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Review Article

A PHARMACODYNAMICAL AND THERAPEUTIC POTENTIAL OF *STHAVAR VISHA* W.R.T. *VISHA GUNA*

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ABSTRACT

Ayurveda always emphasized the two aspects i.e., concept of *Sukham dukham ayu* or *Hitam-ahitam.* This *Dvandaj* relationship helps us to understand the concept of useful nature of *Visha dravya*. It's remarkable how the *Visha dravya* present in nature has been utilized by the knowledge of Ayurveda to the benefit of human beings. **Aim:** To review the *Rasapanchak* of *Sthavar visha* with the 10 *Guna* of *Visha* mentioned in Schedule E (1) drug & *Upvisha.* **Objective:** To compare the similar *Gunas* of *Sthavar visha* with *Visha guna.* **Material & Method:** Plants mentioned in schedule E of Drugs & Cosmetic Act 1945, were studied for their *Dravyaguna* properties and obtained from the *Dravyaguna vigyan*. The rules and regulation related with poisonous drugs are given in Drugs & Cosmetic Act 1945. Relevant information related to *Visha* was collected from the Ayurvedic text, databases, books affiliated with *Agad Tantra*. **Result:** There are 14 drugs of plant origin mentioned in schedule E (1) along with the safety studies and packing of these drugs guidelines in drugs and cosmetic act 1945, 1 drug of animal origin and 7 drugs of mineral origin. Out of 10 *Gunas* of *Visha* 6 *Gunas* i.e., *Laghu, Tikshna, Ruksha, Vyavayi, Vikasi* and *Sukshma* are similar to *Gunas* of poisonous plants. **Conclusion:** Due to similarities in *Visha guna* there is separate category of *Sthavar visha* (poisonous drugs) which makes them different from other plant drugs, along with their different mode of action which is similar to action of *Visha*. There is a need of detailed safety studies of these drugs to make them recognizable at global health.

INTRODUCTION

We all are versed with term poison defined as a substance which when introduced in the living body or brought into the contact with any part will produce ill-health or death by its constitutional or local effects or both[1]. Thus, almost anything is a poison. Clearly, toxin is a poisonous substance produced by a biological organism, such as microbe, animal, plant, or fungus and venom is a toxic substance by some animals that are injected into prey or an enemy, mostly by biting or stinging and has adverse or lethal effect [2]. In the field of Agad tantra all the terms are considered uniquely under the term '*Visha'*.

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What are Poisonous Plants?

Poisonous plants are a group of plants that exhibit phytochemical constituents, which exert directly or indirectly toxic activities and intervene in the metabolism of human beings and animals[3].

- It may be due to presence of known or unknown biochemical essences in it and not by mechanical activity.
- In Ayurveda poisonous plants studied under *Sthavar visha*

There are 55 types of *Sthavar visha* distributed in 10 *Adhisthana* i.e., *Mula* (root), *Patra* (leaf), *Phala* (fruit), *Pushpa* (flower), *Tvak* (bark), *Sara* (pith), *Niryasa* (gum), *Kshira* (latex), *Dhātu* (metallic), *Kanda* (bulb) [4].

Following symptoms can be observed after the ingestion of *Sthavar visha: Jwar* (fever), *Hikka* (hiccup), *Dantharsha* (intolerance to be touched in teeth), *Galgraha* (choking sensation in throat), *Pena-vamih* (frothy vomiting), *Aruchi* (tastelessness), *Svasah* (difficult breathing) and *Murcha* (syncope) [5].

Individual symptoms of *Sthavar visha* on the basis of their *Adhisthan* are as follows:

- *Moola visha: Udwsetan* (convulsive movements of limbs), *Pralap* (excess talking), *Moha* (confusion)[6].
- *Patra visa: Jrimbha* (yawning) *Anga udwestan* (convulsive movements of body) *Shwasa* (difficulty in breathing [7].
- *Phala: Mushka shopha* (scrotal oedema), *Daho* (burning sensation) *Annadwesha* (aversion to food[8].
- *Puspha: Chardi* (vomiting), *Adhman* (abdominal distension), *Moha* (confusion)[9].
- *Twak, sar, Niryasa: Asya daurghandh* (*halitosis*), *Parushya* (roughness), *Shiroruk* (headache), *Kapha Strava* (secretion of mucous)[10].
- *Ksheer: Phenagam* (frothing from mouth), *Vida bheda* (altered stools), *Guru jihvata* (heaviness of tongue)[11].
- *Dhatu: Hrutapeeda* (cardiac pain), *Talu daha* (burning sensation in palate[12].

Poisonous drugs & Drugs and cosmetic act 1945

1. This act was further amended by drugs (amendment) act, 1964 to include Ayurvedic and Unani drugs.
2. Provisions relating to Ayurvedic drugs is mentioned in **Schedule IVA** [13].
3. List of poisonous substances under the Ayurvedic mentioned in **Schedule E (1**) [14].
4. 14 drugs of vegetable origin are stated under Ayurvedic system, aside 1 drug of animal origin & 7 drugs of mineral origin.
5. **Schedule 1A**: 54 classical Ayurvedic text to take under as reference [15].
6. 158(B) Guidelines for issue of license with respect to Ayurveda, Siddha or Unani drugs [16].

II.B For issue of license with respect to Patent or Proprietary medicine. The condition relating to Safety studies and experience or evidence of effectiveness shall be specified as follows:

Ayurveda, Siddha and Unani drugs with any of the ingredients of **Schedule E(1)** of the Drugs and Cosmetics Act, 1940, safety study, published literature of ingredients and proof of its effectiveness by the virtue of pilot study as per relevant protocol for Ayurveda, Siddha And Unani drugs [17].

III. For issue of license with respect to *Balya* and *Poshak* medicines the person who applied for license is required to submit the following:

(ii) Conduct safety studies in case the product contains of any of the ingredients as specified in the **Schedule E (1),** as per the guidelines for evaluation of Ayurveda Siddha and Unani Drugs formulations [18];

IV. For issue of license with respect to *Saundarya Prasadak* (*Husane afza/Azhagu Sodhan*) the person who applied for license is required to do following:

(ii) Conduct safety studies in case the product contains of any of the ingredients as specified in the **Schedule E (1),** as per the guidelines for evaluation of Ayurveda Siddha and Unani Drugs formulations [19].

7. For textual indications the safety and effectiveness study is not required [20].

Textual indications: schedule 1A; 54 Ayurvedic text mentioned

8. 161.Labelling, packing and limit of alcohol in] Ayurvedic (including Siddha) or Unani drugs:

(2) The container of a medicine for internal use made up ready for the treatment of human ailments shall, if it is made up from a substance specified in **Schedule E (1)**, be labelled conspicuously with the words - Caution: To be taken under medical supervision 'both in English and Hindi language [21].

Sthavar visha mentioned in schedule E (1) drugs and the *Sthavar visha* classification in *Rasatarangni* are similar except *Snuhi & Arka ksheera*. There are 9 *Visha* [22] & 11 *Upvisha* [23] listed in the *Rasatarangani.*

Table 1: List of *Visha dravya* in schedule E (1) & *Rasa Tarangani*

S.no.	Vegetable origin	Animal origin	Mineral origin	*Rasatarangani visha* [9]	*Rasatarangni Upvisha* [11]
1	*Ahiphena* (*Papaver somniferum* Linn)	*Sarpa visha*	*Gauripashana*	*Halahal*	*Vishtinduka*
2	*Arka* (*Calotropis procera* (Ait.) R.Br. ex.)		*Hartala*	*Kalkoota*	*Ahiphena*
3	*Bhallataka* (*Semecarpus anacardium* Linn. F.)		*Manahashila*	*Shringak*	*Rechak*
4	*Bhanga* (*Cannabis sativa* Linn.) [Except seeds]		*Parada*	*Pradeepan*	*Dhattura*
5	*Danti* (*Baliospermum montanum* Mull. Arg)		*Rasakarpura*	*Saurashtrik*	*Vijaya*
6	*Dhattura* (*Datura metal* Linn)		*Tuttha*	*Brahmaputra*	*Gunja*
7	*Gunja* [Abrus *precatorium* Linn. (seed)]		*Hingula*	*Haridra*	*Bhallatak*
8	*Jaipala* (seeds) (*Croton tiglium* Linn.)			*Saktuka*	*Arka ksheer*
9	*Karaveera* (*Nerium indicum* Mill.)			*Vatsnabha*	*Snuhi ksheer*
10	*Langali* (*Gloriosa superba* Linn)				*Langali*
11	*Parasika yavani* (*Hyoscyamus niger* Linn.)				*Karveera*

12	*Vatsnabha* (*Acontium ferox* Stapf ex Holm.)				
13	*Vishamushti* (*Strychnox nuxvomica* Linn.)				
14	*Shringivisha* (*Acontium chasmanthum* Stapf ex Holm.)				

Rasa panchak of all the *Sthavar visha* is obtained from the '*Dravyaguna Vigyanam'* as in table no. 2.

Table 2: *Rasapanchak* of *Sthavar visha*

S.no.	Drugs of plant/animal origin	*Rasapanchak*			
		Rasa	***Guna***	***Vipaka***	***Virya***
1	*Ahiphena* (*Papaver somniferum* Linn) [23]	*Tikta kashyaya*	*Laghu, Ruksha sukshma, Vyavayi, Vikasi*	*Katu*	*Ushna*
2	*Arka* (*Calotropis procera* (*Ait.*) R.Br. ex.)[24]	*Katu tikta*	*Laghu, Ruksha, Tikshna*	*Katu*	*Ushna*
3	*Bhallataka* (*Semecarpus anacardium* Linn. F.) [25]	*Katu tikta kashyay*	*Laghu, Snigdha, Tikshna*	*Katu*	*Ushna*
4	*Bhanga* (*Cannabis sativa* Linn.) [Except seeds] [26]	*Tikta*	*Laghu, Tikshna*	*Katu*	*Ushna*
5	*Danti* (*Baliospermum montanum Mull. Arg*)[27]	*Katu*	*Guru, Tikshna*	*Katu*	*Ushna*
6	*Dhattura* (*Datura metal* Linn) [28]	*Tikta katu*	*Laghu, Ruksha, Vyavayi, Vikasi*	*Katu*	*Ushna*
7	*Gunja* [*Abrus precatorium* Linn. (*seed*)][29]	*Tikta kashya*	*Laghu, Ruksha tikshna*	*Katu*	*Ushna*
8	*Jaipala* (*seeds*) (*Croton tiglium* Linn.)[30]	*Katu*	*Guru ruksha tikshna*	*Katu*	*Ushna*
9	*Karaveera* (*Nerium indicum* Mill.) [31]	*Katu*	*Laghu ruksha tikshna*	*Katu*	*Ushna*
10	*Langali* (*Gloriosa superba* Linn)[32]	*Tikta*	*Laghu, Tikshna*	*Katu*	*Ushna*
11	*Parasika yavani* (*Hyoscyamus niger* Linn.)[33]	*Tikta katu*	*Ruksha*	*Katu*	*Ushna*
12	*Vatsnabha* (*Acontium chasmanthum Stapf ex* Holm.) [34]	*Madhura*	*Ruksha, Tikshna, Laghu, Vyavayi, Vikasi*	*Madhura*	*Ushna*
13	*Vishamushti* (*Strychnox nuxvomica* Linn.)[35]	*Tikta katu*	*Laghu ruksha tikshna*	*Katu*	*Ushna*
14	*Snuhi ksheera* [36]	*Katu*	*Laghu tikshna*	*Katu*	*Ushna*
15	*Shringivisha* [37]	*Katu*	*Laghu tikshna*	*Katu*	*Ushna*

In *Samhitas* 10 *Guna* have *Visha* has been listed by *Acharya Charaka* [38], *Sushruta* [39] *& Ashtanga Samgraha* [40]. *Ashtang Hrudaya* has mentioned 11 *Guna* [41] and 8 *Gunas* by *Acharya Sharangdhar* respectively [42].

Table 3: *Visha guna*

S.no.	*Visha guna*	*Charaka*	*Sushruta*	*Vagbhata*	*Sharanghdhar*
1	*Laghu*	+	+	+	-
2	*Ruksha*	+	+	+	-
3	*Aashu*	+	+	+	-
4	*Vishad*	+	+	+	-
5	*Vyavayi*	+	+	+	+
6	*Tikshna*	+	+	+	-
7	*Vikasi*	+	+	+	+
8	*Sukshma*	+	+	+	+
9	*Ushna*	+	+	+	-
10	*Anirdeshiya*	+	-	-	-
11	*Apaki*	-	+	+	-
12	*Avyakt rasa*	-	-	+	-
13	*Chedi*	-	-	-	+
14	*Madavaha*	-	-	-	+
15	*Jeevitahar*	-	-	-	+
16	*Yogavahi*	-	-	-	+
17	*Agneya*	-	-	-	+

Table 4: Pharmacological activity of poisonous plant drugs

S.no.	Poisonous drugs	Pharmacological action
1	*Ahiphena* (*Papaver somniferum* Linn)[43]	Antiallodynic, analgesics activity, antitussive, anti-diarrheal, anti- smoking, antidepressant activity, anti-anxiety, bronchodilator, antibacterial, narcotic
2	*Arka* (*Calotropis procera* (Ait.) R.Br. ex.)[44]	Anti-inflammatory, anti-fungal, HIV, antioxidant, anti-diarrhoeal activity, anti-cancer, anti-ulcer, anti- hyperbilirubinemic, hepatoprotective activity, antipyretic, anti-HIV-1, anti-microbial activity larvicidal, wound healing
3	*Bhallataka* (*Semecarpus anacardium* Linn. F.)[45]	Anti rheumatic activity, anti-inflammatory, anti-arthritic, anti-oxidant, anti-helminthic, anti-cancer, anti-dabetic, anti-spermatogenic activity
4	*Bhanga* (*Cannabis sativa* Linn.) [Except seeds][46]	Antioxidant, antibacterial, anticoagulant, antifungal, anti-aflatoxigenic, insecticidal, anti-inflammatory, anticancer, neuroprotective and dermo cosmetic activities.
5	*Danti* (*Baliospermum montanum* Mull. Arg)[47]	Anticancer, hydroxy nitrile lyase activity, free radical scavenging activity, immunomodulatory activity, anti-helminthic activity, anti- microbial activity, hepatoprotective activity
6	*Dhattura* (*Datura metal* Linn)[48]	Anti-asthmatic, anticholinergic, acaricidal, repellent and oviposition deterrent properties, ant- microbial, anti-cancer, anti-inflammatory, larvicidal & mosquito repellent, pesticide, anti-fungal, vibriocidal, toxicity, biopesticide with antifungal
7	*Gunja* [*Abrus precatorium* Linn. (seed)][49]	Anti-diabetic, anti-viral, neuromuscular, anti-epileptic anti-convulsant, anti-helminthic, diuretic, anti-microbial, anti-inflammatory, anti-arthritic and analgesic, anti-cancer, anti-fertility, anti-spermatogenic, anti-malarial, wound healing activity, anti-asthmatics, anti-cataract, antidiarrheal, anti-spasmodic, cytotoxicity and antitumor
8	*Jaipala* (seeds) (*Croton tiglium* Linn.)[50]	Antitumor activity, gastrointestinal activity, analgesic, antinociceptive effect, anti-HIV activity
9	*Karaveera* (*Nerium indicum* Mill.)[51]	Antioxidant activity, analgesic, antiulcer, cell proliferation disease, antimicrobial activity, anti-diabetic, molluscidal, hepatoprotective, anti-viral activity
10	*Langali* (*Gloriosa superba* Linn)[52]	Antitumor, anti-HIV, analgesic, anti-inflammatory and antibacterial effects.
11	*Parasika yavani* (*Hyoscyamus niger* Linn.)[53]	Analgesic, anti-bacterial, anti-cancer, anti-convulsant, anti-depressant, antidiabetic, anti-microbial, antioxidant, antipyretic, antispasmodic, broncho dilatory, cardioprotective, anti-hypertesnsive, anti-hyperuricemic, anti-inflammatory, insecticidal, anti-diarrhoeal,
12	*Vatsnabha* (*Acontium ferox* Stapf ex Holm.)[54]	Analgesic, anti-inflammatory, antimicrobial, anaesthetic, antiarthritic, diuretic, stimulant, anti-helminthic, anti-carcinogenic, hepatoprotective activities.
13	*Vishamushti* (*Strychnox nuxvomica* Linn.)[55]	Anti diabetic, hepatoprotective, anti-allergic
14	*Shringivisha* (*Acontium chasmanthum* Stapf ex Holm.)[56]	Anti-fungal, anti-oxidant

DISCUSSION

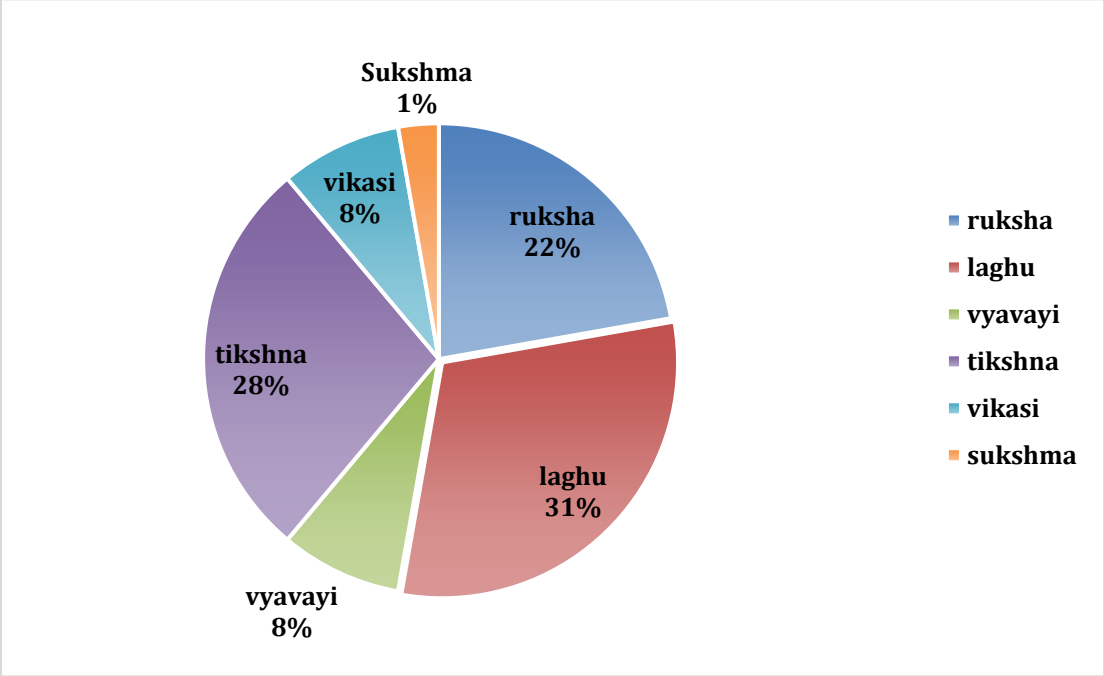

Chart 1. Similarties between *Visha guna & Sthavar visha guna*

- *Laghu guna* occupies the maximum area i.e., 31%
- *Tikshna guna* is occupying 28% of area
- *Ruksh guna* is occupying 22% area.
- Other *Guna*, *Vyavayi, Vikasi, Sukshma* occupy less part of area i.e., is 8%, 8% & 1% respectively.

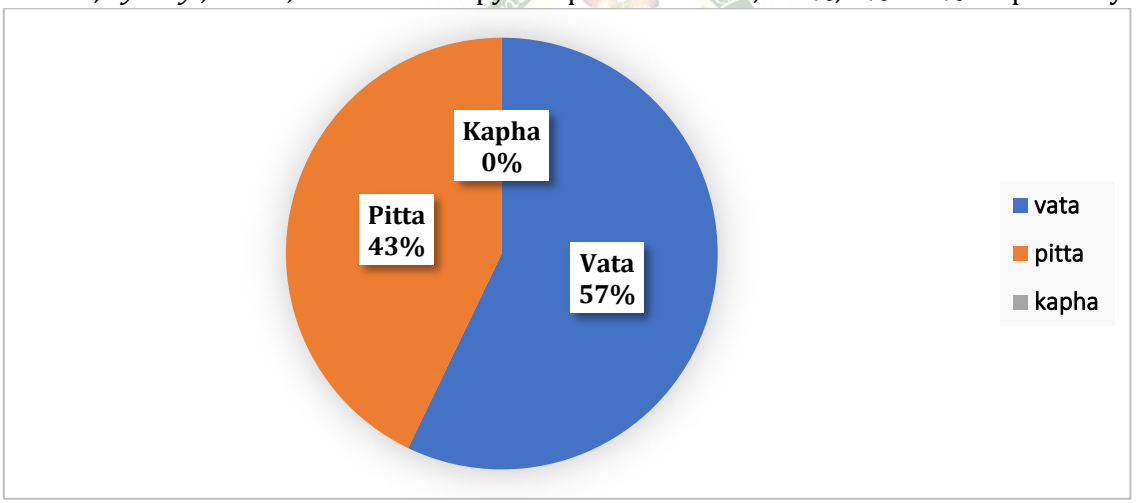

Chart 2. Comparison between *Visha guna & Tridosha*

- 57% of *Vata guna* complies with *Visha guna* whereas *Pitta guna* occupies 43% respectively.

Laghu guna is the most dominating attribute in *Sthavar visha.* Due to *Laghu guna*, the treatment of poison is *Dushchikitsya* (challenging) also due to *Laghtva,* it easily get subside in *Dhatu*. Secondly predominating, *Tikshna guna* indicates how it can deeply penetrate into tissues and cell, ultimately affecting *Marma sthan* (vital systems of body). It is responsible for quick activity. *Ruksha* is the third predominating *Guna* which reduces the *Kapha* content from *Dhatus* and ultimately decreasing the *Oja* content of body. *Vata dosh* is largely responsible for its rapid action. *Pitta dosh* might be responsible for inflammatory action. *Vatsnabha* is studied under *Visha* category i.e., it is more potent in its action than the plants under the category of *Upvisha. Vatsnabha* and *Ahiphena* almost have same *Gunas* i.e., *Laghu, Ruksha, Vyavayi* and *Vikasi* with the difference of *Tikshna* and *Sukshma* respectively. There are 14 drugs of plant origin mentioned in schedule E (1) of drugs and cosmetic act 1945, one drug of animal origin and 7 drugs of mineral origin. Besides 10 *Guna* as mentioned by Acharyas, *Sharanghdhar* has mentioned 5 more i.e., *Chedi, Madavaha, Jivithar, Yogvahi* and *Agneya*.

These poisonous plants also have various proven pharmacological activity as mentioned in table no. 4.

CONCLUSION

What's more interesting that *Visha utpati* took place from the nature itself by the process of '*Samudramanthan'* for obtaining the *Amrita*. Before that the representative of *Visha* '*Harikeshaanalekshana'* created '*Vishaan'* (sadness) among the *Devtas* and the whole world was affected by its impact, was distributed in the *Sthavar* ad *Jangam yoni* by Lord Brahma for the preparation of amrita. *Aahar* is given the stature of *Prana* in which case if wrong type food is taken it will ultimately destroy the *Prana* (life), similarly *Visha* is said to be *Pranhara*, if utilised with *Yukti* it will act as *Rasayana.* Therefore, schedule E (1) was introduced in the drugs and cosmetic act 1945 to regulate the use of *Sthavar visha* (poisonous plants) for medicinal purpose. Out of 10 *Gunas* of *Visha* 6 *Gunas* i.e., *Laghu, Tikshna, Ruksha, Vyavayi, Vikasi* and *Sukshma* are similar to *Gunas* of poisonous plants, which make them fast acting and better absorption at cellular level. *Vatsnabha* being *Tikshna* along with other characteristics make it exhibit quick activity as compared to *Sukshma* of *Ahiphena* enables to enter the minute channel i.e., it may enter blood brain barrier and act on CNS.

Visha being a *Yogwahi*, makes *Sthavar visha* a potential herbal drug where its fast-acting property can be combined with other drugs or individually to improve the efficacy of Ayurvedic formulations or in the management of diseases. There is preconception about Ayurvedic drugs i.e., long course of intake is required to manage the diseases. Inclusion of *Sthavar visha* with appropriate safety studies may have a better scope for treatment and management of disease.

Also as per their various pharmacological activities, their various clinical aspects also need to be explored from the point of Ayurveda and inculcate this in the clinical toxicology.

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