives added during the processing steps. However, the core principles of Ayurvedic drug combination is to nullify these undesirable pharmacological effects.

The Ayurvedic herbs may contain numerous contaminants due to the use of chemical fertilizers, pesticides and

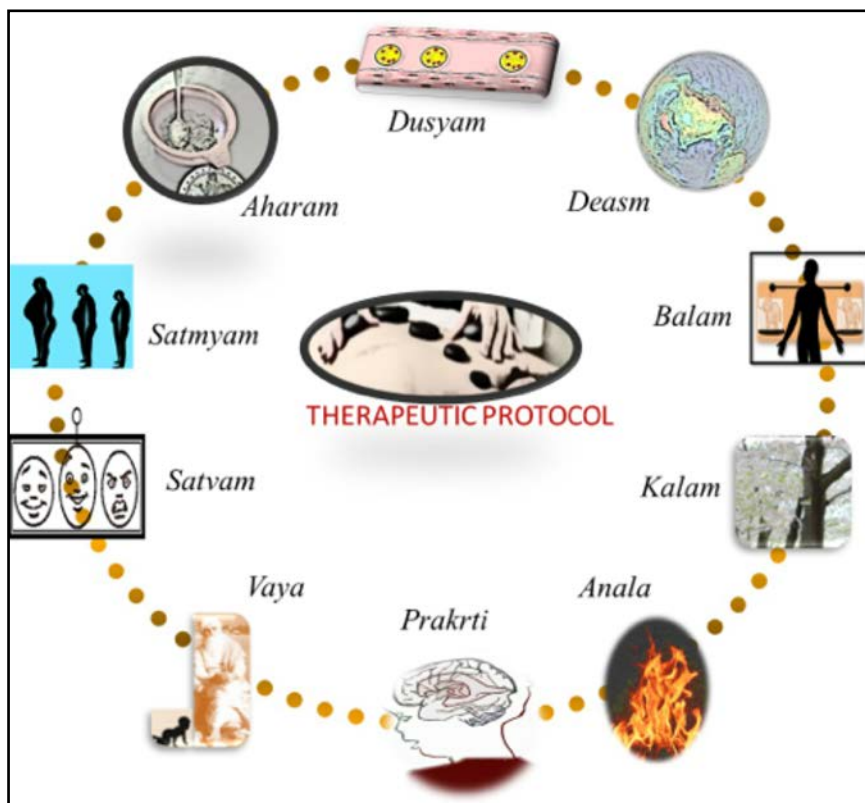


Figure 2: Therapeutic Protocol that need to be considered in Ayurvedic diagnosis; Dusyam, deasm, balam, Kalam, Anala, Prakriti, Vaya, Satvam, Satmyam and Aharam are the ten different parameters.

GMO products. Also the industrial processing for commercialization and long distance transportation can accumulate a huge number of foreign elements whose effect could nullify the benefits of Ayurvedic herbs and treatments. It is possible that in the process there can be cross reactions. Moreover, even Ayurveda classics state that there is synergistic effect of drugs [15]. For instance when medicated spirituous liquors (*arista* and *asava*) are prepared, the herbal decoction or juice is allowed to undergo fermentation wherein some of the compounds in the medium may be acted upon by the microbes. One more possibility is the contamination through air borne bacterial which is inevitable.

Ayurvedic drugs ingested by the patient undergo chemical reactions inside the body and some metabolite may be the therapeutic agent. Thus many ayurvedic medicines may have properties which qualify them to conform to the modern drugs which are commercialized for contemporary pharmaceutical research [16-17]. The Vyas Committee appointed by the Government of India in 1962 to suggest improvements in Ayurveda education and research, has strongly criticized the practice of isolating therapeutically active compounds using

grants that are earmarked for the development of Ayurveda [18]. Nevertheless, similar trend prevails in many Ayurveda research institutes. However, Ayurvedic fundamentals of medicine, can be understood only when one gets a clear picture of the axiomatic construct [9, 19].

## Conclusion

It can be concluded that that when diseases are properly diagnosed and treated exclusively based on the paradigm shift principles of Ayurveda, all the practical problems facing the Ayurvedic system can be resolved. A “true” pharmacologic study, embedding the Ayurvedic fundamentals of medicine, is possible only when one gets a clear picture of the axiomatic construct of Ayurveda. Without applying the “tridosha code” viewing Ayurveda under the lens of modern medicine can become detrimental to the core principles of Ayurvedic fundamentals. In this paper the authors put forward their strong opinion that resurrection and reconstruction of Ayurveda (using new sets of axioms-that address the needs of the modern world, while maintaining authenticity and respect toward the original knowledge provided in the ancient texts) is imperative. Concerted and far-sighted action by a team of Ayurveda scholars and modern scientists alone can polish and bring to light the ancient and yet very much “contemporary” Ayurveda Way for the betterment of the world at large.

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