



## CONCEPT OF “VISANKRAMANA”- A COMPREHENSIVE REVIEW ON AYURVEDIC DISINFECTION

**Dr Archana Panchaxarimath\***

Professor and HOD Department of Swasthavritta and Yoga, Sumandeep Ayurved Medical College and Hospital Sumandeep Vidyapeeth At and post: Piparia, Tal. Waghodia, Vadodara-391760, Gujarat, India. \*Corresponding Author

**ABSTRACT** Ayurveda the ancient science of life emphasizes on prevention of disease and maintenance of health. The personal hygiene plays a pivotal role in controlling the transmission of disease. The disease-causing microorganisms present in our environment and may cause infections. *Visankramana* (Disinfection) is the procedure explained in Ayurvedic classics to prevent the transmission of infectious diseases. Our ancient Acharya's emphasized the importance of disinfecting the room and articles used by the patients to prevent the communicability of infectious disease. Several traditional techniques such as *Dhoopana* and have been adopted in the fumigation process to minimize microbial load in the environment to non-pathogenic level. Surgical instruments can be disinfected by traditional methods like *Payana*, *Dhoopana*, *Parisheka* and *Agnitapana* etc. Similarly, there are various classical references for disinfection of air, water, and land. This suggests that there is lot scope for the researchers to explore and evaluate the efficacy of traditional methods of disinfection.

**KEYWORDS :** Disinfection (*Visankramana*), Fumigation, Antimicrobial

### INTRODUCTION:

Disinfection (*Visnkramana*) is a well-known method to reduce the nosocomial infections which are the major health care associated problems worldwide. There are millions of micro-organisms around us in air, cloths, on floor and other surfaces. Since ancient times, naturally available plants have played an important role in disinfection. *Acharya Sushruta* in his work, *Sushruta Samhita* described *Dhoopana* with *Rakshoghna Dravyas*. He has stated many combinations and different types of *Dhoopa* for different types of organisms. *Acharya Sushruta* has explained *Rakshavidhan* under *Shasthi upakrama*. He emphasizes on *dhoopana* for *vranit* (patient of wound) to ensure sterilization. In *Kashyap Samhita* entire chapter named *Dhoopa kalpa* is dedicated on this subject. He has mentioned many formulations of *dhoopa* for fumigation of cloths, Pediatric ward, patient's bed.<sup>[1]</sup> In *Charak Samhita Chikitsasthan* 25th *Acharaya Charak* has explained *dhoopan karma* (fumigation) for prevention of *Vrana* (wound).<sup>[2]</sup> *Acharya vagbhata* in *Astangahridaya* mentioned fumigants of Jaw (*Hordeum vulgare*), *Ghruta*, *Bhurja Patra* (*betula utilis*), Wax, *Gandha biroja* (*paederia foetida*) and *Devdar* (*Cedrus deodara*) for killing microorganisms. In chapter 1st *Balopacharniyam* acharya has mentioned to fumigate pediatric room, bed with *Rakshoghna dravyas*. He said fumigations of killed crow painted with three *sneha*'s such as (fat, oil, and bone marrow) makes best effect.<sup>[3]</sup>

Even though various disinfection methods are generally followed as per modern science in most of the domestic and professional setups, they have their own disadvantages like adverse effects on human, animal, and plants on long term use. *Ayurveda* recommends fumigation (*Dhoopana*) as a method of disinfection for various chambers like *Shastragara*, *Kumaragara*, *Sutikagara* and for instruments like *Yantra* and *Shastras*, the methods are *Payana*, *Dhoopana*, *Parisheka*, *Agnitapana* etc. *Sushruta* has also explained the method of treating *Vrana*, *Vranitagara* and *Shastrakarmaghruha* by *Dhoopana*. *Visankramana* or *Nirjantukarana* is the ayurvedic term used for Disinfection. This is an ancient method adopted for purification water and air, also for disinfection of fomites to break the chain of disease transmission. The fumigation through herbo-mineral drugs has large potential to solve the problem of hospital acquired infections (nosocomial infections).<sup>[4]</sup>

### AIM:

To critically review the available references on methods of disinfection in Ayurveda classics.

### MATERIAL & METHODS:

Literary analytical method of research is adopted in present study. Classical text books of *Ayurveda* like *Charak Samhita*, *Sushruta Samhita*, *Ashtang Samgrah*, *Ashtang Hridayam* and *Kashyap Samhita* etc. online publications cited through Google scholar, science direct, research gate, MEDLINE database etc. modern science books like park's text book of preventive and social medicine are also the source of content for this review article.

### REVIEW OF LITERATURE:

**Purification of Water:** Polluted water is purified by, *Agniquathana*

(boiling) *Suryatapa pratapana* (exposing to sunlight), Dipping heated *Loha pinda*/ Sand/ *Ishtika* in water and then *Nagakeshara*, *champak*, *kamala nala*, *ketaki pushpa* are added to make water fragrant. The turbidity of the water can be treated with *Kataka*, *Gomedaka*, *Bisagrathi*, *Shaivala moola*, *Vastra galana*, *Mukta* and *Mani* (Alum).<sup>[5,6]</sup> Ash of herbs such as *Dhava* (*Anogeissus latifolia* WALL. EX.), *Ashvakarna* (*Dipterocarpus alatus* ROXB.), *Asana* (*Pterocarpus marsupium* ROXB.), *Paribhadra* (*Erythrina variegata*), *Siddharthaka* (*Brassica alba* L.), *Mokshaka* (*Schrebera swietenoides* ROXB.), *Aragvadha* (*Cassia Fistula*), *Somavalka* (*Acacia leucophloea* ROXB.), *Katphala* (*Myrica nagi* Thumb.) were recommended to be added about one *anjali* (100-135 ml) to the pitcher containing water. As an alternative, an *Anjali*-measure (half a seer) of the said ashes cast in a *Ghata*-measure (sixty-four seers) of the required water would lead to its purification.<sup>[7]</sup>

### Purification of air:

In Vedic literature, there are references of *Homa-Havana* and *Yajna*, sterilization of air by *Agnihotra*, sterilization of house and place around it by *Dhoopana* (Fumigation with medicated smoke).<sup>[8]</sup> *laksa* (*Ficus lacur*), *Haridra* (*Curcuma longa*), *Ativisa* (*Aconitum heterophyllum*), *haritaki* (*Terminalia chebula*), *mustā* (*Cyperus rotundus*), *ela* (*Euleteria cardamomum*), *valka* (*Cinnamomum tamāla*), *kustha* (*Sassuria lappa*) and *Priyangu* are used in the form of fumes to purify air.<sup>[9]</sup>

*Karpura* (*Cinnamomum kamphora*), *Devadāru* (*Cedrus deodara*), *Dhūpa*, *Candana* (*Santalum indicum*), *Śrīvāsa*, *Sarja* (*Shorea robusta*), *Agaru* (*Aquallaria agullacha*), *Nimba* (*Azadirachtaindica*), *Somarāji* (*Psoralea corilifolia*), *Gandhaka* (Sulphur) & *Guggulu* (*Commifera mukul*) are used in *Havana* i.e. sacrifice to purify the air.<sup>[10]</sup>

**Disinfection of Land:** Traditionally land can be disinfected by sweeping, burning, leaving for certain period, grazing of cows, sprinkling of water or disinfectant, scraping, land covering. House can be purified by mopping, washing and white washing or painting.<sup>[11]</sup> The poisoned surface should be purified by sprinkling it over with a solution of *Ananta* (*hemidesmus indicus*) and *Sarvagandha* (the scented drugs) dissolved in *Sura* (wine), or with required amount of black clay dissolved in water or with the decoction of *Vidanga* (*Emblia ribes*), *Patha* (*Cissampelos paieta*), and *Katabhi* (*Cardiospermum halicacabum* L.).<sup>[12]</sup>

**Disinfection of Room:** Fumigation of room with *Sarshapa* (mustard), *Nimba* (Neem), *Ghruta* (ghee), and *Lavana* (salt) twice daily for 10 days is advocated for disinfection.<sup>[13]</sup> *Acharya vagbhata* advised to use feathers of crow died of its own mixed with the powder of *Trivrit*, *Vacha*, *Kusta*, *Shrivesta*, *Sarshapa* along with ghee for fumigation of room for the purpose of disinfection.<sup>[14]</sup> Disinfection of the room by fumigating with ten parts of *Putikaranja*, *Siddhartha*, *Vacha*, *Bhallataka*, *Dipyaka*, *Kusta* mixed with ghee will be helpful to ward off all infectious microbes. Fumigation with *Sarshapa*, *Nimbapatra*, roots of *Ashvakhura* (*Girikarnika*), *Vacha*, *Bhujapatra* along with ghee will be helpful for disinfection of room.<sup>[15]</sup>

Disinfection of Wound: Fumigation with *Guggulu* and *Agaru*, *Sarjarasa*, *Vacha*, *Gourasarshapa* etc is advised by acharya vagbhata to for disinfection of wound.<sup>[16]</sup> *Dhoopana* is indicated to purify wound (Vrana) as well as the room and beddings of the patient by *Rakshoghna Dhoopa* made from drugs like *Guggula* (*Commifora wightii*), *Aguru* (*Aquilaria malaccensis*), *Raal* (exudate of *Shorea robusta*), *Vacha* (*Acoruscalamus* Linn.), *Shweta Sarsap* (variety of mustard seeds), *Saindhav Lavana*

(rocksalt), *Nimba Patra* (neem leaves), and *Ghrita* (ghee).<sup>[17]</sup>

Disinfection of Surgical Instruments: Disinfection of surgical instruments prior to surgery is mentioned by *Acharya Sushruta*. Incision is taken after proper heating of instruments, otherwise Paka (pus formation) takes place.<sup>[18]</sup> Disinfection of surgical instruments is done by *Payana* technique.<sup>[19]</sup>

**Table No: 1 Properties Of The Drugs Commonly Used For Disinfection:**

Name of the Drug	Scientific Name	Karma	Research Findings
<i>Guggulu</i>	<i>Commiphora wightii</i> (Arn.)	<i>Krimi Nashaka</i>	broad spectrum antimicrobial activity – <i>Bacillus megaterium</i> , <i>Micrococcus luteus</i> , <i>Enterococcus faecalis</i> , <i>Staphylococcus aureus</i> and fungal strains of <i>Aspergillus niger A. flavus</i> , <i>Candida albicans</i> and <i>Microsporium fulvum</i> <sup>[20, 21]</sup>
<i>Nimba</i>	<i>Azadirachta indica A.Juss</i>	<i>Krimi Nashaka</i>	Antimicrobial property against <i>streptococcus pyogenes</i> , <i>S aureus</i> , <i>Sepidermidis</i> and <i>P. aeruginosa</i> <sup>[20, 21]</sup>
<i>Agaru</i>	<i>Aquilaria agallocha Roxb</i>	<i>Krimi Nashaka</i>	Antimicrobial activity against <i>K. pneumonia</i> than <i>Juniperus oxycedrus</i> <sup>[20, 21]</sup>
<i>Sarjarasa</i>	<i>Shorea robusta Gaertn</i>	<i>Graha Nashaka</i>	High concentration of bioactive components such as alkaloids, glycosides, phenols, tannin, steroids and terpenoids which contribute to high antibacterial activities <sup>[20, 21]</sup>
<i>Vacha</i>	<i>Acorus calamus L</i>	<i>Krimi Nashaka</i>	exhibited potent antiviral activity against herpes virus <sup>[20, 21]</sup>
<i>Shweta Sarshapa</i>	<i>Brassica campestris</i>	<i>Graha and krimi Nashaka</i>	<i>Nematodes</i> , parasites and broad-spectrum antimicrobial and antifungal properties <sup>[20, 21]</sup>
<i>Haridra</i>	<i>Curcuma longa Linn</i>	<i>krimighna</i>	Antimicrobial activity against <i>Aspergillus flaws</i> , <i>Fuserium semitectum Colletotrichum gloeosporioides</i> and <i>C. muse</i> <sup>[20, 21]</sup>
<i>Kusta</i>	<i>Saussurea costus (Falc.) Lipsch.</i>	<i>Shotha Nashaka</i>	antiviral effect against HBV <sup>[20, 21]</sup>
<i>Devadaru</i>	<i>Cedrus deodara (Roxb. ex D.Don) G.Don</i>	<i>Shotha Nashaka</i>	antiviral activity against Herpes simplex virus type-1 <sup>[20, 21]</sup>
<i>Vidanga</i>	<i>Embelica ribes</i>	<i>Krimi Nashaka</i>	Antibacterial activity against both gram positive and gram negative bacteria <sup>[22]</sup>
<i>Ativisha</i>	<i>Aconitum heterophyllum Wall</i>	<i>Krimihara</i>	Antibacterial activity against <i>E. coli</i> , <i>S. aureus</i> and <i>B. subtilis</i> <sup>[23]</sup>

## DISCUSSION:

“*Rakshoghna karma*” described in Ayurvedic literatures have correlations to the aseptic measures and disinfection (*Visankramana*) procedure of modern science. Various procedures like *Dhoopana*, *Payana*, *Parisheka* and *Agnitapana* are adopted by our ancient acharya to disinfect instruments, wards, rooms, beddings, and fomites for disinfection. We also have lot of references on methods to be adopted for purification of air water and land. This serves as evidence for the concept of disinfection in ayurveda. When we go through the properties of medicinal drugs used for these procedures, most of them are having *Katu* and *Tikta* rasa, and *Krimighna Karma*. Research findings are suggestive of broad spectrum antibacterial, antiviral, and antifungal activity of the drugs used for *Dhoopana*, *Payana* etc and various *dhoopana* yogas.

## CONCLUSION:

The formulations mentioned our classics for various types of *Dhoopana*, *Payana*, *Parisheka* etc are effective as antimicrobial. The *Dhoopa Yogas* and *Kashayas* used for fumigation and disinfection of instruments respectively can be an alternative method to modern chemical disinfectants. These herbal and herbomineral and other formulations mentioned our classics can become effective measures of disinfection for prevention of nosocomial infection, water purification, indoor air purification and surface cleaning agents.

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