

**PRELIMINARY PHYTOCHEMICAL SCREENING AND CRITICAL REVIEW ON SHYAMADI AGADA IN CONTACT POISONING****Seleena V.<sup>1\*</sup> and Suresh Y.<sup>2</sup>**

<sup>1</sup>P.G. Scholar, Dept. of P.G. Studies in Agadatantra Vyavahara Ayurveda Evum  
Vidhivaidhyaka, Alvas Ayurveda Medical College, Moodbidri.

<sup>2</sup>Associate Professor, Dept. of P.G. Studies in Agadatantra Vyavahara Ayurveda Evum  
Vidhivaidhyaka, Alvas Ayurveda Medical College, Moodbidri.

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**\*Corresponding Author****Dr. Seleena V.**

P.G. Scholar, Dept. of P.G.  
Studies in Agadatantra  
Vyavahara Ayurveda Evum  
Vidhivaidhyaka, Alvas  
Ayurveda Medical College,  
Moodbidri.

**ABSTRACT**

Scientific evaluation and documentation is inevitable for a novel drug development. Ayurvedic formulations are proven and practiced since thousands of years. But to enhance the entire world through the treasure of its knowledge, it should be evidence based and standardised. *Agada Lepas* are the idiosyncratic contribution among *Agada Yogas* (formulation) in *Agadatantra* (a branch of Ayurveda). *Shyamadi Agada* is an *Agadalepa* which is mentioned under the context of contact poison. Preliminary phytochemical screening on *Shyamadi Agada* reveals the pharmaceutical action based on the detected phyto - constituents. Here through this paper an effort has been done to throw a light on *Shyamadi Agada* yoga which is not explored recently.

**KEYWORDS:** Ayurveda, *Shyamadi Agada*, Ingredients, Phytochemical Screening.

**INTRODUCTION**

Ayurveda is enriched with its herbal formulations and unique way of treating to pacify the ailments from its root level. *Agadatantra* is a specialized branch of Ayurveda, that advocates different antidotes for materials which are poisonous to human body.<sup>[1]</sup> *Agada Yogas* are less explored and documented since ancient times. The systematic records of actual potency of these *Yogas* (formulation) are essential in this modern era for the universal acceptance and its upliftment.

Lepa is a preparation where the powdered drugs are mixed with appropriate liquid medium and made into paste form for the external application on skin. *Agada* is the term used to indicate the formulations in poisonous conditions according to Ayurveda.

*Shyamadi Agada* is a polyherbal formulation mentioned as *Lepa* form in Ayurvedic authentic texts. There are many formulations are mentioned in various *Visha Chikitsa* references regarding contact poisoning of hand (*Paanivisha*). *Shyamadi Agada* is mentioned in *Susruta Samhita* and *Ashtanga Sangraha* in the context of *Paanivisha*. The symptoms which are explained for *Paanivisha* is distinctive according to different *Acharyas*. Phytochemical screening of this *Yoga* is helpful for apprehension of its action as well as the confirmation of its phyto-constituents. Global recognition of *Agadayoga* is applicable only through this type of innovative movement.

## MATERIALS AND METHODS

### Literary source

All the Ayurvedic, Modern literature and Contemporary texts including the website about the *Shyamadi Agada* and its phytochemical constituents were reviewed and documented for this study.

### Trial drug source

Ingredients of trial drug *Shyamadi Agada* (Table no.1) collected from the authorized source and Drug Authentication was obtained from the Dravya Guna Vijnana expert. All the drugs were taken in equal quantity and dried it properly. Then made into fine powder form for the phytochemical analysis.

### Phytochemical study

Phytochemical qualitative screening by cold extraction method was conducted in Dravya Guna Vijnana dept. of Alvas Ayurveda Medical College. The extracts of the sample drug (*Shyamadi Agada*) was subjected to different solvents to detect the various phytoconstituents.

### Review on *shyamadi agada*

In *Susruta Samhita*, it has been elucidated that burning sensation and falling off the nails are the symptoms exhibited by touch of poisoned food with hand *Vishagna lepa* which is made up of *Shyamadi* drugs can be called as *Shyamadi Agada*. And this formulation is indicated in this plight.<sup>[2]</sup>

In *Ashtanga Samgraha*, *Vagbhata* opines that touch of poisoned food with hand causes the symptoms viz. burning sensation, swelling, numbness and falling off nails. In order to treat this condition *Shyamadi Agada* has been mentioned.<sup>[3]</sup> The ingredients of *Shyamadi Agada* illustrated in *Susruta Samhita* and *Ashtanga Samgraha* are *Shyama*, *Indra*, *Gopa*, *Soma* and *Utpala*.

**Table no. 1: Ingredients of *shyamadi agada*.**

| Sl. no. | Drug name                  | Botanical name              | Part used |
|---------|----------------------------|-----------------------------|-----------|
| 1       | <i>Shyama (Trivruth)</i>   | <i>Operculina turpethum</i> | Root bark |
| 2       | <i>Indra (Indravaruni)</i> | <i>Citrulus colocynthis</i> | Root      |
| 3       | <i>Gopa (Sariva)</i>       | <i>Hemidismus indicus</i>   | Root      |
| 4       | <i>Soma (Guduchi)</i>      | <i>Tinospora cordifolia</i> | Bark      |
| 5       | <i>Utpala</i>              | <i>Nimphaea alba</i>        | Flower    |

### ***Shyama (Trivrut)***

*Trivrut* is an important Ayurvedic herb used in treatment of *Kapha* and *Pitta* dominant disorders. Apart from being useful as a medicinal herb, it is also a very important herb used in *Panchakarma* treatment called as *Virechana* (purgation treatment).<sup>[4]</sup> It is one of the best *Sukhavirechaka* drug. It is given with *Shunti* (Dried ginger) and other *Sugandha Dravya* (Spices) and *Saindhava* (Rock salt) to avoid griping sensation.<sup>[5]</sup>

### ***Indra (Indravaruni)***<sup>[6,7]</sup>

Bitter cucumber is rich in potent chemical constituents which makes it more of a medicinal herb rather than a vegetable.<sup>[8]</sup> Earliest references about *Indravaruni* are available in “Keshava Paddhati” wherein it is indicated for leucoderma (*Sveta Kushta*) and grey hair (*Palita*). A paste of root prepared with water is applied on *Shotha* (Swelling) and on *Udara* (Abdomen) of children during *Udarasula* (Abdominal pain).

### ***Gopa (Sariva)***<sup>[9,10]</sup>

*Sariva* is known as Indian sarsaparilla but it is different from the Sarsaparilla. In Ayurveda it is widely used in the treatment of oligospermia, gastritis, anorexia, menorrhagia etc. Antimicrobial activity and anti-carcinogenic effect are the research findings done on *Sariva*.<sup>[11]</sup>

### ***Soma (Guduchi)***<sup>[12,13]</sup>

*Guduchi* is a well-recognised and widely distributed traditional plant that is used successfully in Indian Ayurveda Medicine. *Guduchi* is a rich source of protein and micro nutrients, such

as iron, calcium, phosphorus and manganese. Anti-inflammatory and analgesic action of *Guduchi* is reported in various research works.

### *Utpala (Kumuda)*<sup>[14]</sup>

It is an aquatic plant with white coloured flowers as ‘Water Lilly’. *Utpala* is most extensively used herb compared to *Kamala* (Lotus) in Ayurveda. Extract of *Utpala* has significant analgesic activity.

**Table no. 2: Therapeutic properties of ingredients.**

| Sl. no. | Drugs  | Rasa panchaka  | Dosha karma  | Karma   | Major chemical constituents   |
|---------|--------|--|--|---|---|
| 1       | Shyama | Rasa: Tikta, Katu<br>Guna: Laghu,<br>Rooksha,<br>Theekshna<br>Vipaka: Katu<br>Veerya: Ushna<br>Prabhava :<br>Rechana | <i>Pittakapha shamaka</i><br>(Balances Pitta and Kapha). <i>It increases Vata Dosha.</i> | <i>Bhedana, Rechaka, Pitta jvaragna, Shotagna, Udararogahara, Sukha virechaka.</i>                    | A and B –Turpethins, Scopoletin, Turpethinic acids A, Turpethin, Coumarin   |
| 2       | Indra  | Rasa:Tikta<br>Guna: Laghu,<br>Ruksha, Tikshna.<br>Virya: Ushna<br>Vipaka: Katu                                       | Kaphapitta shamaka   | <i>Kushtagna, Vranaropana, Swasagna, Kasagna, Granthigna, Vishagna, Jwaragna, Shotagna.</i>           | Resins – Rescinous glycosides (Colocynthin, Colocynthitin.) A phytosterol glycoside, Citrullol, Pectin and albuminoids, Cucurbitacins – cucurbitacin E and I. |
| 3       | Gopa   | Rasa: Madhura,<br>Tikta<br>Guna: Guru,<br>Snigdha Vipaka :<br>Madhura Veerya :<br>Sheeta                             | Tridoshahara   | <i>Kushtagna, Kandugna, Jvaragna, Mehanashana, Vishapaha, Agnisada, Shvasahara, Kasahara</i>          | Hyperoside, Rutin, Desinine, Hexatriacontane, B-Sistosterol, Hemidesminine, Coumarin  |
| 4       | Soma   | Rasa: Tikta,<br>Kashaya<br>Guna: Guru,<br>Snigdha<br>Virya: Ushna<br>Vipaka: Madhura                                 | Tridoshahara (Balances the Tridosha)   | <i>Jwaragna, Trishnagna, Chardigna, Krimigna, Pramehagna, Kaasagna, Visarpanashaka, Medorogahara.</i> | T. Cordifolia – Tinosporidine, cordifolide, Heptacosanol, Octacosanol, T. Malabarica Tetracosanoic acid, tinosporin, tinosporinon, Beta – sistosterol etc     |
| 5       | Utpala | Rasa : Madhura,<br>Kashaya, Tikta<br>Guna : Laghu,<br>Snigdha, Picchila<br>Virya: Sheeta<br>Vipaka: Madhura          | Kaphapitta shamaka   | <i>Varnya, Dahaprshamana Vishagna, Visarpanashaka, Pramehagna, Jvaragna.</i>                          | Nymphalin, quercetin, Kaempferol etc.   |

**Phytochemical study – preliminary screening**

Organoleptic evaluation was carried out by analysing the colour, texture, odour, taste, size, special characters etc. of the trial drug.

**Table no. 3: Organoleptic characters of *shyamadi agada*.**

| Sl.no. | Organoleptic characters           | <i>Shyamadi agada</i> properties |
|--------|-----------------------------------|----------------------------------|
| 1      | <i>Rupa</i> (External appearance) | Fine Powder                      |
| 2      | <i>Varna</i> ( Colour)            | Yellowish brown                  |
| 3      | <i>Sparsha</i> (Touch)            | Smooth                           |
| 4      | <i>Gandha</i> (Smell)             | Characteristic                   |
| 5      | <i>Rasa</i> ( Taste)              | Bitter, Astringent (Slightly)    |

**Procedure**

To detect the various Phyto – constituents, the extracts of the sample drug (*Shyamadi Agada*) was prepared by using different solvents. Chloroform, Petroleum ether, ethanol, methanol and distilled water were taken 100ml each in separate conical flask and added with 10g *Choorna*. Shake it thoroughly and kept for 24hrs and next day filtered it through Whatman filter paper.

Qualitative analysis was carried out by subjecting the extracts into the chemical tests (as per the standard protocol of API) for detecting the phytochemicals. Such as carbohydrates, proteins, starch alkaloids, flavonoids, triterpenoids, phenolics, elagic acid, tannin, saponin and steroids.

**Table no. 4: Results of phytochemical study.**

| Sl. no. | Phytochemical test & observations  | Results              | Biological action   |
|---------|--|----------------------|---|
| 1.      | <b>Carbohydrates</b><br>a) Benedict's test :-<br>Formation of a coloured precipitate<br>b) Fehling's test :- A brick red precipitate | Positive<br>Positive | Anti-inflammatory,<br>Analgesics, Anti-toxic.                           |
| 2.      | <b>Alkaloids</b><br>a) Dragendorff's test :- an orange red precipitate<br>b) Mayer's test :- Pale yellow Precipitate.                | Positive<br>Positive | Anti-inflammatory,<br>Analgesics,<br>Anti-bacterial                     |
| 3.      | <b>Triterpenoids</b><br>a) Liebermann – Burechard's test<br>Violet coloured ring was developed.                                      | Positive             | Anti-inflammatory,<br>Anti-viral,<br>Anti-microbial,<br>Immunomodulator |
| 4.      | <b>Phenolics</b>   |                      | Anti-inflammatory,  |

|    |   |                          |                    |
|----|---|--------------------------|--------------------|
|    | Bluish – black colour   | Positive                 | Anti-oxidant       |
| 5. | <b>Steroids</b><br>a) Liebaermann – Burchard’s test.<br>A greenish colour was developed which turned to blue.<br>b) Salkowski Reaction :- A red colour was produced | Positive<br><br>Positive | Anti-inflammatory. |

## DISCUSSION

*Shyamadi Agada* ingredients possess *Vishagna* (anti-toxic), *Dahaprashamana* (pacify burning sensation), *Kushtagna* (reduces skin disorders), *Kandugna* (cure itching), *Varnya* (improve complexion), *Shothagna* (reduces swelling) properties which facilitate the action on *Paanivisha*. Therapeutic properties of the drugs are analysed in Ayurveda based on its *Rasa Panchakas i.e; Rasa (taste), Guna(basic nature of drug), Virya( potency), Vipaka (metabolite of drug) and Prabhava (specific action)*. The formulation shows bitter taste due to the predominance of this taste in all the ingredients with slight astringent taste. As per Ayurveda, the bitter taste itself have certain pharmacological actions like anti-toxic, relieves burning sensation, itching and skin diseases, kills germs and micro-organisms etc. 60% of ingredients are having *Guru Guna* and 40% have *Laghu Guna*. *Guru guna* act as tonic and *Laghu Guna* helps for easy absorption. These two Gunas along with other Gunas counter act the contact poisoning. *UshnaVeerya* (60%) and *Sheeta Veerya* (40%) drugs in this formulation together brings the potency to eliminate the *Visha* (poison) as well as detoxify the skin.

Acharya Charaka has mentioned that the touch of the poison will lead to the swelling of hand, numbness in fingers, burning sensation, pain and brittleness or cracking of nails. In *Ashtanga Hrudaya*, it has been elucidated that the contact of poisoned food produces itching, burning sensation all over the body, burning sensation at the site of touch, fever, pain, eruptions, loss of tactile sensation, falling of the nails and hairs and swelling. The treatment shall be bathing, external application, pouring of water processed with anti-poisonous drugs. But the formulation *Shyamadi Agada* is mentioned in *Susruta Samhita* and *Ashtanga Samgraha* only. Other *Samhitas* enlisted different formulations in the context of *Paanivisha*. However, the symptoms of *Paanivisha* such as burning sensation, swelling, numbness and falling off nails etc. are nothing but inflammatory reactions against toxic materials.

Contact dermatitis conditions are manifested due to exposure of any irritants like cosmetics, medicines, poison ivy, detergents, perfumes, rubber, urine, saliva etc. Contact dermatitis is generally classified into Allergic and Irritant. Irritant contact dermatitis is most common

(80%) and can occur in anyone, any time after repeated exposure. Burning sensation, itching, redness, swelling, peeling are common clinical features. If we are analysing these clinical features proximately, there is a resemblance with the contact poisoning mentioned in the Ayurvedic authentic texts. At this perspective, there is a scope for *Shyamadi Agada* to alleviate this conditions by conducting a clinical trial.

Chemical compounds produced as a result of metabolic reaction during plant growth are known as Phytochemicals. The medicinal value of plant lies in the phytochemical (bioactive) constituents of the plant which shows various physiological effects on human body. The phytochemical screening of *Shyamadi Agada* showed the presence of carbohydrates, alkaloids, triterpenoids, phenolics and steroides. Carbohydrates which contributes the anti-inflammatory, analgesics, anti-toxic in action as documented in various research works. Triterpenoids is known for anti-inflammatory, mucolytic, mucociliary potentials, analgesic, anti-bacterial properties. Alkaloids are presumed to have a broad range of pharmacological potentials like antimicrobial, antibacterial and anti-inflammatory and immunomodulatory properties. Phenolic substances generate an antioxidant and anti-inflammatory activity. Plant steroids are known to possess anti-inflammatory action. Preliminary Phytochemical screening of formulation gave only the conceptions about its phytoconstituents. But further analysis like qualitativative and quantitative analysis, HPLC, GCMS etc. techniques are appreciable to rule out the genuine potency of this formulation.

External application of *Shyamadi Agada* may lead to the absorption of active principles (viz. Carbohydrates, Alkaloids, Triterpenoids, Phenolics and Steroides) to the skin through Trans – epidermal intake. Epidermal barrier function is mainly occurs in stratum corneum (horny layer). The dermal layer contains many capillaries which help for the absorption of drugs. As per *Susruta Acharya, Tiryakgata Dhamanis* (Numerous capillaries) facilitates the absorption of medicine with the help of *Bhrajakaagni* (Irradiating fire or heat in skin). And the combined action of the ingredients together bring backs the equilibrium of *Doshas*. Thus, the goal of the treatment will become great success.

## CONCLUSION

The cutaneous administration is advocated mainly when the local effect is required in clinical practice. In phytochemical preliminary screening, *Shyamadi Agada* exhibited its anti-toxic, anti-inflammatory, anti-microbial, analgesic, anti-oxidative and immunomodulatory properties through the confirmed active principles of the formulation. These observed

phytochemicals in the *Shyamadi Agada* which contributes the pharmaceutical action against the contact poison, which is documented by *Acharyas* thousands of years before. This phytochemical screening expound a new window to the clinical trials to explore this formulation. Thus, the *Shyamadi Agada* can be applicable not only in *Paanivisha* but also in other inflammatory skin manifestations.

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