iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** XII **Month of publication:** December 2020

DOI: https://doi.org/10.22214/ijraset.2020.32079

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue XII Dec 2020- Available at www.ijraset.com

Effect of Coagulants on Physico-Chemical Properties of Peanut Paneer

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Abstract: ***Peanut and its products i.e. peanut paneer and peanut milk are also well known for their nutritional benefits for young and old people because of their richness in terms of protein, minerals, essential amino acids as well as essential fatty acids such as linoleic and oleic acid which are considered to be highly valuable for human nutrition. This study was carried out to develop paneer with three different coagulants (Citric acid, Tamarind and Vinegar) using Peanut milk. The thesis was undertaken with two main objectives. The first objective was to prepare paneer from peanut milk using different coagulants. The second objective was to find out the physico-chemical properties of the developed peanut paneer. Moreover, Physicochemical and sensory properties of prepared peanut paneer was assessed. Physicochemical properties showed that color and appearance, body and texture and taste and flavor of paneer were highly observed by using tamarind coagulants. Significant variation among the different samples of peanut paneer. Study Sensory evaluation found that the sample (T_2) i.e. tamarind obtained the highest sensory score for the each sensory attributes compare to the control. Nutritional composition was calculated using the different chemical analysis procedure; data obtained during investigation were statically analyzed by using analysis of variance (ANOVA) and critical difference (CD) techniques.***
Keywords: Citric acid, Peanut Milk, Peanut Paneer.

I. INTRODUCTION

Peanut (*Arachis hypogaea*) or groundnut is an annual herbaceous plant of the Fabaceae or Legume family. It is known by many other local names such as earthnuts, ground nuts, goober peas, monkey nuts. Despite its name and appearance, the peanut is not a nut, but rather a legume. Globally, peanut is the 13th most important food crop with 50% of it is used as raw material for the manufacture of peanut oil, 37% for confectionery, and 12% for seed purposes. Peanuts are rich in nutrients, providing over 30 essential nutrients and phytonutrients. Peanuts are a good source of niacin, folate, fiber, vitamin E, magnesium and phosphorus. They also are naturally free of trans-fats and sodium, and contain about 25% protein. Research published in the journal Food Chemistry shows that peanuts contain high concentrations of antioxidant polyphenols, primarily a compound called p- coumaric acid, and that roasting can increase peanuts p-coumaric acid levels, boosting their overall antioxidant content by as much as 22%. Peanuts are consumed in many forms such as boiled peanuts, peanut oil, peanut butter, roasted peanuts, and added peanut meal in snack food, energy bars and candies. Peanuts are considered as a vital source of nutrients. Nutrition plays an important role in growth and energy gain of living organisms.

Paneer is a rich source of animal protein available at a comparatively lower cost and forms important source of animal protein for vegetarians. Over and above its high protein content and digestibility, the biological value of protein in paneer is in the range of 80 - 86%. Peanut paneer is a vegetarian food item and there is a growing demand in the world for vegetarian food items at present. Even though peanut paneer is highly nutritious with low production cost. Peanut Paneer can be easily manufactured using locally available coagulants at household level. Normally, peanut milk is used to produce paneer. Therefore, aim of this study was to develop paneer with locally available coagulants such as vinegar, citric acid and Tamarind. Conventionally, tamarind is used for coagulating hot milk for paneer making. Tamarind is low cost coagulants have been suggested for manufacture of paneer without any loss of its yield and quality.

II. MATERIALS AND METHODS

A. Experimental Site

The present investigation was carried out in the Nutrition Research Laboratory, Department of Food, Nutrition and Public Health, Ethelind College of Home Science, Sam Higginbottom university of Agriculture, Technology & Sciences, Prayagraj, Uttar Pradesh.

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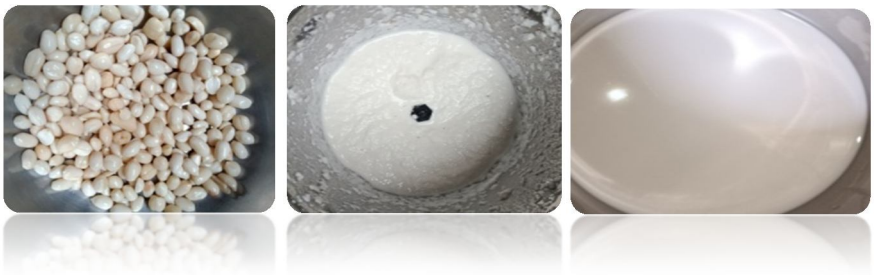
B. Procurement Of Raw Materials

The fresh peanuts, citric acid, Vinegar, Tamarind juice were procured from local market, Mahewa, Prayagraj District.

1) Preparation Of Peanut Milk

Clean peanut
↓
Washing and soaking ← water (1:5) 6-8 hrs
↓
Drained → water
↓
Remove outer layer (husk) of peanut
↓
Washing
↓
Grinding
↓
Slurry ← adding water (1:5)
↓
Cooking slurry (100-110 ^{0}C for10 min)
↓
Extracted Peanut milk → peanut okra

Fig.1 Flow chart for the preparation of Peanut Milk



Source: Res. *J. Animal Hus. & Dairy Sci.*; 6 (2); (Dec., 2015): 121- 124 Hind Agriculture Research and Training Institute.

2) Preparation of Peanut Paneer

Peanut milk
↓
Heating at 80 ^{0}C
↓
Coagulation (1% citric acid/2% vinegar/3% tamarind)
↓
Straining
↓
Collection of coagulum
↓
Pressing
↓
Steeping in chilled water
↓
Peanut Paneer

Fig.2 Flow chart for the preparation of Peanut Paneer

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Source: *Res. J. Animal Hus. & Dairy Sci.*; 6 (2); (Dec., 2015) : 121- 124 Hind Agriculture Research and Training Institute.

3) Treatments And Replication of Products

Table.1. Details of treatments

Treatments	Peanut Milk (Liter)	Liquid soln. in ml	Replication
T_0 (Citric Acid -2%)	-	50	5
T_1 (Citric Acid -1%)	1	60	
T_2 (Tamarind -2%)	1	65	
T_3 (Vinegar -3%)	1	70	

a) Physicochemical Properties of Paneer: Color and appearance was observed visually. Moisture, Fat, Protein, and Ash was determined by methods given in A.O.A.C. (2003).

b) Sensory evaluation of Peanut Paneer: Paneer were evaluated for sensory characteristics like appearance, color and appearance, body and texture, taste and flavor and overall acceptability by a panel of 5 judges who was selected from the faculty of the Department of Food Nutrition and Public Health from Ethelind College of Home Science. The panel of judges was requested to analyze the prepared products with the help of nine points Hedonic Scale Score Card as suggested by ***Srilakshmi (2011)*** purposefully made for analysis.

III. RESULTS AND DISCUSSION

Physicochemical properties of peanut paneer prepared from different coagulants at the different level of incorporation.

Table.2. Chemical Analysis of Peanut Paneer

A) Chemical analysis of Paneer prepared from Peanut milk using 1% coagulants.

Parameters	Citric Acid	Tamarind	Vinegar
Moisture	49.5	52.2	51.23
Total solid	42.56	44.78	43.12
Fats	22.23	21.16	22.12
Protein	18.42	21.23	20.56
Ash	1.23	1.964	1.03

B) Chemical analysis of Paneer prepared from Peanut milk using 2% coagulants.

Parameters	Citric Acid	Tamarind	Vinegar
Moisture	50.11	52.64	51.46
Total solid	43.23	45.29	46.21
Fats	20.06	21.96	20.36
Protein	19.26	22.26	21.23
Ash	1.11	1.994	1.45

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C) Chemical analysis of Paneer prepared from Peanut milk using 3% coagulants.

Parameters	Citric Acid	Tamarind	Vinegar
Moisture	51.78	53.89	52.79
Total solid	43.98	47.23	46.12
Fats	20.79	22.46	46.98
Protein	20.13	23.76	22.6
Ash	1.023	1.91	1.56

The study was conducted in a systematic approach to known the characterization of peanut paneer. The first approach in terms of their chemical analysis of the fresh paneer made by peanut milk using different coagulant which evaluate overall acceptability, yield of paneer. By chemical analysis, the higher fat content in the paneer prepared by using 1% coagulant was citric acid (22.23%) sample followed by Tamarind (21.16%), vinegar (22.12%). Similarly peanut paneer prepared by using 2% coagulant was Citric acid (20.06), Tamarind (21.96) and vinegar having (20.36). Using 3% coagulants was citric acid (20.79%) sample followed by Tamarind (22.46%) and vinegar (46.98%). By using 1% coagulant the higher moisture content in tamarind (52.2%) and lower in citric acid (49.5%) and vinegar (51.23). Similarly using 2% coagulant the higher moisture content in tamarind (53.89) lower in vinegar and citric acid.

Table.3. Effect of different Coagulant on the sensory attributes of Peanut Paneer.

	ATTRIBUTES			
CONTROL AND TREATMENT	COLOR & APPEARANCE	CONSISTENCY	TASTE AND FLAVOR	OVERALL ACCEPTABILITY
	Mean±S.E	Mean±S.E	Mean±S.E	Mean±S.E
T_0	6.7 ± 0.11	6.93 ± 0.33	6.8 ± 0.21	7.1 ± 0.09
T_1	7.13 ± 0.14	7.2 ± 0.19	7.3 ± 0.09	7.34 ± 0.33
T_2	7.9 ± 0.14	7.8 ± 0.10	7.89 ± 0.09	8.1 ± 0.09
T_3	7.0 ± 0.05	7.03 ± 0.05	7.2 ± 0.05	7.3 ± 0.14
F-test	6.47^S	1.14^S	1.45^S	1.45^S
C.D	0.6	0.3	0.4	0.4

1) Color and Appearance

F= 1.47 (1.27), Significant ($p \leq 0.05$)
C.D = 0.6

2) Body and Texture

F = 1.49 (1.32), Significant ($p \leq 0.05$)
C.D = 0.3

3) Taste and Flavor

$F_{(cal)}$ = 1.45 (1.24), Significant ($p \leq 0.05$) C.D = 0.4

4) Overall Acceptability

$F_{(cal)}$ = 1.45 (1.19), Significant ($p \leq 0.05$) C.D = 0.4

Peanut Paneer were evaluated for sensory attributes and results are presented in Table.3.The mean scores obtained from sensory evaluation showed that all treatments were accepted. There was significant ($p \leq 0.05$) difference between overall acceptability of all the formulations. The data illustrated in the table 4.3 shows the average sensory scores of different parameters in weaning food clearly indicates that treatments T_2 (7.9) had the highest score for color and appearance followed by T_0 (6.7), T_1 (7.13) and T_3 (7.0). In case of texture T_2 (7.8) had the highest score followed by T_0 (6.93), T_1 (7.2) and T_3 (7.03).

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T_2 (7.89) had the highest mean score for taste and flavor followed by T_0 (6.8), T_1 (7.3) and T_3 (7.2). The average sensory scores of overall acceptability of Peanut Paneer shows that treatments T_2 (8.1) had the highest score followed by T_0 (7.3), T_1 (7.34) and T_3 (7.3). There was a significant difference between the treatments at 5% probability level. The calculated value of F is greater than the tabulated value of 5% probability level. Therefore, it can be concluded that there was significant difference between treatments of weaning food regarding the various sensory attributes (color and appearance, taste and flavor, consistency and over all acceptability).

Table.4. Comparison between the color and appearance of treatments of Peanut Paneer against C.D

Treatment and Mean Value	T_0(7.13)	T_1(6.8)	T_2(7.5)	T_3(6.5)
T_0 (7.13)		5.87*	0.64*	0.2*
T_1 (6.8)			0.53*	0.16*
T_2 (7.5)				0.28*
T_3 (6.5)				

C.D = 0.5;*S = Significant ($p \leq 0.05$), NS= Non Significant

On comparing the average scores for color and appearance of Peanut Paneer against critical difference in the above table 4.3, the variation in scores for color and appearance of Peanut Paneer can be seen as follows. The difference in the mean value of T_0T_1 (5.87); T_0T_2 (0.64); T_0T_3 (0.2); T_1T_2 (0.53); T_1T_3 (0.16); T_2T_3 (0.28) were greater than C.D, (0.5) therefore the difference is significant while the difference in the mean value of T_0T_1(5.87) were high than C.D., therefore the difference is significant.

Table.5. Comparison between the consistencies of the treatments of Peanut Paneer against C.D.

Treatment and Mean Value	T_0(6.7)	T_1(7.2)	T_2(7.4)	T_3(6.8)
T_0 (6.7)		0.02*	1.53*	0.7*
T_1 (7.2)			1.5*	0.5*
T_2 (7.4)				0.22*
T_3 (6.8)				

C.D = 0.7;*S = Significant ($p \leq 0.05$), NS= Non Significant

On comparing the average scores for consistency of Peanut Paneer against critical difference in the above table 4.13, the variation in scores for consistency of Peanut Paneer can be seen as follows. The difference in the mean value of T_0T_1(0.02), T_0T_2 (1.53); T_0T_3 (0.7); T_1T_2 (1.5); T_1T_3 (0.5); T_2T_3 (0.22) were greater than C.D, (0.7) therefore the difference is significant.

Table.6. Comparison between the taste and flavor of the treatments of Peanut Paneer against C.D.

Treatment and Mean Value	T_0(6.8)	T_1(7.3)	T_2(7.6)	T_3(7.2)
T_0 (6.8)		0.23*	0.35*	0.39*
T_1 (7.3)			0.01*	0.7*
T_2 (7.6)				0.3*
T_3 (7.2)				

C.D = 0.5;*S = Significant ($p \leq 0.05$), NS= Non Significant

On comparing the average scores for consistency of Peanut Paneer against critical difference in the above table 4.14, the variation in scores for consistency of Peanut Paneer can be seen as follows. The difference in the mean value of T_0T_1 (0.23), T_0T_2 (0.35); T_0T_3 (0.39); T_1T_2 (0.01); T_1T_3 (0.7); T_2T_3 (0.3) were less than C.D,(0.5) therefore the difference is non-significant.

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Table.7. Comparison between the overall acceptability of the treatments of Peanut Paneer against C.D.

Treatment and Mean Value	T_0(7.1)	T_1(6.9)	T_2(7.8)	T_3(7.3)
T_0 (7.1)		0.37*	0.74*	0.74*
T_1 (6.9)			0.13*	0.5*
T_2 (7.8)				0.13*
T_3 (7.3)				

C.D = 0.7;*S = Significant ($p \leq 0.05$), NS= Non Significant

On comparing the average scores for consistency of Peanut Paneer against critical difference in the above table 4.14, the variation in scores for consistency of Peanut Paneer can be seen as follows. The difference in the mean value of T_0, T_1 (0.37), T_0,T_2 (0.74); T_0,T_3 (0.74); T_1,T_2 (0.13); T_1,T_3 (0.5); T_2,T_3 (0.13) were greater than C.D, (0.7) therefore the difference is significant.

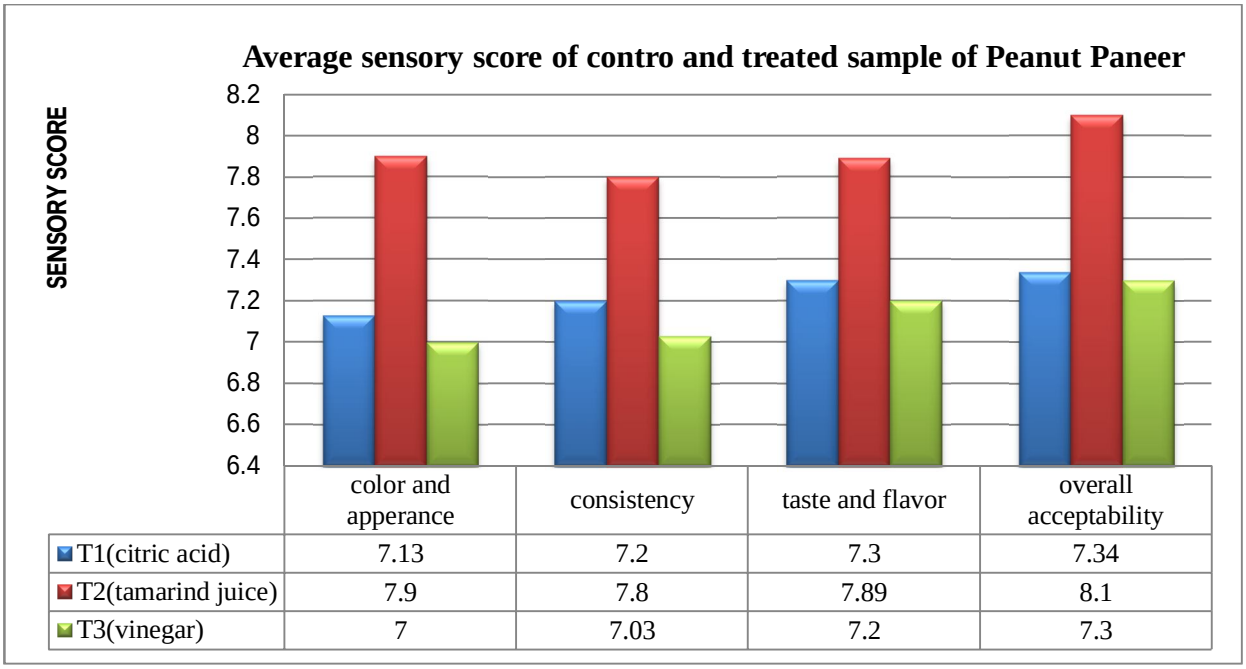

Fig.3. The effect of selected coagulants on the overall acceptability of Peanut Paneer.

Table.8. Comparison between nutrient content of control and best treatment of Peanut Paneer by using t-test.

Nutrients	T_0	T_2	T_0 - T_2	t.cal.	t.tab. (5%)	Result
Energy	165.12	252.32	87.2	214	4.302	S
Protein	10.31	11.95	1.64	1.518	2.776	NS
Fat	8.23	14.12	5.89	48.252	2.776	S
Carbohydrate	12.30	19.24	6.94	45.958	2.776	S
Calcium	354.36	120.34	234.02	655.309	4.302	S
Phosphorus	321.55	249.05	72.5	774.746	2.776	S
Iron	2.42	2.74	0.32	0.288	4.302	NS
Carotene	971.64	955.89	16.05	54.488	4.302	S

On comparing the nutrient content of control and best treatments of Peanut Paneer by using t-test in the table 8, the variation in nutrient content of Peanut Paneer can been seen as follows. The difference in the t- calculated value of energy, fat, carbohydrate, fiber, phosphorus and carotene (T_0 - T_2), were greater than t- tabulated at 5% probability level therefore the difference was iron and protein non significant.

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IV. CONCLUSION

Different coagulants such as citric acid, tamarind and vinegar with peanut milk can be used to prepare peanut paneer with acceptable sensory qualities and nutritional compositions. However, overall acceptability of peanut paneer is greater when tamarind is used as the coagulant.

REFERENCES

[1] Abdul Waheed Ghanghro., Naseem Aslam Channa (2020) Comparison in the physicochemical properties of Buffaloes milk collected from industrial and non-industrial areas of District Jamshoro Sindh, Int. Journal of Biosciences ISSN: 2220-6655
[2] ASF Shanaziya., ULP Mangalika2, WAD Nayananjalie (2018) Effect of Different Coagulants on the Quality of Paneer Made from Cow Milk, Int. Journal of Scientific and Research Publications, 189 ISSN 2250-3153.
[3] Dongare SA, (2018) Physicochemical and sensory properties of paneer prepared from buffalo milk, Journal of Pharmacognosy and Phytochemistry 7(2): 3852-3854.
[4] Mansour AIA, El-Loly MM, Ahmed RO. (2012) A preliminary Detection of physical and chemical properties, inhibitory substances and preservatives in raw milk. Int. Journal of Food Safety 14, 93-103
[5] Rajashekar, G. Kempanna C, Brunda SM, Roopa (2016) Influence of different coagulation temperature and coagulants on chemical and sensory qualities of paneer. Int. J. Agric. Sci. and Res. 6(3):7-12.
[6] S.V.Karadbhajne1., P. Bhoyarkar (2010) Studies on Effect of Different Coagulant on Paneer Texture Prepared from Buffalo Milk, Int. Journal of Pharm Tech Research CODEN (USA): IJPRIF No.3, pp 1916-1923
[7] V. S. Settaluri1., C. V. K. Kandala, N. Puppala1, J. Sundaram (2012) Peanuts and Their Nutritional Aspects-A Review, Food and Nutrition Sciences, 2012, 3, 1644-1650

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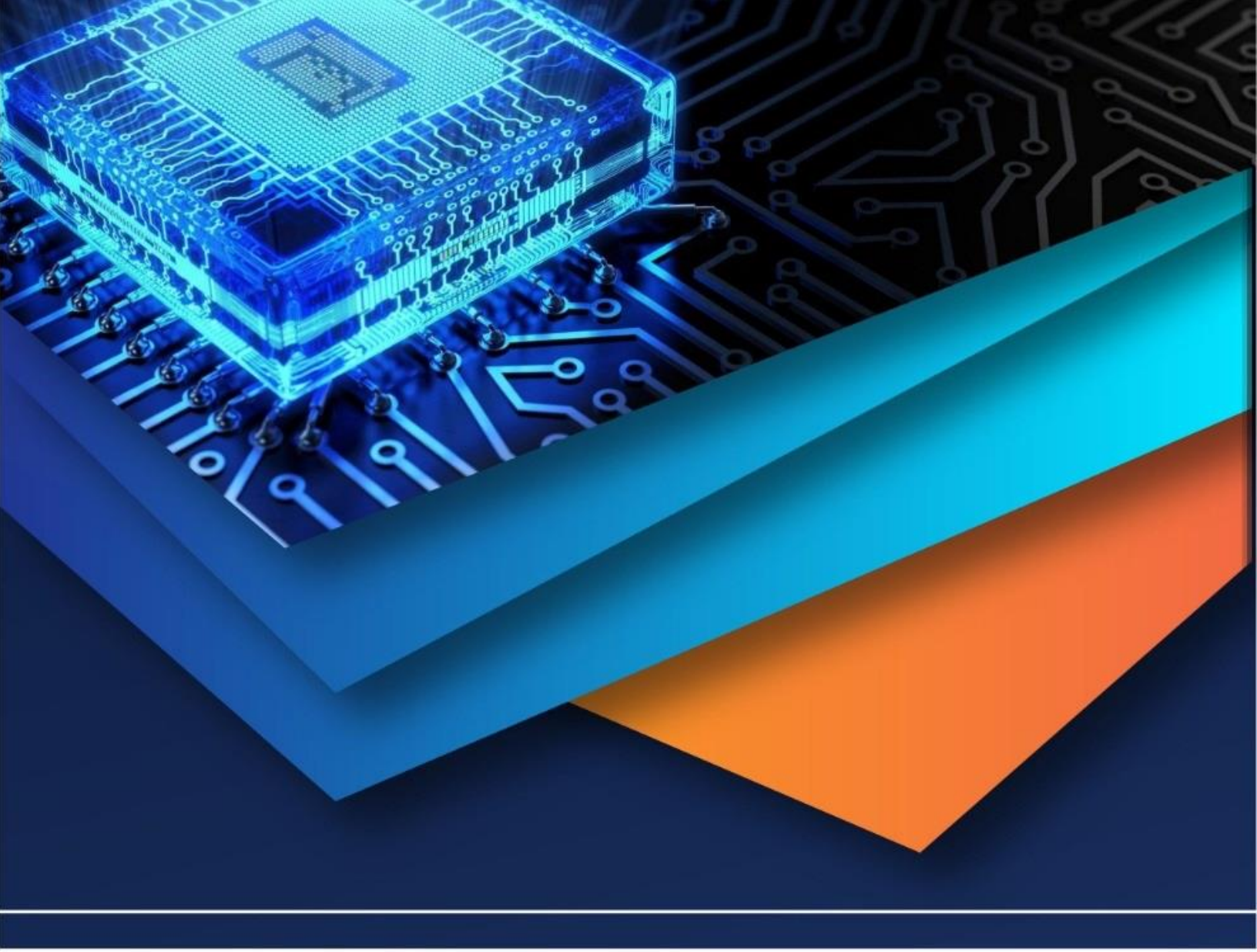

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