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An Ethnomedicinal Survey of Plants used by Kurichiya Tribes in Vilangad, Kozhikode, Kerala

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Abstract: ***An ethnomedicinal survey in Vilangad village, Kerala have revealed a wealth of traditional knowledge on medicinal plants and their uses amongst the Kurichiya tribes. The study was focused on identifying folklore medicinal plants, family wise distribution, habit, disease treated, part of the plant used and mode of preparation etc. From the survey, a total of 75 plant species belonging to 37 families were found to be useful in the treatment of various diseases. In this study the most dominant family was Fabaceae followed by Apocyanaceae and Asteraceae. Traditional medicinal plants are important contributor for treating various diseases among the local tribal communities. It is urgent need for documenting these plant species before such valuable knowledge become extinct. Moreover, this study could play an important role for the conservation of these plants and represent the valuable information required for future phytochemical and pharmacological investigation.***
Keywords: Vilangad village, Tribal community, Medicinal plants, Traditional healer, Kurichiyar.

I. INTRODUCTION

Ethnobotany is the study of interaction between the plant and people with a particular emphasis on traditional tribal cultures. According to the World Health Organization (WHO), about 65-80% of world's population in developing countries depends essentially on plants for their primary health care due to poverty and lack of access to modern medicine. Indian systems of medicine derive many of their curative tools from plants which we used as drugs. Information about these is often found in old literature like Atharveda, Charka Samhita and Sushruta Samhita (Kumar *et a*l., 2005; Saranraj *et al*., 2010; Sivasakthi *et al*., 2011; Bharathi *et al*., 2014). In spite of the many achievement of allopathic medicines, the Indian systems of medicine still continue to provide medical care to majority of people on account of their cheaper cost without side effects (Kokate *et al*., 2002; Sekar *et al*., 2012). Herbal drug obtained are safer in treatment of various diseases.

A mounting body of research is hoisting the credibility of traditional knowledge in morning the challenges of primary healthcare services and natural resources management globally (Ragupathy and New master, 2009). However, societal domination of Western medicine and lack of due recognition to the stakeholders of biological resources, place and value of traditional Knowledge base has been impending the entry of traditional medicine into healthcare services and its related field of human welfare such as environmental assessment, nutrition and natural resource management (Usher, 2000). It is estimated that about 10 million species of plants inhabit the planet Earth of which, however only 1.7 million species are known to science. In India, the main traditional systems of medicine include Ayurveda, Unani, and Siddha, which use over 7,500 plant species have been recorded. Therefore it is the need of the hour to explore the floristic wealth of earth. So as to know what we have.

India is having rich vegetation with a wide variety of plants, due to extreme variation in the geographical and climatic conditions present in the country (Handa, 1998). Today tribal and certain local communities in India still collect and preserve locally available wild and cultivated plant species for their day today life. Traditional ethnomedicine uses the practices and knowledge skills based on theories, beliefs and experiences indigenous to its people and culture for the maintenance of health. It holds a heritage of communal acceptance and is based on the experience gained by herbalists over a period of time. The indigenous knowledge on medicinal plants came when humans started and learned how to use the traditional knowledge on medicinal plants. Nowadays, there is an increasing trend of erosion of traditional knowledge and associated biodiversity due to various reasons, particularly the programs on the upliftment of the Adivasi people throughout the country. In recent years, indigenous medicine is no more an attraction to the younger generation; they are more depended on Western medicine. They are unable to identify the herbs and possess very little knowledge about traditional herbal remedy. Nowadays many young people migrate to urban areas for education and job purposes. As a consequence, only the elder people only possess the knowledge about herbs and it is estimated only a handful of people are able to use the traditional remedy to treat illness. For these reasons, the documentation of the traditional uses of indigenous plants are important to preserve the knowledge.

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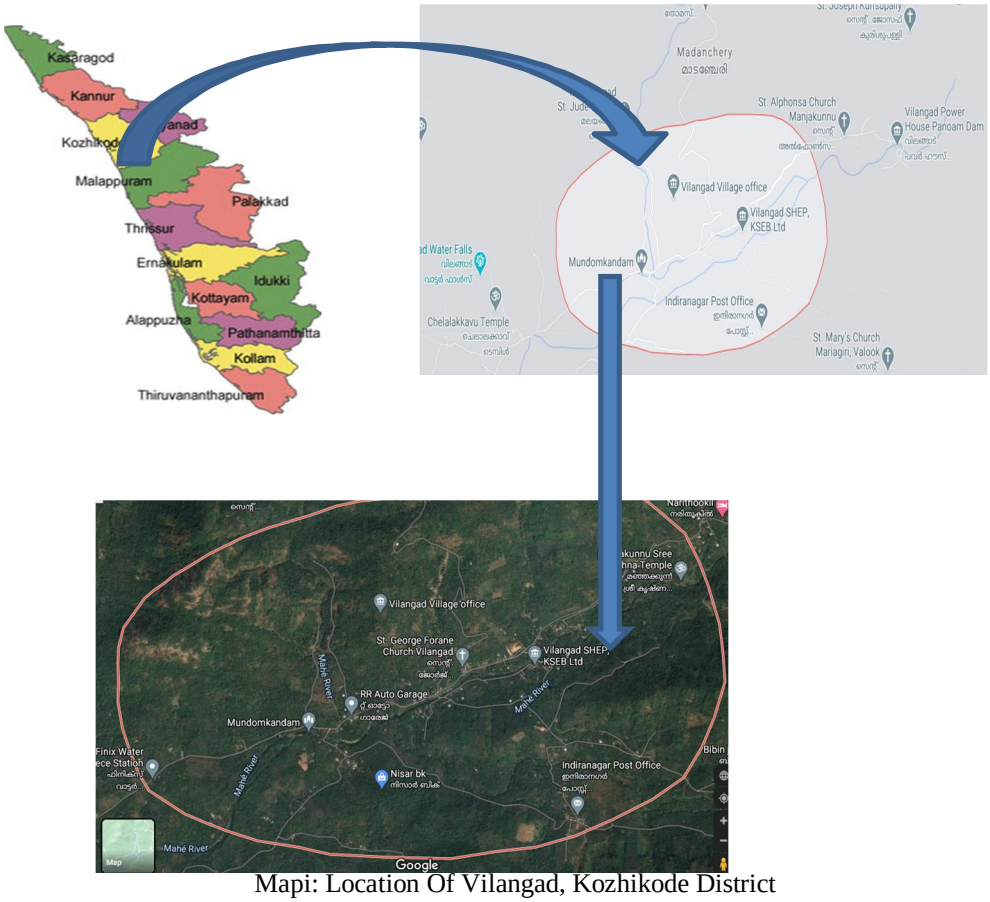
Kerala, the southernmost state of India is known for its biodiversity reserve, high cultural heterogeneity and high rate of literacy reserve (Shyma and Devi Prasad, 2012). Flora of Kerala shows striking similarity with Middle East Central Asia, China and East Africa besides Australia and America. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation of biological resources and their sustainable utilization. The data generated in this study will also help in planning for conservation of endemic and threatened plants. Present study was carried out to document the diversity of Vilangad hills, Kerala. The main objective of this study is to assess the diversity of ethnomedicinal plants used by Kurichiyans and document the traditional medicine practices followed in healing ailments.

II. MATERIALS AND METHODS

A. Field Area Description (Map Enclosed)

Vilangad is a small village in the Kozhikode district, Kerala, India. Vilangad is a small town, North-east of Calicut district bordering with Wayanad and Kannur (Plate 1). Village has population of 3778 as per census data of 2011, in which the female population is 1848 and male population is 1930. The total geographical area of Vilangad is 2283 hectares. Population density of Vilangad village is 2 persons per hectares. Total number of households in the village is 916. The mean annual temperature in the study area ranges from 22° C to 36°C during Mar - Jun and average between 10° C to 25° C during Oct - Jan.

The District Head Quarter name is Kozhikode and its distance from the village is 82 Km. The study area lies between 11.599112° Latitude and 75.581123° Longitude.



Mapi: Location Of Vilangad, Kozhikode District

B. Kurichiya Tribes

Kuruchiyar or Kurichiya also known as Hill Brahmins or Malai Brahmins are the inhabitants of Kannur and Kozhikode district. Kuruchiyans are one of the scheduled tribes in Kerala and stands in fourth in number. Kuruchiyans are segmented into four divisions viz, Kurichiyans of Kannavam forest, Kurichiyans of Wayanad, Anchilla Kurichiyans and Pathiri Kurichiyans. They usually collect wooden materials for spiritual purpose and non-wooden products such as honey, gum, resins and herbs for their commercial income.

C. Plant Collection

Field investigations were conducted in Vilangad hills, Kozhikode. The medicinal plants which used by the tribal people were collected by following standard protocols and preserved using the herbarium techniques. Specimens collected from the field were tagged and taken to the lab. Flora of Presidency of Madras (Gamble, 1936) was used for identification and authentication of the collected plants. Herbarium collections have been vouchering numbered and deposited in the Herbarium at Nirmala College for Women, Coimbatore.

D. Ethnomedicinal Survey

During the study, daily activities of the tribal people were closely observed and interpersonal contacts were established by participating in their functions. There were 10 informants with the age group of 32-68. Among them two were tribal practitioners. The ethnobotanical data were collected using interviews, Questionnaire and discussions in their local dialect.

III. RESULT AND DISCUSSION

The present study has been carried out to document the indigenous traditional knowledge of medicinal plants in Vilangad village, Kozhikode, Kerala which revealed the ethnomedicinal information of 75 plant species belonging to 37 families (Table 1, Plate 2 & 3) and of the total 75 species documented, 72 species belongs to Dicotyledons and 3 species belongs to Monocotyledons. Out of 72 Dicotyledons, 33 plant species belongs to Gamopetalae, 27 plant species belongs to Polypetalae and 12 plant species belongs to Monochlamydeae (Table 2).

The most medicinally important plant species were observed in Fabaceae (7 species) followed by Apocyanaceae and Asteraceae (6 species each), Malvaceae (5 species), Acanthaceae and Lamiaceae (4 species each) and rest of the families are distributed in lesser numbers [Fig 1]. Other families more frequently used by tribal practitioners includes Verbenaceae, Euphorbiaceae and Rubiaceae (3 species each), Myrtaceae, Bignoniaceae, Piperaceae and Rutaceae (2 species each), Combretaceae, Urticaceae, Annonaceae, Scrophulariaceae, Plantaginaceae, Poaceae, Nyctaginaceae, Rhizophoraceae, Convolvulaceae, Solanaceae, Moraceae, Liliaceae, Ulmaceae, Marantaceae, Melastomaceae, Santalaceae, Aizoaceae and Menispermaceae with one species each. Similar results were reported by Loganathan *et al.* (2018) in Vathalmalai Hills, Eastern Ghats, Dharmapuri District, Tamil Nadu.

Analysis of habit diversity of medicinal plants revealed that herbs are dominated with, 37%, followed by shrubs (24%), trees (24%), climbers (12%) and subshrubs (3%) [Fig 2]. Similar results were reported by Marjana *et al.* (2018) in Wayanad District of Kerala, India.

Most of the recorded medicinal plants in the study are used to treat cough, cold and headache (21%) followed by stomach disorders (20%), wounds (7%), malaria (7%), liver diseases, skin diseases, rheumatism and tooth ache, ear ache and eye problems (6%), reproductive diseases (5%), kidney disorders (4%), respiratory diseases (2%), tumour (2%) and cholera (1%) [Fig 3]. This is similar with the other observation which has been reported earlier in relation to medicinal plants studies by the Indian Traditional System of Medicine like Siddha and Ayurveda (Anonymous, 1992; Asolkar *et al.* 1992; Gogte, 2000 and Kirtikar and Basu, 2001).

In the present study, *Aegle marmelos* is reported to treat chronic diarrhoea, dysentery, and peptic ulcers. *Aegle marmelos* is also broadly explained in the Vedic text for the treatment of a range of illness. It is customarily used to treat painful-muscle hyper-acid secretion, feeling aflame stomach-discomfort, leprosy, viral-macula, white spot on skin, spermatorrhoea vision defect, psychological dilemma, endocrine sick, jaundice, constipation, chronic dysentery, stomach ache, pyrexia and upper respiratory tract infections. A lot of nutrients were identified in the fruit pulp such as Vitamin-A, Vitamin-B1, Vitamin-C and Riboflavin, Calcium, Phosphorus, Potassium, Iron, Water, Sugar, Protein, Fibre and Lipids.

The plant which were frequently used were *Bacopa monnieri and Phyllanthus emblica* probably because these plants are common species in Vilangad and can be obtained conveniently (Pius *et al.* 2015). The effectiveness and accessibility of the medicinal plants explain why these plants have so many uses. The medicinal uses of these plants are supported by previous publications in the documentation of Ethnomedicinal flowering plants used by Kurumas, Kurichiyas and Paniyas tribes of Wayanad District of Kerala, India (Marjana *et al.*, 2018).

For herbal formulations, leaves (42%) were the most preferred plant part followed by whole plant (19%), root (11%), bark (9%), fruit (8%), flower (7%), stem (2%) and tuber (2%) [Fig 4]. From the data, it could be inferred that for a greater number of remedies, fresh leaves (42%) are used followed by whole plant and root. Informations gathered during this study are in agreement with the previous reports (Pushpangadan and Atal, 1984; Jain, 2001; Ayyanar and Ignacimuthu, 2005; Kala, 2005; Ignacimuthu *et al.*, 2006 and Sandhya *et al.*, 2006). Healers diagnose ailments based on symptoms but sometimes they may also associate it to spirit. Therefore, preparation of medicines and treatment of diseases are sometimes accompanied by rituals.

Among the drug formulations, decoction (47%) were commonly used followed by juice (20%), infusion (11%), paste (11%), tea (6%) and powder (4%) [Fig 5]. Preparations of paste for the treatment of ailments is a common practice among the other tribal people in India (Ignacimuthu *et al.*, 2006) and other parts of the world (Giday *et al*., 2010). Herbal remedies are considered the oldest forms of healthcare known to mankind on this earth. Prior to the progress of modern medicine, the traditional systems of medicine that has evolved over the centuries within various communities, are still maintained as a great traditional knowledge base in herbal medicine (Mukherjee and Wahil *et al*., 2006). Similar results were reported by Marjana *et al*. (2018) in Wayanad District of Kerala, India.

From this study it is easily understood that some plants were used to treat multiple ailments. For example, the plant species *Urena lobata* belonging to the family Malvaceae is used to treat cold, dysentery, malaria and rheumatism. Sometimes, different plants are used to treat a single disease. For example, *Syzygium cuminii* and *Stereospermum colais* are used to treat diabetes. Most of the herbal formulation were prepared from a single plant. Sometimes combination of other parts of the same plant is also used. For example, leaves and flowers of *Datura stramonium* is used for bronchitis and tubers and leaves of *Gloriosa superba* is used for itching throat. Similar remedies has been reported by Latheef *et al*. (2014) for treating cuts and wound by the tribes of Attappady, Kerala.

Tribal practitioners use specific plant parts and dosage in treatment of specific ailments. Plant products are consumed fresh (raw) or made to paste/juice, sometimes it is taken as decoction juice/infusion (oral treatment). Most of the formulations were prepared from fresh leaves, stem and root were preferred and more frequently used when compared to other plant parts. However, in most of the cases, it was recorded that oral consumption (71%) predominates external application. The most important aspect of Kurichiya tribal medicine is that fresh plant material is used in the preparation of medicine and if fresh plant materials are not available, dried plant materials are used alternatively, to circumvent the non-availability of plants (especially annuals), several plants served as complementary alternative source of medicine to cure a single disease. From this study it is clear that Kuruchiyans possess an innate ability to discern plant characters and exploit them to meet their health care needs.

The present survey concludes that the Kurichiyans tribes of Vilangad has detailed knowledge regarding ethno-medicinal plants and their utilization in various simple to critical diseases. The promising ethno-medicinal plants of Vilangad are interesting and provide new medicinal plants for further ethno-pharmacological investigation on them. Such species may be applied in the formation of new medicines after confirmation of their therapeutic value on modern parameters. Recently renewal of interest towards herbal formulations because of their efficiency against different diseases invites instantaneous attention towards herbal protection and conservation of such valuable medicinal plants, otherwise it will be too late. A few medicinal plants such as *Aegle marmelos, Anacardium occidentale, Bacopa monnieri, Gloriosa superba, Mangifera indica, Rauvolfia serpentina* and *Santalum album* need immediate cultivation so that these could be conserved for revenue generation amongst the local people of this region.

Traditional Healthcare System is believed to be very cost effective, easily accessible and highly trusted by the patients who get the services if it is carefully performed by well experienced traditional healers (Ragupathy *et al*. 2009). Just as a medical doctor treats his/her patients psychologically well in addition to other medical services, both the traditional healers and the patients in Vilangad who are going to get conventional medication have a common faith that God has produced the herbs, natural medicines and shared his medical knowledge to the authorized person, the traditional healer, so that they confidentially approaches the herbalist in their locality for getting medication. The healers also believe that God does not reject them to care for their patients when they give the drugs on behalf of him. Such well-gifted people in Vilangad are usually nominated as “Mooppan” and have specially recognized places in all social aspects in the culture and believe of the Vilangad people. They even participate in governance, conflict resolution and related issues in their society. The health problems identified include both infectious diseases (bacterial, viral) and non-infectious diseases (mechanical injuries, allergic reactions and deficiency diseases). Non-infectious diseases (92%) predominates the infectious diseases (8%). Similar results have been reported by Diksha *et al*. (2011) in Andra Pradesh. According to the current study, the majority of the routes of administration of the medicinal plants were internal through oral administration (71%). However, there is no guarantee about the side effects of intaking such type of medicinal plants. There may be high chance of health complications to arise creating both short term and long-term problems on the life of patient. Giday *et al*. (2010), for instance, reported that comparatively less risk of being poisoned by inappropriate use of herbal formulations was external/skin application as compared to the internal/oral applications. The implication was the presence of problems of dosage, standardization, side effects, validity and the susceptibility of delicate body parts of the patient above all (Rajith *et al.*, 2009). The study depicts that local people chose folk medicine due to their socio-economic status, lack of modern healthcare facilities and inadequate transportation. Resource persons were regularly elder people and the younger generation is hesitant to take up Nattuvaithiyam. Therefore, documentation of traditional knowledge is the only way to preserve the knowledge base and to conserve the plant resource endemic to this area.

Therefore, it is significant to study and record the uses of plants used by the different tribes on priority aimed at future investigation for product development. These studies may also afford some clues of natural products to scientists for phytochemical analysis and for any novel molecules or chemicals for treating various ailments. Although results of this study encourage practical uses of medicinal plants and research are required on the pharmacological efficiency of various ethnomedicines used by them.

Table 1: Inventory Of Ethnomedicines In Vilangad, Kozhikode, Kerala

Sl. No.	BINOMIAL	FAMILY	HABIT	ENGLISH NAME	MALAYALAM NAME	TAMIL NAME	USEFUL PARTS	ETHNOMEDICINAL PREPARATION
1	*Achyranthes aspera* L.	Amaranthaceae	Herb	Prickly Chaff-flower	Kadaladi	Naagarkaai Mullu	Leaves	Leaves are made into paste and used against skin diseases. Leaves of *Achyranthes* mixed with honey are used for digestive problems.
2	*Adhatoda vasica* L.	Acanthaceae	Shrub	Malabar nut	Adalodakam	Vasa	Leaves	Decoction of the leaves used to treat cough and other symptoms of colds.
3	*Aegle marmelos* (L.) Correa	Rutaceae	Tree	Bilwa or bae	Koovalam	Bilva	Fruit	Bael fruits are of dietary use. Bael fruits are also used in the treatment of chronic diarrhea, dysentery, and peptic ulcers.
4	*Ageratum conyzoides* L.	Asteraceae	Herb	White weed	Kattappa	Aappakkoti	Leaves	Leaf juice is applied for healing wounds.
5	*Alstonia scholaris* L.	Apocynaceae	Tree	Devil's tree	Ezhilam Pala	Elilai Palau	Leaves	The leaves and latex are applied externally to treat tumors.
6	*Albizia lebbeck* (L.) Benth.	Fabaceae	Tree	Lebbek tree	Kattuvaka	Vaagai, Vellaivenkai	Bark	The bark is astringent and is taken internally to treat diarrhea, dysentery and piles. The bark is used externally to treat boils.
7	*Amaranthus spinosus* L.	Amaranthaceae	Herb	Spiny amaranth	Cherucheera	Mullik keerai	Leaves	Juice made up of tender leaves is used to increase blood count in dengue patients.
8	*Anacardium occidentale* L.	Anacardiaceae	Tree	Cashew nut	Kapamava	Andima	Leaves, Bark, Fruit	Leaf and bark infusion are used in the treatment of tooth-ache and sore gums. Cashew syrup is a good remedy for coughs and colds. Cashew juice is effective for the treatment of syphilis, cholera and kidney troubles.
9	*Andrographis paniculata* (Burm.f.) Nees	Acanthaceae	Herb	Creat	Kiriyathu	Nilavembu	Root	A decoction is made from root and consumed orally to control diabetes.
10	*Artabotrys odoratissimus* R.Br.	Annonaceae	Climber	Jackfruit-champa	Manoranjitham	Manoranjitham	Leaves	Leaf decoction is used to treat cholera.
11	*Bacopa monnieri* (L.) Wettst.	Scrophulariaceae	Herb	Water hyssop	Brahmi	Brahmi	Leaves	The leaves are consumed either directly or by preparing lehyam to enhance memory

12	*Bambusa arundinacea* (Retz.) Willd.	Poaceae	Tree	Bamboo	Mula	Mungil	Bark, leaves	Decoction of bark mixed with honey is used for respiratory disease. Decoction of leaf is used for stimulating menstruation.
13	*Blepharis maderaspatensis* (L.) B. Heyne ex Roth.	Acanthaceae	Herb	Creeping Blepharis	Elumbotti	Elumbu otti	Leaves	Juice extracted from the leaf is heated with gingelly oil and applied on affected places to heal wounds.
14	*Boerhaavia diffusa* L.	Nyctaginaceae	Herb	Spreading Hogweed, Red Hogweed,	Thazhuthama	Mukaratte-Kirai	Leaves	A decoction of the leaves is used to treat jaundice. The leaves are used in a cataplasm for treating indurated liver.
15	*Calotropis gigantea* (L.) Dryand.	Apocynaceae	Shrub	Giant milkweed	Erikku	Erukku	Leaves	An infusion of leaves is used to treat severe chest colds and heart conditions. The leaf juice is used in the treatment of intermittent fever.
16	*Canthium rheedii* DC.	Rubiaceae	Shrub	Narrow leaved canthium	Karamullu	Kuttukkarai	Leaves	Decoction of leaves is used to prevent cancer.
17	*Carallia brachiata* Lour.	Rhizophoraceae	Tree	Freshwater mangrove	Vallabham	Andimiriam	Leaves, Bark	The juice from the macerated leaves is used in the treatment of fever. The pulverized bark is rubbed on the body in the treatment of smallpox.
18	*Catharanthus roseus* (L.) G.DON	Apocynaceae	Herb	Madagascar periwinkle	Savamnari	Nithyakalyani	Leaves	The leaf juice or water decoction of *Catharanthus roseus* L. (Apocynaceae) is used as a folk medicine for the treatment of diabetes.
19	*Centella asiatica* (L.) *Urb.*	Apiaceae	Herb	Indian pennywort	Kudangal	Vallarai	Whole plant	The whole plant is boiled with water which regulates diabetes.
20	*Chrozophora rotteleri* (Geiseler) Mull.Arg.	Euphorbiaceae	Shrub	Rottler's chrozophora	Suryavathi	Purapirakkai	Leaves	A paste is made using leaves, mixed with turmeric, and used for wound healing.
21	*Clitoria ternata* L.	Fabaceae	Herb	Butterfly pea	Sankhupushpam	Kakkanan	Whole plant	Decoction prepared from the whole plant of *Clitoria ternatea* plant is used for rinsing piles.
22	*Coleus amboinicus Lour.*	Lamiaceae	Herb	Indian borage	Panikkurkka	Karpooravalli	Leaves	Leave extract or whole leaf is consumed orally to treat cough.
23	*Crotalaria pallida* Aiton	Fabaceae	Herb	Smooth crotalaria	Kilukkachedi	Kilukiluppai	Whole plant	An infusion of the whole plant is used to bathe children to prevent skin infections. The leaves are used to treat wounds

24	*Datura* stramonium L.	Solanaceae	Shrub	Thorn apple	Ummam	Ummatta	Leaves, flowers, fruit	Decoction of leaves and flowers are used for bronchitis. Paste made up of fruit, flowers and turmeric is applied for any kind of pain or inflammation in the breast.
25	*Duranta erecta* L.	Verbenaceae	Shrub	Angel's whisper	Duranta	Pavazha malli	Fruit	Decoction of fruits is used for treating malaria.
26	*Eclipta alba* (L.) Hassk.	Asteraceae	Herb	False Daisy	Kannunni	Karisalankanni	Whole plant	Decoction of the whole plant is used for the treatment of liver cirrhosis and infective hepatitis.
27	*Eclipta prostrata* (L.) L.	Asteraceae	Herb	False Daisy	Kannunni	Karisalankanni	Whole plant	Decoction of whole plant used for skin diseases
28	*Elephantopus scaber* L.	Asteraceae	Herb	Elephants foot	Anachuvadi	Yaanai chuvadi	Whole plant	The whole plant is grinded along with cumin and mixed with breast milk which is applied on eyes to treat eye wounds.
29	*Evolvulus alsinoides* (L.) L.	Convolvulaceae	Climber	Little Glory	Vishnukranthi	Vishnukranthi	Whole plant	A decoction of the root is used for fever. Whole plant is mixed with milk and ghee and used for infertility.
30	*Ficus hispida* L.f.	Moraceae	Tree	Devil fig	Parakam	Peyatti	Leaves	A juice made from leaves will increase secretion of milk, in lactating women. Mixture of leaf and gum is used for leprosy.
31	*Gloriosa superba L.*	Liliaceae	Climber	Climbing lily	Mendonni	Kalappai kilangu	Tuber, leaves	A paste made using tuber and leaves is applied on the throat for itching in the throat.
32	*Glycosmis pentaphylla* (Retz.) DC.	Rutaceae	Shrub	Orange Berry	Panchi	Kula pannai	Leaves	Adding a handful of leaves to boiling water and taking bath with that water will reduce body pain.
33	*Hibiscus sabdariffa* L.	Malvaceae	Shrub	Roselle	Papuli	Sivappu kkasuru	Flowers	Consumption of tea made using petals daily reduces hypertension.
34	*Holoptelea integrifolia* (Roxb.) Planch	Ulmaceae	Tree	Jungle cork tree	Aval	Ayil pattai	Bark	The bark is boiled and squeezed out and applied for rheumatic swellings
35	*Ichnocarpus frutescens* (L.) W.T. Aiton	Apocynaceae	Climber	Black Creeper	Nannari	Udarkkotti	Whole plant	Decoction of the whole plant is used for cough and dysentery.
36	*Ixora coccinea* L.	Rubiaceae	Shrub	Flame of the wood	Chethi	Sindhuram	Leaves, root	An infusion of the leaves or flowers of several species is administered to treat fever, headache and colic. Roots are applied externally to treat sores and chronic ulcers, and also to treat headache.

37	*Justicia gendarussa* Burm F.	Acanthaceae	Herb	Daun Rusa	Vatham Kolli	Karunochi	Leaves	An infusion of the leaves is taken internally in the treatment of pains in the head, paralysis of one side of the body and facial paralysis. The leaf juice is used in the treatment of earache.
38	*Lantana camara* L.	Verbenaceae	Shrub	Lantana	Aripoo	Unnicceti	Bark, leaves	A decoction of the bark is used as a treatment for fevers. Tea prepared from the Lantana camara leaves and flowers was taken against fever, influenza and stomach-ache.
39	*Leucas lavandulifolia* Sm.	Lamiaceae	Herb	Lavender Leaved Leucas	Thumba	Kadar kumbam	Leaves	The juice of the leaves used in the treatment of malarial fever. A decoction of the leaves is considered a good stomachic and is applied internally and externally to treat colic of children.
40	*Mangifera indica* L.	Anacardiaceae	Tree	Mango tree	Mavu	Maa maram	Leaves	Crushed leaves used as tooth brush which is antibacterial in nature
41	*Maranta arundinacea* L.	Marantaceae	Herb	ArrowRoot	Koova	Aruruttuk Kilangu	Tuber	The powdered tuber is mixed with water and is consumed directly or after cooking to treat diarrhoea.
42	*Melastoma malabathricum* (L.)	Melastomaceae	Shrub	Malabar melastome	Kalathi	Kattalai	Root	The decoction of the roots is used to treat diarrhea.
43	*Mimosa pudica* L.	Fabaceae	Shrub	Shameful Plant	Thottavadi	Thottal Surungi	Leaves	A Paste of the leaves applying to treat wounds and eczema. Leaf paste is also applied externally as a psoriasis cure and fresh leaf juice for impotence and spermatorrhea treatments.
44	*Mussaenda glabrata* L.	Rubiaceae	Shrub	Dhobi Tree	Vellila	Velli Matantai	Leaves	Decoction of white leaves is used for asthma. Paste made using green leaves is used for hair growth
45	*Myristica fragrans* Houtt.	Myristicaceae	Tree	NutMeg	Jathikka	Ati-palam	Fruit	Decoction of the dried fruit is taken orally to aid in digestion
46	*Naregamia alata* white & Arn.	Meliaceae	Shrub	Goanese ipecacuanha	Neelankarai	Nilanarakam	Stem, leaves	decoction of the stem and leaves used for the treatment of biliousness
47	*Ocimum americanum* L.	Lamiaceae	Herb	Hoary Basil	Kattu Thulasi	Nai Thulasi	Leaves	Decoction of leaves is used for coughs.
48	*Ocimum sanctum* L.	Lamiaceae	Herb	Holy Basil	Tulsi	Tulsa	Root, leaves	A decoction prepared from the roots of Tulsi plant is used as a diaphoretic in malarial fever. Decoction of the leaves boiled with powdered cardamom used

								for acute fevers.
49	*Parietaria officinalis* L.	Urticacea	Herb	Upright Pellitory	Akkirakkaram	Akkarakaaram	Whole Plant	The whole plant is administered in the form of infusion as diuretic, cholagogue, emollient, healing and soothing. The herbal tea is recommended against cold, cough, sore throat and rheumatism. The poultice of fresh leaves is applied externally against skin ulcers and inflammations.
50	*Passiflora foetida* L.	Passifloraceae	Climber	Bush Passion Fruit	Poochapalam	Siruppunaikkali	Leaves	Juice of leaves are applied to wounds.
51	*Peperomia pellucida* (L.) Kunth	Piperaceae	Herb	Pepper Elder	Kannadipacha	Thippili	Whole Plant	Whole plant is made into juice and having this daily in empty stomach will prevent kidney disorders
52	*Phaseolus coccineus* L.	Fabaceae	Climber	Runner Bean	Perumpayar	Nilgiri	Root	A root decoction is taken against malaria or applied to swollen eyes.
53	*Phyllanthus emblica* (L.) Kurz	Euphorbiaceae	Tree	Indian GooseBerry	Nelli	Tecomantiram	Fruit	Fruit is dried under the sun and it is made into a powder, washing hair using this powder will prevent hair fall and increase hair growth. A paste made using fruit and honey applied in eyes to cure eye diseases.
54	*Phyllanthus urinaria* L.	Euphorbiaceae	Herb	Chamber Bitter	Chirukizhukanelli	Civappu keelanelli	Fruit	Decoction of fruits is used to treat jaundice, diabetes, malaria, and liver diseases.
55	*Piper longum* L.	Piperaceae	Climber	Long pepper	Tippali	Thippili	Spike	The powdered spike is mixed with honey and taken internally to treat cough, colds.
56	*Pongamia pinnata* L.	Fabaceae	Tree	Indian Beech	Pongum	Aciruntam	Flower	Decoction of flowers is used for blood pressure.
57	*Psidium guajava* L.	Myrtaceae	Tree	Guava	Pera, perakka	Sigappu koyyaa	Leaves	Drinking guava leaves tea in the morning with an empty stomach gives lots of health benefits like promotes weight loss, blood sugar levels control, improves the digestive system, kills bad bacteria in the body and detoxifies our body.
58	*Quisqualis indica* L.	Combretaceae	Climber	Rangoon creeper	Thookuchethi	Irangunmalati	Root	Decoction of the root is used to treat rheumatism
59	*Rauvolfia serpentina* (L.) Benth. ex Kurz	Apocynaceae	Shrub	Indian Snake Root	Aval Pori	Karpakanta	Leaves	The juice of leaves is used to remove opacities of the cornea of the eyes and also treat wounds and itches.

60	*Santalum album L.*	Santalaceae	Tree	Sandal Tree	Chandanam	Sandhanam	Wood	Decoction of the wood may be helpful for indigestion, nephritis and gallstones.
61	*Saraca asoca* (Roxb). Wild.	Fabaceae	Tree	Sorrowless Tree	Asokam	Ashokam	Flower	A paste is made using flowers, rice powder and jaggery, which is used for menstrual problems and it also purifies the blood.
62	*Scoparia dulcis* L.	Plantaginaceae	Herb	Sweet-broom	Kallurukki	Sarakkotthini	Whole Plant	A paste made up of whole plant mixed in tender coconut water and having this daily for 1 week will cure Kidney stones.
63	*Sida acuta* Burm.f.	Malvaceae	Shrub	Broom Grass	Kurunthotti	Ponmukuttai	Whole Plant	Decoction of the whole plant is used for the treatment of fevers.
64	*Sida cordifolia* L.	Malvaceae	Sub shrub	Country Mallow	Ana Kurunthotti	Chittamuttie	Whole Plant	The juice of the whole plant is pounded with water and is a remedy for rheumatism and gonorrhea. An infusion of leaves is used to treat fever.
65	*Stachytarpheta jamaicensis (L.)* Vahl	Verbenaceae	Herb	Blue Snake Weed	Kattupunnuthu	Seemai nayuruvi	Whole Plant	Decoction of the whole plant is used for diabetes.
66	*Stereospermum colais* (Buch. -Ham.ex Dillwyn) Mabb.	Bignoniaceae	Tree	Trumpet flower	Pathiri	Ambu	Whole Plant	Decoction of the whole plant is used for fever.
67	*Synedrella nodiflora* (L.)	Asteraceae	Herb	Cinderella Weed	Mudian pacha	Mudiyan pachchai	Leaves, root	An infusion of young leaves is used as a laxative. Decoction of the pounded and cooked roots is drunk as a cough-mixture
68	*Syzygium cuminii* L.	Myrtaceae	Tree	Balck Plum	Njaval	Naval	Bark	Decoction of bark is used to control diabetes.
69	*Tabernaemontana divaricata* R.Br. ex Roem. & Schult.	Apocynaceae	Shrub	Crape Jasmine	Nandiyar-vattom	Nandiar vattai	Root	A decoction of the root is used in the treatment of diarrhea and various abdominal complaints.
70	Tecoma stans (L.) Juss. ex Kunth	Bignoniaceae	Tree	Yellow Bell	Manja Mooppan	Swarmapatti	Leaves	Tea made using leaves is *used* for treatment of diabetes and digestive problems.
71	*Tinospora cordifolia* Thumb.	Menispermaceae	Climber	Heart-leaved moonseed	Amruthu	Amrithu	Bark	Juice of the bark mixed with honey is used for fever.
72	*Trianthema portulacastrum* L.	Aizoaceae	Herb	Giant Pig Weed	Vallikeera	Sharunnai	Whole Plant	Decoction of the whole plant is used for anemia and stomach diseases.
73	*Triumfetta rhomboidea* Jacq.	Malvaceae	Shrub	Diamond burbark	Ottukayal	Kapatam	Root	A decoction of the root is used as a remedy for internal ulcerations. A decoction of the plant in rice water is used to treat diarrhea and dysentery.
74	*Urena lobata* L.	Malvaceae	Sub shrub	Caesar Weed	Oorpanam	Ottu-t-tutti	Leaves, root	A decoction of leaves and roots is drunk to relieve pains all over the body due to excessive exertion. Decoction of the root is

								used to treat colds, dysentery, malaria, rheumatism.
75	*Vernonia cinerea* (L). Less.	Asteraceae	Herb	Little Iron Weed	Poovamkurunnila	Naichotte poonde	Whole Plant	Decoction of the whole plant is used for blood purification, malaria and eye diseases.

Table 2: Inventory Showing The Number Of Genera And Species For Each Family

Sl. No.	Family	Number of Genera	Number of Species
DICOTYLEDONS			
POLYPETALAE			
1	Aizoaceae	1	1
2	Anacardiaceae	2	2
3	Annonaceae	1	1
4	Apiaceae	1	1
5	Combretaceae	1	1
6	Fabaceae	7	7
7	Malvaceae	5	5
8	Melastomaceae	1	1
9	Meliaceae	1	1
10	Menispermaceae	1	1
11	Myrtaceae	2	2
12	Passifloraceae	1	1
13	Rhizophoraceae	1	1
14	Rutaceae	2	2
GAMOPETALAE			
15	Acanthaceae	4	4
16	Apocyanaceae	6	6
17	Asteraceae	6	6
18	Bignoniaceae	2	2
19	Convolvulaceae	1	1
20	Lamiaceae	4	4
21	Myristicaceae	1	1
22	Plantaginaceae	1	1
23	Rubiaceae	3	3
24	Scrophulariaceae	1	1
25	Solanaceae	1	1
26	Verbenaceae	3	3
MONOCHLAMYDEAE			
27	Amaranthaceae	2	2
28	Euphorbiaceae	3	3
29	Moraceae	1	1
30	Nyctaginaceae	1	1
31	Piperaceae	2	2
32	Santalaceae	1	1
33	Ulmaceae	1	1
34	Urticaceae	1	1
MONOCOTYLEDONS			
35	Liliaceae	1	1
36	Marantaceae	1	1
37	Poaceae	1	1

Figure 1: Family Wise Distribution Of Ethnomedicinal Plants In Vilangad

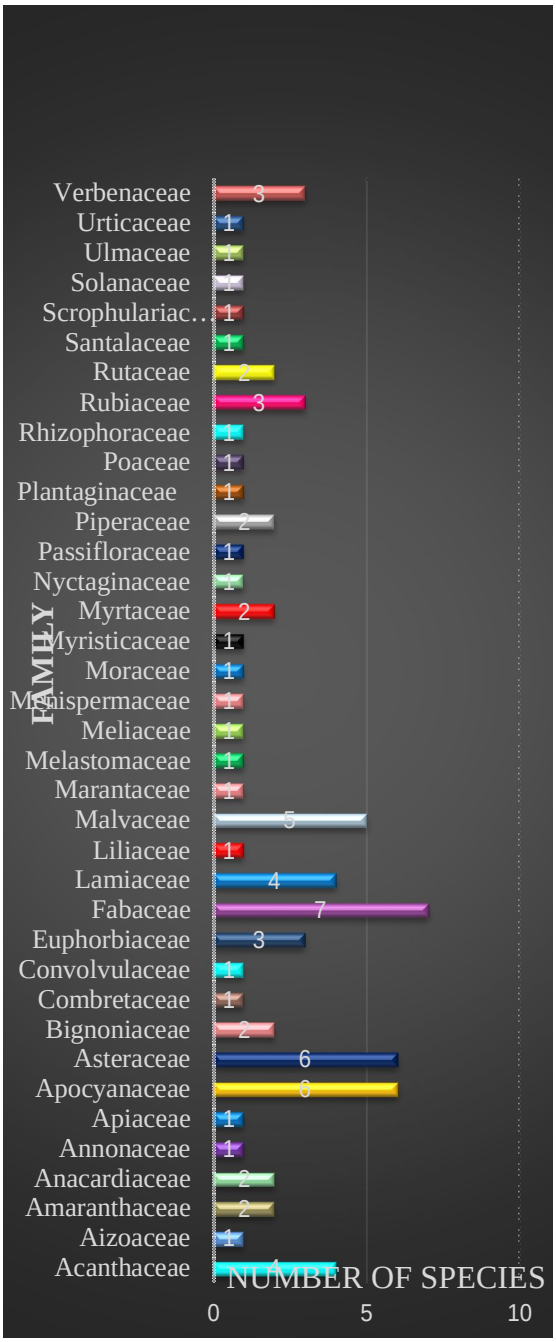


Figure 2: Habit Wise Distribution of Ethnomedicinal Plants in Vilangad

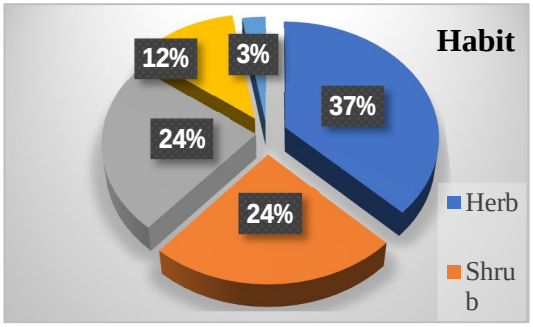


Figure 3: Analysis of Various Diseases Treated in Vilangad

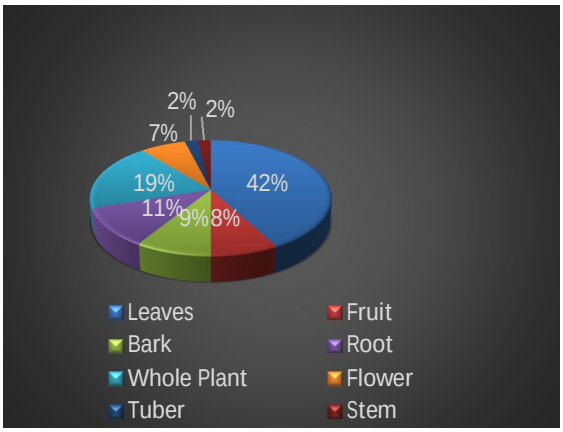


Figure 4: Analysis of Plant Parts Used for the Preparation of Ethnomedicines

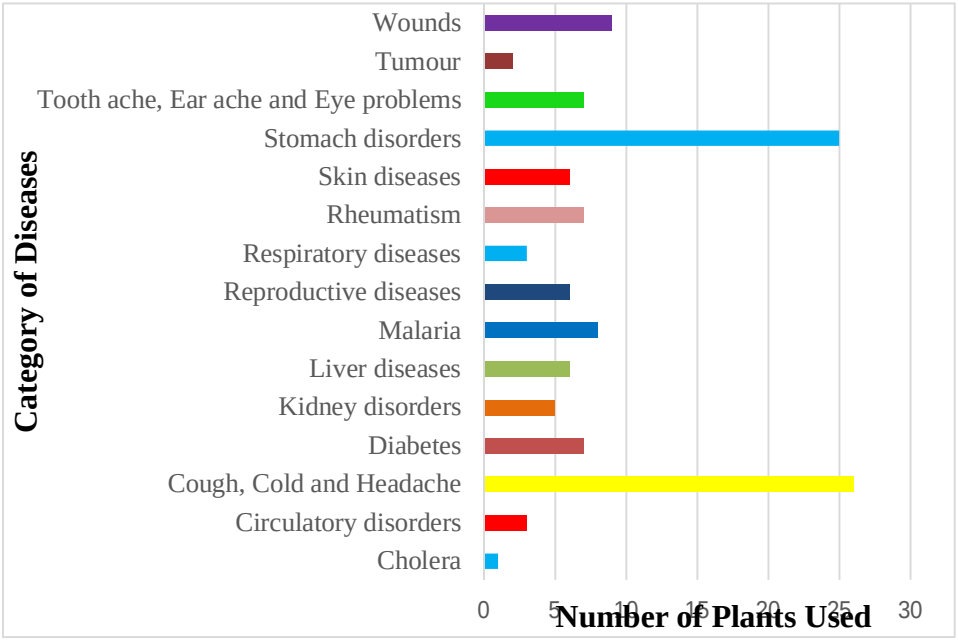
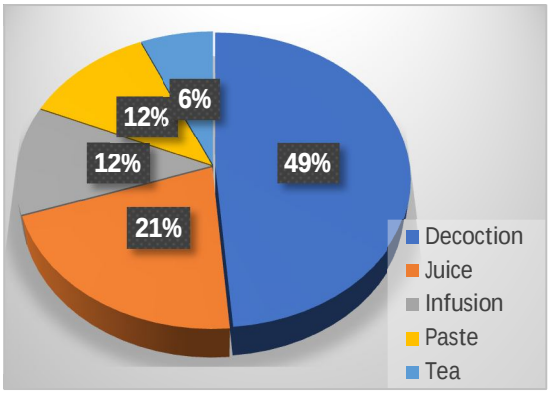


Figure 5: Analysis of Mode of Preparation of Drugs



IV. CONCLUSION

In the present study, it is revealed that the Vilangad village is rich in medicinal plants diversity which are used to treat different ailment categories from simple to complicated diseases. Many studies have been carried out in Kozhikode District but still there are further places which are still waiting for the proper documentation and acceptance in the pharmacological evaluation.

Our natural treasures of these types of hills are booned with herbal medicines which promote health to man. Hence, it is our bound duty to protect and conserve them for the sustenance of biodiversity.

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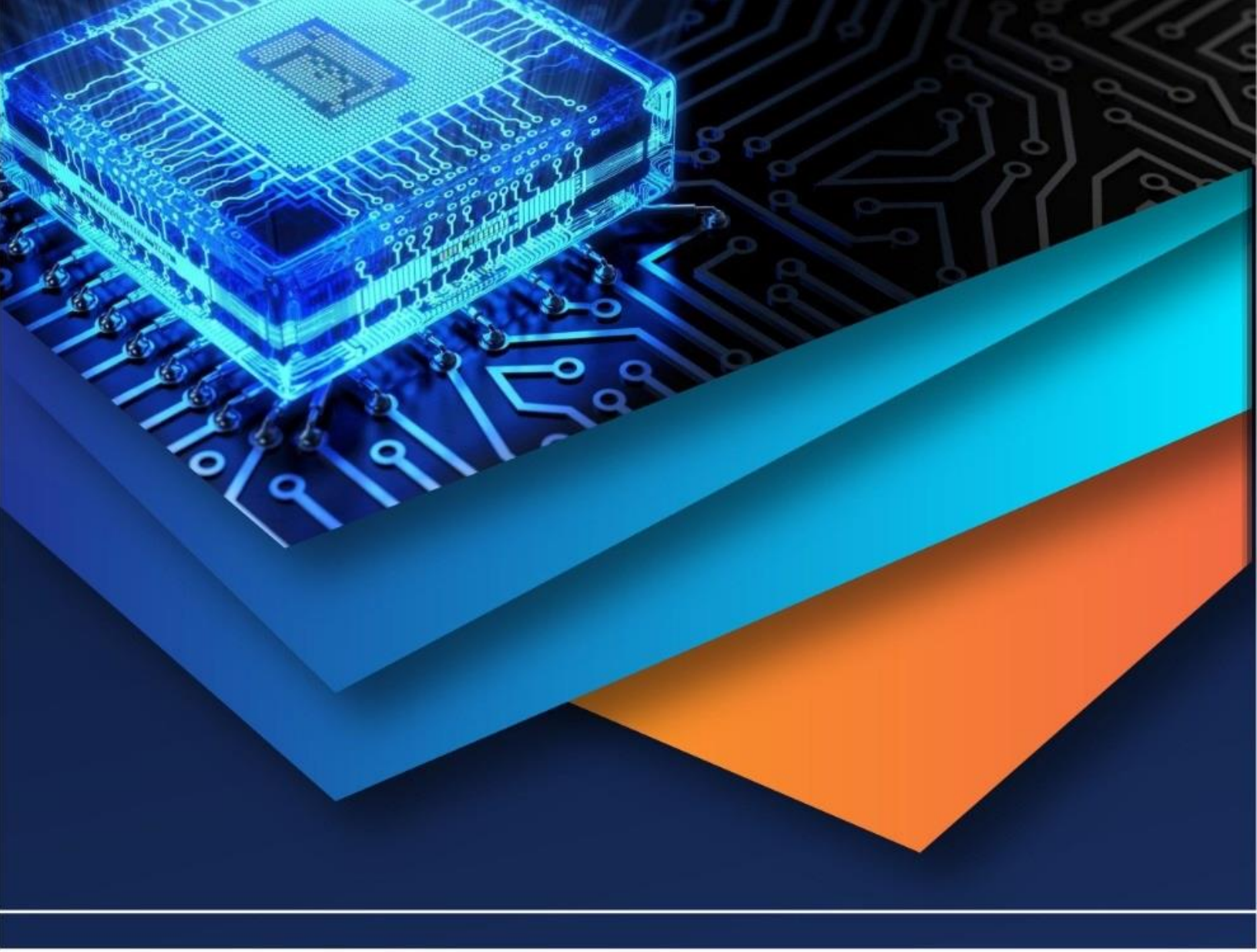

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