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Formulation and Evaluation of HerbalShampoo from Piper Betel and PsidiumGuajava Leaves

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Abstracts: ***Shampoo is a hair care product used for the removal of dirt, oil, dandruff and other air pollutant. It is cosmetic preparation. It is antioxidant shampoo is helpful in increasing the blood circulation and thus help I hair growth as well as in the other treatment of hair diseases. The antioxidant property of plant and different herbs can be utilized in hair fall conditions. The main objective of this study was to eliminate harmful synthetic ingredient and stop the hair fall from shampoo formulation and substitute them with safe natural ingredients. All the ingredients used to formulate shampoo are safe and physiochemical evaluation showed ideal result. The aim of this study is to develop an herbal hair growth promoting shampoo using Piper Betel and Psidium Guajava leaves extract. The results of this study suggested that herbal shampoo formulation of leaves extract is good for the hair growth and control the other hair diseased.***
Keywords: Herbal shampoo, Piper Betel, Psidiumguajava, antioxidant, Hair falls.

I. INTRODUCTION

Shampoo is probably the most widely used cosmetic product for cleansing hairs and scalp inour daily life.

A. Herbal Shampoo

Herbal shampoos are shampoos infused with extracts of natural ingredients. The best thing about these shampoos is that they yield the best and long-lasting results. These Shampoos are free of harsh chemicals and cause no damage to the hair.

Natural cosmetics are popular one all over the world as they convey the impression of having better purity, and safety. The cleansing action of the synthetic cleansers / shampoo aims basically to remove oil content from the hair leaving the hair dry and damaged, whereas herbal shampoos aim at delivering essential nutrients to the hair and at the same time has a mild cleansing effect to remove the unwanted oily content.

B. Definition

1) A shampoo is basically a solution of a detergent containing suitable additives for other benefits such as hair conditioning enhancement, lubrication, medication etc.

2) Now-a-days many synthetic, herbal, medicated and non medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these products being of natural origin are safe and free from side effects.

3) Herbal formulations are considered as alternative to synthetic shampoo but formulating cosmetics using completely natural raw material is a difficult task (Shinde et al., 2013).

There are large numbers of medicinal plants which are reported to have beneficial effects on hair and are commonly used in formulation of shampoo.

a) These plant products may be used in their powdered form, crude form, purified extracts, or derivative form (Pooja et al., 2011).

b) It is extremely difficult to prepare a herbal shampoo using a single natural material that would be milder and safer than the synthetic ones, and at the same time would compete favourably with its foaming, detergency and solid content. We, therefore, considered to formulate a pure herbal shampoo using traditionally and commonly used plant materials for hair washing in India.

C. Hair Growth

Biotin is essential for the production of a hair protein called keratin, which is why biotin supplements are often marketed for hair growth. Research has also shown that consuming more biotin can help improve hair growth in people with a biotin deficiency.

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D. Ideal Characters of Herbal Shampoo:

1) Should effectively and completely remove the dust, excessive sebum.
2) Should effectively wash hair.
3) Should produce a good amount of foam.
4) The shampoo should be easily removed by rinsing with water.
5) Should leave the hair non dry, soft, lustrous with good, manageability.
6) Should impart a pleasant fragrance to the hair.
7) Should not make the hand rough and chapped.

E. Composition of Herbal Shampoo

1) Active agents
2) Conditioning agents
3) Anti-dandruff
4) Thickening agents
5) Sequestrates

F. Types of Shampoo

Shampoos are of the following types:

1) Powder Shampoo
2) Liquid Shampoo
3) Lotion Shampoo
4) Cream Shampoo
5) Jelly Shampoo
6) Aerosol Form Shampoo
7) Specialised shampoo
8) Conditioning shampoo
9) Antidandruff shampoo
10) Baby shampoo
11) Two layer shampoo

G. Functions

1) Lubrication
2) Conditioning
3) Hair growth
4) Maintenance of hair colour
5) Medication.

H. Aim

The aim of this study was to formulation and evaluation of herbal shampoo from Piper Beteland Psidium guajava leaves.

I. Objectives

1) To provide cleansing action of Hair.
2) To remove oil content from the hair leaving hair dry and damaged
3) To delivering essential nutrients to the hairs.
4) To improve hairs texture.
5) To darkening the hair colour.
6) To imparting gloss to hair and to maintain their manageability and oiliness for hairs.

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J. Plan of Work

Sr. No.	Experimental target to be achieved	Time period required
1.	Literature survey	5 days
2.	Collection of ingredients	3 days
3.	Formulation	2 weeks
4.	Evaluation	2 weeks
5.	Final report	3 weeks

Table No: 1 Plan of Work

1) Literature Survey
2) Collection of Ingredients
3) Formulation

By using decoction method

4) Evaluation
a) Physical appearance
- Colour
- Odour
- Clarity
- Texture

b) Solid content
c) Foaming ability
d) Surface Tension
e) Dirt dispersion
f) Density
g) PH
h) Viscosity
i) Stability

II. REVIEW OF LITERATURE

1) Khaloud Al Badi, Shah A. Khan.et.al 2014

The study aimed to formulate a pure herbal shampoo and to evaluate and compare its physicochemical properties with the marketed synthetic and herbal shampoos. The herbal shampoo was formulated by adding the extracts of Acacia concinna Sapindus mukorossi, Phyllanthusemblica, Ziziphusspina-christi and Citrus aurantifolia in different proportions to a 10% aqueous gelatine solution. Small amount of methyl paraben was addedas a preservative and pH was adjusted with citric acid. Several tests such as visual inspection, pH, wetting time, % of solid contents, foam volume and stability, surface tension, detergency, dirt dispersion etc. were performed to determine the physicochemical properties of both prepared and marketed shampoos. The formulated herbal shampoo was also evaluated for conditioning performance by administering a blind test to 20student volunteers.

2) Ali Heyam Saad and Rasool Bazigha Kadhim 2011

Reported formulation of self-preserving shampoo having a low concentration of the detergent using Ziziphusspinacristi leaves with emphasis on safety and efficacy. Evaluation of organoleptic, physicochemical and performance tests were performed and compared with herbal marketed product and considered as safe.

3) Sachin Dubey ET al.2004

Formulated two preparations of herbal shampoo using some common traditional drugs such asbahera, amla, neem-tulasi, shikakai henna and brahmi and evaluated for organoleptic powder characteristics, foam test and physical evaluation and considered as safe evaluation and considered as safe.

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4) Sutar Manisha et al. 2013

Formulated a polyherbal shampoo using amla fruit, hibiscus leaf, neem leaf, shikakai fruit, aloe leaf, henna leaf, ritha fruit and evaluated for organoleptic, powder characteristics, dirt dispersion, wetting time, foam test and physical evaluation and considered as safe.

5) Gholamreza Dehghan et al. 2011

Formulated a herbal conditioner shampoo using fenugreek seeds methanol extract and evaluated for physicochemical properties. It is concluded that the

6) Mohamed Halith ET al.2009

Formulated herbal shampoo using natural ingredients with tulasi and neem. Both are having anti dandruff action. The study revealed that the anti-dandruff activity of Ocimum sanctum and Azadiractaindica against strains of G+ and G-organisms and fungal organisms.

7) Swati Deshmukh et al. 2012

Formulated herbal shampoo using aloevera, shikakai, ritha, Alma, brahmi and evaluated and concluded as safe.

8) Naresh et al. 2013

Formulated a herbal shampoo containing chamomile, rose and orange peel and sodium lauryl sulphate. The shampoo is evaluated for physical parameters and considered as safe.

9) Suriya Prakash ET al.2011

Formulated an herbal shampoo for its antimicrobial and anti-lice activity. The natural ingredients used are neem leaf, tulasi leaf, and mehandi leaf and gooseberry fruit. The prepared formulation was evaluated for its physicoczproperties, antimicrobial and anti-lice activity, which was compared with the marketed products.

10) Nasrinaghel ET al.2007

Formulated a herbal shampoo using total saponins of a canthophyllumsquarrosum. The foaming ability of shampoo was evaluated by the Ross-miles method and the cleansing power by Thompson test.

III. DRUG PROFILE

A. Biological Source of Piper Betel

Piper betel Linn Belongs to family Piperaceae. In that species is piper siriboaL. Common name of Piper Betel is Betel, Betel Vine, Betal Pepper, Pan, Sireh. Bitel or pan leaves areused in Ayurveda to prepare medicines to treat hair related issues l like hair fall and hair loss. Using betel leaves on your hair helps in preventing any such hair issues.

Betel leaves are known to prevent hair loss and promote hair growth. Another way of using these leaves is by applying this anti-hair fall mask.

According to Ayurveda, betel leaves are known to treat issues like hair fall. Using betel leavesregularly helps in quick hair growth. They condition the hair and make your hair thick and long. It also helps in treating issues like itchiness, dandruff, and split ends.

The betel plant is an evergreen and perennial creeper, with glossy heart-shaped leaves. Betel leaves for hair loss are powerful because the content of polyphenols and flavonoids in betel leaf serves as an antioxidant and anti-inflammatory that can protect the hair from broken which is caused by inflammation of skin diseases and free radicals that cause hair loss on the head.

Paan or betel leaves are most commonly used in Indian households during religious ceremonies. Also, paan is a traditional preparation that is usually consumed as a sweet post- meal. However, do you know the betel leaves use .These heart-shaped leaves are also known as Green Gold. They are being used in Indian medicine for ages now.

B. Biological Source of Psidium Guajava

PSIDIUM GUJAVA is the family is Myrtaceae. And Genus is psidium. PsidiumGuajava is the common name is Guava, Yellow guava, Lemon guava. Is an evergreen shrub or small tree native to the Caribbean, Central America and South America It is easily pollinated by insects; when cultivated, it is pollinated mainly by the common honey bee, Apismellifera.

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IV. MATERIALS AND METHODS

A. *Collection of Plant Materials*

Betel leaves were purchased from the local market of Ratlam and guava leaves were collectedfrom local region.

B. *Extraction Process*

1) *Extraction Of Betel Leaves Using Distilled Water As A Solvent:* Betel leaves were extracted using water as a solvent. The extraction was carried out using heating mantle and beaker of1000 ml. Leaves were dried under shade and dried powder leaves was used for extraction. About 30 g of powdered leaves were boiled with 900 ml of water at 50°C to avoid degradation of phytochemical for 4 h, extract was filtered.
2) *Extraction Of Psidium Guajava Leaves Using Distilled Water As A Solvent:* Guava leaves were extracted using water as a solvent. The extraction was carried out using heating mantle and beaker of 1000 ml. Leaves were dried under shade and dried powder of leaves was used for extraction sample of 50 g guava leaves in 1 L distilled water was boiled for 4 h at 100°C. The sample was then filtered.

C. *Formula*

Ingredients	Quantity	Uses
Piper Betelleaves extract	2 ml	Antidandruff agent
Psidium guajava leaves extract	2 ml	Anti Oxidant
Oleic acid	4 ml	Conditioning Agent
Sodium lauryl sulphate	2.5 gm	Foaming agent
Triethanolamine	3 ml	Surfactant
EDTA	0.15 gm	Chelating Agent
Methyl paraben	0.2 gm	Preservative
Rose oil	q.s.	Perfume
Citric acid	q.s.	Maintain the pH
Water	q.s.	Vehicle

Table No: 2 Formulations for Preparation of Herbal Shampoo

Formulation of Herbal Shampoo:

1) The plant extracts are mixed in different proportions to obtain a shampoo whose formulais shown in below table.
2) Herbal extracts were added to 10% gelatine solution and were mixed by shaking for 20minutes.
3) Methyl paraben were also added with stirring.
4) Finally, the pH of the solution was adjusted by adding sufficient quantity of 1% citricacid solution.
5) Few drops of rose essential oil were also added to impart aroma to the prepared shampooand the final volume was made to 100 ml. with gelatine solution

V. EVALUATION PARAMETERS OF SHAMPOO

1) *Physical Appearance /Visual Inspection:* The formulated herbal shampoos is evaluated for physical characteristics such as colour,odour, and transparency.
2) *PH:* Most shampoos are formulated as either neutral or slightly alkaline to minimize the damage tohair. The pH of shampoo also helps to minimizing irritation to the eyes, enhances the quality of hair and maintains the ecological balance of the scalp.
3) *% of Solid Content:* Good shampoos usually have 20%-30% solid content as it is easy to be applied and rinse outfrom the hair

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4) *Dirt Dispersion:* The dirt dispersion is an important criterion for evaluation of cleansing action of shampoo .All shampoo concentrated the ink in the water portion, ensuring their satisfactory cleaning ability and actual effectiveness.
5) *Foaming Ability and Foaming Stability:* Foaming or lathering is very important to the consumer and therefore, it is considered as an important parameter in evaluation of shampoo. The higher foaming property of formulated shampoo may be due to the combination of soap nut, shikakai and ziziphus.
6) *Wetting Time:* The wetting ability of a surfactant is dependent on its concentration and is commonly used to test its efficacy. The canvas disc method is quick, efficient and reliable test to evaluate the wetting ability of a shampoo. The maximum of wetting time shows that the shampoo containslower amount of detergents. Wetting efficiency is considered to be higher if the disc takes lesstime for sinking.

A. *Method Of Preparation Of Herbal Shampoo*

1) 250 ml beaker take 50 ml water and add Take 250 4ml oleic acid dissolve completely
2) The add 6 gm sodium lauryl sulphate and stir heat gently at 60c.
3) When both get dissolved reduced stirring speed and 3 ml of triethalonamine and continueString 5 min.
4) After that EDTA and methyl paraben together were added and continue staring till itbecome clear liquid.
5) In other beaker take 30 ml of water and stir for 10 min and required Purity of plantextract were added.
6) This liquid two phases added to above one and stir for 20 min.

Fig No.1 Formulation of Herbal Shampoo

VI. EVALUATION TESTS

A. *Physical Appearance/ Visual Inspection*

The formulation prepared was evaluated for the clarity, colour, odour and foamproducing ability.

B. *Determination of pH*

The pH of 10% v/v shampoo solution in distilled water was measured by using pH meterat room temperature.

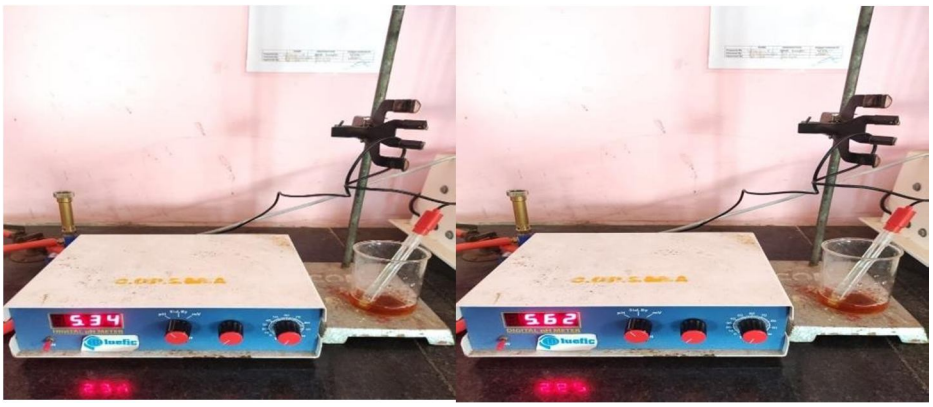

Fig .2 Determination of PH

C. Determination of % of Solid Contents

4 grams of shampoo were placed in a previously clean, dry and weighed evaporating dish. The dish and shampoo was weighed again to confirm of the shampoo. The liquid portion of the shampoo was evaporated by placing the evaporating dish on the hot plate. The weight and thus % of the solid contents of shampoo left after complete drying was calculated.

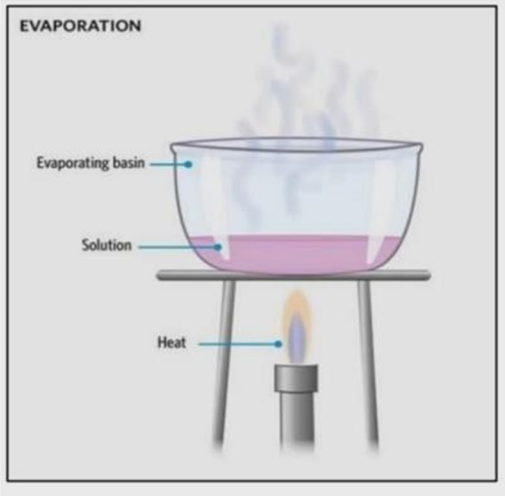

Fig.3 Solid Content Determination

D. Dirt Dispersion Test

Two drops of shampoo were added to 10ml of distilled water taken in a large test tube. To this solution, 1 drop of India ink was added and the test tube was stopper and shaken 10 times. The amount of ink in the foam was indicated by the rubric such as none, light, moderate heavy.

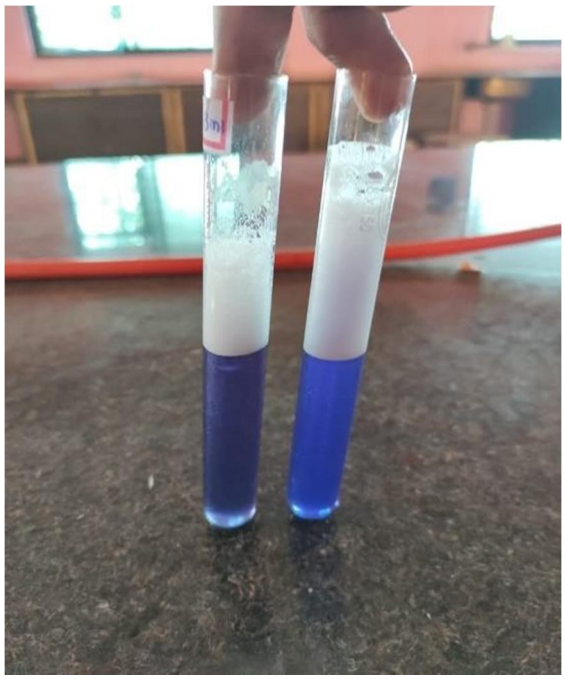

Fig.4 Dirt Dispersion

E. Surface Tension Measurement

The surface tension of 10% w/v shampoo in distilled water was measured using stalagmo meter at room temperature

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F. Test To Evaluate Foaming Ability And Foam Stability

Foaming ability was determined by using cylinder shake method.

Briefly, 50ml of the 1% commercial or formulated shampoo solution was placed into a 250ml graduated cylinder; it was covered with one hand and shaken 10 times. The total volume of the foam content after 1 minute of shaking was recorded.

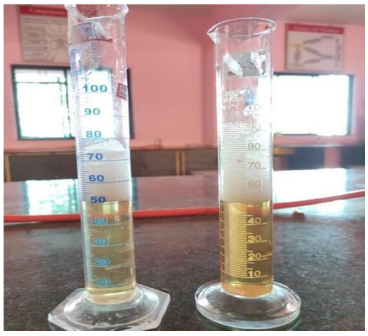

Fig.5 Foaming Ability Test

VII. RESULT & OBSERVATION

A. Result

In the above two formulations. Formulation a show good activity.

B. Observation

Observation Table

Sr. No.	Parameters	FormulationA	FormulationB
1.	Colour	Light brown	Light brown
2.	Odour	Good	Good
3.	Texture	Clear	Clear
4.	Solid content	16.10 %	14.75 %
5.	Foaming ability	90+/-2	80+/-3
6.	Surface tension	74.9	80.73
7.	Dirt dispersion	Light	Moderate
8.	PH	5.34	5.62

Table No: 3 Observation Table

VIII. NEED OF STUDY

1) The purpose of using herbal shampoo is to remove dirt that is build up on the hairwithout stripping out much of the sebum. There are no. of medicinal plants with potential effects on hair used traditionally over a years around the world and are incorporated in herbal shampoo preparation
2) The objective of this study is to formulate and evaluate herbal shampoo for cosmeticpurpose from herbal ingredients.
3) Piper betel leaves powder, psidiumguajava leaves powder
4) Sodium lauryl sulphate, methyl paraben, triethanolamine, EDTA
5) Then prepared decoction of Piper betle and psidium guajava leaves powder in thisIngredients and mixing with each other and evaluated for its organoleptic and physiochemical characteristics.
6) Herbal shampoo is used to cleansing of the hair also conditioning, smoothing, of the hair surface, good health of hair, hair free of dandruff, dirt grease and lice above all, Itssafety benefits are expected.
7) The advantage of herbal cosmetics is their non-toxic nature, reduce the allergicreactions and time tested usefulness of many ingredients
8) Thus in present work, we found good properties for the herbal shampoo and further Optimization study benefits of herbal shampoo on human use as cosmetic product.

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IX. CONCLUSION

At present, time herbal cosmetic has been marked up Personal care system and there is a greatrequirement for the herbal cosmetics in daily life. In this research article, formulate an herbal anti-hair fall and hair growth promoting shampoo containing betel leaves and guava leaves extract. Formulation was prepared containing betel leaves and guava leaves extract of different concentrations in combination and antioxidant activity was determined by taking ascorbic acid as standard. Formulation was evaluated for general parameters such as pH, dirt dispersions, and appearance and it was stable for 2 months and it is best for the hair fall conditions, alopecia, because betel leaves and guava leaves are best for reducing hair fall or hair growth promoter and show best antioxidant activity and their combination formulation is not available in the market now. A need for this research is to prepare herbal cosmetics which will prove beneficial and has lesser side effects.

X. SUMMARY

In this project work of formulation of herbal shampoo following concepts are included; Shampoo are probably the most widely used cosmetic product for cleansing hairs and scalps in our daily life. There are large number of medicinal plants which are reported to have beneficial effects on hair and are commonly used in formulation of shampoo. In this project work advantages, limitations, types of shampoo, composition of herbal shampoo, ideal characteristics of shampoo like it should effectively and completely remove the dust, excessive sebum, should effectively wash hair and produce a good amount of foam, and easilyremoved by rinsing with water, method of preparation of herbal shampoo, different evaluationtest report are included.

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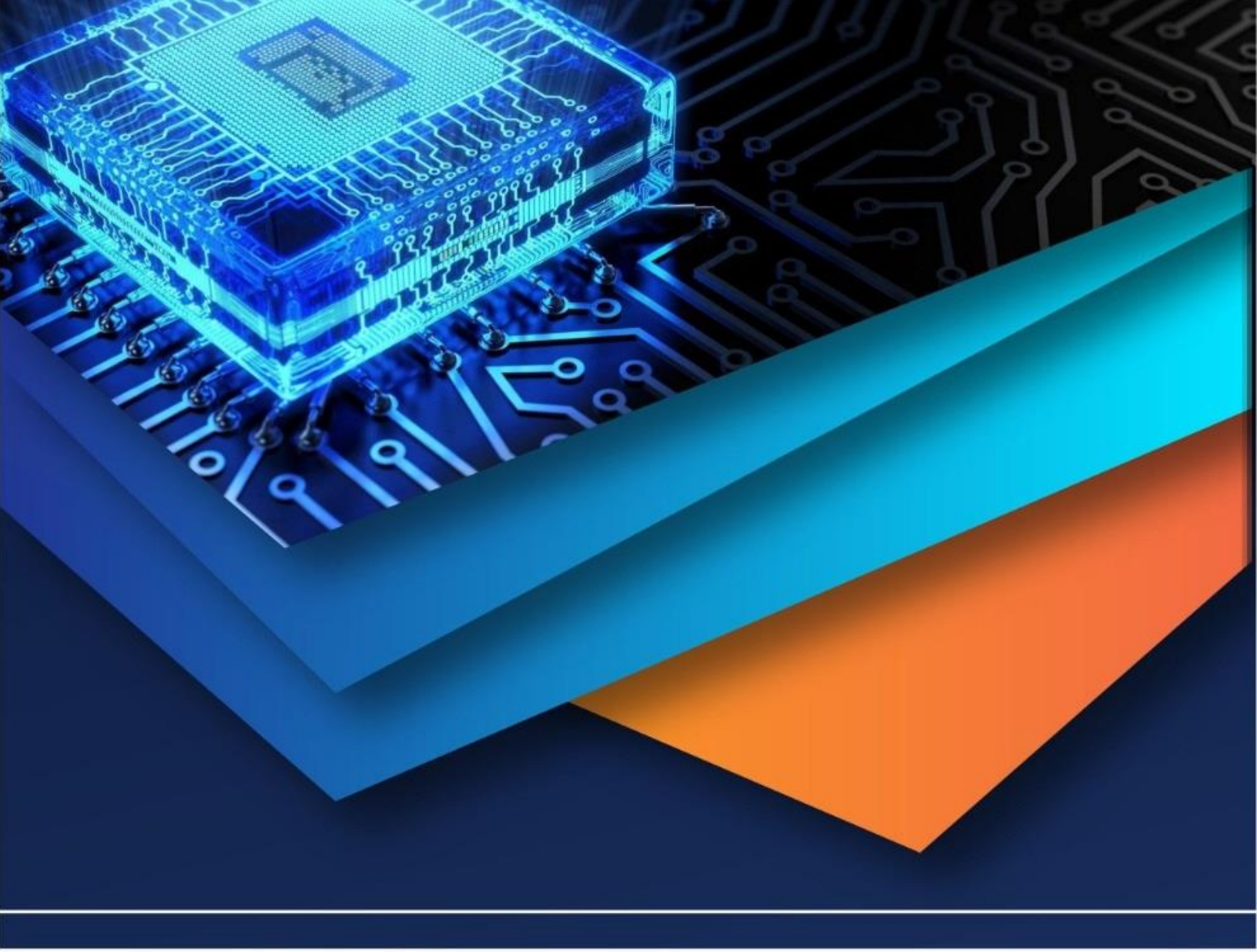

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