



# THE PRICE OF BEAUTY: REVIEW OF TOXICITY RISKS OF COSMETICS W.S.R. DUSHI VISHA

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## ABSTRACT

The history of using cosmetics by humans dates back to 7000yrs in almost all cultures of the world. In today's times, a wide range of cosmetics like skin care creams & lotions, cleansers, lipsticks, nail polishes, deodorants, etc. are utilized by people regularly. These cosmetics are often loaded with hazardous chemicals like Talcum, parabens, Coal tar dye, Phthalates, Fragrance, Triethanolamine, and some heavy metals like Lead, Arsenic, Cadmium, etc which gets accumulated in the body and are not only toxic to the person but also to the environment.

The use of cosmetics containing these harmful ingredients can disrupt the normal functioning of the skin, impair detoxification pathways, and contribute to the accumulation of toxins. This accumulation can lead to various skin issues, including irritation, inflammation, allergies, contact dermatitis, hair loss and even long-term damage to the skin.

Furthermore, the toxins from cosmetic products can enter the bloodstream and affect other organs and systems in the body. They may contribute to hormonal imbalances, disrupt the immune system, can cause kidney, lung and liver damage, reproductive toxicity and carcinogenicity and potentially increase the risk of chronic diseases.

In Ayurveda, the concept of *dushi visha* can be well incorporated with Cosmetic toxicity. According to *Acharya Sushrut*, it is a part of *sthavara ,jaangama, or kritrima visha* , which has not gone out from the body completely ,the poison which is very old, inactivated by anti-poisonous drugs that which by nature is poor in its qualities,

attain the name *Dushivisha* (impotent/weak poison); because of its poor potency, it does not kill the person quickly and remains in the body for many years covered by *Kapha*.

With particular reference to *Dushi Visha*, this article presents the conceptual aspect of cosmetic chemical toxicity. This article aims to discuss cosmetics's health effects and possible solutions from the perspective of ancient toxicology.

Keywords: Cosmetics, Heavy metals, *Dushivisha*, Cumulative toxicity.

## **INTRODUCTION:**

According to the Drugs and Cosmetics Act (India), 1940, cosmetics may be defined as any substance intended to be rubbed, poured, sprinkled, or otherwise applied by human beings for cleansing, beautifying, and promoting attractiveness.

The word "cosmetics" is attributed to all kinds of products adopted to maintain and glorify one's outer personality while beautifying it. Cosmetics have become a necessary component of our daily lives, enhancing our appearance and boosting our confidence. However, concerns about these products' safety and potential toxicity have arisen recently.

Products containing toxic chemicals have long been used by humans to improve their appearance and well-being. Ladies in ancient Rome utilized toxic recipes, to brighten the skin and kohl to line the eyes. Additionally, Egyptians were the first to use black paint containing antimony as eyeliner. In Britain, ladies applied opium to their faces and radiant white lead paint to achieve fair skin.

Cosmetic products and their applications have been documented since the Indus Valley culture in India. Before the turn of the century, beauty products, including skincare and hair care, were mostly homemade, using herbs and ingredients available locally in India. Besides, some beauty practices were based on routine, and others were dependent on the seasons. In *Ayurveda*, *Tailams* (oils) and *Ghritas* (clarified butter or ghee) were used for facial beautification. With globalization, beauty and personal care products from other countries became available in India, increasing accessibility and affordability. One example is the replacement of *Shikakai* (a powder made from parts of a dry shrub) with shampoos containing surfactants.<sup>(1)</sup>

Many of today's products contain chemical additives to enhance cosmetic properties (lead in lipsticks and progressive hair dyes to brighten color), improve the efficacy of the cosmetic (phthalates in nail products as a solvent for dyes and as a plasticizer to keep nail polish from becoming brittle), or preserve the product (triclosan to inhibit microbial and fungal growth).<sup>(2)</sup>

Humans are constantly exposed to these toxic chemicals in their day-to-day life. Long-term use of chemical products produces various toxic hazardous effects on the human body. These toxins enter our bodies by different routes. They enter the system through blood circulation, and retention of these toxins results in toxicity which slowly affects our organ system and immune system and can cause various diseases.

After exposure to the body, some of the components of this substance do not get completely eradicated from the body, and in due course of time, this frequent addition leads to cumulative toxicity.<sup>(3)</sup>

### **MAJOR TOXINS IN COSMETICS** <sup>(4),(5),(6)</sup>

<b>PRODUCT</b>	<b>CONTENT</b>	<b>TOXIC EFFECT</b>
Moisturizers	BHA & BHT	<ul style="list-style-type: none"> <li>• Endocrinedisruption</li> <li>• Cancer</li> </ul>
Moisturizers Shampoo Body lotionsDiaper wipes	DEA-relatedingredients Parabens	<ul style="list-style-type: none"> <li>• Cancer</li> <li>• Endocrinedisruption</li> <li>• Breast cancer</li> </ul>

Almost all cosmetics	Fragrance	<ul style="list-style-type: none"> <li>• Clogs lymphatic system</li> <li>• Endocrine disruption</li> <li>• Organ system toxicity</li> </ul>
Eye shadow Blush Baby powder Deodorant Face powder	Talc	<ul style="list-style-type: none"> <li>• Lung tumour</li> <li>• Ovarian cancer</li> </ul>
Nail products, Hair dye	Formaldehyde	<ul style="list-style-type: none"> <li>• Cancer</li> </ul>
Perfumes Deodorants Lotions	Phthalates	<ul style="list-style-type: none"> <li>• Headaches,</li> <li>• Asthma,</li> <li>• Dermatitis,</li> <li>• Endocrine disruption,</li> <li>• Liver/Kidney/</li> <li>• Lung damage,</li> <li>• Cancer</li> </ul>
Lipstick Hair dye	Lead	<ul style="list-style-type: none"> <li>• Cancer</li> <li>• Neurotoxicity</li> </ul>
Shampoos, cleansers, soaps.	Sodium Lauryl Sulfate (SLS, SLES)	<ul style="list-style-type: none"> <li>• Eye and skin irritation</li> <li>• Depression</li> </ul>

		<ul style="list-style-type: none"> <li>• Liver damage</li> <li>• Cancer</li> </ul>
Nail polish Hair dye	Toluene	<ul style="list-style-type: none"> <li>❖ Reproductive &amp; developmental damage</li> <li>❖ Liver and Kidney damage</li> </ul>

### **CONCEPT OF DUSHIVISHA:**

*Acharya Sushruta* and *Vagbhata* described *Dushi Visha* as any kind of poison originating from inanimate or animate sources or *Kritrima Visha* retained in the body after partial expulsion or which has provisionally undergone detoxification by the anti-poisonous drugs, forest fire, the wind, or the sun is termed as *Dushi Visha*<sup>(7)</sup>

The poison, which has lesser potency and attains a hidden stage in the body, is called *Dushivisha*. Due to the presence of less *Guna* than *Visha* it is responsible for the delayed action and cumulative toxicity on the body.<sup>(8)</sup>

Because of the *Avarana* action by *Kapha*, these low-potency poisons is retained in the body for a long period without producing any grave or fatal symptoms.<sup>(9)</sup>

The poisons which vitiate *dhatu*s, because of factors such as *desha*, *kaala*, food, and sleeping during day time is called “*Dushi visha*”.

### **POORVARUPA OF DUSHIVISHA**

The prodromal symptoms of *Dushivisha* are narcolepsy, the feeling of heaviness of the body, yawning, laxity of joints, horripilation, and body aches.<sup>(10)</sup>

**SIGNS AND SYMPTOMS (LAKSHANS)**

Different kinds of clinical features of *Dushi Visha* according to different classical texts are mentioned in the following table:

<b>CHARAK SAMHITA<sup>(11)</sup></b>	<i>Rakta Dushti, Arunshika, Kitiva, Kotha</i>
<b>SUSHRUT SAMHITA<sup>(12)</sup></b>	<i>Avipaka, Arochak, Annamada, Mandal, Kotha, Moh, Paadshopha, Karashopha, Asyashopha, Dakodar, Chhardi, Atisaar, Vaivarnya, Moorcha, Vishamjwara, Trishna, Unmaad, Shukrashaya, Kushtha</i>
<b>ASHTANG SANGRAH<sup>(13)</sup></b>	<i>Bhinna pureesha , Bhinnavarna, Raktadushti , Trishna, Moorcha, Aruchi, Vami, Gadgadavak, Moha, Dooshyodara.</i>
<b>ASHTANG HRIDYA<sup>(14)</sup></b>	<i>Bhinna pureesha , Bhinnavarna, Raktadushti, Trishna,, Moorcha, Vami, Gadgadavak, Moha, Dooshyodara.</i>
<b>BHAVPRAKASH<sup>(15)</sup></b>	<i>Bhinna pureesha, Bhinnavarna, Vami, Gadgadavak, Vicheshta, Arati (restlessness), Vigandhi, Vairasya, Pipasi, Moorcha, Bhrama.</i>
<b>YOGRATNAKAR<sup>(16)</sup></b>	<i>Bhinna Purisha Varna, Annamada, Mukha Daurgandhya, Arocaka, Avipaka, Mandala, Kotha, Trishna, Moha, Vamana, Atisara, Mamsa kshaya, Pada sophia, Pani sophia, Akshi sophia, Chardi, Murcha, Kustha, Swasha, Jwar, Jathara, Unmada, Aanaha, Sukrakshaya, Gadgadavak.</i>

According to the involvement of the predominance of Dosha, different kinds of *Dushi Visha-related* clinical features mentioned below will be observed.<sup>(17)</sup>

1	<b>VATA</b>	<i>Moha, Arati, Trishna, Murccha, Galagraha, Phena, Chardi</i>
2	<b>PITTA</b>	<i>Kasa, Jwara, Vamathu, Trishna, Klama, Daha, Atisara, Tama</i>
3	<b>KAPHA</b>	<i>Shwasa, Kandu, Lala, Vamana, Galagraha</i>

## **PROGNOSIS**

The effect of immediately consuming *Dushi Visha* on a well-judged and judicious person is *Sadhya* (curable), and 1-year-old poison is *Yapya*. The consumption of *Dushi Visha* irrespective of time is *Asadhya* (incurable) for weaklings and ill dietary persons.<sup>(18)</sup>

## **TREATMENT**

*Acharya Sushruta* has mentioned the treatment principle for *Dushi Visha* with *Swedana karma* followed by *Shodhan karma* i.e., *Vamana, Virechana Karma*, according to the priority of *Dosha* involvement.

Then after *Shodhan Karma*, advised to take *Dushi Visari Agad Paana* daily (anti-toxic Drugs) which contains *Pippali, Kattran, Jatamamsi, Shavar Lodhra, Kevatimotha, Suvarchika, Sukshmaela, Swarnagairik*.

## **SHODHAN CHIKITSA**

The main detoxifying processes that are done to remove accumulated toxins from the body are :

- I. *Vamana*- emesis Therapy.
- II. *Virechana*- Purgation Therapy
- III. *Basti Karma*- enema Therapy
- IV. *Nasya karma*- errhine Therapy
- V. *Rakta mokshna* - Bloodletting Therapy

**SHAMAN CHIKITSA**<sup>(20)</sup>

- I. **Agada (Antidote)** - 1. *Dushi Vishari Agada*,
2. *Shleshmaatakadi Agada (Yogaratanakara)*,
3. *Chandrodaya Agada (Vanagsena Samhita)*,
4. *Sanjivani Agada (charaka samhita)*,
5. *Dashanga Agada (Astanga Hridayam)*,
6. *Maha Agada*.

- II. **Ghrita**- 1. *Amrita Ghrita (Vanagsena Samhita)*, 2. *Nagadantyadi Ghrita (Vanagsena Samhita)*, 3. *Tanduliya Ghrita (Vanagsena Samhita)*, 4. *Ajeya Ghrita (Vanagsena Samhita)*

- III. **Vati**- *Amrita Ankoor Vati (Bhaishajya Ratnavali)*

- IV. **Bhasma**- *Tutha Bhasm*

- V. **Rasayana**- *Gandhaka Rasayana*.

**For external application:**

- I. **Taila** - 1. *Bhringaamalakyadi tail*

2. *Nilibhringyadi tail*

- II. **Mukhakantivardhaka yoga**- 1. *Dwiharidrayadi Tail (Bhaishajya Ratnavali)*

2. *Manjishthyadi Tail (Bhaishajya Ratnavali)*

3. *Kumkumyadi Tail (Bhaishajya Ratnavali)*.

- III. **Lepa**- 1. *Laal Chandanayadi Lepa (Bhaishajya Ratnavali)*

2. *Semalayadi Lepa (Bhaishajya Ratnavali)*

- IV. **Krishnikaran yoga**- 1. *Lohamalayadi Udvartan*

2. *Kapaalranjan Yoga*,

3. *Triphalayadi Lepa*.

- V. **Raktashodhak yoga**- 1. *Saariwayadi vati*

2. *Khadirarista*,

3. *Mahamanjishthayadi Kwath*.



## **AYURVEDIC ALTERNATIVES FOR TOXIC CHEMICAL COSMETICS ARE AS FOLLOWS**<sup>(21)(22)(23)</sup>

**Skin Care Cosmetics** – Cleansers & Body Washes, Scrubs, moisturizing agent etc. can be replaced with the following:

1. *Kumari* (Aloe vera) - Moisturizer, Sunscreen & Emollient
2. *Zendu* (Calendula officinalis) - Wound healing
3. *Kasani* (Cichorium intybus) - Skin blemishes
4. *Haridra* (Curcuma longa) - Antiseptic, Antibacterial, Improves complexion
5. *Gajar* (Daucus carota) - Natural toner and skin rejuvenator
6. *Yashtimadu* (Glycyrrhiza glabra) - Skin whitening
7. *Tulsi* (Ocimum sanctum) - Anti-aging, Antibacterial & Antiseptic
8. *Satapatri/ Gulab* (Rosa centifolia / Rosa indica) - Toning & Cooling
9. *Manjishtha* (Rubia cordifolia) - Wound healing & Anti-aging
10. *Godhuma* (Triticum sativum) - Antioxidant, Skin nourisher, anti-wrinkle

**Hair Care Cosmetics** - Shampoo, Hair remover, Hair Colours & Hair Sprays, etc. can be replaced with the following:

1. *Sikakai* (Acacia concinna) - Natural Detergent & Anti-dandruff
2. *Kumari* (Aloe vera) - Cleanser & Revitalizer
3. *Nimba* (Azadirachta indica) - Reduces hair loss, Anti-dandruff
4. *Brahmi* (Bacopa monnieri) - Hair tonic, Promotes hair growth
5. *Devdaru* (Cedrus deodara) - Anti-dandruff
6. *Mandukparni* (Centella asiatica) - Darkening of hair
7. *Bhringaraj* (Eclipta alba) - Reduces premature graying of hair, Alopecia
8. *Amalaki* (Emblica officinalis) - Toner, Anti-dandruff, Protects & reduces hairloss

9. *Japa* (*Hibiscus rosa sinensis*) - Natural Hair dye, Prevent hair fall, Anti-dandruff
10. *Shathi* (*Hedychium spicatum*) - Promotes hair growth.
11. *Madyantika/ Heena* (*Lawsonia alba*) - Natural Hair dye, Anti-dandruff, Conditioner
12. *Rusmary* (*Rosmarinus officinalis*) - Nourishes, Softens & restores the hair shafts
13. *Arishtak* (*Sapindus trifoliatus*) - Natural detergent & Cleanser
14. *Godhuma* (*Triticum sativum*) - Provides nourishment, lubrication & luster
15. *Bibhitaka* (*Terminalia belerica*) - Prevents graying of hair
16. *Tila* (*Sesamum indicum*) - Promotes hair growth, Blackens the hair.

### **Face Care Cosmetics**

*Ayurvedic* literature describes over 200 herbs and minerals to maintain and enhance the beauty of the skin. So, instead of using foundation, Powder, etc. for enhancing fairness, herbs from *varṇya mahakashaya*, *lodhradi varṇya gaṇa*, *eladi varṇa prasadana gaṇa* and a few *varṇya* formulations viz. *haridra khaṇḍa*, *nimbadi churna*, *chandanadi taila*, *kuṅkumadi taila*, *kanakarishtha* can be used.

Their skin lightening effect is proven on a modern scientific basis by affecting Tyrosinase and other proteins responsible for skin darkness and other cosmetic disorders. Tyrosinase inhibition is still the most sought-after mechanism of skin lightening, herbs having such property will show promise as depigmenting agents. Some of these herbs are as follows:

1. *Shweta Chandana* (*Santalum album*) - for all types of skin, low acute oral and dermal toxicity
2. *Madhuyashti* (*Glycyrrhiza glabra*) - lightening, emollient, anti-acne, antiaging, antimicrobial
3. *Manjishta* (*Rubia cordifolia*) – enhance complexion even lighten dark spots.
4. *Padmaka* (*Prunus cerasoides*) - anti melanogenesis activity by suppression of tyrosinase
5. *Ushira* (*Vetiveria zizanioides*) - suppresses the  $\beta$ -MSH-induced melanogenesis
6. *Lodhra* (*Symplococo racemosa*) - Salireposides isolated from its extract has well documented activity against acne producing bacteria
7. *Kushta* (*Saussurea lappa*) - as leprosy, erysipelas, as well as to improve complexion
8. *Tvak* (*Cinnamomum zeylanicum*) - show anti-tyrosinase activity
9. *Kesar* (*Crocus sativus*) - anti-pruritic and complexion promotion effects.

10. *Haridra* (*Curcuma longa*) - Curcumin has been found to suppress melanogenesis in stimulated melanoma cells. Rhizome has maximum efficacy of 88.56% inhibition of tyrosinase .
11. *Daruharidra* (*Berberis aristata*) - Antioxidant potential, tyrosinase inhibitory activity.
12. *Mustaka* (*Cyperus rotundus*)
13. *Nimba* (*Azadirachta indica*) - bark has shown significant tyrosinase inhibition.
14. *Khadira* (*Acacia catechu*) – methenolic extract has 44.4% tyrosinase inhibitory activity.
15. *Amalaki* (*Phyllanthus embilica*) - potent anti-oxidant, inhibit mRNA expressions of tyrosinase.
16. *Haritaki* (*Termanalia chebula*) - Isoterchebulin had reduced the protein levels of MITF (microphthalmia-associated transcription factor), tyrosinase and its related proteins.
17. *Sunthi* (*Zingiber officinale*) - suppresses murine tyrosinase activity and decreases the amount of melanin as well as intracellular reactive oxygen species (ROS) level in a dose-dependent manner acting as a good whitening agent for skin.
18. *Padma* (*Nelumbo nucifera*) - tyrosinase inhibitory activity, skin whitening agent.

### **UV Screening**

1. Kumari (*Aloe vera*)- Sun screen, Moisturizer,
2. Musta (*Cyperus rotundus*) - Sun tanning
3. Shigru (*Moringa oliefera*) - Sun tanning

### **DISCUSSION:**

Cumulative toxicity refers to the gradual accumulation of toxic substances in an organism's body over time, adversely affecting its health.

According to *Ayurveda*, *dushivisha* can result from the application of cosmetics that contain harmful ingredients or chemicals that disrupt the body's natural balance and contribute to the formation of *ama* (toxic waste).

The effects of cumulative toxicity may not be immediately apparent and can manifest over months, years, or even decades. It is important to note that the cumulative toxicity of a substance is influenced by factors such as

the dose and duration of exposure and individual susceptibility.

The clinical features developed due the prolonged exposure of cosmetics are similar to the *dushivisha*. In the context of *dushivisha*, addressing cosmetic toxicity involves reducing exposure to harmful ingredients and adopting a more holistic approach to skincare. This includes opting for natural and organic cosmetic products that are free from harmful chemicals, toxins, and potential irritants and managing the symptoms by getting proper *shodhan chikitsa* and consuming various *agads* described in our ancient *Samhitas* for detoxification.

Additionally, maintaining a healthy lifestyle, following a balanced diet, practicing stress management, and supporting the body's natural detoxification processes can help prevent the accumulation of toxins and promote overall skin health.

## **CONCLUSION**

Cosmetic toxicity remains a subject of concern and discussion. While it is crucial to acknowledge potential risks associated with certain ingredients of cosmetic products, it is equally important to rely on scientific research, regulatory measures, and informed decision-making. By fostering consumer awareness, supporting responsible industry practices, and promoting a balanced approach to cosmetic safety, we can navigate the realm of cosmetics while prioritizing our health and well-being.

In conclusion, the article highlights the need for awareness and caution regarding the toxicity risks associated with cosmetics. It emphasizes the importance of adopting safer alternatives and exploring *Ayurvedic* principles to address cosmetic chemical toxicity.

It also draws a similarity between cumulative toxicity and *dushi visha*. Therefore, cosmetic toxicity can be treated same as *Dushi Visha janya vyadhi*.

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