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Tanka (Pyrus communis) in *Ayurvedic* Materia Medica: A Comprehensive Review of Its Health Benefits, Traditional Uses, Pharmacological Activities, and Phytochemical Constituents

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Abstract: ***Natural compounds are fundamentally preferable to synthetic substances according to general people and have played an essential role in health care system for illness prevention. Tank (Nashpati), commonly known as the pear in English, is a fruit celebrated for its nutritional benefits and diverse applications. Fruits are an excellent way to boost your body's wellbeing and get all the necessary nutrients. A fruit-rich diet reduces the risk of several diseases and provides your body with the best nourishment. It is the second most nutritious fruit in the world after apple. Pear is a rich source of many nutrients like vitamins, dietary fibre, amino acids, etc. It has various names in different cultures. In Hindi, it is called Nashpati, and in Ayurveda, it is known as Tank (Amritphala), as it is highly beneficial for the human body. Pear, due to its low-calorie content, is an excellent addition to a weight-loss diet. The pear is characterized by its distinctive pyriform shape, crisp to buttery flesh, and a wide range of cultivars exhibiting variations in flavor, texture, and color. The current review study comprises its brief description and cultivation, medicinal and traditional uses , Phytoconstituents of Pyrus communis fruit in order to highlight future research potential for this well-known and commercially relevant medication.***
Key words: Amritphala , Tank ,Pear, Pyrus communis , Ayurveda.

I. INTRODUCTION

The genus *Pyrus*, commonly known as pear and often referred to as "*Nashpati"* in South Asia, represents a significant group of fruit-bearing trees within the *Rosaceae* family, sharing a close phylogenetic relationship with other economically important some fruits like apples (*Malus domestica*). Pears are among the oldest cultivated fruits, with archaeological and historical evidence suggesting their origins in ancient China and parts of Western Asia[1,2]

Beyond their diverse culinary appeal, pears are highly valued for their comprehensive nutritional profile and a growing body of evidence supporting their various health benefits. They are an excellent source of dietary fiber, contributing significantly to digestive health and satiety[3,4]. Furthermore, pears are rich in essential vitamins, particularly Vitamin C and K, and minerals such such as potassium and copper[5]. A key focus of recent research has been the phytoconstituents of pears, which includes an array of bioactive compounds like flavonoids, phenolic acids, and triterpenoids, many of which are concentrated in the peel[6,7]. These compounds are increasingly recognized for their potent antioxidant, anti-inflammatory, and anticarcinogenic properties[6].

Traditional medicinal systems across various cultures have long utilized pears for their therapeutic potential, ranging from remedies for coughs, constipation, and hangovers to their purported benefits in managing inflammatory conditions and supporting overall well-being[8,9]. Modern scientific investigations are progressively validating these traditional uses, with studies exploring the role of pear consumption in mitigating the risk of chronic diseases such as type 2 diabetes, cardiovascular ailments, and certain cancers[10].

This review article aims to provide a comprehensive overview of *Nashpati* (*Pyrus spp.)*, synthesizing current knowledge on its botanical characteristics, geographical distribution, and key cultivated varieties. Particular emphasis will be placed on elucidating the fruit's nutritional composition, highlighting its diverse phytochemical constituents, and critically assessing the scientific evidence pertaining to its health-promoting and medicinal properties.

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A. Taxonomical Classification of Pear

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Rosales
Family: Rosaceae
Genus: Pyrus L.
Species: Communis Linn.

The description of *Tank*(*pyrus communis)* enlisted in different *ayurvedic* literature as follows:
Tank description in various *Samhita* and *Nighantu.*

1) Description in Samhita

Charak & Sushruta Samhita- Phala varga[11,12]
According to Both, *Tank* is *Madhura Kashaya* in *Rasa*, increases *Vata*, *Guru* in *Guna*, cold in potency.

2) Description in Nighantu

Gana/Varga classification according to different *Nigantus* :
In *Madanapala Nighantu*[13]: *Phaladi varga*
According to *Madanapala*, *Tank* is *Amrit*, *Guru* in *Guna*, reduces *Vata*, *Madhura Amla* in *Rasa*, promotes taste, increases level of *Shukra Dhatu.*
In *Bhavprakash Nighantu*[14]: *Amradiphala varga*
According to *Bhavprakash*, *Tank* is *Amrit Phala*, *Laghu* in *Guna*, *Vrshya* properties, *Madhura* in *Rasa* & it alleviates all three *doshas.*
Acharya Priyavat Sharma, quoted it in 3 volumes

- *Acharya Priyavat Sharma* Part:3 – *Tank(Phala varga)*
- *Acharya Priyavat Sharma* Part: 4 - *Nashpati(Phala varga)*
- *Acharya Priyavat Sharma* Part: 5 - *Bhratrayi Dravya* (pg. no 151)

II. BOTANICAL DESCRIPTION OF *TANK*(PEAR)

Pear*(Pyrus communis)* also known as *Amritphala,* is a sweet fruit, medium height tree reaching upto 10-17m (33-56ft), often with high narrow crown shape. some of its species are shrublike, whose height is not high.
Its leaves are arranged on by one to the left and are straight 2-12cm long, shiny green in some species, and densely silvery green covered in some species. They range in size from a wide oval to a narrow phalanx. Some of its description are summarised in below table as follows.

Tree height	10-17m
Trunk colour	Grey
Leaves	Ovate, 2-12cm, bright green
Flower	White or rosy, 1.5 cm wide
Fruit	White pulp, Juicy, Edible pome


Figure1 Pyrus communis tree


Figure2 Pyrus communis flower


Figure3 Pyrus communis fruit

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III. DISTRIBUTION, HABITAT, COLLECTION & CULTIVATION PRACTISES OF TANK(PEAR)

Pyrus communis (Linn.) is distributed in the temperate region of Europe and West Asia. In India it is found in Punjab, Himachal Pradesh and Kashmir.

HABITAT

- Sand: Pear tree prefers deep well drained loam soils with pH less than 8.5. Alkaline soil is unfit for cultivation. High pH soils show iron chlorosis and zinc deficiencies in Pear plants.
- Climate: Pears can be grown successfully at 1200 to 1800 meters above sea level. Pears can tolerate both low temperatures below 0°C and can withstand high temperatures of summer (47°C). Best temperature for flowering and fruiting is 2°C in winter and 32°C in summers.
- Rainfall: 100-125 cm of rainfall is sufficient for good growth of Pears.
- Sun exposure: Pear fruit needs full sun exposure for growth.
- Bloom time: Pear fruits bloom during summer and fall time.

CULTIVATION AND COLLECTION: The Pear tree is widely farmed in temperate regions. Pears requiring chilling conditions are cultivated in plains of North India. Cultivars requiring high chilling hours (900-1000) are cultivated at higher hills of Jammu and Kashmir, Himachal Pradesh and Uttarakhand. Pear tree needs 2-4 years to get the fruit. Pears take 3-5 months for ripping to full bloom. The age of a Pear tree is up to 75 years. India's Pear season ranges from late summer to early winter.

IV. VARITIES OF *PYRUS*(PEAR)

Over millennia, cultivation and selective breeding have led to the proliferation of thousands of distinct pear varieties globally, Basically, there are two varieties of pear, *hard(Nashpati)* and *soft (Babbu- gosha)* but Pyrus(Pear) , broadly categorized into two major groups: the *'European' or 'Western' pears (Pyrus communis L.)* and the *'Asian' or 'Oriental' pears (Pyrus pyrifolia 'chojuro'(Asian pear), P. bretschneideri Chinese white pear, P. ussuriensis, Manchurian flowering pear etc.).* These groups are distinguished by their distinct morphological, textural, and sensory characteristics; European pears typically exhibit a soft, buttery, and juicy texture when ripe, while Asian pears are characterized by their crisp, apple-like crunch[15,16] .

Figure 4 Hard Nashpati

Figure 5 Soft (Babbu- gosha)

Figure 6 Pyrus pyrifolia 'chojuro'(Asian pear)

Figure 7 P. bretschneideri Chinese white pear

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Figure 8 Pyrus ussuriensis(Manchurian flowering pear)

V. USES & MEDICINAL USES OF PEAR

A. *Uses*

- Pear is a rich dietary source of minerals and vitamins.
- Leaves and bark are used in wound healing. It acts as anti-inflammatory.
- Flowers are used as components of pain relieving and spasmolytic drugs.
- Fruits as a good source of pectin maintains the desirable acid balance in the body.
- Due to low sucrose content of pear, it is recommended in diabetic patients.
- Plant extract controls freckle and blemishes on the skin. It prevents the formation of melanin and used in skin lightening. Arbutin content present in plant is used as skin whitening agent and in urinary therapeutics.
- Used as remedies for alcohol hangovers, cough and constipation.

B. *Medicinal uses*

Medicinal uses	Plant Parts
Anti-microbial	Fruit, leaf, Shoot
Anti-inflammatory (Wound healing)	Leaf, Flower, Bark, Root, Fruit
Hypoglycaemic	Fruit
Anti-oxidant	Fruit
Anti-radical	Leaf
Hypolipidemic	Fruit
Anti-aging	Fruit
Urinary therapeutics	Fruit, Leaf
Skin whitening	Fruit
Analgesic	Flower
Spasmolytic	Flower
Anti-tussive	Fruit
Anti-pyretic	Fruit
Astringent	Leaf, Bark
Sedative	Fruit
Anti-cancer	Fruit

C. Traditional Uses

Pear is a natural product favored with a few healthy benefits, consequently fills in as a valuable caffeinated drink. It is being utilized in the treatment of different sicknesses from old time. Pear keeps up folic corrosive levels during pregnancy and forestalls advancement of birth absconds in babies. Pear is suggested for weaning babies, which aren't excessively cruel on a child's stomach related framework. Pear is helpful in dysmenorrhea, when taken regularly. Low sugar substance and high gelatin levels make Pear reasonable for diabetic patients. Pears were utilized as a characteristic cure against queasiness in antiquated Greece. It keeps up corrosive equalization in body. Pear juice is an invulnerable promoter. Corpulent individuals favor it in diminishing body weight. Pear is an amazing cardio-defensive natural product as it brings down hypertension. Pear additionally has promising neuro-defensive properties consequently forestalling the advancement of neurodegenerative illnesses, for example, Parkinsonism, Huntington's infection and Alzheimer's ailment. Pears are utilized in forestalling blockage as they contain a great deal of fiber, which is fundamental for a solid stomach related framework. It is valuable in fever because of its cooling property. Pear juice feeds the throat and aides in forestalling brevity of breath during hot days. Pear is favored by people, who are adversely affected by wheat or different nourishments. Customary utilization of Pear brings down the danger old enough related macular degeneration, which is the primary driver of vision misfortune in more established grown-ups.

D. Therapeutic Uses

- *Virya* (Potency) - cold *(shita)*
- *Laghu* -light for digestion
- *Vrshya* - aphrodisiac

E. Ayurvedic Indication

Pear help to manage digestive problem like acidity when it is taken before food. According to ayurveda, hyperacidity means an increased level of acid in the stomach. This is due to an aggravated Pitta. Pear help to reduce acidity due to its *Sita* (cold) nature.
DOSES: Juice-1/2-1 cup a day.
PART USED: Fruit, Flower, Leaves and Bark

VI. PHARMACOLOGICAL ACTIVITY

1) *Anti-microbial activity*: Crisp Pear juice and fluid concentrate of leaves show hostile to bacterial action against Staphylococcus and E.coli due to the nearness of phytoconstituent arbutin (bacteriostatic), which gets further, changed over into hydroquinone in body[17,18]. This hydroquinone additionally has hostile to bacterial movement, helps biochemical procedures and works barrier instruments against microscopic organisms intrusion. Fluid concentrate of youthful shoots of Pear show hostile to bacterial action as it contains hydroquinone[19]. Ethyl acetic acid derivation extricate shows most grounded enemy of bacterial movement than different concentrates.
2) *Anti-oxidant activity*: Pear is a rich wellspring of nutrient C, quercetrin and copper, which shield cells from harm by free radicals. Fruits[20] (phloridzin, chlorogenic corrosive and quercetin), leaves (quercetin, coumarin and chlorogenic corrosive), root barks (phloridzin) and blossoms (chlorogenic corrosive) of Pear tree help in annihilating receptive oxygen species in this manner going about as an enemy of oxidant.
3) *Anti-cancer activity*: Utilization of Pear on standard premise forestalls the threat of bladder[21], lungs[22] and oesophageal cancer[23]. Pears contain urosolic corrosive that represses aromatase movement in this way forestalling malignancy. Isoquercitrin present in natural product keeps up DNA trustworthiness. In this manner, utilization of Pear on everyday schedule forestalls the peril of disease, particularly in menopausal ladies.
4) *Cholesterol lowering activity*: Pears have high content of pectin, which lowers down levels of LDL, triglycerides and VLDL thereby reducing risk of high cholesterol[24].
5) *Anti-inflammatory action*: Pears can be useful in treating inflammation of mucous membranes, colon, chronic gall-bladder disorders, arthritis and gout. Carotene, zeaxanthin and vitamin C are nutrients present abundantly in Pear, which lower the concentration of inflammation causing C-reactive proteins.
6) *Anti-diabetic activity*: The fruit contains high amount of fiber, which maintains blood glucose levels in diabetics[25] Furthermore, levulose, low fructose and low sucrose fruit sugars are well tolerated by diabetic patients.
7) *Skin- whitening effect*: Pear contains arbutin, which decreases melanin in the skin and acts as a natural skin whitening agent[26].

8) *Wound healing effect*: Pear has likewise been demonstrated to be strong in accelerating the recuperating procedure for different sorts of wounds. It really helps in a few stages of the recuperating procedure. Astringent tannins contract wounds. Nutrient C, a cell reinforcement, animates the creation of collagen, the essential auxiliary protein in skin. The nearness of phytoconstituent arbutin (bacteriostatic) helps in abridging the danger of wound infection[27].
9) *Bone health*: Pears maintain pH level of the body. Its boron content helps the body to retain calcium, which in turn retards osteoporosis.
10) *Constipation*: Pear is a delicate diuretic because of its gelatin content. Drinking Pear squeeze consistently controls defecations. Gelatin is a sort of fiber that ties to greasy substances in the stomach related tract and advances their end. Pear may deliver gastric bombshell, stomach agony and the runs in people experiencing peevish inside issue.
11) *Immune-booster*: The anti-oxidant nutrients of Pears are critical in building up your immune system. Pear juice shows mild anti-pyretic effect due to its cooling property,
12) Pregnancy: It contains high amount of folate, which prevents neural tube defects in infants.
13) *Cardiovascular disease*: Pears prevent high blood pressure, stroke and thus, help in curing cardiovascular disorders.
14) *Respiratory diseases*: The summer heat may make kids have brevity of breath with unnecessary mucus. Drinking of Pear juice during summers helps in clearing the mucus. It diminishes vocal rope irritation, sustains the throat and forestalls throat issues.
15) *Action on urinary system*: Arbutin present in Pear helps in relieving urinary infections and extract of leaves act as urodisinfectant[28].
16) *Weight loss*: Pectin is a type of fibre that binds to fatty substances in the digestive tract and promotes their elimination. Thus,
17) *Malnutrition*: Pears helps in improving children health, such as maintaining HB, blood circulation. helps to get over of constipation, helps in improving growth &immunity. It is also a good appetizer.

VI. PHYTOCONSTITUENTS OF PEAR[30,31,32,33,34]

The leaves contains arbutin, isoquercitrin, sorbitol, ursolic acid, astragalin and tannin. The bark contains friedelin, epifreidelanol and beta- sitosterol. Flavonoid glycosides such as quercetin 3-O-B-D (6"-O-a-L- rhamnopyranosyl) -glucopyranoside and quercetin 3-O-B-D (6"-O-a-L-rhamnopyranosyl) -glucopyranoside. Sterols and triterpenes (B-sitosterol and a-amyrin), phenolics and coumarins are present in pyrus communis Linn.

Chlrogenic acid is also isolated and identified from *Pyrus communis Linn*. flower. The triterpenoids were isolated from the stem bark of *Pyrus communis Linn.*

Sr.	Phytoconstituents.	Plant Part
1.	Glycosides Arbutin, Quercetin, Isorhamnetin Kaempferol, 3,5-dicafeoylquinic acid, Astragalin and Pyroside	Leaf, Fruit
2.	Vitamins Vitamin A, Retinol, Vitamin C, Vitamin E, Vitamin K, Vitamin B12 (folate), Vitamin B3 (niacin), Choline, Betaine and Vitamin B5 (pantothenic acid)	Fruit
3.	Minerals Sodium, Potassium, Magnesium, Calcium, Phosphorous, Copper, Iron, Zinc, Manganese, Selenium and Fluoride	Seed, Fruit
4.	Flavonoids Quercetin 3-O-B-D glucopyranoside, Kaempferol 3-O-B-D (6"-O-a-Lrhamnopyranosyl)- glucopyranoside and Querce 3-O-B-D-(6"-O-a-L-rhamnopyranosyl)-glucopyranoside Phloridzin	Fruit, Flower, Root bark
5.	Alkaloids	Fruit
6.	Sterol B-sitosterol, Saccharostenon	Flower
7.	Phenolic acid- Chlorogenic acid, Gallic acid	Leaf, Flower, fruit

8.	Anthocyanins	Fruit
9.	Tannins	Leaf, Fruit
10.	Coumarin	Leaf
11.	Carbohydrate	Seed, Fruit
12.	Polyphenol oxidase	Fruit
13.	Triterpenes α-amyrin Ursolic acid Friedelin, Epifeiedelanol	Flower, Stem bark, Leaf
14.	Lipid	Seed, Fruit
15.	Fatty acid Stearic acid, Palmitic acid and Arachidic acid	Flower

Amino Acid Content of Pear for Edible Portion[35]

- Threonine- 2.12g
- Isolucine- 3.18g
- Leucine- 4.98g
- Lysine- 3.28g
- Methionine- 0.72g
- Cystine- 0.56g
- Phenylalanine- 3.13g
- Tyrosine- 0.34g
- Valine- 3.02g
- Arginine- 3.09g
- Histidine- 2.87g
- Alanine- 2.71g
- Aspartic acid- 5.79g
- Glutamic acid- 6.58g
- Glycine- 2.81g
- Serine- 1.77g

VII. CONCLUSION

In conclusion, *Pyrus* species exhibit significant therapeutic potential, largely attributed to their abundant phytochemical content and wide range of pharmacological effects. These fruits have demonstrated beneficial properties—including antioxidant, anti-inflammatory, anticancer, and cardioprotective activities—that support their role in promoting human health and wellness. Key bioactive constituents such as phenolic compounds, flavonoids, triterpenoids, and essential vitamins contribute to their value as functional foods and natural therapeutic agents. Contemporary scientific findings increasingly validate the traditional uses of *Pyrus species*, paving the way for the development of innovative medicinal formulations and dietary interventions. However, further in-depth studies are essential to fully elucidate their mechanisms of action, refine extraction methods, and explore their clinical applications. Collectively, these insights position *Pyrus* species as promising valuable resource in the field of natural medicine and integrative health strategies.

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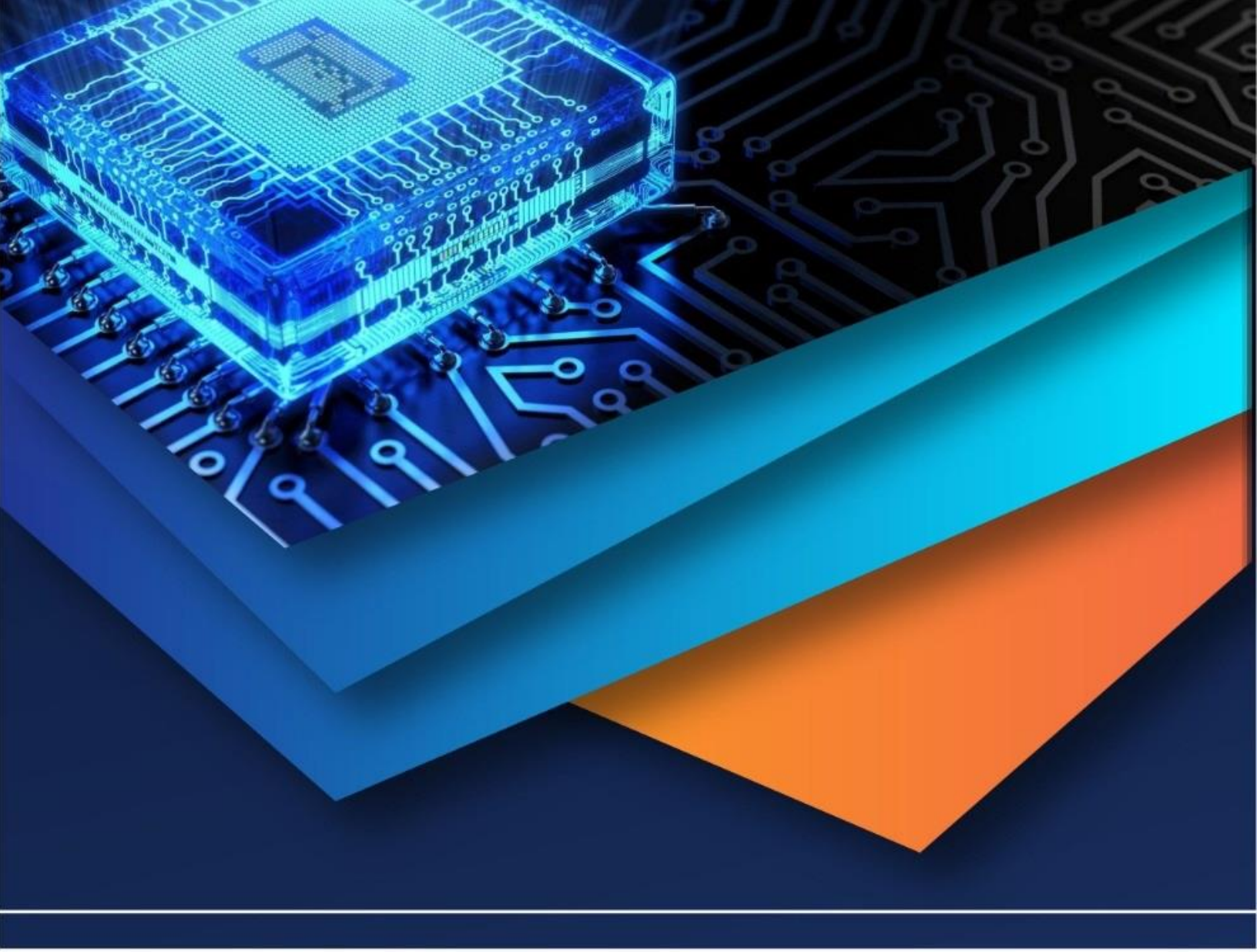

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