

Poisonous Cosmetics



THE PROBLEM OF MERCURY IN
SKIN WHITENING CREAMS IN NEPAL

Ram Charitra Sah



CEPHED



SSNC

Sample of different brand of skin whitening creams tested for mercury



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(CEPHED)

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About CEPHED

Center for Public Health and Environmental Development (CEPHED) is an environmental NGO established in the year 2004, by and through the contribution, coordination from a group of activist and experienced people from medical, environment and public health sectors. CEPHED's focus is to serve Nepalese people and communities in the field of public health and environment. CEPHED has adopted the vision of bridging people with the science and technology for healthy living and environmental safety and taken a mission to act as bridging forum between people with science and technology to make access new scientific knowledge, technology and safety measures of environment and public health sector through research, coordination, capacity building and policy dialogue, etc. CEPHED is working with and also willing to work with group and organizations around the country with an understanding that this will help to bring the experience from the ground to the concerned authorities' notice that leads to more meaningful and sustainable solutions. From past eight years CEPHED has been engaged mainly on research, awareness raising, capacity building, policy influence especially in the area of chemical management, pesticide, obsolete pesticide, healthcare waste, POPs, heavy metals like mercury, lead and cadmium, electronic waste etc.

Additionally, CEPHED has been actively engaged in research, production of Information, Education and Communication (IEC) materials both in printed and electronic format widely disseminating all over the country. The research results and findings have been shared with all stakeholders especially government, business communities and general public at large scale through all possible means such as meeting, interaction, presentation, newspaper, radio and television programme and also through organizing series of district, regional and national level awareness and capacity building training programmes on these issues.

With its growing interest and engagement with various environmental issues of national and international importance, it became an active participating organization of several global networks working in the area of public health, environment and toxic free future. CEPHED is member organization of Toxic Link, International POPs Elimination Network (IPEN), Global Alliance for Incinerator Alternatives (GAIA), Healthcare Without Harm (HCWH), Collaborative on Health and the Environment (CHE) and Zero Mercury Working Group (ZMWG)/EEB. CEPHED has been doing research, raising awareness and at the same time setting pilot model projects. CEPHED has recently completed the feasibility study and strategy development for mercury free health care services from there pilot projects. The second intervention made by CEPHED towards curbing the release of POPs (Dioxins, Furans) is the development of environmentally sound management of health care waste and promotion of the use of dry welding machine for metal fabricating as model programme.

CEPHED has been awarded with "2011 Stockholm Convention's PEN Award" in the ceremony hosted by POPs Convention Secretariat because of organization's outstanding work on raising awareness on PCBs, their health effects and ways to prevent their release.

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Executive Summary

Cosmetics are being used from the early historical era but simply the form of the cosmetics and the way of using it was different. From the time immemorial both the men and women are equally fond of cosmetics. In earlier days people use to mix different types of chemicals and products to make cosmetics to be applied in their face which include even the heavy metals. Galena Mesdemet is one example of such cosmetic used in ancient Egyptian period. It is an eye product that is made up of copper and lead ore.

Different literatures available prove that the heavy metals are used in large quantity in cosmetics during different time period depending in the products of cosmetics they wanted to use. And these cosmetics that have been prepared as heavy metals as their ingredients is very toxic to health. It may cause various problems like damage in brain, kidney, nervous system, reproductive system and even cause a cancer and death.

Many European and African countries have banned heavy metal in cosmetics and even fix the standards. However, Nepal does not have any standards, guidelines or policies regarding the concentration of heavy metals in cosmetics or in any other products. There is no any government agencies responsible for regulating chemicals in cosmetics in Nepal. Therefore, there is no limit for such concentration in products in Nepal. For this reason, under this study the guideline considered for analyzing the result of mercury test were again compared with US Food and Drugs Administration's mercury in cosmetic guidelines which is less than 1 mg/kg.

This was the first ever study carried out by CEPHED in Nepal about chemicals in product especially in cosmetics to inform the wide users about the level of contamination and associated health impacts. Basically the study was done in two very popular and most used cosmetic products: skin whitening and moisturizing creams. The concentration observed in these products were Mercury at the level of health concern.

Seven samples of most common and popular brand of skin whitening and moisturizing creams were collected from different market areas of Kathmandu. The collected samples of skin whitening cream was send to Delhi Test House (DTH), New Delhi, India for mercury (Hg) detection. Mercury in skin whitening creams were tested by ICP MS method. The result shows that the popular skin whitening creams available in the Nepalese market has mercury level at detectable level and is enough to cause different kinds of disabilities and problems in human health up on continuous use. The mercury level in the studied skin whitening creams ranges from below 0.025 mg/kg (instrument detection limit) to maximum of 0.521 mg/kg for Garnier skin natural. The average value of mercury contain in all samples was found to be 0.112 mg/kg.

The market survey shows that there is no any monitoring regarding quality, sell, import and distribution of cosmetics in Nepalese market. There is no proper labelling of ingredients in the cosmetic products and specially regarding heavy metals. So, general people are not aware of such contamination in the product they are relying on. Therefore, there is an immediate need to formulate a guidelines and standards regarding the heavy metal concentration in cosmetics to minimize the exposure of general public with toxic heavy metals as well as there should be some institutional arrangement to regulate the sector. The mass awareness about the chemicals in products especially in cosmetics needs to be launched.

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Mercury in Skin Whitening Creams

1. Introduction to Mercury

Mercury is heavy metals that can be found naturally in the environment. Mercury is a chemical element that occurs in nature and can be found almost everywhere in the environment. Mercury is metal which is liquid at ordinary temperature; in fact it is liquid at 298 Kelvin. Mercury is sometimes called **quicksilver** because of its silvery-white appearance. It is naturally occurring heavy, odorless, lustrous liquid metal found in three forms: metallic; inorganic and organic. In terms of toxicity, organic form of mercury is more toxic than inorganic form is more toxic than elemental form. These days large numbers of lighting bulbs such as CFL and Tube light does uses of mercury in vapor forms. It is a rather poor conductor of heat if compared with other metals but it is a fair conductor of electricity. It alloys easily with many metals, such as gold, silver, and tin. These alloys are called amalgams.

In skin whitening creams, mercury has been used by many names such as “mercurous chloride”, calomel, mercuric, mercurio or mercury as one can see in the labelling however, most of the skin whitening creams does not contain any labelling of mercury ingredients. Mercuric oxide is used in skin ointments. Vermilion, a red pigment, is mercuric sulphide; another crystalline form of the sulphide (also used as a pigment) is black. Mercury fulminate, $\text{Hg}(\text{CNO})_2$, is used as a detonator.

2. Use of Mercury in Skin Whitening Creams

Mercury is a common ingredient found in skin lightening soaps and creams. It is also found in other cosmetics, such as eye makeup cleansing products and mascara. Skin lightening soaps and creams are commonly used in certain African and Asian nations. They are also used among dark-skinned populations in Europe and North America. Mercury salts inhibit the formation of melanin, resulting in a lighter skin tone.

Mercury in cosmetics exists in two forms: inorganic and organic. Inorganic mercury (e.g. ammoniated mercury) is used in skin lightening soaps and creams. Organic mercury compounds (thiomersal [ethyl mercury] and phenyl mercuric salts) are used as cosmetic preservatives in eye makeup cleansing products and mascara.¹

It is often difficult to distinguish between the dozens of products on the market that all claim to be “miracle” skin lighteners. Unfortunately, most products use ineffective ingredients, concentrations that are too low to be useful or contain potentially dangerous chemicals such as mercury. Some skin whitening products contain mercury (II) chloride as the active ingredient. The use of mercury in cosmetics is illegal in the United States and European Union as it can lead to cases of mercury poisoning and banned by law.²

Mercury is used in skin whiteners because the metal blocks production of melanin, which gives hair and skin their pigmentation. Other chemicals can do the same thing, but mercury is inexpensive and effective. It's also toxic. Mercury is rapidly absorbed through the skin and can affect people neurologically. They might experience blurred vision or trouble walking. Severe mercury poisoning can shut down organs and lead to death.

High levels found as products gain popularity worldwide. Some creams promising to lighten skin, eliminate age spots and zap freckles contain high levels of mercury, a toxic metal that can cause severe health problems.

1 MERCURY IN SKIN LIGHTENING PRODUCTS © World Health Organization 2011, <http://www.who.int/ipcs/assessment/public/mercury/en/index.html>

2 <http://www.lantomi.com/en/how-lantomi-works>

The market for skin lighteners is booming everywhere. Some people of Asian, Hispanic and African heritage use the creams because lighter skin is often considered a status symbol in their cultures. Many consumers, including Caucasians, use the creams to diminish age spots or to even out skin tone, while others want to lighten their entire face or bodies.

The creams were bought at a variety of stores: a large beauty-supply store in the uptown neighborhood, an herbal medicine shop in shopping malls Chinatown, and beauty parlor and salon on each and every corner of the cities.

Researchers say people are affected differently by mercury, depending on the amount and duration of exposure, among other variables. The amounts of mercury found by the previous studies in many countries were troubling and could lead to kidney damage at the least.³

Sometimes it is read or heard about banned skin whitening cream products and must have wonder why. This is because these products contain ingredients that have been found to be very harmful to human health. For example: mercury (II) chloride is used as an active chemical in several skin whitening creams. When applied, the chemical readily absorbs through the skin into the bloodstream.^[4] Basically it is used because; mercury has the ability to make dark spots on the skin lighter as well as getting rid of hyper-pigmentation on the skin.

History of mercury used in cosmetics product dates back to the early 1900s. They were used in bleaching soaps and creams during those days. Even before early 70s, mercury was already popularly used as a skin lightener. Most creams containing mercury were mainly targeting the black generation in the United States.

2.1 Pathways of Mercury Poisoning

“It goes through the [skin] tissue and then goes to the liver mainly. It has a long life of up to 90 days in the body after consumption. When the liver metabolizes it, it then goes into the bile duct, and part of this is re-absorbed. The remaining goes out from the kidney but it continuously accumulates in the body. Continuous use of mercury-containing products will result in chronic low-dose exposure toxicity or poisoning over a period of time.

But mercury poisoning doesn't just harm the person using the product.

“If pregnant women are using these mercury-containing products, then it can disturb the pregnancy or have damaging effects on the foetus,” Younger women may have infertility issues with an overdose of mercury and the immune system can get compromised.

3. Impacts of Mercury on Health and Environment

3.1 Impact of Mercury on Health

The main adverse effect of the inorganic mercury contained in skin lightening soaps and creams is kidney damage. Mercury in skin lightening products may also cause skin rashes, skin discoloration and scarring, as well as a reduction in the skin's resistance to bacterial and fungal infections. Other effects include anxiety, depression or psychosis and peripheral neuropathy.¹

The medical literature reports specific instances of individuals suffering from the aforementioned health effects following exposure to mercury through skin lightening creams and soaps. One case report describes a 34-year-old Chinese woman who developed nephrotic syndrome, a condition marked by high levels of

³ articles.chicagotribune.com/.../ct-met-mercury-skin-creams-2010051.

⁴ Counter SA (December 16, 2003). [Whitening skin can be deadly](#).

protein in the urine. The mercury levels in her blood and urine returned to normal one month and nine months, respectively, after she stopped using the skin lightening cream.¹

Similarly according to the China Central Television (CCTV) report dated 14 May 2012, one of the women Wang from north China's Shanxi province discovered swelling in her eye and face last October. Doctors diagnosed her with nephritic syndrome caused by mercury poisoning, and it was deduced that this mercury content was in the whitening cosmetics she used⁵.

One study indicated a large proportion of nephrotic syndrome among African women using ammoniated mercuric chloride-containing skin lightening creams for periods ranging from one month to three years. Over three quarters of the women who stopped using the creams went into remission.¹

Mercury in soaps, creams and other cosmetic products is eventually discharged into wastewater. The mercury then enters the environment, where it becomes methylated and enters the food-chain as the highly toxic methylmercury in fish. Pregnant women who consume fish containing methylmercury transfer the mercury to their fetuses, which can later result in neurodevelopmental deficits in the children. Exposure to inorganic mercury can be quantified through measurements in blood and urine. According to the World Health Organization, mercury in cosmetics can lead to kidney damage, depression, anxiety, mental disorders, a deteriorating immune system and other disorders.

Symptoms of mercury poisoning have resulted from the use of various mercury-containing cosmetic products.^[6] In Hong Kong in 2002, two products were discovered to contain between 9,000 to 60,000 times the recommended doses.^[7] In 2010, the news paper named as Chicago Tribune in U.S.A collected the 50 samples of skin whitening creams and sent to a certified lab for testing and found that six were found to contain the amount of mercury banned by federal law. The six creams that tested high in the Tribune tests were manufactured in Lebanon, China, India, Pakistan and Taiwan.^[8]

The use of mercury in cosmetics, however, was banned in Europe in 1976 and years later in the United States after the discovery of its dangerous effects on the body. Such products are also banned in the UAE and recently also in Malaysia.

Mercury poisoning manifests through these symptoms: frenzy, sore mouth and gums, tiredness, fatigue and memory loss. It also leads to kidney problems and affects the nervous system.

The Health Authority - Abu Dhabi (Haad) has urged the public to stop using any whitening product that may contain the words "mercurouschloride", calomel, mercuric, mercurio or mercury. Also, avoid using any product that has no proper labelling.⁹

3.2 Impact of Mercury on Environment

A very important factor in the impacts of mercury to the environment is its ability to build up in the organisms and up along the food chain known as bioaccumulation. In other words bioaccumulation is also known as an increase in concentration of a chemical in an organism over a time, compares to the chemical's concentration in the environment. There is a constant biogeochemical cycle of mercury that includes:

- Release of elemental mercury as a gas from the rocks and waters (degassing);

5 Cosmetics Contain Excessive Mercury, 2012-05-14 10:31:40 CRIENGLISH.com, Web Editor: Yihang

6 Counter SA, Buchanan LH (PDF). *Mercury exposure in children: a review*

7 Bray M (2002-05-15). *SKIN DEEP: Dying to be white*

8 Ellen and Roe Sam, 2010, Some Skin Whitening Creams contain toxic mercury: testing finds, Chicago Tribune.

9 <http://gulfnews.com/news/gulf/uae/health/skin-whitening-products-slowly-poison-the-body-1.1008853>.

- Long-range transport of the gases in the atmosphere;
- Wet and dry deposition upon land and surface water;
- Absorption onto sediment particles;
- Bioaccumulation (or biomagnifications) in terrestrial and aquatic food chains.

Mercury in the air may settle into water bodies and affect water quality. This airborne mercury can fall to the ground in raindrops, in dust, or simply due to gravity (known as “air deposition”). After the mercury falls, it can end up in streams, lakes, or estuaries, where it can be transferred to methylmercury through microbial activity. Methylmercury accumulates in fish at levels that may harm the fish and the other animals that eat them. Mercury deposition in a given area depends on mercury emitted from local, regional, national, and international sources.^[10]

Below is a schematic drawing of mercury cycling in an aquatic ecosystem. With the exception of isolated cases of known point sources, the source of most mercury to most aquatic ecosystems is deposition from the atmosphere, primarily associated with rainfall.

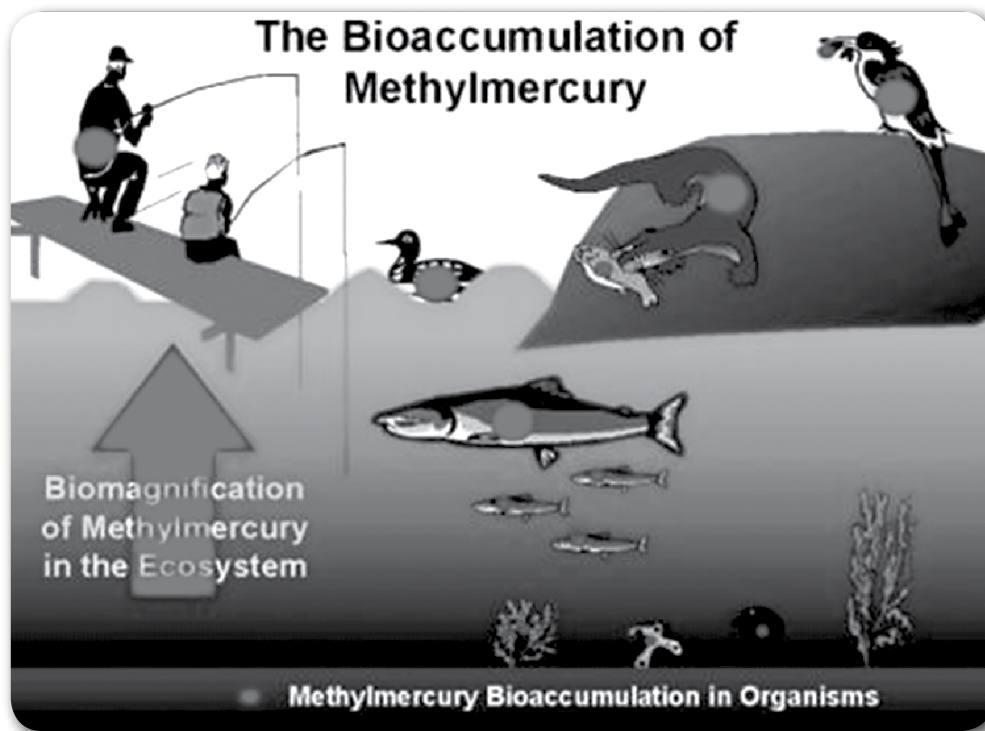


Figure 2: Bioaccumulation of Methylmercury¹¹.

4. International Guidelines for Mercury in Cosmetics

Several scientists came up claiming that mercury was harmful to human health. After several conclusive studies, some countries such as the EU and numerous African nations banned the distribution of mercury containing creams and soaps.^{[12], [13]} A European Union Directive specifies

10 www.epa.gov/environmentaleffects

11 [www. http://health.state.tn.us/environmental/mercury.htm](http://health.state.tn.us/environmental/mercury.htm)

12 Uram E, Bischofer BP, Hagemann S (2010). Market analysis of some mercury-containing products and their mercury-free alternatives in selected regions. Gesellschaft für Anlagenund Reaktorsicherheit (GRS) mbH, March (GRS-253; <http://www.ipen.org/ipenweb/documents/ipen%20documents/grs253.pdf>).

13 IPCS (1991). Mercury-containing cream and soap. In: Inorganic mercury. Geneva, World Health Organization,

that mercury and mercury compounds are not allowed as ingredients in cosmetics (including soaps, lotions, shampoos and skin bleaching products).

Table 1: International Guidelines for Mercury in Cosmetics other than eye product. ¹⁴

Regulatory body	Limits for cosmetics other than eye area products
European Union	Banned
Many African nations	Banned
United States Food and Drug Administration	< 1mg/kg
Health Canada	≤ 3 mg/kg
Philippines Food and Drug Administration	≤ 1 mg/kg
Nepal	Neither have standard nor regulatory bodies.

Table 2: Some International Guidelines for mercury in eye product.

Regulatory body	Limits for eye area products
European Union	≤ 0.007% by weight
United States Food and Drug Administration	≤ 65 mg/kg expressed as mercury (approximately 100 mg/kg expressed as phenylmercuric acetate or nitrate)

5. National Law and Standard for Mercury in Cosmetics

In most of the nations, rules, guidelines and standard for cosmetics is regulated by Department of Food and Drugs Administration. But in case of Nepal, no any governing body had made the guideline, laws and standards regarding the cosmetics and its quality control yet. The initiations have not been so far taken to limit and test the level of mercury in cosmetics. Nepal is still not yet thinks of formulation and regulation of guidelines, standards and policy on cosmetic products that binds its quality, import, sell and distribution as there is no any government bodies made responsible for this issues to be addressed so far.

6. Rational of the Study and Problem Statement

The market for skin lighteners is booming in Nepal and abroad. Cosmetics are very popular among women in every nation and now days it is even among men too. In Nepalese context, the increasing pollution and adulterated foods are causing different types of skin problems in both men and women. Among which skin darkening problem is the common one. And thus as a solution they prefer to use various skin whitening products available in market, unaware of harmful chemicals including heavy metal like mercury which is very toxic in nature. This may be because there is no such awareness rising campaign or also may be because there is no standard, laws or guidelines regarding the issue. Therefore, this study is of the first of this type, a pioneer step towards raising the awareness among general public about the skin whitening cream they have been using undoubtedly could hamper their health instead of benefit. Consumers can't know for sure which creams are tainted. Stores across the city sell dozens of brands, many of them made overseas and unregulated import, sale, distribution and promotional use.

International Programme on Chemical Safety (Environmental Health Criteria 118; <http://www.inchem.org/documents/ehc/ehc/ehc118.htm#SectionNumber:3.5>).

¹⁴ http://www.who.int/ipcs/assessment/public_health/mercury/en/index.html.

7. Objectives of the Study

Broad Objective

- To study the mercury concentration in Skin Whitening Creams.

Specific Objective

- To study the mercury traces in the skin whitening cream available in the market of Kathmandu.
- To raise awareness among the public and consumers about mercury in skin whitening creams.
- To carry out the advocacy for formulating mercury guideline and standards in Cosmetics and allocate the responsible government authority to deal with the issues of chemical in products.

8. Sample Collection and Laboratory Analysis for Mercury in Skin Whitening Creams

8.1 Sampling

This study is based on the research carried out by Center for Public Health and Environment Development (CEPHED) on mercury contamination in skin whitening cream. CEPHED collected the seven samples of most commonly used brands of skin whitening creams that are most popular among Nepalese men and women around the market of Kathmandu. The samples collected from the market have its manufacturing date from 2010 to 2011. The collected samples were then coded and sent to Delhi Test House (DTH) (ISO-9000 and NABL Certified Laboratory) in India for the analysis of total amount of mercury in the samples. All the details of the samples were tabulated for the record as follows before these samples had been sent to lab.



Sample of different brand of skin whitening creams tested for mercury

Table 3: Details of skin whitening creams samples.

Name of Brand	Date of manufacture	Volume	Mfg Lic No	Feedback Provision	Product No.	Manufacture by	Remark	Price
Papaya Cold Cream	Jan 2011	100 mL E3.38 Fl oz	9/C/UA/2008	Given	890413710107	MAC Personal Care Pvt Ltd.	Aloevera Silk and milk protein. Directions	
Fair and Lovely (Female)	June 2011	25 g	202/048-049	Not Given	8901030286797	Unilever Nepal Ltd.	Multivitamins. For clear and fair skin. Directions	MRP Rs 50. 02/06/11.C.304
Fair and Lovely (male)	Dec 2010	25g	202/048-049	Not Given	8901030296970	Unilever Nepal Ltd	Max Fairness Directions	MRP Rs 50. 30/12/10.C.018
Touch and Glow™ (Revlon)	Nov 2010	40 g	17/C/UA/2009	Not Given	IN101591 17/C/UA/2009	G.S. Pharmbuter Pvt Ltd	Advanced Fairness Instant Mattifying cream (Oil-free)	MRP Rs 185
7 in 1 Anti-ageing cream OLAY®	Oct 8, 2010	50 g	B 20101008-01 91184811sc	Not Given	4902430051231	Procter and Gamble Manufacturing, Thailand	Total Effect. Normal Warning. SPF 15 UVA/UVB	
Lotus Herbal	June 2011	60 g	11M/ COS/07/ S100	Given	0806360320600	Kanidi Cosmeceuticals	White Glow skin Whitening and brightening gel cream	
Garnier Skin Natural	17-01/2011		MPD/C-44 17-01/2011 B517429	Given	8901526201020	Loreal India Pvt Ltd , Pune-410501	Light Pure lemon essence. Long dam extract	Rs 140

8.2 Materials and Methods ^{15 16}

Scope: The scope of this standard operating procedures includes analysis of mercury in skin whitening cream by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). the procedure is also applicable for other cosmetics.

Chemical and Apparatus Required

- Ultra pure acid HNO_3 , HCL , H_3BO_3 .
- De- ionized water (Free of Elements).
- Clean sample preparation environment.
- Adequate facility for close system digestion. (e.g. MDS, Teflon vials)
- 50 mL volumetric flask.
- 0.45 micron membrane filter paper and filtering units.
- Final samples collection containers made up of high quality. e.g. Nalgene
- Certificate reference standards for ICP-MS.

Preparation of Standard Solution

- Prepare stock solution of one ppm from centripure reference standard in 2% HNO_3 .
- Make the final dilution to concentrations of 0, 0.5, 1, 5; 10, 20, 50,100 ppb to achieve a linearity of minimum 5 points.

Sample Preparation

- Remove the protective cap and the seal from the teflon vessel (Micro wave Digestion System) present inside the protective casing.
- Take out the teflon vessel and check that they are properly cleaned.
- Take 0.5 mg of sample in the clean vessel.
- Add 5 mL of HNO_3 + 1 mL of HCL + 4 mL of 4 % of Boric Acid and close the vessel.
- Out of all the vessels, keep one for acid blank only (without a sample).

15 J. Cosmet.Sci., 60, 405-414 (July/August/2009).

16 UMA -5440.

- Use the teflon compressor kit to create the vacuum inside the vessel.
- Put back the seal and protective cap.
- Tighten the venting screw till they are finger tight.
- Fit the vessels in the roter according to their number.
- Tighten the rotor in diagonal fashion.
- Put the cover of the rotor following the number to number technique.
- Then switch on the Microwave Digestion System.
- Go to “Library” in the instrument panel window and open the pre existing.
- Start the method by selecting the start option.
- Once the process is finished the instrument shows the message of completion.
- Push the stop button and switch off.
- Take out the vessels and de-pressure the vessels in the exhaust chamber.
- Takeout the vessels one by one carefully and decent the samples in the 50 mL volumetric flask.
- Wash the vessels and vessel cap with de-ionized water and pour them into volumetric flask.
- Make up the volume to 50 mL with de-ionized water.
- Filter the sample with 0.45 micro membrane filter papers and put the filtered in the sample containers to be nebulised into the ICP-MS.

Calculation

$$\text{Final conc. (in mg/kg)} = \frac{\text{Measured conc.} \times \text{Dilution factor}}{\text{Sample wt (mg)} \times 1000}$$

9. Key Findings

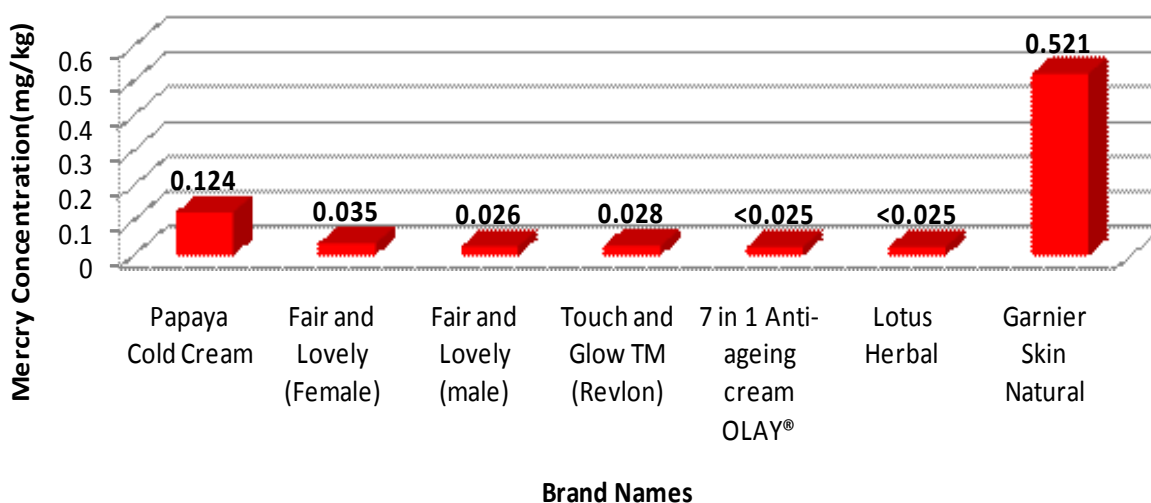
The results of Laboratory analysis of Mercury in Skin Whitening Cream is given in following table:

Table 4: Test result of Samples of Skin Whitening Creams

S.No	Brand Name	Sample Code	Manufacture Date	Volume	Manufactured by	Total amount of Mercury
1	Papaya Cold Cream	NPSWC 1	Jan 2011	100 mL	MAC Personal Care Pvt Ltd.	0.124mg/kg (0.025)
2	Fair and Lovely (Female)	NPSWC 2	June 2011	25 g	Unilever Nepal Ltd.	0.035mg/kg (0.025)
3	Fair and Lovely (male)	NPSWC 3	Dec 2010	25g	Unilever Nepal Ltd	0.026mg/kg (0.025)
4	Touch and Glow™ (Revlon)	NPSWC 4	Nov 2010	40 g	G.S. Pharmbuter Pvt Ltd	0.028mg/kg (0.025)
5	7 in 1 Anti-ageing cream OLAY®	NPSWC 5	Oct 8, 2010	50 g	Procter and Gamble Manufacturing, Thailand	Not Detected (0.025)
6	Lotus Herbal	NPSWC 6	June 2011	60 g	Kanidi Cosmeceuticals	Not Detected (0.025)
7	Garnier Skin Natural	NPSWC 7	17-01/2011	-	Loreal India Pvt Ltd, Pune-410501	0.521mg/kg (0.025)

Note: (0.025) in last column is the detectable limit of an instrument

Mercury Content in Skin Whitening Creams (mg/kg)



- Out of seven samples collected only two samples (7 in 1 Anti-ageing cream OLAY, NPSWC 5 and Lotus Herbal, NPSWC 6) contain mercury level below the detection level of the instrument (0.025mg/kg).
- Papaya gold cream contain second highest amount of mercury 0.124 mg/kg.
- Highest concentration of mercury 0.521 mg/kg is found in Garnier Skin Naturals (NPSWC7).
- Least mercury concentration in Fair and Lovely Male (NPSWC 3) was found 0.026 mg/kg.
- In all Skin Whitening Cream available in market does not content any labelling indicating the mercury contained in it.
- Nepal does not have any standard regarding mercury limit in Skin Whitening Cream or for any other cosmetics.
- There is no any regulatory body made responsible so far to regulate the law and guidelines regarding regarding chemical in product including mercury in cosmetics.

10. Conclusion

Most of the common and widely used skin whitening creams found in Nepalese market contain some level of mercury ranges from below 0.025 mg/kg to 0.521mg/kg that are though less than the USFDA guideline value of 1 mg/kg for mercury in cosmetics but it will build up at the level of health concern in the body of upon its continious application. Mercury content also varies across brands and products. There is no proper labelling about lead content in most of the cosmetics products. There are neither any legal frameworks nor any authorized government agencies to monitor this sector. Besides that there is lack of awareness among all active as well as passive consumers of the cosmetics like skin whitening creams. Children and pregnant and breast feeding women are the major affected groups of mercury from any exposure coming from different sources including cosmetics calls for immediate actions from responsible government and business communities to protect consumer health and well being.

11. Recommendations

Based on study carried out about mercury in skin whitening creams available in Nepalese market, following recommendations have been made:

- Mass awareness program should be launched with specific target group like children and pregnant women first and then for all.
- Regulatory bodies should be identified and made responsible for effective monitoring of the import, production, sale, distribution, promotion and process as well as market.
- Standard should be enacted in order to limit the mercury content in cosmetics. Act and Regulation must be made and implemented along with effective compliance monitoring mechanisms in place.
- Harmonize the laws, standard and chemical in products across the globe, continents, and regions and even within the country.
- Packaging must have clear labelling about heavy metals like lead, mercury etc. So that general public could make informed choice of selecting safe products.
- Producers should put cautionary notice about toxic levels of ingredients used in their cosmetic products.
- The consumers should see the label and enquire if the products they are going to use are actually safe for them or not.
- The independent monitoring agencies should be established that will be responsible for testing and monitoring the heavy metal and other toxic impurities in cosmetic products and make a public dissemination of the result on regular basis.