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Scientific rationality, adoption and perceived effectiveness of ethno medical practices on Throat Infection in Idukki District Kerala

¹Sundaramari M, ²Priyanka R, ³Simi Asharaf and ²Rajaguru S

¹Dean, School of Agriculture and Animal Sciences, The Gandhigram Rural Institute (DTBU), Gandhigram, Dindigul, Tamil Nadu, India

²Guest Faculty, School of Agriculture and Animal Sciences, The Gandhigram Rural Institute (DTBU), Gandhigram, Dindigul, Tamil Nadu, India

³Assistant Professor Cardamom Research Station, Kerala Agricultural University, Pampadum para, Idukki, Kerala, India

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Corresponding Author: Sundaramari M

Abstract

The present study aimed to document traditional ethno-medicinal practices (EMPs) used for the treatment of throat infections among tribal farmers of Idukki district, Kerala, to scientifically assess the rationality of selected practices, and to analyze their extent of adoption and perceived effectiveness. Field surveys, participatory informal interviews, and focus group discussions were carried out across major tribal groups to record indigenous knowledge related to throat ailments. Scientific validation of the selected EMPs was undertaken through expert evaluation and review of relevant literature to examine their therapeutic plausibility. A total of six EMPs involving six medicinal plant species were identified for the management of throat infections. Scientific assessment revealed that three EMPs were rational and supported by pharmacological evidence, while the remaining practices lacked sufficient scientific support. Adoption of the documented EMPs ranged from 22.78 per cent to 95.35 per cent, indicating varying levels of community acceptance. Four EMPs were adopted by more than half of the respondents and were perceived as effective by the tribal farmers. Frequently used medicinal plants such as *Camellia sinensis*, *Ferula narthex*, and *Terminalia bellirica* are known to contain bioactive compounds with antimicrobial, antioxidant, and immunomodulatory properties. The findings highlight the continued relevance, cultural importance, and therapeutic potential of traditional ethno-medicinal practices for throat infections. The study emphasizes the need for systematic scientific validation, conservation of medicinal plant resources, and preservation of indigenous knowledge to support sustainable and community-based healthcare systems.

Keywords: Ethnomedical practices, adoption, perceived effectiveness

1. Introduction

Throat infections are among the most common health problems affecting rural and tribal populations, particularly in regions with limited access to modern healthcare facilities. Indigenous communities have traditionally depended on locally available medicinal plants and inherited knowledge systems to manage such ailments. These ethno-medicinal practices (EMPs), passed down through generations, form an integral part of the primary healthcare system of tribal societies.

Idukki district of Kerala is home to several tribal groups who possess rich traditional knowledge related to the use of medicinal plants for treating common diseases, including throat infections. However, much of this knowledge remains undocumented and scientifically unexplored, posing a risk of erosion with changing lifestyles and reduced intergenerational transfer.

In this context, the present study was undertaken to document the ethno-medicinal practices used by tribal farmers of Idukki district for the treatment of throat infections, to assess their scientific rationality, and to examine their adoption and perceived effectiveness within

the community. Such an approach not only helps in validating indigenous knowledge but also contributes to the conservation and potential integration of effective traditional remedies into mainstream healthcare systems.

2. Objectives

1. To identify and document ethno medicinal practices (EMPs) used for throat Infection among tribal farmers in Idukki.
2. To scientifically assess the therapeutic potential and rationality of selected EMPs.
3. To analyze the extent of adoption and perceived effectiveness of these selected EMPs within the community.

3. Research Methodology

The study was carried out in three distinct phases.

Phase I: Documentation of Ethno-Medicinal Practices (EMPs)

In the first phase, nine major tribal groups of the Idukki district, Muthuvan, Mannan, Malayaraya, Ullada, Hill

Pulayan or Mala Pulayan, Paliyan, Malavedan, and Malapandaram were selected for the study. The local health care system of these tribes primarily relies on Ethno-Medicinal Practices (EMPs). To ensure comprehensive representation, all eight blocks of the district were purposively chosen based on the high concentration and scattered population of tribal communities, after consultations with officers from the Integrated Tribal Development Project (ITDP), Thodupuzha. The inference is in line with the findings of Sundaramari. M *et al.*, (2025) [5]. Ten traditional healers or elderly farmers aged above sixty years and possessing thirty to forty years of experience were selected from each tribal group through a judgment sampling method, with assistance from tribal promoter workers of the respective village panchayat offices. This resulted in a total of ninety respondents. Data regarding EMPs related to the treatment of hypotension were collected through participatory informal interviews. To validate and refine the gathered information, nine focus group discussions (one for each tribal group) were conducted, in which a total of one hundred and eleven healers and farmers participated.

Phase II: Rationality Assessment of EMPs

In the second phase, after excluding tribe- and block-specific EMPs, a rationality analysis was conducted on the remaining six EMPs. The rationality of these EMPs was assessed by experts in Agadathantra (Toxicology) from various Ayurveda and Siddha medical colleges across Kerala and Tamil Nadu. A structured questionnaire was used, following a four-point continuum suggested by Husain and Sundaramari (2011) [2], wherein the experts were asked to rate each EMP as rational based on scientific evidence, rational based on experience, irrational based on experience, or irrational based on scientific evidence, and corresponding scores of 4, 3, 2, and 1 were assigned respectively. Out of sixty-four experts approached, fifty-two responded by returning the filled-in questionnaires. The mean score for each EMP was calculated, and EMPs with a mean score of 2.5 and above were considered rational, while those below 2.5 were classified as irrational. With the guidance of experts, the underlying principles of the rational EMPs were further explored through open-ended questions. For validation purposes, forty-three additional experts from the Dravyaguna (Ayurvedic Pharmacology) departments were also consulted.

Phase III: Adoption and Perceived Effectiveness of EMPs

In the third phase, the extent of adoption and perceived effectiveness of the EMPs among tribal farmers were assessed using a structured interview schedule. Two or more villages were selected from each of the eight blocks, namely Adimali, Devikulam, Nedumkandam, Elamdesam, Idukki, Kattappana, Thodupuzha, and Azhutha, making a total of forty village panchayats. A total of four hundred and fifty-two tribal farmers were selected through a proportionate random sampling technique. The inference is in line with the findings of Sundaramari M *et al.*, (2025) [6].

Adoption was operationalized as the extent to which an individual respondent had ever practiced the selected EMPs. Each EMP was described in detail to the respondents, and they were asked whether they had ever followed that practice. A score of one was given for a “Yes” response and

zero for a “No.” The scores were then summed up and the Adoption Index (AI) was calculated using the formula:

$$\text{Adoption index of EMPs} = \frac{\text{Number of farmers adopted}}{\text{Number of farmers having applicability}} \times 100$$

The perceived effectiveness of the EMPs, defined as the degree of usefulness perceived by the farmers in addressing hypotension conditions, was measured using the Perceived Effectiveness Index (PEI) methodology developed by Husain and Sundaramari (2011) [2]. An EMP with a mean perceived effectiveness index (MPEI) of three was considered most effective, an EMP with an MPEI of two was considered moderately effective, and an EMP with an MPEI of one was considered least effective. EMPs having an MPEI greater than two were classified as effective based on the farmers’ perception, whereas those below this value were considered less effective. Only EMPs adopted by at least fifty percent of the farmers were included for the assessment of perceived effectiveness.

Results and Discussion

Scientific rationale behind the rational EMPs on Throat Infection

In the case of throat-related diseases, six ethnomedicinal practices (EMPs) were selected for the study, of which four practices were scientifically validated as rational by experts. The details of these rational practices are presented in Table 1.

It is evident from the Table that almost all the plants used in the rational EMPs were found to contain various phytochemicals such as flavonoids, catechins, coumarin, epicatechin, alkaloids, terpenoids etc. in different combination as indicated against each medical practices in the below table. These phytochemicals are indicated to possess antioxidant, antimicrobial and immunomodulatory activities that would cure throat related diseases. The inference is in line with the findings of Mehreen *et al.*, (2016) [3].

There are six EMPs on throat infection, consisting of six medical plant species. The detailed results are explained in the Table.

It could be observed from Table 1 that out of the six EMPs related to the throat aid, three (2,3 and 6) were rated as rational, and three others (1, 4, and 5) were rated as irrational. One EMP (2), two EMPs (3 and 4), one EMP (6), and two EMP (1 and 5) were found adopted by more than 90, 70-90, 60-70, and less than 50 percent of respondents, respectively. It is evident from the table that four practices were perceived as effective by the respondents.

More than 50.00 percent of the respondents had adopted the four practices and perceived as effective of which three were rational and the other one as irrational. EMP 2 was adopted by 95.35 percent of the respondents with an MPEI of 2.40. *Camellia sinensis* contains chemical constituents such as tannic acid, gallic acid, quercetin, xanthine, adenine, saponins, theophylline, catechin, and epicatechin. It possesses anti-bacterial and antioxidant activities. It also contains a catechin polysaccharide complex with immune stimulatory activity (Akram *et al.*, 2014) [1]. *C. sinensis* contains polyphenols that have anti-bacterial activity (Mahmood *et al.* 2010) [4]. Hence, higher adoption of this EMP against throat pain is justifiable.

Table 1: Practice wise rationality, adoption and perceived effectiveness of EMPs on throat infection

Sl. No.	Ethno medicinal Practices	Rationality	Adoption		MPEI
			Number	%	
1	EMP 1 Wood ear (<i>Auricularia auricular-judae</i> (Bull.) J.Schrot./ <i>Auricula buccina</i> . Mart) 20 gm paste prepared with toddy with a shelf life of 1 hour taing 10 gm inside and applyingexternally twice a day to cure throat pain	2.12 IR	194	42.92	-
2	EMP 2 Tea (<i>Camellia sinensis</i> (L) Kuntze) 350 ml decoction prepared by boiling 10 gm tender leaves in 750 ml water mixed with 25 ml sour gruel and 10 gm rock salt with shelf life of 1 day gargling a day thrice for three days to cure throat pain.	3.32 R	431	95.35	2.40 E
3	EMP 3 Asafoetida (<i>Ferula narthex</i>) 300 ml decoction prepared by boiling 15 gm root gum in 500 ml water with a shelf life of 30 minutes gargling twice a day to cure throat pain.1111	2.85 R	356	78.76	2.35 E
4	EMP 4 Nutmeg (<i>Myristica fragrans</i>) paste prepared by grinding 7 gm leaf petiole and 2 gm thippali mixed with 1 gm rock salt with a shelf life of 1 day, taking twice a day to cure throat pain.	1.90 IR	324	71.68	2.26 E
5	EMP 5 Tamarind (<i>Tamarindus indica</i> L.) decoction prepared by boiling 100 ml thick fruit pulp in 450 ml water for 5 minutes mixed with 100 gm rock salt and 10 gm common salt with a shelf life of 1 day gargling a day thrice to cure sour throat.	2.02 IR	103	22.78	-
6	EMP 6 Bastard myrobalan (<i>Terminalia bellirica</i> (Gaertn.) Roxb.) the formulation prepared by mixing 10 gm seed powder, 1 gm rock salt 3 gm rock salt, 3 gm black pepper and 1 gm dried ginger powder with a shelf life of 3 days taking twice a day with one glass boiled water cinnamon stem bark to cure throat pain.	2.57 R	315	69.69	2.30 E

In throat aid, six EMPs were taken up for the study, of which three practices were judged as rational by the scientists. Four EMPs were adopted by more than fifty percent of the respondents and all four practices were perceived as effective.

Conclusion

The present study documented and evaluated ethno-medicinal practices (EMPs) used by tribal farmers of Idukki district for the management of throat infections, integrating indigenous knowledge with scientific validation and community perception. Six EMPs involving six medicinal plant species were identified and subjected to rationality assessment, adoption analysis, and perceived effectiveness evaluation.

Scientific scrutiny revealed that three EMPs (EMP 2, EMP 3, and EMP 6) were rational, supported by the presence of bioactive phytochemicals such as flavonoids, catechins, tannins, alkaloids, and terpenoids, which are known for their antimicrobial, antioxidant, and immunomodulatory properties. These findings corroborate with earlier scientific reports and validate the traditional wisdom underlying these practices. The remaining three EMPs were categorized as irrational based on expert judgment, though they continued to be used within the community.

Adoption analysis indicated a high level of acceptance of EMPs among tribal farmers, with four practices being adopted by more than 50 per cent of the respondents. Overall, the findings highlight that several traditional remedies for throat infection are both widely accepted and scientifically plausible. Systematic validation and promotion of rational EMPs can help preserve indigenous knowledge and support their integration into primary healthcare systems.

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