



MEDIBEST PHARMA PVT. LTD.,

Regd. Office / Works : N-31, Sidco Industrial Estate, Hosur - 635 126 (T.N.)
Phone : 04344 - 276617 / 276393 , Mobile : 9487557528
E-mail : medibest06@gmail.com URL : www.medibestpharma.com
CIN : U24231TZ1985PTC003995



01/09/2020

To

The Principal,
JKK Munirajah Institute of Health Sciences College of Pharmacy,
TN Palayam.

Subject: Proposal for Research Collaboration – Reg.

Dear Sir,

Greetings. I am writing on behalf of **Medibest Pharma Private Limited, Hosur**, to propose a collaboration that aligns with our mutual interests and scientific objectives.

We are impressed by your institution's expertise and research capabilities, particularly in the area of pharmacology and the study of natural extracts. Our organization is keen to explore the possibility of engaging JKK Munirajah Institute of Health Sciences College of Pharmacy in conducting research on the "**Assessment for Ocular Irritation in Selected cosmetic product**".

Our interest in this project stems from our dedication to advancing pharmaceutical research and developing innovative solutions to combat hyperlipidaemia. Given the esteemed reputation of your institution, we believe that a collaboration with JKK Munirajah Institute of Health Sciences College of Pharmacy would significantly enhance our research efforts in this specific area.

In this regard, we would like to propose that your institution undertakes the research project outlined above, with funding and logistical support provided by Medibest Pharma Private Limited. We are committed to ensuring the success of this project and will facilitate all necessary resources required for its completion.

Thanking you,

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



Sincerely,

For MEDIBEST PHARMA PVT.LTD.,

P.V.VIGNESHWAR
DIRECTOR



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

07.09.2020

To

Medibest Pharma Private Limited,
SIDCO Industrial Estate,
Hosur – 635126.

Subject: Response to Proposal for Research Collaboration – Reg.

Dear Sir,

Greetings. We greatly appreciate your interest in collaborating with JKK Munirajah Institute of Health Sciences College of Pharmacy for the research project titled "**An Alternative Assessment for Ocular Irritation in Selected cosmetic products**"

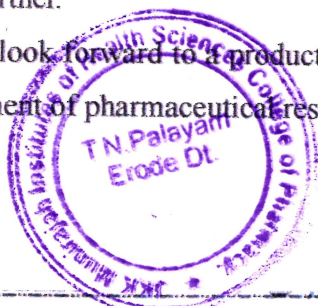
First and foremost, we are honoured and excited about the possibility of working with **Medibest Pharma Private Limited** on this significant research endeavour. Your organization's dedication to advancing pharmaceutical research resonates with our mission to contribute to the field of pharmacology and improve healthcare outcomes.

We are enthusiastic about the potential impact of this collaboration. The research project aligns perfectly with our expertise and ongoing efforts in the area of natural extracts and their therapeutic applications. We believe that this partnership will not only enhance our research capabilities but also foster valuable contributions to the scientific community.

We would like to express our gratitude for your willingness to provide financial support and logistical assistance for this project. We are confident that this collaboration will yield substantial results for an alternative assessment for Ocular Irritation.

To move forward, our team is excited to engage in this research endeavour and is committed to ensuring the successful completion of the project. Please let us know your availability, and we will coordinate a meeting that accommodates your schedule. You can reach me at principal@jkkmihsdp.org to coordinate further.

We look forward to a productive partnership and the opportunity to contribute meaningfully to the advancement of pharmaceutical research.




Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY


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DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
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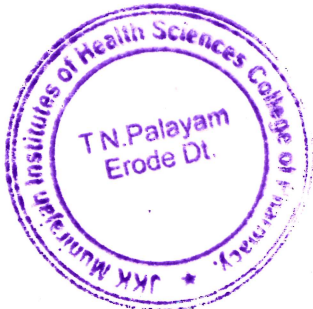
With reference to the letter dated 01/09/2020, JKKMIHSCP is permitting the following faculty members to do collaborative research with Medibest Pharma Private Limited and a proposal on the mentioned title "An Alternative Assessment for Ocular Irritation in Selected cosmetic products" is submitted along with this letter. The faculty members were assigned to do research work with Medibest Pharma Private Limited.


Principal Investigator (PI):	Mr. G. M. SIVAKUMAR, M. Pharm., Assistant Professor, Department of Pharmacology, JKKMIHSCP.
Co-Investigators:	DR. M. PERIASAMY, Professor, DR. S. SURESHKUMAR, Professor, Department of Pharmacology, JKKMIHSCP.

Thanking you,


Principal Investigator


Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506




Principal
JKK Munirajah Institute of Health Science
College of Pharmacy, T.N.Palayam,
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DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

BUDGET AND FACULTY DETAILS

Project Title: An Alternative Assessment for Ocular Irritation in Selected cosmetic products.

Name of the Institution: JKK Munirajah Institute of Health Sciences College of Pharmacy.

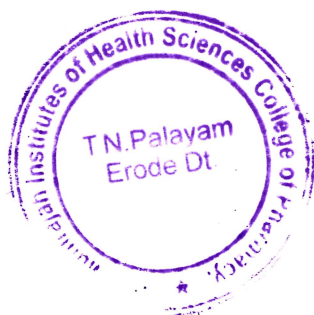
Project Duration: 4 months

Project Budget Estimation:

S. No	Detail of Expenditure	Amount
1.	<i>In Vitro Ocular Irritation Testing Equipment</i>	40000
2.	<i>Laboratory Consumables (Reagents, Culture Media, etc.)</i>	15000
3.	<i>Personnel Costs (Salaries, stipends for researchers)</i>	20000
4.	Data Analysis Software and Tools	10000
5.	Miscellaneous Expenses (e.g., sample procurement)	15000
Total Budget		1 lakh

We kindly request an opportunity to discuss this funding application further. Your support will contribute significantly to the success of our project.

Thank you



Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

Yours Sincerely,

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506



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CIN : U24231TZ1985PTC003995



Date: 15/09/2020

To

The Principal,
JKK Munirajah Institute of Health Sciences College of Pharmacy,
T.N. Palayam, Erode, 638506.

Copy to: HOD/Principal Investigator/Co-investigator

Sub: Project Acceptance and Sanction Order – Reg.

Dear Sir/Madam,

We are greatly privileged to offer the grant of Rs. 1,00,000/- (Rupees One lakh only) to the project "An Alternative Assessment for Ocular Irritation in Selected cosmetic products". The project will be carried forward during the period of 4 months by the team members of Mr. G. M. SIVAKUMAR, as a Principal Investigator, DR. M. PERIASAMY and DR. S. SURESHKUMAR, as a Co-investigator of JKK Munirajah Institute of Health Sciences College of Pharmacy. We would extend our continuous support throughout the implementation of the project.

Thanking You

Sincerely

For MEDIBEST PHARMA PVT.LTD.,


P.V.VIGNESHWAR
DIRECTOR

Copy to:

Mr. G. M. SIVAKUMAR, M. Pharm.,
Assistant Professor, JKKMIHSCP.

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506





JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

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Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

PROJECT COMPLETION REPORT

Title of the Project: An Alternative Assessment for Ocular Irritation in Selected cosmetic products.

Category of the Project: Research project

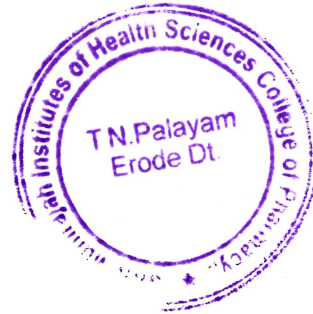
Date of approval of competent authority : 15/09/2020

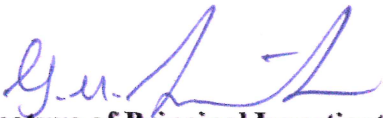
Total cost of the Project : Rs: 1,00,000/-

S. NO.	ITEMS	AMOUNT (₹) IN LAKHS
1.	<i>In Vitro Ocular Irritation Testing Equipment</i>	40000
2.	<i>Laboratory Consumables (Reagents, Culture Media, etc.)</i>	15000
3.	<i>Personnel Costs (Salaries, stipends for researchers)</i>	20000
4.	Data Analysis Software and Tools	10000
5.	Miscellaneous Expenses (e.g., sample procurement)	15000
	Total	1 Lakh

Date of start of the Project : 15/09/2020


Date of completion of Project : 05/01/2021




Name and Signature of Principal Investigator


Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506


Name and Signature of Co-investigator



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CIN : U24231TZ1985PTC003995



LETTER OF APPRECIATION

Date: 12.01.2021

To

The Principal,
JKK Munirajah Institute of Health Sciences College of Pharmacy,
T.N. Palayam, Erode, 638506.

Subject: Completion of project – reg.

Dear Sir,

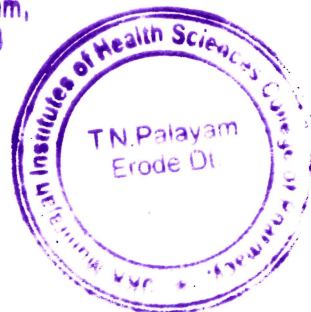
With reference to above cited subject, Medibest Pharma Private Limited, Hosur, extend sincere gratitude towards JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N. Palayam, for successfully completion of project "An Alternative Assessment for Ocular Irritation in Selected cosmetic products"

We also appreciate sincere efforts taken by Mr. G. M. SIVAKUMAR, for guiding and valuable suggestions provided for completion of this project. We look forward to the continuation of our successful partnership and to exploring new opportunities for collaboration.

Thank you

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506



Sincerely,

For MEDIBEST PHARMA PVT.LTD.

P.V.VIGNESHWAR
DIRECTOR



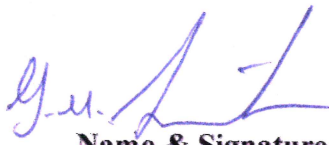
JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

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Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

UTILIZATION CERTIFICATE

Certified that out of Rs. 1,00,000..... sanctioned by **Medibest Pharma Private Limited** towards financial assistance for the student project titled "An Alternative Assessment for Ocular Irritation in Selected Cosmetic Products.....", an amount of Rs. 1,00,000..... was utilized for the purpose for which it was sanctioned, leaving a balance of Rs. NIL..... at the close of 05/01/2021. As shown in the Statement of Expenditure annexed.



(G.M. SIVAKUMAR)
Name & Signature

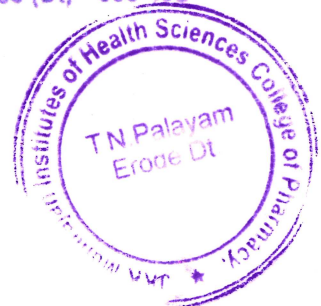
of the Principal Investigator


Name & Signature

of Head of Institution

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506


Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



**“AN ALTERNATIVE ASSESSMENT FOR OCULAR IRRITATION IN
SELECTED COSMETIC PRODUCTS”**

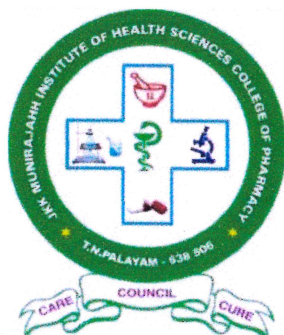
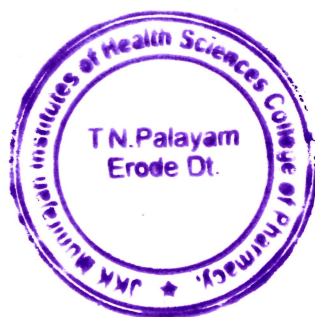
PRINCIPAL INVESTIGATOR

**Mr. G. M. SIVAKUMAR, M. Pharm.,
Assistant Professor,
Department of Pharmacology,**

CO-INVESTIGATORS

**DR. M. PERIASAMY, M. Pharm., Ph. D.,
Professor,
Department of Pharmacology,**

**DR. S. SURESHKUMAR, M. Pharm., Ph. D.,
Professor,
Department of Pharmacology,**



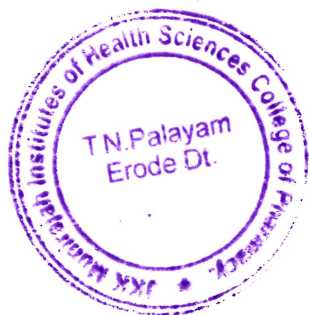
**Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506**

JANUARY-2021

**JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES
COLLEGE OF PHARMACY,
T.N- PALAYAM-638506, GOBI (TK), ERODE
(DT), TAMILNADU.**

CERTIFICATE

This is to certify that the Research entitled “AN ALTERNATIVE ASSESSMENT FOR OCULAR IRRITATION IN SELECTED COSMETIC PRODUCTS” submitted to The Medibest Pharma Private Limited, is the bonafide project work carried out in the Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode, Under the guidance of Mr. G. M. SIVAKUMAR, M. Pharm., Assistant Professor, Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N Palayam, Gobi, Erode. During the academic year 2020-2021.



Place: T.N-Palayam

Date: 05.01.2021

A handwritten signature in green ink, appearing to be "P. Perumal".

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

A handwritten signature in blue ink, appearing to be "P. Perumal".

Dr. P. Perumal. M.Pharm, Ph.D, FIC

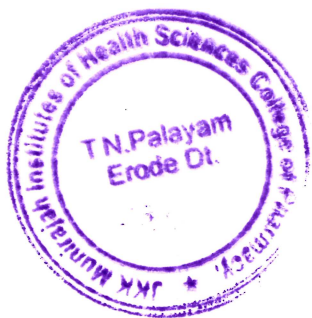
PRINCIPAL

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

DECLARATION

This is to certify that the Research entitled “AN ALTERNATIVE ASSESSMENT FOR OCULAR IRRITATION IN SELECTED COSMETIC PRODUCTS” submitted to The **Medibest Pharma Private Limited**, is the bonafide project work carried out in the Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode, Under the guidance of **Mr. G. M. SIVAKUMAR, M. Pharm., Assistant Professor, Department of Pharmacology**, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N Palayam,Gobi, Erode. During the academic year 2020-2021.



Place: T.N-Palayam

Date: 05.01.2021

Mr. G. M. SIVAKUMAR, M. Pharm.,

Principal Investigator

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 508

DR. M. PERIASAMY, M. Pharm., Ph. D.,

Co-Investigator

DR. S. SURESHKUMAR, M. Pharm., Ph. D.,

Co-Investigator

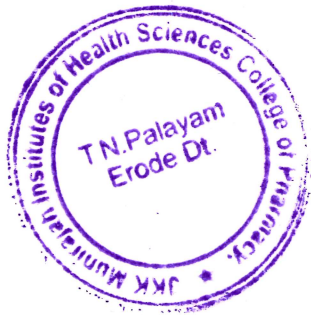
DECLARATION

The research work embodied in this work entitled “An Alternative Assessment for Ocular Irritation in Selected Cosmetic Products” was carried out by us under the direct supervision of Mr. G. M. SIVAKUMAR, M. Pharm Assistant Professor, Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi.

The Project submitted to the **Medibest Pharma Private Limited**, during the academic year 2020-2021.



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



ACKNOWLEDGEMENT

First and for most we express our heartfelt sense of gratitude and faithfulness to God 'grace and our family members, which has enabled us to finish our project work successfully.

With the blessing of our Founder chairman Dr. J.K.K Munirajah, M.Tech, (Bolton). D.Litt., and Secretary Mrs. Kasthuripriya Kirupakarmurali, M.B.A.,

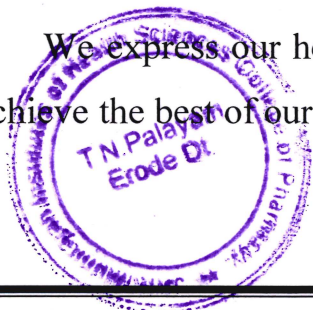
J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode for providing all the facilities to carry out this work.

Our sincere gratitude to our beloved sir, Dr. P.Perumal, M.Pharm, Ph.D, FIC., Principal and Head of the Department of Pharmaceutical Chemistry, J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode for his kindly support for our project work and for his encouragement and also providing all facilities in this Institute to the fullest possible extent enabling us to complete this work.

With the immense pleasure and pride, we would to take opportunity in expressing our deep sense of gratitude to our beloved guide Mr. G. M. SIVAKUMAR, M. Pharm., Assistant Professor, Department of Pharmacology J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode under whose active guidance, innovate ideas, constant inspiration and encouragement of the work entitled "An Alternative Assessment for Ocular Irritation in Selected Cosmetic Products" has been carried out.

We also express our grateful thanks to all the teaching and non-teaching staff members of J.K.K Munirajah Institute of Health Sciences College of Pharmacy for their valuable advice and cooperation.

We express our heartfelt gratitude to the almighty, for giving us the right way to achieve the best of our project.



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk) Erode (Dt) 628 506

We would like to give sincere thanks to our classmates for their timely help and co-operation.

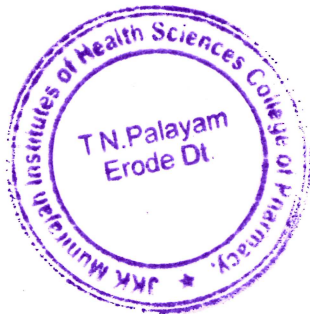
We also extend our thanks to all staff members of Department of Pharmaceutical Biotechnology, Pharmaceutical Chemistry, Pharmacognosy, Pharmaceutics and Pharmacology for their co-operation.

We would like to Thank Medibest Pharma Private Limited, to give a Financial and moral support to completion of the project being a successful manner on the duration of 2020-2021.

Last but not least, great thanks from the heart to our beloved MOTHER and FATHER. They are our living god, as who guided us in the rightful way to achieve all our activities. They gave the incredible effort to become a successful for bright future in this world. Thanks a lot, to my parents.



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



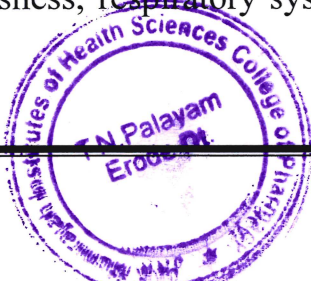
INTRODUCTION

Cosmetics are articles meant to be rubbed, poured, sprinkled, sprayed, introduced into or otherwise applied to the human body for cleansing, beautifying, promoting attractiveness or altering the appearance. These include skin creams, lotions, perfumes, makeups, hair preparations, deodorants and others 12). Cosmetic products have become everybody's daily grooming habit, particularly the fashion following groups, young females who dwell in higher institutions.

Food, drug and cosmetics regulatory authorities urge cosmetic makers to do whatever tests are needed to prove whether their cosmetics are safe. Nevertheless, cosmetics makers can sell products without the authorities' approval. In addition, a cosmetic manufacturer does not have to report injury from its product and they can add any ingredient to beautify their brand without any approval. This set up expose consumers to suffer from adverse effects of cosmetics 151. Currently, cosmetics, due to their multiple ingredients, are the top causes of toxicity exposure. 167)

The problem is most of the cosmetic users are not seriously concerned about the effect of usage of products to their skin. Instead, they focus on the short term result to their skin appearance rather than the long-term effects to the whole body II, Studies indicated that quite a large number of cosmetic users were threatened with terrible result but still continued using the product in order to satisfy their egoistic needs. 191

Several studies revealed the fact that cosmetics use is highly related with self-confidence 110,11,12] and providing educational programs for promotion of self-esteem can be beneficial to minimize unnecessary cosmetics use. 131 Adverse effects from cosmetics can happen after application or on long-term usage. The multitude of adverse reactions include dermatitis, tissue damage, infection, discoloration, bleeding, nervousness, respiratory system reactions, vomiting, diarrhea, urogenital reactions and



Principal

JKK Munirajah Institute of Health Sciences
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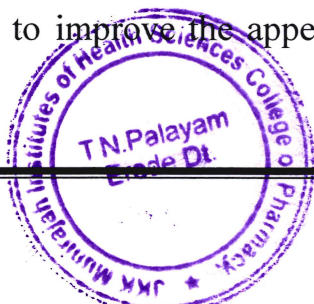
flammability induced death. Even though these reactions are seen in every consumer, at least once, they are more pronounced in those who do not follow the safety tips. Moreover, females are the most affected, most likely because they tend to use more cosmetic products than do men.

To come up with this problem FDA has established a network system for the sake of gathering consumers' complaints. Likewise, European countries have designed a project intended to collect information on cosmetics utilization pattern, so that they can use the information as an input for hazard assessment [15], Similarly. Cosmetics, Toiletry and Fragrance Association have donated different institutions to conduct risk assessment studies Through this technique, more than nine cosmetic ingredients were reviewed to be unsafe. though their usage is not ceased

Generally, the goal of all the above measures were urging manufacturers to turn to safer products and update consumers' knowledge on safe utilization of cosmetics. Hence, preliminary data could help a lot in supplementing any adverse reaction (risk assessment) test on cosmetics and as well it will serve as baseline data for health education in creating public awareness, the reason that the commencement of this study

1.1 HISTORY OF COSMETICS:

The health-giving property of cosmetics was first identified by the Egyptians. The cosmetics were first used by Egyptians in 4000 B.C whose records are being available. 7 Up to the beginning of 19th century, there was no clear separation between cosmetics and pharmaceuticals, the separation occurred when the first modern pharmaceutical industry was developed. In 1980's there was a rapid expansion of the cosmeceuticals due to Hydroxy acids (natural fruit acids) used as exfoliants against wrinkles. In 1961 the term cosmeceuticals was coined by the Raymond Reed, founding member of the United States Society of Cosmetic Chemists, Albert Kligman in 1971 developed a formula to improve the appearance of UV damaged and wrinkled skin, using retinoic





Principal
JKK Murugiah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

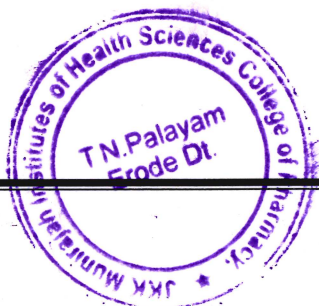
acid thereby reactivated interest of the people in cosmeceuticals. World-renowned dermatologist Dr.Kligman made a long-lasting contribution to the world of skincare by discovering that topical retinoic acid (or tretinoin) can be used for both an acne and wrinkle treatment.

Kligman may be described as the father of cosmeceuticals, a term he popularized. (19) but cosmeceuticals first appeared in the world market in 1996, 20

The several cosmetic jars have been unearthed by the Archaeologists whose hieroglyphics say "good for sight" and "stops bleeding". A medical papyrus "Ebers," which was written in 1600 BC, makes frequent reference to a number of cosmeceuticals-type products.

The favorite was the one prepared using honey and milk that claimed to help cure skin diseases, while different product mentioned in the Ebers, claiming to "expel wrinkles from the face", were made from frankincense, balantine oil, rush oil and wax in equal proportions,

A dark powder known as Kohl was being applied around the eyes in an almond shape with a stick. Kohl was made of different colors of copper ore, lead, ochre, ash, burnt almonds and oxidized copper, Red clay mixed with water was the choice of make-up, for the cheeks and lips. Henna was used to paint the finger-nails yellow or orange. Egg whites, gum Arabic, beeswax and gelatin were used to create nail color in ancient China. As time moved on cultures were fused and the Greeks began to move into cosmetics history and accept the use of Egyptian cosmetics. They did it just simply to look good and not for spiritual purposes Centuries later, as the Romans moved in they started the use of cosmetic formidas for other purposes, such as creating aphrodisiacs. They started to use blood mixed sheep fat for nail polish and instead of just using the traditional body oils created by Egyptians, they took baths in mud and crocodile excrement.



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1.2 THE REGULATION FOR COSMETICS IN INDIA

As per Drugs and Cosmetics Act, Cosmetic definition as "any article intended to be rubbed, poured, sprinkled or sprayed on, or The Indian cosmetics and personal care market is amongst the fastest growing in the world, with compound annual growth rates over the past five years at over 17%. Cosmetics products in India are regulated under the Drugs and Act 1940 and Rules 1945 and Labeling Declarations by Bureau of Indian Standards (BIS). The procedure to be followed in order to manufacture cosmetics in India BIS the standards for cosmetics for the products listed under Schedule 'S' of the D&C Rules 1945. And Schedule M-II classifies cosmetics into 11 broad product categories.

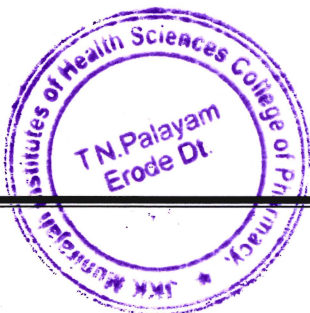
Observation of Indian cosmetic regulations:


India has several guidelines and regulations in terms of quality, safety & efficacy and gradually enhancing the standards from EU but the speed is very slow and as all countries are contributing the sale of cosmetics in India. It should adopt the mandatory steps which correlate the safety issues and also need to concentrate on the harmonization activities like regulated countries.

1.3. AUTHORITY OF CDSCO IN COSMETICS:

1.3.1 The central drug standard control organization (CDSCO)

Under directorate general of health services, ministry of health & family welfare, government of India is the national regulatory authority (NRA) of India. Its headquarter is located at FDA bhawan, kotla road, new delhil 10002 and also has six zonal offices, four sub zonal offices, thirteen port offices and seven laboratories spread across the country.




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1.3.2 As per rule, 129 of drugs and cosmetic rules, 1945

No cosmetic shall be imported into India unless the product is registered under the rules by the authority appointed by the central government under rule 21 or by any person to whom such powers may be delegated under rule 22.

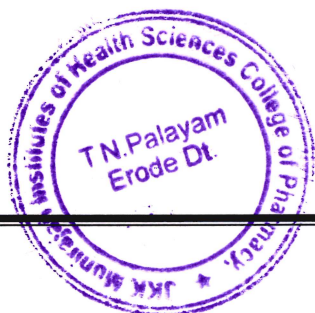
1.4 ISO and FDA regulation in cosmetics:


ISO 18416:2007-"Cosmetics, Microbiology, Detection of candida albicans," will help reduce cases of infection from cosmetic products by providing laboratories with a microbiological examination to ensure their quality and safety,

ISO 18416:2007 Gives guidelines for the detection and identification of candida albicans, a microorganism that can cause skin and mucous membrane infections.

ISO 18416 is one a series of standards being developed by ISO technical committee ISO/TC 217, Cosmetics, for the detection and identification of microorganisms in cosmetic products. The use of the standards will play an important role in the creation of safe cosmetic products, (2)

The term "cosmetics" covers a broad range of FDA- regulated products that may be used externally, orificially, and internally. For regulatory purposes, the term "cosmetics" includes products for the eyes, face, nails, hair, skin, and mouth, which may be in the form of products such as makeup, polish, hair dyes and coloring, sunscreens, fragrances, shave gel, oral care and bath products, and products for infants and children. In some settings, cosmetics are known as "personal care products" because of the wide range of products now regulated as cosmetics that are not strictly facial cosmetics. For purpose of this report, "cosmetics" will be used to refer to the entire category of products being discussed.




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1.5 CLASSIFICATION OF COSMETICS:

Can be classified based on widely used body parts as:-

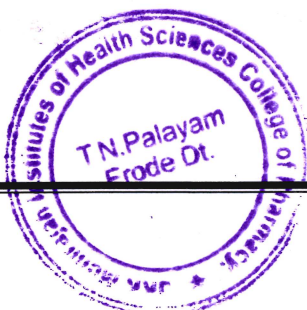
- 1.Skin cosmetics
- 2.Hair cosmetics
- 3.Face cosmetics
- 4.Eye make ups
- 5.Lip decorators and carers
- 6.Nail cosmetics

1.5.1 SKIN COSMETICS:

The use of cosmetics has grown phenomenally over the years. People, utilize a range of washes to foot powders and so on, in the hope of developing a charming personality. protecting their bodies and avoiding bad smell. Cosmetics are described as article intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part thereof, for cleansing, beautifying, promoting attractiveness or altering the appearance. Actually, alteration of appearance through the use of cosmetics has been a practice for thousands of years. The early Egyptians used powders antimony and the green copper ore, malachite, as eye shadow. Egyptians pharaohs used perfumed hair oils, has for back 3500 BC.

1.5.2 SKIN CARE:

Which has its objects the maintenance of a soft, supple and clean skin and the prevention of effects external causes such as excessive exposure to cold, heat, sun,



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wind, etc. Examples of such products are, cleansing creams, sunscreen creams, moisturizing creams and lotions etc.

1.5.3 SKIN:

Skin is the outermost and one of the largest and most complex organs of the body. It acts as a protective cover for the internal body tissues and organs and serves a variety of useful physiological functions. Skin takes extreme abuse from the external environment with a variety of products that we spray, splash, paint or massage

1.5.4 VARIOUS TYPES SKIN:

NORMAL SKIN:

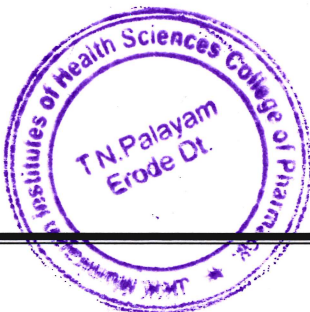
Contrary to all expectations, it is worth nothing that there is no definition of normal skin, which is qualified in comparison with the other skin types: normal skin is not dry skin is not oily skin, is not mixed skin, and is not pathological skin.


DRY SKIN:

The concept of dry skin has also never been clearly defined. The term conceals several complementary or opposite points of view. It remains completely different according to the way it is approached. People connect this notion to the effects observed and to their sensorial dimension

OILY SKIN

Whereas dry skin reflects a functional change of different skin components, oily skin results from an over activity of the sebaceous glands leading to an overproduction of sebum overflowing on skin, giving it a characteristic oily and shiny appearance.




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MIXED SKIN:

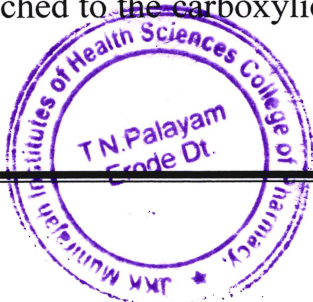
It corresponds to complex skin where the different types previously described coexist on different areas of the body or face. Such skin requires conjugating the particularities and sensitivities peculiar to normal, dry, and oily skin, a


1.5.5 SKIN CARE PRODUCTS

Our skin reflects our origin, lifestyle, age and state of health. Skin color, tone and evenness, pigmentation, as well as skin surface characteristics are signs of our skin's health. The cosmetic and pharmaceutical industry offers a vast armamentarium of skin care products and procedures to clean, soothe, restore, reinforce, protect and to treat our skin and hence to keep it in 'good condition. Skin care products are readily available in daily life and they play a major role in health and nursing care. The promotion of skin care products including their claims are often based on an effect [eg, moisturizing, antioxidant], evoked by an active [eg, urea, tocopherol] that is delivered through a vehicle [eg, lotion] that relies on a specific technology [e. g., nanotechnology]. In addition, without 'claims [eg, without para bens] often accompany now days promotions (7)

1.6 SOAP:

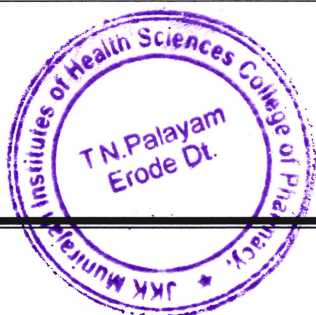
Soap is common cleansing agent well known to everyone. Many authors defined soap indifferent ways. It as any cleaning agent, manufactured in granules, bars, flakes, or liquid form obtained from by reacting salt of sodium or potassium of various fatty acids that are of natural origin (salt of non-volatile fatty acids). Soap can also be said to be any water-soluble salt of fatty acids containing eight or more carbon atoms. Soaps are produced for varieties of purpose ranging from washing, bathing, medication etc. The cleansing action of the soap is due to the negative ions on the hydrocarbon chain attached to the carboxylic group of the fatty acids 2930) The affinity of the hydrocarbon




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chain to oil and grease, while carboxylic group to water is the main reason soap is being used mostly with water for cleaning purposes 90. In addition to basic raw materials, other substances are added to the composition in order to improve its application. For examples soap made for medicinal. purposes other medicinal importance ingredients are added to it to produce medicated soaps. In addition to potassium and sodium salt, other metals such as calcium, magnesium and chromium are also used to produce metallic insoluble soap that are not used as cleaning agents, but are used for other purposes 03) It is generally known that soap is produced by the saponification of a triglyceride (fat or oil). In the process the triglyceride is reacted with a strong alkali such as; potassium or sodium hydroxide to produce glycerol and fatty acid salts. The salt of the fatty acid is called soap. An Example of cleansing soap formula is given below:

INGREDINTS	EXAMPLES	RANGE (%)
Cleansing surfactants	Soap , synthetic detergent	65-85 0-10S
Moisturizes	Glycerin , lanolin	0.5-5
Superfating agent	Fatty acids	0.5-3
Bar – hardening agent	Salt(NaCl)	0.3-2
Filers	starch	0-10
Antioxidant (preservative)	BHT(Butylated hydroxyl toluene)	0.1-0.5
Chelating agents	EDTA	0.1-0.5
Whitening agents	Titanium dioxide (TiO ₂)	0.1-0.5
Deodorants	Triclosan, trichlorocarban	0.2-1.5
Fragrance		0.5-2.5
Dyes and pigment		0-0.01
Water		8-15

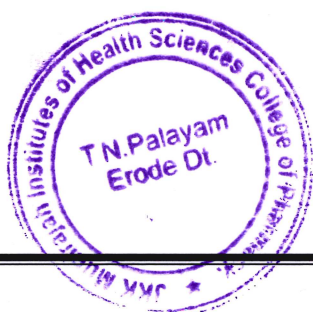


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1.7 SHAMPOOS:

Shampoo is a basic hair care product representing the largest segment of hair care cosmetics. Shampoo is typically in the form of viscous liquid with some exceptions of waterless solid form such as bar. Shampoo was developed to replace soap for cleansing scalp and hair by removing unwanted sebum, dandruff, environmental dust, and residues of hair care products. Most of the dirt including sebum are water insoluble and cannot be effectively removed by water alone. Therefore, a shampoo containing a combination of surfactants is necessary. The content of surfactants in a shampoo is typically between 10% and 20%. An example of cleansing shampoo formula is given in table

INGREDIENTS	FUNCTION	% (W/W)
Sodium laureth sulphate	Primary surfactant for lathering and cleansing	16.0
Cocamidopropyl betaine	Cosurfactant for lathering	2.0
Cocamide MEA	Cosurfactant for lathering	2.0
Glycol distearate	Pearling agent	1.5
Dimethicone	Conditioning agent for dry hair	1.0
Guarhydroxypropyltrimonium Chloride	Conditioning agent for Wet hair	0.5
Citric acid	pH adjuster	Qs
Sodium chloride	Viscosity booster	Qs
Preservatives	Preservation	Qs
Perfume	Fragrance	Qs
Deionized water	Solvent	Qs to 100



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Shampoo is generally used by applying in to wet hair, massaging the product into the hair, and then rinsing it out thoroughly. While some consumers may follow a shampooing with the use of hair conditioner, there are still consumers who may only use shampoo as daily hair washing and conditioning product. Hair conditioning effects such as making hair smooth soft, easy to comb, etc. are expected from a shampoo by these consumers at both wet hair and dry hair stages, wet hair conditioning of shampoo is mainly delivered by a colloid structure called coacervate formed by cationic polymer and anionic surfactant in water. On the other hand, dry hair conditioning is primarily the result of depositing silicones and conditioning oils on hair conditioning is primary the result of depositing silicones and conditioning oils a hair surface.

1.7.1 TYPES OF

1. Clear liquid shampoo:

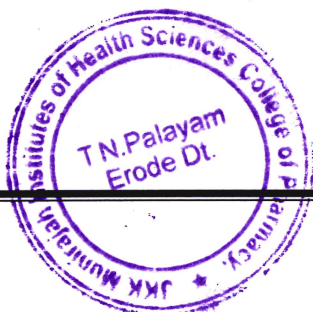
These are clear liquid preparations that are mostly widely used. They are usually made by using detergent of low cloud point. Alkanolamides can also be used in this preparations. Some of these shampoos may be transparent.

2. cream shampoo:

These are called as lotion shampoos. Which are modification of clear liquid shampoos. Addition of opacifier such as glyceryl monostearate, glycol stearate ect. to the clear liquid shampoo yields liquid cream shampoo. Solubilizing agent such as magnesium stearate is also used to dissolve the added opacifier

3. Cream shampoo:

These shampoos have a paste like consistency and are packed in a collapsible tube. They find use in hair salons. They are also available in jars with wide mouth. The paste



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consistency is developed by addition of alkyl sulphates, also cetyl alcohol is added, which serves as a builder.

4. Gel shampoo;

These are transparent and thick usually made by incorporating a gelling agent, (e.g.cellulose). These is great use in hair salons and beauty parlors.

5. Powder shampoos;

It is available in the form of dry powder, initially it was prepared from dry soaps, but nowadays dry synthetic detergents are used for their preparation.

6. Aerosol shampoos (foam type);

They are called aerosol shampoos because they are packed in aerosol containers. Their formulation, preparation and packing is complicated as an additional propellant is included.

7. Special shampoos;

a) Medicated shampoo:

these shampoos contain medicinal agents, These agents treat these disorders of the scalp or hair. eg, anti-dandruff shampoo. Anti-lice shampoo, b) Conditioner shampoo: these shampoos serve for hair conditioning initially they clean the hair (and scalp) and keep them in smooth and lustrous condition. They also prevent sticking of hairs.

1.8 EYE:

The human eye is one of the most remarkable sensory systems. "The eye, which is termed the window of the soul, is the chief organ where by the senso comune can have the most complete and magnificent view of the infinite works of nature". Human beings



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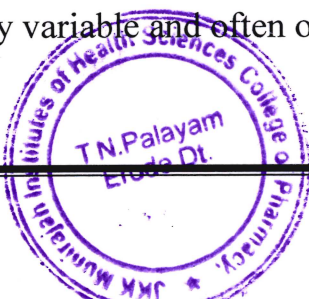
gather most of the information about the external environment through their eyes and thus rely on more than on any other sense, with the eye being the most sensitive organ we have.


Besides its consideration as a window to the soul, the eye can indeed serve as a window to the identity of an individual. It offers unique features for the application of identification technology. Both the highly detailed texture of the iris and the fundus blood vessel pattern are unique to every person, providing suitable traits for biometric recognition. (15)

The determination of eye irritation potential is required for the hazard assessment not only for chemicals under the European Union REACH system, but also for cosmetic ingredients. Eye irritation assessment of final formulations also plays a role in consumer product development. Validated or valid alternative methods should be used exclusively for the testing of chemicals produced or imported at between 1 and 10 tonnes per annum. Since the EU ban on animal testing of cosmetic ingredients and formulations came into force, no animal experiments on eye irritation are authorized at all in this field.

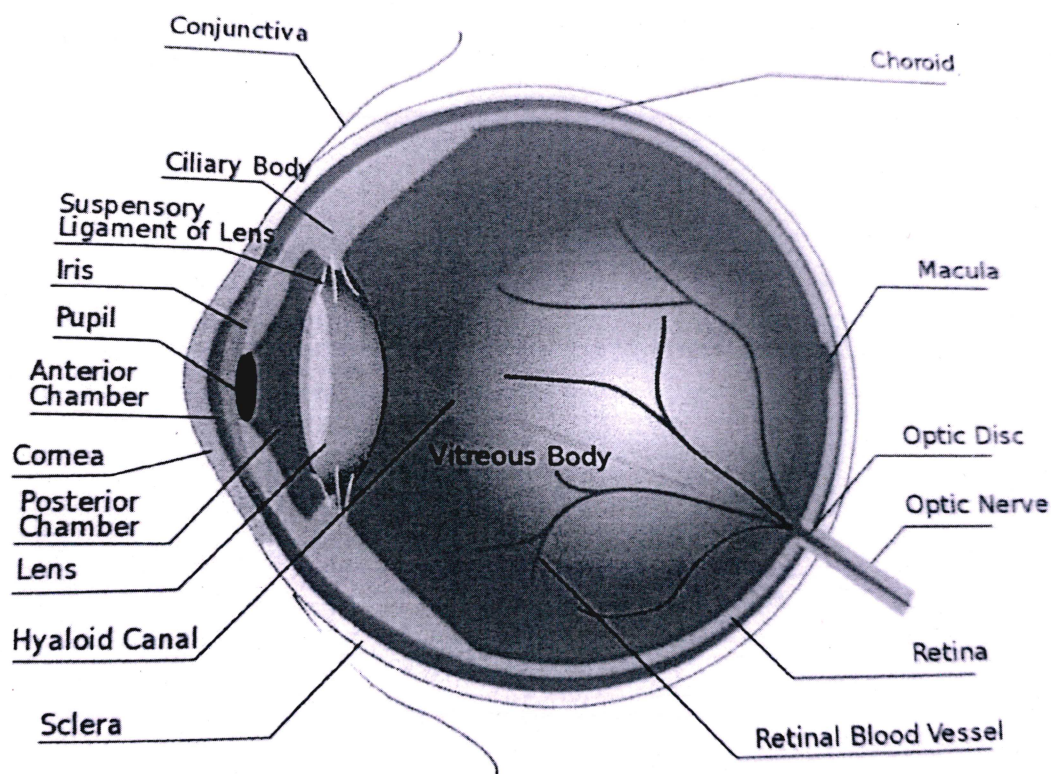
Various in vitro protocols, involving tissue and organotypic models, are currently being assessed, developed or redesigned with the aim to evaluate eye irritation hazard. Each of the in vitro methods available so far provides only partial information related to the individual ocular tissue structures such as cornea, conjunctiva and/or iris. None of the in vitro alternatives can reproduce all the aspects of the in vivo method and thus are most likely to be used in combination or test batteries.

To date, no single stand-alone in vitro method has been validated to fully replace the conventional Draize eye irritation test. However, a key difficulty in determining the validity of alternative in vitro methods is that the in vivo animal data are both scarce, highly variable and often of limited utility for hazard prediction for man. The aim of this

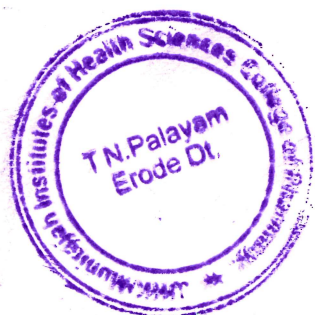



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study was to compare human and animal skin irritation data with results of selected in vitro methods. including HET-CAM test, Neutral Red Release Assay, Neutral Red Uptake Assay and Epiocular irritation test, and with animal eye irritation data when existing. Selected chemicals subjected to in vitro testing included substances previously tested with regard to their skin irritation



potential in the ECVAM validation study on in vitro tests for acute skin irritation and in studies focused on skin irritation determined by means of 4-h human patch test. In addition, nine commercially available surfactant-based cosmetic formulations were also subjected to in vitro testing for eye irritation potential, odnosn



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1.7. USE OF COSMETIC PRODUCTS AND RELATED ADVERSE

REACTION

The word "cosmetics" is derived from the Greek word kosmetikos which means "skilled at decorating". Cosmetic products include a very large number of products that are used for the care, cleaning, protection, and beautification of skin, hair, teeth, and nails. Cosmetic products can contain more than 10,000 ingredients which can be linked to many diseases like cancer, birth defects, developmental and reproductive impairments (

Many of these products have been added with chemical additives to increase their performance, effectiveness and viability. Some examples of these chemical additives are Diazolidinyl Urea, Dioxane, Formaldehyde and Paraformaldehyde, Imidazolidinyl urea, metals, Methylchloroiso-thiazolinone-methylisothiazolinone (MCI-MI), Methylidibromoglutaronitrile-phenoxyethanol (MDBGN-PE), Parabens, Phthalate, Quaternium-15, Thimerosal and others, (41)

Women and men all over the world use large amount of cosmetic products in pursuit of everlasting youth, ignoring the probable health. Although cosmetics can help us feel more beautiful, their use has been associated with many adverse and unwanted reactions generally traced to their main ingredients or excipients. Several studies conducted in Africa, Asia and the Middle East on the awareness, attitude and perception of cosmetic users revealed a high prevalence of cosmetic use especially among young people as well as a high incidence of adverse reactions, (42)



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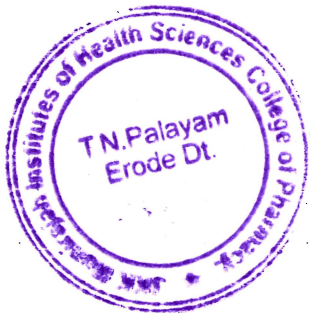
AIM AND OBJECTIVES

3. AIM

The aim of present study is an alternative assesement for ocular irritation in selected cosmetic products.

OBJECTIVES

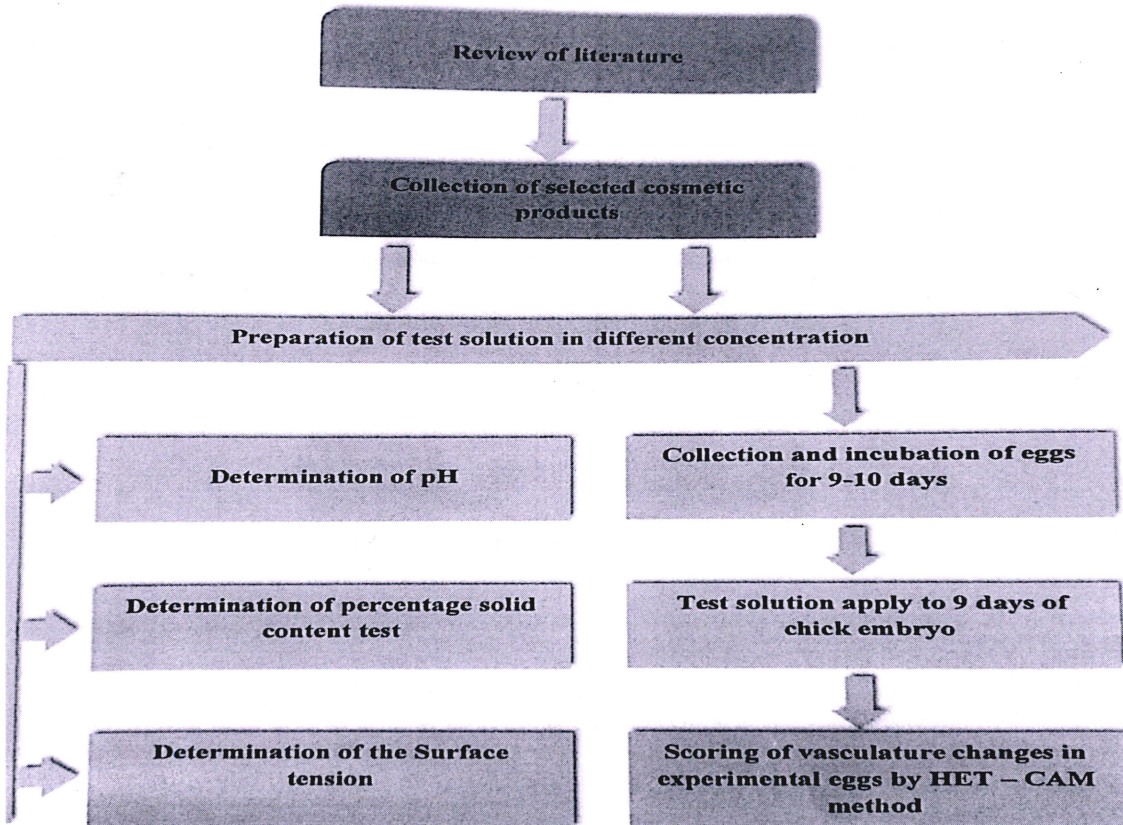
- To collection of eggs and selected cosmetic products samples
- To evaluation of pH for selected cosmetic products.
- To evaluation of percentage solid content for selected cosmetic products.
- To evaluation of surfactant content by using drop count method.
- To evaluation of ocular toxicity effect by using HET-CAM method.
- To evaluation of vasculature changes in experimental eggs.



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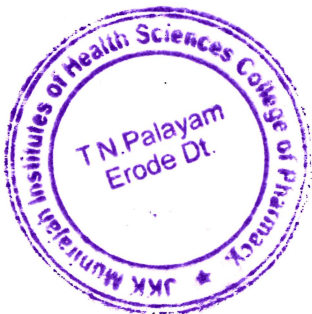
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PLAN OF WORK



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RESULTS AND DISCUSSION

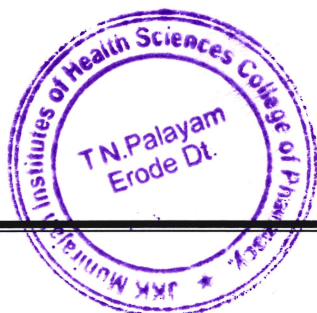
6.1. DETERMINATION OF PH:


Determination of pH for selected soap and shampoo were studied and depicted in Table 4. The pH of the eye is normally neutral (7.0 to 7.3) to avoid eye injuries. Here determine the pH value of shampoo - A and Shampoo - B were found to be 8.2 and 6.1 respectively. Shampoo A Which is in alkaline pH may cause irritant effect to eye and skin. The normal healthy skin has potential of hydrogen pH range of 5.4-5.9. Use of soap with high pH causes an increase in skin pH, which in turn causes an increase in dehydrative and irritable effect. In this study selected bath soap A & B has pH value of 10.1 and 9.3. Selected samples may cause to skin in turn must be used with at most caution to pediatrics.

S.NO	SAMPLE	pH
1	Shampoo-A	8.1
2	Shampoo-B	6.1
3	Soap -A	10.1
4	Soap -B	9.3

6.2. PERCENTAGE SOLID CONTENT TEST:

Determination of Percentage solid content for selected shampoo were studied and depicted in Table 5. A good shampoo has normal range 20-30% of solids. Here The determine the percentage solid content of shampoo-A & shampoo-B were found to be 17.8 & 16.6 respectively




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S.NO	SAMPLE	PERCENTAGE
1	Shampoo-A	17.8
2	Shampoo-B	16.6

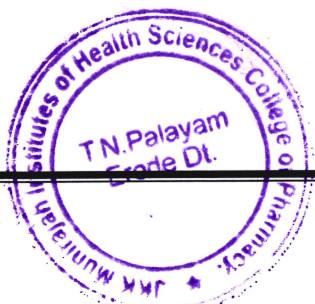
6.3. DETERMINATION OF SURFACE TENSION BY DROP WEIGHT METHOD:

Determination of surface tension for selected shampoo and bath soap were studied and depicted in tables 5. The surface can be measured by the amount of surfactant present in shampoos to reduce the surface tension. The lesser the surface tension, the stronger the cleaning ability of the shampoo..

A shampoo is considered to be of good quality if it decreases the surface tension of pure water from 72.28 dyn/cm to about 40 dyn/cm. The below range (40 dyn/cm) of surface tension is represented strong surfactant activity, so this strong surfactant activity may cause any unwanted irritation effect on eye and skin. Here determined surface tension value of all the tested shampoos and soaps showed similar reductions in surface tension ranging IS38.48 (shampoo-A) and 33.32 dyn/cm (Shampoo-B) and 30.23 to 28.17dyn/cm.

The reduction in surface tension is an indication of their efficient detergent action. The tested soap' surface tensions is 30.23 (soap-A) and 28.17 (Soap-B) dyn/cm, which are acceptable results, with the lowest surface tension indicating that it has the strongest cleaning ability.

S.NO	SAMPLE	SURFACE TENSION
1	Shampoo –A	38.48
2	Shampoo- B	33.32



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3	Soap-A	30.23
4	Soap-B	28.17

6.4 HET – CAM test method :

6.4.1. Effect of chick embryo Vasculature changes in different time interval on Positive control and Negative control

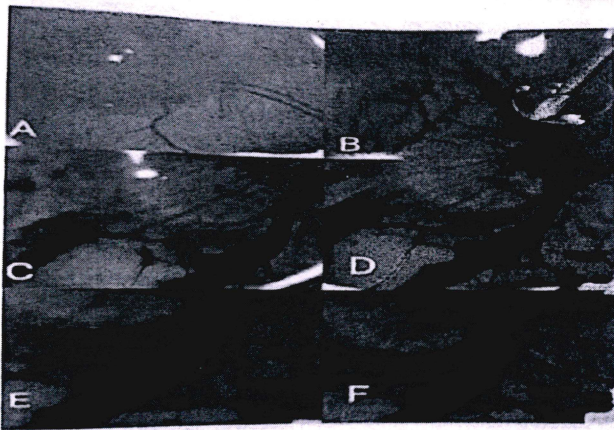


Figure no: 5(positive control)

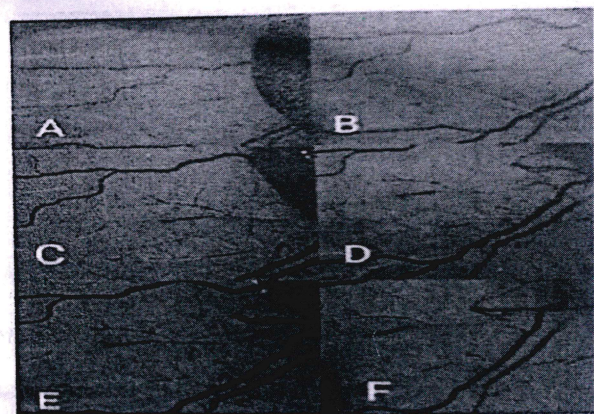
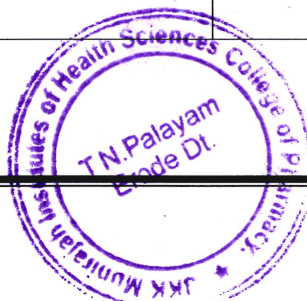


Figure no: 6(negative control)

Effect of chick embryo Vasculature changes in different time interval on negative Control and positive control solution irritation score

S.NO	SAMPLE	TIME INTERVAL	IRRITATION SCORE
1	Postive Control	AT0 Minute	0
		BT0.5MINUTE	0
		CT1 MINUTE	0
		DT2 MINUTE	0
		ET4 MINUTE	0
		FT5 MINUTE	0



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2	Negative Control	AT0 MINUTE	0
		BT0.5 MINUTE	1
		CT1 MINUTE	2
		DT2 MINUTE	3
		ET4 MINUTE	3
		FT5 MINUTE	3

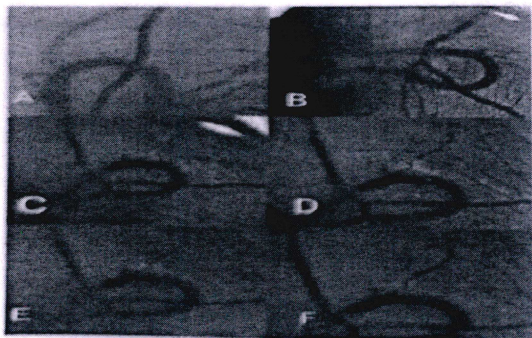


Figure no: 7(10% concentration)

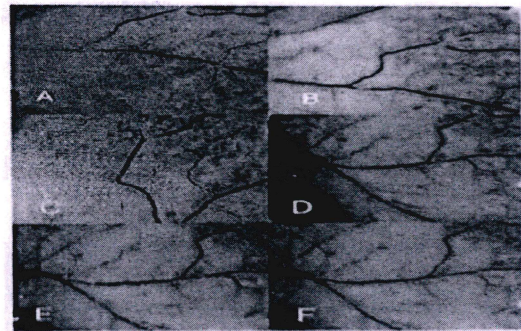
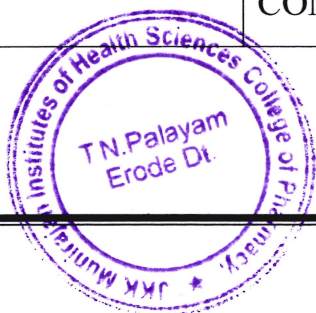


Figure no: 8(30% concentration)

Effect of chick embryo Vasculature changes in different time interval on negative Control and positive control solution irritation score

S.NO	SAMPLE	TIME TRAVEL	IRRITATION SCORE
1	10% CONCENTRATION	ATO MINUTE	0
		BT0.5 MINUTE	0
		CT1 MINUTE	0
		DT2 MINUTE	0
		ET4 MINUTE	0
		FT5 MINUTE	1
	30% CONCENTRATION	ATO MINUTE	0
		BT0.5 MINUTE	1



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		CT1 MINUTE	1
		DT2 MINUTE	1
		ET4 MINUTE	1
		FT5 MINUTE	1

Shampoo-A 10% and 30% concentration solution irritation score

Sequence of photographs illustrating the effect of 0.3ml of positive control (0.3 ml 0.9% saline) and negative control (0.3 ml IM NaOH) solution applied on the membrane over a 5-minute period. A. Healthy membrane at TO, B. Membrane at T0.5minutes, C. Membrane at T1minute, D. Membrane at T2minutes, E. Membrane at T4minutes, F. Membrane at T5minutes. The shampoo-A solution was produced a faint reddening and lysis of the membrane gradually over the time period (Figure 5 and 6) compared with positive (figure 3) and negative control (figure 4). Shampoo sample irritation score (table no: 8) compared to positive and negative control irritation score (table no: 7). - A 10% and 30% concentration of

6.4.2. Effect of chick embryo Vasculature changes in different time interval on Shampoo-B solution

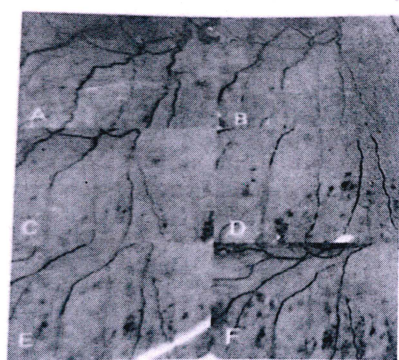


Figure no 9: 10% concentration

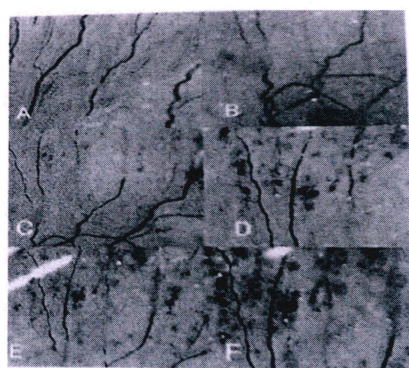
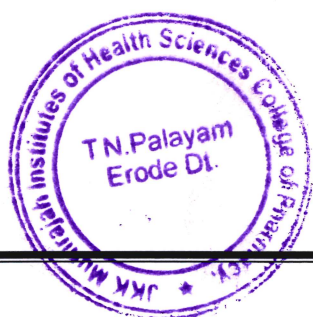


Figure no 10: 30% concentration



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S.NO	SAMPLE	TIME TRAVEL	IRRITATION SCORE
1	10% CONCENTRATION	A T 0 MINUTE	0
		BT0.5MINUTE	0
		CT1 MINUTE	1
		DT2 MINUTE	1
		E T4 MINUTE	1
		FT5 MINUTE	1
2	30% CONCENTRATION	AT0 MINUTE	0
		BT0.5 MINUTE	0
		CT1 MINUTE	1
		DT2 MINUTE	1
		ET4 MINUTE	1
		FT5 MINUTE	2

Sequence of photographs illustrating the effect of 0.3ml of 10% concentration (fig no: 2) and 30% concentration (fig no: 8) Shampoo-B solution was applied on the membrane over a 5-minute period. A. Healthy membrane at TO, B. Membrane at T 0.5minutes, C. Membrane at T1minute, D. Membrane at T2minutes, E. Membrane at T4minutes, F. Membrane at T5minutes. Shampoo B 10% and 30% concentration of sample irritation score (table no: 9) compared to positive and negative control irritation score (table no: 7).

6.4.3. Effect of chick embryo Vasculature changes in different time interval on Soap- A solution



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Gobi (Tk), Erode (Dt) - 638 506

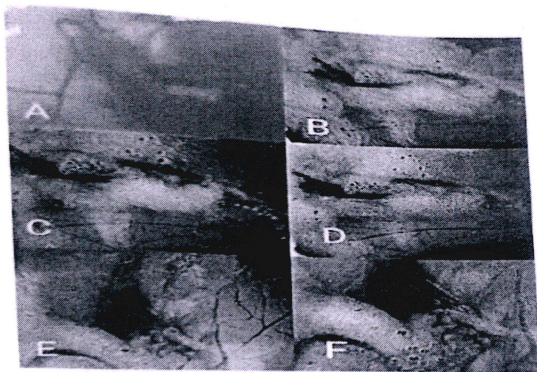


Figure no 11: 10% concentration

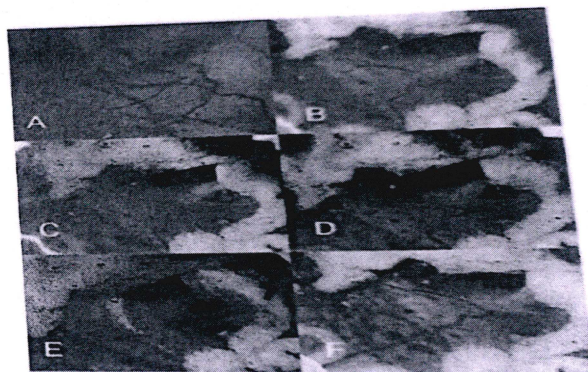
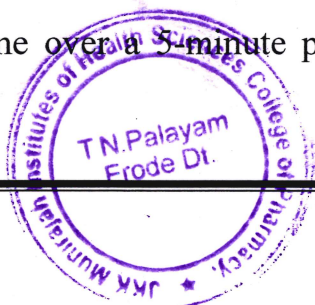


Figure no 12: 30% concentration

Effect of chick embryo Vasculature changes in different time interval on solution Soap -A 10% and 30% concentration irritation score

S.NO	SAMPLE	TIME INTERVAL	IRRITATION SCORE
1	10% CONCENTRATION	AT0 MINUTE	0
		BT0.5 MINUTE	0
		CT1 MINUTE	1
		DT2 MINUTE	1
		ET4 MINUTE	1
		FT5 MINUTE	1
2	30% CONCENTRATION	AT0 MINUTE	0
		BT0.5 MINUTE	0
		CT1 MINUTE	1
		DT2 MINUTE	1
		ET4 MINUTE	1
		FT5 MINUTE	2

Sequence of photographs illustrating the effect of 0.3ml of 10% concentration (fig no:11) and 30% concentration (fig no:12) Soap-B solution was applied on the membrane over a 5-minute period. A. Healthy membrane at TO, B. Membrane at T



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0.5minutes, C. Membrane at T1minute, D. Membrane at T2minutes, E. Membrane at T4minutes, F. Membrane at T5minutes. Soap - B 10% (figure no:9) and 30% (figure no:10) concentration of sample irritation score (table no: 11) compared to positive and negative control irritation score (table no: 7).

6.4.4. Effect of chick embryo Vasculature changes in different time interval on Soap-B solution

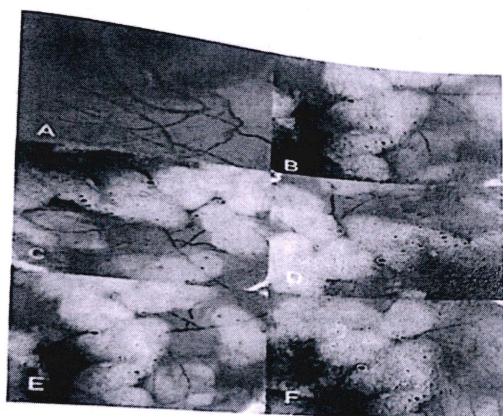


Figure no 13: 10% concentration

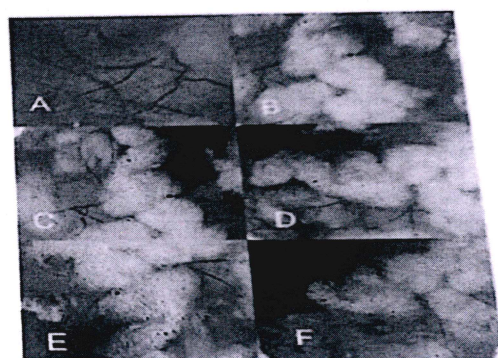
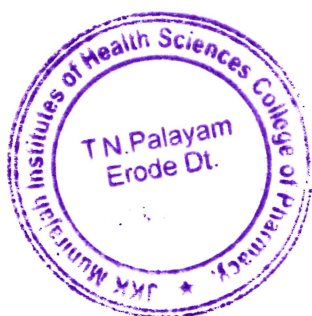


Figure no 14: 30% concentration

Sequence of photographs illustrating the effect of 0.3ml of 10% concentration (fig no:11) and 30% concentration (fig no:12) Soap-B solution was applied on the membrane over a 5-minute period. A. Healthy membrane at T0, B. Membrane at T 0.5minutes, C. Membrane at T1minute, D. Membrane at T2minutes, E. Membrane at T4minutes, F. Membrane at T5minutes. Soap - B 10% (figure no:9) and 30% (figure no:10) concentration of sample irritation score (table no: 11) compared to positive and negative control irritation score (table no: 7).

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College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



SUMMARY & CONCLUSION

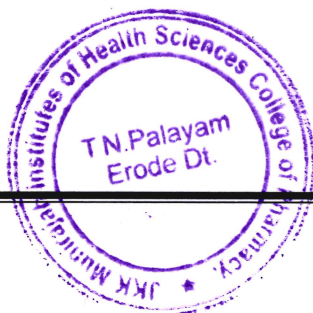
7. SUMMARY & CONCLUSION

Evaluation tests for shampoo and soaps are undertaken during production and which, occasionally, ought to be undertaken post-marketing surveillance by regulatory agencies and researchers.

In this study, two shampoo and two soap brands were evaluated in terms of their pH levels, solid content of shampoo, surface tension and various concentration of shampoo and soap solution. Ocular irritation effect is examined in chorio allantoic membrane of chick embryo and assessed the quality of these shampoos and soaps

Our experimental results revealed that the pH of selected products was found to be alkaline in nature, which may cause irritation to skin and eye.

Percentage solid content for shampoo-A (17.8) and shampoo-B (16.6) did not cross the normal range (20-30%) of expected solid content. So in terms of solid content shampoo A and B don't cause any unwanted ocular irritant and skin irritant effect. Surface tension measured by the amount of surfactant present in shampoos and soaps to reduce the surface tension. The lesser the surface tension, the stronger the cleaning ability of the shampoo and soaps. Sample -A in shampoo is considered to be of good quality as it decreases the surface tension of pure water from 72.28 dyn/cm to about 40 dyn/cm. The tested shampoos showed 38.48 (shampoo-A), 33,32 dyn/ cm (Shampoo-B) surface tension. Here shampoo surface tension value is below 40 dyn/cm. and hence, take all the sebum, this cleaning agent are so harsh that they can damage hair otherwise like they produce irritation effect on skin and eye. The strong surfactants affect the eye tenderness and they produce ocular irritation effect.



Principal

JKK Murirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

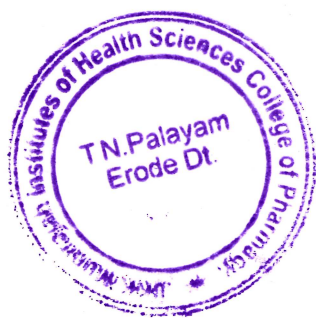
The bath soap also below range of surface tension value there are 30.23 (soap-A), 28.17 (soap-B) dyn/cm, the lowest surface tension indicating that it as the strongest cleaning ability. The strongest surfactants increase the skin dryness that may be produce skin and eye irritation.

The chorio allantioc assay method used to evaluate eye irritant effect of shampoos and bath soaps at different concentrations. The HET-CAM test is useful as a model for ophthalmic tissue (such as the conjunctiva), since it is a functional membrane complete with vasculature and inflammatory responses, and can be evaluated for endpoints that are with ocular injuries.

he HET-CAM test evaluates the ability of a test substance to damage blood vessels, and cause haemorrhage, coagulation, hyperaemia or lysis. The endpoints evaluated in the HET-CAM test method are different to those evaluated in the in vivo test method (discharge from the conjunctiva, redness and chemosis). The 9 day incubated egg was taken and different concentration shampoo and bath soap solution were applied on membrane in shell removed chick embryo. Then observed the vasculature changes of chick embryo and irritation effect were scored. From the scores obtained it is understood that selected products fall in to the safe category and may not produce any irritation to skin or eye. But little effect on destruction to vasculatures indicate the caution for use of products in pediatrics.



Principal
JKK Munirajah Institute of Health Sciences
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Gobi (Tk), Erode (Dt) - 638 506



CONCLUSION

It was observed that many characteristics of these shampoos and bath soaps were in the standard range, although some were out of range for some shampoos. Thus, it is clear that, all tested shampoos and soaps can be alternatives for each other since they had comparable results for the different tests. It is difficult to determine which shampoo and soaps is the best amongst those tested because no one formulation fared better than the others in all the performed tests. Shampoo A and B is compared multiple parameters like pH, shampoo solid content test, surface tension test and HET-CAM test method finally the shampoo A best compared to shampoo B. Soap A and B also compared with multiple parameters finally bath soap B is best compared to bath soap A. The above branded shampoo and soap safe for adult but not safe children because children skin and eye highly tenderness compared with adult.

Further research is required to investigate these brands in terms of their microbiology, theological evaluations, surface tension measurement, skin sensitization test and toxicity.



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

