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Pharmacological and Medicinal Important of Plant Phyllanthus Emblica Linn. (Syn.Emblica Officinalis), Indian Gooseberry

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Abstract: ***The plant names phyllanthus emblica linn (Amla) are very precious gift of nature which have a vital role in health care. Nowadays, use of herbal product become most important for humans over the world. This drug is very useful for the treatment of disease. The most important part of this plant (phyllanthus emblica) is fruit. Phyllanthus emblica Linn. (syn. Emblica officinalis), commonly known as Indian gooseberry or amla, belongs to the family Euphorbiaceae. Though all parts of the plant are used for medicinal purposes, the fruits especially are found tremendous pharmacological applications. They are highly nutritious and form an important dietary source of vitamin C, amino acids, and minerals. Emblica Officinalis Plant is reported to have diverse Pharmacological actions like Adaptogenic Activity, Hepatoprotective Activity, Anti-Bacterial Activity, Anti-Hyperlipidemia Activity, Hypolipidemic Activity, Anti-Atherogenic Activity, Immunostimulatory Activity, Anti-oxidant Activity, Anti-Tumor Activity,Anti-Microbial Activity,Chondroprotective Activity, Analgesic Activity, Anti-Inflammatory Activity & AntiDiarreheal Activity. Emblica Officinalis plant is used in the treatments of various ailments. The diverse ailments like cancer, Atherosclerosis, Inflammation, Osteoporosis, Nuerological disorders, Hypertention and other infectious disorders.***
Keywords: Amla, Emblica Officinalis, Phyllanthus Emblica, Chemical constituents, medicinal uses.

I. INTRODUCTION

Indian mythology holds that Amla, a member of the Euphorbiaceae family and also known as Phyllanthus emblica or Indian gooseberry, was the first tree to be created in the universe. Amla is a native of India and also grows in Pakistan, Uzbekistan, Sri Lanka, South East Asia, China, and Malaysia in tropical and subtropical climates. The plant also contains phenolic compounds, tannins, phyllembelic acid, phyllembelin, rutin, curcuminoids, and emblicol. All parts of the plant are used for medicinal purposes, especially the fruit, which has been used in Ayurveda as a potent rasayana and in traditional medicine for the treatment of diarrhea,jaundice and inflammation . It's a 5000 year old natural healing system of medicine that is indigenous to India. In India, it is common to eat the Amla or Indian gooseberries in the pickle format. It is probably the most important natural source of vitamin C, which is easily absorbed by the digestive system. The fruits of the Amla tree are frequently employed in Ayurvedic medicine and are thought to strengthen the body's resistance to illness.

II. BOTANICAL DESCRIPTION OF PLANT PHYLLANTHUS EMBLICA

A. Fruit

Phyllanthus emblica is small to medium size fruity tree. The fruit is ripened in autumn season and sour, bitter as well as astringent in taste. Pale yellow, depressed, fleshy about 2cm in diameter with 6 vertical furrows enclosed in six trigonus seeds.

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B. Bark

Height is about 8-18 metre with light grey in color. It also has small irregular flake.

C. Flower

The flower of phyllanthus emblica are yellowish green, unisexual and have 6 vertical strip.The male flower is unisexual and slender and pedicels, females few, ovary are three.

III. VERNACULAR NAMES

English – Emblic myrobalan, Indian gooseberry
Marathi – Amla
Gujrati – Ambala
Malayalam – Nelli kayi
Telugu – Usirikaya Kashmiri – Aomla
Chinese – Anmole
French – Phyllanthe emblica
German – Amla Italian – Mirabolena emblico
Sanskrit – Dhatri phala, Amla
Malaysian – Popok, Melaka
Orissa – Anala, Ainla
Punjabi – Aula, Amla

IV. TAXONOMICAL CLASSIFICATION OF PHYLLANTHUS EMBLICA

KINGDOM : PLANTS
SUBKINGDOM : Tracheobionta (vascular plants)
SUPERDIVISION : Spermatophyta (seed plant)
DIVISION : Angiospermae (flowering plant)
CLASS : Dicotyledonae (Dicotyledons)
SUBCLASS : Rosidae
ORDER : Geraniales
FAMILY : Euphorbiaceae
GENUS : Emblica
SPECIES : Officinalis Geartn

V. HISTORY

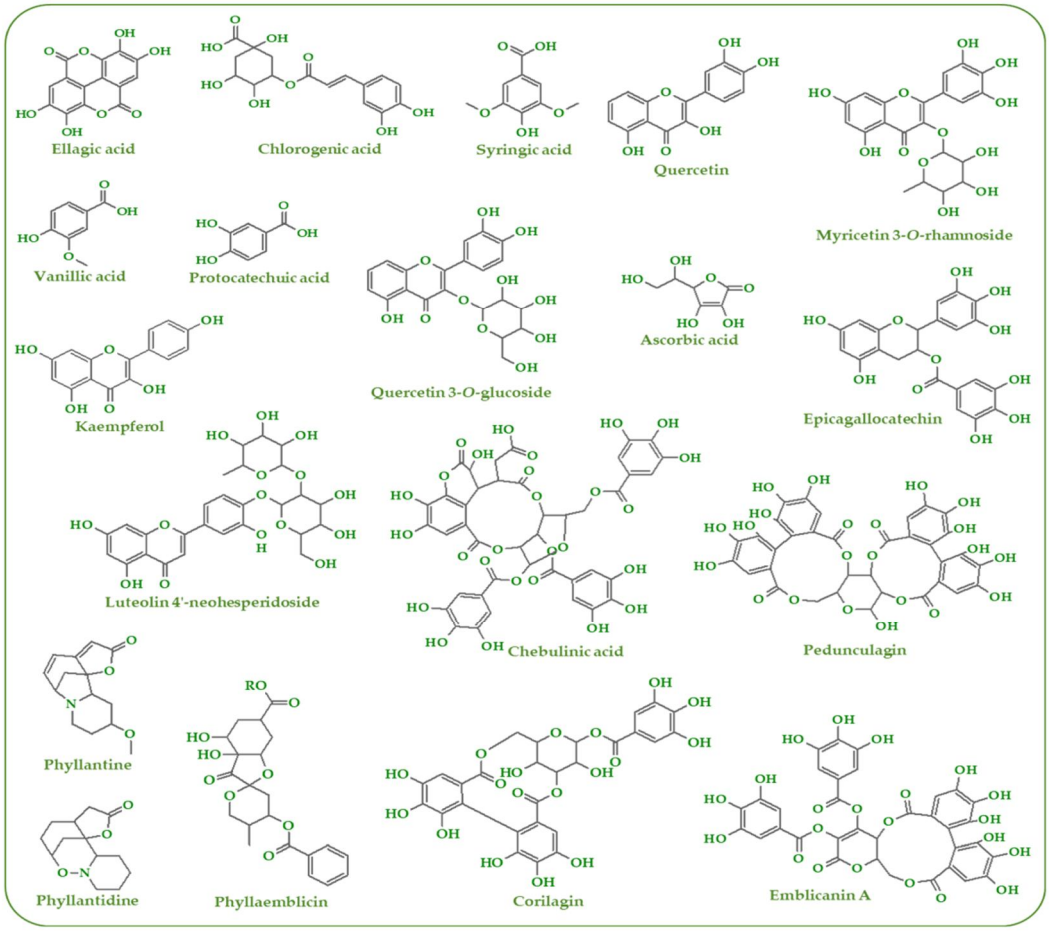
Amla is the greatest boon to the humanity and one of the effective traditional herbal medicines, which had been used to treat and manage diseases since the ancient times. It is the reservoir of minerals, vitamins and other bio-chemical substances. A method of emblica preparation was described in the first century AD in Sanskrit. Records of the medicinal use of emblica also have been found in Arabic, Tibetan, and Egyptian texts, as well as in the Sidha (Indian), Ayurvedic, and Unani systems of medicine. All parts of the plant including the fruit, seed, leaves, root, bark, and flowers are used in both dried and fresh forms. In the Ayurvedic system, the amla fruit is noted for its light and dry qualities, as well as being cooling in energy. In India, the fruit is commonly eaten as a pickle.

VI. MORPHOLOGY

Amla tree is a small to medium sized deciduous tree with an average height of 8-18 m, with thin light grey bark exfoliating in small thin irregular flakes, exposing the fresh surface of a different color underneath the older bark. The average girth of the main stem is 70 cm. In most cases, the main trunk is divided into 2 to 7 scaffolds very near to the base. Leaves are 10 -13 mm long, 3 mm wide, closely set in pinnate faishon3 which makes the branches feathery in general appearance. After setting of the fruits leaves develop. Flowers are unisexual, 4 to 5 mm in length , pale green in color, borne in leaf axils in clusters of 6 to 10. Fruits are fleshy, almost depressed to globose shape, 2.1-2.4 cm in diameter, 5.3-5.7 g in weight, 4.5-5.0 mL in volume. The stone of the fruit is 6 ribbed, splitting into three segments each containing usually two seeds; seeds are 4-5 mm long and 2-3 mm wide, each weighing 572 to 590 mg.

VII. PHYTOCHEMISTRY OF AMLA

Amla has been found to possess rich phytochemistry distributed in different sections of the plant (fruits, leaves, and roots). Polyphenols comprise the main group of secondary metabolites wherein several compounds belonging to phenolic acids, flavonoids, tannins, other phenolics and derivatives compounds have been reported in different studies.



VIII. CHEMICAL COMPOSITION OF AMLA

Amla is one of the most extensively studied plants. Reports suggest that it contains tannins, alkaloids and phenols . Fruits have 28% of the total tannins distributed in the whole plant. The fruit contains two hydrolysable tannins Emblicanin A and B , which have antioxidant properties; one on hydrolysis gives gallic acid, ellagic acid and glucose wherein the other gives ellagic acid and glucose respectivel. Emblica It is often used in the form of Triphala, which is an herbal formulation containing fruits of Terminalia bellirica, Terminalia chebula, and Emblica officinalis in equal amount. Terminalia bellirica is composed of tannic acid, gallic acid, ellagic acid, anolignan B, flavonoids and termilignan. It has an antioxidant, antibacterial, anti-spasmodic, cardioprotective, hepatoprotective, hypoglycemic and bronchodialtory properties. Therefore, it is beneficial in the management of various diseases like diarrhea, hypertension asthama, inflammation. Terminalia chebula is composed of tannin, polyphenols and anthraquinones. It has antiviral, antifungal, antibacterial, antioxidant, anti-mutagenic properties. It has been used effectively in the treatment of diabetes, hypercholesterolemia and retinopathy.

1) *Tannins:* It is a group of polymeric phenols possessing astringent property. This group of compounds, especially green teas and red wines, prevent variety of illnesses. They have been shown to exhibit physiologic properties such as stimulation of phagocytic cells, host-mediated tumor activity and a wide range of anti-infective actions. The anti-microbial action may due to their ability to inactivate microbial adhesions, enzymes, and cell envelope transport proteins
2) *Quinones:* It has an antimicrobial property. Its potential sites of action are surface-exposed adhesins, cell wall polypeptides, and membrane-bound enzymes. It provides a source of stable free radicals leading to the inactivation of the protein and loss of function
3) *Flavones, Flavonoids, and Flavanols:* These are effective antimicrobial substances against a wide array of microorganisms. They are mainly synthesized by plants in response to microbial infection. They bind with the extracellular proteins and form complex with the bacterical cell wall.

IX. AMLA FRUIT: CHEMICAL CONSTITUENTS

(Ellagitannin), Chebulagic acid (Benzopyran tannin), Corilagin (Ellagitannin), Geraniin (Dehydroellagitannin), Ellagotannin Alkaloids: Phyllantine, Hydrolysable Tannins : Emblicanin A and B, Punigluconin, Pedunculagin, Chebulinic acid Phyllembein, Phyllantidine

Phenolic compounds : Gallic acid, Methyl gallate, Ellagic acid, Trigallayl glucose Amino acids : Glutamic acid, Proline, Aspartic acid, Alanine, Cystine, Lysine Carbohydrates : Pectin Vitamins : Ascorbic acid Flavonoids Quercetin, Kaempferol.

X. MEDICINAL IMPORTANCE

A. *Traditional Uses in Ayurveda*

The Amla fruit has these properties using the Ayurvedic classifications:

Rasa (taste): Sour and astringent are the most dominant, but the fruit has five tastes including sweet, bitter, and pungent.

Veerya (nature): Cooling, it uses in treatment of burning sensation in inflammation and fever which are considered to be manifestations of pitta (fire) agitation.

Vipaka (taste developed through digestion): Sweet.

Guna (qualities): Light, dry.

Doshas (effect on humors): Quietens all three doshas: vata, kapha, pitta, and is especially effective for pitta.

Due to its cooling nature, amla is a common ingredient in treatments for a burning sensation anywhere in the body and for many types of inflammation and fever; these are manifestations of pitta (fire) agitation. Amla or Amlaki has been considered the best of the Ayurvedic rejuvenative herbs. It has a natural balance of tastes (sweet, sour, pungent, bitter and astringent) all in one fruit, so, stimulates the brain to rebalance the three main components of all physiological functions, the water, fire, and air elements within the body.

Amla or Indian gooseberry is one of the best remedy for scurvy as it is an extremely rich source of vitamin C. Drinking amla juice early in the morning with an empty stomach is a natural tonic prevent outbreak of scurvy and jaundice. Oral administration of powder of the dry herb, mixed with an equal quantity of sugar, 3 times a day with milk can prevent scurvy.

In traditional folk medicine, the fruits exert several beneficial effects include cooling, ophthalmic, carminative, digestive, stomachic, laxative, dyspepsia, rejuvenative, diuretic, antipyretic and tonic. They are also useful in diabetes, cough, asthma, bronchitis, dyspepsia, flatulence, peptic ulcer, skin diseases, leprosy, inflammations, diarrhoea, haemorrhages, cardiac disorders, hair tonic and other disease condition.

B. Anticancer Activity

Phyllanthus Emblica might prevent reactive oxygen species induced DNA damage and oncogenesis due to its potent free radical scavenging activities. Phyllanthus Emblica extracts have anti-inflammatory activities that might prevent cancer related inflammation. Finally, Phyllanthus Emblica possess potent antitumor activity. Amla is a wonder fruit known for the treatment and prevention of Cancer. The potential anticancer effects of aqueous fruit extract of P. emblica was tested in several different human cancer cell lines such as A549 (lung), HepG2 (liver), HeLa (cervical), MDA-MB-231 (breast), SKOV3 (ovarian) and SW620 (Colorectal). It inhibits the growth and spread of different types of cancer cell lines at doses of 50-100 µg/ml. It also reduces the side effect induced by radiotherapy and chemotherapy, which generally used for the treatment of cancer. Cyclophosphamide (CP) is one of the most commonly used alkylating anticancer drugs, but has toxic side effects including immunotoxicity, hematotoxicity and mutagenicity. It is found that oral administration of an extract of P. emblica to rats at a dose of 100 mg kg-1 body weight (BW) per day for 10 days resulted in the modulation of immunological parameters and antioxidants in the kidney and liver in normal as well as cyclophosphamide (50 mg kg-1)-treated animals. The result suggested that, amla extract is very effective in reducing the cyclophosphamide induced suppression of humoral immunity. Immune system acts as great barrier against any type of infection in our body.

C. Antidiabetic Activity

The compounds naturally found in P. emblica L. have been associated with protective effects against diabetes. An in vitro study indicated that the activity of the main phytochemicals found in amla (such as ellagic acid and ascorbic acid) reduced the activity of key enzymes involved in glucose digestion (especially amylase and glucosidase). The anti-diabetic activities of amla due to its high vitamin C content that is effective in controlling diabetes. One tablespoon of its juice mixed with bitter gourd juice, taken daily for two months will stimulate the pancreas and enable it to secrete insulin, thus reducing the blood sugar level. Diet restrictions should be strictly maintained while taking this medication. It will also prevent eye complication in diabetes. It also involved in regeneration and rejuvenation of beta cells, thus leading to an increased insulin production and secretion. This mechanism greatly decreases the blood sugar levels. Tannins has the capability to enhance glucose uptake and inhibit adipogenesis to make them potential drugs for the treatment of non-insulin dependent diabetes mellitus. The extract exerted rapid protective effects against lipid peroxidation by scavenging the free radicals. Decoctions of the leaves and seeds are used in the treatment of diabetes. Different studies suggested that, fruits, infusion of seeds and decoctions of the leaves and seeds are also used in the treatment of diabetes mellitus.

D. Antiulcerogenic Activity

The tannins and phenolic compounds, having antioxidant properties, are effective in the management of oral ulcers. It is beneficial in the healing of oral ulcers when used in the combination with honey. A decoction of the leaves is useful as a mouthwash in the treatment of aphthous stomatitis.

E. Antidiuretic Activity

A paste of the fruit alone or in combination with Nelumbium speciosum (the Egyptian Lotus), Saffron [more likely to be Curcuma longa (Indian saffron) than Crocus sativus (saffron)] and rose water is a useful application over the pubic region in irritability of the bladder, in retention of urine. Amla-Berry is very supportive to the urinary system and can be helpful if anyone feel a mild burning sensation while urinating. It supports natural diuretic action, but does not force water from the body like diuretic pills. In other words, it helps eliminate waste from the body but does not over-stimulate the urinary system. The paste made by 20gms of pulp of dried E.officinalis in 160 gms of water till 40 gms are left. This was mixed with 20gms of Gur. Regular use of this portion may cure urinary problem. Having amla powder with radish can break the stones present in urinary bladder and washed it out through urine. The best time to have them is morning or evening.

F. Dental Problems

The roots of Phyllanthus emblica Linn. (10 g) are ground and taken twice daily for one day only after taking food. Alternatively, the leaves of Phyllanthus emblica Linn. are squeezed to extract the juice. This juice then put in the ear (a few drops) to relief from toothache. A final alternative is to grind the node of a Phyllanthus emblica Linn. and mix it with water. After vigorous stirring it is filtered through a cloth. This water is put drop by drop in the right ear if the teeth on the left hand side are in pain and vice versa. The remedy is continuing for three days. A cytokine like substances, Zeatin is also present in amla leaves and fruits that helps in refining the mouth, strengthens teeth and bones.

G. Respiratory Problems

The paste made by 10gm leaves of Phyllanthus emblica, 5 fruits of Terminalia chebula, 9 seeds of Piper nigrum, one garlic are crushed over and mixed with 25 ml ghee made from cow's milk and a clove. The fresh juice of Amla mixed with honey can get back best from asthma, cough, and other respiratory disorders. Research suggested that intake of amla juice regularly reduces harmful effects of the cigarette smoke in the lungs. Due to its high anti-oxidant contents, it fights with free radicals liberated from the smoke.

H. Memory Enhancing and Antidepressant Activity

Amla-Berry is good for the brain. It is supportive for the mind and enhance coordination. It sharpen the intellect and helps in mental functioning. It supports the nervous system and strengthens the senses. P. emblica is traditionally used to treat disorders of the central nervous system (CNS). It reversed the amnesia induced by scopolamine and diazepam. Powder of amla may prove to be a useful remedy for the management of Alzheimer's disease due to its beneficial effects on memory improvement and reversal of memory deficiency.

I. Hair Tonic

Amla-Berry boosts absorption of calcium, thus creating healthier bones, teeth, nails and hair. It also helps maintain vernal hair color and retards premature graying, and supports the strength of the hair follicles, so there is less thinning of hair with age. Dried fruit boiled in coconut oil till solid matter becomes charres, prevents greying. The water in which dried amla pieces are soaked overnight is also nourishing to hair.

J. Eye Tonic

The juice of fresh amla has been found to improve eyesight and may be helpful in treating conjunctivitis and glaucoma. A cup ful of amla juice mixed with honey should be taken twice daily for eye problems. Even if one does not suffer from eye disease, amla is also used to reduce intraocular tension and weakness of the eyes. Ophthacare is a herbal eye drop preparation containing basic principles of different herbs in patients suffering from different ophthalmic disorders such as conjunctival xerosis, conjunctivitis, acute dacryocystitis etc. In most cases improvement observed with the treatment of the herbal eye drop.

K. Gonorrhea

The juice of the bark combined with honey and turmeric can be used to treat gonorrhea. The Barks notorious to exert anti-diarrheic effects and for treatment of leucorrhoea (vaginal infection). Juice of the bark combined with honey and turmeric is used to cure gonorrhea.

L. Gout

uric acid and its salts deposited on the blood and joints. This problem is cured by taken of a amla juice with old ghee makes Gout is a form of inflammatory arthritis that develops in some people who have high levels of softening of joints and helps in curing gout and also removing the spots caused by measles, chicken pox, small pox.

M. Diarrhea

Fruit decoction is used for the treatment of diarrhea. Mixed with sour milk it can be given in cases of dysentery. A decoction and evaporation of the root solution produces an astringent extract equal to catechu. Infusion of the leaves with fenugreek seed is used during chronic diarrhea. Recent report shows that, the P. emblica fruit extract possesses.

N. Remedy for Menstrual Disorders

The synergistic effect of Neem leaves (Azadirachta indica) in combination with amla can be very effective to patients suffering from iron deficiency anaemia. Amla-fruit keeps menstruation regular and healthy. It supports the reproductive systems of both men and women and can help overcome difficulty in conceiving. It enhances the reproductive tissue and nurtures the ovaries and sperm that enhances fertility and the possibility of conception. It is especially supportive for women, strengthens the uterus and protects the reproductive system. White discharge in women is the major problems which can be reduced by taking dried amla seeds mixed with honey. Amla can also increase the sperm count and it acts as an aphrodisiac. A mixture of the fruit juice and sugar is used for the relief of burning in the vagina.

XI. CONCLUSION

The use of medicinal plants in the management of various illnesses is due to their phytochemical constituents and dates back to historical age. it is an important ingredient of many Ayurvedic medicines and tonics. It is one of the richest natural sources of Vitamin C and plays a vital role in preventing innumerable health disorders. It is considered to be a safe herbal medicine without any adverse effect. On the basis of its traditional uses on various potential remedies this plant can be used as a natural source for the future drug development. Therefore, our careful consideration must be needed for increasing the use of amla for the treatment of various diseases and its development as a established, potential and safe dosage form.

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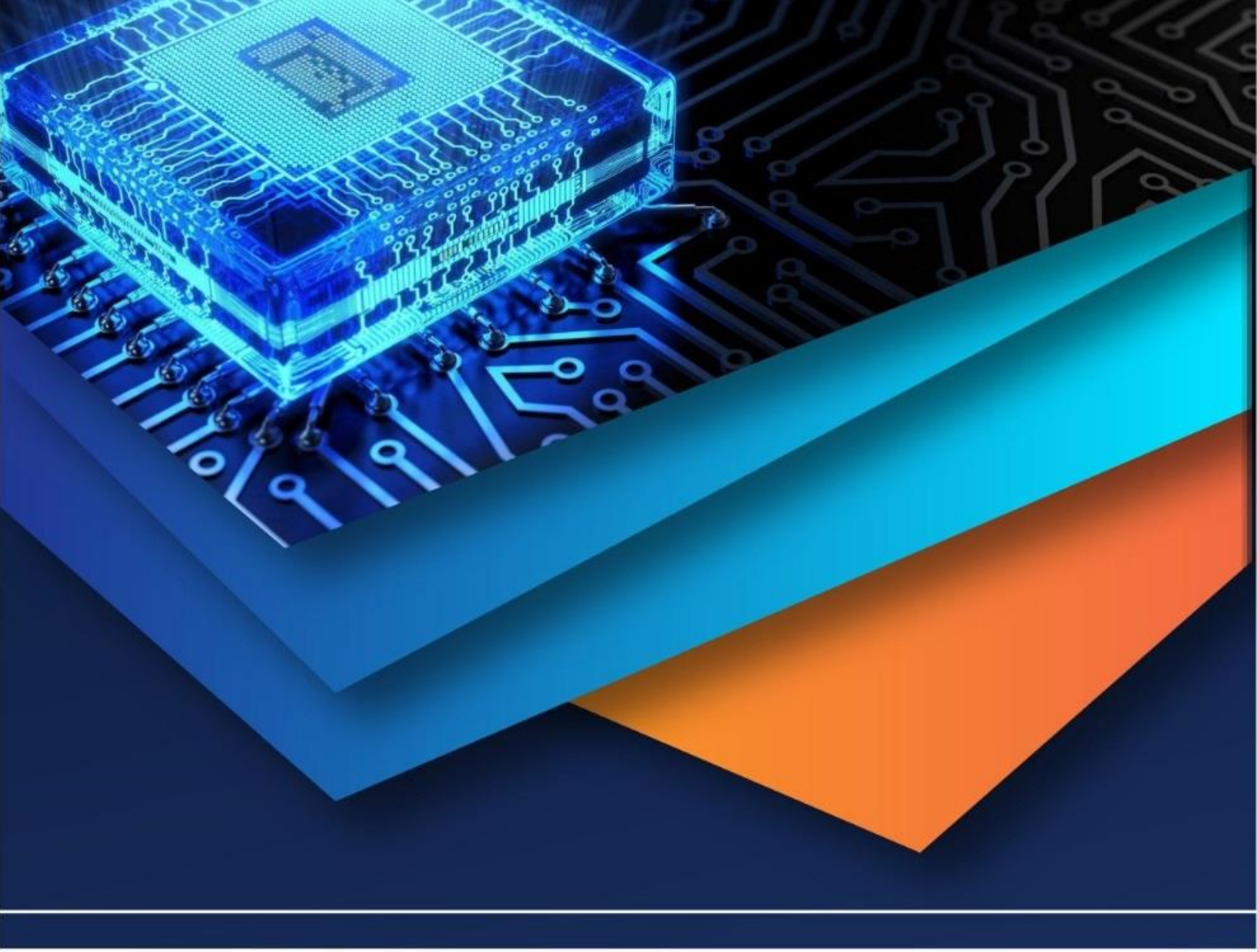

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