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

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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.\textsuperscript{1,2,3,4} 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*, *Abras precatorius* etc., are some of the interesting examples of toxic plants, which are still used in the Indian system of medicine.[5,6,7] Aconite, Bilawanols, strychnine, β-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.[8] The list of poisonous plants has been provided in Schedule E-1 of Drugs & Cosmetics Rule, 1945(Vijay, 2005).[9,10] 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.[11,12]

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.[10] 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[14] 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, Godudha, 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.


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) minimises 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 *Apanmarg 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*[15], *(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.[16]

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.[17]

3. **Bhavana** (levigation)[18] The drug is triturated with prescribed liquid media for specific time period, e.g. *Aliphena Shodhana* with ginger juice.[19]

4. **Nimajjana** (dipping) The drug is kept immersed in the prescribed liquid media for specific time period e.g. *Vatsanabha shodhanacow’s urine.*[20]

5. **Swedana**[21,22,23] (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)*.[24]

**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) Dhatura (Datura metal Linn.)
Gunja (Abrus precatorium Linn.)
Jaipala (Jayapala) (Croton tigium 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.)
Kattamanakkku (Jatropha glandulifera Roxb.)
Kattu thumatti (Cucmis trigonus Roxb.)
Kunri (Abrus precatorusi Linn.)
Cheran Kottai (Semicarpus anacardium Linn.)
Thillai (Enoecaria agallocha Linn.)
Nabi (Aconitum feron Wall.)
Nervalam (Croton tiglum Linn.)
Pugai Elai (Nicotiana tobucum Linn.)
Marukkarai (Randia dumetorum Linn.)
Mansevikkalli (Euphorbia sp.)

Unani System

Drugs of Vegetable Origin
Afizun (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.\(^{[25]}\) (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.\(^{[26]}\) 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.\(^{[27]}\) 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's 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.\(^{[28]}\) (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.\(^{[29]}\) (PK Sarkar, Prajapati, Shukla, Ravishankar 2012).

Bhallatak (Semecarpus Anacardium Linn)
Bhallatak (Semecarpus anacardium Linn.) has been used for medicinal\(^{[30]}\) and non-medicinal purposes since ancient times. Before using, Bhallatak for medical purpose, it is subjected to the process of Shodhana.\(^{[31]}\) 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 (monoenepentadecyl catechol I), bhilavanol B (dienepentadecyl catechol II) and anacardoside (glucoside). Bhilawanols A & B are known as Uru-shiols & 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). 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. After Shodhan Anacardol level increased, it may be due to change of toxic Urushiol into Anacardol. 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 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. When Shodhana occurred by different traditional methods, its percentage of alkaloid Strychnine & Brucine became very less. 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.

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\textsuperscript{[40,41]} (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.\textsuperscript{[42]} (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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