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Indigenous medicinal plants of the Kani tribes in Kanyakumari District: Ethnobotanical documentation and quantitative study

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The investigation identified 120 species distributed in 54 families. 70 plants of ethnomedicinal importance were identified, which have not yet been reported so far from the Kanyakumari wildlife forest of Southern-Western Ghats. 52 participants were approached three times to verify the information provided by twenty informants. This approach was undertaken to ensure the accuracy and reliability of the data collected. The data quality was ensured by selecting well-trained 20 practitioners for pointing out missing information if any and the data is carefully analyzed. In total, 120 Medicinal plant species of which Dicot plants constitute 116 species (96.7%) and monocot plant constitutes 4 species (3.3%). Fabaceae with 12 (10.00%) was the most commonly reported family of medicinal plant species. The habit-wise study revealed that 40 species (33.33%) were trees, followed by the most widely used life types herb (36 species) (30%). The most popular preparation method for treating the ailment was paste (40 preparations) for internal consumption as well as external application. The documents valuable therapeutic knowledge, which opens up possibilities for future exploration in plant-based compounds and pharmaceutical inquiry. These investigations have the potential to contribute to the development of plant-based nanomedicine, drug discovery, and production. Finally, the paper deals with the combination of socio-economic and legal facets of the interaction between tribals and forests.

Keywords: Ethnobotany, Kanyakumari, Kani tribes, Species, Informants, Quantitative study

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The forest reserves of India have deep historical roots and played an important role throughout the country's development. The establishment of these reservations serves the purpose of safeguarding forests, preserving biodiversity, and promoting the sustainable utilization of resources. India is also host to a significant autochthonous populace, commonly referred to as Scheduled Tribes or Adivasis. Based on the data from the 2011 census, the tribal population in the nation was recorded at 10.45 crore (104.5 million), accounting for approximately 8.08% of the overall population[1]. Approximately 87% of the Scheduled Tribes population is concentrated in the central region, encompassing states such as Madhya Pradesh, Odisha, Bihar, Maharashtra, Gujarat, Rajasthan, and Andhra Pradesh. A further 3% of the tribal population is dispersed throughout various states, primarily concentrated in the northeastern region of India[2] (Ministry of Tribal Affairs., 2021). The Indigenous communities possess enduring affiliations with the forests, heavily depending on them for sustenance and the preservation of their cultural traditions[3]. The Indian government has undertaken initiatives to acknowledge and safeguard the rights of forest-dwelling communities, including indigenous populations, through the implementation of legislative measures such as the Forest Rights Act of 2006[4].

The majority of India's Scheduled Tribes are concentrated in Madhya Pradesh, which has a population of around 1.54 million. Tribal communities exhibit a profound respect for the natural environment, perceiving it as a sacred sanctuary and

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assuming the duty of protecting it against potential hazards. Regrettably, the communities in question have encountered instances of oppression and marginalization from prevailing sectors of society, as documented by Williams (2006)[5]. To tackle these concerns, it is imperative to establish a clear definition of tribal sovereignty and implement legislative measures that safeguard the rights of indigenous communities. The recognition and respect for the rights of tribal peoples not only serve to uphold their dignity but also presents an effective and economically efficient strategy for the conservation of areas with high biodiversity[6].

The field of ethno-medico botany has experienced a surge in attention and activity over the past few decades, primarily driven by various factors. A notable determinant pertains to the increasing recognition of the consequences of coerced displacement and cultural assimilation on indigenous populations[7]. The aforementioned processes frequently result in the disruption of conventional healthcare systems, thereby generating an increased inclination toward the preservation and documentation of indigenous health knowledge *via* ethno-medico botanical investigations[8]. Through the comprehension and conservation of these customary practices, researchers possess the ability to make a valuable contribution towards safeguarding cultural identities and fostering healthcare approaches that are more inclusive in nature[9].

The investigation of traditional knowledge within the field of ethno-medico botany has provided significant findings about traditional methods of sustenance, medicinal knowledge, and associated customs. The aforementioned studies have contributed valuable insights into the utilization of medicinal plants by indigenous populations to address a range of health conditions[10].

The utilization of herbal medicine has experienced a surge in worldwide recognition, as evidenced by the growing interest and active engagement of individuals in its practice[11]. The field of ethnobotanical studies, which centers on the traditional knowledge pertaining to medicinal plants, has garnered significant attention, particularly within developing nations. The aforementioned studies offer an avenue for the examination and recording of indigenous knowledge, thereby enhancing comprehension and conservation of traditional healthcare methodologies[12].

The WHO acknowledges the significant importance of traditional medicinal plants in the provision of primary healthcare and the management of diseases. In line with WHO (2019)[10], a significant proportion of the worldwide populace, potentially reaching 80%, depends on conventional medicine as their primary source of healthcare, frequently incorporating traditional medicinal approaches. The utilization and manufacture of autochthonous pharmaceuticals derived from medicinal flora not only make a significant contribution to the field of healthcare but also yield economic advantages[70]. According to previous studies conducted by, Choudhury *et al*.[13] and Kadhirvel *et al*.[14], these botanical species possess promising therapeutic properties that could be explored for the management of diverse ailments and medical conditions.

India is home to a significant tribal population, comprising more than 53 million individuals residing in 550 villages, and encompassing 227 distinct ethnic groups[15]. According to Ramachandrana *et al.*[16], these communities frequently reside in settlements situated in forested areas or adopt nomadic lifestyles within forest environments, thereby preserving their distinct social and cultural identities. The Kani tribe, situated in the southernmost area of the Western Ghats along the boundary between Kerala and Tamil Nadu, exhibits a profound understanding of herbal medicine as a means of treating a diverse array of ailments[17].

In essence, the discipline of ethno-medico botany assumes a pivotal function in comprehending and safeguarding the ancestral wisdom about the utilization of medicinal flora by indigenous populations[35]. The burgeoning interest in this particular domain has been driven by a multitude of factors, encompassing the acknowledgment of diverse cultural identities, the pursuit of novel medical treatments, and the imperative to meticulously record traditional customs and practices[18]. The utilization of ethnomedical practices and the incorporation of medicinal plants remain pertinent in the realm of primary healthcare and the management of diseases. Tribal communities in India, such as the Kani tribe, possess significant expertise in the field of herbal medicine[19].

Methods

Study area and informants

The forests in the Kanyakumari district of Tamil Nadu are located at the southernmost tip of the Western Ghats, covering approximately 3500 square kilometers. The geographical coordinates of their location fall

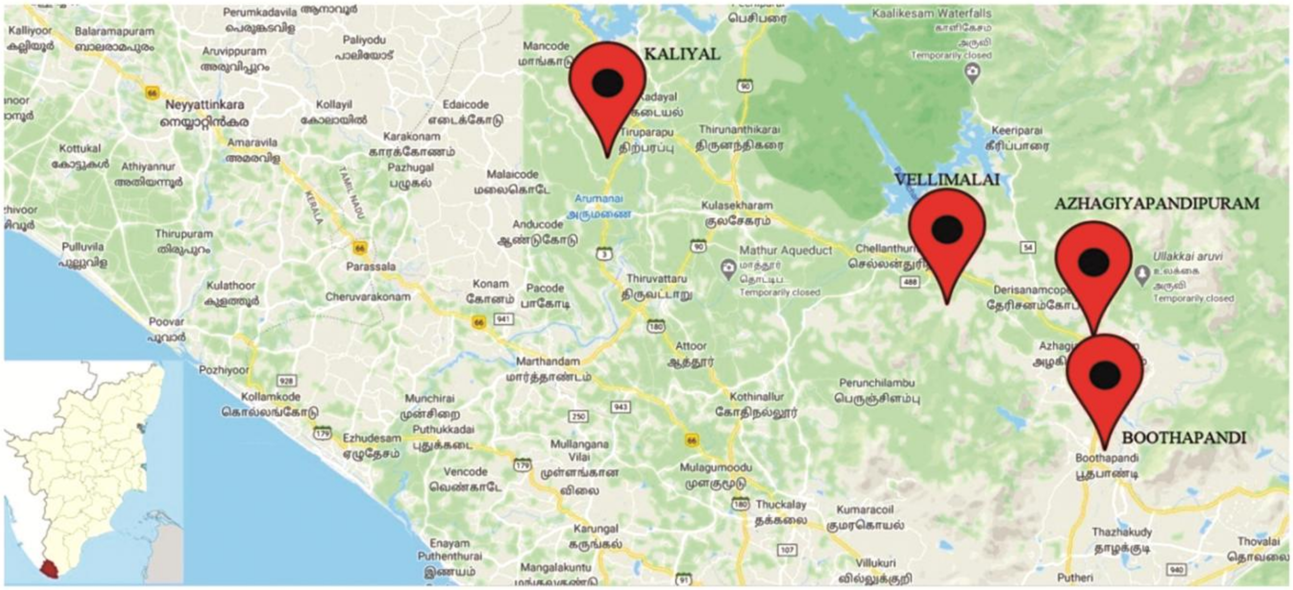

Fig. 1 — Map of the Study area, Kanyakumari Wildlife Forest

within the longitudes of 77°15' and 77°36' E, and the latitudes of 8°03' and 8°35' N (Fig. 1). The forest ranges encompassing the region consist of Azhagiyapandipuram, Boothapandi, Kaliyal range, Kulasekaram, and Vellimalai. The forests in question exhibit a wide array of plant life and span a range of altitudes, from 50 to 1868 meters. Prominent elevations found in the area encompass Kodayaru (1100 m), Thadagamalai (1300 m), Keeriparai (1450 m), Olakaiaruvi (1640 m), and Vanathiparai (1750 m). A series of medico-ethnobotanical surveys were undertaken in various settlements located within the Kanyakumari district, encompassing Aralvaimozhi, Kalikesam, Keeriparai, Kiliviyaru, Kodithurai, Maramalai, Marunthuvalmalai, Olakaiaruvi, Vanathiparai, and Veerapuli. The surveys encompassed a sample size of twenty informants, who were chosen through a selection process that took into account their gender, indigenous knowledge of medicinal plants, and prior informed consent was obtained from all the informants before conducting the study.

Ethno-medico botanical survey

Jain's (1981)[20] approach guided an ethno-medicobotanical study among the Kani tribes. It involved structured interviews with tribal members, using a questionnaire to document their medicinal plant knowledge comprehensively. Data included plant therapeutic properties, indigenous names, botanical components, preparation methods, administration, dosage, and application. Rigorous data documentation and cross-validation with ethnobotanical literature ensured accuracy. Additionally, credibility was established through recurrent interviews and discussions with indigenous sources. This meticulous approach ensured the reliable documentation of Kani tribe's ethno-medicobotanical knowledge.

Collection and identification of plants

To catalog Kani tribe's medicinal plants, various botanical sources, including www.theplantlist.org and www.IPNI.org, were consulted. Herbarium specimens, collected following, standardized methods, were documented and stored at Guru Nanak College's Plant Biology and Plant Biotechnology department in Chennai. This reference collection ensures the accuracy of documented plant species for future research.

Quantitative analysis

The Use value (UV), Informant consensus factor (ICF), Fidelity level (FL), Disease-consensus index (DCI), Relative popularity level (RP+L), and Rank order priority (ROP) were used to evaluate ethno-medicobotanical data. Finally, the results are visualized using graphs and charts.

Use value (UV)

The use value (UV) is a metric employed to assess the relative importance of a plant species in traditional medicine, based on its various applications. The UV is determined by aggregating the usage citations (U) from all informants for a specific plant species and dividing it by the total number of informants (ns).

The formula for calculating the usage value (UVc) is as follows:

UVc = ΣU / ns

In this equation, ns is the total number of informants who gave data on the plant, and U is the total number of use citations for a particular plant species.

This calculation aids in identifying frequently mentioned and utilized plants by informants, indicating their significance and popularity in the traditional medicinal practices of the Kani tribes. Greater usage values indicate that a specific plant species is extensively acknowledged and employed for diverse medicinal applications[21].

Informant consensus factor (ICF)

ICF is a metric used to gauge how well informants agree on the traditional use of certain plant species for various diseases. The ICF aids in determining the consensus among informants as well as the ethnobotanical relevance of the plant species that have been gathered.

The informant consensus factor (ICF) is calculated using the following formula:

ICF = (Nt - Nur) / (Nur - 1)

The ICF formula assesses consensus among informants about plant usage for specific illnesses. Higher ICF scores indicate greater agreement, highlighting the cultural relevance and reliability of traditional knowledge. Lower scores suggest informants' differences, possibly due to local variations in customs and expertise[22].

Fidelity level (FL)

The fidelity level (FL) is a metric employed to evaluate the proportion of individuals who report utilizing a particular plant species for a consistent primary purpose or primary rationale. This aids in assessing the level of agreement among informants regarding the utilization of plants for a specific medicinal purpose.

The formula used to determine the fidelity level (FL) is as follows:

FL = (Np / N) x 100

The FL (Fidelity Level) calculation assesses consensus among informants regarding a specific plant's usage for an ailment. A higher FL indicates strong agreement, signifying robust traditional knowledge and uniform use of the plant for medicinal purposes. A lower FL suggests informants have less consensus, indicating diversity in plant usage or alternative treatments within the community[23].

Disease consensus index (DCI)

DCI is a computational method employed to identify the predominant plant species utilized in the treatment of a particular chronic ailment. This method aids in identifying plant species with a significant level of agreement among informants regarding their efficacy in treating a specific disease.

The formula for calculating the DCI is as follows:

$$DCI = \left\{ \sum_{i=1}^{\infty} \left(\frac{Vxi}{Cc} \right) \text{ mVx} \right\} Pm^{-0.1}$$

The DCI formula assesses plant knowledge, mentions, and informants' consensus regarding plant efficacy in treating a disease. It uses variables like x (plant species), Vxi (sum of values for that species), mVx (mean of individual values), Cc (correlation coefficient), and Pm (number of individuals consulted). DCI values range from 0.01 to 1, with higher values indicating stronger consensus on plant use for a specific disease[23].

Relative popularity level (RPL)

In medicinal plant research, the total number of diseases treated by a specific plant is recorded based on informants' reports. This information reflects the plant's adaptability and healing potential, showcasing its versatility in addressing various ailments. By counting the number of illnesses associated with each medicinal plant, its perceived value increases as it demonstrates a broad range of applications. The Fidelity Level (FL) is adjusted using this data, considering both widely accepted and debated herbs. A corrective scale assigns a score between 0 and 1, indicating a plant's popularity for a specific disease among informants. This method helps assess a plant's significance and acceptance for specific conditions within a demographic[24].

Rank order priority (ROP)

The ROP method is an effective approach that takes into account both the relative popularity (RP) and the fidelity degree (FL) values to accurately rank plant species.

As you said, the following formula may be used to determine the Rank Order Priority (ROP):

ROP = FL × RP

Where, FL stands for "Fidelity Level," which calculates the proportion of informants who say they use a certain plant primarily for that purpose.

Relative Popularity, or RP, is calculated by dividing a species' citation frequency by the frequency of the species on the list that receives the most citations. The Rank Order Priority calculates a combination score that takes into account a plant's traditional importance (based on FL) and popularity (based on RP) by multiplying the FL and RP values together. Based on the ethno-medicobotanical information gathered, aids in assessing the significance and priority of a particular plant species in traditional medical practices[25].

Results and Discussion

The (Supplementary Table S1) contains information about the plant species, their local names, the specific maladies they are used to treat, the plant parts used, the preparation methods, modes of administration, dosages, and the number of informants who mentioned each plant for a specific ailment. This information offers important new perspectives on the indigenous tribes' traditional beliefs, ways of life, and usage of medicinal plants in healthcare.

Medico-ethnobotanical documentation

Taxonomy and plant life form

This study documented a total of 120 medico-ethnobotanical plant taxa, spanning 54 families, 109 genera, and 120 species. Dicots constituted the majority, comprising 96.7% of the plants, while monocots represented only 3.3%. The Fabaceae family was the most dominant, with 12 species (10%), followed by Mimosaceae and Solanaceae, each with 6 species (5%). Notably, Solanum genus prevalence aligned with previous research. Other families like Apocynaceae, Caesalpiniaceae, Euphorbiaceae, and Rutaceae each had five species (4.17%). Families like Asteraceae and Cucurbitaceae had four species each (3.33%). Several families had three species (2.50%), and nine families had two species (1.67%). Twenty-nine families were represented by a single species (0.8%). *Solanum* L. was the most prevalent genus (3.33%), followed by *Acacia* Mart., *Senna* Mill., and *Terminalia* L., each with four species (2.5%). Most other genera were represented by a single species (0.8%). Regarding life forms, trees were predominant (33.33%), followed by herbs (30%), shrubs (25.83%), climbing herbs (10%), and climbing shrubs (08.3%) (Fig. 2). This extensive range of medico-ethnobotanical plants holds significant potential for traditional medicine[28]. It emphasizes the importance of preserving and documenting indigenous knowledge associated with these resources. Further research into their medicinal attributes can contribute to novel therapeutic interventions and healthcare alternatives (Supplementary Table S2).

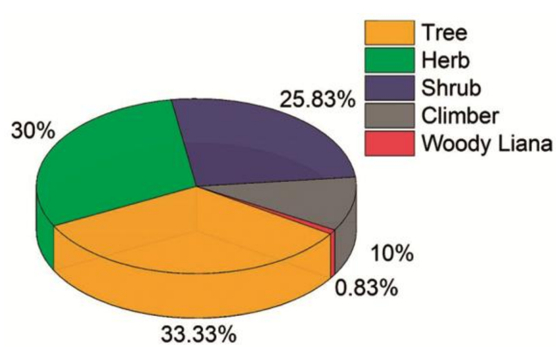

Fig. 2 — Habit wise classification of plants

Plant parts used, mode of preparation, and mode of administration

The use of different plants in traditional medical practices provides valuable insights into the healing techniques that are utilized within a particular culture. The findings of this study indicate that leaves were the predominant plant part utilized, constituting 42.22% of the overall usage of medicinal plants (Fig. 3). The present discovery aligns with prior investigations that have emphasized the importance of leaves in the realm of traditional medicine[29]. Leaves are recognized for their diverse range of bioactive compounds, including alkaloids, flavonoids, and phenolics, which are responsible for their medicinal attributes. The plant parts used in this study were categorized as stems, fruits, whole plant parts, seeds, flowers, stem bark, latex, roots, root bark, and gum and rhizomes. Stems accounted for 4.53% of the plant parts used, followed by fruits (11.3%), whole plant parts (9.05%), seeds (7.54%), flowers (6.79%), stem bark (6.03%), latex (5.27%), roots (3.77%), root bark (0.49%), and gum and rhizomes (1.51%) (Fig. 3). The

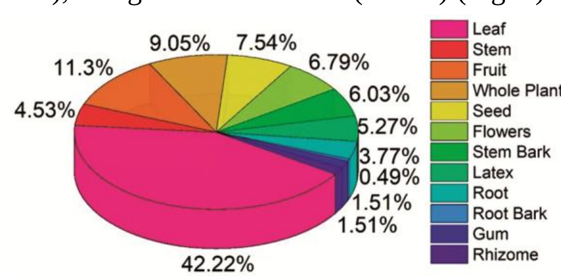

Fig. 3 — Percentage of Plant parts used

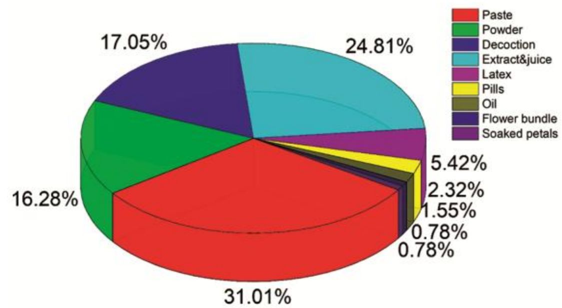

Fig. 4 — Form of preparation

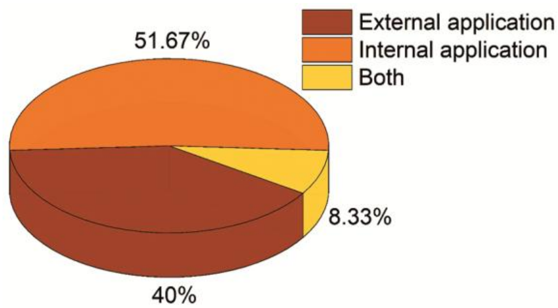

Fig. 5 — Mode of application

results of this study are consistent with prior research conducted in comparable geographical areas, which have likewise documented the use of these botanical components for therapeutic intentions. Every component of a plant exhibits distinct phytochemical compositions that contribute to their therapeutic capabilities. In terms of the mode of preparation, it was observed that paste was the predominant method, constituting 31.01% of the recorded preparations (Fig. 4). Subsequently, the subsequent methods employed were powder (16.28%), decoction (17.05%), extract and juice (24.81%), latex (5.42%), pills (2.32%), oil (1.55%), and flower bundle and soaked petals (0.78%). The results presented in this study align with the various preparation techniques utilized in traditional medicine, as reported by Manzoor *et al.*[30]. Every method of preparation has unique benefits in terms of extracting and concentrating the bioactive compounds from the plant materials. Regarding administration, internal use was found to be the prevailing mode, constituting 51.67% of the documented occurrences. This suggests that traditional healers and local communities predominantly depend on the consumption of medicinal plant preparations as a means of treating diverse ailments. The process of internal administration facilitates the systematic dissemination of bioactive compounds throughout the body, resulting in their therapeutic effects[31]. It is worth noting that 40% of the applications were related to internal administration, while 8.33% made use of both internal and external modes (Fig. 5). The results of this study align with previous scholarly articles that have documented comparable patterns in the utilization of different plant parts, methods of preparation, and modes of administration in ethno medicinal traditions[32].

Quantitative analysis

***Informant consensus factors* (*ICF*)**

The study categorized various afflictions into 24 distinct groups and assessed the level of agreement among informants using the Informant Consensus Factor (ICF) values, which ranged from 0 to 1. Higher ICF values indicated a greater consensus among informants regarding the use of specific medicinal plants for particular conditions. Notably, ailments like dengue fever, menstrual disorders, excessive bleeding, stomach pain, and indigestion scored the highest with a perfect ICF value of 1, suggesting a strong consensus in their treatment approaches. Several other conditions also exhibited high ICF values, such as ulcer, delivery pain, eye pain, venereal disease, headache, joint pain, liver disease, and impotence[35]. The study's findings were consistent with prior research, highlighting elevated ICF values for fever and other prevalent illnesses. The high ICF values for menstrual disturbances, prolonged bleeding, gastrointestinal disorders, and other discomforts in the study region indicated their significant prevalence, aligning with previous studies. Moreover, the study revealed that medicinal plant use for gastrointestinal disorders was more widespread than for dermatological conditions (Supplementary Table S3). The International Classification of Functioning, Disability, and Health (ICF) levels varied across different types of illnesses, with the lowest observed for nervous disorders and the highest for gastrointestinal diseases[36]. Additionally, the presence or absence of specific plant species within the study area could impact the calculated values of the Index of Cultural Significance (ICF). The inclusion of multiple informant consensus variables in the research enhanced information sharing among participants, leading to greater uniformity in knowledge and experience.

***Use value* (*UV*)**

UV scores for medicinal plants serve as indicators of their importance, aiding in their identification and potential development for herbal medication therapeutic systems through phytochemical and pharmacological research. However, it's crucial to recognize that low UV ratings for certain plants don't diminish their potential significance. Rather, it underscores the need to focus on preserving and disseminating knowledge about these plants, as the loss of traditional wisdom may lead to the depletion of vital medical resources[37]. Medicinal plants with high UV values offer opportunities for scientific investigation alongside their conventional usage. Conducting phytochemical and pharmacological studies can validate traditional uses and uncover bioactive components, potentially leading to the development of evidence-based herbal therapies and pharmaceuticals. Identifying such plants also aids conservation efforts, ensuring their availability for future generations while preserving cultural and ecological value. Bridging the gap between traditional wisdom and scientific verification is essential to support safe and effective herbal treatments. Collaboration between conventional and scientific methodologies has been recognized in various research, enhancing informant consistency and knowledge sharing. The prevalence of menstrual irregularities, gastrointestinal diseases, and common illnesses across diverse locations aligns with the current study's findings.

***Fidelity level* (*FL*)**

In the present study, informants offered up to 10 therapeutic plants for both human and animal nourishment and treatment of illnesses. To further examine their bioactivity and medicinal qualities, these plants were chosen. To learn more about these plants' potential medical uses, additional research is required. The FL values demonstrate how well medicinal plants work to cure illnesses that are often seen. Higher FL values are thought to make some plants more suited for treating certain diseases. Conversely, plants with lower FL values may not be as effective in treating specific medical issues (Supplementary Table S4). This indicates that the traditional knowledge related to the usage of these plants goes above and beyond expectations and is founded on extensive experience and beneficial results. In addition to emphasizing a plant's medicinal potential, a high FL value may also point to that plant's possible resistance to certain illnesses[40]. When evaluating the effectiveness and potential of medicinal herbs, it is essential to combine traditional knowledge with scientific confirmation. Studies like highlight the need of fusing conventional wisdom with cutting-edge scientific methodologies in order to confirm traditional medicinal plant applications and investigate their therapeutic potential. In the final analysis, FL values provide useful information on the relative effectiveness of medicinal plants in curing certain illnesses and their potential as animal feed. To prove the bioactivity and medicinal qualities of these plants and to fully realize their potential advantages, more investigation and validation are required.

***Disease consensus index* (*DCI*)**

The current study employed the Disease-Consensus Index (DCI) to evaluate the effectiveness of various traditional therapies for different medical conditions. DCI values were used to measure the level of agreement among informants regarding the efficacy of specific medicinal plants. Among the numerous medicinal plant species assessed, several exhibited notably high DCI values, indicating their potential therapeutic value. *Tribulus terrestris*, *Syzygium cumini*, *Piper nigrum*, *Phyllanthus amarus*, and *Gymnema sylvestre* had the highest DCI values, closely followed by *Ocimum tenuiflorum*, *Ficus bengalensis*, *Azadirachta indica*, and *Justicia adhatoda*. These plants likely possess significant therapeutic properties for various medical conditions[41]. The DCI approach is widely utilized to assess the therapeutic efficacy of botanical remedies for specific ailments. Higher DCI values, as observed in this study, help identify plant species deserving further research and investigation. Elevated DCI values suggest that these plants exhibit strong medicinal characteristics, warranting additional scrutiny (Table 1). Furthermore, the study noted a positive correlation between the use values of medicinal plants and their DCI values, emphasizing the importance of traditional knowledge and the potential of these botanical species to offer effective remedies for various medical conditions[42]. The use of the Disease-Consensus Index (DCI) aids in discerning botanical specimens with noteworthy therapeutic attributes. This information can inform and guide future research and advancements in herbal medicine, leveraging the insights and consensus of local communities.

***Relative popularity level* (*RPL*)**

In this study, a comprehensive compilation of 38 plant species was documented based on the input of 20 informants. This highlights the profound knowledge held by the indigenous community regarding the therapeutic properties of botanical resources. Out of the considered species, 24 were singled out for further recognition, reflecting their

Table 1 — Highly utilized species of the study are along with UV, DCI, RPL and ROP

Name of medicinal plant	Number of citation by informants	Total number of informants	UV index	Disease-Consensus Index DCI	RPL	ROP
Abrus precatorius	12	20	0.6	0.063	0.72	89
Acacia nilotica	14	20	0.7	0.072	0.77	42
Achyranthes aspera	14	20	0.7	0.072	0.97	89
Justicia adhatoda	16	20	0.8	0.264	0.99	100
Argemone mexicana	12	20	0.6	0.032	0.63	92
Azadirachta indica	20	20	1	0.238	1	89
Senna alata	14	20	0.7	0.086	0.72	65
Cassia auriculata	15	20	0.75	0.076	0.73	67
Eclipta prostrata	14	20	0.7	0.073	0.81	56
Ficus bengalensis	17	20	0.85	0.212	0.76	78
Gymnema sylvester	12	20	0.6	0.106	0.98	100
Lawsonia inermis	16	20	0.8	0.041	0.71	65
Naravelia zeylanica	16	20	0.8	0.014	0.87	77
Ocimum tenuiflorum	20	20	1	0.271	1	100
Phyllanthus amarus	20	20	1	0.116	0.98	93
Piper nigrum	20	20	1	0.132	1	100
Pongamia pinnata	20	20	1	0.012	0.73	85
Santalum album	14	20	0.7	0.015	0.73	34
Strychnos nux-vomica	17	20	0.85	0.012	0.98	85
Syzygium cumini	16	20	0.8	0.121	0.97	77
Tribulus terrestris	20	20	1	0.122	1	99
Vitex negundo	16	20	0.8	0.0231	0.79	72
Withania somnifera	17	20	0.85	0.011	1	100
Zizyphus jujube	20	20	1	0.011	0.87	61

perceived significance and efficacy in traditional medicine. It's noteworthy that the cumulative citations for these 24 species did not show an upward trend with an increase in the number of informants. This suggests a collective agreement among informants regarding the importance of these plants in addressing specific health conditions, bolstering the credibility of their traditional use. Among the 24 selected species, 15 were categorized as unpopular, cited by fewer than 11 informants, while 5 were deemed popular, recognized by 19 or more informants. This categorization helps distinguish between frequently used botanical species and those with more specialized applications, shedding light on their cultural significance and therapeutic potential. Species like *Azadirachta indica, Ocimum americanum, Piper nigrum, Tribulus terrestris*, and *Withania somnifera* received the highest Relative Popularities Level (RPL) value of 1.0, showcasing their strong presence in traditional medicinal practices and endorsement among the indigenous population[43]. This prevalence suggests their consistent effectiveness in treating various ailments. The correlation between low Relative Frequency of Citation (RFC) values for certain plant species and findings from prior ethnomedicinal research was observed, emphasizing the importance of prioritizing and further investigating widely recognized and frequently referenced plants. The community's extensive knowledge and ongoing use of these plants imply their efficacy and safety. In essence, the selection of these 24 plant species for study was guided by the expertise of informants and their extensive utilization within the local traditional medicine system. Integrating traditional wisdom with empirical inquiry can harness the inherent curative properties of these botanical varieties, contributing significantly to evidence-based herbal medicine[44].

***Rank order priority* (*ROP*)**

The ROP scores signify the significance and weight attributed to different medicinal plant species. Among the species analyzed, 22 were classified as having high ROP scores, with values of 50 or higher. Notably, *Justicia adhatoda, Gymnema sylvestre, Ocimum tenuiflorum, Piper nigrum*, and *Withania somnifera* received perfect ROP scores of 100. Additionally, *Argemone mexicana, Phyllanthus amarus*, and *Tribulus terrestris* scored 92, 93, and 99, respectively, among the 24 species evaluated[45]. This highlights the importance of researching these specific plant species in terms of their historical use and potential medicinal benefits. These findings underscore the significance of certain medicinal plant species with high ROP scores and emphasize the need for further investigation into their therapeutic potential, shedding light on their prioritization based on health benefits.

Conclusion

In conclusion, this study offers a comprehensive overview of the ethnobotanical uses of indigenous plants in the Kanyakumari district. It emphasizes the extensive knowledge and utilization of traditional herbal remedies by the Kani tribes. The results emphasize the significance of conserving traditional knowledge systems, raising awareness about traditional treatments, and integrating them with contemporary healthcare practices. Additionally, this study highlights the importance of ethnobotanical research in informing conservation strategies and promoting the sustainable utilization of medicinal plant resources. By recognizing and safeguarding indigenous knowledge, we can cultivate a mutually beneficial connection between humans and the environment, while also harnessing the therapeutic value inherent in traditional herbal medicine.

Supplementary Data

Supplementary data associated with this article is available in the electronic form at https://nopr.niscpr.res.in/jinfo/ijtk/IJTK_23(01)(2024)39-48_SupplData.pdf

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Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors' Contributions

EG & RP: Conceptualization, Visualization, Writing - review & editing; UK: Writing - original draft; PP and KS: Review & editing; ARC: Review & editing; and NP: Supervision, Review & editing.

Consent to Participation

Signed "consent to participate" certificate was taken from the farmers & tribals participating in the survey.

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