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The Ugly Truth Behind The Colourful World

Holi, a festival of vibrant hues that brings with it a variety of colours -- red, yellow, blue, green, magenta, purple, orange, golden, black, silver... the list is endless. This festival, which marks the harvest of rabi crop and the arrival of spring, was traditionally celebrated using natural coloured extracts from seasonal herbs. However gradually, these natural herbs were replaced by synthetic dyes, most of which contain a plethora of chemicals. Did you know that these seemingly harmless, “pleasing to eye” colours could be toxic.



This is because of the presence of cheap materials like mica, acids, alkalis, pieces of glass, which not only induce skin disorders like abrasion, irritation, itching but can impair vision, cause respiratory problems and also cancer.

Broadly, there are three categories of colours available in the market – pastes, dry powder and water colours – all of which are hazardous. The hazard increases when these are mixed with oil and applied to the skin and these “rogue” chemicals sneak easily through the skin into the body system. From whatever information is available on this subject, it is known that these chemicals have serious health implications. Let us examine each.

Pastes

Did you ever smear the devilish black paste on holi or the nice glittery golden silver to get the mermaid look or the white for the snowwhite look? If yes, then indeed you are in for trouble, as you have exposed yourself to some very hazardous chemicals.

Holi pastes contain very toxic chemicals that can have severe health effects. We have listed a few of them according to colour.

Color	Chemical	Health Effects
Black	Lead oxide	Renal Failure
Green	Copper Sulphate	Eye Allergy, Puffiness and Temporary blindness
Silver	Aluminium Bromide	Carcinogenic
Blue	Prussian Blue	Contract Dermatitis
Red	Mercury Sulphite	Highly toxic can cause skin cancer

(Source: Vatavaran)

Dry Colours (Gulal)

Dry colours or *gulals* have two components—a colourant which is toxic and a base which could either be asbestos or silica both of which are capable of causing health hazards. While silica may dry as well as chap the skin, asbestos which is a known human carcinogen gets built up in the body tissue. It can result in cancer even in microquantities i.e. the slightest of exposure increases risk which is directly proportional to both the level and duration of exposure.

The major constituent of the colourants in *gulals* are mostly heavy metals that are known systemic toxins. These heavy metals not only get deposited in the kidneys, liver and bones but are also capable of disrupting the metabolic functions.

A glance at the health effects caused by heavy metals

Heavy metals	Health effects
Lead	Learning disability
Chromium	Bronchial asthma, Allergies
Cadmium	Itai Ita disease (fragile bones)
Nickel	Dermatitis pneumonia
Mercury	Minimata disease (disorder of the nervous system)
Zinc	Fever
Iron	Skin becomes sensitive to light

(Source: Down to Earth)

Lead is the most dangerous of all the heavy metals found in holi colours. It can affect the nervous system, kidneys and the reproductive system. Among children, it can affect the physical and mental growth, even in small quantities. If a pregnant woman is exposed to lead, it can be carried to the unborn child and damage its nervous system. It can even result in premature birth, low birth weight, miscarriage or abortion. Yet another heavy metal of concern is cadmium which has been classified a probable human carcinogen.

In an attempt to ascertain the presence of heavy metals in gulals, Toxics Link got red and blue gulals, that are the most commonly used colours, analysed at IIT Kanpur. The red sample was found to contain mercury which is a very toxic metal that can enter the body through the skin and even by inhalation. It has the potential to pass through the brain barrier and the placental barrier and is also known to affect the sensitive organs like kidney, liver and the central nervous system.

The test results of the blue sample confirmed the presence of copper. The organs that are targeted by this metal are eyes, skin, respiratory system, liver and the kidneys.

Water Colours

Gentian violet is the most widely used colour concentrate during holi. But are you aware that this innocuous to look at concentrate can cause skin discolouration, dermatitis, develop skin allergy or irritation of mucous membrane. It is very toxic in concentrated form and can lead to keratoconjunctivitis and dark purple staining of the cornea.

When asked about the fatalities which an individual is prone to on exposure to Holi colours, Dr S.K. Gupta of the Poison Centre at All India Institute of Medical Sciences, Delhi told that these colours have an alkaline base which can cause injury, the severity of which depends upon the area of contact and the degree of penetration. For instance, if the colour enters the eye, it can damage the ocular surface and cause temporary visual disability, discomfort and complications that pose a great danger to the vision. As for the precautions one should keep in mind while playing holi, Dr Gupta was of the opinion that sensitive areas like the eyes should be avoided. However, if a colour comes in contact with the eye, one should immediately wash it with large amounts of water and incase irritation persists, medical aid should be sought immediately.

While throwing colours at each other, people donot realise that these colours might enter the eye and impair vision. There are well documented cases of injury due to holi colours. For example in 1997, Rajendra Prasad Centre for Ophthalmic Sciences at AIIMS, was visited by 40 patients after sustaining

injuries due to colours during holi. All the patients complained of irritation, redness and watering. While 24 of these patients suffered from photophobia and 16 from pain, 2 of them experienced discoloration of conjunctiva.

Hope this information has not turned off all the holi lovers as there is a good news. You can celebrate this colourful festival with the same fervour and gaiety as the National Botanical Research Institute (NBRI), Lucknow has made organic holi colours from vegetable dyes, an area not explored for long. Infact they had exhibited some eco-friendly options at IIT Delhi's Swadeshi Vigyan Mela. For those of you who cannot lay your hands on these organic colours, revert to the traditional way and celebrate using *tesu* flowers. These flowers can be boiled and soaked overnight to get a rich yellow colour. The Delhiites can buy these from the *Delhi Haat* (during Holi) or *Chandini Chowk*. If you are not able to find these flowers in the market, try out



some household receipes and get some nice shades and colors. Boil the petals of marigold flowers or the peels of pomegranate (*Anar*) and soak them overnight to get yellow colour. For rich magenta red, use beetroot or the stem of castor (*Aran*) and for orange red try henna leaves (*mehndi*). You can use turmeric or even red sandalwood powder to make holi pastes. These would not just impart colour but would also be good for skin as they are endowed with some therapeutic values. Let us celebrate holi in an environmentally benign manner and say no to toxic chemicals this year.

Reference:

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For details contact Toxics Link, c/o H-2 Jangpura Extension, Ground Floor, New Delhi 110 014, tel :+ 91 11 24328006, 24320711 email: tldelhi@vsnl.com