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Evaluating Ancient Indian History and Culture towards Malaria Control Measures Based on Traditional Knowledge System

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Abstract:

India, the country which incorporated its efforts towards (RAT) the innovation of light (AABHA) and that's why it was named BHARAT. It depicts the country proceeding towards light of Truth (SAT), Consciousness (CHIT) and Bliss (ANANDA). Parallel to spiritualism, Indian Intelligentsia tried to protect the body from diseases, which is supposed to be temple of God. Ayurveda is a holistic approach to cure the diseases by natural means. The Objectives of the work is to cover historical aspect of disease treatment in ancient India, to appreciate customs and practices prevalent in ancient Indian societies for malaria control which was primarily based on traditional knowledge system by carrying out multi-sectoral inter disciplinary work. It is tried depict the approach of ancient Indian wisdom in treatment of malaria by different means i.e. Ayurveda, Herbs, Yoga, Mudras etc. This shows the vastness of Indian understanding of health which is worth following by modern science. However, Modern medical science is now embracing ancient Indian Health wisdom and pursuing enormous researches after experiencing inappropriateness of modern medical science. The burning example of it is AYUSH, to led researches in Ayurvedic, Yunani, Sindhi and Homeopathy ways of treatments.

Keywords: Ancient Indian History; Antimalarial; Ayurveda; Charak & Susruta *Sanhita*; Medicinal Plant; Traditional Knowledge System.

1. Introduction:

Malaria is a foremost health problem in tropical, subtropical world and to the world which are socio-economically backward. In India, 95 % population resides in malaria endemic regions and it is major public health problem in most part of the country. Malaria is a parasitic protozoal disease, caused by parasites of Plasmodium genus. About 92% malaria cases and 97% of deaths due to malaria is reported from North-eastern states ,Chhattisgarh, Jharkhand, Madhya Pradesh, Orrissa, Andhra Pradesh, Maharashtra, Gujraat, Rajasthan, West Bengal and Karnataka ¹. Around 2.5 million malaria cases are reported annually from South East Asian Nations ², of which India alone

contributes 76% of in the global malaria incidences (WHO, 2012). Its general symptoms are high fever come with chills, intermittent fever, and very often headache as well as trembling as major symptom.

The preventive health measures have still not been able to penetrate the economically downtrodden society including typical rural and schedule tribes. Their life is purely dependent on traditional knowledge system (TKS) of herbal plants. The native people are exploiting a variety of herbals for effective curing of various ailments and most widely malaria. Such herbal plants possess potential remedy even for some incurable disease. The plant parts used, preparation method of medicine from it, and its administration as drug varies geographically. However, the knowledge of herbal medicines is gradually perishing, although some of the traditional herbal men like *Vaidyas & Hakims* are still practicing the art of herbal healing effectively³.

Many ancient texts mention about various aspects of malaria and its linkage with bits of insects and mosquitoes. Ancient medical literatures suitably recognize malaria, its symptoms, cure methods and such study offers us new avenues for tackling the modern malaria epidemic. India is known to be one of the rich bio-diverse regions of the world equipped with enough anti-plasmodic plants and has huge traditional & cultural legacy. India possesses rich floristic wealth and diversified genetic resources of medicinal plants. Several plants are used in traditional medicine for the treatment of malaria and fever in many parts of the world. History of malaria is known since the existence of mankind and also the history of medicinal plants is as old as history of civilization and the relevance of traditional knowledge for local health treatments have not diminished despite of the deeper penetration in the modern aspect of medicine system. 25 % of the drugs are primarily plants dependent and 75 % world population of developing nations are still dependent of traditional knowledge system of medicine⁴.

Over time, malaria spread from Africa along travel/shipping routes to Europe, India, China and Indonesia⁵. It is an amazing fact that Malaria was considered as a Deity, in Greek mythology, who lives in marshes. Around 500 BC, the father of medicine in Greece, Hippocrates threw light on the root cause of Malaria and had argued that the stagnant water is the very reason for the birth of mosquito. Further, he went on writing on ill effects of stagnant water as those who drink it have always hard, thin, hot stomachs and large, stiff spleens while their collarbones, faces and shoulders are thin⁶. Interestingly, he was talking about malaria only as evident from the symptoms.

1.1 Indian time line of malaria

In Hindu mythology, God of death is Lord Shiva; Malaria might be his weapon for apocalypso. Vedic literature (3500 – 2800 BC) and Brahmanical Literatures (2800-1900 BC) describe many fevers a kin to Malaria. Early man accredited all kind of fevers to angered deities, evil spirits, demons and black magic. Indian legacy continued its saga from as early as period of Dhanvantari during 800 BC. Dhanvantari claimed bites of mosquitoes could cause diseases like, fever, shivering which is Malaria symptom. Later during 300 BC, Charaka *Samhita* classified the fevers into five

different categories. Further, around 100 BC Susruta *Samhita* was written and it confirmed the relationship of different types fever with the insect bites. Then, in late 19th centuries Ronald Ross at Secunderabad, India demonstrated oocysts in the gut of anopheline mosquito and confirmed that mosquito was the vector for primarily responsible for malaria. At present, with multilateral interventions from institutions like National Vector Borne Disease Control Program (NVBDCP) ¹ and National Institute of Malaria Research (NIMR), New Delhi; medicinal history of India has sailed to new epitome of victory and valor.

The Objectives of the current work is to cover historical aspect of disease treatment in Ancient India, to appreciate customs and practices prevalent in ancient Indian societies for malaria control which was primarily based on traditional knowledge system by carrying out multi-sectoral inter disciplinary work. And, further to derive meaning from ancient literature to prepare road map for modern challenges and current medication system especially millennium most fatal disease of malaria which is killing millions of people every year.

2. Methodology

2.1 Literature survey

Study is based on extraction of ethno-medicinal utilities of plants based in various literatures, books ⁷⁻⁸ and it was cross examined and validated with traditional knowledge discussed in published research papers & journals ⁹⁻¹⁰.

2.2 Development of traditional knowledge system

The medicinal virtues of plants are identified by instinct/intuition or by trial and errors. Globally, traditional healers are using various medicinal plants for the treatment of malaria; however, this practice is not really completely recognized by modern medical Science. Knowledge about traditional medicinal practices and plants is currently transmitted from generation to generation principally by word of mouth. Large number of plant species has been identified as anti-malarial medicinal plants.

3. Results

3.1 Plants having anti- malarial activities

There are numerous plants like *Duranta Repens*, *Rauwolfia serpentina Benth*, *Ocimum sanctum*, *Azadirachta indica*, *Tamarindus indica*, *Ficus bussei* etc ¹¹, that have been widely published. Beside all these Herbs some more useful Herbs which contains anti-malarial properties are - Caper-bush, *Teclea nobilis*, *Governor plum*, *Shrub verbenas*, Curry bush, *Sibipiruna*, *Bankanas*, *Viola serpens Var.*, Bitter Oleander, Grains of paradise, Ginseng, Toothache Plant, Alstonia, Cheesewood, Damsisa, Um Galagel, El-Handal, Kamun-Aswad, El-Hargel, Sunkurtae, Feaxxo, Bissano, Chugughee etc ¹².

3.2 Traditional Indian ways to malaria cure

Tulsi- this is mentioned in Charaka Samhita and shusruta samhita for its anti malarial properties. In Charaka Samhita the essence of Tulsi leaves is described as efficient medicine for Malaria¹³. It is written as-

“तुलसी कानन चैव गृहे यास्यावतिष्ठते, तदगृहं तीर्थभूतं हि नायान्ति ममकिंकरा।

तुलसी विपिनस्यापी समन्तात् पावनं स्थलम्, क्रोशमात्रं भवत्येव गांगेयेनेक चांभसा।

Means the home with Tulsi is like a pilgrimage where no grievances and sickness can enter into. One more modern Research throws its light on anti malarial properties of Tulsi essence. In nut shell the conclusion is that Tulsi leaves can kill the Malarial Parasites¹¹.

Neem- Ancient Health wisdom knows that the area surrounded by Neem Tree remains free from malarial parasites.

There are many other plants that are found to have strong anti-plasmodic activities (Table 1).

Table 1. Indian Anti-malarial plants from ancient literatures

S. No	Botanical Name	Family	Vernacular Name/ Medicine	Knowledge Known Since	Methodology Used	Plant Part Used	Plant Image	Reference
1	<i>Aloe barbadensis</i> Mill.	Xanthorrhoeaceae	Aloe vera	200 Years	As herbal paste obtained with mixing plant with water	Root		[14] Pg-139.
2	<i>Ocimum sanctum</i> Linn.	Lamiaceae	Tulsi	500 Years	By applying pressure on leaf to extract juice & mixed with water	Leaf		[15] Pg-129.
3	<i>Argemonemexicana</i> Linn.	Papaveraceae	Satyanashi	500 Years	Rasdravya like Hg. HgS & herb is prepared by method of trituration in mortar	Root		[16] Pg-67
4.	<i>Leucascephalotes</i> Spreng.	Lamiaceae	Dronpushpi	500 Years	By applying pressure on leaf to extract expressed juice and mixed with water	Stem, Bark, Leaf, Flower & Fruit		[15] pg-129.
5	<i>Tinosporacaridifolia</i> Miers	Menispermaceae	Giloe	200 Years	Decoction of stem is given	Stem		[17]
6	<i>Daturastramonium</i> Linn.	Solanaceae	Dhatura	500 Years	Expressed juice with Hg, blue vitriol & As ₂ O ₃	Seed & leaves		[17] Pg 302
7	<i>Momordicacarantia</i> Linn.	Cucurbitaceae	Kathnim	500 Years	Rasdravya like HgS, As ₂ S ₃ prepared by trituration in a mortar	Roots		[17] Pg 302 [18] Pg 123
8	<i>Andrographispaniculata</i> Wall. ex Nees	Acanthaceae	Kalmegh	1000 Years	As decoction with tinospora, Swertia chirayita & Terminalia chebul	Stem, Bark		[19] Pg 8

9	<i>Calotropis procera</i> (Aiton) A.T. Aiton	Asclepiadaceae	Mudar	100 Years	Rasdravya like HgS, Hg & As ₂ S ₃ prepared by trituration in mortar	Latex		[17] Pg 301
10	<i>Piper longum</i> Linn	Piperaceae	Indian long Peeper	200 Years	Rasdravya with HgS, Hg & <i>Mristicafra</i> <i>ns</i> by trituration in a mortar	Fruit		[20] Pg 294
11	<i>Euphorbia nerifolia</i> Linn	Euphorbiaceae	Indian spurge tree	100 Years	Rasdravya like HgS, As ₂ S ₃ & Hg prepared by trituration in mortar with <i>Semicarpus anacardium</i>	Latex		[17] Pg 300
12	<i>Aconitum ferox</i> Wall. ex Ser	Ranunculaceae	Indian aconite	500 Years	Rasdravya like Hg, S & prepared by trituration in mortar with <i>Croton tiglium</i> , <i>Citrus limon</i> & <i>Argemone mexicana</i>	Root Tubers		[17] Pg 285
13	<i>Cannabis sativa</i> Linn.	Cannabaceae	Hashish, Hemp	500 Years	Rasdravya like Hg, S & prepared by trituration in mortar with <i>Croton tiglium</i> & <i>Piper nigrum</i>	St. Bark Leaf Flower		[17] Pg 308
14	<i>Eclipta prostrata</i> (Linn.) Linn	Asteraceae	Bhangraiya, Bhringaraj	200 Years	Rasdravya like Hg, S & <i>Daturametel</i> , <i>Aconitum ferox</i> and prepared by trituration in mortar	Roots & leaves		[17] Pg 303
15	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Ginger	500 Years	Rasdravya like Hg, S, FeSO ₄ & <i>Piper longum</i> , <i>Terminalia chebul</i> & <i>Michelia champaca</i> & by trituration in mortar	Rhizome		[17] Pg 305

16	<i>Citrus limon</i> (Linn.) Burm. f.	Rutaceae	Lemon	500 Years	Rasdravya like Cu, Hg, S, As ₂ S ₃ & fruit of lemon is prepared by trituration in mortar	Fruits		[17] Pg 143
17	<i>Solanum indicum</i> Linn.	Solanaceae	Nightshade	200 Years	As decoction of plant part with ginger, earths smoke, nightshade, chirata pepper & honey.	St Bark Leaf Flower		[17] Pg 2
18	<i>Vitex negundo</i> Linn.	Lamiaceae	Negundo	500 Years	Rasdravya like Cu, Fe, Hg, mica, rock salt & herb pepper is prepared by trituration in mortar	Roots		[17] Pg 307
19	<i>Aconitum chasmanthum</i> Stapf & Holmes	Ranunculaceae	Aconite Visha	500 Years	Rasdravya like mica, Cu, Hg, S & herb, dhatura, ginger pepper is prepared by trituration in mortar	Root tuber		[17] Pg 307
20	<i>Moringa pterigocarpa</i> C. F. Gaertn.	Moringaceae	Drumstick tree	100 Years	Prepared as pill from herb, S, Hg, tinospora, aconite, ginger & pepper.	Stem bark		[17] Pg 290
21	<i>Senecarpus naccardium</i> Linn. f.	Anacardiaceae	Markingnut tree Bhallatak	100 Years	Rasdravya like Hg, S & herb, ginger, pepper, sandstone, borax & croton is prepared by trituration in mortar	Fruits		[17] Pg 296
22	<i>Cyperus scariosus</i> Br.	Cyperaceae	Mustaka	100 Years	Rhizome is dried & obtained as pills using mica, dhatura, cumin, Adhatodavasic & tinospora.	Rhizo me		[17] Pg 287
23	<i>Croton tiglium</i> Linn.	Euphorbiaceae	Jamaal gota	100 Years	Part is dried & mixed with S, Hg, borax, ginger, pepper & aconite to form mortar.	Endos perm		[17] Pg 296
24	<i>Plumbago zeylanica</i> Linn.	Plumbaginaceae	Leadwort	1000 Years	As herbal paste in milk consisting of ginger, pepper, rock salt & roots of leadwort.	Roots		[17] Pg 182
25	<i>Tamarindus indica</i> Linn.	Fabaceae	Tamarind	500 Years	Rasdravya like Hg, Cu, S, HgS, Sn, Fe, CuFeS ₂ , ZnCO ₃ , Mica, borax, lemon, tulsi, hemp & herb is prepared by trituration in mortar	Leaf		[20] Pg 276

mortar

3.3 Treatment of malaria by Mudras

In Ancient book Hatha Yoga Pradipika, mudras are mentioned as complimentary Yoga. Mudra works basically on Panch Tatwa of the body and Prana (Vital Force). Five fingers of man's hand represent five elements (*panch tatwa*) Mudra science suppose that any disease affects the human body due to imbalance in natural setup of the 5 elements and Prana. So Mudra creates Balance in those essential elements. In Malaria, Prana Mudra (Figure 1) and Apana Mudra (Figure 2) are very useful. Prana Mudra activated the immunity of the Body whereas Apana Mudra eradicates the foreign impurities and this way Mudra is useful in treatment of the Malaria ²¹. These are the ways through which Ancient Indian wisdom were trying to cope against Malaria to which modern Medical Science approves.



Figure 1. Demonstrating Prana Mudra



Figure 2. Demonstrating Apana Mudra

Mudra Science is a part of Ayurveda which is supposed to be evolved in Rigveda by Brahma when he was creating the Universe. Ayurveda is supposed to be fifth Veda and the knowledge was reached to Sushruta and Charaka by Bhardwaja, Aitreya, Indra, Ashwini Kumaras and Agnivesha. Charaka Samhita is just modified compilation of Agnivesha Tantra. Bhava Prakasha, in which Mudra science is mentioned, is part of Agnivesha Tantra.

4. Discussion

4.1 Tracing Indian History: Medicinal milestones

Brahmanical scriptures of Indus valley has several references that's relates fever to malaria. It is claimed in the Atharva Veda that after excessive rains (*Mahavarsha*) fevers were common as well as when there was huge grass cover. Later, it was proved by many in late 21st centuries ²²⁻²³ that environmental and climatic factors plays crucial role in influencing malaria incidences & its transmission. Rainfall does not affect parasite directly but it provides medium for aquatic mosquito stages.

Dhanvantari (800 BC) was known as the Doctor of Deities in Hindu scriptures. He mentioned Malaria fever and its symptoms and has written about mosquito bite and compared it as painful as that of the serpents and such bite causes diseases, wound as if burnt with caustic or fire, is red, white, pink and yellow colour, accompanied by fever, pain of limbs, hair standing on end, pains, burning sensation, intense cold, vomiting, diarrhoea, thirst, giddiness, yawning, shivering etc ⁶.

Charaka *Samhita* (300 BC) has described malaria symptoms and suggested its Ayurvedic treatment. The Charaka Samhita classifies the fevers into five different categories, viz., remittent fevers (*satatah*), continuous fevers

(*samatah*), tertian fevers (*trtiyakah*), quartan fevers (*caturthakah*) and quotidian fevers (*anyedyuskah*). Susruta *Samhita* (100 BC) even established association of fevers with the bites of the insects²⁴.

In Ancient India there were innumerable Herbs and plant which were being used in treatment of Malaria. 1277 plant species from 160 families used to treat malaria²⁵. Ayurveda mentions numerous herbs and plants which were used in treatment of fever. Ayurveda has identified Malaria fever since hundreds of thousands years before and founded the foolproof treatment of this diseases, conditions and its syndromes. Ayurveda termed it as VISHAMA JWAR²⁶ which has classified according to their symptoms and natures. Madhava Nidana is the classic book of Ayurveda which describes all kinds of fever in detail²⁷. Ayurvedic treatment of Malaria is depending on tri-Dosha. There are three Doshas or in capabilities in human according to Ayurveda and i.e. *Vata*, *Pitta* and *Kafa* and on inclusion of Sapt Dhatu and Mala. Ayurveda classifies 7 elements of the body. These are *Rasa*, *Rakta*, *Mansa*, *Majja*, *Asthi*, *Meda*, and *Shukra*. Mala are the substances or waste matter to be thrown out of the body. They are actually by products formed as a result of various physiological activities going on in the body. *Purish* (stool), *Mutra* (urine) and *Sweda* (sweat) are considered as main excretory product of the body. The diagnosis of these three is the base of the selection of right medicine for Malaria of any fever. For the treatment of Malaria it is essential to clear the Bowl and Ayurveda uses Trifla, Amaltash and Nisotha to clear the bowl easily.

Some very common Ayurvedic Herbs to cure Malaria are *Veronia cineria*, *Adina cardifolia*, *Gentiana kurroa*, *Momordica charantia*, *Momordica cochinchinensis*, *Alastonia scholarasis*, *Ciasalpinia bundisella*, *Leweas cephalotas*, *Ocimum sanctum*, *Swertia chiraita*. These herbs solely or in combined form can cure the Malaria. Apart from these herbal medicines there are many more complimentary Herbs which are widely mentioned in the famous Ayurvedic Book Bhav Prakash. This book is classic one which contains wide range of medicines for different fever including Malaria²⁸. Some Herbal medicines which are useful for Malaria and are free from any side effects and are absolutely safe to use find places in Bhav Prakasha. Such medicines are *Sudarshan Ghan vati*, *Maha Sudarshan Churna*, *Sudarshan Churna*, *Saptam Ghan Vati*, *Nimbashava Nimbadi Churna*, *Amritrista*, *Kalmegha Shava* and *Guruchi Ghanstava Vati*.

4.2 Why herbal plants in the treatment of malaria?

Apart from the pharmacological treatment, various options are being used since ancient times for many health ailments. Nearly 80 % of the global population still depends upon the herbal drugs for their health care. In India, the use of several medicinal plants to cure specific ailments has been practiced since ancient times. Various cultural traditions are associated with use of wild plants as medicinal herbs. This medico-lore is passed over generations traditionally all over the world. Reliance on plants is primarily due to their safety, effectiveness,

cultural preferences, Inexpensiveness and abundant availability all the time.

4.3 Praising Indian Heritage

History of medicinal plants has proved to be an eye for future directions of search of plants with anti-plasmodic activities. Ancient books have been referred for finding out Indian legacy over malarial medicinal control of ancient people masses. Many of the texts are available in Sanskrit and Devnagari Script and its nearest meaning have been taken in English. Our Sage, who encountered Mysticism in normal life, defines Matter in the Light of Consciousness. Science in 18th century Science could get the conclusion that matter is only the condensed form of light (electron) or energy, nothing else. In 6 Century BCE Sage KANADA invented PARAMANU (Atom) and in 2nd Century BCE PATANJALI invented YOGA. YOGA literally means merging of man into Supreme and only this way Man can attain total Health (SWASTHYA). The western term Health is derived from HEAL. It means 'to treat' but it is not that much deeper phenomenon as Swasthya is, it is not the synonyms of SWASTHYA. SWASTHYA is very vast phenomenon. It means Centered within or centred in 'Self' (swa+stha). And at the Centre is nothing else but Supreme entity. YOGA means to add the uprooted part of being to its centre. Hence Yoga is the only way to attain Swasthya.

AYURVEDA emerged thus from RIGVEDA. It is texted in Rigveda that with the emergence of Universe God has propounded the knowledge of Ayurveda. According to Charaka Samhita the first Ayurveda preacher was Brahma, The Creator, who transferred the very knowledge to Prajapati (head of Hindu Deities) from which it flows through Ashwani Kumaras (Doctors of Hindu Deities), Indra, (King of Hindu Deities) Bhardwaj (A Sage) to Dhanwantari. Lastly, in this chain, Agnivesha got the knowledge of Ayurveda who texted it in Agnivesha Tantra which is finally compiled by Charaka and named as Charaka Samhita (Rigveda).

Conclusion:

The holistic approach in treatment of malaria needs many dimensions, Indian subtle science believes that we are not just Material but we are much more than this. This Virtual part or unseen part of being is termed as Atma. And this Atma is part of Supreme Atma or Param Atma. The disease is one and this is separation of this Atma from its Origin, Parmatma. The way is one YOGA. YOGA means 'To Add'. And that Added form is called SWASTHYA, means Centred within one self. Ayurveda suppose this doctrine a roadmap to treat any disease. Disease means DISEASE. Restlessness. If we are not centred within than its obvious to remain in restlessness. Ayurveda makes patient EASY at physical level. Yoga makes him centred and hence Swasthya takes place. Malaria was just a case study through which we tried to depict the very picture to show the approach of Ancient India to cure a disease.

There is serious obstacle in data acquisition that researchers find because of the sensitive nature of the data sought from TKS. Local people may not like the intention of outside researchers and they may have apprehension against external intervention is their highly fragile system because of increasing demand & need. Many communities use antimalarial plant parts & whole plant for their primary healthcare. It is primarily due to lack of modern medicines, medications, self-reliance on herbs, poor economic condition and more importantly faiths in TK System. The treatment of malaria with plants and plant parts causes little or no side effects and also it is very cheap and affordable. The TK coupled with new technology will make such study highly useful for basic amenity stressed nations like India.

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