TO STUDY ETHNOPHARMACOLOGY AND PUBLIC AWARENESS STUDY ON CINNAMOMUM ZEYLANICUM IN SOUTH INDIA

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ABSTRACT

As a flavouring agent as well as a medicinal herb, cinnamon (*Cinnamomum zeylanicum*) has been used throughout history for its health benefits. The culture in which it is used may vary from one another. Observe how the Indian population views cinnamon and how it is used in their daily lives. In Pondicherry, India, a novel questionnaire was utilized in a 3-month cross-sectional study. This survey resulted in the collection of 600 responses in total. It was found that 95.6% of respondents were females, 75.54 % were adults, 66.7% were married, and 60.21 % had a bachelor's degree. Eighty-five percent of those surveyed knew about cinnamon and used it as a bark (40.7%) and as a flavouring agent (758%). A majority (50%) of menstrual pain and menstrual cramps were relieved by using this medication, while 36.0% of people used it as an antidiabetic, while 6.7% of people used it for weight loss. Family and relatives (76.0%) used cinnamon, i.e., folkloric knowledge, to provide information on cinnamon use. Indians' knowledge and usage of cinnamon are influenced by folkloric uses of the spice.

Key words: Indian community, cinnamon, phytochemicals, folklore uses, menstrual problems, antidiabetic,

INTRODUCTION

Humans were the first to discover that plants could be used as medicines. From 70,000 years ago, people believed that plants had healing powers. Different diseases and pain were treated with plants containing active phytochemicals. In the past, herbs have been used for therapeutic purposes, which led to the development of herbalism (herbal medicine). A major milestone in the development of scientific pharmacy was the isolation of medicinally active phytochemicals in the early nineteenth century. Scientists and physicians in ancient India were interested in herbs and medicinal plants.

Besides Cannabis sativa, there are other plants that are used as sources of local and general anesthetics such as *Hyoscyamus aureus* and *Papaver somniferum*. It has been estimated that Indian botanists, physicians, and pharmacologists have discovered over 355 species of medicinal plants. Herbal medicine was developed in the early days of the 20th century in a great deal of part by Indians. Although there are a handful of herbalists who are well-educated and experienced in their field, there are not many of them. The number of plants still used for therapeutic purposes in Indian traditional medicine is less than 255.

The loss of their natural habitat in the East is caused by detrimental climatic and environmental changes. In spite of this, local medicinal herbal treatments have still been used for centuries in order to treat various illnesses.

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There are a number of plants that have been used in Indian medicine for treating skin diseases such as *Anchusa strigosa*, *Alchemilla vulgaris*, and *Calotropis procera*. Several different types of plants have been used for the treatment of cancer, including *Arum palaestinum*, *Allium cepa, and Brassica oleracea.*

Bedouins used to make a drink from the leaves of Artemisia herba-alba as well as *Haplophyllum tuberculatum* as a means of treating coughs. *Convolvulus hystrix* and *Euphorbia hierosolymitana* roots and the leaves of *Cassia italica's* tea have been used for treating constipation. In the past, people who had fever used *Achillea fragrantissima*, *Varthemia iphionoides*, and *Haplophyllum tuberculatum* leaves as bath treatments.

Honey and plain coffee are used to treat anemia in traditional Yemeni medicine as coffee enhances honey's effects. The best healing properties are also believed to be found in coffee husk decoctions flavoured with cardamom and ginger. Jaundice can be treated with boiled roots and fruits of *Citrullus colocynthis* (murrah), which also act as cathartics, diuretics, and hydragogs. There is also a long-standing tradition of using *Plantago coronopus* L., a species of Plantago, as a laxative.

In the field of medicinal plants, there is a rich tradition that can be found in India. A widely used herb for menstrual problems among Indian women is *Trigonella foenum-graecum* L., commonly referred to as hulba. Aphrodisiac benefits and blood glucose level control are also two ways in which hulba is used in diabetes and as an aphrodisiac. There are many traditional foods like kapssa that use *Elettaria cardamomum* Maton (heil) as a spice. Additionally, it is a stimulant as well as a carminative that also has a wealth of health benefits.

For contusions and sprains, Curcuma longa L. (curcuma) is applied as a paste. It is said that the fruit of *Piper longum* L. (filfil) can be used to treat colds, coughs, and headaches using its fruits. As a coloring agent for the skin and hair, *Lawsonia inermis* L. leaves are widely used in the form of henna leaves. Aside from treating skin and liver problems, henna is believed to reduce body heat. Coffee decoction is a traditional drink that is the most commonly consumed beverage in Indian cultures. There is no doubt that it has a stimulating and diuretic effect on the body. Carminative and aphrodisiac properties are found in the wood of *Aquilaria agallocha* in India.

As far as cinnamon is concerned, *Cinnamomum zeylanicum* is one of the plants in the Lauraceae family. In India, Sri Lanka, Indochina, and Madagascar, there is a wild tree called *C. zeylanicum* that grows wild in tropical climates. From a crude extract of *C.zeylanicum*, a variety of phytochemical compounds were isolated and identified. The compounds that are commonly found in cinnamon include (E)-cinnamaldehyde, trans-cinnamamic acid, trans-cinnamyl acetate, cinnzeylanine, cinnzeylanol, and cinnamtannin B-1, among others.

Cinnamon barks are used in a number of cultures around the world as a flavoring agent/spice. The use of cinnamon is traditional and still used today to treat gastrointestinal complaints. It is believed that cinnamon oil can enhance your mood in aromatherapy. Individuals with Parkinson's disease can be diagnosed with hyposmia caused by Parkinson's disease using a selective olfactory defect test with cinnamon. Studies in mice have demonstrated antinociceptive (analgesic) effects of ethanolic extracts from cinnamon. People and animals have been shown to benefit from cinnamon alone or combined with oregano and fenugreek.

According to the study, the lipid levels and glucose levels of 70 Indians with type 1 diabetes mellitus (DM) decreased. It is widely known in the East that cinnamon is used for a variety of purposes. The Middle Eastern cuisine usually adds this spice to savoury dishes to make them more flavorful. In pregnancy, Eastern women used cinnamon to alleviate stomach aches and bloating. Cinnamon was used to control glucose levels by 3.6% of 170 diabetic patients. It has been reported that cinnamon has been found to have a cleansing effect on female genital systems according to a study conducted in SLIMS, Pondicherry. There was a survey conducted in India in order to collect ethnobotanical data. Folklore tells us that cinnamon is used in Western India for antiseptic purposes, as well as for relieving nausea and vomiting.

MATERIALS AND METHODS

The Eastern Province of India was examined through a quantitative cross-sectional study.

Study duration and location:

The study was conducted in the city of Pondicherry, India, and was conducted over the period of 3 months, between the months of February and April 2019.

Exclusion criteria and target population:

It was intended to reach a public that resides in the Pondicherry City area of India, the target population. In addition to participants over 13 years of age, both male and female citizens participated in the study, regardless of their education level.

Instruments used in research:

As part of the study, a questionnaire was developed in the English language which was then used in the study. As per the standard guidelines, the translation was carried out in accordance with the standards. An Indian speaker who speaks English as a second language drafted the original draft. There were two academic professors who validated the English version.

A questionnaire validation study:

Three clinical pharmacists, an herbalist, and three academic professors validated the tool's content in two

rounds of meetings. A content validity assessment was performed on all questions, so that a content validity ratio of 2.00 to 0.5 was achieved. It was found that the content validity index for the research instrument was 0.90. As a result, the research instrument contained a total of 15 questions. There are six sections on the questionnaire: demographic information; knowledge of cinnamon; prevalence of cinnamon use; part used, reasons for use, and health benefits of cinnamon; and sources of information. Cronbach's alpha value for the reliability analysis was 0.65, which is considered to be an acceptable value.

Procedural and sizing considerations for sampling:

We conducted an online survey as part of our research. An appropriate sampling method was selected after carrying out a population-based sample size calculation. Approximately 3,155,580 people were reported as part of the population. By using an online sample size calculator, the sample size was calculated based on this figure. There were 400 samples to be collected, according to the report.

Analyses of data:

There were a number of techniques used in entering the data into IBM Statistical Package for the Social Sciences (SPSS) Statistics, Version 22, for Windows. Counts of samples (N) and percentages (%) were used to express data. Chi-square ($\chi2$) test was used to evaluate correlations between demographics and cinnamon knowledge. A P-value of 0.06 was considered statistically significant for the study.

Ethics approval and participant consent:

Informed consent was obtained from all participants after a brief presentation about the study. As long as participants were willing to participate, an online questionnaire was filled out and their response was recorded. Indian Natural Products and Alternative Medicine Department approved this study.

RESULTS
Respondent demographics:

Approximately 75.5% of the respondents were adults (n = 440/600), most of whom were female (92.6%) and married (66.7%). The majority of the students (60.2%) had at least a bachelor's degree on their resume. Listed below are a summary of some of the demographic characteristics that can be found in Table 1. There is a majority of respondents (85.4%) who are aware of the use of cinnamon. Cinnamon was used as a flavouring agent by the majority (75.7%) of the respondents. About one-third of those who used cinnamon bark did so (n = 226, or 40.7% of those who used cinnamon bark). Table 2 shows a summary of what is known about the use of cinnamon in the world.

A one- third of the respondents to the survey reported that they use cinnamon once a month (35%), for medical or general health reasons. Cinnamon is believed by approximately half the respondents to ease menstrual pain and ease menstruation (50%) and to regulate blood glucose level (36%). Among the respondents, 6.7% reported weight loss activity, 5.4% reported miscellaneous uses (regulation of hormones, metabolic activity, blood circulation, minerals, treating colds, acting as diuretic, and lowering cholesterol), 3.8% reported digestive activity, and 2.0 % reported anticoagulant activity. Folkloric use of cinnamon was widely known by most respondents (80%).

Cinnamon use in the population:

According to the study, the prevalence of cinnamon use for the past three months was 46.5%. Table 3 lists individual prevalences by demographic groups.

Demographic factors and knowledge:

Knowledge variables were cross-tabulated with demographic variables such as age, gender, education level, and marital status. There was a weak association between age and cinnamon knowledge ($\chi2$ = 2.71, P<0.430, phi = 0.06). A similar relationship was found between age and the type of part used ($\chi2$ = 14.55, P<0.06, phi = 0.16). A significant relationship was created between marital status and education ($\chi2$ = 65.8, P<0.002, phi = 0.4 and $\chi2$ = 23.5, P<0.06, phi = 0.20, respectively). Table 4 provides a summary of the crosstabulation.

Table 1: Responses were categorized according to their demographic characteristics

VARIABLE	THE NUMBER	CALCULATE PERCENTAGES
Indicator of gender		
Male	55	9.6
Female	540	92.6
Age		
Adolescents	77	12.4
Adults	440	75.5
Old age	85	15.5
Marital status		
Single	200	34.8
Married	385	66.7

Widow	5	0.8
Qualifications		
Education at the primary level	8	2.3
Education at the intermediate level	25	5.2
Secondary education	195	34.3
Bachelor's degree	345	59.2
Master's degree/PhD	25	4.5

Table 2: An understanding of the use of cinnamon

VARIABLE	NO.	PERCENTAGE
Are familiar with cinnamon		
Yes	500	85.4
No	95	16.8
Include cinnamon in your diet?		
As a flavoring agent	440	75.8
Therapeutic purposes	65	11.4
Avoid using cinnamon	90	16

Table 3: An overview of cinnamon prevalence

SEGMENT BASED ON DEMOGRAPHICS	RATE OF PREVALENCE (%)	STATISTICAL CONFIDENCE INTERVALS (96%)
General	46.50	
Gender		42.40-50.61
Male	51	
Female	46.10	36.55-65.48
Relationship status		41.88-50.38
Single	47.20	40.09-54.43
Married	46.23	41.20-51.44

Table 4: Comparing demographics with cinnamon knowledge.

Analysis Of Cross Tabulations		N = 600				P VALUE
		OBSERVED (EXPECTED COUNT)				
Age	familiar with cinnamon?	Yes		No		0.43
	Teenagers	53(56.7)		15(11.5)		
	The adult population	380(377)		66(69.5)		
	The elderly	72(71.9)		14(14.3)		
Age	consumption of cinnamon?	As bark	As cinnamon oil	Powder	Not applicable	0.04
	Teenagers	19 26.6	2 3.4	14 12.9	35 27.5	
	The adult population	190 170.2	13 15.0	78 79.2	177 175.0	
	An aging population	29 33.6	8 3.0	16 16.2	35 34.7	
Relationship status	consumption of cinnamon?	As bark	As cinnamon oil	Powder	Not applicable	00
	Single	40 77.2	6 7.8	32 36.5	125 79.9	
	Married	190 150.5	16(14.2	74 69.0	222 155.7	
	Widow	3 2.0	00	2 0.8	2 2.7	
Qualifications	How do you use cinnamon?	As bark	As cinnamon oil	Powder	Not applicable	0.04
	Primary	2 1.6	0	1 1.4	3 3.9	
	Intermediate	6 8.2	0	2 3.3	20 10.0	

Secondary	64 75.0	7 7.7	35 35.9	94 78.7	
Bachelor's degree	145 135.5	14 12.7	75 70.0	120 135.0	
Master's degree/PhD	10 8.8	2 0.8	5 4.7	8 9.0	

DISCUSSION

Many cultures have used cinnamon throughout history for a variety of purposes. Additionally, to its culinary applications, cinnamon also contains antioxidants, antidiabetic properties, digestive aids, antibacterial properties, as well as properties beneficial to respiratory problems and gynecological conditions. Cinnamon bark and essential oil are mostly used for health and other purposes. Cinnamon bark is also used to extract essential oils.

Various groups of people use cinnamon differently based on its folklore uses. In this study, we attempted to report ethnobotanical and ethnopharmacological usages of cinnamon in the eastern part of India, which was followed by a review of the current knowledge regarding cinnamon. A large portion of the respondents knew about cinnamon, and most of them used it in their food as a flavoring agent, so cinnamon had an overwhelming presence among the respondents. A flavoring agent, cinnamon is widely used to flavor foods, baked goods, sweets, and drinks due to its aromatic and flavoring properties.

Pharmaceutics such as toothpaste, mouthwashes, and mouth fresheners also use cinnamon as an ingredient. When it comes to baked gingerbread, cinnamon blends wonderfully with other natural ingredients such as cloves, anise, and nutmeg in the Western cuisine, in addition to other spices. In our study, cinnamon was found to be a suitable flavoring agent, as reported in previous studies. Most respondents in our survey preferred cinnamon bark over cinnamon powder or essential oil. Bark has a lower price and is more readily available than oil or powder. Cinnamon bark can also be stored relatively more easily than other forms of cinnamon. Powder lasts only a few months at room temperature while bark can be stored for up to 2.5 years. It is also a concentrated product, predominantly used for therapeutic purposes. There is therefore a greater convenience to consumers when using the bark. Cinnamon is most commonly used by women for menstrual pain and ease of menstruation. Cinnamon is widely reported to ease menstruation and reduce menstrual cycle pain in numerous studies. Thus, we can conclude that our findings are congruent with literature that has already been published. Secondly, blood sugar levels were regulated.

Cinnamon contains polyphenols that improve insulin sensitivity, making it an anti-diabetic. A number of studies have also reported the use of cinnamon in folklore and knowledge of its properties. Among the fraction of users, a small majority used the product as a weight loss supplement and digestive aid. Various studies have shown that cinnamon increases bile flow and biliary solids. Cinnamon has been reported to be an effective digestive and carminative agent in pregnant women. As a result, our findings agree with the same. It has been reported that cinnamon reduces serum cholesterol, low-density lipoprotein, and triglyceride levels, and increases high-density lipoprotein levels for weight loss. In addition to hyperlipidaemia, Klop mentions obesity as a metabolic risk.

Due to its antihyperlipidemic activity, cinnamon may aid weight loss; however, no studies have confirmed this. Taking into account the folkloric use of a plant within the Indian community, it is a novel finding. Cinnamon is used by family and relatives and knowledge of its uses comes from them, according to our study. Cinnamon is used in three quarters of respondents' families. As a result, the use and knowledge of cinnamon were influenced by the folkloric use of plants. Traditionally, folkloric use refers to how herbs were used in ancient times and how they have been passed down from generation to generation. Cinnamon is used extensively in the Indian community based on the findings of this study. Content validation was performed on a novel survey we developed in English.

Its additional strength was the fact that a large sample size of respondents was gathered in this study. Study findings are not generalizable to the whole Indian population due to convenient sampling. It is recommended to investigate the herb's use and general knowledge in patients with diabetes and hyperlipidaemia.

CONCLUSION

Indians were found to have a very significant influence on cinnamon knowledge and use as a result of folkloric use of cinnamon.

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