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Medicinal Plants Used by Traditional Healers in Vadakku Kalankarai Village, Thoothukudi District, Tamil Nadu, India

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Abstract

This study aimed to collaborate with local traditional healers in Vadakku Kalankarai to document their knowledge of medicinal plants, their uses, and the illnesses they treat. We obtained verbal consent from 32 selected informants, ranging in age from 20 to 85, including 8 men and 24 women. We surveyed and gathered information on 37 medicinal plants in 26 families. The Piperaceae and Malvaceae families had the most species (3 each) used by traditional healers to treat various ailments. The survey includes information on the botanical name, local name (in Tamil), family name, parts of the plant used to treat ailments, and the name of the disease treated by using the medicinal plants. Out of the 37 medicinal plants used, 18 (48.65%) were herbs, 10 (27.03%) were trees, 7 (18.92%) were shrubs, and 2 (5.40%) were climbers. The traditional healers utilised leaves from 15 plants, fruits from 7 plants, seeds from 4 plants, roots, flowers, and whole plants from 3 plants each, and stem, husk fibre and bulb from 1 plant each. The species of medicinal plants, such as *Azadirachta indica* (0.375), *Cynodon dactylon* (0.187), *Phyllanthus amarus* (0.187), *Acalypha indica* (0.156), and *Aloe vera* (0.156), showed the highest use values. These medicinal plants can be incorporated into primary healthcare, as people feel safer with indigenous cures.

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Keywords

Traditional healers, medicinal plants, use values, allopathic medicine.

Introduction

Rural areas lack modern medical facilities and transportation to urban hospitals. Traditional medicine is resurging due to the side effects of allopathic medicine and microbial resistance. Allopathic medicines were discovered through indigenous medicinal practices (Gilani and Rahman, 2005).

Plants have been used in traditional medicine for centuries. Recently, there has been a growing interest in researching medicinal plants and their traditional use.

This knowledge is important for conserving and utilising biological resources. According to WHO, up to 80% of the world's population relies on traditional medicine. In India, 65% of people in rural areas use Ayurveda and medicinal plants for primary healthcare (Anonymous, 1992).

India is a hub of medicinal and aromatic plants. Various religions and communities in India have their traditions, beliefs, and rituals. Rural communities use thousands of plants to create crude drugs to cure different ailments. Most of the rural population in India use these plants, or

their parts found around their locality, as their primary healthcare. The current traditional healers are elderly people, and due to a lack of interest among the younger generation and their tendency to move to cities for better employment opportunities, the vast knowledge in this field is declining (Priyadharshana *et al.*, 2019).

Due to the significant importance of medicinal plants, we have chosen to survey Vadakku Kalankarai village. Until now, no proper botanical survey has been conducted in the area, making this the first report on the medicinal plants utilised by the traditional healers of the village. This study aimed to work with local traditional healers in Vadakku Kalankarai to document their knowledge of medicinal plants, their uses, and the illnesses they treat. Traditional healing practices are still highly valued in this village.

Materials and Methods

Study Area

Vadakku Kalankarai (GPS coordinate: 8°45'20.664N and 78°5'43.116E) is a small village situated in Thoothukudi Block of Thoothukudi District in Tamil Nadu, India. As of the 2021 census, the village's population is 426, comprising 240 males and 186 females. The village falls under the administration of Korampallam Panchayath and is located 7 km from the west of the district headquarters in Thoothukudi. Vadakku Kalankarai is located 621 km away from the state capital Chennai and shares its borders with Thoothukudi Block to the east, Srivaikundam Block to the south, Ottapidaram Block to the north, and Alwarthirunagari Block to the west.

Data Collection

Field trips were conducted between December 2023 and March 2024 to interview traditional healers in a village who had practical knowledge of medicinal plants. Prior verbal consent was obtained from the 32 selected informants, who ranged in age from 20 to 85 and included 8 men and 24 women. These informants were chosen based on their knowledge of medicinal plants, which they either used for self-treatment or to help others. Structured interviews were conducted and responses were recorded in the local language (Tamil), as most of the informants were not formally educated.

The questionnaire was divided into two sections. The first section was designed to collect demographic

information from the participants. The second section aimed to gather details about the local names of the plant species used, the plant parts used, the modes of preparation, and the diseases treated.

The species entries were accompanied by data on their taxonomic position (family) and life form. The life form was classified into four categories, namely herbs, shrubs, climbers, and trees, according to the Indian Biodiversity Portal (Vattakaven *et al.*, 2016).

Plant specimens used in herbal recipes were collected with the aid of respondents and authenticated using their local names and standard text (Gamble and Fischer, 1956; Matthew, 1982; 1983; 1988; Nair and Henry, 1983; Henry *et al.*, 1987; 1989; Sanjappa, 1992). Voucher specimens were collected, processed and deposited at the V.O. Chidambaram College Herbarium in Thoothukudi.

The correctness of scientific names was checked in the database of the International Plant Names Index (IPNI) (<http://www.ipni.org>), Indian Biodiversity Portal (Vattakaven *et al.*, 2016), The Plant List (<http://www.theplantlist.org/>), Plants of the World Online (<http://www.plantsoftheworldonline.org/>) and GRIN Taxonomy site (<http://www.ars-grin.gov/cgi-bin/npgs/html/queries.pl>) while that of families follow A.P.G. system IV (APG IV, 2016).

Quantitative Analysis of Data Use Value

The study utilised the use value index to evaluate the importance of medicinal plants quantitatively (Rossato *et al.*, 1999). It is calculated by the formula.

$$UV = \sum U_i / N$$

Where U_i is the number of users who reported the particular plant and N is the total number of informants interviewed for a given plant species.

Results and Discussion

The table below (Table 1) represents the proportion of informants of Vadakku Kalankarai village categorised by certain socio-economic variables. Among the informants, 25% were males (8) and 75% were females (24). In terms of age, 6.25% (2) were aged between 20-30 years, 12.5% (4) were aged between 30-40 years, 18.75% (6) were aged between 40-50 years, 18.75% (6) were aged between 50-60 years, 18.75% (6) were aged between 60-70 years, and 25% (6) were aged above 70 years. In

terms of education level, 46.87% (15) were uneducated, 18.74% (7) had completed SSLC, 12.5% (4) had completed.

HSC, 12.5% (4) were graduates, and 6.25% (2) were post-graduates. In regards to occupation, 31.25% (10) were coolies, 18.75% (8) were farmers, 9.37% (3) were business people, 18.75% (6) were government employees, and 21.87% (7) were housewives.

Diversity of Traditional Medicinal Plants

We have surveyed to gather information on 37 medicinal plants that were utilised by traditional healers in Vadakku Kalankarai village to treat various ailments. The survey includes information on the botanical name, local name (in Tamil), family name, parts of the plant used to treat ailments, and the name of the disease treated by using the medicinal plants. The plants are sorted alphabetically by their binomial and family names. This information is available in Table 2.

The study covers 37 traditional medicinal plants from 26 families, with the Piperaceae and Malvaceae families having the most species (3 each) (as shown in Table 3). The results of this study are similar to earlier ones conducted on medicinal plant knowledge and practices in Tamil Nadu. A study was conducted by Rajalakshmi *et al.*, (2019) to investigate the usage of medicinal plants by local people in the Thanjavur region and surrounding areas of Tamil Nadu, India. The researchers discovered a total of 85 medicinal plants that belong to 73 families. They also found that the Malvaceae family had the highest number of species, with a total of 5.

Malvaceae species contain a diverse range of chemical components like polysaccharides, coumarins, flavonoids, polyphenols, vitamins, terpenes, and tannins which are primarily present in different plant organs, specifically in flowers and leaves. These compounds are associated with the biological activity of the plant. Generally, Malvaceae species have moderate antimicrobial activity, high anti-inflammatory and wound-healing properties, strong antioxidant activity, and anticancer characteristics (Sharifi-Rad *et al.*, 2020).

In Figure 1 of this study, we can observe the distribution of medicinal plants used by traditional healers of the Vadakku Kalankarai village based on their habits. Out of the 37 medicinal plants used, 18 (48.65%) were herbs, 10 (27.03%) were trees, 7 (18.92%) were shrubs, and 2 (5.40%) were climbers. The traditional healers in

Vadakku Kalankarai mostly use herbs to treat various illnesses of the people.

The previous report has already accounted for the widespread use of herbaceous remedial plants in various parts of the world (Addo-Fordjour *et al.*, 2008; Rajalakshmi *et al.*, 2019; Priyadharshana *et al.*, 2019). Herbaceous plants were known to have a wide range of bioactive molecules (Kadir *et al.*, 2012). Traditional healers, herbal practitioners, and local communities around the world frequently use herbs and trees for medicinal purposes due to their natural availability (Uniyal *et al.*, 2006; Sanz-Biset *et al.*, 2009).

The people of Vadakku Kalankarai were well-versed in the knowledge of medicinal plants and how to use them. They used different parts of various plants to cure a range of ailments. For example, they utilised leaves from 15 plants, fruits from 7 plants, seeds from 4 plants, roots, flowers, and whole plants from 3 plants each, and stem, husk fibre and bulb from 1 plant each (Figure 2). In a study conducted by Rajalakshmi *et al.*, (2019), it was found that leaves were the most commonly used part of medicinal plants, accounting for 66% of usage. These leaves were used either alone or in combination with other plant parts to prepare various medicines. The fruit was the second most commonly used part, accounting for 19% of usage, followed by bark (11%), root and seed (each 10%), rhizome (8%), flowers (6%), latex (3%), whole plant (2%), and stem bark (1%).

The traditional healers of Vadakku Kalankarai village predominantly used leaves of medicinal plants to treat a variety of illnesses. The plant leaves are most commonly used for the preparation of herbal medicine all over the world (Ghorbani, 2005; Boomibalagan *et al.*, 2013). Collecting plant leaves is relatively easier compared to other plant parts such as flowers, fruits, seeds (seasoning available), underground parts (destroy the entire plant life), and bark (damage plant surface tissues).

Leaves are crucial in photosynthesis and are involved in producing metabolites, especially secondary metabolites of phytoconstituents like alkaloids and flavonoids, as per a study by Rajalakshmi *et al.*, (2019). This is consistent with the findings of other botanical researchers (Boomibalagan *et al.*, 2013; Rani *et al.*, 2018).

Leaves are more easily accessible and pose less of a threat to the plant's existence compared to other parts, especially underground parts like tubers, roots, and rhizomes.

Table.1 Proportion of informants by socioeconomic variables

Variable	Category	Number		%
Gender	Male	8		25
	Female	24		75
Age (years)		Male	Female	
	20 - 30	0	2	6.25
	30 - 40	1	3	12.5
	40 - 50	2	4	18.75
	50 - 60	1	5	18.75
	60 - 70	2	4	18.75
	< 70	2	6	25
Education		Male	Female	
	Uneducated	4	11	46.87
	SSLC	2	5	18.74
	HSC	1	3	12.5
	Graduate	1	3	12.5
	Post-Graduate	0	2	6.25
Occupation		Male	Female	
	Coolie	4	6	31.25
	Farmer	2	4	18.75
	Business	1	2	9.37
	Government Staff	1	5	18.75
	Housewife	0	7	21.87

Figure.1 Habit-wise distribution of medicinal plants

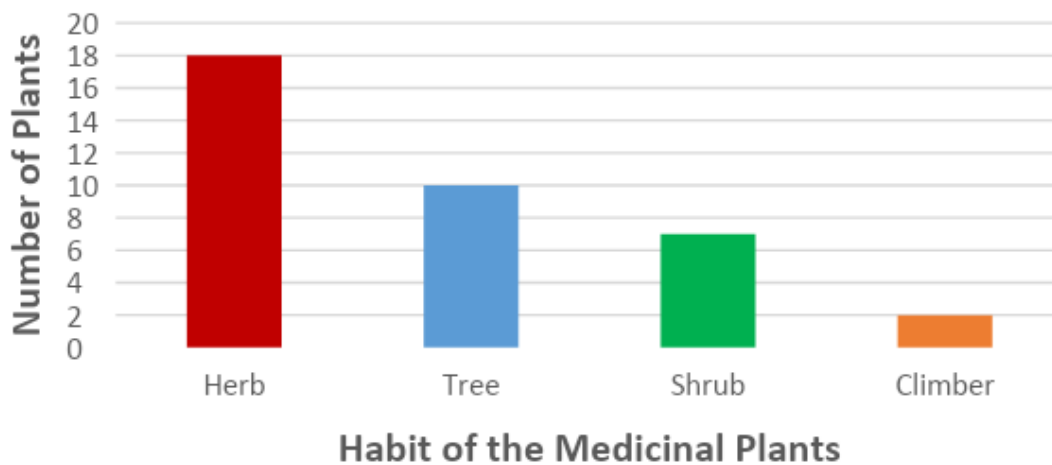


Table.2 Data on medicinal plants used by the traditional healers of Vadakku Kalankari village

S. No	Botanical Name	Family	Local Name	Useful Parts	Habit	Mode of Prepara	Uses	Use Report (out of 32)	Use Value
1	<i>Abutilon indicum</i> L.	Malvaceae	Thuthi	Leaves	Shrub	Decoction	Piles	1	0.031
2	<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppaimeni	Leaves	Herb	Paste	Scabies	5	0.156
3	<i>Allium sativum</i> L.	Lilliaceae	Vellai poondu	Bulbs	Herb	Chewing	Cold	3	0.093
4	<i>Aloe vera</i> (Burm.f.)	Xanthoraceae	Sotrukatalai	Leaves	Herb	Paste	Wounds	5	0.156
5	<i>Andrographis lineata</i> Nees	Acanthaceae	Periyangai	Leaves	Tree	Decoction	Snake Bite	1	0.031
6	<i>Argyrea cuneata</i> Willd. ex Ker-Gawl.	Convolvulaceae	Kanvalipoo	Leaves	Herb	Extract	Body pain	1	0.031
7	<i>Azadirchta indica</i> A. Juss	Meliaceae	Vembu	Leaves	Tree	Extract	Fever	12	0.375
8	<i>Borassus flabellifer</i> L.	Areacaceae	Panaimaram	Root	Tree	Decoction	Diuretic	2	0.062
9	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Mudakathan	Leaves	Climber	Powder	Rheumatoid arthritis	1	0.031
10	<i>Carum capticum</i> L.	Apiaceae	Oamam	Seeds	Herb	Decoction	Cold	3	0.093
11	<i>Citrus limon</i> L.	Rutaceae	Elumichai	Fruit	Tree	Juice	Blood Pressure	4	0.125
12	<i>Cocos nucifera</i> (L.)	Arecaceae	Thennai	Husk fibre	Tree	Extract	Diarrhea	2	0.062
13	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Arugampullu	Leaves	Herb	Juice	Cold	6	0.187
14	<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Thailamaram	Leaves	Tree	Oil	Cough	1	0.031
15	<i>Eugenia caryophyllus</i> L.	Myrtaceae	Kiraambu	Flower Buds	Tree	Chewing	Dental pain	3	0.093
16	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Amman Pacharisi	Whole Plant	Herb	Powder	Asthma	2	0.062
17	<i>Hemidesmus indicus</i> (L.)	Apocynaceae	Nannaari	Roots	Herb	Juice	Urinary tract Infection	3	0.093
18	<i>Hibiscus rosasinnensis</i> L.	Malvaceae	Sembaruthi	Flower	Herb	Brewing	Cough	4	0.125
19	<i>Hibiscus sabdariffal</i> L.	Malvaceae	Pulichai Keerai	Leaves	Herb	Chewing	Cough	1	0.031

20	<i>Justicioa adhatoda</i> L.	Acanthaceae	Aadathodai	Leaves	Shrub	Decoction	Cough	5	0.156
21	<i>Lawsonia inermis</i> L.	Lythraceae	Maruthaani	Leaves	Shrub	Paste	Hair growth	5	0.156
22	<i>Luffa acutangula</i> (L.)	Cucurbitaceae	Peerkangai	Fruit	Climber	Juice	Cold	1	0.031
23	<i>Manilkkara zapota</i> (L.) P. Royen	Sapotaceae	Sapota	Fruit	Tree	Juice	Fever	2	0.062
24	<i>Muntingia calabura</i> L.	Muntingiaceae	Then Pazham	Leaves	Tree	Juice	headaches	1	0.031
25	<i>Murraya koenigi</i> (L.) Spreng	Rutaceae	Karuveppilai	Leaves	Shrub	Paste	Hair growth	4	0.125
26	<i>Musa paradisiaca</i> L.	Musaceae	Vaalai	Stem	Herb	Brewing	Cholesterol	3	0.093
				Fruit		Chewing	Diabetes	1	0.031
				Flower		Decoction	Kidney	2	0.062
27	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Jathikai	Fruit	Tree	Powder	Stimulant	1	0.031
28	<i>Nelumbo nuciefera</i> Gaertn	Nelumbonaceae	Thamarai	Flower	Shrub	Powder	Diarrhea	1	0.031
29	<i>Papaver somniferum</i> L.	Papaveraceae	Ghasa-Ghasa	Seeds	Herb	Powder	Digestion	2	0.062
30	<i>Phaseolus vulgaris</i> L.	Fabaceae	Beans	Seeds	Climber	Decoction	Kidney	1	0.031
31	<i>Phyllanthus amarus</i> Schumach & Thonn.	Phyllanthaceae	Keelanelli	Whole Plant	Herb	Decoction	Jaundice	6	0.187
32	<i>Piper betle</i> L.	Piperaceae	Vettilai	Leaves	Habit	Chewing	Insect Bite	3	0.093
33	<i>Piper cubeba</i> L.f.	Piperaceae	Thippili	Fruit	Herb	Decoction	Fever	2	0.062
34	<i>Piper nigrum</i>	Piperaceae	Milagu	Fruit	Shrub	Powder	Digestion	4	0.125
35	<i>Polygala chinensis</i> L.	Polygalaceae	Siriyangai	Root	Herb	Paste	Cough	1	0.031
36	<i>Pseudarthra viscida</i> (L.)	Fabaceae	Neermulli	Whole Plant	Shrub	Powder	Asthma	1	0.031
37	<i>Zea mays</i> L.	Poaceae	Makka Solam	Seeds	Herb	Powder	Anaemia	2	0.062

Table.3 Families with the number of genera and species.

Sl. No	Family	No of Genus	No of Species
1.	Musaceae	1	1
2.	Rutaceae	2	2
3.	Lythraceae	1	1
4.	Acanthaceae	2	2
5.	Xanthorrhoeaceae	1	1
6.	Myrtaceae	2	2
7.	Liliaceae	1	1
8.	Meliaceae	1	1
9.	Piperaceae	1	3
10.	Euphorbiaceae	2	2
11.	Papaveraceae	1	1
12.	Malvaceae	2	3
13.	Myristicaceae	1	1
14.	Nelumbonaceae	1	1
15.	Sapindaceae	1	1
16.	Apiaceae	1	1
17.	Poaceae	2	2
18.	Arecaceae	2	2
19.	Polygolaceae	1	1
20.	Fabaceae	2	2
21.	Convolvulaceae	1	1
22.	Cucurbitaceae	1	1
23.	Sapotaceae	1	1
24.	Apocynaceae	1	1
25.	Muntingiaceae	1	1
26.	Phyllanthaceae	1	1

Figure.2 Plant parts used for the preparation of medicine

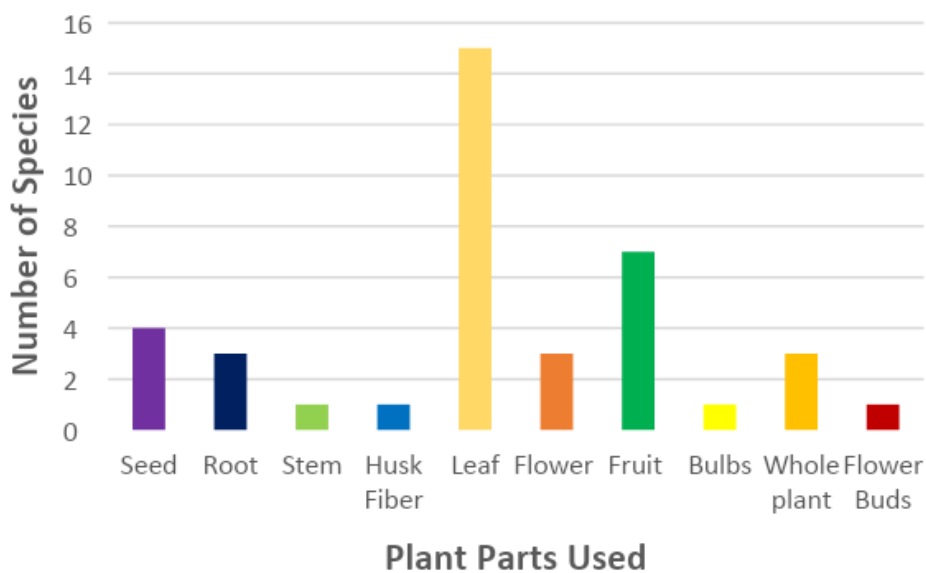
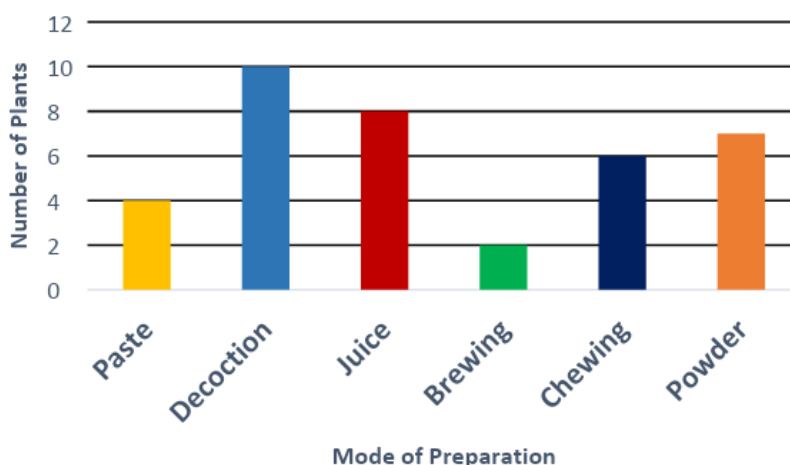


Figure.3 The method of preparation

Collecting underground parts or the whole plant can have a critical impact on the species from both ecological and survival perspectives as they are active in photosynthesis and the production of metabolites (Dawit and Ahadu, 1993; Ghorbani, 2005). Leaves remain green and available for most months of the year and fresh parts were commonly used for medicine preparation. When fresh parts are not available, dried parts are also used.

The process of preparing and administering herbal remedies can be grouped into six different classes. Based on the information provided, the most common method of preparing plant remedies is through decoction, which accounts for 27.03% of the processes, followed by juice (21.62%), powder (18.92%), chewing (16.22%), paste (10.81%), and brewing (5.40%). According to the informants, the traditional healers of the villages mostly use decoction as a common system for treating ailments and disorders. This information is supported by the studies conducted by Priyadharshana *et al.*, (2019) and Girija *et al.*, (2021).

Quantitative Analysis

Quantitative analyses, such as use value, were computed from the ethnobotanical documentation in this study. The species of medicinal plants, like *Azadirachta indica* (0.375), *Cynodon dactylon* (0.187), *Phyllanthus amarus* (0.187), *Acalypha indica* (0.156), and *Aloe vera* (0.156), showed the highest use values (as noted in Table 1). In a quantitative ethnobotanical analysis, *Solanum trilobatum* (0.95), *Thespesia populnea* (0.94), and *Cissus quadrangularis* (0.91) were found to have high-use values (Rajalakshmi *et al.*, 2019).

Conclusion

The study found that the traditional healers in Vadakku Kalankarai utilised a variety of plant parts, and certain medicinal plants showed higher use values. The use of plant materials in traditional medicine can significantly benefit general healthcare, and these medicinal plants can be incorporated into primary healthcare due to their perceived safety and lower cost compared to modern drugs.

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Declarations

Ethical Approval

Not applicable.

Consent to Participate

Not applicable.

Consent to Publish

Not applicable.

Conflict of Interest

The authors have no competing interests to declare.

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