

## ROLE OF SHODHAN (DETOXIFICATION/ PURIFICATION) ON SOME SCHEDULE E1 HERBAL DRUGS W.S.R. TO VISHA & UPVISHA

<sup>1</sup>Dr. Rajni Bala, <sup>2\*</sup>Dr. Suneeti Chaudhary and <sup>3</sup>Dr. Vikas Chandra Gupta

<sup>1</sup>Professor, Himalayiya Ayurvedic Medical College, Dehradun.

<sup>2</sup>Reader, SRM State Ayurvedic College, Bareilly.

<sup>3</sup>Lecturer, Lalit Hari State Ayurvedic College, Pilibhit.

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**\*Corresponding Author**

**Dr. Suneeti Chaudhary**

Reader, SRM State

Ayurvedic College, Bareilly.

### ABSTRACT

*Visha & Upvisha* are considered highly valuable on account of their quick effectiveness even in smaller doses. But at the same time these are very dangerous also as these may prove very fatal to human beings if used without proper care and in higher doses. Not only this these are likely to produce some toxic effects also in the body on internal use. Hence ancient *Ayurvedic* scholars have advised their *Shodhan* (Detoxification/ purification) methods to either minimize their toxic effects to great extent or to change their toxic effects into desirable

therapeutic effects so as to make these highly useful for the human system. According to *Ayurveda* concept *Shodhan* may not be considered as chemical purification as in many cases the material purified as per *Ayurvedic Shodhan* methods may be added with such materials which from chemical point of view may be considered as impurities but from therapeutic point of view these are considered very essential for improving their therapeutic effects and minimizing their toxic effects. The main objective of *Ayurvedic Shodhan* treatment in case of *Visha & Upvisha* is to remove or lessen the undesired toxic effects of the materials and to make the materials suitable for use.

**KEYWORDS:** *Visha & Upvisha*, *Shodhan* (Detoxification/ purification), *Ayurvedic Shodhan*.

*Ayurveda* involves the use of drugs obtained from plants, animals, and mineral origin.<sup>[1,2,3,4]</sup>

All the three sources of drugs can be divided under poisonous and nonpoisonous category. There are various crude drugs, which generally possess unwanted impurities and toxic

substances, which can lead to harmful health problems. Many authors have reported that not all medicinal plants are safe to use since they can bear many toxic and harmful phytoconstituents in them. *Śodhana* (detoxification/purification) is the process, which involves the conversion of any poisonous drug into beneficial, nonpoisonous/nontoxic ones. *Vatsanābha* (*Aconitum* species), *Semecarpus anacardium*, *Strychnos nux-vomica*, *Acorus calamus*, *Abrus precatorius* etc., are some of the interesting examples of toxic plants, which are still used in the Indian system of medicine.<sup>[5,6,7]</sup> *Aconite*, *Bhilawanols*, *strychnine*,  $\beta$ -*asarone*, *abrin* are some of the toxic components present in these plants and are relatively toxic in nature. *Śodhana* process involves the purification as well as reduction in the levels of toxic principles which sometimes results in an enhanced therapeutic efficacy.<sup>[8]</sup> The list of poisonous plants has been provided in Schedule E-1 of Drugs & Cosmetics Rule, 1945 (Vijay, 2005).<sup>[9,10]</sup> Ayurveda emphasises on administration of these poisonous drugs only after through processing technique called as *Shodhan*.

### Shodhan

To remove the impurities of drug for that *Peshanadi* means *Mardana*, *Kshalana*, *Nirvapanadi* karma's are done that are called *Shodhana*. To remove the *dosha* (impurities) of *dravya* (medicinal substances) is called *Shodhana*.<sup>[11,12]</sup>

According to Ayurved *Aushudikaran* *Shodhana* means only separation of additional drugs. It depends upon structure of *dravya*, ingredients, impurities, properties & some kind of chemical change also. *Shodhana* is combinations of processes which removes unwanted material from the drug & controls toxic effect then enhance the properties of drug.<sup>[10]</sup> While considering the *shodhana* process the substance which has to be purified is called as *Shudhidravya/shodhya dravya*. And the substance with which it is treated for purification called *Shodhana dravya*.

### Types of Shodhan

Mainly two types<sup>[14]</sup> i.e. *Samanya* & *Vishesh Shodhan*.

1. ***Samanya (General)***: It is generally applied for the drugs which are come into one category like *Maharasa*, *Uparasa*, *Ratna*, *Dhatu*. The drugs of one group having some similar types of impurities. So that with the help of *Samanya Shodhana* general impurities can be removed. E.g. *Dhatu- Samanya Shodhan*.

2. **Vishesh (Specific):** It is specifically applied for the drugs which contain high concentrated chemicals. Each drug of the group may have different types of impurities. Which are vary from substances to substances & are removed by *Vishesh Shodhan*.

### Different Procedures & It's Pharmaceutical Action

1. **Swedana** (Vaporizations of raw drugs in certain liquid materials) due to which brittleness occurs by removing external impurities, e.g.- *Hartal* in *Kushmand swaras*.
  2. **Mardana** (Trichuration with *Swarasa, Kashay, Godugdha, Gomutra*) -Particle size of drug becomes synergistic additives which causes an agonistic effect *Jambir Swaras* used to triturate *Tamra patra*.
  3. **Murchana** (Trachuration up to fine disintegration Particle size reduces), e.g.- *Parad* by *Adrak swaras*.
  4. **Patan** (To Distil)- By giving heat to substances so that it vaporizes & the extract is collected Separation of adulterants causes purified medicine e.g.- Extraction of *Parad* from *Hinguna*.
  5. **Aavap/Dhalan** (Melting solid raw drug and dipping in cold liquid). It cause separation of adulterants & reducing brittleness as *Gandhak* in *Godugdha*.
  6. **Nirvap** (Heating solid drug & dipping into cold liquid) reduces brittleness. *Nirvap* example is *Abhrak* in *Triphala Quath*.
  7. **Prakshalan** (To clean or proper washing) removes dust particles & insects *Shatavari* roots washing with water.
  8. **Nimjjan** (dipping) Keeping raw drug in certain liquid for certain time. Chemical Changes from higher concentration to lower concentration takes place. Its good example is *Vastnabha* in *Godugdha – Gomutra*.
  9. **Bharjan** (To fry / to dehydrate Unwanted part evaporates) e.g.- *Kankshi*.
  10. **Sanyog** (Addition of drug into another drug) mininises toxicity or works as antidote, e.g.- *Tankan* in *Vastanabha*.
- Vibhag** (Separation of unwanted part) minimizes the *Tikshanata Rasankur* in *Rasun, Jhivya* in *Kucchla*.
11. **Pachan** (*Shodhya Dravya* Immersed in *Shodhana Dravya* and keeping on fire) due to this process softness occurs and stickiness reduce, E.g.- *Guggulu* in *Gudugdha / Triphala Kwath*.

12. **Shoshan** (Drying in sunlight/moonlights Absorption takes place at tissue level) occurs in *Apamarg bija*. *Sinchan* (Sprinkling liquid on hot red drugs) Brittleness reduces, e.g. *Tamra shodhan*
13. **Sthapan** (Keeping *Dravya* in stable condition) main cause for *Kalgunvradhi* (increases quality of drug) of *Puran gruth*, *Puran guda*, *Puran Guggulu*
14. **Nishtush** (Remove husk from grains) separates unwanted Part such as *Shali Dhanya* To Peel / to remove Skin Separates unwanted Part e.g.- Ginger.

Classical texts of Ayurveda recommend different techniques/ procedure for *Shodhan* of a specific *Visha Dravy*<sup>[15]</sup>, (*Prashant*, 2008 & *Upadhyaya*, 1999)

1. **Achushana** (Absorption) Oily content of certain toxic materials are minimized through different absorption means, e.g. *Bhallataka Shodhana* with brick powder.<sup>[16]</sup>
2. **Bharjana** (frying or roasting) The drug is fried with specific liquid media on *Mandagni* (mild heat), e.g. *Kupilu Shodhana* with cow's ghee.<sup>[17]</sup>
3. **Bhavana** (levigation)<sup>[18]</sup> The drug is triturated with prescribed liquid media for specific time period, e.g. *Ahiphena Shodhana* with ginger juice.<sup>[19]</sup>
4. **Nimajjana** (dipping) The drug is kept immersed in the prescribed liquid media for specific time period e.g. *Vatsanabha shodhan* cow's urine.<sup>[20]</sup>
5. **Swedana**<sup>[21,22,23]</sup> (boiling under liquid bath) The drug is boiled in prescribed liquid media through *Dola Yantra* method.

Among the drugs of herbal origin certain plants are known for their toxic effects and are categorized under *Visha* (poisonous) and *Upavisha* (semi-poisonous) drugs and are used either as a single drug or as an ingredient of a compound formulations. The list of poisonous plants has been provided in Schedule E-1 of Drugs & Cosmetic rule, 1945(*Vijay*, 2005).<sup>[24]</sup>

### Schedule-E(1)

List of poisonous substances under the Ayurvedic (including Siddha) and Unani Systems of Medicine.

### Ayurvedic System

#### Drugs of Vegetable Origin

*Ahipena* (*Papaver somniferum* Linn.)

*Arka* (*Calotropis gigantea* (linn.)R. Br. ex. Ait.

*Bhallataka* (Semecarpus anacardium Linn. F.)  
*Bhanga* (Cannabis sativa Linn.)  
*Danti* (Baliospermum montanum) *Dhattura* (Datura metal Linn.)  
*Gunja* (Abrus precatorium Linn.)  
*Jaipala* (Jayapala) (Croton tiglium Linn.)  
*Karaveera* (Rerium indicum Mill.)  
*Langali* (Gloriosa superba Linn.)  
*Parasika Yavani* (Hyoscyamus inibar Linn)  
*Snuhi* (Euphorbia neriifolia Linn.)  
*Vatsanabha* (Acontium ferox Linn)  
*Vishamushti* (Strychnox nuxvomica Linn.)  
*Shringivisha* (Acontium chasmanthum stapfex Holm.)

#### **Drugs of Animal Origin**

*Sarpa Visha* (Snake poison).

#### **Drugs of Mineral Origin**

*Gauripashana* (Arsenic)  
*Hartala* (Arseno sulphide)  
*Manahashila* (Arseno sulphide)  
*Parada* (Mercury)  
*Rasa Karpura* (Hydrargyri subchloridum)  
*Tuttha* (Copper sulphate)  
*Hingula* (Cinnabar)  
*Sindura* (Red oxide of lead)  
*Girisindura* (Red oxide of mercury)

#### **Siddha System**

*Alari* (Nerium indicum Mill.)  
*Azhavanam* (Lawsonia inermis Linn.)  
*Attru thummatti* (Citrullis colocynthis Scharad)  
*Anai Kunri* (Adananthera pavonina Linn)  
*Rattha Polam* (Aloe barbadensis Mill)  
*Ilaikalli* (Euphorbia neriifolia Linn.)  
*Eezhaththalari* (Plumeria acuminata Ait.)

*Gomatthai* (*Datura stramonium* Linn.)

*Etti* (*Strychnos nuxvomica* Linn.)

*Gunja* (*Cannabis sativa* Linn.)

*Kalappaik Kizhangu* (*Gloriosa superba* Linn.)

*Kodikkalli* (*Euphorbia tiruqalli* Linn.)

*Chadurakkalli* (*Euphorbia antiquorium* Linn.)

*Karia polam* (*Aloe* sp.)

*Kattamanakku* (*Jatropha glandulifera* Roxb.)

*Kattu thumatti* (*Cucumis trigonus* Roxb.)

*Kunri* (*Abrus precatorius* Linn.)

*Cheran Kottai* (*Semicarpus anacardium* Linn.)

*Thillai* (*Enoecaria agallocha* Linn.)

*Nabi* (*Aconitum feron* Wall.)

*Nervalam* (*Croton tiglium* Linn.)

*Pugai Elai* (*Nicotiana tobucum* Linn.)

*Marukkarai* (*Randia dumetorum* Linn.)

*Mansevikkalli* (*Euphorbia* sp.)

## Unani System

### Drugs of Vegetable Origin

*Afiyun* (*Papaver somniferum* Linn.)

*Bazrul-banj* (*Hyoscyamus niger* Linn.)

*Bish* (*Aconitum chasmanthum* Strapfex Holmes.)

*Bhang* (*Cannabis sativa* Linn.)

*Charas* (*Canabis sativa* Linn.)

*Dhatura* seeds (*Datura metal* Linn (seeds.)

*Kuchla* (*Strychnos nuxvomica* Linn.)

*Shokran* (*Conium maculatum* Linn.)

In recent past many systemic and scientific studies have been carried on poisonous drugs to find out the impact of *Shodhana* procedures on phytochemical and pharmacological aspects of the drugs like *Vatsanabha* (*Acontium ferox* Wall.), *Kupilu* (*Strychnos nux-vomica* Linn.), *Bhallataka* (*Semecarpus anacardium* Linn) etc.

**Vatsanabha (Acontium Ferox Wall.)**

The tuberous roots are the official part of *Vatsanabha* (*Acontium ferox* Wall.; Ranunculaceae), contains aconite, an alkaloid, which is mainly responsible for its toxic effect. In *Ayurveda* it is used as an ingredient in many compound formulations, which are indicated for the management of fever, rheumatic pain, common cold, indigestion etc.<sup>[25]</sup> (*Sanjeev*, 2011).

A series of pharmacological activities pertaining to raw and process *Vatsanabha* was reported by *L B Singh* in his book *visa plants in Ayurveda*.<sup>[26]</sup> It is reported that due to *Shodhana* technique, the active principles of *Vatsanabha* lose their depressant action on the heart and instead become stimulant having mild cardio-tonic property.<sup>[27]</sup> It is being postulated that the cow's urine treatment to the crude aconite hydrolyzed partially or wholly the parent alkaloids into aconines and benzoyl aconines and behaved as a cardiac stimulant. *Vatsanabha* treated with cow' urine and cow's milk potentiated barbiturate hypnosis, and the effects were more pronounced than that produced by crude aconite. *Vatsanabha* treated with cow's urine and cow's milk was found to possess anti-inflammatory effect and could effectively block the phlogestic action of carrageenin. Milk treated *Vatsanabha* gave equal response like hydrocortisone whereas urine treated drug gave a poor response. Aconite treated with cow's urine had a more pronounced antipyretic effect than paracetamol. The onset of antipyretic effect of paracetamol and aconite treated with cow's milk was found to be quicker but the duration of action was short, whereas the effect of urine treated aconite was more sustained. *Vatsanabha* treated with cow's urine and cow's milk produced statistically significant analgesic activity. The analgesic effect of urine treated and milk treated aconite although was belated, yet persisted for a longer time.<sup>[28]</sup> (*Singh L.B.2003*). The result showed that *Shodhan* treatment removes toxic effect of crude *Vatsanabha* on cardiac & neuromuscular system without affecting the antipyretic activity.<sup>[29]</sup> (*PK Sarkar, Prajapati, Shukla, Ravishankar* 2012).

**Bhallatak (Semecarpus Anacardium Linn)**

*Bhallatak* (*Semecarpus anacardium* Linn.) has been used for medicinal<sup>[30]</sup> and non-medicinal purposes since ancient times. Before using, *Bhallatak* for medical purpose, it is subjected to the process of *Shodhana*.<sup>[31]</sup> The most significant components of the *Semecarpus anacardium* Linn. oil are phenolic compounds. On exposure to air, phenolic compounds get oxidized to quinones. The oxidation process can be prevented by keeping the oil under nitrogen. Two

main phenolic compounds and a glucoside are bhilavanol A (monoeneptadecyl catechol I), bhilavanol B (dienepentadecyl catechol II) and anacardoside (glucoside).<sup>[32,33]</sup> Bhilawanols A & B are known as Urushiols & also Anacardic acid is closely related to Urushiol. Before and after *Shodhan* process, Biological activity of *Semecarpus* nuts were tested against lipopolysaccharides-induced nitric oxide production in rat peritoneal macrophages. It showed minimum activity in the extract from unpurified nut (8.06%), which gradually enhanced when treated with brick (10.61).<sup>[34]</sup> (Yamini et al., 2008). TLC of methanol extracts of the fruits before and after *Shodhana* reveals that almost all the compounds corresponding to certain Rf values are present both before after *Shodhana* except that corresponding to 0.82. Besides, the intensity of the chromatogram was reduced after *Shodhana* which indicates that *Shodhana* has brought in some change in the oily fraction of the constituents of *Bhallataka* by removing a certain compound that makes it non-toxic.<sup>[35]</sup> (Venkateshwarlu et al., 2010). After *Shodhan* Anacardol level increased, it may be due to change of toxic Urushiol into Anacardol.<sup>[36]</sup> (Ilanchezhia R et al., 2012). The result concluded that the lipid lowering effect was found to be remarkably potentiated by the *Shodhana* process & anti inflammatory activity significantly enhanced in *Shodhita Bhallataka*.

#### **Kupilu (Strychnos Nux-Vomica)**

*Kupilu*<sup>[37]</sup> is a poisonous drug mainly producing tetanus like convulsions and eventually death in large doses and mental derangement in lesser doses, due to presence of toxic alkaloids, but shows miraculous therapeutic effects after *Shodhana* as *Ayurveda*. It contains alkaloid Strychnine & Brucine which have toxic effect.<sup>[38]</sup> (Swarnendu, Rabinarayan, 2012). When *Shodhana* occurred by different traditional methods, its percentage of alkaloid Strychnine & Brucine became very less.<sup>[39]</sup> (Swarnendu et al., 2011). So it is concluded that *Kupilu Shodhana* is the best one to decrease the toxicity on the one hand and to increase the therapeutic efficacy on the other, thereby supporting the ancient claims of *Ayurveda* regarding *Shodhana* process effect (Swarnendu, Rabinarayan, 2012).

#### **CONCLUSION**

Without *Shodhan* we cannot use any drug in *Ayurvedic* formulations. That's why *Shodhana* is very essential in *Ayurvedic* Herbo-mineral preparation. For efficacy & safety of drug proper *Shodhana* is very important. *Shodhan* process is important, according to nature of collection, its structure, its chemical constituents to enhance pharmaceutical actions. Also by *shodhan* process we can improve qualities of basic elements of drug to exert its good. *Ayurveda*

emphasises on administration of these poisonous drugs only after through processing technique called as *Shodhana*<sup>[40,41]</sup> (purification/detoxification). Adverse effects of the poisonous medicinal plants are mainly due to the improper *Shodhana* (purification/detoxification technique) and over dose etc. Safety is a fundamental principle in the provision of herbal medicines and herbal products for health care and a critical component of quality control.<sup>[42]</sup> (WHO guidelines, 2004). The concept of *Shodhana* (detoxification technique) in Ayurveda is not only a process of purification /detoxification, but also a process to enhance the potency and efficacy of the drugs (*Shastri*, 2009) etc. Without subjecting to the *Shodhana* processes the drugs of mineral & plant origin could not be used internally and if at all used they are likely to produce various harmful or toxic effects in the body. Hence in *Rasashastra & Bhaishajya Kalpana*, *Shodhana* process plays very important role while preparing medicine. Proper awareness about *Visha*, its classifications, *Shodhana* methods, media used for detoxification procedures and researches on impact of *Shodhana*, are the tools to bring poisonous medicinal plants into the mainstream and to make them more accountable.

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